

FCC SAR TEST REPORT

FCC ID : UZ7-RTL10C1
Equipment : Tablet PC with Windows OS
Brand Name : Zebra
Model Name : RTL10C1
Applicant : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Manufacturer : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Standard : FCC 47 CFR Part 2 (2.1093)

The product was received on Jan. 04, 2022 and testing was started from Jan. 12, 2022 and completed on Jan. 22, 2022. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Cona Huang / Deputy Manager



Sporton International Inc. EMC & Wireless Communications Laboratory

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History of this test report

Report No.	Version	Description	Issued Date
FA181117	01	Initial issue of report	Feb. 21, 2022



1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Zebra Technologies Corporation, Tablet PC with Windows OS, RTL10C1, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary		Highest Simultaneous Transmission 1g SAR (W/kg)
			Body		
			1g SAR (W/kg)		
Licensed	WCDMA	WCDMA II	0.99		1.54
		WCDMA IV	0.94		
		WCDMA V	1.18		
	LTE	LTE Band 7	1.00		
		LTE Band 12	0.99		
		LTE Band 13	1.06		
		LTE Band 14	1.12		
		LTE Band 2 / 25	0.93		
		LTE Band 5 / 26	1.11		
		LTE Band 30	1.00		
		LTE Band 4 / 66	0.98		
		LTE Band 71	0.99		
		LTE Band 38 / 41	1.00		
		LTE Band 48	0.64		
		FR1	FR1 n5	1.09	
	FR1 n7		0.93		
	FR1 n12		1.18		
	FR1 n2 / n25		0.99		
	FR1 n66		0.98		
	FR1 n71		1.03		
FR1 n41	1.18				
FR1 n77	1.08				
DTS	WLAN	2.4GHz WLAN	0.37		1.54
NII		5GHz WLAN	0.58		1.50
DSS	2.4GHz Band	Bluetooth	0.07		1.50
Date of Testing:			2022/1/12 ~ 2021/1/22		

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

Reviewed by: Jason Wang
Report Producer: Carlie Tsai



2. Equipment Under Test (EUT) Information

2.1 General Information

Product Feature & Specification	
Equipment Name	Tablet PC with Windows OS
Brand Name	Zebra
Model Name	RTL10C1
FCC ID	UZ7-RTL10C1
Integrated WWAN Module	Brand Name: Quectel Model Name: RM505Q-AE
Integrated WLAN Module	Brand Name: Intel Model Name: AX210NGW
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77 : 3700 MHz ~ 3980 MHz WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE NFC: ASK
HW Version	EV
SW Version	Windows 10 Pro
FW Version	BIOS LRX09E06
MFD	2021/10/18
EUT Stage	Identical Prototype
	<ol style="list-style-type: none"> The device has two Samples and difference is appearance, the appearance of Xpad is based on the addition of a handle above the Xslate edge1, the antenna location was not change, RF exposure evaluation selects Xslate as the main test, Xpad will spot check worst case found in Xslate. The device implements the power management and sensor detection for SAR compliance and the smart transmit will manage to ensure the power level not exceeding the associated power table. The device implements the sensor to detect human body proximity and trigger power reduction for SAR compliance of UMTS B2/B4/B5, LTE B2/B4/B7/B25/B30/B38/B41/B66 and 5G NR n2/n7/n25/n41/n66/n77. The device support uplink MIMO for 5G FR1 n41, the Smart Transmit will control the device to transmit at higher power instantaneously, as high as Pmax, when needed, but enforces power limiting to maintain time-averaged transmit power to Plimit This device has NFC operations, the NFC antenna is integrated into the device for this model, therefore, all SAR test were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the antenna can be found in the operational description. According to FCC KDB publication 447498 D01v06, transmitters are consider to be operating simultaneously when there is overlapping transmission, with the exception of transmission during network hand-offs with maximum hand-off duration less than 30 seconds.

Accessories Information				
Adaptor with CLA cable	Brand Name	Zebra	Model Number	ADP-65JH HB
Battery	Brand Name	ZEBRA	Model Number	XLBM1
Power cord	Brand Name	Zebra	Model Number	450040

Support unit				
Keyboard	Brand Name	Zebra	Model Number	L10-KB
98 Whr Extended Battery (Certified)	Brand Name	Zebra	Model Number	XLBE1
AEI LONG RANGE RFID MODULE	Brand Name	Zebra	Model Number	M6E-MICRO
PASSIVE SHORT STYLUS	Brand Name	Zebra	Model Number	440007
ET8X MPP 2.0 ACTIVE STYLUS WITH 5 REPLACEMENT TIPS. AAAA BATTERY INCLUDED	Brand Name	Zebra	Model Number	SG-ET8X-STYLUS1-01

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02



3.1 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																															
FCC ID	UZ7-RTL10C1																																																														
Equipment Name	Tablet PC with Windows OS																																																														
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz																																																														
Channel Bandwidth	LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 14: 5MHz, 10MHz LTE Band 25: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 26: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 30: 5MHz, 10MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 48: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 71: 5MHz, 10MHz, 15MHz, 20MHz																																																														
uplink modulations used	QPSK / 16QAM / 64QAM / 256QAM																																																														
LTE Voice / Data requirements	Data only																																																														
LTE MPR permanently built-in by design	<p align="center">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6" style="text-align: center;">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table>	Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)																																																								
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256 QAM	≥ 1						≤ 5																																																								
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)																																																														
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																														
Power reduction applied to satisfy SAR compliance	Yes, Proximity Sensor.																																																														
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to section 13.																																																														
LTE Carrier Aggregation Additional Information	This device supports maximum of 3 carriers in the downlink and 2 carriers in the uplink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.																																																														



Transmission (H, M, L) channel numbers and frequencies in each LTE band																
LTE Band 2																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860				
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880				
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900				
LTE Band 4																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720				
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5				
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745				
LTE Band 5																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20407	824.7	20415	825.5	20425	826.5	20450	829	20450	829	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	847.5	20625	846.5	20600	844	20600	844	20600	844				
LTE Band 7																
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510	20850	2510	20850	2510				
M	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535				
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560	21350	2560	21350	2560				
LTE Band 12																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	23017	699.7	23025	700.5	23035	701.5	23060	704	23060	704	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5				
H	23173	715.3	23165	714.5	23155	713.5	23130	711	23130	711	23130	711				
LTE Band 13																
	Bandwidth 5 MHz				Bandwidth 10 MHz				Bandwidth 15 MHz				Bandwidth 20 MHz			
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)		Channel #		Freq.(MHz)		Channel #		Freq.(MHz)	
L	23205		779.5		23230		782		23255		784.5		23280		787	
M	23230		782		23255		784.5		23280		787		23305		789.5	
H	23255		784.5		23280		787		23305		789.5		23330		792	
LTE Band 14																
	Bandwidth 5 MHz				Bandwidth 10 MHz				Bandwidth 15 MHz				Bandwidth 20 MHz			
	Channel #		Channel #		Channel #		Freq.(MHz)		Channel #		Freq.(MHz)		Channel #		Freq.(MHz)	
L	23305		790.5		23330		793		23355		795.5		23380		798	
M	23330		793		23355		795.5		23380		798		23405		800.5	
H	23355		795.5		23380		798		23405		800.5		23430		803	
LTE Band 25																
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860				
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880				
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905				



LTE Band 26												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz			
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)		
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5		
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5		
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5		
LTE Band 30												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)					
L	27685		2307.5		27710		2310					
M	27710		2310									
H	27735		2312.5									
LTE Band 38												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580				
M	38000	2595	38000	2595	38000	2595	38000	2595				
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610				
LTE Band 41												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506				
L	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5				
M	40620	2593	40620	2593	40620	2593	40620	2593				
H	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5				
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680				
LTE Band 48												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	55265	3552.5	55290	3555	55315	3557.5	55340	3560				
L	55810	3607	55815	3607.5	55820	3608	55830	3609				
M	56170	3643	56165	3642.5	56160	3642	56150	3641				
H	56715	3697.5	56690	3695	56665	3692.5	56640	3690				
LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770
LTE Band 71												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	133147	665.5	133172	668	133197	670.5	133222	673				
M	133297	680.5	133297	680.5	133297	680.5	133297	680.5				
H	133447	695.5	133422	693	133397	690.5	133372	688				



3.2 General 5G NR SAR Test and Reporting Considerations

5G NR Information								
FCC ID	UZ7-RTL10C1							
Equipment Name	Tablet PC with Windows OS							
Operating Frequency Range of each 5G NR transmission band	5G NR n2: 1850 MHz ~ 1910 MHz 5G NR n5: 824 MHz ~ 849 MHz 5G NR n7: 2500 MHz ~ 2570 MHz 5G NR n12: 699 MHz ~ 716 MHz 5G NR n25: 1850 MHz ~ 1915 MHz 5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n71: 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz							
Channel Bandwidth	5G NR n2: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n5: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n7: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n12: 5MHz, 10MHz, 15MHz 5G NR n25: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n41: 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 80MHz, 100MHz 5G NR n66: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n71: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n77: 100MHz							
SCS	FDD: SCS15KHz, TDD: SCS30KHz							
uplink modulations used	DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM CP-OFDM QPSK / 16QAM / 64QAM / 256QAM							
A-MPR (Additional MPR) disabled for SAR Testing?	Yes							
LTE Anchor Bands for n2	LTE B5/12/13							
LTE Anchor Bands for n5	LTE B2/30/66							
LTE Anchor Bands for n7	LTE B5/12							
LTE Anchor Bands for n12	LTE B2							
LTE Anchor Bands for n25	LTE B12							
LTE Anchor Bands for n41	LTE B2/25/26/66							
LTE Anchor Bands for n66	LTE B5/12/13/14/71							
LTE Anchor Bands for n71	LTE B2/7/66							
NR Band 2								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860
M	376000	1880	376000	1880	376000	1880	376000	1880
H	381500	1907.5	381000	1905	380500	1902.5	380000	1900
NR Band 5								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	165300	826.5	165800	829	166300	831.5	166800	834
M	167300	836.5	167300	836.5	167300	836.5	167300	836.5
H	169300	846.5	168800	844	168300	841.5	167800	839
NR Band 7								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	500500	2502.5	501000	2505	501500	2507.5	502000	2510
M	507000	2535	507000	2535	507000	2535	507000	2535
H	513500	2567.5	513000	2565	512500	2562.5	512000	2560
NR Band 12								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 15MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	140300	701.5	140800	704	141300	706.5	141300	706.5
M	141500	707.5	141500	707.5	141500	707.5	141500	707.5
H	142700	713.5	142200	711	141700	708.5	141700	708.5



NR Band 25														
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz							
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)						
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860						
M	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5						
H	382500	1912.5	382000	1910	381500	1907.5	381000	1905						
NR Band 41														
	Bandwidth20MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 80MHz		Bandwidth100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	501204	2506.02	502200	2511	503202	2516.01	504204	2521.02	505200	2526	507204	2536.02	509202	2546.01
M	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99
H	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	529998	2649.99	528000	2640
NR Band 66														
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz							
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)						
L	342500	1712.5	343000	1715	343500	1717.5	344000	1720						
M	349000	1745	349000	1745	349000	1745	349000	1745						
H	355500	1777.5	355000	1775	354500	1772.5	354000	1770						
NR Band 71														
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz							
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)						
L	133100	665.5	133600	668	13410	670.5	134600	673						
M	136100	680.5	136100	680.5	136100	680.5	136100	680.5						
H	139100	695.5	138600	693	13810	690.5	137600	688						
NR Band 77														
	Bandwidth100MHz													
		Ch. #						Freq. (MHz)						
L		650000						3750						
M		656000						3840						
H		662000						3930						

3.3 Antenna switched capabilities of this device
<Pin Definition of Antenna Interfaces>

Transmit Antenna	Description	Transmit Frequency
MIMO1	5G NR: MHB_TRX & n41 TRX1 ¹⁾ LTE: MHB_TRX & UHB_PRX MIMO ²⁾ WCDMA: MHB_TRX	1400 – 5000 MHz
Main	5G NR: LB_TRX & MHB_DRX MIMO & n41_DRX1 ¹⁾ LTE: LB_TRX & MHB_DRX MIMO & UHB_DRX MIMO ²⁾ & LAA PRX WCDMA: LB_TRX	600 – 6000 MHz
Aux	5G NR: LB_DRX & MHB_PRX MIMO & n41 TRX0 ¹⁾ LTE: LB_DRX & MHB_PRX MIMO & UHB_TRX ²⁾ WCDMA: LB_DRX	600 – 5000 MHz

<Antenna Mapping>

Transmit Antenna	WCDMA	LTE	5G NR Reframed	n41	LB (MHz)	MHB (MHz)
MIMO1	MHB_TRX	MHB_TRX, UHB_PRX ¹⁾ MIMO	MHB_TRX, UHB_PRX ¹⁾ MIMO	TRX1 ²⁾	-	1452-2690
Main	LB_TRX	LB_TRX, MHB_DRX MIMO, UHB_PRX ¹⁾ MIMO, LAA PRX	LB_TRX, MHB_DRX MIMO, UHB_DRX ¹⁾ MIMO	DRX1 ²⁾	617-960	1452-2690
Aux	LB_DRX	LB_DRX, MHB_PRX MIMO, UHB_TRX ¹⁾	LB_DRX, MHB_PRX MIMO, UHB_TRX ¹⁾	TRX0 ²⁾	617-960	1452-2690

Remark:

1. UHB frequency range: 3400–3800 MHz
2. NR TRX1 = TX MIMO + PRX MIMO; NR DRX1 = DRX MIMO

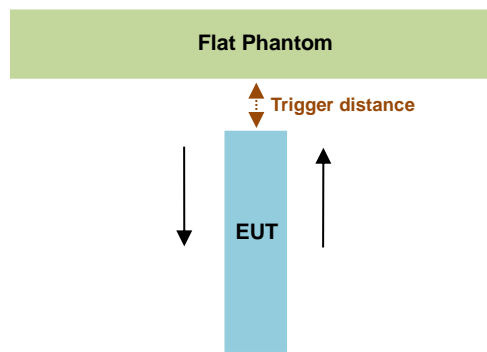
4. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance (KDB 616217 D04 section 6.2)>:

For the device is fully integrated, touch sensing capacitive sensor. It uses a charge transfer capacitive acquisition method that is capable of near range proximity detection. In this device offers a state of the art capacitive sensing engine with an embedded sampling capacitor and voltage regulator allowing the overall solution cost to be reduced and improving system immunity in noisy environments.

Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed. The details are illustrated as following, and the shortest triggering distances were reported and used for SAR assessment.

In the preliminary triggering distance testing, the tissue-equivalent medium for different frequency bands were used for verification; no other frequency bands tissue-equivalent medium was found to result in shortest triggering distance than that for 1900MHz, and the tissue-equivalent medium for 1900MHz was used for formal proximity sensor triggering testing.



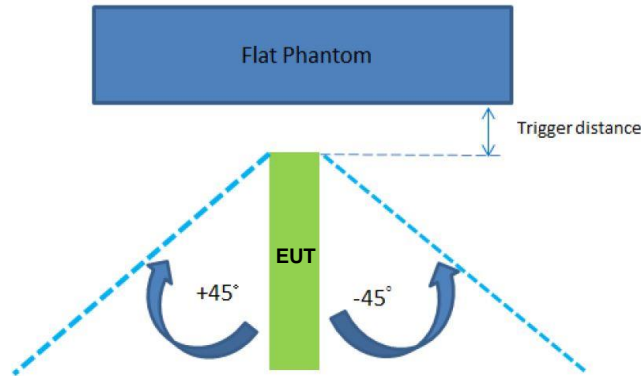
Proximity Sensor Trigger Distance (mm)												
Antenna	Main				MIMO 1				Aux			
Position	Bottom Face		Edge 1		Bottom Face		Edge 1		Bottom Face		Edge 3	
Minimum	Moving toward	Moving away	Moving toward	Moving away	Moving toward	Moving away	Moving toward	Moving away	Moving toward	Moving away	Moving toward	Moving away
		31	24	40	33	21	15	26	18	16	13	26

<Proximity Sensor Triggering Coverage (KDB 616217 D04 section 6.3)>:

Since the antenna and sensor are collocated and all of the peak SAR location is overlapping with the sensor pad for this device, therefore, According to KDB 616217 section6.3, these procedures do not apply and are not required for this device. Due to the antenna and sensor are collocated and the peak SAR location is overlapping with the sensor on this device.

<Tablet Tilt angle influences to proximity sensor triggering (KDB 616217 D04 section 6.4)>:

The influence of table tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at above separation distance. Rotating the tablet around the edge next to the phantom in $\leq 10^\circ$ increments until the tablet is $\pm 45^\circ$ from the vertical position at 0° , and the maximum output power remains in the reduced mode.



The Sensor Trigger Distance (mm)						
Position	Edge 1_Main		Edge 1_MIMO 1		Edge 1_Aux	
Minimum	+45	-45	+45	-45	+45	-45
		29	29	14	14	17

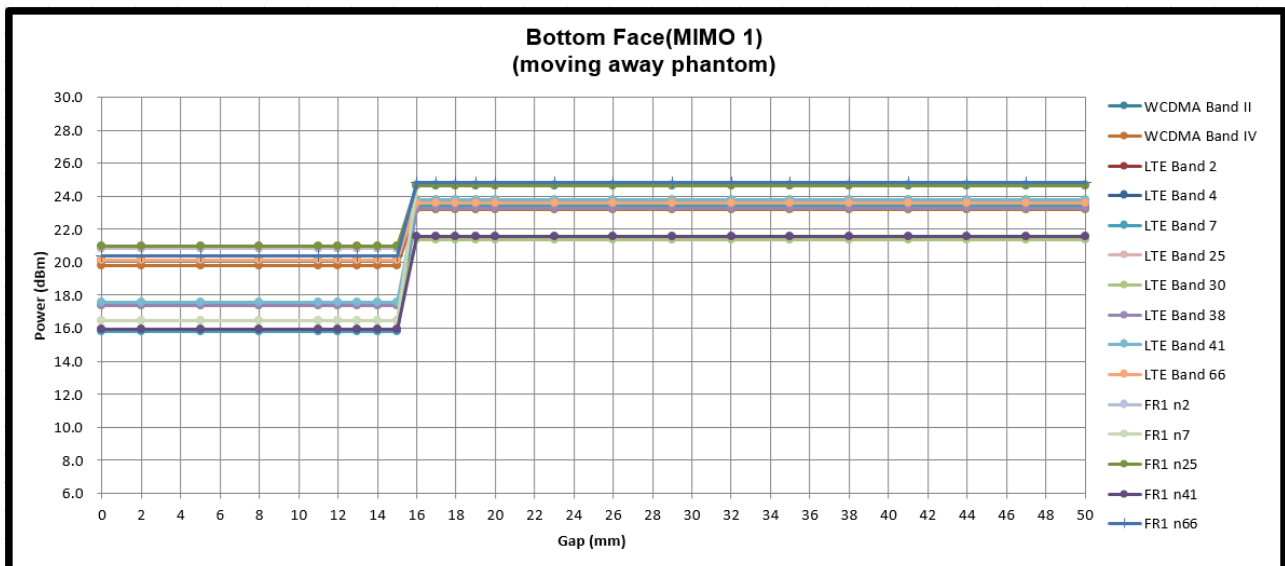
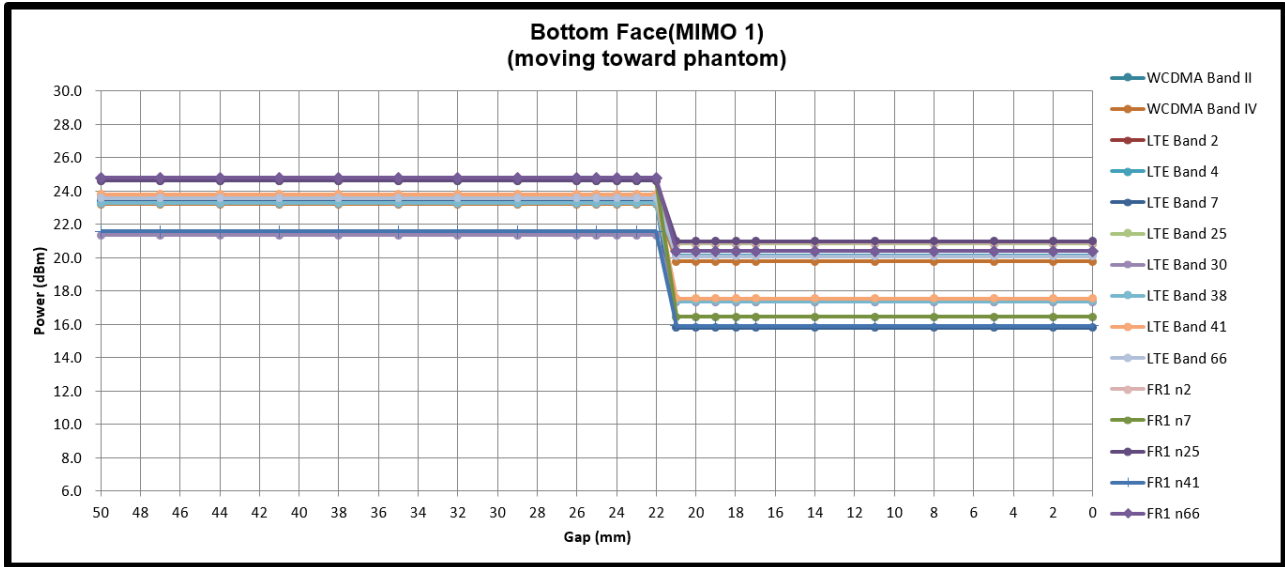
Proximity sensor power reduction

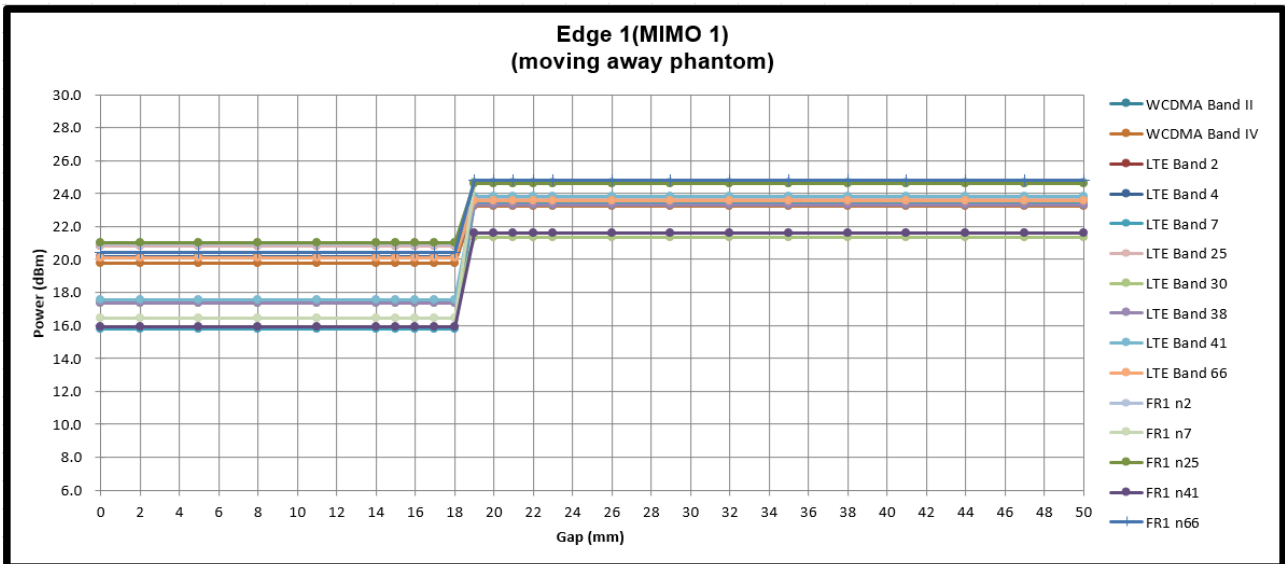
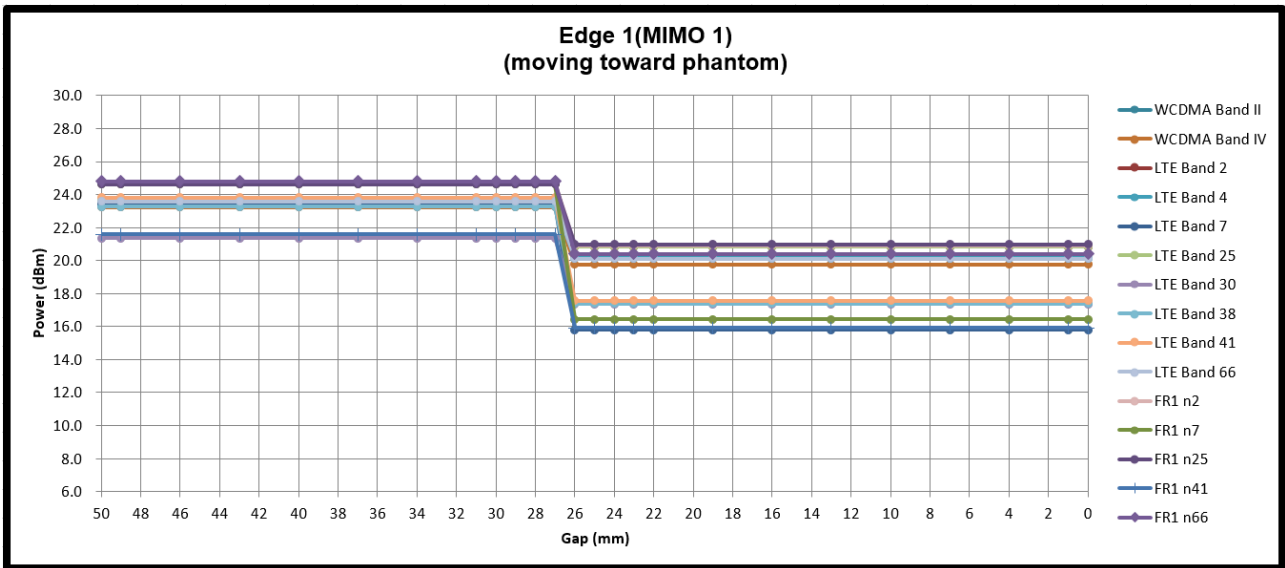
Exposure Position		Reduce Level (dB) Bottom Face/ Edge 1/ Edge 3 ⁽¹⁾
wireless mode	Antenna	
WCDMA II	MIMO 1	3.5 dB
WCDMA IV	MIMO 1	4.4 dB
WCDMA V	Main	0.6 dB
LTE B2/25	MIMO 1	3.8 dB
LTE B66/4	MIMO 1	4.8 dB
LTE B7	MIMO 1	8.3 dB
LTE B30	MIMO 1	5.3 dB
LTE B41/38(PC3)	MIMO 1	6.8 dB
LTE B41/38(PC2)	MIMO 1	8.2 dB
n7	MIMO 1	8.0 dB
n25/n2	MIMO 1	3.3 dB
n41	MIMO 1	5.7 dB
n41 HPUE	MIMO 1	5.7 dB
n41	AUX	6.2 dB
n41 HPUE	AUX	6.2 dB
n66	MIMO 1	3.9 dB
n77	AUX	2.4 dB
n77 HPUE	AUX	2.4 dB

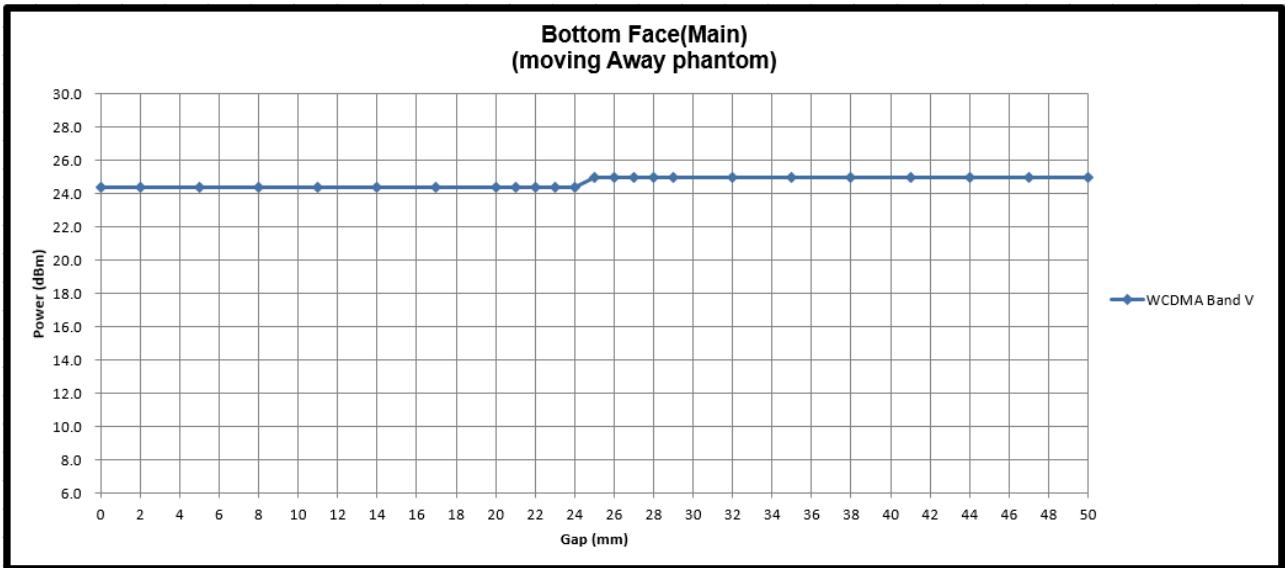
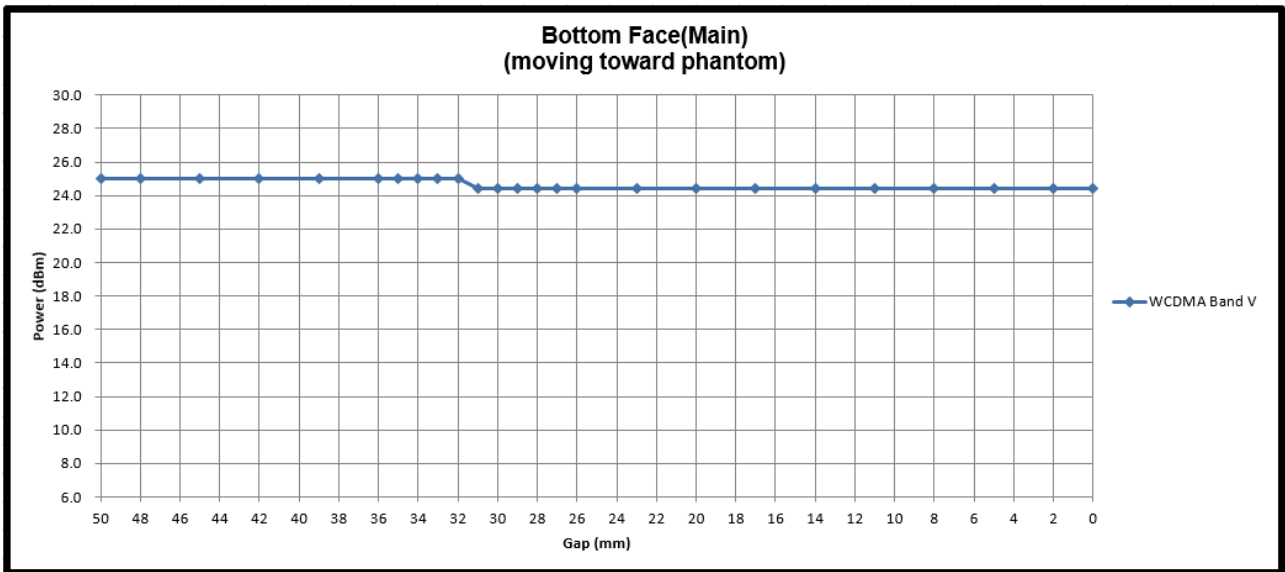
Remark:

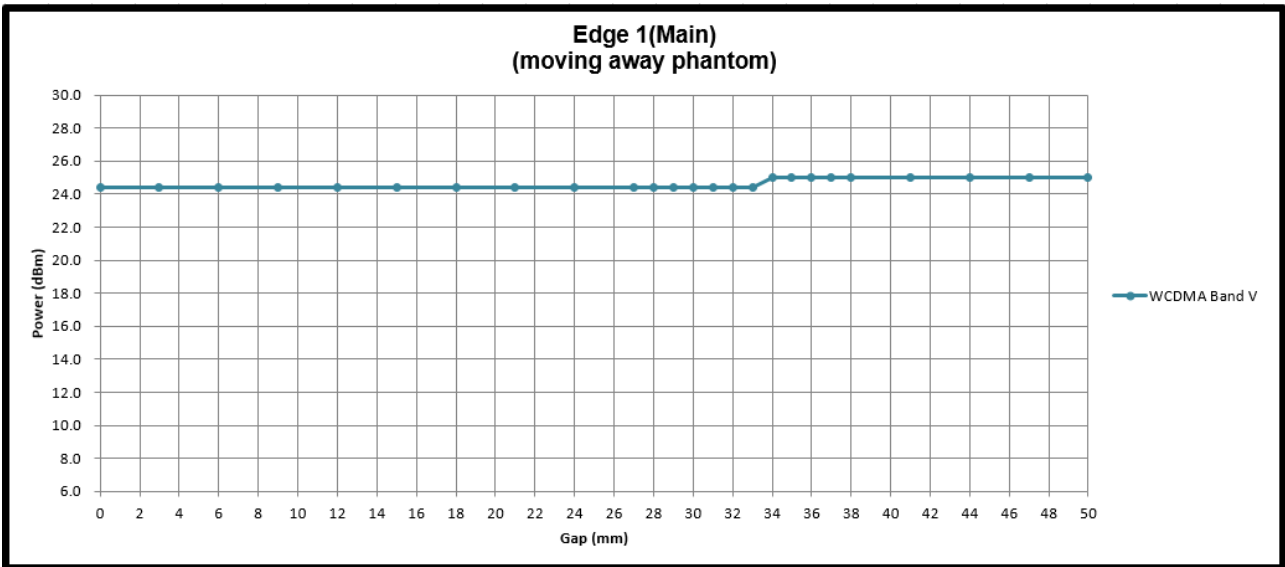
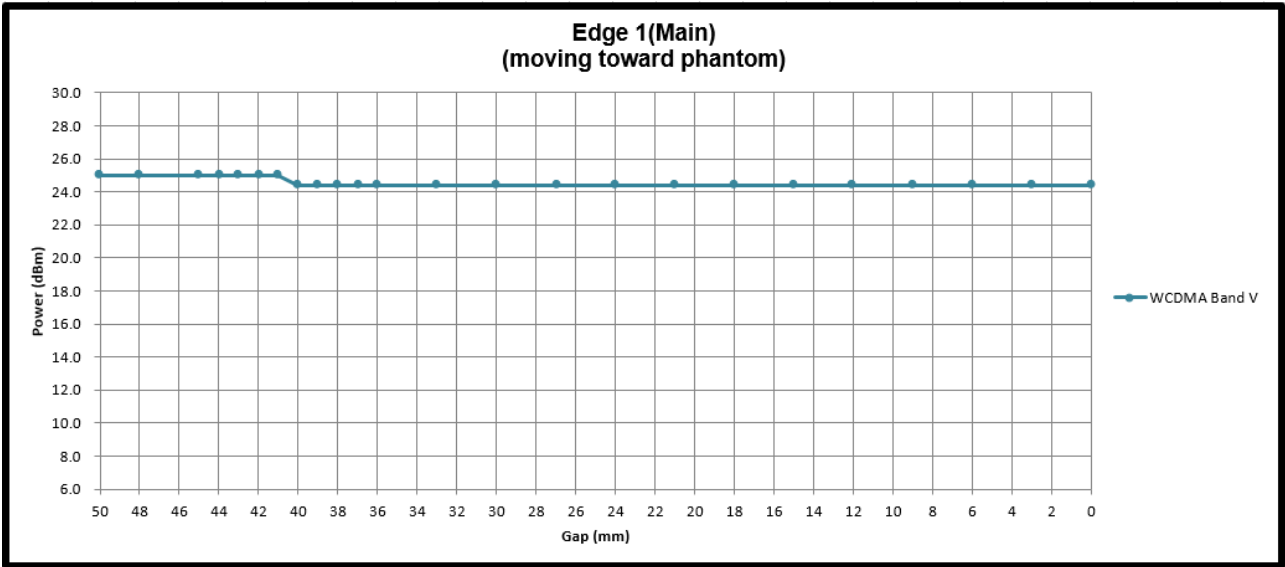
1. ⁽¹⁾: Reduced maximum limit applied by activation of proximity sensor.
2. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown as below
3. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
 - (a) **MIMO 1**
 - Bottom Face: [14 mm](#)
 - Edge1: [13 mm](#)
 - (b) **Main**
 - Bottom Face: [23 mm](#)
 - Edge1: [28 mm](#)
 - (c) **Aux**
 - Bottom Face: [12 mm](#)
 - Edge3: [16 mm](#)

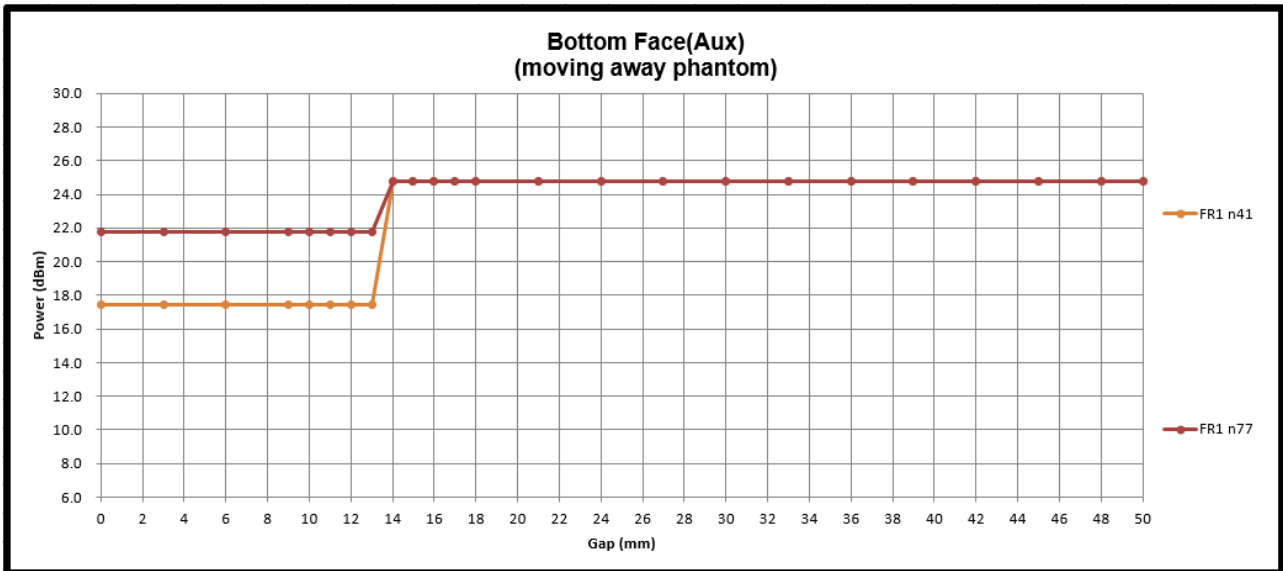
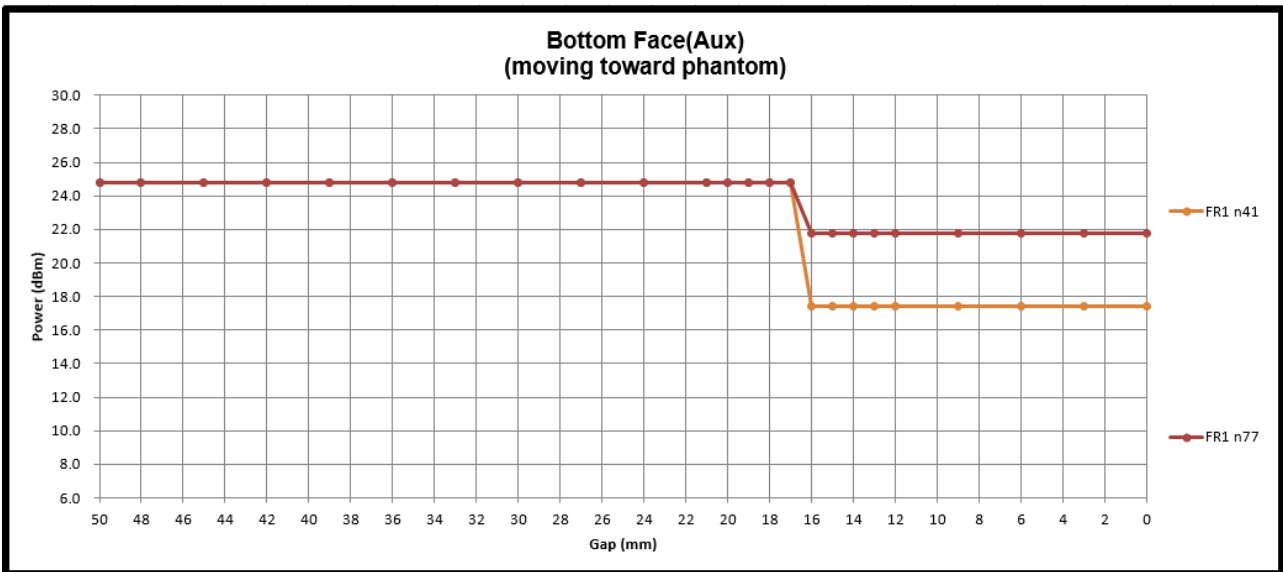
Power Measurement during Sensor Trigger distance testing

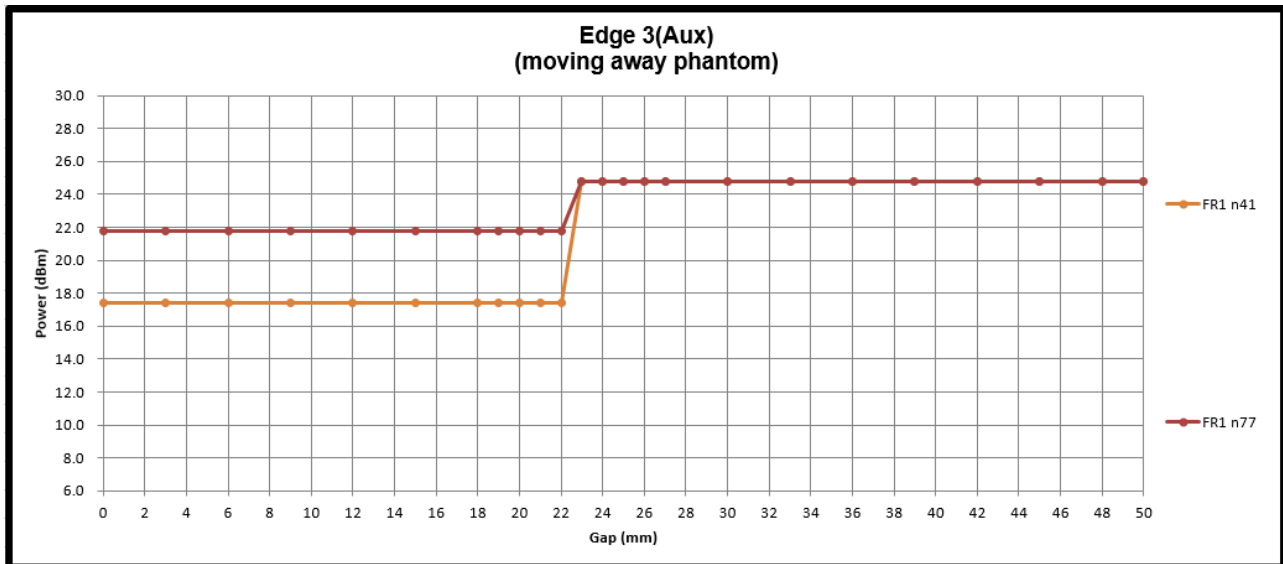
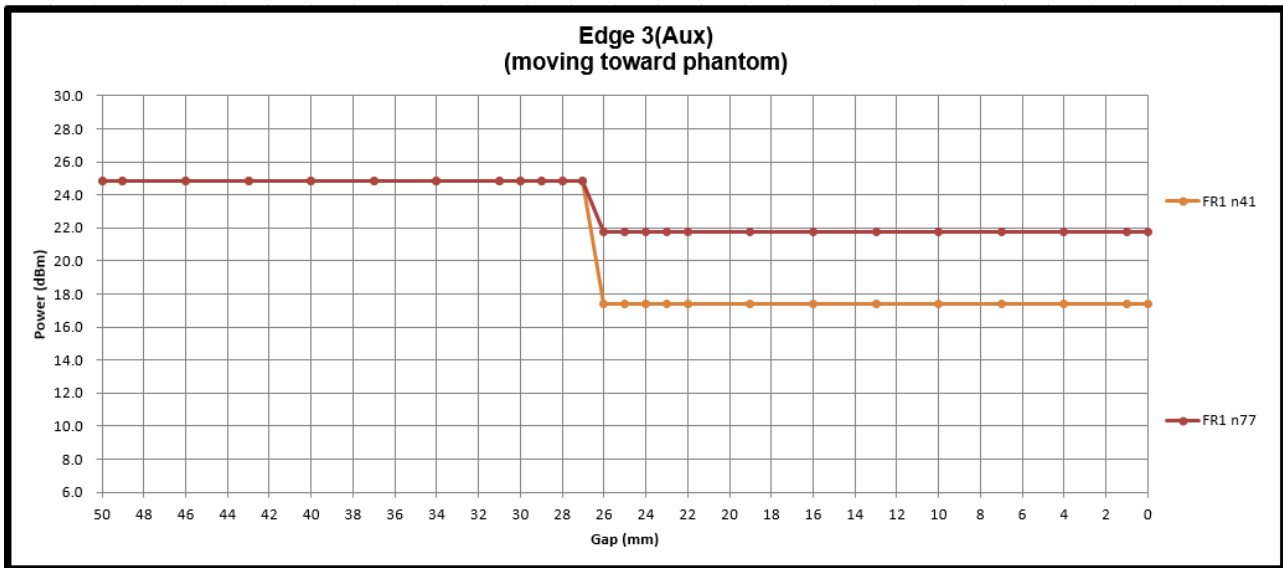














5. Smart Transmit feature for RF Exposure compliance

The Smart Transmit algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of SAR_design_target or PD_design_target, below the predefined time-averaged power limit (i.e., input.power.limit for 5G mmW NR), for each characterized technology and band (refer to RF exposure part0 report)

Smart Transmit allows the device to transmit at higher power instantaneously, as high as Pmax, when needed, but enforces power limiting to maintain time-averaged transmit power to Plimit. Below table shows Plimit EFS settings and maximum tune up output power Pmax configured for this EUT for various transmit conditions (Device State Index DSI).

<Terminologies in this report>

P _{limit}	The time-averaged RF power which corresponds to SAR_design_target.
P _{max}	Maximum target power level
SAR_design_target:	The design target for SAR compliance. It should be less than regulatory power density limit to account for all device design related uncertainties.
SAR char	P _{limit} for all the technologies/bands for all applicable DSI

<SAR Characterization>

SAR char must be generated to cover all radio configurations and usage scenarios that the wireless device supports for operating at 6 GHz or below. It will then be used as input for Smart Transmit to control and manage RF exposure for f < 6 GHz.

<SAR design target and uncertainty>

The detail SAR design target relate to each exposure conditions pls refer to operation description

Band	Antenna	SAR Design Target 1g SAR (W/kg)	Total Uncertainty (dB)
WCDMA V	Main	0.95	1
LTE B12	Main	0.76	2
LTE B13	Main	0.76	2
LTE B14	Main	0.76	2
LTE B26/5	Main	0.76	2
LTE B26_IC	Main	0.76	2
LTE B71	Main	0.76	2
FR1 n5	Main	0.76	2
FR1 n12	Main	0.76	2
FR1 n71	Main	0.76	2
WCDMA II	MIMO1	0.79	1
WCDMA IV	MIMO1	0.79	1
LTE B7	MIMO1	0.63	2
LTE B25/2	MIMO1	0.63	2
LTE B30	MIMO1	0.63	2
LTE B66/4	MIMO1	0.63	2
LTE B41/38	MIMO1	0.63	2
LTE B41/38_HPUE	MIMO1	0.79	1
FR1 n7	MIMO1	0.63	2
FR1 n25/2	MIMO1	0.63	2
FR1 n66	MIMO1	0.63	2
FR1 n41	MIMO1	0.63	2
FR1 n41 HPUE	MIMO1	0.79	1
LTE B48	Aux	0.76	2
FR1 n41	Aux	0.76	2
FR1 n41 HPUE	Aux	0.95	1
FR1 n77	Aux	0.76	2
FR1 n77 HPUE	Aux	0.95	1

To account for total uncertainty, SAR_design_target should be determined as:

$$SAR_{design_target} < SAR_{regulatory_limit} \times 10^{\frac{-total\ uncertainty}{10}}$$

<P_{limit} for supported technologies and bands (P_{limit} in EFS file)>

Band	Antenna	Duty cycle	P limit (dBm) time-average power	P Max* (dBm) time-average power
WCDMA V	Main	100	23.4	24.0
LTE B12	Main	100	23.8	23.0
LTE B13	Main	100	23.5	23.0
LTE B14	Main	100	23.3	23.0
LTE B26/5	Main	100	23.3	23.0
LTE B71	Main	100	23.8	23.0
FR1 n5	Main	100	23.4	23.0
FR1 n12	Main	100	23.0	23.0
FR1 n71	Main	100	23.6	23.0
WCDMA II	MIMO1	100	20.5	24.0
WCDMA IV	MIMO1	100	19.6	24.0
LTE B7	MIMO1	100	14.7	23.0
LTE B25/2	MIMO1	100	19.2	23.0
LTE B30	MIMO1	100	15.7	23.0
LTE B66/4	MIMO1	100	18.2	23.0
LTE B41/38**	MIMO1	63.3	14.2	21.0
LTE B41/38_HPUE**	MIMO1	43.3		21.4
FR1 n7	MIMO1	100	15	23.0
FR1 n25/2	MIMO1	100	19.7	23.0
FR1 n66	MIMO1	100	19.1	23.0
FR1 n41	MIMO1	100	15.0	21.0
FR1 n41 HPUE**	MIMO1	50		20.0
LTE B48	Aux	63.3	21.7	19.0
FR1 n41	Aux	100	16.8	23.0
FR1 n41 HPUE**	Aux	50		23.0
FR1 n77	Aux	100	20.6	23.0
FR1 n77 HPUE**	Aux	50		23.0

*P_{max} is used for RF tune up procedure. The maximum allowed output power is equal to P_{max} + 1dB uncertainty.

**All P_{limit} power levels entered in the Table correspond to average power levels after accounting for duty cycle in the case TDD modulation schemes (for e.g., GSM & LTE TDD & NR TDD).

The max allowed output power is the P_{limit} + 1dB device uncertainty, and if P_{limit} is higher than P_{max}, the device output power will be P_{max} instead.



6. RF Exposure Limits

6.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

6.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

7. Specific Absorption Rate (SAR)

7.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

7.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt} \left(\frac{dW}{dm} \right) = \frac{d}{dt} \left(\frac{dW}{\rho dv} \right)$$

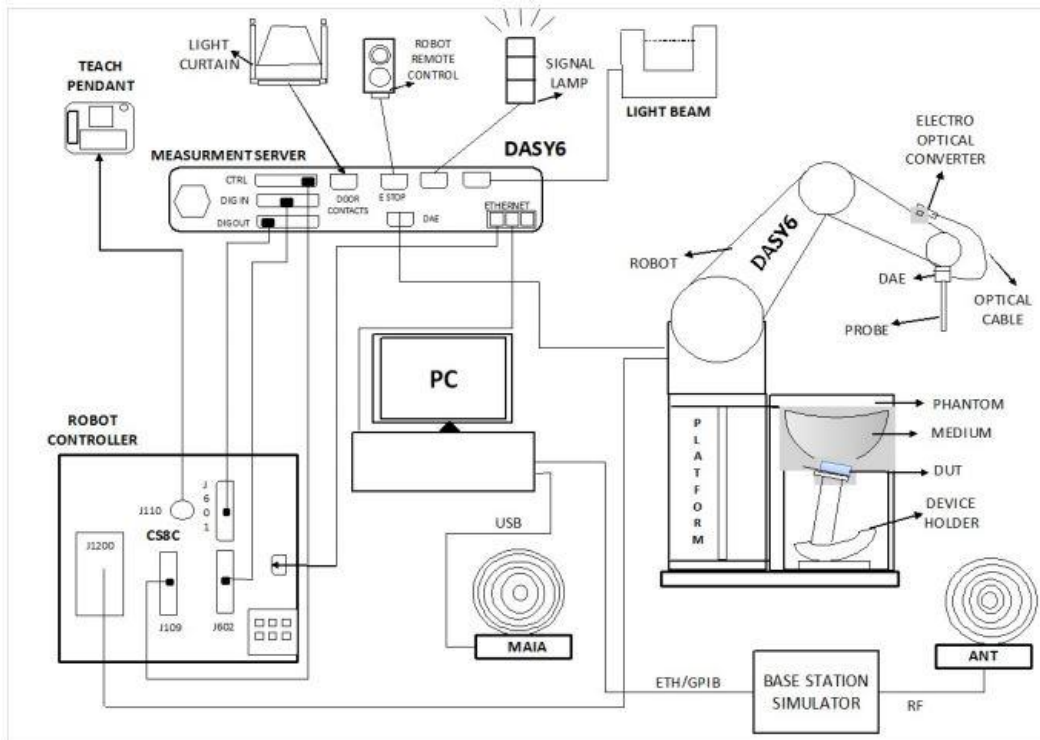
SAR is expressed in units of Watts per kilogram (W/kg)

$$SAR = \frac{\sigma |E|^2}{\rho}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

8. System Description and Setup

The DASY system used for performing compliance tests consists of the following items:



- The DASY system in DASY6/DASY5 V5.2 SAR Configuration is shown above
- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running windows software and the DASY5/DASY6 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

8.1 Test Site Location


The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No. TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. In system validation list test site number, if the test site number is include in the Wensan Laboratory, that's mean the test data are subcontracted to Sporton International Inc. Wensan Laboratory.

Test Site	EMC & Wireless Communications Laboratory TW1190		Wensan Laboratory TW3786		
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan		
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	


8.2 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: ± 0.2 dB (30 MHz – 4 GHz)	
Directivity	± 0.2 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 μ W/g – >100 mW/g; Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ± 0.2 dB (30 MHz – 6 GHz)	
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 μ W/g – >100 mW/g Linearity: ± 0.2 dB (noise: typically <1 μ W/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

8.3 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

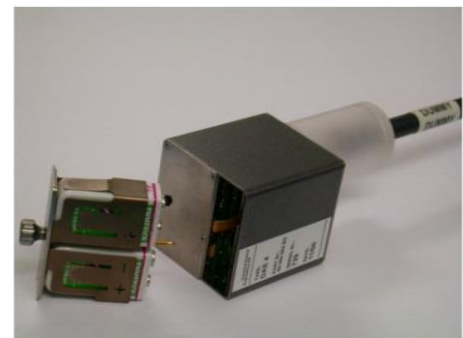



Fig 5.1 Photo of DAE

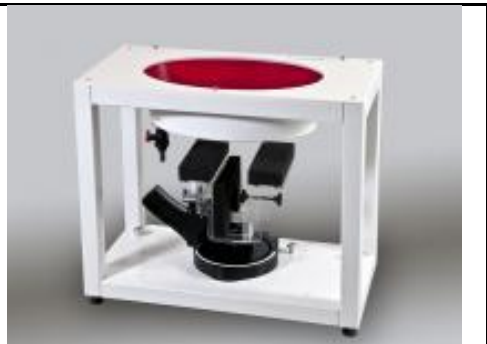
8.4 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

8.5 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.



Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

- (a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- (b) Read the WWAN RF power level from the base station simulator.
- (c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
- (d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
- (b) Place the EUT in the positions as Appendix D demonstrates.
- (c) Set scan area, grid size and other setting on the DASY software.
- (d) Measure SAR results for the highest power channel on each testing position.
- (e) Find out the largest SAR result on these testing positions of each band
- (f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g

9.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

9.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{Area}, \Delta y_{Area}$	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

9.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

		≤ 3 GHz	> 3 GHz	
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$		≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm	
	graded grid	$\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm	
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

9.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASy measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.



10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1012	Aug. 18, 2021	Aug. 17, 2022
SPEAG	835MHz System Validation Kit	D835V2	499	Aug. 18, 2021	Aug. 17, 2022
SPEAG	1750MHz System Validation Kit ⁽²⁾	D1750V2	1112	Mar. 07, 2019	Mar. 04, 2022
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Aug. 19, 2021	Aug. 18, 2022
SPEAG	2300MHz System Validation Kit ⁽²⁾	D2300V2	1006	Jan. 28, 2019	Jan. 25, 2022
SPEAG	2450MHz System Validation Kit	D2450V2	736	Aug. 17, 2021	Aug. 17, 2022
SPEAG	2600MHz System Validation Kit ⁽²⁾	D2600V2	1078	Mar. 06, 2019	Mar. 03, 2022
SPEAG	3500MHz System Validation Kit ⁽²⁾	D3500V2	1014	Jan. 29, 2019	Jan. 26, 2022
SPEAG	3700MHz System Validation Kit ⁽²⁾	D3700V2	1006	Mar. 05, 2019	Mar. 02, 2022
SPEAG	3900MHz System Validation Kit ⁽²⁾	D3900V2	1017	Apr. 29, 2019	Apr. 26, 2022
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Sep. 15, 2021	Sep. 14, 2022
SPEAG	Data Acquisition Electronics	DAE4	1512	Feb. 11, 2021	Feb. 10, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Oct. 21, 2021	Oct. 20, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	7306	Jul. 26, 2021	Jul. 25, 2022
RCPTWN	Thermometer	HTC-1	TM685-1	Oct. 28, 2021	Oct. 27, 2022
RCPTWN	Thermometer	HTC-1	TM560-2	Oct. 28, 2021	Oct. 27, 2022
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Oct. 21, 2021	Oct. 20, 2022
Keysight	Wireless Communication Test Set	E5515C	MY50266977	May. 12, 2021	May. 11, 2022
R&S	BT Base Station	CBT	100815	Feb. 19, 2021	Feb. 18, 2022
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Oct. 24, 2021	Oct. 23, 2022
Keysight	ENA Network Analyzer	E5071C	MY46104758	Sep. 07, 2021	Sep. 06, 2022
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 24, 2021	Sep. 23, 2022
LINE SEIKI	Digital Thermometer	DTM3000-spezial	2942	Oct. 26, 2021	Oct. 25, 2022
Anritsu	Power Meter	ML2495A	1419002	Aug. 18, 2021	Aug. 17, 2022
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2021	Aug. 17, 2022
Anritsu	Power Meter	ML2495A	1804003	Oct. 09, 2021	Oct. 08, 2022
Anritsu	Power Sensor	MA2411B	1726150	Oct. 09, 2021	Oct. 08, 2022
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 16, 2021	Jul. 15, 2022
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 19, 2021	Aug. 18, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 12, 2021	Oct. 11, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	479102029	Sep. 06, 2021	Sep. 05, 2022
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Warison	Directional Coupler	WCOU-10-50S-10	WR889BMC4B1	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.



11. System Verification

11.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18°C to 25°C, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.

The liquid tissue depth was at least 15cm in the phantom for all SAR testing

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ε _r)	Conductivity Target (σ)	Permittivity Target (ε _r)	Delta (σ) (%)	Delta (ε _r) (%)	Limit (%)	Date
750	22.1	0.896	42.978	0.89	41.90	0.67	2.57	±5	2022/1/14
750	22.1	0.901	41.894	0.89	41.90	1.24	-0.01	±5	2022/1/21
835	22.1	0.931	42.681	0.90	41.50	3.44	2.85	±5	2022/1/14
835	22.3	0.926	42.090	0.90	41.50	2.89	1.42	±5	2022/1/22
1750	22.6	1.414	40.595	1.37	40.10	3.21	1.23	±5	2022/1/16
1900	22.3	1.437	39.362	1.40	40.00	2.64	-1.60	±5	2022/1/12
1900	22.6	1.470	40.767	1.40	40.00	5.00	1.92	±5	2022/1/18
2300	22.5	1.649	39.123	1.67	39.50	-1.26	-0.95	±5	2022/1/19
2450	22.7	1.783	38.594	1.80	39.20	-0.94	-1.55	±5	2022/1/16
2600	22.1	2.013	38.797	1.96	39.00	2.70	-0.52	±5	2022/1/13
2600	22.6	1.972	38.105	1.96	39.00	0.61	-2.29	±5	2022/1/18
2600	22.5	1.995	37.938	1.96	39.00	1.79	-2.72	±5	2022/1/19
3500	22.8	2.948	37.609	2.91	37.90	1.31	-0.77	±5	2022/1/20
3700	22.8	3.104	37.371	3.12	37.70	-0.51	-0.87	±5	2022/1/20
3900	22.8	3.277	37.127	3.33	37.51	-1.59	-1.02	±5	2022/1/20
5250	22.3	4.724	36.656	4.71	35.95	0.30	1.96	±5	2022/1/17
5600	22.3	5.122	36.109	5.07	35.50	1.03	1.72	±5	2022/1/17
5750	22.3	5.278	35.916	5.22	35.35	1.11	1.60	±5	2022/1/17

11.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
SAR04	2022/1/14	750	50	D750V3-1012	EX3DV4 - SN7306	DAE4 Sn1512	0.398	8.56	7.96	-7.01
SAR12	2022/1/21	750	50	D750V3-1012	EX3DV4 - SN3931	DAE4 Sn1512	0.404	8.56	8.08	-5.61
SAR04	2022/1/14	835	50	D835V2-499	EX3DV4 - SN7306	DAE4 Sn1512	0.467	9.68	9.34	-3.51
SAR12	2022/1/22	835	50	D835V2-499	EX3DV4 - SN3931	DAE4 Sn1512	0.478	9.68	9.56	-1.24
SAR12	2022/1/16	1750	50	D1750V2-1112	EX3DV4 - SN3931	DAE4 Sn1512	1.91	36.70	38.2	4.09
SAR04	2022/1/12	1900	50	D1900V2-5d041	EX3DV4 - SN7306	DAE4 Sn1512	1.92	40.60	38.4	-5.42
SAR12	2022/1/18	1900	50	D1900V2-5d041	EX3DV4 - SN3931	DAE4 Sn1512	2.02	40.60	40.4	-0.49
SAR12	2022/1/19	2300	250	D2300V2-1006	EX3DV4 - SN3931	DAE4 Sn1512	11.30	48.70	45.2	-7.19
SAR12	2022/1/16	2450	50	D2450V2-736	EX3DV4 - SN3931	DAE4 Sn1512	2.61	54.20	52.2	-3.69
SAR12	2022/1/13	2600	50	D2600V2-1078	EX3DV4 - SN3931	DAE4 Sn1512	2.91	57.60	58.2	1.04
SAR12	2022/1/18	2600	50	D2600V2-1078	EX3DV4 - SN3931	DAE4 Sn1512	2.85	57.60	57	-1.04
SAR12	2022/1/19	2600	250	D2600V2-1078	EX3DV4 - SN3931	DAE4 Sn1512	15.10	57.60	60.4	4.86
SAR12	2022/1/20	3500	100	D3500V2-1014	EX3DV4 - SN3931	DAE4 Sn1512	6.95	67.90	69.5	2.36
SAR12	2022/1/20	3700	50	D3700V2-1006	EX3DV4 - SN3931	DAE4 Sn1512	3.32	67.30	66.4	-1.34
SAR12	2022/1/20	3900	100	D3900V2-1017-3900	EX3DV4 - SN3931	DAE4 Sn1512	6.90	69.50	69	-0.72
SAR12	2022/1/17	5250	100	D5GHZV2-1006-5250	EX3DV4 - SN3931	DAE4 Sn1512	8.48	81.70	84.8	3.79
SAR12	2022/1/17	5600	100	D5GHZV2-1006-5600	EX3DV4 - SN3931	DAE4 Sn1512	9.01	85.10	90.1	5.88
SAR12	2022/1/17	5750	100	D5GHZV2-1006-5750	EX3DV4 - SN3931	DAE4 Sn1512	8.61	81.40	86.1	5.77

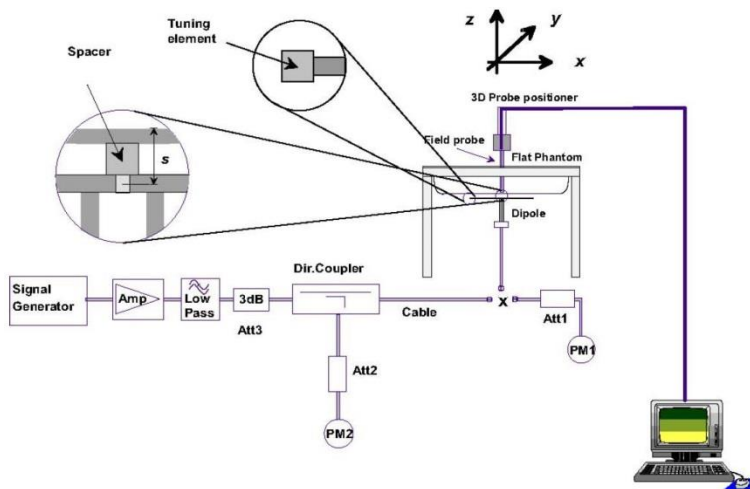


Fig 8.3.1 System Performance Check Setup



Fig 8.3.2 Setup Photo

12. RF Exposure Positions

12.1 SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

13. UMTS/LTE Output Power (Unit: dBm)

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set Gain Factors (β_c and β_d) and parameters were set according to each
 - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - iii. Set RMC 12.2Kbps + HSDPA mode.
 - iv. Set Cell Power = -86 dBm
 - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
 - vi. Select HSDPA Uplink Parameters
 - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
 - viii. Set Ack-Nack Repetition Factor to 3
 - ix. Set CQI Feedback Cycle (k) to 4 ms
 - x. Set CQI Repetition Factor to 2
 - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15, \beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Setup Configuration

HSUPA Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting * :
 - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
 - ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
 - iii. Set Cell Power = -86 dBm
 - iv. Set Channel Type = 12.2k + HSPA
 - v. Set UE Target Power
 - vi. Power Ctrl Mode= Alternating bits
 - vii. Set and observe the E-TFCl
 - viii. Confirm that E-TFCl is equal to the target E-TFCl of 75 for sub-test 1, and other subtest's E-TFCl
- d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCl
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{hs} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set RMC 12.2Kbps + HSDPA mode.
 - ii. Set Cell Power = -25 dBm
 - iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
 - iv. Select HSDPA Uplink Parameters
 - v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - a). Subtest 1: $\beta_c/\beta_d=2/15$
 - b). Subtest 2: $\beta_c/\beta_d=12/15$
 - c). Subtest 3: $\beta_c/\beta_d=15/8$
 - d). Subtest 4: $\beta_c/\beta_d=15/4$
 - vi. Set Delta ACK, Delta NACK and Delta CQI = 8
 - vii. Set Ack-Nack Repetition Factor to 3
 - viii. Set CQI Feedback Cycle (k) to 4 ms
 - ix. Set CQI Repetition Factor to 2
 - x. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

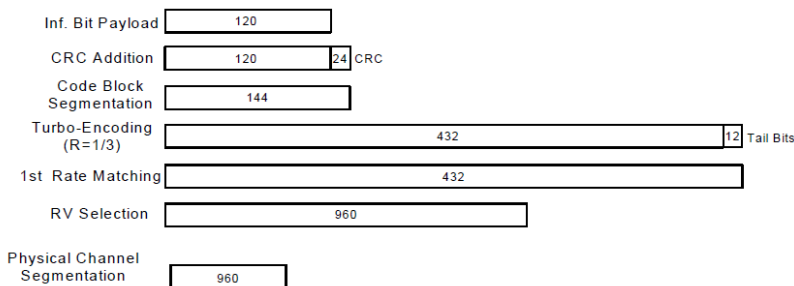


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration



<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

Default Power Mode

Band		WCDMA II_MIMO 1			Tune-up Limit (dBm)	WCDMA IV_MIMO 1			Tune-up Limit (dBm)	WCDMA V_Main			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938	1537	1638	1738	4357	4407	4458			
Frequency (MHz)		1852.4	1880	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6			
3GPP Rel 99	RMC 12.2Kbps	23.59	23.51	23.47	25.00	23.00	23.10	23.23	25.00	23.21	23.31	23.30	25.00
3GPP Rel 6	HSDPA Subtest-1	22.48	22.55	22.38	24.00	22.06	22.08	22.21	24.00	22.13	22.31	22.26	24.00
3GPP Rel 6	HSDPA Subtest-2	22.60	22.54	22.35	24.00	22.13	22.04	22.07	24.00	22.09	22.29	22.23	24.00
3GPP Rel 6	HSDPA Subtest-3	22.07	22.04	21.86	23.50	21.63	21.57	21.60	23.50	21.52	21.79	21.76	23.50
3GPP Rel 6	HSDPA Subtest-4	21.92	22.04	21.90	23.50	21.61	21.53	21.62	23.50	21.51	21.80	21.77	23.50
3GPP Rel 8	DC-HSDPA Subtest-1	22.48	22.36	22.30	24.00	22.16	22.08	22.08	24.00	22.13	22.26	22.09	24.00
3GPP Rel 8	DC-HSDPA Subtest-2	22.58	22.50	22.25	24.00	22.08	22.02	22.17	24.00	22.07	22.24	22.23	24.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.91	21.92	21.81	23.50	21.59	21.67	21.54	23.50	21.52	21.68	21.70	23.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.86	21.85	21.76	23.50	21.59	21.63	21.58	23.50	21.39	21.71	21.63	23.50
3GPP Rel 6	HSUPA Subtest-1	22.60	22.54	22.34	24.00	22.13	22.01	22.14	24.00	22.11	22.25	22.07	24.00
3GPP Rel 6	HSUPA Subtest-2	20.09	20.13	20.22	22.00	20.05	20.00	20.11	22.00	20.10	20.28	20.08	22.00
3GPP Rel 6	HSUPA Subtest-3	21.86	21.87	21.70	23.00	21.17	21.26	21.35	23.00	20.97	21.26	21.21	23.00
3GPP Rel 6	HSUPA Subtest-4	20.57	20.63	20.53	22.00	20.16	20.31	20.31	22.00	20.13	20.27	20.16	22.00
3GPP Rel 6	HSUPA Subtest-5	22.58	22.53	22.36	24.00	22.28	22.26	22.31	24.00	22.01	22.30	22.09	24.00

Reduced Power Mode

Band		WCDMA II_MIMO 1			Tune-up Limit (dBm)	WCDMA IV_MIMO 1			Tune-up Limit (dBm)	WCDMA V_Main			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938	1537	1638	1738	4357	4407	4458			
Frequency (MHz)		1852.4	1880	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6			
3GPP Rel 99	RMC 12.2Kbps	20.75	20.89	20.78	21.50	19.68	19.77	19.63	20.60	23.21	23.31	23.30	24.40
3GPP Rel 6	HSDPA Subtest-1	19.71	19.94	19.74	20.50	18.63	18.74	18.71	19.60	22.13	22.31	22.26	23.40
3GPP Rel 6	HSDPA Subtest-2	19.80	19.93	19.66	20.50	18.62	18.65	18.51	19.60	22.09	22.29	22.23	23.40
3GPP Rel 6	HSDPA Subtest-3	19.22	19.38	19.20	20.00	18.38	18.36	18.20	19.10	21.52	21.79	21.76	22.90
3GPP Rel 6	HSDPA Subtest-4	19.12	19.42	19.20	20.00	17.94	18.14	18.08	19.10	21.51	21.80	21.77	22.90
3GPP Rel 8	DC-HSDPA Subtest-1	19.62	19.75	19.62	20.50	18.55	18.55	18.64	19.60	22.13	22.26	22.09	23.40
3GPP Rel 8	DC-HSDPA Subtest-2	19.70	19.85	19.56	20.50	18.52	18.76	18.32	19.60	22.07	22.24	22.23	23.40
3GPP Rel 8	DC-HSDPA Subtest-3	19.09	19.27	19.08	20.00	17.94	18.05	17.95	19.10	21.52	21.68	21.70	22.90
3GPP Rel 8	DC-HSDPA Subtest-4	18.97	19.19	19.13	20.00	17.88	18.03	18.09	19.10	21.39	21.71	21.63	22.90
3GPP Rel 6	HSUPA Subtest-1	19.73	19.87	19.69	20.50	18.66	18.62	18.42	19.60	22.11	22.25	22.07	23.40
3GPP Rel 6	HSUPA Subtest-2	17.21	17.44	17.54	18.50	16.36	16.44	16.54	17.60	20.10	20.28	20.08	21.40
3GPP Rel 6	HSUPA Subtest-3	18.89	19.12	18.99	19.50	17.75	17.87	17.88	18.60	20.97	21.26	21.21	22.40
3GPP Rel 6	HSUPA Subtest-4	17.69	18.00	17.88	18.50	16.74	16.97	16.67	17.60	20.13	20.27	20.16	21.40
3GPP Rel 6	HSUPA Subtest-5	19.69	19.83	19.73	20.50	18.83	18.65	18.67	19.60	22.01	22.30	22.09	23.40

**<LTE Conducted Power>****General Note:**

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4/B5/B12/B26/B38/B71 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 2/4/5/38 SAR test was covered by Band 25/66/26/41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is \leq the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band



Default Power Mode

<LTE Band 2 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	23.37	23.36	23.35	25
20	QPSK	1	49	23.32	23.32	23.28	
20	QPSK	1	99	23.33	23.33	23.26	
20	QPSK	50	0	22.44	22.44	22.40	24
20	QPSK	50	24	22.53	22.42	22.40	
20	QPSK	50	50	22.50	22.47	22.43	
20	QPSK	100	0	22.51	22.48	22.38	24
20	16QAM	1	0	22.51	22.47	22.45	
20	16QAM	1	49	22.45	22.44	22.38	
20	16QAM	1	99	22.46	22.43	22.40	23
20	16QAM	50	0	21.49	21.48	21.43	
20	16QAM	50	24	21.55	21.44	21.40	
20	16QAM	50	50	21.54	21.52	21.46	23
20	16QAM	100	0	21.54	21.53	21.40	
20	64QAM	1	0	21.21	21.18	21.14	
20	64QAM	1	49	21.19	21.15	21.05	23
20	64QAM	1	99	21.21	21.26	21.19	
20	64QAM	50	0	20.50	20.48	20.44	
20	64QAM	50	24	20.58	20.47	20.42	22
20	64QAM	50	50	20.54	20.51	20.47	
20	64QAM	100	0	20.55	20.54	20.40	
20	256QAM	1	0	18.35	18.35	18.19	20
20	256QAM	1	49	18.47	18.47	18.14	
20	256QAM	1	99	18.41	18.52	18.33	
20	256QAM	50	0	18.14	18.31	18.03	20
20	256QAM	50	24	18.33	18.42	18.17	
20	256QAM	50	50	18.41	18.46	18.19	
20	256QAM	100	0	18.33	18.41	18.09	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	23.25	23.11	23.11	25
15	QPSK	1	37	23.02	23.14	23.25	
15	QPSK	1	74	23.24	23.04	23.08	
15	QPSK	36	0	22.22	22.16	22.32	24
15	QPSK	36	20	22.50	22.33	22.20	
15	QPSK	36	39	22.49	22.26	22.20	
15	QPSK	75	0	22.30	22.29	22.38	24
15	16QAM	1	0	22.47	22.24	22.24	
15	16QAM	1	37	22.24	22.14	22.30	
15	16QAM	1	74	22.18	22.23	22.33	23
15	16QAM	36	0	21.22	21.48	21.27	
15	16QAM	36	20	21.38	21.17	21.40	
15	16QAM	36	39	21.48	21.38	21.35	23
15	16QAM	75	0	21.32	21.49	21.11	
15	64QAM	1	0	21.14	21.07	21.11	
15	64QAM	1	37	21.16	21.11	21.06	23
15	64QAM	1	74	21.12	21.03	21.19	
15	64QAM	36	0	20.33	20.43	20.14	
15	64QAM	36	20	20.29	20.21	20.22	22
15	64QAM	36	39	20.48	20.49	20.18	



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15	64QAM	75	0	20.48	20.53	20.15	
15	256QAM	1	0	18.22	18.23	18.19	20
15	256QAM	1	37	18.36	18.41	18.14	
15	256QAM	1	74	18.25	18.34	18.22	
15	256QAM	36	0	18.03	18.14	18.06	20
15	256QAM	36	20	18.27	18.28	18.15	
15	256QAM	36	39	18.38	18.30	18.16	
15	256QAM	75	0	18.17	18.41	18.06	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	23.15	23.27	23.13	25
10	QPSK	1	25	23.30	23.26	23.20	
10	QPSK	1	49	23.08	23.11	23.08	
10	QPSK	25	0	22.31	22.39	22.37	24
10	QPSK	25	12	22.49	22.16	22.15	
10	QPSK	25	25	22.36	22.39	22.17	
10	QPSK	50	0	22.26	22.37	22.24	
10	16QAM	1	0	22.44	22.41	22.45	24
10	16QAM	1	25	22.19	22.28	22.26	
10	16QAM	1	49	22.34	22.32	22.30	
10	16QAM	25	0	21.35	21.33	21.27	23
10	16QAM	25	12	21.51	21.17	21.28	
10	16QAM	25	25	21.27	21.33	21.26	
10	16QAM	50	0	21.26	21.39	21.32	
10	64QAM	1	0	21.11	21.09	21.11	23
10	64QAM	1	25	21.06	21.04	21.07	
10	64QAM	1	49	21.03	21.01	21.15	
10	64QAM	25	0	20.20	20.20	20.25	22
10	64QAM	25	12	20.58	20.21	20.30	
10	64QAM	25	25	20.39	20.29	20.19	
10	64QAM	50	0	20.55	20.52	20.26	
10	256QAM	1	0	18.18	18.34	18.05	20
10	256QAM	1	25	18.36	18.30	18.13	
10	256QAM	1	49	18.39	18.36	18.30	
10	256QAM	25	0	18.07	18.19	18.29	20
10	256QAM	25	12	18.23	18.37	18.08	
10	256QAM	25	25	18.23	18.36	18.10	
10	256QAM	50	0	18.22	18.39	18.25	
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	23.17	23.32	23.35	25
5	QPSK	1	12	23.20	23.20	23.13	
5	QPSK	1	24	23.11	23.30	23.13	
5	QPSK	12	0	22.40	22.21	22.38	24
5	QPSK	12	7	22.33	22.29	22.14	
5	QPSK	12	13	22.37	22.38	22.25	
5	QPSK	25	0	22.48	22.38	22.34	
5	16QAM	1	0	22.27	22.34	22.41	24
5	16QAM	1	12	22.26	22.34	22.23	
5	16QAM	1	24	22.43	22.27	22.28	
5	16QAM	12	0	21.43	21.42	21.13	23
5	16QAM	12	7	21.51	21.17	21.39	
5	16QAM	12	13	21.32	21.31	21.20	
5	16QAM	25	0	21.39	21.39	21.40	
5	64QAM	1	0	21.03	21.05	21.04	23
5	64QAM	1	12	21.17	21.19	21.07	



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5	64QAM	1	24	21.26	21.08	21.15	
5	64QAM	12	0	20.27	20.44	20.35	22
5	64QAM	12	7	20.38	20.36	20.34	
5	64QAM	12	13	20.26	20.49	20.40	
5	64QAM	25	0	20.48	20.35	20.24	
5	256QAM	1	0	18.24	18.35	18.15	20
5	256QAM	1	12	18.41	18.30	18.11	
5	256QAM	1	24	18.33	18.40	18.32	
5	256QAM	12	0	18.27	18.30	18.36	20
5	256QAM	12	7	18.22	18.27	18.00	
5	256QAM	12	13	18.24	18.31	18.10	
5	256QAM	25	0	18.32	18.24	18.00	
Channel				18615	18900	19185	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	23.22	23.06	23.16	25
3	QPSK	1	8	23.28	23.22	23.12	
3	QPSK	1	14	23.24	23.08	23.16	
3	QPSK	8	0	22.35	22.24	22.18	24
3	QPSK	8	4	22.41	22.15	22.32	
3	QPSK	8	7	22.34	22.32	22.39	
3	QPSK	15	0	22.47	22.18	22.21	
3	16QAM	1	0	22.44	22.30	22.38	24
3	16QAM	1	8	22.22	22.22	22.28	
3	16QAM	1	14	22.42	22.39	22.34	
3	16QAM	8	0	21.39	21.48	21.28	23
3	16QAM	8	4	21.26	21.19	21.14	
3	16QAM	8	7	21.47	21.49	21.44	
3	16QAM	15	0	21.54	21.33	21.35	
3	64QAM	1	0	21.06	21.18	21.07	23
3	64QAM	1	8	21.05	21.24	21.05	
3	64QAM	1	14	21.17	21.10	21.04	
3	64QAM	8	0	20.38	20.31	20.19	22
3	64QAM	8	4	20.39	20.24	20.31	
3	64QAM	8	7	20.45	20.33	20.26	
3	64QAM	15	0	20.40	20.25	20.15	
3	256QAM	1	0	18.22	18.19	18.01	20
3	256QAM	1	8	18.36	18.40	18.27	
3	256QAM	1	14	18.40	18.52	18.30	
3	256QAM	8	0	18.03	18.27	18.16	20
3	256QAM	8	4	18.33	18.25	18.27	
3	256QAM	8	7	18.39	18.29	18.03	
3	256QAM	15	0	18.25	18.26	18.08	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	23.30	23.22	23.25	25
1.4	QPSK	1	3	23.13	23.15	23.14	
1.4	QPSK	1	5	23.26	23.31	23.09	
1.4	QPSK	3	0	23.36	23.20	23.29	
1.4	QPSK	3	1	23.22	23.31	23.18	
1.4	QPSK	3	3	23.14	23.16	23.09	
1.4	QPSK	6	0	22.32	22.33	22.30	24
1.4	16QAM	1	0	22.39	22.41	22.22	24
1.4	16QAM	1	3	22.45	22.29	22.27	
1.4	16QAM	1	5	22.32	22.41	22.37	
1.4	16QAM	3	0	22.44	22.39	22.39	
1.4	16QAM	3	1	22.45	22.34	22.27	



1.4	16QAM	3	3	22.40	22.42	22.30	
1.4	16QAM	6	0	21.35	21.43	21.33	23
1.4	64QAM	1	0	21.36	21.29	21.33	23
1.4	64QAM	1	3	21.36	21.48	21.44	
1.4	64QAM	1	5	21.40	21.41	21.39	
1.4	64QAM	3	0	21.29	21.37	21.39	
1.4	64QAM	3	1	21.50	21.29	21.29	
1.4	64QAM	3	3	21.38	21.48	21.26	
1.4	64QAM	6	0	20.37	20.35	20.34	22
1.4	256QAM	1	0	18.22	18.19	18.01	20
1.4	256QAM	1	3	18.36	18.40	18.27	
1.4	256QAM	1	5	18.40	18.52	18.30	
1.4	256QAM	3	0	18.28	18.19	18.29	
1.4	256QAM	3	1	18.33	18.33	18.01	
1.4	256QAM	3	3	18.25	18.38	18.15	
1.4	256QAM	6	0	18.27	18.21	18.03	20

<LTE Band 4 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20050	20175	20300	25
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	23.26	23.32	23.27	24
20	QPSK	1	49	23.12	23.15	23.21	
20	QPSK	1	99	23.17	23.25	23.31	
20	QPSK	50	0	22.35	22.36	22.44	24
20	QPSK	50	24	22.37	22.38	22.49	
20	QPSK	50	50	22.29	22.32	22.44	
20	QPSK	100	0	22.37	22.42	22.37	24
20	16QAM	1	0	22.60	22.67	22.61	
20	16QAM	1	49	22.51	22.51	22.57	
20	16QAM	1	99	22.52	22.54	22.64	23
20	16QAM	50	0	21.34	21.38	21.43	
20	16QAM	50	24	21.39	21.40	21.47	
20	16QAM	50	50	21.33	21.33	21.43	23
20	16QAM	100	0	21.36	21.42	21.38	
20	64QAM	1	0	21.40	21.50	21.14	
20	64QAM	1	49	21.34	21.21	21.47	22
20	64QAM	1	99	21.31	21.05	21.51	
20	64QAM	50	0	20.38	20.08	20.46	
20	64QAM	50	24	20.40	20.14	20.50	20
20	64QAM	50	50	20.36	20.18	20.46	
20	64QAM	100	0	20.38	20.15	20.42	
20	256QAM	1	0	18.23	18.32	18.01	20
20	256QAM	1	49	18.34	18.29	18.13	
20	256QAM	1	99	18.24	18.36	18.17	
20	256QAM	50	0	18.26	18.26	18.36	20
20	256QAM	50	24	18.30	18.35	18.01	
20	256QAM	50	50	18.38	18.30	18.03	
20	256QAM	100	0	18.20	18.40	18.06	25
Channel				20025	20175	20325	
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	23.16	23.16	23.22	25
15	QPSK	1	37	23.06	23.00	23.07	



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15	QPSK	1	74	23.25	23.27	23.06	
15	QPSK	36	0	22.16	22.24	22.22	24
15	QPSK	36	20	22.12	22.17	22.31	
15	QPSK	36	39	22.28	22.07	22.15	
15	QPSK	75	0	22.30	22.38	22.36	
15	16QAM	1	0	22.35	22.59	22.48	24
15	16QAM	1	37	22.25	22.48	22.52	
15	16QAM	1	74	22.28	22.35	22.42	
15	16QAM	36	0	21.21	21.35	21.19	23
15	16QAM	36	20	21.22	21.35	21.26	
15	16QAM	36	39	21.13	21.06	21.24	
15	16QAM	75	0	21.08	21.26	21.23	
15	64QAM	1	0	21.10	21.34	21.26	23
15	64QAM	1	37	21.20	21.21	21.46	
15	64QAM	1	74	21.31	21.08	21.41	
15	64QAM	36	0	20.29	20.19	20.28	22
15	64QAM	36	20	20.15	20.14	20.32	
15	64QAM	36	39	20.36	20.23	20.30	
15	64QAM	75	0	20.21	20.13	20.41	
15	256QAM	1	0	18.29	18.23	18.05	20
15	256QAM	1	37	18.46	18.45	18.00	
15	256QAM	1	74	18.26	18.46	18.13	
15	256QAM	36	0	18.24	18.20	18.16	20
15	256QAM	36	20	18.13	18.40	18.00	
15	256QAM	36	39	18.32	18.27	18.12	
15	256QAM	75	0	18.31	18.31	18.14	
Channel				20000	20175	20350	Tune-up limit (dBm)
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	23.15	23.02	23.21	25
10	QPSK	1	25	23.03	23.19	23.10	
10	QPSK	1	49	23.17	23.00	23.26	
10	QPSK	25	0	22.29	22.11	22.40	24
10	QPSK	25	12	22.07	22.27	22.36	
10	QPSK	25	25	22.14	22.21	22.44	
10	QPSK	50	0	22.14	22.20	22.22	
10	16QAM	1	0	22.54	22.60	22.39	24
10	16QAM	1	25	22.46	22.25	22.54	
10	16QAM	1	49	22.22	22.42	22.58	
10	16QAM	25	0	21.31	21.08	21.36	23
10	16QAM	25	12	21.12	21.35	21.34	
10	16QAM	25	25	21.11	21.09	21.32	
10	16QAM	50	0	21.06	21.19	21.26	
10	64QAM	1	0	21.38	21.33	21.23	23
10	64QAM	1	25	21.11	21.03	21.22	
10	64QAM	1	49	21.03	21.05	21.37	
10	64QAM	25	0	20.21	20.00	20.25	22
10	64QAM	25	12	20.32	20.10	20.37	
10	64QAM	25	25	20.21	20.25	20.18	
10	64QAM	50	0	20.20	20.01	20.42	
10	256QAM	1	0	18.34	18.29	18.19	20
10	256QAM	1	25	18.43	18.39	18.04	
10	256QAM	1	49	18.38	18.47	18.22	
10	256QAM	25	0	18.11	18.29	18.15	20
10	256QAM	25	12	18.30	18.41	18.05	
10	256QAM	25	25	18.24	18.44	18.19	
10	256QAM	50	0	18.14	18.25	18.20	



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Channel				19975	20175	20375	Tune-up limit (dBm)	
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.29	23.22	23.27	25	
5	QPSK	1	12	23.11	23.15	23.12		
5	QPSK	1	24	23.05	23.16	23.13		
5	QPSK	12	0	22.22	22.33	22.41	24	
5	QPSK	12	7	22.14	22.20	22.31		
5	QPSK	12	13	22.05	22.02	22.22		
5	QPSK	25	0	22.08	22.36	22.37	24	
5	16QAM	1	0	22.32	22.48	22.46		
5	16QAM	1	12	22.40	22.21	22.41		
5	16QAM	1	24	22.48	22.41	22.52	23	
5	16QAM	12	0	21.34	21.26	21.16		
5	16QAM	12	7	21.11	21.32	21.45		
5	16QAM	12	13	21.32	21.24	21.29	23	
5	16QAM	25	0	21.23	21.30	21.11		
5	64QAM	1	0	21.19	21.46	21.10		
5	64QAM	1	12	21.20	21.13	21.21	23	
5	64QAM	1	24	21.03	21.14	21.39		
5	64QAM	12	0	20.18	20.11	20.29		
5	64QAM	12	7	20.14	20.12	20.48	22	
5	64QAM	12	13	20.07	20.17	20.36		
5	64QAM	25	0	20.11	20.01	20.31		
5	256QAM	1	0	18.15	18.20	18.18	20	
5	256QAM	1	12	18.44	18.43	18.12		
5	256QAM	1	24	18.39	18.35	18.25		
5	256QAM	12	0	18.24	18.31	18.20	20	
5	256QAM	12	7	18.17	18.34	18.16		
5	256QAM	12	13	18.21	18.40	18.05		
5	256QAM	25	0	18.22	18.29	18.23	20	
Channel				19965	20175	20385		Tune-up limit (dBm)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.29	23.09	23.17	25	
3	QPSK	1	8	23.15	23.18	23.12		
3	QPSK	1	14	23.16	23.11	23.22		
3	QPSK	8	0	22.14	22.30	22.23	24	
3	QPSK	8	4	22.09	22.36	22.21		
3	QPSK	8	7	22.27	22.08	22.32		
3	QPSK	15	0	22.12	22.16	22.17	24	
3	16QAM	1	0	22.59	22.38	22.32		
3	16QAM	1	8	22.50	22.48	22.43		
3	16QAM	1	14	22.42	22.46	22.56	23	
3	16QAM	8	0	21.04	21.31	21.43		
3	16QAM	8	4	21.09	21.27	21.24		
3	16QAM	8	7	21.11	21.29	21.43	23	
3	16QAM	15	0	21.13	21.25	21.13		
3	64QAM	1	0	21.23	21.39	21.14		
3	64QAM	1	8	21.32	21.11	21.35	23	
3	64QAM	1	14	21.03	21.19	21.31		
3	64QAM	8	0	20.16	20.05	20.20		
3	64QAM	8	4	20.38	20.06	20.40	22	
3	64QAM	8	7	20.19	20.18	20.19		
3	64QAM	15	0	20.25	20.05	20.28		
3	256QAM	1	0	18.33	18.16	18.09	20	
3	256QAM	1	8	18.46	18.32	18.09		
3	256QAM	1	14	18.36	18.50	18.15		



3	256QAM	8	0	18.04	18.30	18.00	20
3	256QAM	8	4	18.31	18.24	18.16	
3	256QAM	8	7	18.29	18.41	18.02	
3	256QAM	15	0	18.32	18.41	18.03	
Channel				19957	20175	20393	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	23.12	23.25	23.16	25
1.4	QPSK	1	3	23.08	23.19	23.03	
1.4	QPSK	1	5	23.03	23.16	23.31	
1.4	QPSK	3	0	23.12	23.31	23.16	
1.4	QPSK	3	1	23.10	23.04	23.16	
1.4	QPSK	3	3	23.09	23.10	23.12	
1.4	QPSK	6	0	22.16	22.28	22.34	24
1.4	16QAM	1	0	22.25	22.27	22.38	24
1.4	16QAM	1	3	22.12	22.25	22.25	
1.4	16QAM	1	5	22.18	22.37	22.25	
1.4	16QAM	3	0	22.27	22.34	22.24	
1.4	16QAM	3	1	22.28	22.32	22.40	
1.4	16QAM	3	3	22.14	22.12	22.35	
1.4	16QAM	6	0	21.17	21.36	21.23	23
1.4	64QAM	1	0	21.31	21.30	21.40	23
1.4	64QAM	1	3	21.14	21.21	21.35	
1.4	64QAM	1	5	21.29	21.35	21.18	
1.4	64QAM	3	0	21.34	21.18	21.42	
1.4	64QAM	3	1	21.20	21.36	21.40	
1.4	64QAM	3	3	21.30	21.26	21.40	
1.4	64QAM	6	0	20.37	20.04	20.28	22
1.4	256QAM	1	0	18.35	18.26	18.18	20
1.4	256QAM	1	3	18.41	18.36	18.05	
1.4	256QAM	1	5	18.22	18.40	18.19	
1.4	256QAM	3	0	18.32	18.32	18.11	
1.4	256QAM	3	1	18.27	18.30	18.08	
1.4	256QAM	3	3	18.23	18.40	18.21	
1.4	256QAM	6	0	18.21	18.31	18.15	20

<LTE Band 5 Main>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20450	20525	20600	Tune-up limit (dBm)
Frequency (MHz)				829	836.5	844	
10	QPSK	1	0	23.17	23.15	23.13	25
10	QPSK	1	25	23.16	23.02	23.15	
10	QPSK	1	49	23.03	23.04	23.00	
10	QPSK	25	0	22.08	22.14	22.07	24
10	QPSK	25	12	22.17	22.18	22.05	
10	QPSK	25	25	22.15	22.19	22.09	
10	QPSK	50	0	22.18	22.17	22.05	24
10	16QAM	1	0	22.44	22.41	22.41	
10	16QAM	1	25	22.35	22.43	22.33	
10	16QAM	1	49	22.47	22.43	22.28	23
10	16QAM	25	0	21.08	21.14	21.06	
10	16QAM	25	12	21.20	21.17	21.06	
10	16QAM	25	25	21.17	21.17	21.04	
10	16QAM	50	0	21.19	21.16	21.08	



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10	64QAM	1	0	21.21	21.40	21.04	23	
10	64QAM	1	25	21.18	21.11	21.44		
10	64QAM	1	49	21.26	21.05	21.29		
10	64QAM	25	0	20.38	20.03	20.18	22	
10	64QAM	25	12	20.39	20.05	20.29		
10	64QAM	25	25	20.07	20.15	20.30		
10	64QAM	50	0	20.31	20.10	20.24	20	
10	256QAM	1	0	18.24	18.22	18.19		
10	256QAM	1	25	18.39	18.28	18.01		
10	256QAM	1	49	18.30	18.44	18.21	20	
10	256QAM	25	0	18.13	18.17	18.01		
10	256QAM	25	12	18.19	18.26	18.05		
10	256QAM	25	25	18.36	18.37	18.13	20	
10	256QAM	50	0	18.22	18.29	18.11		
Channel				20425	20525	20625		Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.05	23.01	23.00	25	
5	QPSK	1	12	23.10	23.03	23.06		
5	QPSK	1	24	23.04	23.04	23.01		
5	QPSK	12	0	22.16	22.11	22.05	24	
5	QPSK	12	7	22.15	22.16	22.06		
5	QPSK	12	13	22.19	22.15	22.00		
5	QPSK	25	0	22.14	22.01	22.12	24	
5	16QAM	1	0	22.35	22.15	22.24		
5	16QAM	1	12	22.32	22.42	22.25		
5	16QAM	1	24	22.24	22.18	22.18	23	
5	16QAM	12	0	21.08	21.08	21.05		
5	16QAM	12	7	21.19	21.06	21.06		
5	16QAM	12	13	21.13	21.08	21.16	23	
5	16QAM	25	0	21.16	21.02	21.08		
5	64QAM	1	0	21.15	21.19	21.06		
5	64QAM	1	12	21.14	21.02	21.28	23	
5	64QAM	1	24	21.05	21.04	21.03		
5	64QAM	12	0	20.30	20.17	20.10		
5	64QAM	12	7	20.18	20.07	20.00	22	
5	64QAM	12	13	20.18	20.17	20.22		
5	64QAM	25	0	20.17	20.09	20.12		
5	256QAM	1	0	18.21	18.18	18.00	20	
5	256QAM	1	12	18.28	18.35	18.09		
5	256QAM	1	24	18.38	18.35	18.14		
5	256QAM	12	0	18.08	18.16	18.19	20	
5	256QAM	12	7	18.15	18.35	18.11		
5	256QAM	12	13	18.39	18.34	18.11		
5	256QAM	25	0	18.33	18.33	18.05	20	
Channel				20415	20525	20635		Tune-up limit (dBm)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.06	23.09	23.05	25	
3	QPSK	1	8	23.04	23.12	23.02		
3	QPSK	1	14	23.00	23.06	23.05		
3	QPSK	8	0	22.05	22.00	22.07	24	
3	QPSK	8	4	22.05	22.09	22.01		
3	QPSK	8	7	22.10	22.18	22.00		
3	QPSK	15	0	22.17	22.14	22.17	24	
3	16QAM	1	0	22.32	22.17	22.12		
3	16QAM	1	8	22.27	22.41	22.21		
3	16QAM	1	14	22.24	22.29	22.06		



3	16QAM	8	0	21.15	21.14	21.09	23
3	16QAM	8	4	21.15	21.05	21.05	
3	16QAM	8	7	21.08	21.13	21.07	
3	16QAM	15	0	21.17	21.06	21.15	
3	64QAM	1	0	21.11	21.28	21.04	23
3	64QAM	1	8	21.15	21.08	21.36	
3	64QAM	1	14	21.14	21.10	21.23	
3	64QAM	8	0	20.23	20.03	20.12	22
3	64QAM	8	4	20.11	20.02	20.03	
3	64QAM	8	7	20.03	20.07	20.20	
3	64QAM	15	0	20.26	20.04	20.05	
3	256QAM	1	0	18.23	18.33	18.02	20
3	256QAM	1	8	18.31	18.36	18.00	
3	256QAM	1	14	18.30	18.39	18.21	
3	256QAM	8	0	18.13	18.22	18.20	20
3	256QAM	8	4	18.20	18.31	18.06	
3	256QAM	8	7	18.24	18.27	18.16	
3	256QAM	15	0	18.19	18.26	18.14	
Channel				20407	20525	20643	Tune-up limit (dBm)
Frequency (MHz)				824.7	836.5	848.3	
1.4	QPSK	1	0	23.06	23.10	23.03	25
1.4	QPSK	1	3	23.14	23.02	23.15	
1.4	QPSK	1	5	23.02	23.03	23.01	
1.4	QPSK	3	0	23.01	23.15	23.06	
1.4	QPSK	3	1	23.05	23.05	23.11	
1.4	QPSK	3	3	23.07	23.04	23.07	
1.4	QPSK	6	0	22.08	22.17	22.02	24
1.4	16QAM	1	0	22.32	22.34	22.22	24
1.4	16QAM	1	3	22.23	22.39	22.26	
1.4	16QAM	1	5	22.36	22.31	22.12	
1.4	16QAM	3	0	22.17	22.07	22.19	
1.4	16QAM	3	1	22.17	22.19	22.14	
1.4	16QAM	3	3	22.12	22.07	22.01	
1.4	16QAM	6	0	21.09	21.10	21.01	23
1.4	64QAM	1	0	21.18	21.06	21.09	23
1.4	64QAM	1	3	21.03	21.10	21.07	
1.4	64QAM	1	5	21.04	21.00	21.08	
1.4	64QAM	3	0	21.05	21.07	21.03	
1.4	64QAM	3	1	21.06	21.08	21.19	
1.4	64QAM	3	3	21.03	21.02	21.02	
1.4	64QAM	6	0	20.34	20.02	20.12	22
1.4	256QAM	1	0	18.08	18.07	18.18	20
1.4	256QAM	1	3	18.37	18.20	18.05	
1.4	256QAM	1	5	18.22	18.36	18.06	
1.4	256QAM	3	0	18.24	18.16	18.05	
1.4	256QAM	3	1	18.19	18.13	18.14	
1.4	256QAM	3	3	18.28	18.33	18.18	
1.4	256QAM	6	0	18.11	18.16	18.12	20



<LTE Band 7 MIMO 1>

Channel	Frequency (MHz)	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel		20850	21100	21350	
Frequency (MHz)		2510	2535	2560	
20	QPSK 1 0	23.38	23.45	23.39	25
20	QPSK 1 49	23.31	23.37	23.32	
20	QPSK 1 99	23.43	23.43	23.40	
20	QPSK 50 0	22.39	22.42	22.40	24
20	QPSK 50 24	22.51	22.45	22.47	
20	QPSK 50 50	22.55	22.55	22.50	
20	QPSK 100 0	22.51	22.46	22.49	24
20	16QAM 1 0	22.64	22.68	22.72	
20	16QAM 1 49	22.72	22.75	22.79	
20	16QAM 1 99	22.82	22.80	22.79	23
20	16QAM 50 0	21.43	21.45	21.39	
20	16QAM 50 24	21.56	21.48	21.53	
20	16QAM 50 50	21.58	21.57	21.52	23
20	16QAM 100 0	21.53	21.46	21.51	
20	64QAM 1 0	21.54	21.55	21.56	
20	64QAM 1 49	21.66	21.61	21.61	23
20	64QAM 1 99	21.74	21.73	21.68	
20	64QAM 50 0	20.47	20.48	20.41	
20	64QAM 50 24	20.59	20.49	20.52	22
20	64QAM 50 50	20.63	20.60	20.55	
20	64QAM 100 0	20.58	20.47	20.51	
20	256QAM 1 0	18.24	18.21	18.06	20
20	256QAM 1 49	18.31	18.37	18.02	
20	256QAM 1 99	18.39	18.48	18.25	
20	256QAM 50 0	18.05	18.22	18.11	20
20	256QAM 50 24	18.25	18.36	18.12	
20	256QAM 50 50	18.32	18.44	18.19	
20	256QAM 100 0	18.31	18.37	18.02	
Channel		20825	21100	21375	Tune-up limit (dBm)
Frequency (MHz)		2507.5	2535	2562.5	
15	QPSK 1 0	23.33	23.43	23.37	25
15	QPSK 1 37	23.02	23.24	23.21	
15	QPSK 1 74	23.29	23.26	23.32	
15	QPSK 36 0	22.15	22.20	22.13	24
15	QPSK 36 20	22.32	22.34	22.17	
15	QPSK 36 39	22.25	22.32	22.43	
15	QPSK 75 0	22.39	22.17	22.23	24
15	16QAM 1 0	22.48	22.58	22.59	
15	16QAM 1 37	22.62	22.49	22.49	
15	16QAM 1 74	22.75	22.67	22.64	23
15	16QAM 36 0	21.13	21.28	21.30	
15	16QAM 36 20	21.38	21.33	21.36	
15	16QAM 36 39	21.41	21.51	21.36	23
15	16QAM 75 0	21.53	21.16	21.23	
15	64QAM 1 0	21.42	21.54	21.35	
15	64QAM 1 37	21.58	21.48	21.53	23
15	64QAM 1 74	21.63	21.51	21.63	
15	64QAM 36 0	20.34	20.29	20.13	
15	64QAM 36 20	20.43	20.32	20.37	22
15	64QAM 36 39	20.53	20.50	20.25	
15	64QAM 75 0	20.43	20.26	20.47	



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15	256QAM	1	0	18.31	18.19	18.18	20
15	256QAM	1	37	18.45	18.37	18.14	
15	256QAM	1	74	18.41	18.48	18.30	
15	256QAM	36	0	18.10	18.30	18.17	20
15	256QAM	36	20	18.29	18.23	18.00	
15	256QAM	36	39	18.21	18.44	18.12	
15	256QAM	75	0	18.17	18.41	18.18	
Channel				20800	21100	21400	Tune-up limit (dBm)
Frequency (MHz)				2505	2535	2565	
10	QPSK	1	0	23.19	23.30	23.11	25
10	QPSK	1	25	23.12	23.25	23.24	
10	QPSK	1	49	23.22	23.23	23.20	
10	QPSK	25	0	22.21	22.18	22.17	24
10	QPSK	25	12	22.30	22.19	22.34	
10	QPSK	25	25	22.32	22.47	22.36	
10	QPSK	50	0	22.47	22.25	22.38	
10	16QAM	1	0	22.36	22.45	22.55	24
10	16QAM	1	25	22.60	22.75	22.66	
10	16QAM	1	49	22.63	22.61	22.54	
10	16QAM	25	0	21.26	21.40	21.12	23
10	16QAM	25	12	21.55	21.32	21.29	
10	16QAM	25	25	21.33	21.57	21.39	
10	16QAM	50	0	21.42	21.40	21.31	
10	64QAM	1	0	21.32	21.48	21.26	23
10	64QAM	1	25	21.42	21.43	21.59	
10	64QAM	1	49	21.73	21.64	21.49	
10	64QAM	25	0	20.25	20.19	20.30	22
10	64QAM	25	12	20.44	20.39	20.35	
10	64QAM	25	25	20.34	20.41	20.49	
10	64QAM	50	0	20.53	20.26	20.36	
10	256QAM	1	0	18.33	18.23	18.00	20
10	256QAM	1	25	18.37	18.44	18.05	
10	256QAM	1	49	18.27	18.50	18.18	
10	256QAM	25	0	18.05	18.30	18.02	20
10	256QAM	25	12	18.24	18.40	18.06	
10	256QAM	25	25	18.36	18.42	18.16	
10	256QAM	50	0	18.25	18.29	18.03	
Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	23.14	23.17	23.20	25
5	QPSK	1	12	23.18	23.32	23.27	
5	QPSK	1	24	23.16	23.20	23.35	
5	QPSK	12	0	22.17	22.19	22.19	24
5	QPSK	12	7	22.41	22.16	22.37	
5	QPSK	12	13	22.48	22.38	22.28	
5	QPSK	25	0	22.37	22.29	22.33	
5	16QAM	1	0	22.56	22.59	22.56	24
5	16QAM	1	12	22.67	22.62	22.74	
5	16QAM	1	24	22.64	22.63	22.66	
5	16QAM	12	0	21.42	21.44	21.35	23
5	16QAM	12	7	21.38	21.33	21.42	
5	16QAM	12	13	21.50	21.40	21.28	
5	16QAM	25	0	21.27	21.28	21.48	
5	64QAM	1	0	21.41	21.51	21.54	23
5	64QAM	1	12	21.57	21.33	21.51	
5	64QAM	1	24	21.73	21.65	21.43	



5	64QAM	12	0	20.45	20.20	20.16	22
5	64QAM	12	7	20.55	20.35	20.25	
5	64QAM	12	13	20.58	20.54	20.49	
5	64QAM	25	0	20.54	20.17	20.43	
5	256QAM	1	0	18.15	18.28	18.19	20
5	256QAM	1	12	18.45	18.36	18.07	
5	256QAM	1	24	18.39	18.44	18.14	
5	256QAM	12	0	18.09	18.24	18.05	20
5	256QAM	12	7	18.19	18.27	18.08	
5	256QAM	12	13	18.24	18.34	18.19	
5	256QAM	25	0	18.23	18.33	18.00	

<LTE Band 12 Main>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23060	23095	23130	Tune-up limit (dBm)
Frequency (MHz)				704	707.5	711	
10	QPSK	1	0	23.08	23.10	23.17	25
10	QPSK	1	25	23.01	23.07	23.03	
10	QPSK	1	49	23.02	23.02	23.01	
10	QPSK	25	0	22.03	22.06	22.05	24
10	QPSK	25	12	22.11	22.07	22.06	
10	QPSK	25	25	22.09	22.12	22.11	
10	QPSK	50	0	22.11	22.06	22.07	24
10	16QAM	1	0	22.26	22.32	22.35	
10	16QAM	1	25	22.29	22.38	22.34	
10	16QAM	1	49	22.42	22.39	22.37	23
10	16QAM	25	0	21.04	21.09	21.07	
10	16QAM	25	12	21.12	21.08	21.08	
10	16QAM	25	25	21.08	21.09	21.07	23
10	16QAM	50	0	21.12	21.08	21.08	
10	64QAM	1	0	21.14	21.13	21.23	
10	64QAM	1	25	21.25	21.28	21.27	23
10	64QAM	1	49	21.35	21.26	21.27	
10	64QAM	25	0	20.04	20.11	20.09	
10	64QAM	25	12	20.15	20.12	20.10	22
10	64QAM	25	25	20.14	20.16	20.12	
10	64QAM	50	0	20.15	20.12	20.06	
10	256QAM	1	0	18.26	18.35	18.19	20
10	256QAM	1	25	18.30	18.45	18.18	
10	256QAM	1	49	18.35	18.49	18.32	
10	256QAM	25	0	18.14	18.18	18.07	20
10	256QAM	25	12	18.25	18.41	18.07	
10	256QAM	25	25	18.31	18.32	18.02	
10	256QAM	50	0	18.28	18.40	18.05	20
Channel				23035	23095	23155	
Frequency (MHz)				701.5	707.5	713.5	Tune-up limit (dBm)
5	QPSK	1	0	23.09	23.05	23.12	25
5	QPSK	1	12	23.02	23.01	23.03	
5	QPSK	1	24	23.03	23.04	23.02	
5	QPSK	12	0	22.02	22.05	22.05	24
5	QPSK	12	7	22.01	22.16	22.06	
5	QPSK	12	13	22.00	22.09	22.12	
5	QPSK	25	0	22.14	22.11	22.07	



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5	16QAM	1	0	22.12	22.14	22.18	24
5	16QAM	1	12	22.28	22.21	22.26	
5	16QAM	1	24	22.39	22.39	22.28	
5	16QAM	12	0	21.00	21.13	21.07	23
5	16QAM	12	7	21.03	21.12	21.08	
5	16QAM	12	13	21.01	21.09	21.01	
5	16QAM	25	0	21.09	21.11	21.10	23
5	64QAM	1	0	21.01	21.16	21.10	
5	64QAM	1	12	21.23	21.14	21.11	
5	64QAM	1	24	21.18	21.14	21.14	22
5	64QAM	12	0	20.11	20.12	20.09	
5	64QAM	12	7	20.12	20.19	20.19	
5	64QAM	12	13	20.00	20.11	20.06	20
5	64QAM	25	0	20.02	20.03	20.01	
5	256QAM	1	0	18.10	18.15	18.17	
5	256QAM	1	12	18.28	18.29	18.17	20
5	256QAM	1	24	18.33	18.46	18.15	
5	256QAM	12	0	18.11	18.14	18.04	
5	256QAM	12	7	18.07	18.36	18.16	20
5	256QAM	12	13	18.15	18.24	18.03	
5	256QAM	25	0	18.15	18.40	18.19	
Channel				23025	23095	23165	Tune-up limit (dBm)
Frequency (MHz)				700.5	707.5	714.5	
3	QPSK	1	0	23.04	23.09	23.05	25
3	QPSK	1	8	23.10	23.00	23.06	
3	QPSK	1	14	23.05	23.09	23.01	
3	QPSK	8	0	22.04	22.05	22.00	24
3	QPSK	8	4	22.06	22.09	22.08	
3	QPSK	8	7	22.06	22.05	22.00	
3	QPSK	15	0	22.07	22.09	22.16	24
3	16QAM	1	0	22.24	22.28	22.16	
3	16QAM	1	8	22.20	22.20	22.19	
3	16QAM	1	14	22.38	22.26	22.35	23
3	16QAM	8	0	21.17	21.03	21.07	
3	16QAM	8	4	21.16	21.00	21.19	
3	16QAM	8	7	21.05	21.02	21.11	23
3	16QAM	15	0	21.08	21.18	21.10	
3	64QAM	1	0	21.04	21.03	21.19	
3	64QAM	1	8	21.22	21.09	21.10	22
3	64QAM	1	14	21.21	21.14	21.17	
3	64QAM	8	0	20.02	20.18	20.07	
3	64QAM	8	4	20.15	20.03	20.19	20
3	64QAM	8	7	20.09	20.00	20.03	
3	64QAM	15	0	20.19	20.15	20.08	
3	256QAM	1	0	18.12	18.32	18.00	20
3	256QAM	1	8	18.25	18.26	18.09	
3	256QAM	1	14	18.18	18.31	18.13	
3	256QAM	8	0	18.18	18.16	18.17	20
3	256QAM	8	4	18.18	18.26	18.18	
3	256QAM	8	7	18.18	18.27	18.01	
3	256QAM	15	0	18.10	18.28	18.12	Tune-up limit (dBm)
Channel				23017	23095	23173	
Frequency (MHz)				699.7	707.5	715.3	
1.4	QPSK	1	0	23.10	23.04	23.04	25
1.4	QPSK	1	3	23.09	23.05	23.07	
1.4	QPSK	1	5	23.00	23.08	23.09	



1.4	QPSK	3	0	23.05	23.04	23.09	
1.4	QPSK	3	1	23.06	23.07	23.09	
1.4	QPSK	3	3	23.03	23.03	23.01	
1.4	QPSK	6	0	22.16	22.06	22.09	24
1.4	16QAM	1	0	22.11	22.08	22.17	24
1.4	16QAM	1	3	22.02	22.07	22.01	
1.4	16QAM	1	5	22.14	22.04	22.19	
1.4	16QAM	3	0	22.14	22.12	22.08	
1.4	16QAM	3	1	22.04	22.03	22.06	
1.4	16QAM	3	3	22.15	22.05	22.13	
1.4	16QAM	6	0	21.05	21.19	21.10	23
1.4	64QAM	1	0	21.07	21.04	21.08	23
1.4	64QAM	1	3	21.05	21.09	21.07	
1.4	64QAM	1	5	21.01	21.01	21.06	
1.4	64QAM	3	0	21.13	21.06	21.07	
1.4	64QAM	3	1	21.07	21.19	21.13	
1.4	64QAM	3	3	21.18	21.15	21.12	
1.4	64QAM	6	0	20.10	20.09	20.04	22
1.4	256QAM	1	0	18.31	18.25	18.09	20
1.4	256QAM	1	3	18.33	18.33	18.03	
1.4	256QAM	1	5	18.32	18.43	18.24	
1.4	256QAM	3	0	18.11	18.29	18.16	
1.4	256QAM	3	1	18.13	18.23	18.08	
1.4	256QAM	3	3	18.37	18.46	18.01	
1.4	256QAM	6	0	18.32	18.24	18.16	20

<LTE Band 13 Main>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23230			25
Frequency (MHz)				782			
10	QPSK	1	0		23.18		25
10	QPSK	1	25		23.12		
10	QPSK	1	49		23.15		
10	QPSK	25	0		22.19		24
10	QPSK	25	12		22.22		
10	QPSK	25	25		22.27		
10	QPSK	50	0		22.26		24
10	16QAM	1	0		22.49		
10	16QAM	1	25		22.50		
10	16QAM	1	49		22.44		23
10	16QAM	25	0		21.22		
10	16QAM	25	12		21.22		
10	16QAM	25	25		21.26		23
10	16QAM	50	0		21.25		
10	64QAM	1	0		21.12		
10	64QAM	1	25		21.17		23
10	64QAM	1	49		21.43		
10	64QAM	25	0		20.09		
10	64QAM	25	12		20.28		22
10	64QAM	25	25		20.30		
10	64QAM	50	0		20.03		
10	256QAM	1	0		18.29		20
10	256QAM	1	25		18.31		



10	256QAM	1	49		18.43		
10	256QAM	25	0		18.27		20
10	256QAM	25	12		18.24		
10	256QAM	25	25		18.42		
10	256QAM	50	0		18.36		
Channel				23205	23230	23255	
Frequency (MHz)				779.5	782	784.5	
5	QPSK	1	0	23.04	23.14	23.03	25
5	QPSK	1	12	23.05	23.07	23.00	
5	QPSK	1	24	23.13	23.08	23.09	
5	QPSK	12	0	22.17	22.10	22.18	24
5	QPSK	12	7	22.21	22.14	22.15	
5	QPSK	12	13	22.18	22.09	22.04	
5	QPSK	25	0	22.04	22.09	22.12	24
5	16QAM	1	0	22.34	22.37	22.31	
5	16QAM	1	12	22.47	22.28	22.46	
5	16QAM	1	24	22.38	22.30	22.16	23
5	16QAM	12	0	21.09	21.22	21.06	
5	16QAM	12	7	21.04	21.14	21.16	
5	16QAM	12	13	21.22	21.23	21.18	23
5	16QAM	25	0	21.01	21.19	21.05	
5	64QAM	1	0	21.00	21.03	21.00	
5	64QAM	1	12	21.07	21.16	21.09	23
5	64QAM	1	24	21.19	21.13	21.30	
5	64QAM	12	0	20.05	20.05	20.00	
5	64QAM	12	7	20.18	20.28	20.07	22
5	64QAM	12	13	20.09	20.29	20.11	
5	64QAM	25	0	20.30	20.01	20.00	
5	256QAM	1	0	18.31	18.17	18.04	20
5	256QAM	1	12	18.45	18.32	18.16	
5	256QAM	1	24	18.39	18.45	18.15	
5	256QAM	12	0	18.00	18.21	18.15	20
5	256QAM	12	7	18.14	18.24	18.00	
5	256QAM	12	13	18.33	18.45	18.07	
5	256QAM	25	0	18.25	18.40	18.05	

<LTE Band 14 Main>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23330			Tune-up limit (dBm)
Frequency (MHz)				793			
10	QPSK	1	0		23.16		25
10	QPSK	1	25		23.05		
10	QPSK	1	49		23.03		
10	QPSK	25	0		22.12		24
10	QPSK	25	12		22.13		
10	QPSK	25	25		22.17		
10	QPSK	50	0		22.12		24
10	16QAM	1	0		22.52		
10	16QAM	1	25		22.45		
10	16QAM	1	49		22.38		23
10	16QAM	25	0		21.12		
10	16QAM	25	12		21.09		
10	16QAM	25	25		21.15		



10	16QAM	50	0		21.12		
10	64QAM	1	0		21.38		23
10	64QAM	1	25		21.40		
10	64QAM	1	49		21.34		
10	64QAM	25	0		20.16		22
10	64QAM	25	12		20.17		
10	64QAM	25	25		20.19		
10	64QAM	50	0		20.14		
10	256QAM	1	0		18.24		20
10	256QAM	1	25		18.36		
10	256QAM	1	49		18.36		
10	256QAM	25	0		18.19		20
10	256QAM	25	12		18.29		
10	256QAM	25	25		18.41		
10	256QAM	50	0		18.29		
Channel				23305	23330	23355	Tune-up limit (dBm)
Frequency (MHz)				790.5	793	795.5	
5	QPSK	1	0	23.14	23.10	23.09	25
5	QPSK	1	12	23.01	23.10	23.06	
5	QPSK	1	24	23.06	23.03	23.06	
5	QPSK	12	0	22.02	22.08	22.01	24
5	QPSK	12	7	22.04	22.13	22.12	
5	QPSK	12	13	22.13	22.14	22.18	
5	QPSK	25	0	22.11	22.11	22.13	
5	16QAM	1	0	22.42	22.30	22.25	24
5	16QAM	1	12	22.16	22.41	22.21	
5	16QAM	1	24	22.38	22.30	22.22	
5	16QAM	12	0	21.05	21.06	21.04	23
5	16QAM	12	7	21.02	21.05	21.16	
5	16QAM	12	13	21.03	21.07	21.07	
5	16QAM	25	0	21.09	21.04	21.13	
5	64QAM	1	0	21.23	21.16	21.16	23
5	64QAM	1	12	21.29	21.39	21.16	
5	64QAM	1	24	21.23	21.11	21.32	
5	64QAM	12	0	20.09	20.16	20.03	22
5	64QAM	12	7	20.02	20.13	20.08	
5	64QAM	12	13	20.03	20.08	20.01	
5	64QAM	25	0	20.04	20.10	20.19	
5	256QAM	1	0	18.32	18.28	18.07	20
5	256QAM	1	12	18.33	18.40	18.14	
5	256QAM	1	24	18.33	18.41	18.23	
5	256QAM	12	0	18.10	18.28	18.18	20
5	256QAM	12	7	18.29	18.38	18.18	
5	256QAM	12	13	18.26	18.38	18.17	
5	256QAM	25	0	18.30	18.39	18.14	

<LTE Band 25 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				26140	26340	26590	
Frequency (MHz)				1860	1880	1905	
20	QPSK	1	0	23.71	23.61	23.51	25
20	QPSK	1	49	23.64	23.52	23.48	
20	QPSK	1	99	23.59	23.55	23.51	



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20	QPSK	50	0	22.68	22.63	22.57	24
20	QPSK	50	24	22.76	22.71	22.67	
20	QPSK	50	50	22.72	22.67	22.66	
20	QPSK	100	0	22.78	22.68	22.69	
20	16QAM	1	0	23.03	22.95	22.90	24
20	16QAM	1	49	22.94	22.86	22.85	
20	16QAM	1	99	22.88	22.89	22.83	
20	16QAM	50	0	21.73	21.63	21.62	23
20	16QAM	50	24	21.78	21.71	21.68	
20	16QAM	50	50	21.74	21.70	21.66	
20	16QAM	100	0	21.75	21.68	21.67	
20	64QAM	1	0	21.85	21.81	21.76	23
20	64QAM	1	49	21.85	21.80	21.77	
20	64QAM	1	99	21.81	21.80	21.17	
20	64QAM	50	0	20.76	20.64	20.63	22
20	64QAM	50	24	20.79	20.72	20.71	
20	64QAM	50	50	20.75	20.70	20.67	
20	64QAM	100	0	20.79	20.73	20.58	
20	256QAM	1	0	18.23	18.35	18.19	20
20	256QAM	1	49	18.31	18.28	18.13	
20	256QAM	1	99	18.32	18.34	18.15	
20	256QAM	50	0	18.11	18.30	18.13	20
20	256QAM	50	24	18.31	18.41	18.03	
20	256QAM	50	50	18.21	18.43	18.08	
20	256QAM	100	0	18.29	18.31	18.19	
Channel				26115	26340	26615	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1907.5	
15	QPSK	1	0	23.52	23.55	23.22	25
15	QPSK	1	37	23.60	23.32	23.39	
15	QPSK	1	74	23.57	23.41	23.26	
15	QPSK	36	0	22.65	22.38	22.37	24
15	QPSK	36	20	22.51	22.64	22.48	
15	QPSK	36	39	22.64	22.45	22.42	
15	QPSK	75	0	22.54	22.47	22.54	
15	16QAM	1	0	22.91	22.86	22.75	24
15	16QAM	1	37	22.81	22.76	22.74	
15	16QAM	1	74	22.62	22.71	22.71	
15	16QAM	36	0	21.49	21.63	21.60	23
15	16QAM	36	20	21.63	21.59	21.66	
15	16QAM	36	39	21.56	21.59	21.62	
15	16QAM	75	0	21.53	21.68	21.44	
15	64QAM	1	0	21.60	21.70	21.70	23
15	64QAM	1	37	21.60	21.59	21.50	
15	64QAM	1	74	21.57	21.52	21.07	
15	64QAM	36	0	20.53	20.58	20.57	22
15	64QAM	36	20	20.70	20.53	20.45	
15	64QAM	36	39	20.69	20.58	20.65	
15	64QAM	75	0	20.60	20.51	20.43	
15	256QAM	1	0	18.31	18.30	18.11	20
15	256QAM	1	37	18.34	18.37	18.18	
15	256QAM	1	74	18.27	18.39	18.16	
15	256QAM	36	0	18.01	18.29	18.02	20
15	256QAM	36	20	18.13	18.39	18.17	
15	256QAM	36	39	18.32	18.31	18.06	
15	256QAM	75	0	18.21	18.26	18.10	
Channel				26090	26340	26640	Tune-up limit



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Frequency (MHz)				1855	1880	1910	(dBm)
10	QPSK	1	0	23.60	23.36	23.28	25
10	QPSK	1	25	23.54	23.36	23.37	
10	QPSK	1	49	23.31	23.54	23.38	
10	QPSK	25	0	22.56	22.43	22.27	24
10	QPSK	25	12	22.76	22.53	22.66	
10	QPSK	25	25	22.46	22.52	22.43	
10	QPSK	50	0	22.51	22.65	22.66	24
10	16QAM	1	0	22.75	22.82	22.80	
10	16QAM	1	25	22.91	22.76	22.71	
10	16QAM	1	49	22.76	22.65	22.82	23
10	16QAM	25	0	21.55	21.54	21.33	
10	16QAM	25	12	21.61	21.63	21.43	
10	16QAM	25	25	21.59	21.44	21.48	23
10	16QAM	50	0	21.50	21.44	21.63	
10	64QAM	1	0	21.83	21.64	21.68	
10	64QAM	1	25	21.67	21.70	21.67	23
10	64QAM	1	49	21.77	21.79	21.16	
10	64QAM	25	0	20.46	20.64	20.45	
10	64QAM	25	12	20.71	20.43	20.49	22
10	64QAM	25	25	20.67	20.67	20.43	
10	64QAM	50	0	20.67	20.63	20.38	
10	256QAM	1	0	18.24	18.15	18.18	20
10	256QAM	1	25	18.32	18.35	18.10	
10	256QAM	1	49	18.26	18.34	18.28	
10	256QAM	25	0	18.14	18.12	18.09	20
10	256QAM	25	12	18.33	18.41	18.07	
10	256QAM	25	25	18.31	18.27	18.00	
10	256QAM	50	0	18.22	18.31	18.13	Tune-up limit (dBm)
Channel				26065	26340	26665	
Frequency (MHz)				1852.5	1880	1912.5	
5	QPSK	1	0	23.60	23.32	23.37	25
5	QPSK	1	12	23.58	23.45	23.28	
5	QPSK	1	24	23.40	23.54	23.30	
5	QPSK	12	0	22.45	22.50	22.27	24
5	QPSK	12	7	22.57	22.42	22.66	
5	QPSK	12	13	22.42	22.54	22.63	
5	QPSK	25	0	22.60	22.47	22.51	24
5	16QAM	1	0	22.79	22.86	22.80	
5	16QAM	1	12	22.93	22.73	22.58	
5	16QAM	1	24	22.59	22.70	22.61	23
5	16QAM	12	0	21.55	21.58	21.51	
5	16QAM	12	7	21.61	21.66	21.42	
5	16QAM	12	13	21.73	21.53	21.50	23
5	16QAM	25	0	21.50	21.68	21.53	
5	64QAM	1	0	21.63	21.62	21.55	
5	64QAM	1	12	21.74	21.72	21.48	23
5	64QAM	1	24	21.51	21.78	21.17	
5	64QAM	12	0	20.74	20.56	20.59	
5	64QAM	12	7	20.68	20.72	20.56	22
5	64QAM	12	13	20.59	20.66	20.63	
5	64QAM	25	0	20.51	20.72	20.39	
5	256QAM	1	0	18.30	18.20	18.02	20
5	256QAM	1	12	18.43	18.28	18.09	
5	256QAM	1	24	18.30	18.45	18.25	
5	256QAM	12	0	18.03	18.19	18.03	20



5	256QAM	12	7	18.13	18.38	18.12		
5	256QAM	12	13	18.28	18.34	18.16		
5	256QAM	25	0	18.25	18.36	18.00		
Channel				26055	26340	26675	Tune-up limit (dBm)	
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	23.67	23.61	23.28	25	
3	QPSK	1	8	23.40	23.47	23.42		
3	QPSK	1	14	23.34	23.47	23.34		
3	QPSK	8	0	22.40	22.57	22.53	24	
3	QPSK	8	4	22.71	22.42	22.63		
3	QPSK	8	7	22.47	22.60	22.61		
3	QPSK	15	0	22.78	22.57	22.60	24	
3	16QAM	1	0	22.74	22.94	22.79		
3	16QAM	1	8	22.86	22.82	22.72		
3	16QAM	1	14	22.86	22.68	22.77	24	
3	16QAM	8	0	21.45	21.38	21.45		
3	16QAM	8	4	21.66	21.48	21.46		
3	16QAM	8	7	21.44	21.69	21.47	23	
3	16QAM	15	0	21.63	21.57	21.56		
3	64QAM	1	0	21.62	21.51	21.56		
3	64QAM	1	8	21.77	21.80	21.65	23	
3	64QAM	1	14	21.71	21.66	21.15		
3	64QAM	8	0	20.63	20.60	20.33		
3	64QAM	8	4	20.68	20.59	20.60	22	
3	64QAM	8	7	20.58	20.64	20.65		
3	64QAM	15	0	20.66	20.61	20.50		
3	256QAM	1	0	18.29	18.26	18.15	20	
3	256QAM	1	8	18.33	18.29	18.14		
3	256QAM	1	14	18.21	18.45	18.29		
3	256QAM	8	0	18.04	18.17	18.14	20	
3	256QAM	8	4	18.19	18.35	18.04		
3	256QAM	8	7	18.28	18.30	18.03		
3	256QAM	15	0	18.26	18.23	18.16	20	
Channel				26047	26340	26683		Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	23.58	23.42	23.44	25	
1.4	QPSK	1	3	23.64	23.46	23.45		
1.4	QPSK	1	5	23.55	23.50	23.43		
1.4	QPSK	3	0	23.70	23.60	23.37	25	
1.4	QPSK	3	1	23.62	23.46	23.35		
1.4	QPSK	3	3	23.49	23.36	23.33		
1.4	QPSK	6	0	22.67	22.59	22.45	24	
1.4	16QAM	1	0	22.75	22.60	22.58	24	
1.4	16QAM	1	3	22.60	22.49	22.49		
1.4	16QAM	1	5	22.67	22.54	22.66		
1.4	16QAM	3	0	22.48	22.46	22.52	24	
1.4	16QAM	3	1	22.65	22.51	22.50		
1.4	16QAM	3	3	22.66	22.58	22.64		
1.4	16QAM	6	0	21.63	21.47	21.54	23	
1.4	64QAM	1	0	21.78	21.67	21.57	23	
1.4	64QAM	1	3	21.57	21.66	21.63		
1.4	64QAM	1	5	21.63	21.49	21.60		
1.4	64QAM	3	0	21.57	21.62	21.48	23	
1.4	64QAM	3	1	21.77	21.56	21.65		
1.4	64QAM	3	3	21.67	21.69	21.46		
1.4	64QAM	6	0	20.73	20.47	20.56	22	



1.4	256QAM	1	0	18.35	18.33	18.19	20
1.4	256QAM	1	3	18.31	18.44	18.16	
1.4	256QAM	1	5	18.27	18.51	18.21	
1.4	256QAM	3	0	18.31	18.23	18.09	
1.4	256QAM	3	1	18.45	18.46	18.11	
1.4	256QAM	3	3	18.40	18.37	18.22	
1.4	256QAM	6	0	18.25	18.27	18.01	20

<LTE Band 26 Main>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				26765	26865	26965	25
Frequency (MHz)				821.5	831.5	841.5	
15	QPSK	1	0	23.14	23.21	23.20	25
15	QPSK	1	37	23.05	23.00	23.07	
15	QPSK	1	74	23.11	23.14	23.04	
15	QPSK	36	0	22.01	22.10	22.05	24
15	QPSK	36	20	22.07	22.09	22.00	
15	QPSK	36	39	22.12	22.11	22.02	
15	QPSK	75	0	22.07	22.06	22.00	24
15	16QAM	1	0	22.25	22.30	22.33	
15	16QAM	1	37	22.20	22.31	22.22	
15	16QAM	1	74	22.24	22.30	22.15	23
15	16QAM	36	0	21.03	21.09	21.03	
15	16QAM	36	20	21.07	21.08	21.01	
15	16QAM	36	39	21.12	21.12	21.03	23
15	16QAM	75	0	21.10	21.08	21.02	
15	64QAM	1	0	21.13	21.16	21.18	
15	64QAM	1	37	21.10	21.26	21.16	23
15	64QAM	1	74	21.16	21.16	21.04	
15	64QAM	36	0	20.06	20.15	20.12	
15	64QAM	36	20	20.11	20.12	20.04	22
15	64QAM	36	39	20.20	20.15	20.09	
15	64QAM	75	0	20.12	20.08	20.06	
15	256QAM	1	0	18.33	18.32	18.04	20
15	256QAM	1	37	18.39	18.39	18.06	
15	256QAM	1	74	18.27	18.40	18.25	
15	256QAM	36	0	18.10	18.31	18.06	20
15	256QAM	36	20	18.22	18.26	18.10	
15	256QAM	36	39	18.23	18.33	18.10	
15	256QAM	75	0	18.33	18.23	18.20	20
Channel				26740	26865	26990	
Frequency (MHz)				819	831.5	844	
10	QPSK	1	0	23.09	23.07	23.13	25
10	QPSK	1	25	23.09	23.00	23.02	
10	QPSK	1	49	23.12	23.03	23.09	
10	QPSK	25	0	22.09	22.02	22.19	24
10	QPSK	25	12	22.12	22.15	22.08	
10	QPSK	25	25	22.12	22.11	22.00	
10	QPSK	50	0	22.13	22.02	22.19	24
10	16QAM	1	0	22.18	22.30	22.24	
10	16QAM	1	25	22.01	22.23	22.12	
10	16QAM	1	49	22.09	22.14	22.14	24
10	16QAM	25	0	21.02	21.09	21.20	



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10	16QAM	25	12	21.06	21.10	21.21	
10	16QAM	25	25	21.12	21.00	21.11	
10	16QAM	50	0	21.15	21.00	21.03	
10	64QAM	1	0	21.07	21.09	21.17	23
10	64QAM	1	25	21.10	21.19	21.18	
10	64QAM	1	49	21.07	21.19	21.04	
10	64QAM	25	0	20.18	20.07	20.07	22
10	64QAM	25	12	20.11	20.18	20.16	
10	64QAM	25	25	20.11	20.02	20.10	
10	64QAM	50	0	20.11	20.17	20.12	
10	256QAM	1	0	18.31	18.29	18.06	20
10	256QAM	1	25	18.32	18.39	18.06	
10	256QAM	1	49	18.12	18.22	18.17	
10	256QAM	25	0	18.06	18.25	18.14	20
10	256QAM	25	12	18.05	18.19	18.18	
10	256QAM	25	25	18.10	18.17	18.19	
10	256QAM	50	0	18.28	18.05	18.00	
Channel				26715	26865	27015	Tune-up limit (dBm)
Frequency (MHz)				816.5	831.5	846.5	
5	QPSK	1	0	23.06	23.13	23.01	25
5	QPSK	1	12	23.13	23.07	23.02	
5	QPSK	1	24	23.10	23.08	23.04	
5	QPSK	12	0	22.14	22.06	22.05	24
5	QPSK	12	7	22.02	22.17	22.11	
5	QPSK	12	13	22.07	22.16	22.14	
5	QPSK	25	0	22.05	22.06	22.10	
5	16QAM	1	0	22.13	22.25	22.26	24
5	16QAM	1	12	22.14	22.27	22.16	
5	16QAM	1	24	22.21	22.13	22.29	
5	16QAM	12	0	21.03	21.22	21.29	23
5	16QAM	12	7	21.03	21.04	21.12	
5	16QAM	12	13	21.01	21.05	21.25	
5	16QAM	25	0	21.26	21.22	21.16	
5	64QAM	1	0	21.00	21.08	21.11	23
5	64QAM	1	12	21.20	21.20	21.00	
5	64QAM	1	24	21.29	21.12	21.00	
5	64QAM	12	0	20.26	20.08	20.06	22
5	64QAM	12	7	20.16	20.08	20.02	
5	64QAM	12	13	20.07	20.07	20.05	
5	64QAM	25	0	20.08	20.00	20.18	
5	256QAM	1	0	18.26	18.32	18.18	20
5	256QAM	1	12	18.28	18.21	18.23	
5	256QAM	1	24	18.27	18.28	18.11	
5	256QAM	12	0	18.20	18.18	18.28	20
5	256QAM	12	7	18.15	18.16	18.28	
5	256QAM	12	13	18.16	18.28	18.22	
5	256QAM	25	0	18.20	18.12	18.08	
Channel				26705	26865	27025	Tune-up limit (dBm)
Frequency (MHz)				815.5	831.5	847.5	
3	QPSK	1	0	23.00	23.03	23.18	25
3	QPSK	1	8	23.15	23.04	23.05	
3	QPSK	1	14	23.04	23.04	23.10	
3	QPSK	8	0	22.17	22.29	22.25	24
3	QPSK	8	4	22.25	22.21	22.13	
3	QPSK	8	7	22.23	22.07	22.01	
3	QPSK	15	0	22.01	22.27	22.20	



3	16QAM	1	0	22.06	22.27	22.19	24
3	16QAM	1	8	22.03	22.31	22.14	
3	16QAM	1	14	22.24	22.24	22.25	
3	16QAM	8	0	21.14	21.06	21.13	23
3	16QAM	8	4	21.00	21.06	21.27	
3	16QAM	8	7	21.04	21.28	21.28	
3	16QAM	15	0	21.03	21.01	21.20	23
3	64QAM	1	0	21.08	21.28	21.17	
3	64QAM	1	8	21.22	21.21	21.27	
3	64QAM	1	14	21.11	21.15	21.20	22
3	64QAM	8	0	20.27	20.25	20.28	
3	64QAM	8	4	20.18	20.05	20.16	
3	64QAM	8	7	20.02	20.09	20.04	20
3	64QAM	15	0	20.14	20.06	20.16	
3	256QAM	1	0	18.27	18.18	18.19	
3	256QAM	1	8	18.21	18.28	18.10	20
3	256QAM	1	14	18.18	18.27	18.07	
3	256QAM	8	0	18.07	18.24	18.00	
3	256QAM	8	4	18.04	18.07	18.22	20
3	256QAM	8	7	18.08	18.19	18.03	
3	256QAM	15	0	18.17	18.07	18.17	
Channel				26697	26865	27033	Tune-up limit (dBm)
Frequency (MHz)				814.7	831.5	848.3	
1.4	QPSK	1	0	23.17	23.15	23.15	25
1.4	QPSK	1	3	23.11	23.06	23.05	
1.4	QPSK	1	5	23.13	23.16	23.01	
1.4	QPSK	3	0	23.10	23.10	23.06	
1.4	QPSK	3	1	23.04	23.17	23.04	
1.4	QPSK	3	3	23.19	23.14	23.04	
1.4	QPSK	6	0	22.12	22.11	22.13	24
1.4	16QAM	1	0	22.29	22.03	22.17	24
1.4	16QAM	1	3	22.29	22.21	22.17	
1.4	16QAM	1	5	22.00	22.19	22.11	
1.4	16QAM	3	0	22.10	22.18	22.04	
1.4	16QAM	3	1	22.00	22.18	22.00	
1.4	16QAM	3	3	22.13	22.10	22.02	
1.4	16QAM	6	0	21.02	21.10	21.17	23
1.4	64QAM	1	0	21.13	21.15	21.13	23
1.4	64QAM	1	3	21.16	21.19	21.04	
1.4	64QAM	1	5	21.03	21.08	21.04	
1.4	64QAM	3	0	21.02	21.17	21.03	
1.4	64QAM	3	1	21.16	21.13	21.06	
1.4	64QAM	3	3	21.14	21.09	21.02	
1.4	64QAM	6	0	20.17	20.16	20.07	22
1.4	256QAM	1	0	18.30	18.21	18.04	20
1.4	256QAM	1	3	18.35	18.34	18.00	
1.4	256QAM	1	5	18.25	18.32	18.18	
1.4	256QAM	3	0	18.22	18.17	18.14	
1.4	256QAM	3	1	18.37	18.43	18.13	
1.4	256QAM	3	3	18.41	18.39	18.29	
1.4	256QAM	6	0	18.32	18.25	18.09	20



<LTE Band 30 MIMO 1>

Channel	BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					27710			23
Frequency (MHz)					2310			
10	QPSK	1	0		21.36		23	
10	QPSK	1	25		21.27			
10	QPSK	1	49		21.32			
10	QPSK	25	0		20.34		22	
10	QPSK	25	12		20.39			
10	QPSK	25	25		20.50			
10	QPSK	50	0		20.40		22	
10	16QAM	1	0		20.64			
10	16QAM	1	25		20.69			
10	16QAM	1	49		20.72		21	
10	16QAM	25	0		19.35			
10	16QAM	25	12		19.39			
10	16QAM	25	25		19.52		21	
10	16QAM	50	0		19.38			
10	64QAM	1	0		19.47			
10	64QAM	1	25		19.63		21	
10	64QAM	1	49		19.57			
10	64QAM	25	0		18.36			
10	64QAM	25	12		18.42		20	
10	64QAM	25	25		18.55			
10	64QAM	50	0		18.45			
10	256QAM	1	0		16.17		18	
10	256QAM	1	25		16.29			
10	256QAM	1	49		16.35			
10	256QAM	25	0		16.25		18	
10	256QAM	25	12		16.34			
10	256QAM	25	25		16.34			
10	256QAM	50	0		16.26			
Channel					27685	27710	27735	Tune-up limit (dBm)
Frequency (MHz)					2307.5	2310	2312.5	
5	QPSK	1	0		21.12	21.17	21.12	23
5	QPSK	1	12		21.21	21.17	21.19	
5	QPSK	1	24		21.15	21.31	21.13	
5	QPSK	12	0		20.05	20.15	20.14	22
5	QPSK	12	7		20.30	20.32	20.22	
5	QPSK	12	13		20.34	20.26	20.22	
5	QPSK	25	0		20.29	20.35	20.11	22
5	16QAM	1	0		20.45	20.52	20.41	
5	16QAM	1	12		20.46	20.51	20.43	
5	16QAM	1	24		20.72	20.59	20.42	21
5	16QAM	12	0		19.22	19.07	19.10	
5	16QAM	12	7		19.36	19.26	19.16	
5	16QAM	12	13		19.38	19.24	19.47	21
5	16QAM	25	0		19.08	19.18	19.21	
5	64QAM	1	0		19.22	19.27	19.32	
5	64QAM	1	12		19.62	19.60	19.46	21
5	64QAM	1	24		19.43	19.41	19.27	
5	64QAM	12	0		18.34	18.25	18.24	
5	64QAM	12	7		18.31	18.27	18.22	20
5	64QAM	12	13		18.36	18.27	18.29	
5	64QAM	25	0		18.17	18.21	18.19	



5	256QAM	1	0	16.05	16.08	16.15	18
5	256QAM	1	12	16.28	16.10	16.13	
5	256QAM	1	24	16.15	16.21	16.21	
5	256QAM	12	0	16.13	16.23	16.13	18
5	256QAM	12	7	16.20	16.30	16.29	
5	256QAM	12	13	16.32	16.32	16.18	
5	256QAM	25	0	16.24	16.15	16.25	

<LTE Band 66 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				132072	132322	132572	
Frequency (MHz)				1720	1745	1770	
20	QPSK	1	0	23.48	23.58	23.56	25
20	QPSK	1	49	23.30	23.50	23.34	
20	QPSK	1	99	23.39	23.48	23.33	
20	QPSK	50	0	22.42	22.59	22.47	24
20	QPSK	50	24	22.49	22.57	22.47	
20	QPSK	50	50	22.46	22.63	22.52	
20	QPSK	100	0	22.48	22.57	22.45	24
20	16QAM	1	0	22.72	22.82	22.81	
20	16QAM	1	49	22.67	22.85	22.68	
20	16QAM	1	99	22.71	22.83	22.65	23
20	16QAM	50	0	21.41	21.60	21.49	
20	16QAM	50	24	21.51	21.59	21.47	
20	16QAM	50	50	21.48	21.63	21.52	23
20	16QAM	100	0	21.50	21.56	21.45	
20	64QAM	1	0	21.59	21.63	21.69	
20	64QAM	1	49	21.62	21.74	21.60	23
20	64QAM	1	99	21.68	21.72	21.61	
20	64QAM	50	0	20.44	20.63	20.51	
20	64QAM	50	24	20.55	20.62	20.48	22
20	64QAM	50	50	20.50	20.67	20.53	
20	64QAM	100	0	20.51	20.60	20.48	
20	256QAM	1	0	18.17	18.19	18.06	20
20	256QAM	1	49	18.47	18.39	18.01	
20	256QAM	1	99	18.34	18.51	18.15	
20	256QAM	50	0	18.26	18.16	18.19	20
20	256QAM	50	24	18.24	18.27	18.01	
20	256QAM	50	50	18.28	18.28	18.14	
20	256QAM	100	0	18.22	18.31	18.03	
Channel				132047	132322	132597	
Frequency (MHz)				1717.5	1745	1772.5	
15	QPSK	1	0	23.26	23.48	23.55	25
15	QPSK	1	37	23.20	23.40	23.21	
15	QPSK	1	74	23.19	23.43	23.11	
15	QPSK	36	0	22.37	22.44	22.33	24
15	QPSK	36	20	22.25	22.34	22.23	
15	QPSK	36	39	22.37	22.50	22.32	
15	QPSK	75	0	22.46	22.47	22.26	24
15	16QAM	1	0	22.61	22.62	22.60	
15	16QAM	1	37	22.46	22.77	22.58	
15	16QAM	1	74	22.54	22.64	22.53	23
15	16QAM	36	0	21.33	21.50	21.44	



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15	16QAM	36	20	21.32	21.56	21.32	
15	16QAM	36	39	21.41	21.54	21.42	
15	16QAM	75	0	21.25	21.28	21.25	
15	64QAM	1	0	21.40	21.40	21.54	23
15	64QAM	1	37	21.39	21.44	21.36	
15	64QAM	1	74	21.39	21.65	21.51	
15	64QAM	36	0	20.42	20.42	20.33	22
15	64QAM	36	20	20.50	20.39	20.41	
15	64QAM	36	39	20.24	20.65	20.27	
15	64QAM	75	0	20.34	20.52	20.28	
15	256QAM	1	0	18.33	18.28	18.14	20
15	256QAM	1	37	18.42	18.32	18.13	
15	256QAM	1	74	18.36	18.34	18.17	
15	256QAM	36	0	18.15	18.29	18.02	20
15	256QAM	36	20	18.33	18.31	18.11	
15	256QAM	36	39	18.36	18.31	18.17	
15	256QAM	75	0	18.29	18.36	18.09	
Channel				132022	132322	132622	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	QPSK	1	0	23.48	23.29	23.29	25
10	QPSK	1	25	23.04	23.29	23.15	
10	QPSK	1	49	23.15	23.43	23.25	
10	QPSK	25	0	22.38	22.52	22.42	24
10	QPSK	25	12	22.39	22.49	22.42	
10	QPSK	25	25	22.30	22.35	22.25	
10	QPSK	50	0	22.46	22.49	22.17	
10	16QAM	1	0	22.42	22.75	22.69	24
10	16QAM	1	25	22.65	22.75	22.60	
10	16QAM	1	49	22.45	22.72	22.58	
10	16QAM	25	0	21.23	21.46	21.28	23
10	16QAM	25	12	21.39	21.45	21.20	
10	16QAM	25	25	21.39	21.37	21.25	
10	16QAM	50	0	21.41	21.34	21.37	
10	64QAM	1	0	21.59	21.38	21.39	23
10	64QAM	1	25	21.57	21.74	21.32	
10	64QAM	1	49	21.54	21.47	21.58	
10	64QAM	25	0	20.29	20.45	20.39	22
10	64QAM	25	12	20.31	20.52	20.31	
10	64QAM	25	25	20.50	20.38	20.45	
10	64QAM	50	0	20.41	20.41	20.30	
10	256QAM	1	0	18.24	18.24	18.04	20
10	256QAM	1	25	18.31	18.27	18.15	
10	256QAM	1	49	18.33	18.42	18.23	
10	256QAM	25	0	18.16	18.22	18.20	20
10	256QAM	25	12	18.28	18.32	18.17	
10	256QAM	25	25	18.36	18.31	18.08	
10	256QAM	50	0	18.13	18.40	18.16	
Channel				131997	132322	132647	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	QPSK	1	0	23.28	23.43	23.47	25
5	QPSK	1	12	23.23	23.29	23.34	
5	QPSK	1	24	23.24	23.45	23.14	
5	QPSK	12	0	22.15	22.55	22.37	24
5	QPSK	12	7	22.29	22.36	22.19	
5	QPSK	12	13	22.43	22.53	22.50	
5	QPSK	25	0	22.27	22.36	22.43	



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5	16QAM	1	0	22.48	22.67	22.66	24
5	16QAM	1	12	22.46	22.76	22.43	
5	16QAM	1	24	22.58	22.55	22.62	
5	16QAM	12	0	21.29	21.57	21.22	23
5	16QAM	12	7	21.33	21.58	21.19	
5	16QAM	12	13	21.25	21.42	21.28	
5	16QAM	25	0	21.38	21.28	21.43	23
5	64QAM	1	0	21.43	21.63	21.58	
5	64QAM	1	12	21.42	21.59	21.58	
5	64QAM	1	24	21.46	21.50	21.51	22
5	64QAM	12	0	20.22	20.34	20.31	
5	64QAM	12	7	20.33	20.49	20.30	
5	64QAM	12	13	20.30	20.38	20.46	20
5	64QAM	25	0	20.23	20.34	20.37	
5	256QAM	1	0	18.29	18.33	18.02	
5	256QAM	1	12	18.39	18.32	18.19	20
5	256QAM	1	24	18.41	18.39	18.21	
5	256QAM	12	0	18.07	18.13	18.08	
5	256QAM	12	7	18.17	18.32	18.12	20
5	256QAM	12	13	18.38	18.43	18.11	
5	256QAM	25	0	18.32	18.29	18.05	
Channel				131987	132322	132657	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1745	1778.5	
3	QPSK	1	0	23.29	23.52	23.55	25
3	QPSK	1	8	23.11	23.30	23.32	
3	QPSK	1	14	23.37	23.36	23.29	
3	QPSK	8	0	22.30	22.35	22.23	24
3	QPSK	8	4	22.33	22.40	22.17	
3	QPSK	8	7	22.33	22.38	22.50	
3	QPSK	15	0	22.31	22.48	22.28	24
3	16QAM	1	0	22.53	22.58	22.79	
3	16QAM	1	8	22.67	22.66	22.47	
3	16QAM	1	14	22.49	22.71	22.44	23
3	16QAM	8	0	21.38	21.38	21.36	
3	16QAM	8	4	21.38	21.55	21.25	
3	16QAM	8	7	21.22	21.35	21.39	23
3	16QAM	15	0	21.37	21.36	21.18	
3	64QAM	1	0	21.58	21.43	21.48	
3	64QAM	1	8	21.43	21.71	21.35	22
3	64QAM	1	14	21.49	21.47	21.38	
3	64QAM	8	0	20.25	20.40	20.24	
3	64QAM	8	4	20.50	20.44	20.48	20
3	64QAM	8	7	20.30	20.37	20.47	
3	64QAM	15	0	20.37	20.37	20.27	
3	256QAM	1	0	18.25	18.15	18.11	20
3	256QAM	1	8	18.27	18.30	18.25	
3	256QAM	1	14	18.41	18.35	18.23	
3	256QAM	8	0	18.24	18.27	18.15	20
3	256QAM	8	4	18.28	18.37	18.13	
3	256QAM	8	7	18.26	18.29	18.17	
3	256QAM	15	0	18.33	18.27	18.25	Tune-up limit (dBm)
Channel				131979	132322	132665	
Frequency (MHz)				1710.7	1745	1779.3	
1.4	QPSK	1	0	23.41	23.40	23.38	25
1.4	QPSK	1	3	23.17	23.50	23.18	
1.4	QPSK	1	5	23.21	23.30	23.24	



1.4	QPSK	3	0	23.41	23.40	23.38	
1.4	QPSK	3	1	23.17	23.50	23.18	
1.4	QPSK	3	3	23.21	23.30	23.24	
1.4	QPSK	6	0	22.42	22.47	22.39	24
1.4	16QAM	1	0	22.38	22.55	22.29	24
1.4	16QAM	1	3	22.31	22.52	22.39	
1.4	16QAM	1	5	22.48	22.45	22.30	
1.4	16QAM	3	0	22.42	22.47	22.39	
1.4	16QAM	3	1	22.38	22.55	22.29	
1.4	16QAM	3	3	22.31	22.52	22.39	
1.4	16QAM	6	0	21.33	21.45	21.36	23
1.4	64QAM	1	0	21.40	21.44	21.31	23
1.4	64QAM	1	3	21.32	21.63	21.48	
1.4	64QAM	1	5	21.31	21.49	21.37	
1.4	64QAM	3	0	21.33	21.45	21.36	
1.4	64QAM	3	1	21.40	21.44	21.31	
1.4	64QAM	3	3	21.32	21.63	21.48	
1.4	64QAM	6	0	20.35	20.44	20.51	22
1.4	256QAM	1	0	18.28	18.33	18.12	20
1.4	256QAM	1	3	18.34	18.43	18.07	
1.4	256QAM	1	5	18.37	18.33	18.17	
1.4	256QAM	3	0	18.18	18.27	18.01	
1.4	256QAM	3	1	18.40	18.32	18.00	
1.4	256QAM	3	3	18.28	18.52	18.14	
1.4	256QAM	6	0	18.25	18.23	18.09	20

<LTE Band 71 Main>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				133222	133322	133372	
Frequency (MHz)				673	683	688	
20	QPSK	1	0	23.40	23.28	23.28	25
20	QPSK	1	49	23.25	23.25	23.24	
20	QPSK	1	99	23.27	23.24	23.20	
20	QPSK	50	0	22.44	22.39	22.37	24
20	QPSK	50	24	22.42	22.36	22.39	
20	QPSK	50	50	22.43	22.90	22.38	
20	QPSK	100	0	22.41	22.36	22.36	24
20	16QAM	1	0	22.75	22.61	22.60	
20	16QAM	1	49	22.61	22.70	22.61	
20	16QAM	1	99	22.58	22.58	22.56	23
20	16QAM	50	0	21.44	21.37	21.39	
20	16QAM	50	24	21.45	21.39	21.39	
20	16QAM	50	50	21.42	21.39	21.41	23
20	16QAM	100	0	21.44	21.35	21.37	
20	64QAM	1	0	21.59	21.48	21.51	
20	64QAM	1	49	21.49	21.42	21.44	23
20	64QAM	1	99	21.52	21.47	21.48	
20	64QAM	50	0	20.47	20.40	20.40	
20	64QAM	50	24	20.47	20.43	20.41	22
20	64QAM	50	50	20.44	20.41	20.41	
20	64QAM	100	0	20.47	20.41	20.39	
20	256QAM	1	0	18.73	18.78	18.68	20
20	256QAM	1	49	18.84	18.81	18.46	



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20	256QAM	1	99	18.74	18.90	18.74	20
20	256QAM	50	0	18.47	18.68	18.53	
20	256QAM	50	24	18.74	18.72	18.52	
20	256QAM	50	50	18.72	18.76	18.51	
20	256QAM	100	0	18.72	18.87	18.57	
Channel				133197	133297	133397	Tune-up limit (dBm)
Frequency (MHz)				670.5	680.5	690.5	
15	QPSK	1	0	23.32	23.24	23.11	25
15	QPSK	1	37	23.20	23.15	23.16	
15	QPSK	1	74	23.08	23.13	23.10	
15	QPSK	36	0	22.44	22.19	22.29	24
15	QPSK	36	20	22.38	22.25	22.24	
15	QPSK	36	39	22.26	22.88	22.36	
15	QPSK	75	0	22.27	22.30	22.25	24
15	16QAM	1	0	22.59	22.57	22.59	
15	16QAM	1	37	22.42	22.70	22.55	
15	16QAM	1	74	22.51	22.48	22.50	
15	16QAM	36	0	21.34	21.29	21.39	
15	16QAM	36	20	21.29	21.37	21.28	23
15	16QAM	36	39	21.25	21.19	21.41	
15	16QAM	75	0	21.39	21.22	21.23	
15	64QAM	1	0	21.50	21.43	21.33	23
15	64QAM	1	37	21.44	21.22	21.26	
15	64QAM	1	74	21.44	21.40	21.42	
15	64QAM	36	0	20.42	20.28	20.24	22
15	64QAM	36	20	20.30	20.27	20.36	
15	64QAM	36	39	20.26	20.37	20.37	
15	64QAM	75	0	20.43	20.23	20.23	
15	256QAM	1	0	18.60	18.62	18.60	
15	256QAM	1	37	18.67	18.73	18.29	20
15	256QAM	1	74	18.55	18.70	18.72	
15	256QAM	36	0	18.30	18.64	18.47	
15	256QAM	36	20	18.62	18.54	18.37	20
15	256QAM	36	39	18.70	18.70	18.41	
15	256QAM	75	0	18.58	18.72	18.51	
Channel				133172	133272	133422	Tune-up limit (dBm)
Frequency (MHz)				668	678	693	
10	QPSK	1	0	23.33	23.26	23.11	25
10	QPSK	1	25	23.09	23.17	23.15	
10	QPSK	1	49	23.26	23.13	23.20	
10	QPSK	25	0	22.43	22.38	22.28	24
10	QPSK	25	12	22.30	22.23	22.28	
10	QPSK	25	25	22.27	22.74	22.25	
10	QPSK	50	0	22.40	22.35	22.33	
10	16QAM	1	0	22.71	22.49	22.53	
10	16QAM	1	25	22.57	22.53	22.45	24
10	16QAM	1	49	22.42	22.45	22.36	
10	16QAM	25	0	21.26	21.25	21.30	
10	16QAM	25	12	21.41	21.29	21.37	23
10	16QAM	25	25	21.35	21.33	21.23	
10	16QAM	50	0	21.32	21.26	21.33	
10	64QAM	1	0	21.51	21.43	21.46	23
10	64QAM	1	25	21.45	21.25	21.33	
10	64QAM	1	49	21.38	21.28	21.37	
10	64QAM	25	0	20.32	20.20	20.31	22
10	64QAM	25	12	20.40	20.28	20.21	



10	64QAM	25	25	20.36	20.24	20.24	
10	64QAM	50	0	20.44	20.33	20.31	
10	256QAM	1	0	18.60	18.69	18.48	
10	256QAM	1	25	18.72	18.62	18.37	20
10	256QAM	1	49	18.72	18.72	18.58	
10	256QAM	25	0	18.35	18.56	18.42	
10	256QAM	25	12	18.58	18.67	18.52	20
10	256QAM	25	25	18.69	18.67	18.46	
10	256QAM	50	0	18.59	18.68	18.57	
Channel				133147	133247	133447	Tune-up limit (dBm)
Frequency (MHz)				665.5	675.5	695.5	
5	QPSK	1	0	23.36	23.28	23.21	25
5	QPSK	1	12	23.15	23.20	23.04	
5	QPSK	1	24	23.24	23.11	23.20	
5	QPSK	12	0	22.41	22.37	22.33	24
5	QPSK	12	7	22.33	22.35	22.22	
5	QPSK	12	13	22.35	22.84	22.26	
5	QPSK	25	0	22.37	22.28	22.35	24
5	16QAM	1	0	22.62	22.60	22.48	
5	16QAM	1	12	22.50	22.63	22.48	
5	16QAM	1	24	22.44	22.44	22.43	23
5	16QAM	12	0	21.29	21.31	21.26	
5	16QAM	12	7	21.44	21.36	21.39	
5	16QAM	12	13	21.39	21.28	21.25	23
5	16QAM	25	0	21.41	21.28	21.26	
5	64QAM	1	0	21.46	21.45	21.33	
5	64QAM	1	12	21.31	21.22	21.28	22
5	64QAM	1	24	21.45	21.31	21.41	
5	64QAM	12	0	20.32	20.28	20.21	
5	64QAM	12	7	20.44	20.36	20.40	20
5	64QAM	12	13	20.33	20.41	20.31	
5	64QAM	25	0	20.37	20.35	20.31	
5	256QAM	1	0	18.67	18.59	18.49	20
5	256QAM	1	12	18.84	18.81	18.46	
5	256QAM	1	24	18.67	18.87	18.73	
5	256QAM	12	0	18.30	18.50	18.34	20
5	256QAM	12	7	18.72	18.55	18.40	
5	256QAM	12	13	18.70	18.64	18.42	
5	256QAM	25	0	18.52	18.82	18.56	



Reduced Power Mode

<LTE Band 2 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	20.85	20.72	20.76	21.2
20	QPSK	1	49	20.82	20.67	20.73	
20	QPSK	1	99	20.82	20.63	20.68	
20	QPSK	50	0	19.85	19.62	19.66	20.2
20	QPSK	50	24	19.77	19.62	19.70	
20	QPSK	50	50	19.81	19.59	19.60	
20	QPSK	100	0	19.78	19.64	19.76	20.2
20	16QAM	1	0	19.70	19.52	19.58	
20	16QAM	1	49	19.72	19.54	19.55	
20	16QAM	1	99	19.68	19.47	19.54	19.2
20	16QAM	50	0	18.68	18.52	18.66	
20	16QAM	50	24	18.62	18.54	18.61	
20	16QAM	50	50	18.68	18.48	18.48	19.2
20	16QAM	100	0	18.69	18.62	18.63	
20	64QAM	1	0	18.71	18.58	18.61	
20	64QAM	1	49	18.68	18.48	18.54	19.2
20	64QAM	1	99	18.62	18.50	18.55	
20	64QAM	50	0	17.60	17.51	17.46	
20	64QAM	50	24	17.56	17.43	17.53	18.2
20	64QAM	50	50	17.61	17.36	17.41	
20	64QAM	100	0	17.53	17.43	17.48	
20	256QAM	1	0	15.80	15.66	15.69	16.2
20	256QAM	1	49	15.79	15.64	15.71	
20	256QAM	1	99	15.76	15.59	15.65	
20	256QAM	50	0	15.83	15.67	15.74	16.2
20	256QAM	50	24	15.78	15.65	15.72	
20	256QAM	50	50	15.77	15.62	15.68	
20	256QAM	100	0	15.81	15.71	15.72	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	20.82	20.62	20.75	21.2
15	QPSK	1	37	20.77	20.63	20.72	
15	QPSK	1	74	20.81	20.57	20.60	
15	QPSK	36	0	19.82	19.54	19.64	20.2
15	QPSK	36	20	19.68	19.58	19.61	
15	QPSK	36	39	19.72	19.59	19.55	
15	QPSK	75	0	19.74	19.61	19.74	20.2
15	16QAM	1	0	19.69	19.42	19.57	
15	16QAM	1	37	19.72	19.47	19.46	
15	16QAM	1	74	19.65	19.39	19.44	19.2
15	16QAM	36	0	18.63	18.49	18.62	
15	16QAM	36	20	18.52	18.49	18.51	
15	16QAM	36	39	18.63	18.44	18.42	19.2
15	16QAM	75	0	18.63	18.52	18.61	
15	64QAM	1	0	18.68	18.55	18.54	
15	64QAM	1	37	18.61	18.44	18.51	19.2
15	64QAM	1	74	18.58	18.46	18.48	
15	64QAM	36	0	17.59	17.44	17.42	
15	64QAM	36	20	17.54	17.38	17.47	18.2
15	64QAM	36	39	17.53	17.28	17.35	



15	64QAM	75	0	17.53	17.38	17.45	
15	256QAM	1	0	15.79	15.57	15.60	16.2
15	256QAM	1	37	15.78	15.59	15.61	
15	256QAM	1	74	15.67	15.52	15.57	
15	256QAM	36	0	15.80	15.65	15.65	16.2
15	256QAM	36	20	15.76	15.61	15.68	
15	256QAM	36	39	15.71	15.58	15.64	
15	256QAM	75	0	15.73	15.64	15.66	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	20.76	20.53	20.67	21.2
10	QPSK	1	25	20.77	20.62	20.71	
10	QPSK	1	49	20.71	20.54	20.54	
10	QPSK	25	0	19.80	19.52	19.54	20.2
10	QPSK	25	12	19.64	19.48	19.60	
10	QPSK	25	25	19.71	19.52	19.52	
10	QPSK	50	0	19.72	19.55	19.74	
10	16QAM	1	0	19.62	19.40	19.48	20.2
10	16QAM	1	25	19.72	19.45	19.41	
10	16QAM	1	49	19.61	19.39	19.44	
10	16QAM	25	0	18.63	18.41	18.60	19.2
10	16QAM	25	12	18.42	18.43	18.44	
10	16QAM	25	25	18.53	18.43	18.42	
10	16QAM	50	0	18.63	18.46	18.51	
10	64QAM	1	0	18.59	18.49	18.52	19.2
10	64QAM	1	25	18.61	18.37	18.49	
10	64QAM	1	49	18.50	18.44	18.43	
10	64QAM	25	0	17.52	17.40	17.41	18.2
10	64QAM	25	12	17.46	17.36	17.45	
10	64QAM	25	25	17.53	17.22	17.32	
10	64QAM	50	0	17.43	17.36	17.44	
10	256QAM	1	0	15.69	15.55	15.52	16.2
10	256QAM	1	25	15.71	15.55	15.56	
10	256QAM	1	49	15.57	15.50	15.49	
10	256QAM	25	0	15.80	15.55	15.62	16.2
10	256QAM	25	12	15.68	15.53	15.64	
10	256QAM	25	25	15.68	15.53	15.64	
10	256QAM	50	0	15.71	15.60	15.60	
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	20.68	20.50	20.64	21.2
5	QPSK	1	12	20.67	20.54	20.70	
5	QPSK	1	24	20.65	20.48	20.50	
5	QPSK	12	0	19.71	19.51	19.52	20.2
5	QPSK	12	7	19.54	19.39	19.58	
5	QPSK	12	13	19.71	19.44	19.44	
5	QPSK	25	0	19.71	19.48	19.74	
5	16QAM	1	0	19.59	19.36	19.44	20.2
5	16QAM	1	12	19.68	19.36	19.31	
5	16QAM	1	24	19.51	19.33	19.43	
5	16QAM	12	0	18.63	18.33	18.51	19.2
5	16QAM	12	7	18.36	18.34	18.34	
5	16QAM	12	13	18.48	18.36	18.38	
5	16QAM	25	0	18.61	18.40	18.46	
5	64QAM	1	0	18.55	18.49	18.46	19.2
5	64QAM	1	12	18.61	18.28	18.41	



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5	64QAM	1	24	18.47	18.41	18.33	18.2
5	64QAM	12	0	17.42	17.31	17.39	
5	64QAM	12	7	17.37	17.26	17.39	
5	64QAM	12	13	17.48	17.15	17.32	
5	64QAM	25	0	17.38	17.34	17.37	
5	256QAM	1	0	15.61	15.48	15.45	16.2
5	256QAM	1	12	15.62	15.49	15.55	
5	256QAM	1	24	15.51	15.40	15.40	
5	256QAM	12	0	15.72	15.46	15.55	16.2
5	256QAM	12	7	15.60	15.46	15.60	
5	256QAM	12	13	15.63	15.45	15.56	
5	256QAM	25	0	15.62	15.56	15.50	
Channel				18615	18900	19185	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	20.63	20.41	20.61	21.2
3	QPSK	1	8	20.59	20.49	20.61	
3	QPSK	1	14	20.59	20.38	20.43	
3	QPSK	8	0	19.70	19.49	19.47	20.2
3	QPSK	8	4	19.45	19.35	19.58	
3	QPSK	8	7	19.71	19.44	19.42	
3	QPSK	15	0	19.64	19.41	19.69	
3	16QAM	1	0	19.50	19.35	19.37	20.2
3	16QAM	1	8	19.61	19.32	19.30	
3	16QAM	1	14	19.48	19.24	19.39	
3	16QAM	8	0	18.63	18.31	18.42	19.2
3	16QAM	8	4	18.26	18.33	18.27	
3	16QAM	8	7	18.48	18.30	18.29	
3	16QAM	15	0	18.57	18.32	18.36	
3	64QAM	1	0	18.52	18.41	18.40	19.2
3	64QAM	1	8	18.56	18.27	18.31	
3	64QAM	1	14	18.43	18.41	18.26	
3	64QAM	8	0	17.32	17.21	17.32	18.2
3	64QAM	8	4	17.32	17.23	17.31	
3	64QAM	8	7	17.47	17.06	17.27	
3	64QAM	15	0	17.35	17.26	17.32	
3	256QAM	1	0	15.59	15.42	15.41	16.2
3	256QAM	1	8	15.59	15.43	15.53	
3	256QAM	1	14	15.50	15.40	15.35	
3	256QAM	8	0	15.65	15.46	15.47	16.2
3	256QAM	8	4	15.56	15.41	15.58	
3	256QAM	8	7	15.53	15.42	15.48	
3	256QAM	15	0	15.59	15.49	15.40	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	20.59	20.36	20.53	21.2
1.4	QPSK	1	3	20.58	20.42	20.60	
1.4	QPSK	1	5	20.52	20.38	20.33	
1.4	QPSK	3	0	19.65	19.40	19.42	
1.4	QPSK	3	1	19.40	19.25	19.52	
1.4	QPSK	3	3	19.70	19.37	19.39	
1.4	QPSK	6	0	19.55	19.32	19.60	20.2
1.4	16QAM	1	0	19.46	19.32	19.35	20.2
1.4	16QAM	1	3	19.60	19.31	19.25	
1.4	16QAM	1	5	19.39	19.24	19.31	
1.4	16QAM	3	0	18.63	18.30	18.41	
1.4	16QAM	3	1	18.23	18.30	18.21	



1.4	16QAM	3	3	18.42	18.26	18.29	
1.4	16QAM	6	0	18.48	18.30	18.36	19.2
1.4	64QAM	1	0	18.52	18.38	18.31	19.2
1.4	64QAM	1	3	18.52	18.24	18.22	
1.4	64QAM	1	5	18.36	18.37	18.20	
1.4	64QAM	3	0	17.22	17.21	17.29	
1.4	64QAM	3	1	17.30	17.22	17.24	
1.4	64QAM	3	3	17.38	17.20	17.22	
1.4	64QAM	6	0	17.33	17.24	17.26	18.2
1.4	256QAM	1	0	15.52	15.39	15.31	16.2
1.4	256QAM	1	3	15.56	15.38	15.53	
1.4	256QAM	1	5	15.47	15.35	15.29	
1.4	256QAM	3	0	15.55	15.42	15.37	
1.4	256QAM	3	1	15.53	15.33	15.51	
1.4	256QAM	3	3	15.47	15.39	15.48	
1.4	256QAM	6	0	15.54	15.43	15.37	16.2

<LTE Band 4 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20050	20175	20300	20.2
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	20.14	20.12	20.05	20.2
20	QPSK	1	49	20.02	20.11	19.89	
20	QPSK	1	99	20.02	19.97	20.00	
20	QPSK	50	0	19.07	19.04	19.04	19.2
20	QPSK	50	24	19.01	19.02	18.79	
20	QPSK	50	50	18.98	18.92	18.90	
20	QPSK	100	0	19.06	19.01	18.97	19.2
20	16QAM	1	0	19.09	19.12	18.99	
20	16QAM	1	49	18.92	19.10	18.86	
20	16QAM	1	99	19.00	18.88	19.00	18.2
20	16QAM	50	0	16.89	16.94	16.98	
20	16QAM	50	24	16.99	17.00	17.03	
20	16QAM	50	50	16.94	16.98	16.69	18.2
20	16QAM	100	0	17.05	16.96	16.96	
20	64QAM	1	0	17.88	17.86	17.80	
20	64QAM	1	49	17.73	17.86	17.65	
20	64QAM	1	99	17.77	17.69	17.79	
20	64QAM	50	0	16.87	16.78	16.74	17.2
20	64QAM	50	24	16.00	15.99	15.69	
20	64QAM	50	50	15.97	15.84	15.85	
20	64QAM	100	0	15.99	15.96	15.93	15.2
20	256QAM	1	0	14.95	14.95	14.95	
20	256QAM	1	49	14.91	14.93	14.77	
20	256QAM	1	99	14.85	14.83	14.83	15.2
20	256QAM	50	0	15.04	15.00	14.94	
20	256QAM	50	24	14.95	15.02	14.76	
20	256QAM	50	50	14.89	14.90	14.85	15.2
20	256QAM	100	0	15.04	14.97	14.96	
Channel				20025	20175	20325	
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	19.97	19.93	19.92	20.2
15	QPSK	1	37	19.92	19.93	19.79	



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15	QPSK	1	74	19.91	19.86	19.85	
15	QPSK	36	0	18.91	18.92	18.90	19.2
15	QPSK	36	20	18.81	18.89	18.68	
15	QPSK	36	39	18.88	18.76	18.70	
15	QPSK	75	0	18.92	18.81	18.81	
15	16QAM	1	0	18.89	19.02	18.85	19.2
15	16QAM	1	37	18.77	18.93	18.67	
15	16QAM	1	74	18.89	18.77	18.83	
15	16QAM	36	0	16.69	16.82	16.86	18.2
15	16QAM	36	20	16.81	16.89	16.84	
15	16QAM	36	39	16.75	16.81	16.57	
15	16QAM	75	0	16.89	16.85	16.80	
15	64QAM	1	0	17.76	17.70	17.68	18.2
15	64QAM	1	37	17.63	17.71	17.46	
15	64QAM	1	74	17.64	17.52	17.61	
15	64QAM	36	0	16.67	16.68	16.64	17.2
15	64QAM	36	20	15.87	15.82	15.54	
15	64QAM	36	39	15.77	15.69	15.73	
15	64QAM	75	0	15.83	15.76	15.79	
15	256QAM	1	0	14.80	14.85	14.76	15.2
15	256QAM	1	37	14.81	14.78	14.62	
15	256QAM	1	74	14.72	14.73	14.67	
15	256QAM	36	0	14.93	14.90	14.75	15.2
15	256QAM	36	20	14.85	14.82	14.62	
15	256QAM	36	39	14.69	14.80	14.73	
15	256QAM	75	0	14.94	14.77	14.86	
Channel				20000	20175	20350	Tune-up limit (dBm)
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	19.99	20.01	19.89	20.2
10	QPSK	1	25	19.91	19.93	19.75	
10	QPSK	1	49	19.87	19.84	19.80	
10	QPSK	25	0	18.89	18.90	18.90	19.2
10	QPSK	25	12	18.86	18.84	18.64	
10	QPSK	25	25	18.86	18.80	18.80	
10	QPSK	50	0	18.94	18.81	18.77	
10	16QAM	1	0	18.89	18.99	18.86	19.2
10	16QAM	1	25	18.77	18.98	18.68	
10	16QAM	1	49	18.83	18.77	18.89	
10	16QAM	25	0	16.73	16.79	16.84	18.2
10	16QAM	25	12	16.81	16.85	16.92	
10	16QAM	25	25	16.77	16.83	16.58	
10	16QAM	50	0	16.95	16.80	16.81	
10	64QAM	1	0	17.68	17.73	17.67	18.2
10	64QAM	1	25	17.55	17.75	17.54	
10	64QAM	1	49	17.58	17.49	17.67	
10	64QAM	25	0	16.70	16.59	16.54	17.2
10	64QAM	25	12	15.85	15.85	15.58	
10	64QAM	25	25	15.77	15.69	15.70	
10	64QAM	50	0	15.89	15.78	15.73	
10	256QAM	1	0	14.80	14.82	14.75	15.2
10	256QAM	1	25	14.75	14.76	14.59	
10	256QAM	1	49	14.75	14.63	14.63	
10	256QAM	25	0	14.87	14.82	14.78	15.2
10	256QAM	25	12	14.82	14.86	14.58	
10	256QAM	25	25	14.71	14.79	14.71	
10	256QAM	50	0	14.94	14.86	14.85	



Channel				19975	20175	20375	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	20.03	19.97	19.92	20.2
5	QPSK	1	12	19.84	19.94	19.75	
5	QPSK	1	24	19.85	19.87	19.85	
5	QPSK	12	0	18.94	18.93	18.92	19.2
5	QPSK	12	7	18.91	18.87	18.63	
5	QPSK	12	13	18.80	18.81	18.75	
5	QPSK	25	0	18.96	18.91	18.78	
5	16QAM	1	0	18.93	18.92	18.88	19.2
5	16QAM	1	12	18.82	18.92	18.74	
5	16QAM	1	24	18.81	18.69	18.86	
5	16QAM	12	0	16.79	16.78	16.80	18.2
5	16QAM	12	7	16.87	16.82	16.86	
5	16QAM	12	13	16.78	16.85	16.50	
5	16QAM	25	0	16.89	16.81	16.84	
5	64QAM	1	0	17.69	17.69	17.64	
5	64QAM	1	12	17.60	17.69	17.45	18.2
5	64QAM	1	24	17.65	17.54	17.61	
5	64QAM	12	0	16.68	16.67	16.60	
5	64QAM	12	7	15.90	15.81	15.56	17.2
5	64QAM	12	13	15.83	15.72	15.68	
5	64QAM	25	0	15.88	15.77	15.78	
5	256QAM	1	0	14.80	14.80	14.78	
5	256QAM	1	12	14.80	14.74	14.63	15.2
5	256QAM	1	24	14.68	14.63	14.71	
5	256QAM	12	0	14.89	14.85	14.75	
5	256QAM	12	7	14.76	14.88	14.62	15.2
5	256QAM	12	13	14.70	14.71	14.73	
5	256QAM	25	0	14.92	14.78	14.79	
Channel				19965	20175	20385	
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	20.02	20.01	19.86	20.2
3	QPSK	1	8	19.83	19.92	19.70	
3	QPSK	1	14	19.85	19.81	19.86	
3	QPSK	8	0	18.92	18.93	18.93	19.2
3	QPSK	8	4	18.82	18.83	18.67	
3	QPSK	8	7	18.84	18.79	18.80	
3	QPSK	15	0	18.93	18.81	18.85	
3	16QAM	1	0	18.95	18.92	18.82	19.2
3	16QAM	1	8	18.81	18.93	18.66	
3	16QAM	1	14	18.84	18.77	18.90	
3	16QAM	8	0	16.71	16.79	16.88	18.2
3	16QAM	8	4	16.86	16.83	16.84	
3	16QAM	8	7	16.78	16.78	16.50	
3	16QAM	15	0	16.90	16.79	16.80	
3	64QAM	1	0	17.75	17.75	17.67	
3	64QAM	1	8	17.62	17.66	17.52	18.2
3	64QAM	1	14	17.67	17.55	17.60	
3	64QAM	8	0	16.69	16.60	16.62	
3	64QAM	8	4	15.90	15.82	15.52	17.2
3	64QAM	8	7	15.77	15.70	15.75	
3	64QAM	15	0	15.85	15.79	15.74	
3	256QAM	1	0	14.81	14.78	14.80	
3	256QAM	1	8	14.72	14.78	14.63	15.2
3	256QAM	1	14	14.68	14.67	14.63	



3	256QAM	8	0	14.93	14.82	14.75	15.2
3	256QAM	8	4	14.77	14.87	14.64	
3	256QAM	8	7	14.79	14.74	14.67	
3	256QAM	15	0	14.87	14.85	14.82	
Channel				19957	20175	20393	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	20.02	19.93	19.90	20.2
1.4	QPSK	1	3	19.85	19.98	19.75	
1.4	QPSK	1	5	19.92	19.79	19.84	
1.4	QPSK	3	0	18.91	18.86	18.88	
1.4	QPSK	3	1	18.82	18.87	18.64	
1.4	QPSK	3	3	18.82	18.74	18.78	
1.4	QPSK	6	0	18.86	18.88	18.78	19.2
1.4	16QAM	1	0	18.98	18.95	18.86	19.2
1.4	16QAM	1	3	18.81	19.00	18.76	
1.4	16QAM	1	5	18.89	18.73	18.83	
1.4	16QAM	3	0	17.01	16.75	16.87	
1.4	16QAM	3	1	16.79	16.80	16.92	
1.4	16QAM	3	3	16.81	16.81	16.54	
1.4	16QAM	6	0	16.93	16.84	16.81	18.2
1.4	64QAM	1	0	17.69	17.73	17.65	18.2
1.4	64QAM	1	3	17.59	17.67	17.45	
1.4	64QAM	1	5	17.65	17.53	17.62	
1.4	64QAM	3	0	16.69	16.59	16.61	
1.4	64QAM	3	1	15.86	15.81	15.53	
1.4	64QAM	3	3	15.80	15.74	15.68	
1.4	64QAM	6	0	15.80	15.85	15.82	17.2
1.4	256QAM	1	0	14.85	14.81	14.80	15.2
1.4	256QAM	1	3	14.71	14.79	14.65	
1.4	256QAM	1	5	14.68	14.67	14.65	
1.4	256QAM	3	0	14.93	14.84	14.74	
1.4	256QAM	3	1	14.84	14.88	14.58	
1.4	256QAM	3	3	14.75	14.78	14.68	
1.4	256QAM	6	0	14.85	14.84	14.86	15.2

<LTE Band 7 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20850	21100	21350	Tune-up limit (dBm)
Frequency (MHz)				2510	2535	2560	
20	QPSK	1	0	15.78	15.81	15.69	
20	QPSK	1	49	15.69	15.75	15.60	
20	QPSK	1	99	15.77	15.80	15.68	
20	QPSK	50	0	14.68	14.73	14.59	15.7
20	QPSK	50	24	14.63	14.71	14.58	
20	QPSK	50	50	14.59	14.63	14.53	
20	QPSK	100	0	14.75	14.76	14.70	15.7
20	16QAM	1	0	14.74	14.69	14.67	
20	16QAM	1	49	14.57	14.60	14.52	
20	16QAM	1	99	14.61	14.74	14.54	14.7
20	16QAM	50	0	13.00	13.08	13.04	
20	16QAM	50	24	13.07	13.03	12.93	
20	16QAM	50	50	12.95	13.13	12.96	
20	16QAM	100	0	13.14	13.23	13.07	



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20	64QAM	1	0	13.72	13.65	13.64	14.7	
20	64QAM	1	49	13.50	13.54	13.51		
20	64QAM	1	99	13.52	13.71	13.48		
20	64QAM	50	0	11.97	12.05	12.00	13.7	
20	64QAM	50	24	11.99	12.02	11.84		
20	64QAM	50	50	11.88	12.10	11.96		
20	64QAM	100	0	12.10	12.22	12.05	11.7	
20	256QAM	1	0	11.64	11.62	11.63		
20	256QAM	1	49	11.45	11.51	11.51		
20	256QAM	1	99	11.45	11.69	11.47	11.7	
20	256QAM	50	0	10.92	10.98	10.92		
20	256QAM	50	24	10.93	11.01	10.74		
20	256QAM	50	50	10.79	11.02	10.87	11.7	
20	256QAM	100	0	11.06	11.13	11.02		
Channel				20825	21100	21375		Tune-up limit (dBm)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	15.64	15.76	15.53	16.7	
15	QPSK	1	37	15.58	15.56	15.51		
15	QPSK	1	74	15.62	15.67	15.64		
15	QPSK	36	0	14.70	14.54	14.51	15.7	
15	QPSK	36	20	14.49	14.54	14.52		
15	QPSK	36	39	14.54	14.53	14.48		
15	QPSK	75	0	14.59	14.61	14.64	15.7	
15	16QAM	1	0	14.72	14.64	14.48		
15	16QAM	1	37	14.38	14.49	14.34		
15	16QAM	1	74	14.45	14.55	14.50	14.7	
15	16QAM	36	0	12.93	13.00	12.97		
15	16QAM	36	20	12.87	13.03	12.85		
15	16QAM	36	39	12.84	13.08	12.79	14.7	
15	16QAM	75	0	13.03	13.23	13.03		
15	64QAM	1	0	13.57	13.48	13.49		
15	64QAM	1	37	13.45	13.49	13.41	14.7	
15	64QAM	1	74	13.33	13.59	13.31		
15	64QAM	36	0	11.87	11.86	11.92		
15	64QAM	36	20	11.80	11.85	11.69	13.7	
15	64QAM	36	39	11.85	11.96	11.92		
15	64QAM	75	0	11.98	12.04	12.01		
15	256QAM	1	0	11.49	11.55	11.46	11.7	
15	256QAM	1	37	11.30	11.49	11.33		
15	256QAM	1	74	11.34	11.58	11.39		
15	256QAM	36	0	10.74	10.91	10.92	11.7	
15	256QAM	36	20	10.84	10.81	10.54		
15	256QAM	36	39	10.68	10.87	10.74		
15	256QAM	75	0	10.96	11.05	10.96	11.7	
Channel				20800	21100	21400		Tune-up limit (dBm)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	15.53	15.71	15.48	16.7	
10	QPSK	1	25	15.50	15.38	15.35		
10	QPSK	1	49	15.56	15.52	15.57		
10	QPSK	25	0	14.67	14.47	14.35	15.7	
10	QPSK	25	12	14.43	14.54	14.33		
10	QPSK	25	25	14.54	14.45	14.30		
10	QPSK	50	0	14.44	14.50	14.61	15.7	
10	16QAM	1	0	14.52	14.49	14.40		
10	16QAM	1	25	14.31	14.30	14.34		
10	16QAM	1	49	14.40	14.48	14.46	15.7	



10	16QAM	25	0	12.78	12.97	12.90	14.7
10	16QAM	25	12	12.79	12.85	12.84	
10	16QAM	25	25	12.70	12.97	12.69	
10	16QAM	50	0	12.96	13.19	12.87	
10	64QAM	1	0	13.50	13.44	13.41	14.7
10	64QAM	1	25	13.44	13.46	13.30	
10	64QAM	1	49	13.22	13.58	13.22	
10	64QAM	25	0	11.82	11.68	11.72	13.7
10	64QAM	25	12	11.70	11.67	11.68	
10	64QAM	25	25	11.79	11.84	11.87	
10	64QAM	50	0	11.88	11.90	11.97	
10	256QAM	1	0	11.36	11.51	11.29	11.7
10	256QAM	1	25	11.24	11.42	11.25	
10	256QAM	1	49	11.25	11.40	11.25	
10	256QAM	25	0	10.62	10.75	10.84	11.7
10	256QAM	25	12	10.78	10.76	10.52	
10	256QAM	25	25	10.50	10.69	10.74	
10	256QAM	50	0	10.84	11.02	10.82	
Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	15.61	15.61	15.38	16.7
5	QPSK	1	12	15.48	15.36	15.36	
5	QPSK	1	24	15.51	15.48	15.58	
5	QPSK	12	0	14.67	14.41	14.40	15.7
5	QPSK	12	7	14.29	14.42	14.47	
5	QPSK	12	13	14.48	14.36	14.45	
5	QPSK	25	0	14.51	14.51	14.56	
5	16QAM	1	0	14.55	14.58	14.28	15.7
5	16QAM	1	12	14.31	14.39	14.27	
5	16QAM	1	24	14.39	14.51	14.34	
5	16QAM	12	0	12.90	12.85	12.91	14.7
5	16QAM	12	7	12.81	12.98	12.80	
5	16QAM	12	13	12.78	12.88	12.77	
5	16QAM	25	0	13.01	13.21	12.90	
5	64QAM	1	0	13.40	13.42	13.39	14.7
5	64QAM	1	12	13.37	13.29	13.21	
5	64QAM	1	24	13.30	13.44	13.24	
5	64QAM	12	0	11.69	11.66	11.88	13.7
5	64QAM	12	7	11.66	11.81	11.66	
5	64QAM	12	13	11.77	11.76	11.74	
5	64QAM	25	0	11.82	11.90	11.87	
5	256QAM	1	0	11.30	11.38	11.27	11.7
5	256QAM	1	12	11.23	11.32	11.27	
5	256QAM	1	24	11.23	11.54	11.30	
5	256QAM	12	0	10.66	10.81	10.74	11.7
5	256QAM	12	7	10.69	10.81	10.50	
5	256QAM	12	13	10.66	10.84	10.69	
5	256QAM	25	0	10.93	10.99	10.94	



<LTE Band 25 MIMO 1>

Bandwidth [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				26140	26340	26590	21.2
Frequency (MHz)				1860	1880	1905	
20	QPSK	1	0	20.85	20.77	20.75	
20	QPSK	1	49	20.75	20.68	20.62	20.2
20	QPSK	1	99	20.83	20.50	20.66	
20	QPSK	50	0	19.86	19.78	19.74	
20	QPSK	50	24	19.71	19.67	19.66	20.2
20	QPSK	50	50	19.76	19.66	19.72	
20	QPSK	100	0	19.91	19.83	19.79	
20	16QAM	1	0	19.43	19.60	19.41	20.2
20	16QAM	1	49	19.40	19.43	19.31	
20	16QAM	1	99	19.36	19.44	19.54	
20	16QAM	50	0	18.82	18.51	18.41	19.2
20	16QAM	50	24	18.49	18.26	18.44	
20	16QAM	50	50	18.76	18.23	18.36	
20	16QAM	100	0	18.71	18.66	18.76	19.2
20	64QAM	1	0	18.37	18.56	18.33	
20	64QAM	1	49	18.36	18.40	18.26	
20	64QAM	1	99	18.28	18.37	18.44	18.2
20	64QAM	50	0	17.74	17.45	17.36	
20	64QAM	50	24	17.45	17.18	17.42	
20	64QAM	50	50	17.66	17.14	17.35	16.2
20	64QAM	100	0	17.67	17.66	17.74	
20	256QAM	1	0	15.27	15.39	15.14	
20	256QAM	1	49	15.25	15.29	15.09	16.2
20	256QAM	1	99	15.12	15.22	15.31	
20	256QAM	50	0	15.58	15.31	15.26	
20	256QAM	50	24	15.34	15.01	15.31	16.2
20	256QAM	50	50	15.55	15.04	15.21	
20	256QAM	100	0	15.53	15.46	15.56	
Channel				26115	26340	26615	21.2
Frequency (MHz)				1857.5	1880	1907.5	
15	QPSK	1	0	20.80	20.56	20.64	
15	QPSK	1	37	20.63	20.54	20.54	20.2
15	QPSK	1	74	20.47	20.28	20.34	
15	QPSK	36	0	19.63	19.71	19.44	
15	QPSK	36	20	19.69	19.53	19.43	20.2
15	QPSK	36	39	19.36	19.32	19.41	
15	QPSK	75	0	19.64	19.55	19.58	
15	16QAM	1	0	19.12	19.48	19.04	20.2
15	16QAM	1	37	19.31	19.28	19.23	
15	16QAM	1	74	18.97	19.36	19.49	
15	16QAM	36	0	18.60	18.17	18.40	19.2
15	16QAM	36	20	18.34	17.87	18.09	
15	16QAM	36	39	18.52	18.07	17.98	
15	16QAM	75	0	18.71	18.54	18.48	19.2
15	64QAM	1	0	18.34	18.33	18.13	
15	64QAM	1	37	18.33	18.19	17.93	
15	64QAM	1	74	18.05	18.06	18.10	18.2
15	64QAM	36	0	17.55	17.40	17.31	
15	64QAM	36	20	17.24	16.92	17.35	
15	64QAM	36	39	17.31	17.05	17.11	18.2
15	64QAM	75	0	17.59	17.32	17.43	



15	256QAM	1	0	14.99	15.10	14.97	16.2
15	256QAM	1	37	14.92	15.14	14.93	
15	256QAM	1	74	14.98	15.12	15.26	
15	256QAM	36	0	15.44	15.20	15.02	16.2
15	256QAM	36	20	15.22	14.65	15.31	
15	256QAM	36	39	15.54	14.76	15.05	
15	256QAM	75	0	15.26	15.28	15.43	
Channel				26090	26340	26640	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1910	
10	QPSK	1	0	20.48	20.27	20.61	21.2
10	QPSK	1	25	20.42	20.26	20.42	
10	QPSK	1	49	20.12	20.02	20.21	
10	QPSK	25	0	19.53	19.35	19.18	20.2
10	QPSK	25	12	19.68	19.34	19.12	
10	QPSK	25	25	19.22	19.17	19.01	
10	QPSK	50	0	19.55	19.26	19.35	
10	16QAM	1	0	19.11	19.42	18.87	20.2
10	16QAM	1	25	19.03	18.90	19.01	
10	16QAM	1	49	18.58	19.04	19.40	
10	16QAM	25	0	18.57	17.96	18.07	19.2
10	16QAM	25	12	18.11	17.49	17.84	
10	16QAM	25	25	18.28	18.04	17.85	
10	16QAM	50	0	18.52	18.48	18.39	
10	64QAM	1	0	18.05	18.05	17.87	19.2
10	64QAM	1	25	18.08	18.06	17.80	
10	64QAM	1	49	17.77	17.83	17.98	
10	64QAM	25	0	17.44	17.27	17.19	18.2
10	64QAM	25	12	17.20	16.67	17.32	
10	64QAM	25	25	17.27	16.76	17.04	
10	64QAM	50	0	17.47	16.97	17.38	
10	256QAM	1	0	14.85	14.85	14.78	16.2
10	256QAM	1	25	14.69	14.93	14.76	
10	256QAM	1	49	14.88	14.94	14.96	
10	256QAM	25	0	15.27	15.15	14.75	16.2
10	256QAM	25	12	14.93	14.45	14.92	
10	256QAM	25	25	15.37	14.68	14.96	
10	256QAM	50	0	15.08	15.25	15.07	
Channel				26065	26340	26665	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1912.5	
5	QPSK	1	0	20.62	20.43	20.60	21.2
5	QPSK	1	12	20.35	20.48	20.52	
5	QPSK	1	24	20.28	20.03	19.99	
5	QPSK	12	0	19.52	19.36	19.44	20.2
5	QPSK	12	7	19.45	19.37	19.22	
5	QPSK	12	13	19.24	19.14	19.05	
5	QPSK	25	0	19.40	19.44	19.47	
5	16QAM	1	0	18.75	19.35	18.94	20.2
5	16QAM	1	12	19.10	19.08	19.13	
5	16QAM	1	24	18.95	19.33	19.09	
5	16QAM	12	0	18.46	17.93	18.10	19.2
5	16QAM	12	7	18.28	17.87	17.74	
5	16QAM	12	13	18.16	17.85	17.67	
5	16QAM	25	0	18.59	18.47	18.33	
5	64QAM	1	0	18.18	18.10	18.07	19.2
5	64QAM	1	12	18.23	18.17	17.77	
5	64QAM	1	24	17.72	18.01	18.03	



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5	64QAM	12	0	17.25	17.29	17.22	18.2
5	64QAM	12	7	16.91	16.70	17.28	
5	64QAM	12	13	17.12	16.96	17.06	
5	64QAM	25	0	17.42	16.94	17.43	
5	256QAM	1	0	14.73	14.72	14.93	16.2
5	256QAM	1	12	14.89	14.80	14.65	
5	256QAM	1	24	14.64	14.97	15.12	
5	256QAM	12	0	15.29	15.06	14.67	16.2
5	256QAM	12	7	15.13	14.42	14.92	
5	256QAM	12	13	15.54	14.41	14.99	
5	256QAM	25	0	15.17	14.92	15.12	
Channel				26055	26340	26675	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1913.5	
3	QPSK	1	0	20.64	20.22	20.63	21.2
3	QPSK	1	8	20.62	20.29	20.36	
3	QPSK	1	14	20.18	20.06	20.01	
3	QPSK	8	0	19.45	19.36	19.27	20.2
3	QPSK	8	4	19.67	19.51	19.35	
3	QPSK	8	7	19.35	19.12	19.06	
3	QPSK	15	0	19.30	19.40	19.43	
3	16QAM	1	0	18.80	19.23	18.95	20.2
3	16QAM	1	8	19.10	19.26	19.19	
3	16QAM	1	14	18.93	19.20	19.22	
3	16QAM	8	0	18.31	17.78	18.40	19.2
3	16QAM	8	4	18.31	17.78	17.98	
3	16QAM	8	7	18.36	17.83	17.68	
3	16QAM	15	0	18.35	18.30	18.36	
3	64QAM	1	0	18.08	18.07	17.84	19.2
3	64QAM	1	8	18.17	17.83	17.77	
3	64QAM	1	14	17.97	17.79	17.97	
3	64QAM	8	0	17.16	17.34	16.99	18.2
3	64QAM	8	4	16.98	16.67	17.15	
3	64QAM	8	7	17.02	16.71	16.96	
3	64QAM	15	0	17.44	17.12	17.30	
3	256QAM	1	0	14.93	14.88	14.59	16.2
3	256QAM	1	8	14.57	15.06	14.85	
3	256QAM	1	14	14.68	15.11	14.97	
3	256QAM	8	0	15.19	15.01	14.90	16.2
3	256QAM	8	4	15.00	14.59	14.93	
3	256QAM	8	7	15.45	14.53	14.75	
3	256QAM	15	0	15.02	15.07	15.28	
Channel				26047	26340	26683	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1914.3	
1.4	QPSK	1	0	20.63	20.19	20.61	21.2
1.4	QPSK	1	3	20.27	20.51	20.41	
1.4	QPSK	1	5	20.14	19.90	20.06	
1.4	QPSK	3	0	19.60	19.66	19.29	
1.4	QPSK	3	1	19.66	19.39	19.08	
1.4	QPSK	3	3	19.17	19.08	19.26	
1.4	QPSK	6	0	19.42	19.20	19.23	20.2
1.4	16QAM	1	0	19.09	19.33	18.76	20.2
1.4	16QAM	1	3	19.28	19.13	19.19	
1.4	16QAM	1	5	18.74	19.21	19.11	
1.4	16QAM	3	0	18.41	18.14	18.01	
1.4	16QAM	3	1	18.06	17.71	18.00	
1.4	16QAM	3	3	18.26	17.79	17.60	



1.4	16QAM	6	0	18.62	18.21	18.41	19.2
1.4	64QAM	1	0	18.33	18.28	17.76	19.2
1.4	64QAM	1	3	18.05	18.10	17.77	
1.4	64QAM	1	5	17.94	17.67	17.90	
1.4	64QAM	3	0	17.24	17.38	16.94	
1.4	64QAM	3	1	17.09	16.61	16.98	
1.4	64QAM	3	3	17.25	16.65	16.76	
1.4	64QAM	6	0	17.46	17.09	17.19	18.2
1.4	256QAM	1	0	14.98	14.96	14.90	16.2
1.4	256QAM	1	3	14.57	15.04	14.57	
1.4	256QAM	1	5	14.95	14.94	15.23	
1.4	256QAM	3	0	15.36	15.09	14.82	
1.4	256QAM	3	1	15.03	14.50	14.97	
1.4	256QAM	3	3	15.28	14.72	14.74	
1.4	256QAM	6	0	15.17	15.03	15.21	16.2

<LTE Band 30 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				27710			17.7
Frequency (MHz)				2310			
10	QPSK	1	0		17.36		17.7
10	QPSK	1	25		17.29		
10	QPSK	1	49		17.34		
10	QPSK	25	0		16.34		16.7
10	QPSK	25	12		16.28		
10	QPSK	25	25		16.32		
10	QPSK	50	0		16.39		16.7
10	16QAM	1	0		16.27		
10	16QAM	1	25		16.23		
10	16QAM	1	49		16.29		15.7
10	16QAM	25	0		15.25		
10	16QAM	25	12		15.21		
10	16QAM	25	25		15.26		15.7
10	16QAM	50	0		15.33		
10	64QAM	1	0		15.20		
10	64QAM	1	25		15.16		
10	64QAM	1	49		15.20		
10	64QAM	25	0		14.18		14.7
10	64QAM	25	12		14.18		
10	64QAM	25	25		14.19		
10	64QAM	50	0		14.26		12.7
10	256QAM	1	0		12.23		
10	256QAM	1	25		12.16		
10	256QAM	1	49		12.20		12.7
10	256QAM	25	0		12.15		
10	256QAM	25	12		12.17		
10	256QAM	25	25		12.18		12.7
10	256QAM	50	0		12.21		
Channel				27685	27710	27735	
Frequency (MHz)				2307.5	2310	2312.5	
5	QPSK	1	0	17.22	17.27	17.25	17.7
5	QPSK	1	12	17.18	17.20	17.21	
5	QPSK	1	24	17.14	17.18	17.24	



5	QPSK	12	0	16.05	16.17	15.99	16.7
5	QPSK	12	7	16.04	16.07	16.08	
5	QPSK	12	13	16.01	15.93	16.08	
5	QPSK	25	0	16.04	16.01	15.96	16.7
5	16QAM	1	0	16.11	16.08	16.11	
5	16QAM	1	12	16.18	16.06	16.20	
5	16QAM	1	24	16.00	16.18	16.09	15.7
5	16QAM	12	0	14.93	15.17	14.93	
5	16QAM	12	7	14.90	15.06	15.00	
5	16QAM	12	13	14.89	14.84	14.97	
5	16QAM	25	0	14.88	14.91	14.80	15.7
5	64QAM	1	0	15.01	14.96	15.04	
5	64QAM	1	12	14.94	14.94	14.98	
5	64QAM	1	24	14.92	14.99	15.02	14.7
5	64QAM	12	0	13.78	13.94	13.85	
5	64QAM	12	7	13.82	13.97	13.80	
5	64QAM	12	13	13.85	13.86	13.91	
5	64QAM	25	0	13.94	13.86	13.85	12.7
5	256QAM	1	0	12.00	11.93	11.85	
5	256QAM	1	12	11.90	11.76	11.92	
5	256QAM	1	24	11.79	11.95	11.94	
5	256QAM	12	0	12.14	12.24	12.27	12.7
5	256QAM	12	7	12.15	12.47	12.10	
5	256QAM	12	13	12.15	12.27	12.26	
5	256QAM	25	0	12.31	12.23	12.30	

<LTE Band 66 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				132072	132322	132572	
Frequency (MHz)				1720	1745	1770	
20	QPSK	1	0	20.10	20.02	20.08	20.2
20	QPSK	1	49	19.64	19.53	19.60	
20	QPSK	1	99	19.66	19.60	19.64	
20	QPSK	50	0	19.13	19.04	19.09	19.2
20	QPSK	50	24	18.66	18.57	18.65	
20	QPSK	50	50	18.67	18.61	18.64	
20	QPSK	100	0	19.14	18.97	19.01	19.2
20	16QAM	1	0	18.86	18.83	18.82	
20	16QAM	1	49	18.37	18.50	18.41	
20	16QAM	1	99	18.65	18.53	18.56	18.2
20	16QAM	50	0	17.98	17.95	17.86	
20	16QAM	50	24	17.44	17.52	17.37	
20	16QAM	50	50	17.57	17.35	17.42	
20	16QAM	100	0	17.86	17.74	17.84	18.2
20	64QAM	1	0	17.62	17.74	17.65	
20	64QAM	1	49	17.18	17.36	17.32	
20	64QAM	1	99	17.50	17.31	17.31	17.2
20	64QAM	50	0	16.75	16.92	16.84	
20	64QAM	50	24	16.28	16.27	16.33	
20	64QAM	50	50	16.32	16.06	16.21	
20	64QAM	100	0	16.62	16.69	16.80	15.2
20	256QAM	1	0	14.36	14.54	14.52	
20	256QAM	1	49	13.90	14.13	14.29	



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20	256QAM	1	99	14.22	14.22	14.19	15.2
20	256QAM	50	0	14.56	14.77	14.79	
20	256QAM	50	24	14.25	13.98	14.14	
20	256QAM	50	50	14.25	13.90	13.94	
20	256QAM	100	0	14.47	14.46	14.57	
Channel				132047	132322	132597	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	QPSK	1	0	19.81	20.00	20.08	20.2
15	QPSK	1	37	19.64	19.53	19.48	
15	QPSK	1	74	19.61	19.37	19.48	
15	QPSK	36	0	19.05	18.92	19.08	19.2
15	QPSK	36	20	18.56	18.35	18.47	
15	QPSK	36	39	18.66	18.35	18.60	
15	QPSK	75	0	19.03	18.75	18.71	19.2
15	16QAM	1	0	18.80	18.77	18.65	
15	16QAM	1	37	18.31	18.40	18.26	
15	16QAM	1	74	18.45	18.33	18.28	18.2
15	16QAM	36	0	17.73	17.65	17.77	
15	16QAM	36	20	17.39	17.37	17.29	
15	16QAM	36	39	17.36	17.20	17.23	18.2
15	16QAM	75	0	17.66	17.59	17.80	
15	64QAM	1	0	17.44	17.54	17.48	
15	64QAM	1	37	17.18	17.28	17.16	18.2
15	64QAM	1	74	17.43	17.29	17.20	
15	64QAM	36	0	16.55	16.62	16.64	
15	64QAM	36	20	16.16	16.07	16.20	17.2
15	64QAM	36	39	16.04	15.83	16.18	
15	64QAM	75	0	16.34	16.41	16.57	
15	256QAM	1	0	14.09	14.34	14.49	15.2
15	256QAM	1	37	13.79	14.10	14.25	
15	256QAM	1	74	14.19	14.03	14.01	
15	256QAM	36	0	14.56	14.54	14.63	15.2
15	256QAM	36	20	13.98	13.79	14.12	
15	256QAM	36	39	14.21	13.75	13.86	
15	256QAM	75	0	14.25	14.38	14.52	15.2
Channel				132022	132322	132622	
Frequency (MHz)				1715	1745	1775	
10	QPSK	1	0	20.10	19.88	19.90	20.2
10	QPSK	1	25	19.46	19.34	19.58	
10	QPSK	1	49	19.38	19.42	19.49	
10	QPSK	25	0	19.06	18.89	18.85	19.2
10	QPSK	25	12	18.50	18.54	18.58	
10	QPSK	25	25	18.49	18.48	18.53	
10	QPSK	50	0	18.97	18.79	18.83	19.2
10	16QAM	1	0	18.73	18.82	18.63	
10	16QAM	1	25	18.26	18.41	18.39	
10	16QAM	1	49	18.40	18.35	18.36	18.2
10	16QAM	25	0	17.71	17.92	17.78	
10	16QAM	25	12	17.18	17.36	17.08	
10	16QAM	25	25	17.45	17.25	17.39	18.2
10	16QAM	50	0	17.76	17.49	17.83	
10	64QAM	1	0	17.34	17.74	17.39	
10	64QAM	1	25	17.04	17.14	17.17	18.2
10	64QAM	1	49	17.23	17.09	17.22	
10	64QAM	25	0	16.46	16.78	16.57	
10	64QAM	25	12	16.03	16.01	16.29	17.2



10	64QAM	25	25	16.30	15.91	16.16	
10	64QAM	50	0	16.44	16.62	16.57	
10	256QAM	1	0	14.36	14.38	14.33	
10	256QAM	1	25	13.84	13.90	14.20	15.2
10	256QAM	1	49	14.05	14.07	14.14	
10	256QAM	25	0	14.29	14.61	14.53	15.2
10	256QAM	25	12	14.13	13.98	13.92	
10	256QAM	25	25	14.03	13.86	13.75	
10	256QAM	50	0	14.47	14.23	14.35	
Channel				131997	132322	132647	
Frequency (MHz)				1712.5	1745	1777.5	
5	QPSK	1	0	19.84	19.61	19.74	20.2
5	QPSK	1	12	19.45	19.09	19.38	
5	QPSK	1	24	19.19	19.29	19.24	
5	QPSK	12	0	19.02	18.89	18.58	19.2
5	QPSK	12	7	18.33	18.29	18.39	
5	QPSK	12	13	18.48	18.46	18.30	
5	QPSK	25	0	18.80	18.78	18.81	
5	16QAM	1	0	18.57	18.72	18.51	
5	16QAM	1	12	18.03	18.28	18.37	19.2
5	16QAM	1	24	18.10	18.19	18.17	
5	16QAM	12	0	17.71	17.62	17.58	18.2
5	16QAM	12	7	17.08	17.10	17.05	
5	16QAM	12	13	17.37	17.10	17.34	
5	16QAM	25	0	17.65	17.41	17.58	
5	64QAM	1	0	17.29	17.60	17.25	
5	64QAM	1	12	16.84	16.96	17.14	18.2
5	64QAM	1	24	16.98	17.09	17.14	
5	64QAM	12	0	16.26	16.75	16.33	17.2
5	64QAM	12	7	15.87	15.77	16.05	
5	64QAM	12	13	16.13	15.67	16.12	
5	64QAM	25	0	16.27	16.48	16.28	
5	256QAM	1	0	14.34	14.22	14.30	
5	256QAM	1	12	13.62	13.77	14.20	15.2
5	256QAM	1	24	14.03	13.94	14.04	
5	256QAM	12	0	14.09	14.51	14.32	
5	256QAM	12	7	13.94	13.75	13.76	15.2
5	256QAM	12	13	13.83	13.56	13.45	
5	256QAM	25	0	14.17	14.20	14.05	
Channel				131987	132322	132657	
Frequency (MHz)				1711.5	1745	1778.5	
3	QPSK	1	0	19.73	19.56	19.68	20.2
3	QPSK	1	8	19.17	18.89	19.29	
3	QPSK	1	14	18.89	19.07	19.00	
3	QPSK	8	0	18.74	18.76	18.43	19.2
3	QPSK	8	4	18.14	18.04	18.24	
3	QPSK	8	7	18.45	18.40	18.29	
3	QPSK	15	0	18.75	18.74	18.58	
3	16QAM	1	0	18.31	18.60	18.26	
3	16QAM	1	8	17.77	18.02	18.07	19.2
3	16QAM	1	14	17.99	18.17	18.08	
3	16QAM	8	0	17.44	17.40	17.37	18.2
3	16QAM	8	4	16.85	17.07	16.84	
3	16QAM	8	7	17.31	16.95	17.22	
3	16QAM	15	0	17.65	17.28	17.29	
3	64QAM	1	0	17.14	17.30	17.13	



3	64QAM	1	8	16.73	16.70	16.87	
3	64QAM	1	14	16.73	17.03	17.13	
3	64QAM	8	0	16.04	16.67	16.30	
3	64QAM	8	4	15.57	15.55	15.92	17.2
3	64QAM	8	7	16.02	15.55	16.01	
3	64QAM	15	0	16.25	16.37	16.27	
3	256QAM	1	0	14.13	14.10	14.21	15.2
3	256QAM	1	8	13.34	13.54	14.03	
3	256QAM	1	14	13.74	13.65	13.97	
3	256QAM	8	0	13.86	14.23	14.10	15.2
3	256QAM	8	4	13.85	13.69	13.52	
3	256QAM	8	7	13.53	13.51	13.43	
3	256QAM	15	0	13.97	14.20	14.03	
Channel				131979	132322	132665	
Frequency (MHz)				1710.7	1745	1779.3	
1.4	QPSK	1	0	19.58	19.34	19.46	20.2
1.4	QPSK	1	3	19.42	19.06	19.34	
1.4	QPSK	1	5	18.98	19.04	18.95	
1.4	QPSK	3	0	18.81	18.82	18.40	
1.4	QPSK	3	1	18.33	18.10	18.20	
1.4	QPSK	3	3	18.23	18.34	18.28	
1.4	QPSK	6	0	18.50	18.74	18.68	19.2
1.4	16QAM	1	0	18.33	18.58	18.26	19.2
1.4	16QAM	1	3	18.03	18.08	18.30	
1.4	16QAM	1	5	17.82	18.06	17.90	
1.4	16QAM	3	0	17.70	17.49	17.44	
1.4	16QAM	3	1	17.01	17.06	16.77	
1.4	16QAM	3	3	17.07	16.86	17.25	
1.4	16QAM	6	0	17.62	17.11	17.58	18.2
1.4	64QAM	1	0	17.12	17.42	17.00	18.2
1.4	64QAM	1	3	16.63	16.67	16.84	
1.4	64QAM	1	5	16.92	16.99	16.84	
1.4	64QAM	3	0	15.98	16.68	16.17	
1.4	64QAM	3	1	15.73	15.61	16.02	
1.4	64QAM	3	3	15.91	15.60	16.01	
1.4	64QAM	6	0	15.98	16.42	16.14	17.2
1.4	256QAM	1	0	14.05	14.04	14.01	15.2
1.4	256QAM	1	3	13.33	13.65	14.00	
1.4	256QAM	1	5	13.89	13.90	13.91	
1.4	256QAM	3	0	13.95	14.27	14.21	
1.4	256QAM	3	1	13.72	13.61	13.69	
1.4	256QAM	3	3	13.82	13.56	13.16	
1.4	256QAM	6	0	14.17	13.92	13.79	15.2

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

- a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- b. “special subframe S” contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
- c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.

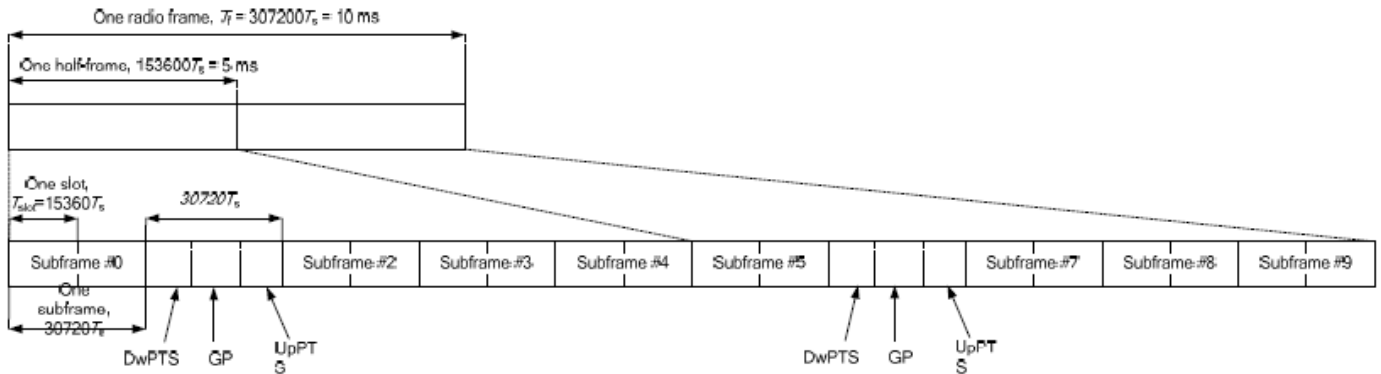


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink				Extended cyclic prefix in downlink			
	DwPTS	UpPTS		DwPTS	UpPTS			
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		
0	6592 · Ts	2192 · Ts	2560 · Ts	7680 · Ts	2192 · Ts	2560 · Ts		
1	19760 · Ts			20480 · Ts				
2	21952 · Ts			23040 · Ts				
3	24144 · Ts			25600 · Ts				
4	26336 · Ts	7680 · Ts	4384 · Ts	5120 · Ts				
5	6592 · Ts	20480 · Ts						
6	19760 · Ts	23040 · Ts						
7	21952 · Ts	4384 · Ts	5120 · Ts	12800 · Ts	4384 · Ts	5120 · Ts		
8	24144 · Ts			-				-
9	13168 · Ts			-			-	

Special subframe (30720·T_s): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~4	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T_s): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~3	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

- i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.167)/5 = 63.3\%$
- iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.143)/5 = 62.9\%$
- v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
- vi. The device supports Power Class 3 uplink-downlink configurations 0 and 6, and Power Class 2 uplink-downlink configurations 1 to 5 operations for LTE Band 41.
- vii. The highest available duty cycle for Power Class 2 operation is 43.3% using UL-DL configuration 1, for Power Class 3 operation is 63.3% using UL-DL configuration 0. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR among all exposure condition.



Default Power Mode

<LTE Band 38 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				37850	38000	38150	
Frequency (MHz)				2580	2595	2610	
20	QPSK	1	0	23.28	23.30	23.24	25
20	QPSK	1	49	23.24	23.20	23.14	
20	QPSK	1	99	23.25	23.22	23.16	
20	QPSK	50	0	22.47	22.48	22.41	24
20	QPSK	50	24	22.53	22.45	22.40	
20	QPSK	50	50	22.51	22.50	22.45	
20	QPSK	100	0	22.54	22.53	22.42	24
20	16QAM	1	0	22.69	22.61	22.63	
20	16QAM	1	49	22.65	22.63	22.50	
20	16QAM	1	99	22.65	22.67	22.60	23
20	16QAM	50	0	21.53	21.51	21.46	
20	16QAM	50	24	21.58	21.48	21.45	
20	16QAM	50	50	21.57	21.53	21.50	23
20	16QAM	100	0	21.58	21.58	21.43	
20	64QAM	1	0	21.49	21.44	21.39	
20	64QAM	1	49	21.47	21.43	21.35	23
20	64QAM	1	99	21.48	21.50	21.44	
20	64QAM	50	0	20.53	20.51	20.46	
20	64QAM	50	24	20.58	20.49	20.45	22
20	64QAM	50	50	20.58	20.55	20.50	
20	64QAM	100	0	20.60	20.57	20.43	
20	256QAM	1	0	18.15	18.18	18.03	20
20	256QAM	1	49	18.44	18.27	18.03	
20	256QAM	1	99	18.31	18.43	18.26	
20	256QAM	50	0	18.16	18.30	18.05	20
20	256QAM	50	24	18.29	18.37	18.14	
20	256QAM	50	50	18.37	18.39	18.16	
20	256QAM	100	0	18.23	18.22	18.11	
Channel				37825	38000	38175	Tune-up limit (dBm)
Frequency (MHz)				2577.5	2595	2612.5	
15	QPSK	1	0	23.18	23.17	23.15	25
15	QPSK	1	37	23.12	23.13	23.01	
15	QPSK	1	74	23.17	23.16	23.15	
15	QPSK	36	0	22.37	22.44	22.34	24
15	QPSK	36	20	22.26	22.24	22.30	
15	QPSK	36	39	22.51	22.23	22.27	
15	QPSK	75	0	22.43	22.25	22.34	24
15	16QAM	1	0	22.42	22.41	22.62	
15	16QAM	1	37	22.44	22.38	22.34	
15	16QAM	1	74	22.61	22.42	22.39	23
15	16QAM	36	0	21.24	21.23	21.28	
15	16QAM	36	20	21.48	21.29	21.30	
15	16QAM	36	39	21.50	21.24	21.34	23
15	16QAM	75	0	21.37	21.29	21.39	
15	64QAM	1	0	21.20	21.16	21.21	
15	64QAM	1	37	21.36	21.38	21.22	23
15	64QAM	1	74	21.28	21.48	21.35	
15	64QAM	36	0	20.51	20.21	20.32	
15	64QAM	36	20	20.40	20.34	20.29	22
15	64QAM	36	39	20.52	20.55	20.44	



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15	64QAM	75	0	20.45	20.36	20.19	
15	256QAM	1	0	18.15	18.18	18.09	20
15	256QAM	1	37	18.42	18.31	18.08	
15	256QAM	1	74	18.22	18.50	18.28	
15	256QAM	36	0	18.08	18.22	18.02	20
15	256QAM	36	20	18.32	18.38	18.13	
15	256QAM	36	39	18.26	18.27	18.16	
15	256QAM	75	0	18.15	18.40	18.00	
Channel				37800	38000	38200	Tune-up limit (dBm)
Frequency (MHz)				2575	2595	2615	
10	QPSK	1	0	23.17	23.18	23.14	25
10	QPSK	1	25	23.01	23.16	23.15	
10	QPSK	1	49	23.09	23.07	23.13	
10	QPSK	25	0	22.18	22.41	22.13	24
10	QPSK	25	12	22.43	22.16	22.21	
10	QPSK	25	25	22.21	22.28	22.33	
10	QPSK	50	0	22.30	22.32	22.36	
10	16QAM	1	0	22.58	22.61	22.56	24
10	16QAM	1	25	22.45	22.54	22.49	
10	16QAM	1	49	22.53	22.61	22.34	
10	16QAM	25	0	21.48	21.46	21.28	23
10	16QAM	25	12	21.44	21.20	21.16	
10	16QAM	25	25	21.56	21.38	21.30	
10	16QAM	50	0	21.42	21.32	21.23	
10	64QAM	1	0	21.47	21.23	21.24	
10	64QAM	1	25	21.25	21.17	21.05	23
10	64QAM	1	49	21.41	21.26	21.24	
10	64QAM	25	0	20.25	20.45	20.36	
10	64QAM	25	12	20.38	20.21	20.24	22
10	64QAM	25	25	20.32	20.39	20.38	
10	64QAM	50	0	20.33	20.34	20.42	
10	256QAM	1	0	18.15	18.33	18.01	
10	256QAM	1	25	18.33	18.32	18.08	20
10	256QAM	1	49	18.37	18.37	18.31	
10	256QAM	25	0	18.14	18.12	18.08	
10	256QAM	25	12	18.30	18.42	18.14	20
10	256QAM	25	25	18.25	18.34	18.10	
10	256QAM	50	0	18.15	18.36	18.19	
Channel				37775	38000	38225	
Frequency (MHz)				2572.5	2595	2617.5	
5	QPSK	1	0	23.03	23.19	23.05	25
5	QPSK	1	12	23.10	23.19	23.11	
5	QPSK	1	24	23.16	23.13	23.01	
5	QPSK	12	0	22.36	22.25	22.38	24
5	QPSK	12	7	22.36	22.40	22.20	
5	QPSK	12	13	22.50	22.36	22.37	
5	QPSK	25	0	22.33	22.29	22.29	
5	16QAM	1	0	22.65	22.59	22.57	24
5	16QAM	1	12	22.49	22.52	22.32	
5	16QAM	1	24	22.42	22.59	22.35	
5	16QAM	12	0	21.30	21.40	21.35	23
5	16QAM	12	7	21.29	21.21	21.20	
5	16QAM	12	13	21.38	21.29	21.22	
5	16QAM	25	0	21.58	21.37	21.24	
5	64QAM	1	0	21.35	21.38	21.32	
5	64QAM	1	12	21.21	21.20	21.29	23



5	64QAM	1	24	21.24	21.21	21.31	22
5	64QAM	12	0	20.41	20.38	20.40	
5	64QAM	12	7	20.37	20.31	20.30	
5	64QAM	12	13	20.32	20.45	20.36	
5	64QAM	25	0	20.49	20.47	20.25	
5	256QAM	1	0	18.15	18.34	18.19	20
5	256QAM	1	12	18.35	18.43	18.12	
5	256QAM	1	24	18.30	18.52	18.20	
5	256QAM	12	0	18.19	18.18	18.12	20
5	256QAM	12	7	18.29	18.23	18.17	
5	256QAM	12	13	18.29	18.28	18.11	
5	256QAM	25	0	18.28	18.29	18.14	

<LTE Band 38 MIMO 1 HPUE>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				37850	38000	38150	27
Frequency (MHz)				2580	2595	2610	
20	QPSK	1	0	26.22	26.06	25.73	27
20	QPSK	1	49	25.92	25.96	25.82	
20	QPSK	1	99	25.98	26.19	26.00	
20	QPSK	50	0	24.94	24.93	24.78	26
20	QPSK	50	24	24.90	24.96	24.79	
20	QPSK	50	50	24.79	24.70	24.43	
20	QPSK	100	0	24.81	24.87	24.73	26
20	16QAM	1	0	25.13	25.20	24.92	
20	16QAM	1	49	25.07	25.23	25.18	
20	16QAM	1	99	25.19	25.65	25.45	25
20	16QAM	50	0	24.18	24.18	23.99	
20	16QAM	50	24	24.14	24.13	23.98	
20	16QAM	50	50	24.17	24.12	23.93	25
20	16QAM	100	0	24.09	24.10	23.80	
20	64QAM	1	0	23.49	23.21	23.28	
20	64QAM	1	49	23.38	23.37	23.36	
20	64QAM	1	99	23.46	23.82	23.70	
20	64QAM	50	0	22.31	22.30	22.15	24
20	64QAM	50	24	22.31	22.27	22.12	
20	64QAM	50	50	22.28	22.29	22.08	
20	64QAM	100	0	22.15	22.12	22.16	22
20	256QAM	1	0	21.78	21.76	21.81	
20	256QAM	1	49	21.73	21.90	21.72	
20	256QAM	1	99	21.71	21.70	21.84	22
20	256QAM	50	0	21.56	21.68	21.61	
20	256QAM	50	24	21.70	21.78	21.66	
20	256QAM	50	50	21.80	21.75	21.77	22
20	256QAM	100	0	21.79	21.77	21.84	
Channel				21.89	21.69	21.72	
Frequency (MHz)				2577.5	2595	2612.5	
15	QPSK	1	0	26.16	25.97	25.69	27
15	QPSK	1	37	25.91	25.95	25.75	
15	QPSK	1	74	25.90	26.17	25.93	
15	QPSK	36	0	24.90	24.93	24.73	26
15	QPSK	36	20	24.81	24.91	24.69	
15	QPSK	36	39	24.73	24.70	24.43	



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15	QPSK	75	0	24.80	24.81	24.69	
15	16QAM	1	0	25.03	25.14	24.91	26
15	16QAM	1	37	25.07	25.17	25.08	
15	16QAM	1	74	25.13	25.63	25.38	
15	16QAM	36	0	24.08	24.08	23.98	25
15	16QAM	36	20	24.07	24.13	23.91	
15	16QAM	36	39	24.15	24.06	23.87	
15	16QAM	75	0	24.00	24.04	23.80	
15	64QAM	1	0	23.49	23.12	23.28	25
15	64QAM	1	37	23.36	23.34	23.31	
15	64QAM	1	74	23.41	23.80	23.68	
15	64QAM	36	0	22.30	22.26	22.05	24
15	64QAM	36	20	22.27	22.20	22.04	
15	64QAM	36	39	22.25	22.22	22.04	
15	64QAM	75	0	22.09	22.09	22.08	
15	256QAM	1	0	21.78	21.76	21.79	22
15	256QAM	1	37	21.71	21.88	21.71	
15	256QAM	1	74	21.67	21.63	21.74	
15	256QAM	36	0	21.55	21.63	21.55	22
15	256QAM	36	20	21.65	21.71	21.61	
15	256QAM	36	39	21.70	21.68	21.70	
15	256QAM	75	0	21.74	21.69	21.82	
Channel				37800	38000	38200	Tune-up limit (dBm)
Frequency (MHz)				2575	2595	2615	
10	QPSK	1	0	26.11	25.97	25.65	27
10	QPSK	1	25	25.82	25.94	25.72	
10	QPSK	1	49	25.88	26.07	25.89	
10	QPSK	25	0	24.84	24.85	24.65	26
10	QPSK	25	12	24.75	24.81	24.69	
10	QPSK	25	25	24.66	24.68	24.34	
10	QPSK	50	0	24.77	24.75	24.65	
10	16QAM	1	0	24.93	25.05	24.88	26
10	16QAM	1	25	25.00	25.10	24.99	
10	16QAM	1	49	25.11	25.62	25.28	
10	16QAM	25	0	23.98	24.00	23.97	25
10	16QAM	25	12	24.03	24.12	23.89	
10	16QAM	25	25	24.07	23.96	23.80	
10	16QAM	50	0	23.95	24.04	23.75	
10	64QAM	1	0	23.41	23.05	23.21	25
10	64QAM	1	25	23.33	23.30	23.29	
10	64QAM	1	49	23.39	23.73	23.59	
10	64QAM	25	0	22.28	22.17	22.00	24
10	64QAM	25	12	22.19	22.16	22.01	
10	64QAM	25	25	22.24	22.19	22.00	
10	64QAM	50	0	22.01	22.05	22.08	
10	256QAM	1	0	21.72	21.76	21.70	22
10	256QAM	1	25	21.67	21.87	21.66	
10	256QAM	1	49	21.61	21.62	21.70	
10	256QAM	25	0	21.49	21.61	21.52	22
10	256QAM	25	12	21.59	21.61	21.59	
10	256QAM	25	25	21.60	21.61	21.68	
10	256QAM	50	0	21.70	21.60	21.81	
Channel				37775	38000	38225	Tune-up limit (dBm)
Frequency (MHz)				2572.5	2595	2617.5	
5	QPSK	1	0	26.02	25.92	25.63	27
5	QPSK	1	12	25.81	25.85	25.66	



5	QPSK	1	24	25.78	25.99	25.80	26
5	QPSK	12	0	24.76	24.81	24.55	
5	QPSK	12	7	24.67	24.75	24.63	
5	QPSK	12	13	24.58	24.63	24.27	
5	QPSK	25	0	24.70	24.72	24.65	
5	16QAM	1	0	24.92	25.01	24.87	26
5	16QAM	1	12	24.90	25.01	24.92	
5	16QAM	1	24	25.09	25.59	25.26	
5	16QAM	12	0	23.94	23.99	23.96	25
5	16QAM	12	7	23.93	24.10	23.81	
5	16QAM	12	13	24.01	23.89	23.78	
5	16QAM	25	0	23.95	24.02	23.68	
5	64QAM	1	0	23.32	23.01	23.15	25
5	64QAM	1	12	23.23	23.26	23.22	
5	64QAM	1	24	23.37	23.66	23.53	
5	64QAM	12	0	22.26	22.07	22.04	24
5	64QAM	12	7	22.16	22.12	22.01	
5	64QAM	12	13	22.19	22.18	22.04	
5	64QAM	25	0	22.01	22.04	22.05	
5	256QAM	1	0	21.70	21.74	21.63	22
5	256QAM	1	12	21.60	21.83	21.64	
5	256QAM	1	24	21.51	21.55	21.60	
5	256QAM	12	0	21.44	21.55	21.44	22
5	256QAM	12	7	21.49	21.58	21.50	
5	256QAM	12	13	21.52	21.57	21.67	
5	256QAM	25	0	21.67	21.50	21.77	

<LTE Band 41 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				39750	40185	40620	41055	41490	
Frequency (MHz)				2506	2549.5	2593	2636.5	2680	
20	QPSK	1	0	23.76	23.67	23.81	23.61	23.41	25
20	QPSK	1	49	23.75	23.71	23.70	23.46	23.23	
20	QPSK	1	99	23.73	23.70	23.78	23.50	23.19	
20	QPSK	50	0	22.80	22.80	22.94	22.67	22.35	24
20	QPSK	50	24	22.91	22.89	22.86	22.63	22.30	
20	QPSK	50	50	22.88	22.87	22.85	22.58	22.32	
20	QPSK	100	0	22.88	22.87	22.91	22.62	22.30	
20	16QAM	1	0	22.90	22.89	22.92	22.72	22.52	24
20	16QAM	1	49	22.87	22.78	22.79	22.56	22.31	
20	16QAM	1	99	22.91	22.80	22.89	22.58	22.28	
20	16QAM	50	0	21.98	21.83	21.85	21.68	21.37	23
20	16QAM	50	24	21.94	21.91	21.89	21.64	21.32	
20	16QAM	50	50	21.93	21.90	21.88	21.62	21.35	
20	16QAM	100	0	21.94	21.90	21.89	21.64	21.33	
20	64QAM	1	0	21.54	21.59	21.60	21.39	21.20	23
20	64QAM	1	49	21.63	21.53	21.55	21.31	21.02	
20	64QAM	1	99	21.73	21.52	21.76	21.28	21.23	
20	64QAM	50	0	21.00	20.86	20.85	20.69	20.40	22
20	64QAM	50	24	20.95	20.94	20.89	20.66	20.33	
20	64QAM	50	50	20.94	20.91	20.87	20.63	20.36	
20	64QAM	100	0	20.96	20.92	20.88	20.66	20.33	
20	256QAM	1	0	18.32	18.01	18.15	18.34	18.07	20



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20	256QAM	1	49	18.37	18.13	18.28	18.37	18.13	20
20	256QAM	1	99	18.47	18.29	18.34	18.51	18.16	
20	256QAM	50	0	18.31	18.27	18.28	18.22	18.00	
20	256QAM	50	24	18.36	18.03	18.32	18.29	18.00	
20	256QAM	50	50	18.41	18.17	18.34	18.26	18.04	
20	256QAM	100	0	18.23	18.20	18.21	18.37	18.00	
Channel				39725	40173	40620	41068	41515	Tune-up limit (dBm)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	
15	QPSK	1	0	23.52	23.52	23.64	23.44	23.39	25.00
15	QPSK	1	37	23.55	23.55	23.57	23.26	23.27	
15	QPSK	1	74	23.56	23.51	23.56	23.28	23.19	
15	QPSK	36	0	22.64	22.60	22.74	22.44	22.09	24
15	QPSK	36	20	22.74	22.85	22.63	22.34	22.09	
15	QPSK	36	39	22.80	22.82	22.65	22.48	22.24	
15	QPSK	75	0	22.69	22.87	22.83	22.47	22.12	24
15	16QAM	1	0	22.65	22.69	22.63	22.62	22.38	
15	16QAM	1	37	22.86	22.50	22.59	22.55	22.02	
15	16QAM	1	74	22.76	22.58	22.83	22.54	22.26	23
15	16QAM	36	0	21.97	21.62	21.71	21.60	21.10	
15	16QAM	36	20	21.65	21.77	21.82	21.36	21.15	
15	16QAM	36	39	21.68	21.90	21.86	21.33	21.18	23
15	16QAM	75	0	21.76	21.83	21.73	21.43	21.07	
15	64QAM	1	0	21.42	21.49	21.42	21.25	21.00	
15	64QAM	1	37	21.37	21.43	21.54	21.12	21.28	22
15	64QAM	1	74	21.57	21.29	21.63	21.15	21.29	
15	64QAM	36	0	20.81	20.78	20.77	20.63	20.36	
15	64QAM	36	20	20.75	20.67	20.80	20.39	20.08	20
15	64QAM	36	39	20.68	20.88	20.74	20.63	20.20	
15	64QAM	75	0	20.89	20.64	20.76	20.36	20.15	
15	256QAM	1	0	18.25	18.03	18.15	18.15	18.07	20
15	256QAM	1	37	18.39	18.27	18.44	18.36	18.08	
15	256QAM	1	74	18.35	18.26	18.24	18.41	18.17	
15	256QAM	36	0	18.20	18.25	18.29	18.16	18.24	20
15	256QAM	36	20	18.33	18.16	18.28	18.30	18.10	
15	256QAM	36	39	18.36	18.06	18.30	18.27	18.14	
15	256QAM	75	0	18.28	18.06	18.21	18.41	18.00	Tune-up limit (dBm)
Channel				39700	40160	40620	41080	41540	
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	23.49	23.44	23.79	23.54	23.32	25.00
10	QPSK	1	25	23.66	23.45	23.53	23.42	23.03	
10	QPSK	1	49	23.43	23.56	23.70	23.40	23.39	
10	QPSK	25	0	22.68	22.56	22.66	22.66	22.17	24
10	QPSK	25	12	22.89	22.79	22.84	22.62	22.01	
10	QPSK	25	25	22.83	22.63	22.61	22.47	22.08	
10	QPSK	50	0	22.81	22.59	22.82	22.49	22.11	24
10	16QAM	1	0	22.83	22.64	22.79	22.52	22.37	
10	16QAM	1	25	22.76	22.59	22.58	22.50	22.21	
10	16QAM	1	49	22.80	22.56	22.64	22.52	22.23	23
10	16QAM	25	0	21.93	21.53	21.64	21.61	21.20	
10	16QAM	25	12	21.68	21.87	21.65	21.41	21.04	
10	16QAM	25	25	21.75	21.79	21.86	21.47	21.17	23
10	16QAM	50	0	21.81	21.71	21.59	21.58	21.29	
10	64QAM	1	0	21.32	21.44	21.38	21.19	21.35	
10	64QAM	1	25	21.63	21.39	21.40	21.04	21.15	22
10	64QAM	1	49	21.63	21.43	21.58	21.27	21.42	
10	64QAM	25	0	20.96	20.83	20.77	20.59	20.16	



10	64QAM	25	12	20.74	20.73	20.86	20.59	20.05	
10	64QAM	25	25	20.79	20.68	20.70	20.49	20.23	
10	64QAM	50	0	20.92	20.76	20.70	20.62	20.22	
10	256QAM	1	0	18.20	18.06	18.15	18.32	18.08	20
10	256QAM	1	25	18.27	18.05	18.45	18.46	18.06	
10	256QAM	1	49	18.44	18.27	18.36	18.47	18.13	
10	256QAM	25	0	18.12	18.00	18.10	18.12	18.24	20
10	256QAM	25	12	18.31	18.14	18.22	18.37	18.14	
10	256QAM	25	25	18.39	18.12	18.40	18.45	18.00	
10	256QAM	50	0	18.29	18.23	18.18	18.38	18.09	
Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5	
5	QPSK	1	0	23.64	23.56	23.51	23.61	23.30	25.00
5	QPSK	1	12	23.45	23.53	23.49	23.24	23.28	
5	QPSK	1	24	23.44	23.70	23.65	23.31	23.25	
5	QPSK	12	0	22.68	22.76	22.51	22.40	22.12	24
5	QPSK	12	7	22.85	22.89	22.56	22.49	22.27	
5	QPSK	12	13	22.63	22.66	22.60	22.31	22.16	
5	QPSK	25	0	22.78	22.61	22.76	22.39	22.24	24
5	16QAM	1	0	22.83	22.65	22.80	22.53	22.37	
5	16QAM	1	12	22.59	22.72	22.53	22.48	22.22	
5	16QAM	1	24	22.81	22.78	22.61	22.36	22.00	23
5	16QAM	12	0	21.77	21.72	21.68	21.48	21.37	
5	16QAM	12	7	21.79	21.64	21.84	21.34	21.17	
5	16QAM	12	13	21.76	21.76	21.62	21.37	21.32	23
5	16QAM	25	0	21.86	21.79	21.62	21.51	21.16	
5	64QAM	1	0	21.34	21.33	21.39	21.22	21.18	
5	64QAM	1	12	21.34	21.26	21.28	21.16	21.22	23
5	64QAM	1	24	21.46	21.50	21.74	21.22	21.23	
5	64QAM	12	0	20.71	20.75	20.75	20.56	20.25	
5	64QAM	12	7	20.65	20.92	20.88	20.62	20.27	22
5	64QAM	12	13	20.85	20.80	20.78	20.41	20.18	
5	64QAM	25	0	20.66	20.69	20.84	20.38	20.32	
5	256QAM	1	0	18.15	18.05	18.15	18.35	18.17	20
5	256QAM	1	12	18.40	18.13	18.40	18.39	18.12	
5	256QAM	1	24	18.42	18.14	18.28	18.52	18.33	
5	256QAM	12	0	18.16	18.27	18.06	18.30	18.28	20
5	256QAM	12	7	18.41	18.28	18.22	18.34	18.27	
5	256QAM	12	13	18.45	18.07	18.39	18.33	18.12	
5	256QAM	25	0	18.33	18.29	18.17	18.24	18.29	

<LTE Band 41 MIMO 1 HPUE>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				39750	40185	40620	41055	41490	Tune-up limit (dBm)
Frequency (MHz)				2506	2549.5	2593	2636.5	2680	
20	QPSK	1	0	25.65	25.67	25.73	25.61	25.60	27
20	QPSK	1	49	25.62	25.35	25.25	25.17	25.18	
20	QPSK	1	99	25.62	25.33	25.36	25.28	25.25	
20	QPSK	50	0	24.51	24.58	24.95	24.49	24.44	26
20	QPSK	50	24	24.93	24.67	24.58	24.47	24.42	
20	QPSK	50	50	24.77	24.64	24.55	24.47	24.42	
20	QPSK	100	0	24.92	24.67	24.93	24.49	24.42	
20	16QAM	1	0	25.00	24.80	24.75	24.67	24.66	26



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20	16QAM	1	49	24.95	24.72	24.64	24.53	24.57	
20	16QAM	1	99	24.97	24.70	24.72	24.61	24.21	
20	16QAM	50	0	23.92	23.62	23.53	23.53	23.46	
20	16QAM	50	24	23.89	23.67	23.61	23.50	23.45	25
20	16QAM	50	50	23.85	23.67	23.59	23.51	23.49	
20	16QAM	100	0	23.88	23.67	23.58	23.51	23.43	
20	64QAM	1	0	23.16	23.34	23.20	23.32	23.22	25
20	64QAM	1	49	23.43	23.20	23.49	23.37	23.28	
20	64QAM	1	99	23.81	23.24	23.62	23.21	23.01	
20	64QAM	50	0	22.49	22.06	22.51	22.49	22.01	24
20	64QAM	50	24	22.47	22.09	22.52	22.43	22.27	
20	64QAM	50	50	22.34	22.18	22.47	22.28	22.23	
20	64QAM	100	0	22.34	22.28	22.35	22.32	22.28	
20	256QAM	1	0	21.03	21.08	20.98	21.11	21.09	22
20	256QAM	1	49	20.89	20.97	20.93	20.95	20.96	
20	256QAM	1	99	21.14	21.11	21.13	21.04	21.14	
20	256QAM	50	0	20.87	20.90	20.93	20.80	20.84	22
20	256QAM	50	24	20.94	20.90	21.03	20.91	21.10	
20	256QAM	50	50	20.92	20.79	20.93	20.77	20.93	
20	256QAM	100	0	21.09	21.00	21.13	20.97	21.16	
Channel				20.78	20.85	20.79	20.79	20.7	
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	
15	QPSK	1	0	25.59	25.65	25.68	25.53	25.56	27.00
15	QPSK	1	37	25.62	25.34	25.20	25.16	25.11	
15	QPSK	1	74	25.55	25.28	25.29	25.18	25.21	
15	QPSK	36	0	24.45	24.52	24.90	24.44	24.44	26
15	QPSK	36	20	24.86	24.58	24.49	24.40	24.36	
15	QPSK	36	39	24.76	24.60	24.51	24.40	24.40	
15	QPSK	75	0	24.91	24.65	24.83	24.41	24.34	
15	16QAM	1	0	24.97	24.71	24.75	24.60	24.62	26
15	16QAM	1	37	24.94	24.63	24.61	24.52	24.49	
15	16QAM	1	74	24.97	24.65	24.63	24.55	24.18	
15	16QAM	36	0	23.84	23.60	23.43	23.43	23.46	25
15	16QAM	36	20	23.84	23.58	23.59	23.46	23.39	
15	16QAM	36	39	23.77	23.61	23.57	23.51	23.45	
15	16QAM	75	0	23.82	23.62	23.54	23.44	23.38	
15	64QAM	1	0	23.09	23.33	23.17	23.27	23.16	
15	64QAM	1	37	23.37	23.18	23.41	23.29	23.24	25
15	64QAM	1	74	23.79	23.24	23.53	23.12	23.01	
15	64QAM	36	0	22.48	22.00	22.47	22.41	22.00	
15	64QAM	36	20	22.40	22.00	22.44	22.41	22.25	24
15	64QAM	36	39	22.28	22.14	22.41	22.20	22.13	
15	64QAM	75	0	22.27	22.21	22.30	22.22	22.26	
15	256QAM	1	0	20.94	20.98	20.98	21.02	21.02	22
15	256QAM	1	37	20.79	20.91	20.92	20.91	20.95	
15	256QAM	1	74	21.04	21.08	21.03	21.00	21.14	
15	256QAM	36	0	20.82	20.83	20.92	20.72	20.75	
15	256QAM	36	20	20.92	20.90	21.03	20.83	21.10	22
15	256QAM	36	39	20.89	20.72	20.88	20.68	20.83	
15	256QAM	75	0	21.02	20.95	21.07	20.92	21.12	
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	25.58	25.60	25.67	25.43	25.49	27.00
10	QPSK	1	25	25.54	25.24	25.18	25.08	25.09	
10	QPSK	1	49	25.54	25.18	25.28	25.12	25.14	
10	QPSK	25	0	24.45	24.46	24.82	24.38	24.35	26



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10	QPSK	25	12	24.83	24.58	24.40	24.32	24.30	
10	QPSK	25	25	24.72	24.52	24.47	24.35	24.39	
10	QPSK	50	0	24.83	24.64	24.75	24.36	24.33	
10	16QAM	1	0	24.89	24.62	24.66	24.54	24.54	26
10	16QAM	1	25	24.84	24.53	24.57	24.47	24.41	
10	16QAM	1	49	24.92	24.56	24.59	24.50	24.18	
10	16QAM	25	0	23.79	23.58	23.36	23.34	23.41	25
10	16QAM	25	12	23.84	23.52	23.52	23.36	23.38	
10	16QAM	25	25	23.70	23.61	23.48	23.49	23.39	
10	16QAM	50	0	23.74	23.56	23.44	23.41	23.34	
10	64QAM	1	0	23.08	23.31	23.16	23.27	23.09	25
10	64QAM	1	25	23.29	23.15	23.39	23.21	23.22	
10	64QAM	1	49	23.78	23.14	23.51	23.03	23.06	
10	64QAM	25	0	22.46	22.06	22.42	22.35	22.08	24
10	64QAM	25	12	22.33	22.00	22.44	22.39	22.22	
10	64QAM	25	25	22.21	22.12	22.40	22.18	22.05	
10	64QAM	50	0	22.24	22.13	22.24	22.15	22.17	
10	256QAM	1	0	20.92	20.94	20.95	20.92	21.02	22
10	256QAM	1	25	20.69	20.89	20.87	20.90	20.92	
10	256QAM	1	49	20.99	21.08	20.94	20.95	21.12	
10	256QAM	25	0	20.82	20.78	20.84	20.64	20.65	22
10	256QAM	25	12	20.89	20.81	21.00	20.83	21.01	
10	256QAM	25	25	20.87	20.72	20.84	20.65	20.83	
10	256QAM	50	0	20.97	20.85	21.00	20.85	21.06	
Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5	
5	QPSK	1	0	25.52	25.50	25.67	25.33	25.46	27.00
5	QPSK	1	12	25.46	25.15	25.11	25.00	25.04	
5	QPSK	1	24	25.51	25.15	25.20	25.10	25.08	
5	QPSK	12	0	24.42	24.38	24.72	24.36	24.26	26
5	QPSK	12	7	24.81	24.56	24.34	24.25	24.29	
5	QPSK	12	13	24.66	24.44	24.45	24.25	24.35	
5	QPSK	25	0	24.73	24.63	24.73	24.33	24.25	
5	16QAM	1	0	24.88	24.58	24.62	24.49	24.44	26
5	16QAM	1	12	24.80	24.44	24.56	24.41	24.41	
5	16QAM	1	24	24.86	24.54	24.59	24.45	24.10	
5	16QAM	12	0	23.77	23.49	23.33	23.28	23.32	25
5	16QAM	12	7	23.82	23.46	23.50	23.31	23.29	
5	16QAM	12	13	23.67	23.59	23.44	23.46	23.36	
5	16QAM	25	0	23.69	23.50	23.34	23.39	23.33	
5	64QAM	1	0	23.04	23.27	23.08	23.20	23.01	25
5	64QAM	1	12	23.24	23.13	23.30	23.20	23.17	
5	64QAM	1	24	23.72	23.06	23.50	23.01	23.03	
5	64QAM	12	0	22.39	22.04	22.42	22.25	22.05	24
5	64QAM	12	7	22.29	22.00	22.35	22.30	22.22	
5	64QAM	12	13	22.17	22.02	22.33	22.12	22.06	
5	64QAM	25	0	22.16	22.06	22.20	22.08	22.11	
5	256QAM	1	0	20.84	20.91	20.95	20.83	20.95	22
5	256QAM	1	12	20.66	20.80	20.85	20.90	20.85	
5	256QAM	1	24	20.95	21.07	20.94	20.87	21.06	
5	256QAM	12	0	20.79	20.76	20.80	20.54	20.58	22
5	256QAM	12	7	20.84	20.78	20.96	20.73	20.94	
5	256QAM	12	13	20.83	20.70	20.78	20.60	20.76	
5	256QAM	25	0	20.90	20.85	20.97	20.84	21.04	



<LTE Band 48 Aux>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				55340	55830	56150	56640	
Frequency (MHz)				3560	3609	3641	3690	
20	QPSK	1	0	21.33	21.42	21.45	21.65	23
20	QPSK	1	49	21.60	21.25	21.23	21.48	
20	QPSK	1	99	21.24	21.25	21.27	21.51	
20	QPSK	50	0	20.37	20.44	20.49	20.69	22
20	QPSK	50	24	20.25	20.32	20.46	20.63	
20	QPSK	50	50	20.20	20.28	20.23	20.53	
20	QPSK	100	0	20.23	20.31	20.44	20.66	22
20	16QAM	1	0	20.48	20.57	20.61	20.40	
20	16QAM	1	49	20.21	20.31	20.38	20.57	
20	16QAM	1	99	20.27	20.32	20.41	20.61	21
20	16QAM	50	0	19.49	19.47	19.06	19.19	
20	16QAM	50	24	19.40	19.42	19.04	19.05	
20	16QAM	50	50	19.34	19.31	19.14	19.13	21
20	16QAM	100	0	19.37	19.25	19.12	19.11	
20	64QAM	1	0	19.67	19.57	19.69	19.55	
20	64QAM	1	49	19.65	19.50	19.52	19.29	21
20	64QAM	1	99	19.97	19.85	19.31	19.28	
20	64QAM	50	0	19.03	18.95	18.60	18.66	
20	64QAM	50	24	19.14	18.90	18.57	18.23	20
20	64QAM	50	50	19.13	19.00	18.59	18.26	
20	64QAM	100	0	19.04	18.98	18.48	18.20	
20	256QAM	1	0	16.30	16.35	16.24	16.13	18
20	256QAM	1	49	16.50	16.41	16.25	16.35	
20	256QAM	1	99	16.64	16.32	16.37	16.47	
20	256QAM	50	0	16.36	16.14	16.18	16.11	18
20	256QAM	50	24	16.49	16.34	16.30	16.29	
20	256QAM	50	50	16.52	16.40	16.35	16.24	
20	256QAM	100	0	16.35	16.40	16.18	16.36	
Channel				55315	55820	56160	56665	Tune-up limit (dBm)
Frequency (MHz)				3557.5	3608	3642	3692.5	
15	QPSK	1	0	21.29	21.22	21.32	21.45	23
15	QPSK	1	37	21.54	21.23	21.15	21.45	
15	QPSK	1	74	21.04	21.25	21.16	21.50	
15	QPSK	36	0	20.27	20.31	20.45	20.54	22
15	QPSK	36	20	20.24	20.13	20.41	20.49	
15	QPSK	36	39	20.01	20.13	20.21	20.33	
15	QPSK	75	0	20.20	20.11	20.42	20.53	22
15	16QAM	1	0	20.44	20.51	20.42	20.36	
15	16QAM	1	37	20.15	20.23	20.31	20.43	
15	16QAM	1	74	20.10	20.30	20.36	20.44	21
15	16QAM	36	0	19.30	19.44	19.02	19.17	
15	16QAM	36	20	19.22	19.28	19.16	19.00	
15	16QAM	36	39	19.27	19.23	19.08	19.10	21
15	16QAM	75	0	19.27	19.16	19.12	19.08	
15	64QAM	1	0	19.64	19.37	19.57	19.20	
15	64QAM	1	37	19.35	19.24	19.48	19.26	21
15	64QAM	1	74	19.85	19.55	19.14	19.04	
15	64QAM	36	0	18.82	18.69	18.45	18.66	
15	64QAM	36	20	18.85	18.77	18.17	18.03	20
15	64QAM	36	39	18.92	18.87	18.46	18.02	
15	64QAM	75	0	19.01	18.78	18.43	18.02	



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15	256QAM	1	0	16.17	16.20	16.17	16.10	18
15	256QAM	1	37	16.47	16.25	16.19	16.27	
15	256QAM	1	74	16.49	16.22	16.21	16.45	
15	256QAM	36	0	16.24	16.11	16.06	16.12	18
15	256QAM	36	20	16.34	16.26	16.20	16.17	
15	256QAM	36	39	16.33	16.38	16.35	16.15	
15	256QAM	75	0	16.19	16.25	16.06	16.35	Tune-up limit (dBm)
Channel				55290	55815	56165	56690	
Frequency (MHz)				3555	3607.5	3642.5	3695	
10	QPSK	1	0	21.26	21.39	21.45	21.49	23
10	QPSK	1	25	21.59	21.20	21.17	21.44	
10	QPSK	1	49	21.06	21.09	21.19	21.49	
10	QPSK	25	0	20.18	20.32	20.47	20.54	22
10	QPSK	25	12	20.25	20.31	20.46	20.43	
10	QPSK	25	25	20.12	20.21	20.10	20.48	
10	QPSK	50	0	20.12	20.31	20.36	20.64	22
10	16QAM	1	0	20.35	20.37	20.53	20.25	
10	16QAM	1	25	20.19	20.23	20.27	20.45	
10	16QAM	1	49	20.26	20.30	20.26	20.48	21
10	16QAM	25	0	19.36	19.43	19.13	19.16	
10	16QAM	25	12	19.31	19.27	19.12	19.02	
10	16QAM	25	25	19.14	19.16	19.02	19.13	21
10	16QAM	50	0	19.34	19.20	19.03	19.11	
10	64QAM	1	0	19.60	19.39	19.48	19.35	
10	64QAM	1	25	19.30	19.30	19.36	19.07	21
10	64QAM	1	49	19.86	19.47	19.09	19.05	
10	64QAM	25	0	18.81	18.71	18.49	18.61	
10	64QAM	25	12	18.82	18.85	18.26	18.06	20
10	64QAM	25	25	18.91	18.85	18.35	18.06	
10	64QAM	50	0	18.99	18.93	18.30	18.01	
10	256QAM	1	0	16.24	16.21	16.04	16.02	18
10	256QAM	1	25	16.44	16.35	16.12	16.16	
10	256QAM	1	49	16.51	16.32	16.32	16.45	
10	256QAM	25	0	16.34	16.20	16.11	16.11	18
10	256QAM	25	12	16.47	16.15	16.27	16.12	
10	256QAM	25	25	16.39	16.31	16.32	16.10	
10	256QAM	50	0	16.26	16.37	16.03	16.31	Tune-up limit (dBm)
Channel				55265	55810	56170	56715	
Frequency (MHz)				3552.5	3607	3643	3697.5	
5	QPSK	1	0	21.33	21.36	21.43	21.58	23
5	QPSK	1	12	21.51	21.22	21.10	21.32	
5	QPSK	1	24	21.14	21.16	21.22	21.34	
5	QPSK	12	0	20.17	20.26	20.39	20.55	22
5	QPSK	12	7	20.06	20.17	20.34	20.57	
5	QPSK	12	13	20.03	20.16	20.18	20.34	
5	QPSK	25	0	20.09	20.22	20.40	20.53	22
5	16QAM	1	0	20.47	20.57	20.53	20.26	
5	16QAM	1	12	20.19	20.16	20.30	20.44	
5	16QAM	1	24	20.10	20.30	20.35	20.54	21
5	16QAM	12	0	19.31	19.42	19.15	19.04	
5	16QAM	12	7	19.25	19.22	19.00	19.15	
5	16QAM	12	13	19.23	19.18	19.06	19.07	21
5	16QAM	25	0	19.31	19.15	19.06	19.19	
5	64QAM	1	0	19.59	19.55	19.40	19.27	
5	64QAM	1	12	19.36	19.34	19.44	19.07	21
5	64QAM	1	24	19.71	19.59	19.16	19.03	



5	64QAM	12	0	18.72	18.70	18.49	18.59	20
5	64QAM	12	7	18.82	18.67	18.35	18.05	
5	64QAM	12	13	18.80	18.84	18.39	18.02	
5	64QAM	25	0	18.98	18.76	18.26	18.00	18
5	256QAM	1	0	16.26	16.23	16.08	16.12	
5	256QAM	1	12	16.47	16.37	16.15	16.16	
5	256QAM	1	24	16.44	16.15	16.37	16.40	18
5	256QAM	12	0	16.19	16.13	16.08	16.01	
5	256QAM	12	7	16.49	16.24	16.18	16.20	
5	256QAM	12	13	16.43	16.28	16.27	16.16	
5	256QAM	25	0	16.20	16.27	16.09	16.36	

Reduced Power Mode

<LTE Band 38 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				37850	38000	38150	
Frequency (MHz)				2580	2595	2610	
20	QPSK	1	0	17.38	17.34	17.27	18.2
20	QPSK	1	49	17.08	17.16	17.02	
20	QPSK	1	99	17.30	17.06	16.99	
20	QPSK	50	0	16.34	16.26	16.35	17.2
20	QPSK	50	24	16.15	16.14	16.10	
20	QPSK	50	50	16.37	16.07	16.18	
20	QPSK	100	0	16.45	16.20	16.05	17.2
20	16QAM	1	0	16.42	16.34	16.40	
20	16QAM	1	49	16.07	16.14	15.98	
20	16QAM	1	99	16.43	16.01	16.13	16.2
20	16QAM	50	0	15.53	15.20	15.48	
20	16QAM	50	24	15.10	15.07	15.23	
20	16QAM	50	50	15.45	15.09	15.23	16.2
20	16QAM	100	0	15.37	15.18	15.04	
20	64QAM	1	0	15.47	15.29	15.44	
20	64QAM	1	49	15.21	15.05	15.01	16.2
20	64QAM	1	99	15.49	14.98	15.16	
20	64QAM	50	0	14.51	14.40	14.58	
20	64QAM	50	24	14.12	14.26	14.16	15.2
20	64QAM	50	50	14.64	14.17	14.26	
20	64QAM	100	0	14.42	14.35	14.15	
20	256QAM	1	0	12.56	12.43	12.44	13.2
20	256QAM	1	49	12.28	12.07	12.14	
20	256QAM	1	99	12.51	12.16	12.22	
20	256QAM	50	0	12.71	12.54	12.74	13.2
20	256QAM	50	24	12.14	12.37	12.33	
20	256QAM	50	50	12.84	12.24	12.42	
20	256QAM	100	0	12.35	12.50	12.16	
Channel				37825	38000	38175	
Frequency (MHz)				2577.5	2595	2612.5	
15	QPSK	1	0	17.36	17.18	17.14	18.2
15	QPSK	1	37	16.87	17.16	16.90	
15	QPSK	1	74	17.07	16.95	16.82	
15	QPSK	36	0	16.32	16.23	16.12	17.2
15	QPSK	36	20	16.09	15.89	16.08	



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15	QPSK	36	39	16.23	15.87	16.13		
15	QPSK	75	0	16.21	16.02	15.88		
15	16QAM	1	0	16.37	16.04	16.32		
15	16QAM	1	37	15.97	16.00	15.86	17.2	
15	16QAM	1	74	16.21	15.90	15.93		
15	16QAM	36	0	15.34	14.99	15.40		
15	16QAM	36	20	14.98	14.93	15.00	16.2	
15	16QAM	36	39	15.40	15.00	15.18		
15	16QAM	75	0	15.34	14.88	15.02		
15	64QAM	1	0	15.39	15.26	15.21	16.2	
15	64QAM	1	37	14.95	14.90	14.77		
15	64QAM	1	74	15.28	14.75	14.89		
15	64QAM	36	0	14.38	14.23	14.30	15.2	
15	64QAM	36	20	13.91	14.06	13.98		
15	64QAM	36	39	14.51	14.14	14.12		
15	64QAM	75	0	14.29	14.17	14.00	13.2	
15	256QAM	1	0	12.50	12.21	12.37		
15	256QAM	1	37	12.17	11.78	12.07		
15	256QAM	1	74	12.40	12.16	11.92	13.2	
15	256QAM	36	0	12.41	12.34	12.67		
15	256QAM	36	20	12.11	12.37	12.19		
15	256QAM	36	39	12.79	11.99	12.26	13.2	
15	256QAM	36	0	12.31	12.43	12.12		
Channel				37800	38000	38200		Tune-up limit (dBm)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	17.36	17.30	17.24	18.2	
10	QPSK	1	25	16.90	17.14	16.75		
10	QPSK	1	49	17.15	17.01	16.93		
10	QPSK	25	0	16.27	16.21	16.33	17.2	
10	QPSK	25	12	15.98	16.00	15.86		
10	QPSK	25	25	16.20	15.89	16.16		
10	QPSK	50	0	16.21	15.96	15.90	17.2	
10	16QAM	1	0	16.37	16.33	16.32		
10	16QAM	1	25	15.82	15.90	15.86		
10	16QAM	1	49	16.27	15.93	16.03	16.2	
10	16QAM	25	0	15.27	15.16	15.48		
10	16QAM	25	12	15.01	14.94	15.04		
10	16QAM	25	25	15.32	14.90	14.93	16.2	
10	16QAM	50	0	15.16	14.98	14.89		
10	64QAM	1	0	15.33	15.11	15.17		
10	64QAM	1	25	14.94	14.99	14.95	16.2	
10	64QAM	1	49	15.26	14.83	14.93		
10	64QAM	25	0	14.35	14.24	14.28		
10	64QAM	25	12	13.92	14.08	13.89	15.2	
10	64QAM	25	25	14.39	14.11	14.19		
10	64QAM	50	0	14.28	14.08	13.95		
10	256QAM	1	0	12.27	12.39	12.38	13.2	
10	256QAM	1	25	12.03	11.88	12.12		
10	256QAM	1	49	12.36	11.86	12.22		
10	256QAM	25	0	12.57	12.43	12.56	13.2	
10	256QAM	25	12	11.99	12.07	12.27		
10	256QAM	25	25	12.63	12.21	12.17		
10	256QAM	50	0	12.16	12.40	12.02	13.2	
Channel				37775	38000	38225		Tune-up limit (dBm)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	17.14	17.14	17.16	18.2	



5	QPSK	1	12	16.83	16.86	16.97	
5	QPSK	1	24	17.08	16.90	16.92	
5	QPSK	12	0	16.10	16.19	16.31	
5	QPSK	12	7	15.98	15.96	16.08	17.2
5	QPSK	12	13	16.14	15.90	16.11	
5	QPSK	25	0	16.30	16.11	15.82	
5	16QAM	1	0	16.38	16.05	16.34	17.2
5	16QAM	1	12	15.94	15.88	15.79	
5	16QAM	1	24	16.38	15.87	16.03	
5	16QAM	12	0	15.52	14.96	15.44	16.2
5	16QAM	12	7	14.95	15.01	15.13	
5	16QAM	12	13	15.15	15.02	15.05	
5	16QAM	25	0	15.16	14.88	14.76	16.2
5	64QAM	1	0	15.18	15.20	15.27	
5	64QAM	1	12	15.11	14.85	15.00	
5	64QAM	1	24	15.26	14.98	14.92	15.2
5	64QAM	12	0	14.34	14.39	14.56	
5	64QAM	12	7	14.02	14.16	14.01	
5	64QAM	12	13	14.34	14.09	14.13	13.2
5	64QAM	25	0	14.19	14.33	14.09	
5	256QAM	1	0	12.43	12.18	12.40	
5	256QAM	1	12	12.01	11.80	12.01	13.2
5	256QAM	1	24	12.27	11.89	12.18	
5	256QAM	12	0	12.47	12.33	12.55	
5	256QAM	12	7	11.90	12.09	12.12	13.2
5	256QAM	12	13	12.78	12.06	12.30	
5	256QAM	25	0	12.23	12.25	12.10	

<LTE Band 38 MIMO 1 HPUE>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				37850	38000	38150	
Frequency (MHz)				2580	2595	2610	
20	QPSK	1	0	18.80	18.78	18.77	
20	QPSK	1	49	18.80	18.74	18.67	
20	QPSK	1	99	17.84	18.62	18.71	
20	QPSK	50	0	17.72	17.80	17.68	17.8
20	QPSK	50	24	17.77	17.48	17.37	
20	QPSK	50	50	17.57	17.62	17.42	
20	QPSK	100	0	17.68	17.66	17.67	17.8
20	16QAM	1	0	17.65	17.80	17.80	
20	16QAM	1	49	17.53	17.66	17.39	
20	16QAM	1	99	17.78	17.47	17.53	16.8
20	16QAM	50	0	16.68	16.59	16.47	
20	16QAM	50	24	16.68	16.19	16.28	
20	16QAM	50	50	16.56	16.33	16.25	16.8
20	16QAM	100	0	16.49	16.56	16.39	
20	64QAM	1	0	16.50	16.75	16.55	
20	64QAM	1	49	16.34	16.42	16.35	16.8
20	64QAM	1	99	16.48	16.39	16.27	
20	64QAM	50	0	15.61	15.58	15.40	
20	64QAM	50	24	15.62	15.06	15.06	15.8
20	64QAM	50	50	15.56	15.26	15.07	
20	64QAM	100	0	15.40	15.45	15.33	



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20	256QAM	1	0	13.41	13.45	13.36	13.8
20	256QAM	1	49	13.08	13.39	13.31	
20	256QAM	1	99	13.18	13.26	13.15	
20	256QAM	50	0	13.36	13.51	13.33	13.8
20	256QAM	50	24	13.41	12.98	12.79	
20	256QAM	50	50	13.52	13.17	13.01	
20	256QAM	100	0	13.37	13.26	13.20	
Channel				21.89	21.69	21.72	Tune-up limit (dBm)
Frequency (MHz)				2577.5	2595	2612.5	
15	QPSK	1	0	18.72	18.56	18.68	18.8
15	QPSK	1	37	18.60	18.39	18.47	
15	QPSK	1	74	18.43	18.30	18.30	
15	QPSK	36	0	17.57	17.66	17.20	17.8
15	QPSK	36	20	17.37	17.15	17.09	
15	QPSK	36	39	17.17	17.41	16.95	
15	QPSK	75	0	17.40	17.33	17.39	
15	16QAM	1	0	17.25	17.59	17.60	17.8
15	16QAM	1	37	17.33	17.31	17.11	
15	16QAM	1	74	17.48	17.02	17.21	
15	16QAM	36	0	16.52	16.14	16.07	16.8
15	16QAM	36	20	16.31	15.86	15.83	
15	16QAM	36	39	16.35	15.90	15.89	
15	16QAM	75	0	16.23	16.30	16.04	
15	64QAM	1	0	16.16	16.40	16.12	16.8
15	64QAM	1	37	16.11	16.10	16.11	
15	64QAM	1	74	16.28	16.17	15.84	
15	64QAM	36	0	15.14	15.21	15.09	15.8
15	64QAM	36	20	15.24	14.66	14.84	
15	64QAM	36	39	15.23	14.84	14.76	
15	64QAM	75	0	15.07	15.21	15.12	
15	256QAM	1	0	13.13	13.25	13.06	13.8
15	256QAM	1	37	12.66	13.10	12.88	
15	256QAM	1	74	12.75	13.04	12.81	
15	256QAM	36	0	12.97	13.18	12.89	13.8
15	256QAM	36	20	13.04	12.58	12.45	
15	256QAM	36	39	13.14	12.71	12.56	
15	256QAM	75	0	13.00	12.94	13.00	
Channel				37800	38000	38200	Tune-up limit (dBm)
Frequency (MHz)				2575	2595	2615	
10	QPSK	1	0	18.43	18.44	18.48	18.8
10	QPSK	1	25	18.33	18.30	18.40	
10	QPSK	1	49	18.50	18.42	18.32	
10	QPSK	25	0	17.46	17.52	17.28	17.8
10	QPSK	25	12	17.45	17.05	16.96	
10	QPSK	25	25	17.19	17.18	17.11	
10	QPSK	50	0	17.22	17.19	17.30	
10	16QAM	1	0	17.17	17.62	17.47	17.8
10	16QAM	1	25	17.26	17.45	16.90	
10	16QAM	1	49	17.49	17.06	17.03	
10	16QAM	25	0	16.39	16.33	16.22	16.8
10	16QAM	25	12	16.47	15.92	15.89	
10	16QAM	25	25	16.07	16.09	15.80	
10	16QAM	50	0	16.04	16.27	16.14	
10	64QAM	1	0	16.02	16.38	16.19	16.8
10	64QAM	1	25	16.12	16.19	16.15	
10	64QAM	1	49	16.19	16.03	15.91	



10	64QAM	25	0	15.24	15.24	15.08	15.8
10	64QAM	25	12	15.28	14.61	14.84	
10	64QAM	25	25	15.09	14.94	14.59	
10	64QAM	50	0	14.93	15.02	14.96	
10	256QAM	1	0	13.09	13.23	13.06	13.8
10	256QAM	1	25	12.68	13.07	12.94	
10	256QAM	1	49	12.98	12.89	12.81	
10	256QAM	25	0	12.96	13.19	13.02	13.8
10	256QAM	25	12	13.21	12.49	12.52	
10	256QAM	25	25	13.20	12.96	12.74	
10	256QAM	50	0	12.92	12.85	12.75	
Channel				37775	38000	38225	Tune-up limit (dBm)
Frequency (MHz)				2572.5	2595	2617.5	
5	QPSK	1	0	18.65	18.61	18.57	18.8
5	QPSK	1	12	18.39	18.44	18.36	
5	QPSK	1	24	18.52	18.12	18.41	
5	QPSK	12	0	17.68	17.47	17.46	17.8
5	QPSK	12	7	17.52	17.14	16.95	
5	QPSK	12	13	17.31	17.34	17.06	
5	QPSK	25	0	17.44	17.25	17.43	
5	16QAM	1	0	17.36	17.48	17.45	17.8
5	16QAM	1	12	17.30	17.36	17.16	
5	16QAM	1	24	17.28	17.19	17.13	
5	16QAM	12	0	16.58	16.34	16.16	16.8
5	16QAM	12	7	16.44	15.86	16.08	
5	16QAM	12	13	16.20	15.84	15.78	
5	16QAM	25	0	16.03	16.12	15.95	
5	64QAM	1	0	16.00	16.30	16.07	16.8
5	64QAM	1	12	15.84	16.18	16.10	
5	64QAM	1	24	16.10	15.95	15.86	
5	64QAM	12	0	15.26	15.24	15.08	15.8
5	64QAM	12	7	15.25	14.58	14.70	
5	64QAM	12	13	15.34	14.87	14.58	
5	64QAM	25	0	15.13	15.11	15.12	
5	256QAM	1	0	12.93	13.11	13.16	13.8
5	256QAM	1	12	12.86	12.96	12.84	
5	256QAM	1	24	12.88	12.77	12.94	
5	256QAM	12	0	13.05	13.29	13.07	13.8
5	256QAM	12	7	12.92	12.71	12.41	
5	256QAM	12	13	13.13	12.77	12.68	
5	256QAM	25	0	12.99	13.03	12.91	

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BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				39750	40185	40620	41055	41490	Tune-up limit (dBm)
Frequency (MHz)				2506	2549.5	2593	2636.5	2680	
20	QPSK	1	0	17.41	17.56	17.53	17.39	17.30	18.2
20	QPSK	1	49	17.35	17.28	17.17	17.13	17.22	
20	QPSK	1	99	17.19	17.41	17.36	17.13	17.11	
20	QPSK	50	0	16.37	16.32	16.35	16.24	16.18	17.2
20	QPSK	50	24	16.40	16.46	16.45	16.19	16.24	
20	QPSK	50	50	16.45	16.24	16.40	16.27	16.18	
20	QPSK	100	0	16.17	16.45	16.38	16.13	16.18	



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20	16QAM	1	0	16.25	16.19	16.47	16.12	16.13	17.2
20	16QAM	1	49	16.00	16.22	15.83	16.13	16.08	
20	16QAM	1	99	15.90	16.35	16.22	16.08	15.78	
20	16QAM	50	0	15.06	15.01	15.35	15.15	14.79	16.2
20	16QAM	50	24	15.09	15.33	15.38	15.12	14.89	
20	16QAM	50	50	15.19	14.94	15.02	15.00	14.84	
20	16QAM	100	0	15.43	14.90	15.17	14.97	15.06	16.2
20	64QAM	1	0	14.94	15.10	15.35	14.95	14.86	
20	64QAM	1	49	14.85	15.04	14.64	14.81	14.91	
20	64QAM	1	99	14.73	15.05	15.06	14.76	14.63	15.2
20	64QAM	50	0	14.04	13.91	14.09	13.88	13.39	
20	64QAM	50	24	13.74	14.10	14.03	13.84	13.63	
20	64QAM	50	50	13.85	13.77	13.65	13.71	13.53	13.2
20	64QAM	100	0	14.26	13.72	14.13	13.65	13.95	
20	256QAM	1	0	11.89	11.80	12.06	11.95	11.77	
20	256QAM	1	49	11.74	11.75	11.38	11.58	11.79	13.2
20	256QAM	1	99	11.70	11.72	11.87	11.70	11.44	
20	256QAM	50	0	11.81	11.70	11.92	11.75	11.34	
20	256QAM	50	24	11.66	11.72	11.78	11.51	11.49	13.2
20	256QAM	50	50	11.54	11.76	11.28	11.40	11.24	
20	256QAM	100	0	11.87	11.32	11.89	11.49	11.88	
Channel				39725	40173	40620	41068	41515	Tune-up limit (dBm)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	
15	QPSK	1	0	17.40	17.22	17.37	17.24	17.18	18.20
15	QPSK	1	37	17.32	17.11	17.05	17.09	17.12	
15	QPSK	1	74	17.09	17.23	17.22	16.95	16.93	
15	QPSK	36	0	16.34	16.12	16.24	16.06	16.12	17.2
15	QPSK	36	20	16.33	16.32	16.32	16.18	16.21	
15	QPSK	36	39	16.37	16.08	16.29	16.11	16.07	
15	QPSK	75	0	16.44	16.02	16.37	16.05	16.04	17.2
15	16QAM	1	0	16.14	16.19	16.35	16.10	15.97	
15	16QAM	1	37	15.83	16.11	15.73	15.96	16.08	
15	16QAM	1	74	15.81	16.33	16.17	15.95	15.68	16.2
15	16QAM	36	0	15.00	14.81	15.24	15.08	14.67	
15	16QAM	36	20	15.01	15.24	15.21	14.98	14.75	
15	16QAM	36	39	15.10	14.76	15.02	14.92	14.79	16.2
15	16QAM	75	0	15.34	14.70	15.11	14.93	14.95	
15	64QAM	1	0	14.81	15.03	15.19	14.83	14.76	
15	64QAM	1	37	14.84	14.99	14.62	14.76	14.84	16.2
15	64QAM	1	74	14.56	14.86	15.00	14.67	14.55	
15	64QAM	36	0	13.85	13.90	13.99	13.83	13.21	
15	64QAM	36	20	13.54	14.01	13.85	13.72	13.61	15.2
15	64QAM	36	39	13.68	13.77	13.45	13.66	13.39	
15	64QAM	75	0	14.07	13.56	14.08	13.65	13.91	
15	256QAM	1	0	11.71	11.80	11.89	11.76	11.60	13.2
15	256QAM	1	37	11.55	11.68	11.25	11.52	11.64	
15	256QAM	1	74	11.50	11.55	11.80	11.67	11.41	
15	256QAM	36	0	11.80	11.62	11.91	11.70	11.18	13.2
15	256QAM	36	20	11.50	11.68	11.65	11.32	11.30	
15	256QAM	36	39	11.36	11.76	11.24	11.21	11.11	
15	256QAM	75	0	11.74	11.15	11.74	11.40	11.70	Tune-up limit (dBm)
Channel				39700	40160	40620	41080	41540	
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	17.43	17.40	17.44	17.24	17.26	18.20
10	QPSK	1	25	17.21	17.12	17.14	16.98	17.17	
10	QPSK	1	49	17.12	17.29	17.28	17.07	16.94	



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10	QPSK	25	0	16.20	16.14	16.34	16.08	16.06	17.2
10	QPSK	25	12	16.29	16.22	16.44	16.05	16.22	
10	QPSK	25	25	16.27	16.12	16.40	16.15	16.17	
10	QPSK	50	0	16.33	16.02	16.29	16.04	16.04	
10	16QAM	1	0	16.19	16.08	16.43	15.94	16.04	17.2
10	16QAM	1	25	15.89	16.16	15.68	15.94	15.95	
10	16QAM	1	49	15.79	16.20	16.10	16.06	15.61	
10	16QAM	25	0	14.92	14.90	15.26	15.09	14.69	16.2
10	16QAM	25	12	14.94	15.24	15.32	14.95	14.74	
10	16QAM	25	25	15.10	14.79	14.95	14.86	14.82	
10	16QAM	50	0	15.32	14.73	15.16	14.97	15.03	
10	64QAM	1	0	14.93	14.96	15.26	14.79	14.76	16.2
10	64QAM	1	25	14.78	14.85	14.50	14.79	14.84	
10	64QAM	1	49	14.72	15.00	14.98	14.65	14.61	
10	64QAM	25	0	14.02	13.86	13.99	13.75	13.24	15.2
10	64QAM	25	12	13.71	14.02	13.98	13.81	13.49	
10	64QAM	25	25	13.71	13.58	13.49	13.59	13.53	
10	64QAM	50	0	14.11	13.71	14.02	13.49	13.91	
10	256QAM	1	0	11.75	11.62	12.04	11.92	11.75	13.2
10	256QAM	1	25	11.63	11.61	11.28	11.46	11.68	
10	256QAM	1	49	11.53	11.71	11.83	11.61	11.24	
10	256QAM	25	0	11.62	11.52	11.77	11.65	11.19	13.2
10	256QAM	25	12	11.56	11.61	11.78	11.37	11.39	
10	256QAM	25	25	11.51	11.70	11.26	11.25	11.12	
10	256QAM	50	0	11.78	11.14	11.84	11.33	11.88	
Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5	
5	QPSK	1	0	17.51	17.21	17.38	17.21	17.23	18.20
5	QPSK	1	12	17.35	17.09	17.14	17.08	17.02	
5	QPSK	1	24	17.02	17.33	17.29	17.09	17.04	
5	QPSK	12	0	16.20	16.13	16.24	16.13	16.18	17.2
5	QPSK	12	7	16.45	16.35	16.30	16.10	16.04	
5	QPSK	12	13	16.26	16.12	16.27	16.25	15.99	
5	QPSK	25	0	16.29	16.06	16.19	15.93	15.99	
5	16QAM	1	0	16.14	15.99	16.30	16.03	15.94	17.2
5	16QAM	1	12	15.97	16.17	15.66	16.12	15.98	
5	16QAM	1	24	15.85	16.20	16.06	15.92	15.70	
5	16QAM	12	0	14.89	14.86	15.31	15.13	14.63	16.2
5	16QAM	12	7	14.96	15.16	15.35	14.93	14.88	
5	16QAM	12	13	15.02	14.83	14.83	14.88	14.82	
5	16QAM	25	0	15.31	14.84	14.99	14.87	15.06	
5	64QAM	1	0	14.94	15.00	15.17	14.86	14.76	16.2
5	64QAM	1	12	14.73	15.04	14.50	14.77	14.71	
5	64QAM	1	24	14.54	14.88	15.05	14.61	14.63	
5	64QAM	12	0	14.03	13.89	13.98	13.72	13.30	15.2
5	64QAM	12	7	13.63	14.04	14.00	13.83	13.43	
5	64QAM	12	13	13.66	13.75	13.49	13.60	13.46	
5	64QAM	25	0	14.24	13.62	13.93	13.60	13.83	
5	256QAM	1	0	11.77	11.78	11.96	11.80	11.62	13.2
5	256QAM	1	12	11.56	11.58	11.21	11.55	11.61	
5	256QAM	1	24	11.55	11.56	11.69	11.51	11.35	
5	256QAM	12	0	11.64	11.52	11.90	11.67	11.19	13.2
5	256QAM	12	7	11.52	11.66	11.77	11.40	11.32	
5	256QAM	12	13	11.36	11.73	11.12	11.34	11.08	
5	256QAM	25	0	11.76	11.14	11.70	11.41	11.78	



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BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				39750	40185	40620	41055	41490	
Frequency (MHz)				2506	2549.5	2593	2636.5	2680	
20	QPSK	1	0	18.76	18.68	18.80	18.61	18.68	18.8
20	QPSK	1	49	18.67	18.62	18.71	18.43	18.62	
20	QPSK	1	99	18.79	18.54	18.72	18.49	18.53	
20	QPSK	50	0	17.63	17.55	17.80	17.43	17.50	17.8
20	QPSK	50	24	17.51	17.60	17.58	17.37	17.62	
20	QPSK	50	50	17.71	17.34	17.68	17.29	17.51	
20	QPSK	100	0	17.77	17.45	17.80	17.37	17.79	17.8
20	16QAM	1	0	17.58	17.47	17.60	17.49	17.61	
20	16QAM	1	49	17.51	17.35	17.69	17.21	17.50	
20	16QAM	1	99	17.65	17.45	17.57	17.25	17.52	16.8
20	16QAM	50	0	16.80	16.26	16.41	16.37	16.42	
20	16QAM	50	24	16.24	16.30	16.36	16.07	16.59	
20	16QAM	50	50	16.61	16.10	16.49	16.26	16.29	16.8
20	16QAM	100	0	16.80	16.38	16.72	16.16	16.60	
20	64QAM	1	0	16.31	16.45	16.49	16.23	16.32	
20	64QAM	1	49	16.50	16.20	16.68	16.08	16.32	16.8
20	64QAM	1	99	16.63	16.25	16.34	16.15	16.40	
20	64QAM	50	0	15.59	15.15	15.25	15.17	15.38	
20	64QAM	50	24	15.09	15.28	15.27	14.80	15.36	15.8
20	64QAM	50	50	15.49	14.96	15.44	15.25	15.10	
20	64QAM	100	0	15.78	15.34	15.47	15.01	15.46	
20	256QAM	1	0	13.08	13.23	13.44	13.12	13.02	13.8
20	256QAM	1	49	13.50	12.90	13.59	12.94	13.07	
20	256QAM	1	99	13.50	13.11	13.25	12.88	13.35	
20	256QAM	50	0	13.42	12.85	13.07	12.87	13.26	13.8
20	256QAM	50	24	12.85	12.99	13.18	12.78	13.34	
20	256QAM	50	50	13.33	12.95	13.17	13.01	12.88	
20	256QAM	100	0	13.81	13.35	13.58	13.22	13.66	
Channel				20.78	20.85	20.79	20.79	20.7	Tune-up limit (dBm)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	
15	QPSK	1	0	18.69	18.66	18.60	18.55	18.61	18.80
15	QPSK	1	37	18.49	18.67	18.57	18.22	18.46	
15	QPSK	1	74	18.69	18.38	18.48	18.50	18.43	
15	QPSK	36	0	17.80	17.34	17.52	17.46	17.32	17.8
15	QPSK	36	20	17.35	17.50	17.37	17.36	17.58	
15	QPSK	36	39	17.75	17.11	17.64	17.13	17.38	
15	QPSK	75	0	17.80	17.49	17.58	17.16	17.80	17.8
15	16QAM	1	0	17.61	17.49	17.47	17.30	17.41	
15	16QAM	1	37	17.52	17.35	17.53	17.21	17.29	
15	16QAM	1	74	17.42	17.39	17.49	17.00	17.44	17.8
15	16QAM	36	0	16.64	16.01	16.41	16.20	16.34	
15	16QAM	36	20	16.16	16.07	16.39	15.83	16.64	
15	16QAM	36	39	16.39	15.86	16.27	16.09	16.07	16.8
15	16QAM	75	0	16.80	16.24	16.56	16.07	16.63	
15	64QAM	1	0	16.10	16.21	16.33	16.23	16.31	
15	64QAM	1	37	16.46	16.23	16.43	15.83	16.33	16.8
15	64QAM	1	74	16.54	16.25	16.39	15.95	16.34	
15	64QAM	36	0	15.51	15.01	15.26	15.07	15.38	
15	64QAM	36	20	15.08	15.15	15.10	14.73	15.34	15.8
15	64QAM	36	39	15.28	14.89	15.42	15.27	14.93	
15	64QAM	75	0	15.74	15.31	15.40	14.85	15.34	



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15	256QAM	1	0	13.00	13.10	13.28	12.91	13.05	13.8
15	256QAM	1	37	13.41	12.66	13.62	12.84	12.89	
15	256QAM	1	74	13.34	12.91	13.04	12.67	13.13	
15	256QAM	36	0	13.41	12.78	13.08	12.63	13.22	13.8
15	256QAM	36	20	12.61	13.01	13.22	12.82	13.26	
15	256QAM	36	39	13.10	12.82	12.99	12.94	12.84	
15	256QAM	75	0	13.50	12.93	13.29	12.80	13.28	
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	18.78	18.68	18.60	18.48	18.45	18.80
10	QPSK	1	25	18.66	18.47	18.52	18.29	18.58	
10	QPSK	1	49	18.56	18.39	18.74	18.34	18.37	
10	QPSK	25	0	17.80	17.33	17.54	17.45	17.35	17.8
10	QPSK	25	12	17.42	17.39	17.54	17.32	17.49	
10	QPSK	25	25	17.51	17.34	17.46	17.21	17.52	
10	QPSK	50	0	17.80	17.31	17.67	17.28	17.77	
10	16QAM	1	0	17.62	17.48	17.59	17.52	17.58	17.8
10	16QAM	1	25	17.42	17.10	17.61	17.16	17.41	
10	16QAM	1	49	17.47	17.43	17.61	17.01	17.56	
10	16QAM	25	0	16.60	16.14	16.26	16.17	16.35	16.8
10	16QAM	25	12	16.12	16.12	16.30	15.82	16.52	
10	16QAM	25	25	16.45	15.90	16.31	16.01	16.21	
10	16QAM	50	0	16.80	16.29	16.57	16.00	16.44	
10	64QAM	1	0	16.07	16.25	16.53	16.00	16.22	16.8
10	64QAM	1	25	16.38	16.05	16.51	15.92	16.15	
10	64QAM	1	49	16.52	16.19	16.12	16.08	16.18	
10	64QAM	25	0	15.61	15.19	15.17	14.94	15.21	15.8
10	64QAM	25	12	14.94	15.13	15.14	14.84	15.38	
10	64QAM	25	25	15.27	14.89	15.27	15.06	15.08	
10	64QAM	50	0	15.53	15.17	15.47	14.82	15.37	
10	256QAM	1	0	12.87	13.17	13.49	13.13	12.92	13.8
10	256QAM	1	25	13.39	12.78	13.53	12.92	13.03	
10	256QAM	1	49	13.49	13.03	13.20	12.87	13.29	
10	256QAM	25	0	13.43	12.83	12.90	12.63	13.02	13.8
10	256QAM	25	12	12.81	12.80	12.93	12.60	13.30	
10	256QAM	25	25	13.16	12.97	12.97	12.97	12.79	
10	256QAM	50	0	13.57	12.97	13.27	12.81	13.20	
Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5	
5	QPSK	1	0	18.77	18.66	18.58	18.45	18.64	18.80
5	QPSK	1	12	18.46	18.52	18.63	18.32	18.59	
5	QPSK	1	24	18.66	18.41	18.50	18.40	18.41	
5	QPSK	12	0	17.71	17.49	17.49	17.46	17.39	17.8
5	QPSK	12	7	17.27	17.44	17.59	17.22	17.50	
5	QPSK	12	13	17.67	17.31	17.63	17.19	17.50	
5	QPSK	25	0	17.80	17.23	17.75	17.18	17.70	
5	16QAM	1	0	17.51	17.40	17.47	17.30	17.59	17.8
5	16QAM	1	12	17.46	17.17	17.54	17.10	17.34	
5	16QAM	1	24	17.41	17.50	17.51	17.09	17.44	
5	16QAM	12	0	16.80	16.11	16.40	16.32	16.43	16.8
5	16QAM	12	7	16.20	16.11	16.22	15.96	16.63	
5	16QAM	12	13	16.53	16.03	16.34	16.23	16.31	
5	16QAM	25	0	16.73	16.39	16.54	16.01	16.53	
5	64QAM	1	0	16.07	16.23	16.54	16.17	16.31	16.8
5	64QAM	1	12	16.46	16.05	16.45	15.90	16.24	
5	64QAM	1	24	16.65	16.20	16.18	15.95	16.33	



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5	64QAM	12	0	15.41	15.08	15.07	15.14	15.32	15.8
5	64QAM	12	7	15.13	15.14	15.16	14.56	15.32	
5	64QAM	12	13	15.50	14.82	15.43	15.00	15.00	
5	64QAM	25	0	15.57	15.32	15.35	14.96	15.25	
5	256QAM	1	0	13.06	13.21	13.23	13.05	12.86	13.8
5	256QAM	1	12	13.28	12.80	13.49	12.88	12.97	
5	256QAM	1	24	13.39	12.87	13.01	12.84	13.30	
5	256QAM	12	0	13.28	12.63	12.97	12.62	13.19	13.8
5	256QAM	12	7	12.74	12.74	13.05	12.64	13.15	
5	256QAM	12	13	13.25	12.75	13.07	12.81	12.78	
5	256QAM	25	0	13.43	13.10	13.37	12.86	13.33	



<LTE Carrier Aggregation combinations>

General Note:

1. This device supports Carrier Aggregation on downlink only for inter and intra band. For the device supports combination bands and configurations are according to 3GPP.
2. In applying the existing power measurement procedure of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of the frequency band and CCs in each row need consideration, and that configurations require power measurement should be highlighted in the below table.

2CC Downlink Carrier Aggregation			3CC Downlink Carrier Aggregation		
Number	Combination	Covered by measurement superset	Number	Combination	Covered by measurement superset
1	2A-2A	53	53	2A-2A-4A	61
2	2A-4A	53	54	2A-2A-5A	62
3	2A-5A	54	55	2A-2A-12A	64
4	2A-7A	63	56	2A-2A-13A	65
5	2A-12A	55	57	2A-2A-14A	78
6	2A-13A	56	58	2A-2A-30A	68
7	2A-14A	57	59	2A-2A-66A	69
8	2A-17A		60	2A-2A-71A	67
9	2A-30A	58	61	2A-4A-4A	64
10	2A-48A	81	62	2A-4A-5A	
11	2A-66A	59	63	2A-4A-7A	
12	2A-71A	60	64	2A-4A-12A	
13	4A-4A	86	65	2A-4A-13A	
14	4A-5A	86	66	2A-4A-30A	
15	4A-7A	90	67	2A-4A-71A	
16	4A-12A	87	68	2A-5A-30A	
17	4A-13A	88	69	2A-5A-66A	
18	4A-17A		70	2A-5B	68
19	4A-30A	89	71	2A-7A-7A	63
20	4A-48A		72	2A-7A-12A	
21	4A-71A	67	73	2A-7A-66A	
22	5A-5A	95	74	2A-7C	71
23	5A-7A		75	2A-12A-30A	
24	5A-12A		76	2A-12A-66A	
25	5A-13A		77	2A-13A-66A	
26	5A-30A	68	78	2A-14A-30A	
27	5A-66A	69	79	2A-14A-66A	
28	7A-7A	71	80	2A-30A-66A	
29	7A-66A	73	81	2A-48A-66A	
30	12A-30A	75	82	2A-66A-66A	84
31	12A-66A	76	83	2A-66A-71A	
32	13A-66A	77	84	2A-66C	82
33	14A-30A	78	85	2C-66A	82
34	14A-66A	79	86	4A-4A-5A	62
35	25A-25A	110	87	4A-4A-12A	64
36	25A-26A		88	4A-4A-13A	65
37	25A-41A	110	89	4A-5A-30A	
38	26A-41A	111	90	4A-7A-7A	63
39	30A-66A	80	91	4A-7A-12A	
40	41A-41A	110	92	4A-7C	90
41	48A-48A	121	93	4A-12A-30A	



42	48A-66A	114	94	4A-12B	93
43	66A-66A	117	95	5A-5A-66A	69
44	66A-71A	119	96	5A-30A-66A	
45	2C	85	97	5A-66A-66A	69
46	5B	100	98	5A-66C	69
47	7C	92	99	5B-30A	92
48	38C		100	5B-66A	69
49	41C	120	101	7A-7A-66A	73
50	48C	121	102	7A-66A-66A	73
51	66B	122	103	12A-30A-66A	
52	66C	122	104	12A-66A-66A	103
			105	12A-66C	103
			106	13A-66A-66A	77
			107	13A-66C	77
			108	14A-30A-66A	
			109	14A-66A-66A	108
			110	25A-41C	
			111	26A-41C	
			112	30A-66A-66A	13
			113	41A-41A-41A	120
			114	48A-66A-66A	81
			115	66A-66A-66A	117
			116	66A-66A-71A	83
			117	66A-66B	114
			118	66A-66C	114
			119	66C-71A	116
			120	41D	113
			121	48D	114
			122	66D	114



<Power verification when LTE Carrier Aggregation Active>

General Note:

- i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.
- ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.
- iii. The device supports downlink two carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
- iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.
- v. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.
- vi. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

$$\text{Nominal channel spacing} = \left\lceil \frac{BW_{\text{Channel}(1)} + BW_{\text{Channel}(2)} - 0.1|BW_{\text{Channel}(1)} - BW_{\text{Channel}(2)}|}{0.6} \right\rceil 0.3 \text{ [MHz]}$$

<Two Carrier power verification>

Configure	PCC							SCC				Power		
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)	
Inter-Band	2	20	1860	18700	QPSK	1	0	17	10	740	5790	23.28	23.37	
	4	20	1732.5	20175	QPSK	1	0	17	10	740	5790	23.15	23.32	
	4	20	1732.5	20175	QPSK	1	0	48	20	3607	55810	23.23	23.32	
	5	10	829	20450	QPSK	1	0	7	20	2655	3100	22.88	23.17	
	5	10	829	20450	QPSK	1	0	12	10	737.5	5095	23.01	23.17	
	5	10	829	20450	QPSK	1	0	13	10	751	5230	22.83	23.17	
Intra-Band	Contiguous	25	20	1860	26140	QPSK	1	0	26	15	876.5	8865	23.53	23.71
Intra-Band	Contiguous	38	20	2595	38000	QPSK	1	0	38	20	2614.80	38198	23.10	23.30



<Three Carrier power verification>

Configure	PCC							SCC1				SCC2				Power	
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	5	10	881.5	2525	23.13	23.37
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	7	20	2655	3100	23.01	23.37
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	12	10	737.5	5095	23.02	23.37
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	13	10	751	5230	23.14	23.37
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	30	10	2355	9820	23.23	23.37
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	71	20	629.5	68711	23.21	23.37
	2	20	1860	18700	QPSK	1	0	5	10	881.5	2525	30	10	2355	9820	22.98	23.37
	2	20	1860	18700	QPSK	1	0	5	10	881.5	2525	66	20	2155	66886	23.06	23.37
	2	20	1860	18700	QPSK	1	0	7	20	2655	3100	12	10	737.5	5095	23.33	23.37
	2	20	1860	18700	QPSK	1	0	7	20	2655	3100	66	20	2155	66886	23.27	23.37
	2	20	1860	18700	QPSK	1	0	12	10	737.5	5095	30	10	2355	9820	23.34	23.37
	2	20	1860	18700	QPSK	1	0	12	10	737.5	5095	66	20	2155	66886	23.21	23.37
	2	20	1860	18700	QPSK	1	0	13	10	751	5230	66	20	2155	66886	23.00	23.37
	2	20	1860	18700	QPSK	1	0	14	10	763	5330	30	10	2355	9820	23.26	23.37
	2	20	1860	18700	QPSK	1	0	14	10	763	5330	66	20	2155	66886	23.26	23.37
	2	20	1860	18700	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	22.97	23.37
	2	20	1860	18700	QPSK	1	0	48	20	3607	55810	66	20	2155	66886	22.97	23.37
	2	20	1860	18700	QPSK	1	0	66	20	2155	66886	71	20	629.5	68711	23.05	23.37
	4	20	1732.5	20175	QPSK	1	0	5	10	881.5	2525	30	10	2355	9820	23.31	23.32
	4	20	1732.5	20175	QPSK	1	0	7	20	2655	3100	12	10	737.5	5095	22.98	23.32
	4	20	1732.5	20175	QPSK	1	0	12	10	737.5	5095	30	10	2355	9820	23.12	23.32
	5	10	829	20450	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	22.85	23.17
	12	10	711	23130	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	22.96	23.17
	14	10	793	23330	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	22.82	23.16
	25	20	1860	26140	QPSK	1	0	41	20	2593	40620	41	20	2612.8	40818	23.57	23.71
	26	20	831.5	26865	QPSK	1	0	41	20	2593	40620	41	20	2612.8	40818	22.89	23.21

<LTE Uplink carrier aggregation>

<Intra-band>

2CC Uplink Carrier Aggregation	
Number	Combination
1	2C
2	5B
3	7C
4	38C
5	41C
6	66C

General Note:

- i. The device supports intra-band uplink carrier aggregation for LTE B2/B5/B7/B66/B38/B41 with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre 3GPP requirement.
- ii. The device supports uplink carrier aggregation with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre the 3GPP requirement.
- iii. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.
- iv. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.
- v. Additional SAR measurement for LTE UL CA whit other DL CA combinations active were not required since the maximum output power for this configuration was not > 0.25dB higher than the maximum output power for UL CA active.

Default Power Mode

CA_2C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
18700	18898	QPSK	1	0	0	0	1	0	23.25	25
18900	18702	QPSK	1	0	1	99	2	0	23.32	25
19100	18902	QPSK	1	0	1	99	2	0	23.35	25

CA_5B										
Combination 10MHz+10MHz (50RB+50RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20450	20549	QPSK	1	0	0	0	1	0	23.11	25
20575	20476	QPSK	1	0	1	49	2	0	23.15	25
20600	20501	QPSK	1	0	1	49	2	0	23.13	25



CA_7C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20850	21048	QPSK	1	0	0	0	1	0	23.28	25
21100	20902	QPSK	1	0	1	99	2	0	23.16	25
21350	21152	QPSK	1	0	1	99	2	0	23.11	25

CA_66B										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132047	132140	QPSK	1	0	0	0	1	0	23.11	25
132322	132229	QPSK	1	0	1	24	2	0	23.05	25
132597	132504	QPSK	1	0	1	24	2	0	23.19	25

CA_66C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132072	132270	QPSK	1	0	0	0	1	0	23.08	25
132322	132124	QPSK	1	0	1	99	2	0	23.29	25
132572	132374	QPSK	1	0	1	99	2	0	23.42	25

CA_38C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
37850	38048	QPSK	1	0	0	0	1	0	23.23	25
37901	38099	QPSK	1	0	0	0	1	0	23.21	25
38150	37952	QPSK	1	0	1	99	2	0	23.14	25

CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	0	0	0	1	0	23.54	25
40185	39987	QPSK	1	0	1	99	2	0	23.57	25
40620	40422	QPSK	1	0	1	99	2	0	23.59	25
41055	40857	QPSK	1	0	1	99	2	0	23.31	25
41490	41292	QPSK	1	0	1	99	2	0	23.36	25

CA_48C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55538	QPSK	1	0	0	0	1	0	21.2	23
55830	55632	QPSK	1	0	1	99	2	0	21.46	23
56150	55952	QPSK	1	0	1	99	2	0	21.53	23
56640	56442	QPSK	1	0	1	99	2	0	21.49	23



Reduced Power Mode

CA_2C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
18700	18898	QPSK	1	0	0	0	1	0	20.78	21.2
18900	18702	QPSK	1	0	1	99	2	0	20.81	21.2
19100	18902	QPSK	1	0	1	99	2	0	20.8	21.2

CA_7C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20850	21048	QPSK	1	0	0	0	1	0	15.77	16.7
21100	20902	QPSK	1	0	1	99	2	0	15.78	16.7
21350	21152	QPSK	1	0	1	99	2	0	15.71	16.7

CA_66B										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132047	132140	QPSK	1	0	0	0	1	0	19.77	20.2
132322	132229	QPSK	1	0	1	24	2	0	19.52	20.2
132597	132504	QPSK	1	0	1	24	2	0	19.75	20.2

CA_66C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132072	132270	QPSK	1	0	0	0	1	0	20.05	20.2
132322	132124	QPSK	1	0	1	99	2	0	19.9	20.2
132572	132374	QPSK	1	0	1	99	2	0	20.03	20.2

CA_38C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
37850	38048	QPSK	1	0	0	0	1	0	17.3	18.2
37901	38099	QPSK	1	0	0	0	1	0	17.27	18.2
38150	37952	QPSK	1	0	1	99	2	0	17.24	18.2

CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	0	0	0	1	0	17.43	18.2
40185	39987	QPSK	1	0	1	99	2	0	17.36	18.2
40620	40422	QPSK	1	0	1	99	2	0	17.45	18.2
41055	40857	QPSK	1	0	1	99	2	0	17.34	18.2
41490	41292	QPSK	1	0	1	99	2	0	17.24	18.2

14. 5G NR Output Power (Unit: dBm)

General Note:

1. Referencing the procedure in KDB 941225, the test procedures are outlined as below
 - a. For DFT-OFDM output power measurement, full measurement was done for Pi/2 BPSK and QPSK and for the largest supported bandwidth, repeat test for 16QAM/64QAM/256QAM under 1RB 1Offset configuration. For smaller bandwidth, measure conducted power for Pi/2 BPSK and 1RB 1Offset configuration.
 - b. According to the tune-up, CP-OFDM output power is not ½ dB higher than DFT-OFDM mode, and the reported SAR of DFT-OFDM mode reported SAR is ≤ 1.45 W/kg, SAR test and thus conducted power for CP-OFDM mode is not required.
 - c. To start SAR test for the largest channel bandwidth for Pi/2 BPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. Also do SAR test for 50% RB allocation for Pi/2 BPSK SAR testing using 1RB Pi/2 BPSK allocation procedure
 - d. For Pi/2 BPSK with 100% RB allocation, SAR test is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
 - e. For higher modulation QPSK/16QAM/64QAM/256QAM, according to tune-up document the power level is not ½ dB higher than the same configuration in Pi/2 BPSK, also reported SAR for the Pi/2 BPSK configuration is less than 1.45 W/kg, QPSK/16QAM/64QAM/256QAM SAR testing are not required.
 - f. Smaller bandwidth output power for each RB allocation configuration for this device is not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
2. Due to test setup limitations, SAR testing for NR was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission. And only for TDD power class2 was performed using Factory Test Mode software to establish the connection and perform SAR with 50% transmission

<3GPP 38.101 MPR for EN-DC>

Table 6.2.2-1 Maximum power reduction (MPR) for power class 3

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	≤ 3.5 ¹	≤ 1.2 ¹	≤ 0.2 ¹
		≤ 0.5 ²	≤ 0.5 ²	0 ²
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM		≤ 2.5	
CP-OFDM	256 QAM		≤ 4.5	
	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM		≤ 3.5	
	256 QAM		≤ 6.5	

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0 dB MPR is 26 dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40 % of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

Table 6.2.2-2 Maximum power reduction (MPR) for power class 2

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	≤ 3.5	≤ 0.5	0
	QPSK	≤ 3.5	≤ 1	0
	16 QAM	≤ 3.5	≤ 2	≤ 1
	64 QAM	≤ 3.5		≤ 2.5
	256 QAM		≤ 4.5	
CP-OFDM	QPSK	≤ 3.5	≤ 3	≤ 1.5
	16 QAM	≤ 3.5	≤ 3	≤ 2
	64 QAM		≤ 3.5	
	256 QAM		≤ 6.5	



Default Power Mode

<n2 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				372000	376000	380000	
Frequency (MHz)				1860	1880	1900	
20	PI/2 BPSK	1	1	24.70	24.51	24.42	
20	PI/2 BPSK	1	53	24.48	24.44	24.32	25.0
20	PI/2 BPSK	1	104	24.45	24.42	24.25	
20	PI/2 BPSK	50	0	23.96	23.87	23.75	
20	PI/2 BPSK	50	28	24.54	24.43	24.25	25.0
20	PI/2 BPSK	50	56	23.95	23.95	23.82	24.5
20	PI/2 BPSK	100	0	23.95	23.96	23.80	
20	QPSK	1	1	24.51	24.51	24.34	
20	QPSK	1	53	24.59	24.53	24.37	25.0
20	QPSK	1	104	24.61	24.45	24.22	
20	QPSK	50	0	23.57	23.43	23.27	
20	QPSK	50	28	24.66	24.48	24.22	25.0
20	QPSK	50	56	23.62	23.48	23.21	24.0
20	QPSK	100	0	23.51	23.43	23.16	
20	16QAM	1	1	23.67	23.55	23.45	
20	64QAM	1	1	21.47	21.46	21.37	22.5
20	256QAM	1	1	20.18	20.08	19.80	20.5
Channel				371500	376000	380500	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	PI/2 BPSK	1	1	24.60	24.46	24.32	
Channel				371000	376000	381000	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	PI/2 BPSK	1	1	24.61	24.41	24.38	
Channel				370500	376000	381500	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	PI/2 BPSK	1	1	24.32	24.26	24.21	



<n5 Main>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				166800	167300	167800	Tune-up limit (dBm)
Frequency (MHz)				834	836.5	839	
20	PI/2 BPSK	1	1	24.68	24.61	24.50	25.0
20	PI/2 BPSK	1	53	24.49	24.50	24.23	
20	PI/2 BPSK	1	104	24.37	24.44	24.28	
20	PI/2 BPSK	50	0	24.01	24.01	23.85	24.5
20	PI/2 BPSK	50	28	24.57	24.50	24.39	25.0
20	PI/2 BPSK	50	56	23.91	23.86	23.62	24.5
20	PI/2 BPSK	100	0	24.03	23.96	23.70	
20	QPSK	1	1	24.35	24.48	24.28	25.0
20	QPSK	1	53	24.37	24.49	24.33	
20	QPSK	1	104	24.30	24.37	24.18	
20	QPSK	50	0	23.40	23.44	23.21	24.0
20	QPSK	50	28	24.36	24.43	24.27	25.0
20	QPSK	50	56	23.40	23.38	23.12	24.0
20	QPSK	100	0	23.37	23.37	23.17	
20	16QAM	1	1	23.39	23.42	23.31	24.0
20	64QAM	1	1	21.96	21.98	21.84	22.5
20	256QAM	1	1	20.03	20.15	19.88	20.5
Channel				166300	167300	168300	Tune-up limit (dBm)
Frequency (MHz)				831.5	836.5	841.5	
15	PI/2 BPSK	1	1	24.60	24.50	24.52	25.0
Channel				165800	167300	168800	Tune-up limit (dBm)
Frequency (MHz)				829	836.5	844	
10	PI/2 BPSK	1	1	24.57	24.37	24.38	25.0
Channel				165300	167300	169300	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	PI/2 BPSK	1	1	24.65	24.46	24.36	25.0



<n7 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				502000	507000	512000	Tune-up limit (dBm)
Frequency (MHz)				2510	2535	2560	
20	PI/2 BPSK	1	1	24.64	24.59	24.37	25.0
20	PI/2 BPSK	1	53	24.37	24.36	24.05	
20	PI/2 BPSK	1	104	24.27	24.35	23.97	
20	PI/2 BPSK	50	0	24.01	23.97	23.58	24.5
20	PI/2 BPSK	50	28	24.39	24.45	24.12	25.0
20	PI/2 BPSK	50	56	23.88	23.91	23.52	24.5
20	PI/2 BPSK	100	0	23.76	23.89	23.47	
20	QPSK	1	1	24.37	24.46	24.18	25.0
20	QPSK	1	53	24.31	24.38	24.16	
20	QPSK	1	104	24.46	24.41	24.04	
20	QPSK	50	0	23.34	23.43	23.20	24.0
20	QPSK	50	28	24.40	24.42	24.04	25.0
20	QPSK	50	56	23.24	23.35	23.12	24.0
20	QPSK	100	0	23.41	23.38	23.11	
20	16QAM	1	1	23.48	23.48	23.18	24.0
20	64QAM	1	1	21.53	21.68	21.43	22.5
20	256QAM	1	1	19.90	19.99	19.76	20.5
Channel				501500	507000	512500	Tune-up limit (dBm)
Frequency (MHz)				2507.5	2535	2562.5	
15	PI/2 BPSK	1	1	24.53	24.49	24.26	25.0
Channel				501000	507000	513000	Tune-up limit (dBm)
Frequency (MHz)				2505	2535	2565	
10	PI/2 BPSK	1	1	24.38	24.32	24.25	25.0
Channel				500500	507000	513500	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	PI/2 BPSK	1	1	24.34	24.23	24.18	25.0



<n12 Main>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				141300	141500	141700	25.0
Frequency (MHz)				706.5	707.5	708.5	
15	PI/2 BPSK	1	1	24.58	24.51	24.59	25.0
15	PI/2 BPSK	1	40	24.05	24.13	24.06	
15	PI/2 BPSK	1	77	23.97	24.05	23.89	
15	PI/2 BPSK	36	0	23.54	23.66	23.62	24.5
15	PI/2 BPSK	36	22	24.17	24.15	24.16	25.0
15	PI/2 BPSK	36	43	23.51	23.56	23.49	24.5
15	PI/2 BPSK	75	0	23.54	23.64	23.54	
15	QPSK	1	1	24.36	24.45	24.37	25.0
15	QPSK	1	40	24.09	24.26	24.09	
15	QPSK	1	77	24.17	24.16	24.03	
15	QPSK	36	0	23.13	23.16	23.16	24.0
15	QPSK	36	22	24.00	24.02	24.02	25.0
15	QPSK	36	43	23.07	23.05	22.89	24.0
15	QPSK	75	0	22.98	23.11	23.05	
15	16QAM	1	1	23.00	22.98	22.82	24.0
15	64QAM	1	1	21.29	21.31	21.15	22.5
15	256QAM	1	1	19.72	19.88	19.74	20.5
Channel				140800	141500	142200	25.0
Frequency (MHz)				704	707.5	711	
10	PI/2 BPSK	1	1	24.16	24.06	24.01	25.0
Channel				140300	141500	142700	25.0
Frequency (MHz)				701.5	707.5	713.5	
5	PI/2 BPSK	1	1	24.19	24.03	24.02	25.0



<n25 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				372000	376500	381000	25.0
Frequency (MHz)				1860	1882.5	1905	
20	PI/2 BPSK	1	1	24.62	24.53	24.49	
20	PI/2 BPSK	1	53	24.54	24.51	24.49	24.5
20	PI/2 BPSK	1	104	24.50	24.41	24.29	
20	PI/2 BPSK	50	0	24.01	23.97	23.89	
20	PI/2 BPSK	50	28	24.46	24.42	24.37	24.5
20	PI/2 BPSK	50	56	23.95	23.93	23.86	
20	PI/2 BPSK	100	0	23.90	23.96	23.91	
20	QPSK	1	1	24.48	24.55	24.34	25.0
20	QPSK	1	53	24.45	24.48	24.29	
20	QPSK	1	104	24.51	24.41	24.22	
20	QPSK	50	0	23.56	23.51	23.40	24.0
20	QPSK	50	28	24.55	24.48	24.41	
20	QPSK	50	56	23.36	23.44	23.40	
20	QPSK	100	0	23.51	23.48	23.38	24.0
20	16QAM	1	1	22.38	22.46	22.40	
20	64QAM	1	1	21.70	21.58	21.57	
20	256QAM	1	1	19.96	20.02	19.90	20.5
Channel				371500	376500	381500	25.0
Frequency (MHz)				1857.5	1882.5	1907.5	
15	PI/2 BPSK	1	1	24.61	24.47	24.43	25.0
Channel				371000	376500	382000	
Frequency (MHz)				1855	1882.5	1910	
10	PI/2 BPSK	1	1	24.52	24.41	24.50	25.0
Channel				370500	376500	382500	
Frequency (MHz)				1852.5	1882.5	1912.5	
5	PI/2 BPSK	1	1	24.48	24.42	24.46	25.0



<n66 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				346000	349000	352000	Tune-up limit (dBm)
Frequency (MHz)				1730	1745	1760	
20	PI/2 BPSK	1	1	24.67	24.69	24.81	25.0
20	PI/2 BPSK	1	53	24.53	24.66	24.65	
20	PI/2 BPSK	1	104	24.54	24.72	24.80	
20	PI/2 BPSK	50	0	23.85	24.05	24.09	24.5
20	PI/2 BPSK	50	28	24.36	24.54	24.54	25.0
20	PI/2 BPSK	50	56	24.05	24.19	24.30	24.5
20	PI/2 BPSK	100	0	23.84	24.06	24.16	
20	QPSK	1	1	24.57	24.73	24.73	25.0
20	QPSK	1	53	24.58	24.75	24.78	
20	QPSK	1	104	24.69	24.73	24.68	
20	QPSK	50	0	23.41	23.57	23.69	24.0
20	QPSK	50	28	24.46	24.54	24.55	25.0
20	QPSK	50	56	23.52	23.61	23.72	24.0
20	QPSK	100	0	23.46	23.57	23.61	
20	16QAM	1	1	23.62	23.73	23.70	24.0
20	64QAM	1	1	21.85	21.99	22.04	22.5
20	256QAM	1	1	20.28	20.32	20.32	20.5
Channel				343500	349000	354500	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	PI/2 BPSK	1	1	24.42	24.36	24.39	25.0
Channel				343000	349000	355000	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	PI/2 BPSK	1	1	24.33	24.34	24.30	25.0
Channel				342500	349000	355500	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	PI/2 BPSK	1	1	24.24	24.29	24.31	25.0



<n71 Main>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				134600	136100	137600	Tune-up limit (dBm)
Frequency (MHz)				673	680.5	688	
20	PI/2 BPSK	1	1	24.63	24.40	24.52	25.0
20	PI/2 BPSK	1	53	24.50	24.27	24.21	
20	PI/2 BPSK	1	104	24.19	24.16	24.16	
20	PI/2 BPSK	50	0	24.07	23.84	23.90	24.5
20	PI/2 BPSK	50	28	24.61	24.38	24.35	25.0
20	PI/2 BPSK	50	56	23.78	23.71	23.68	24.5
20	PI/2 BPSK	100	0	24.00	23.81	23.89	
20	QPSK	1	1	24.59	24.51	24.52	25.0
20	QPSK	1	53	24.48	24.44	24.54	
20	QPSK	1	104	24.47	24.27	24.19	
20	QPSK	50	0	23.27	23.23	23.32	24.0
20	QPSK	50	28	24.23	24.10	24.11	25.0
20	QPSK	50	56	23.32	23.24	23.24	24.0
20	QPSK	100	0	23.42	23.22	23.24	
20	16QAM	1	1	23.04	22.89	22.98	24.0
20	64QAM	1	1	21.53	21.42	21.45	22.5
20	256QAM	1	1	20.18	20.02	20.07	20.5
Channel				134100	136100	138100	Tune-up limit (dBm)
Frequency (MHz)				670.5	680.5	690.5	
15	PI/2 BPSK	1	1	24.59	24.43	24.32	25.0
Channel				133600	136100	138600	Tune-up limit (dBm)
Frequency (MHz)				668	680.5	693	
10	PI/2 BPSK	1	1	24.35	24.17	24.11	25.0
Channel				133100	136100	139100	Tune-up limit (dBm)
Frequency (MHz)				665.5	680.5	695.5	
5	PI/2 BPSK	1	1	24.33	24.36	24.11	25.0



<n41 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				509202	518598	528000	Tune-up limit (dBm)
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	21.48	21.58	21.28	22.0
100	PI/2 BPSK	1	137	21.07	21.22	20.86	
100	PI/2 BPSK	1	271	21.21	21.35	20.90	
100	PI/2 BPSK	135	0	20.97	21.24	20.80	21.5
100	PI/2 BPSK	135	69	21.16	21.31	21.00	22.0
100	PI/2 BPSK	135	138	21.19	21.35	20.89	21.5
100	PI/2 BPSK	270	0	21.08	21.22	20.89	
100	QPSK	1	1	21.17	21.46	21.00	22.0
100	QPSK	1	137	21.15	21.44	20.94	
100	QPSK	1	271	21.18	21.37	20.89	
100	QPSK	135	0	21.08	21.22	20.78	22.0
100	QPSK	135	69	21.18	21.35	21.01	
100	QPSK	135	138	21.08	21.28	20.80	
100	QPSK	270	0	21.14	21.24	20.91	22.0
100	16QAM	1	1	21.06	21.35	20.86	22.0
100	64QAM	1	1	20.75	21.02	20.71	22.0
100	256QAM	1	1	20.92	21.09	20.67	22.0
Channel				507204	518598	529998	Tune-up limit (dBm)
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	21.04	21.24	20.76	22.0
Channel				505200	518598	531996	Tune-up limit (dBm)
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	21.20	21.44	20.96	22.0
Channel				504204	518598	532998	Tune-up limit (dBm)
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	21.27	21.53	21.12	22.0
Channel				503202	518598	534000	Tune-up limit (dBm)
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	21.15	21.45	21.13	22.0
Channel				502200	518598	534996	Tune-up limit (dBm)
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	21.30	21.40	21.05	22.0
Channel				501204	518598	535998	Tune-up limit (dBm)
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	21.36	21.57	21.12	22.0



<n41 MIMO 1 HPUE>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				509202	518598	528000	24.0
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	23.23	23.45	23.16	24.0
100	PI/2 BPSK	1	137	22.77	23.00	22.54	
100	PI/2 BPSK	1	271	22.98	23.07	22.68	
100	PI/2 BPSK	135	0	22.82	22.92	22.58	23.5
100	PI/2 BPSK	135	69	22.96	23.12	22.87	24.0
100	PI/2 BPSK	135	138	22.93	23.14	22.58	23.5
100	PI/2 BPSK	270	0	22.85	23.02	22.61	
100	QPSK	1	1	23.03	23.31	22.68	24.0
100	QPSK	1	137	22.97	23.21	22.67	
100	QPSK	1	271	23.03	23.17	22.66	
100	QPSK	135	0	22.89	23.08	22.60	24.0
100	QPSK	135	69	23.00	23.14	22.76	
100	QPSK	135	138	22.83	22.98	22.64	
100	QPSK	270	0	22.88	23.07	22.78	24.0
100	16QAM	1	1	22.73	23.15	22.63	24.0
100	64QAM	1	1	22.62	22.83	22.56	23.5
100	256QAM	1	1	22.36	22.46	22.41	22.5
Channel				507204	518598	529998	24.0
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	22.79	23.09	22.62	24.0
Channel				505200	518598	531996	24.0
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	22.93	23.13	22.74	24.0
Channel				504204	518598	532998	24.0
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	22.96	23.27	22.98	24.0
Channel				503202	518598	534000	24.0
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	22.87	23.17	22.94	24.0
Channel				502200	518598	534996	24.0
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	23.13	23.25	22.79	24.0
Channel				501204	518598	535998	24.0
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	23.22	23.37	22.99	24.0



<n41 Aux>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				509202	518598	528000	25.0
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	24.27	24.81	24.52	25.0
100	PI/2 BPSK	1	137	23.59	24.21	23.86	
100	PI/2 BPSK	1	271	23.62	24.33	23.93	
100	PI/2 BPSK	135	0	23.41	24.01	23.56	24.5
100	PI/2 BPSK	135	69	23.47	24.11	23.78	25.0
100	PI/2 BPSK	135	138	23.55	24.13	23.75	24.5
100	PI/2 BPSK	270	0	23.32	24.02	23.60	
100	QPSK	1	1	23.51	24.25	23.95	25.0
100	QPSK	1	137	23.41	24.14	23.75	
100	QPSK	1	271	23.46	24.16	23.83	
100	QPSK	135	0	23.34	24.05	23.68	25.0
100	QPSK	135	69	23.45	24.09	23.62	
100	QPSK	135	138	23.56	24.15	23.85	
100	QPSK	270	0	23.26	23.94	23.64	25.0
100	16QAM	1	1	23.58	24.27	23.83	24.5
100	64QAM	1	1	23.08	23.66	23.24	24.0
100	256QAM	1	1	21.21	21.88	21.48	22.0
Channel				507204	518598	529998	25.0
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	23.58	24.25	23.78	25.0
Channel				505200	518598	531996	25.0
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	23.48	24.21	23.78	25.0
Channel				504204	518598	532998	25.0
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	23.75	24.41	24.01	25.0
Channel				503202	518598	534000	25.0
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	24.01	24.75	24.37	25.0
Channel				502200	518598	534996	25.0
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	24.19	24.78	24.37	25.0
Channel				501204	518598	535998	25.0
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	23.91	24.46	24.07	25.0



<n41 Aux HPUE>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				509202	518598	528000	27.0
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	26.44	26.52	26.82	27.0
100	PI/2 BPSK	1	137	26.32	26.45	26.57	
100	PI/2 BPSK	1	271	25.71	25.90	26.08	
100	PI/2 BPSK	135	0	25.58	25.83	25.96	26.5
100	PI/2 BPSK	135	69	26.31	26.53	26.73	27.0
100	PI/2 BPSK	135	138	25.72	25.97	26.24	26.5
100	PI/2 BPSK	270	0	25.66	25.89	26.11	
100	QPSK	1	1	26.39	26.67	26.81	27.0
100	QPSK	1	137	26.50	26.66	26.63	
100	QPSK	1	271	26.26	26.38	26.60	
100	QPSK	135	0	25.37	25.46	25.61	27.0
100	QPSK	135	69	26.42	26.55	26.75	
100	QPSK	135	138	25.31	25.56	25.66	
100	QPSK	270	0	25.33	25.41	25.58	26.0
100	16QAM	1	1	25.51	25.75	25.84	26.0
100	64QAM	1	1	23.92	24.14	24.29	24.5
100	256QAM	1	1	22.14	22.24	22.39	22.5
Channel				507204	518598	529998	27.0
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	26.26	26.50	26.76	27.0
Channel				505200	518598	531996	27.0
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	26.51	26.68	26.61	27.0
Channel				504204	518598	532998	27.0
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	26.56	26.73	26.71	27.0
Channel				503202	518598	534000	27.0
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	26.40	26.53	26.71	27.0
Channel				502200	518598	534996	27.0
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	26.48	26.65	26.76	27.0
Channel				501204	518598	535998	27.0
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	26.45	26.59	26.65	27.0



<n77 Aux>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				650000	656000	662000	
Frequency (MHz)				3750	3840	3930	
100	PI/2 BPSK	1	1	24.81	24.71	24.80	25.0
100	PI/2 BPSK	1	137	24.52	24.62	24.63	
100	PI/2 BPSK	1	271	24.73	24.69	24.78	
100	PI/2 BPSK	135	0	24.46	24.42	24.47	24.5
100	PI/2 BPSK	135	69	24.52	24.44	24.46	25.0
100	PI/2 BPSK	135	138	24.47	24.49	24.47	24.5
100	PI/2 BPSK	270	0	24.36	24.42	24.39	
100	QPSK	1	1	24.43	24.50	24.51	25.0
100	QPSK	1	137	24.75	24.67	24.69	
100	QPSK	1	271	24.70	24.73	24.63	
100	QPSK	135	0	24.45	24.39	24.32	25.0
100	QPSK	135	69	24.55	24.48	24.40	
100	QPSK	135	138	24.55	24.54	24.63	
100	QPSK	270	0	24.24	24.33	24.28	25.0
100	16QAM	1	1	24.79	24.74	24.79	25.0
100	64QAM	1	1	23.74	23.84	23.93	24.5
100	256QAM	1	1	22.04	22.02	21.92	22.5

<n77 Aux HPUE>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				650000	656000	662000	
Frequency (MHz)				3750	3840	3930	
100	PI/2 BPSK	1	1	25.79	25.86	25.74	27.0
100	PI/2 BPSK	1	137	25.50	25.56	25.55	
100	PI/2 BPSK	1	271	25.56	25.75	25.73	
100	PI/2 BPSK	135	0	24.80	24.98	24.88	26.5
100	PI/2 BPSK	135	69	25.36	25.48	25.27	27.0
100	PI/2 BPSK	135	138	24.86	25.12	25.05	26.5
100	PI/2 BPSK	270	0	24.73	24.92	24.88	
100	QPSK	1	1	25.28	25.42	25.22	27.0
100	QPSK	1	137	25.44	25.63	25.61	
100	QPSK	1	271	25.63	25.73	25.64	
100	QPSK	135	0	25.08	25.03	25.01	27.0
100	QPSK	135	69	25.31	25.49	25.35	
100	QPSK	135	138	25.07	25.06	25.08	
100	QPSK	270	0	24.19	24.35	24.30	26.0
100	16QAM	1	1	24.35	24.57	24.40	26.0
100	64QAM	1	1	22.64	22.77	22.71	24.5
100	256QAM	1	1	21.17	21.25	21.19	22.5



Reduced Power Mode

<n2 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				372000	376000	380000	
Frequency (MHz)				1860	1880	1900	
20	PI/2 BPSK	1	1	20.92	20.78	20.64	21.7
20	PI/2 BPSK	1	53	20.75	20.71	20.58	
20	PI/2 BPSK	1	104	20.67	20.69	20.52	
20	PI/2 BPSK	50	0	20.71	20.57	20.49	21.7
20	PI/2 BPSK	50	28	20.81	20.67	20.50	21.7
20	PI/2 BPSK	50	56	20.56	20.59	20.52	21.7
20	PI/2 BPSK	100	0	20.57	20.61	20.45	
20	QPSK	1	1	20.76	20.74	20.62	21.7
20	QPSK	1	53	20.86	20.83	20.67	
20	QPSK	1	104	20.87	20.71	20.48	
20	QPSK	50	0	20.87	20.70	20.56	21.7
20	QPSK	50	28	20.85	20.77	20.49	21.7
20	QPSK	50	56	20.81	20.70	20.51	21.7
20	QPSK	100	0	20.78	20.63	20.46	
20	16QAM	1	1	20.84	20.77	20.75	21.7
20	64QAM	1	1	20.75	20.71	20.67	21.7
20	256QAM	1	1	20.34	20.27	19.97	20.6
Channel				371500	376000	380500	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	PI/2 BPSK	1	1	20.84	20.73	20.62	21.7
Channel				371000	376000	381000	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	PI/2 BPSK	1	1	20.87	20.65	20.67	21.7
Channel				370500	376000	381500	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	PI/2 BPSK	1	1	20.61	20.47	20.43	21.7



<n7 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				502000	507000	512000	Tune-up limit (dBm)
Frequency (MHz)				2510	2535	2560	
20	PI/2 BPSK	1	1	16.33	16.45	16.36	17.0
20	PI/2 BPSK	1	53	16.29	16.37	16.33	
20	PI/2 BPSK	1	104	16.23	16.33	16.31	
20	PI/2 BPSK	50	0	16.27	16.30	16.26	17.0
20	PI/2 BPSK	50	28	16.26	16.36	16.27	17.0
20	PI/2 BPSK	50	56	16.15	16.25	16.24	17.0
20	PI/2 BPSK	100	0	16.24	16.32	16.29	
20	QPSK	1	1	16.29	16.35	16.35	17.0
20	QPSK	1	53	16.20	16.26	16.22	
20	QPSK	1	104	16.25	16.31	16.31	
20	QPSK	50	0	16.23	16.29	16.20	17.0
20	QPSK	50	28	16.28	16.28	16.22	17.0
20	QPSK	50	56	16.19	16.21	16.21	17.0
20	QPSK	100	0	16.22	16.30	16.22	
20	16QAM	1	1	16.29	16.36	16.36	17.0
20	64QAM	1	1	16.35	16.37	16.29	17.0
20	256QAM	1	1	16.32	16.32	16.27	17.0
Channel				501500	507000	512500	Tune-up limit (dBm)
Frequency (MHz)				2507.5	2535	2562.5	
15	PI/2 BPSK	1	1	16.32	16.34	16.21	17.0
Channel				501000	507000	513000	Tune-up limit (dBm)
Frequency (MHz)				2505	2535	2565	
10	PI/2 BPSK	1	1	16.22	16.26	16.18	17.0
Channel				500500	507000	513500	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	PI/2 BPSK	1	1	16.16	16.24	16.19	17.0



<n25 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				372000	376500	381000	Tune-up limit (dBm)
Frequency (MHz)				1860	1882.5	1905	
20	PI/2 BPSK	1	1	20.98	20.99	20.95	21.7
20	PI/2 BPSK	1	53	20.84	20.91	20.83	
20	PI/2 BPSK	1	104	20.93	20.94	20.88	
20	PI/2 BPSK	50	0	20.89	20.93	20.90	21.7
20	PI/2 BPSK	50	28	20.91	20.95	20.87	21.7
20	PI/2 BPSK	50	56	20.89	20.91	20.90	21.7
20	PI/2 BPSK	100	0	20.83	20.89	20.89	
20	QPSK	1	1	20.90	20.94	20.89	21.7
20	QPSK	1	53	20.81	20.87	20.83	
20	QPSK	1	104	20.79	20.89	20.84	
20	QPSK	50	0	20.85	20.90	20.90	21.7
20	QPSK	50	28	20.91	20.91	20.87	21.7
20	QPSK	50	56	20.84	20.93	20.86	21.7
20	QPSK	100	0	20.84	20.92	20.89	
20	16QAM	1	1	20.69	20.79	20.72	21.7
20	64QAM	1	1	20.57	20.65	20.61	21.7
20	256QAM	1	1	20.03	20.13	20.07	20.6
Channel				371500	376500	381500	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1882.5	1907.5	
15	PI/2 BPSK	1	1	20.79	20.89	20.88	21.7
Channel				371000	376500	382000	Tune-up limit (dBm)
Frequency (MHz)				1855	1882.5	1910	
10	PI/2 BPSK	1	1	20.74	20.87	20.84	21.7
Channel				370500	376500	382500	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1882.5	1912.5	
5	PI/2 BPSK	1	1	20.82	20.82	20.76	21.7



<n41 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				509202	518598	528000	16.3
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	15.88	15.93	15.51	16.3
100	PI/2 BPSK	1	137	15.63	15.81	15.69	
100	PI/2 BPSK	1	271	15.80	15.76	15.79	
100	PI/2 BPSK	135	0	15.75	15.83	15.75	16.3
100	PI/2 BPSK	135	69	15.76	15.79	15.74	16.3
100	PI/2 BPSK	135	138	15.57	15.80	15.57	16.3
100	PI/2 BPSK	270	0	15.70	15.72	15.78	
100	QPSK	1	1	15.83	15.90	15.64	16.3
100	QPSK	1	137	15.78	15.75	15.73	
100	QPSK	1	271	15.75	15.78	15.83	
100	QPSK	135	0	15.65	15.79	15.81	16.3
100	QPSK	135	69	15.73	15.69	15.73	
100	QPSK	135	138	15.76	15.71	15.76	
100	QPSK	270	0	15.61	15.68	15.72	16.3
100	16QAM	1	1	15.87	15.87	15.71	16.3
100	64QAM	1	1	15.79	15.72	15.67	16.3
100	256QAM	1	1	15.76	15.74	15.63	16.3
Channel				507204	518598	529998	16.3
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	15.77	15.75	15.55	16.3
Channel				505200	518598	531996	16.3
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	15.76	15.77	15.66	16.3
Channel				504204	518598	532998	16.3
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	15.55	15.72	15.68	16.3
Channel				503202	518598	534000	16.3
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	15.75	15.75	15.81	16.3
Channel				502200	518598	534996	16.3
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	15.75	15.82	15.63	16.3
Channel				501204	518598	535998	16.3
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	15.62	15.67	15.55	16.3



<n41 MIMO 1 HPUE>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				509202	518598	528000	18.3
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	18.25	18.28	17.96	18.3
100	PI/2 BPSK	1	137	18.05	17.92	17.91	
100	PI/2 BPSK	1	271	18.26	17.94	17.71	
100	PI/2 BPSK	135	0	18.13	18.15	17.87	18.3
100	PI/2 BPSK	135	69	18.14	18.24	18.05	18.3
100	PI/2 BPSK	135	138	18.02	17.96	18.08	18.3
100	PI/2 BPSK	270	0	18.07	18.07	17.81	
100	QPSK	1	1	18.20	17.88	17.93	18.3
100	QPSK	1	137	18.05	17.95	17.76	
100	QPSK	1	271	18.05	17.85	17.74	
100	QPSK	135	0	18.13	17.98	17.76	18.3
100	QPSK	135	69	17.94	17.85	17.80	
100	QPSK	135	138	17.94	17.93	17.68	
100	QPSK	270	0	18.06	17.76	17.75	18.3
100	16QAM	1	1	18.21	18.09	17.95	18.3
100	64QAM	1	1	18.09	17.86	17.62	18.3
100	256QAM	1	1	17.84	17.74	17.64	18.3
Channel				507204	518598	529998	18.3
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	18.20	18.22	18.09	18.3
Channel				505200	518598	531996	18.3
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	17.96	17.99	17.72	18.3
Channel				504204	518598	532998	18.3
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	18.21	17.98	17.84	18.3
Channel				503202	518598	534000	18.3
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	18.11	18.16	18.20	18.3
Channel				502200	518598	534996	18.3
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	18.14	17.99	17.80	18.3
Channel				501204	518598	535998	18.3
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	18.01	18.06	17.95	18.3



<n41 Aux>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				509202	518598	528000	18.8
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	17.18	17.43	17.22	18.8
100	PI/2 BPSK	1	137	16.98	17.26	16.95	
100	PI/2 BPSK	1	271	17.13	17.41	17.12	
100	PI/2 BPSK	135	0	17.08	17.36	17.10	18.8
100	PI/2 BPSK	135	69	17.09	17.38	17.08	18.8
100	PI/2 BPSK	135	138	17.10	17.35	17.05	18.8
100	PI/2 BPSK	270	0	17.05	17.33	17.12	
100	QPSK	1	1	17.12	17.42	17.14	18.8
100	QPSK	1	137	16.95	17.29	17.03	
100	QPSK	1	271	17.16	17.41	17.12	
100	QPSK	135	0	17.05	17.38	17.07	18.8
100	QPSK	135	69	17.05	17.32	17.03	
100	QPSK	135	138	17.09	17.41	17.20	
100	QPSK	270	0	17.08	17.36	17.08	18.8
100	16QAM	1	1	17.05	17.39	17.15	18.8
100	64QAM	1	1	17.12	17.38	17.13	18.8
100	256QAM	1	1	17.10	17.42	17.15	18.8
Channel				507204	518598	529998	18.8
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	16.98	17.32	17.12	18.8
Channel				505200	518598	531996	18.8
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	17.17	17.25	17.09	18.8
Channel				504204	518598	532998	18.8
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	17.10	17.27	17.22	18.8
Channel				503202	518598	534000	18.8
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	17.13	17.29	17.20	18.8
Channel				502200	518598	534996	18.8
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	17.06	17.28	17.20	18.8
Channel				501204	518598	535998	18.8
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	17.10	17.37	17.13	18.8



<n41 Aux HPUE>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				509202	518598	528000	20.8
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	20.14	20.53	20.24	20.8
100	PI/2 BPSK	1	137	19.91	20.36	19.98	
100	PI/2 BPSK	1	271	20.10	20.49	20.14	
100	PI/2 BPSK	135	0	19.95	20.39	20.04	20.8
100	PI/2 BPSK	135	69	20.04	20.45	20.06	20.8
100	PI/2 BPSK	135	138	20.00	20.40	20.01	20.8
100	PI/2 BPSK	270	0	19.97	20.44	20.12	
100	QPSK	1	1	20.07	20.46	20.15	20.8
100	QPSK	1	137	19.90	20.33	19.94	
100	QPSK	1	271	20.01	20.44	20.10	
100	QPSK	135	0	19.90	20.37	20.08	20.8
100	QPSK	135	69	19.98	20.43	20.12	
100	QPSK	135	138	19.91	20.39	20.04	
100	QPSK	270	0	19.95	20.43	20.09	20.8
100	16QAM	1	1	19.92	20.38	20.09	20.8
100	64QAM	1	1	19.93	20.36	20.05	20.8
100	256QAM	1	1	19.92	20.40	20.07	20.8
Channel				507204	518598	529998	20.8
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	19.94	20.37	20.13	20.8
Channel				505200	518598	531996	20.8
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	20.07	20.33	20.24	20.8
Channel				504204	518598	532998	20.8
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	20.04	20.33	20.08	20.8
Channel				503202	518598	534000	20.8
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	20.07	20.50	20.22	20.8
Channel				502200	518598	534996	20.8
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	19.96	20.50	20.11	20.8
Channel				501204	518598	535998	20.8
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	19.94	20.47	20.12	20.8



<n66 MIMO 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				345000	349000	353000	21.1
Frequency (MHz)				1725	1745	1765	
20	PI/2 BPSK	1	1	20.32	20.41	20.35	
20	PI/2 BPSK	1	53	20.18	20.28	20.18	21.1
20	PI/2 BPSK	1	104	20.26	20.27	20.25	
20	PI/2 BPSK	50	0	20.26	20.35	20.25	21.1
20	PI/2 BPSK	50	28	20.28	20.36	20.30	21.1
20	PI/2 BPSK	50	56	20.25	20.25	20.21	21.1
20	PI/2 BPSK	100	0	20.21	20.23	20.19	
20	QPSK	1	1	20.22	20.31	20.21	21.1
20	QPSK	1	53	20.31	20.32	20.22	
20	QPSK	1	104	20.14	20.22	20.13	
20	QPSK	50	0	20.22	20.29	20.23	21.1
20	QPSK	50	28	20.23	20.28	20.23	21.1
20	QPSK	50	56	20.23	20.31	20.28	21.1
20	QPSK	100	0	20.26	20.30	20.29	
20	16QAM	1	1	20.30	20.34	20.30	21.1
20	64QAM	1	1	20.01	20.11	20.07	21.1
20	256QAM	1	1	19.89	19.94	19.87	20.5
Channel				343500	349000	354500	21.1
Frequency (MHz)				1717.5	1745	1772.5	
15	PI/2 BPSK	1	1	20.16	20.19	20.19	21.1
Channel				343000	349000	355000	21.1
Frequency (MHz)				1715	1745	1775	
10	PI/2 BPSK	1	1	20.18	20.27	20.17	21.1
Channel				342500	349000	355500	21.1
Frequency (MHz)				1712.5	1745	1777.5	
5	PI/2 BPSK	1	1	20.20	20.21	20.16	21.1



<n77 Aux>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				650000	656000	662000	
Frequency (MHz)				3750	3840	3930	
100	PI/2 BPSK	1	1	21.79	21.70	21.75	22.6
100	PI/2 BPSK	1	137	21.63	21.61	21.65	
100	PI/2 BPSK	1	271	21.58	21.57	21.58	
100	PI/2 BPSK	135	0	21.68	21.64	21.68	22.6
100	PI/2 BPSK	135	69	21.71	21.69	21.65	22.6
100	PI/2 BPSK	135	138	21.62	21.63	21.61	22.6
100	PI/2 BPSK	270	0	21.69	21.67	21.65	
100	QPSK	1	1	21.66	21.63	21.67	22.6
100	QPSK	1	137	21.70	21.67	21.66	
100	QPSK	1	271	21.49	21.50	21.48	
100	QPSK	135	0	21.61	21.58	21.62	22.6
100	QPSK	135	69	21.71	21.76	21.77	
100	QPSK	135	138	21.70	21.67	21.69	
100	QPSK	270	0	21.71	21.71	21.69	22.6
100	16QAM	1	1	21.61	21.59	21.60	22.6
100	64QAM	1	1	21.65	21.56	21.54	22.6
100	256QAM	1	1	21.02	20.97	21.01	22.6

<n77 Aux HPUE>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				650000	656000	662000	
Frequency (MHz)				3750	3840	3930	
100	PI/2 BPSK	1	1	24.59	24.60	24.51	24.6
100	PI/2 BPSK	1	137	24.53	24.60	24.38	
100	PI/2 BPSK	1	271	24.50	24.59	24.43	
100	PI/2 BPSK	135	0	24.57	24.56	24.47	24.6
100	PI/2 BPSK	135	69	24.56	24.60	24.50	24.6
100	PI/2 BPSK	135	138	24.55	24.52	24.40	24.6
100	PI/2 BPSK	270	0	24.55	24.58	24.51	
100	QPSK	1	1	24.52	24.58	24.45	24.6
100	QPSK	1	137	24.39	24.50	24.35	
100	QPSK	1	271	24.29	24.40	24.23	
100	QPSK	135	0	24.52	24.58	24.52	24.6
100	QPSK	135	69	24.47	24.54	24.40	
100	QPSK	135	138	24.48	24.53	24.30	
100	QPSK	270	0	24.60	24.58	24.50	24.6
100	16QAM	1	1	24.46	24.57	24.40	24.6
100	64QAM	1	1	24.43	24.55	24.37	24.6
100	256QAM	1	1	23.90	24.01	23.82	24.6



15. WiFi/Bluetooth Output Power (Unit: dBm)

General Note:

1. For each antenna, transmit power in SISO operation is larger than (or equal to) the power in MIMO operation, RF exposure compliance of MIMO mode can be deduced from the compliance simultaneous transmission of antennas operating in SISO mode.
2. Per KDB 248227 D01v02r02, the simultaneous SAR provisions in KDB publication 447498 should be applied to determine simultaneous transmission SAR test exclusion for WiFi MIMO. If the sum of 1g single transmission chain SAR measurements is $< 1.6\text{W/kg}$ and SAR peak to location ratio ≤ 0.04 , no additional SAR measurements for MIMO.
3. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, additional output power measurements were not necessary.
4. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
5. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
6. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
7. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. 18 The initial test position procedure is described in the following:
 - a. When the reported SAR of the initial test position is $\leq 0.4\text{ W/kg}$, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
 - b. When the reported SAR of the test position is $> 0.4\text{ W/kg}$, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is $\leq 0.8\text{ W/kg}$ or all required test position are tested.
 - c. For all positions/configurations, when the reported SAR is $> 0.8\text{ W/kg}$, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is $\leq 1.2\text{ W/kg}$ or all required channels are tested.
8. Per 201904 TCBC workshops, General principles of FCC KDB Publication 248227 D01 can be applied to determine the SAR Initial Test Configurations and test reduction for 802.11ax SAR testing. For the table below the 802.11ax maximum power is SU (non-OFDMA), and the SU maximum power also higher than RU (OFDMA)
9. In applying the test guidance, the IEEE 802.11 mode with the maximum output power (out of all modes) should be considered for testing
10. For modes with the same maximum output power, the guidance from section 5.3.2 a) of FCC KDB Publication 248227 D01 should be applied, with 802.11ax being considered as the highest 802.11 mode for the appropriate frequency bands
11. When SAR testing for 802.11ax is required
 - a. If the maximum output power is highest for OFDMA scenarios, choose the tone size with the maximum number of tones and the highest maximum output power
 - b. Otherwise, consider the fully allocated channel for SAR testing
 - c. When SAR testing is required on RU sizes less than the fully allocated channel, use the RU number closest to the middle of the channel, choosing the higher RU number when two RUs are equidistant to the middle of the channel



<2.4GHz WLAN>

2.4GHz WLAN				Ant 1			Ant 2			Ant 1+2		
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11b 1Mbps	1	2412	17.20	17.50	99.00	17.40	17.50	99.00				
	6	2437	17.50	17.50		17.20	17.50					
	11	2462	17.40	17.50		17.30	17.50					
802.11g 6Mbps	1	2412	Not required	17.50	Not required	Not required	17.50	Not required	Not required			
	6	2437		17.50			17.50					
	11	2462		17.50			17.50					
802.11n-HT20 MCS0	1	2412	Not required	17.50	Not required	Not required	17.50	Not required	Not required	17.50	17.50	Not required
	6	2437		17.50			17.50			17.50		
	11	2462		17.50			17.50			17.50		
802.11n-HT40 MCS0	1	2412	Not required	17.50	Not required	Not required	17.50	Not required	Not required	17.50	17.50	Not required
	6	2437		17.50			17.50			17.50		
	9	2452		17.50			17.50			17.50		
802.11ax-HE20 MCS0	1	2412	Not required	17.50	Not required	Not required	17.50	Not required	Not required	17.50	17.50	Not required
	6	2437		17.50			17.50			17.50		
	11	2462		17.50			17.50			17.50		
802.11ax-HE40 MCS0	3	2422	Not required	17.50	Not required	Not required	17.50	Not required	Not required	17.50	17.50	Not required
	6	2437		17.50			17.50			17.50		
	9	2452		17.50			17.50			17.50		

<5GHz WLAN>

5.2GHz WLAN				Ant 1			Ant 2			Ant 1+2		
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	36	5180	Not required	16.00	Not required	Not required	16.00	Not required	Not required			
	40	5200		16.00			16.00					
	44	5220		16.00			16.00					
	48	5240		16.00			16.00					
802.11n-HT20 MCS0	36	5180	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	Not required
	40	5200		16.00			16.00			16.00		
	44	5220		16.00			16.00			16.00		
	48	5240		16.00			16.00			16.00		
802.11n-HT40 MCS0	38	5190	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	Not required
	46	5230		16.00			16.00			16.00		
802.11ac-VHT20 MCS0	36	5180	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	Not required
	40	5200		16.00			16.00			16.00		
	44	5220		16.00			16.00			16.00		
802.11ac-VHT40 MCS0	38	5190	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	Not required
	46	5230		16.00			16.00			16.00		
802.11ac-VHT80 MCS0	42	5210	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	Not required
802.11ax-HE20 MCS0	36	5180	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	Not required
	40	5200		16.00			16.00			16.00		
	44	5220		16.00			16.00			16.00		
802.11ax-HE40 MCS0	38	5190	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	Not required
	46	5230		16.00			16.00			16.00		
802.11ax-HE80 MCS0	42	5210	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	Not required



5.3GHz WLAN				Ant 1			Ant 2			Ant 1+2										
5.3GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %								
	5.3GHz WLAN	802.11a 6Mbps	52	5260	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	Not required							
56			5280	16.00																
60			5300	16.00																
64			5320	16.00																
802.11n-HT20 MCS0		52	5260	16.00																
		56	5280	16.00																
		60	5300	16.00																
		64	5320	16.00																
802.11n-HT40 MCS0		54	5270	16.00																
		62	5310	16.00																
802.11ac-VHT20 MCS0		52	5260	16.00																
		56	5280	16.00																
		60	5300	16.00																
		64	5320	16.00																
802.11ac-VHT40 MCS0		54	5270	16.00																
		62	5310	16.00																
802.11ac-VHT80 MCS0		58	5290	15.90		16.00			98.90					16.00	16.00	98.90	16.00	16.00	16.00	
802.11ac-VHT160 MCS0		50	5250			14									15		15		15	
802.11ax-HE20 MCS0		52	5260	Not required		16.00			Not required					Not required	16.00	Not required	Not required	16.00	Not required	Not required
		56	5280			16.00														
	60	5300	16.00																	
	64	5320	16.00																	
802.11ax-HE40 MCS0	54	5270	16.00																	
	62	5310	16.00																	
802.11ax-HE80 MCS0	58	5290	16.00		16.00	16.00	16.00	16.00		16.00	16.00	16.00	16.00							
802.11ax-HE160 MCS0	50	5250			14			15			15		15							



5.5GHz WLAN				Ant 1			Ant 2			Ant 1+2		
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	100	5500	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	Not required	
	116	5580		16.00			16.00					
	124	5620		16.00			16.00					
	132	5660		16.00			16.00					
	144	5720		16.00			16.00					
802.11n-HT20 MCS0	100	5500	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	
	116	5580		16.00			16.00					
	124	5620		16.00			16.00					
	132	5660		16.00			16.00					
	144	5720		16.00			16.00					
802.11n-HT40 MCS0	102	5510	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	
	110	5550		16.00			16.00					
	126	5630		16.00			16.00					
	134	5670		16.00			16.00					
	142	5710		16.00			16.00					
802.11ac-VHT20 MCS0	100	5500	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	
	116	5580		16.00			16.00					
	124	5620		16.00			16.00					
	132	5660		16.00			16.00					
	144	5720		16.00			16.00					
802.11ac-VHT40 MCS0	102	5510	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	
	110	5550		16.00			16.00					
	126	5630		16.00			16.00					
	134	5670		16.00			16.00					
	142	5710		16.00			16.00					
802.11ac-VHT80 MCS0	106	5530	15.80	16.00	98.90	Not required	16.00	Not required	Not required	16.00	16.00	
	122	5610	15.70	16.00			16.00					
	138	5690	15.90	16.00			16.00					
802.11ac-VHT160 MCS0	114	5570	Not required	15.50	Not required	Not required	16.00	Not required	Not required	16.00	16.00	
802.11ax-HE20 MCS0	100	5500		16.00			16.00					
	116	5580		16.00			16.00					
	124	5620		16.00			16.00					
	132	5660		16.00			16.00					
	144	5720	16.00	16.00								
802.11ax-HE40 MCS0	102	5510	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	16.00	
	110	5550		16.00			16.00					
	126	5630		16.00			16.00					
	134	5670		16.00			16.00					
	142	5710		15.50			16.00					



5.8GHz WLAN				Ant 1			Ant 2			Ant 1+2				
5.8GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %		
	802.11a 6Mbps	149	5745	Not required	16.00	Not required	Not required	16.00	Not required	Not required	Not required	16.00	Not required	
		157	5785											16.00
		165	5825											16.00
	802.11n-HT20 MCS0	149	5745	Not required	16.00	Not required	Not required	16.00	Not required	Not required	Not required	16.00	Not required	
		157	5785											16.00
		165	5825											16.00
	802.11n-HT40 MCS0	151	5755	Not required	16.00	Not required	Not required	16.00	Not required	Not required	Not required	16.00	Not required	
		159	5795											16.00
	802.11ac-VHT20 MCS0	149	5745	Not required	16.00	Not required	Not required	16.00	Not required	Not required	Not required	16.00	Not required	
		157	5785											16.00
		165	5825											16.00
	802.11ac-VHT40 MCS0	151	5755	Not required	16.00	Not required	Not required	16.00	Not required	Not required	Not required	16.00	Not required	
		159	5795											16.00
	802.11ac-VHT80 MCS0	155	5775	15.70	16.00	98.90	15.70	16.00	98.90	Not required	16.00	Not required		
802.11ax-HE20 MCS0	149	5745	Not required	16.00	Not required	Not required	16.00	Not required	Not required	Not required	16.00	Not required		
	157	5785											16.00	
	165	5825											16.00	
802.11ax-HE40 MCS0	151	5755	Not required	16.00	Not required	Not required	16.00	Not required	Not required	Not required	16.00	Not required		
	159	5795											16.00	
802.11ax-HE80 MCS0	155	5775	Not required	16.00	Not required	Not required	16.00	Not required	Not required	16.00	Not required			



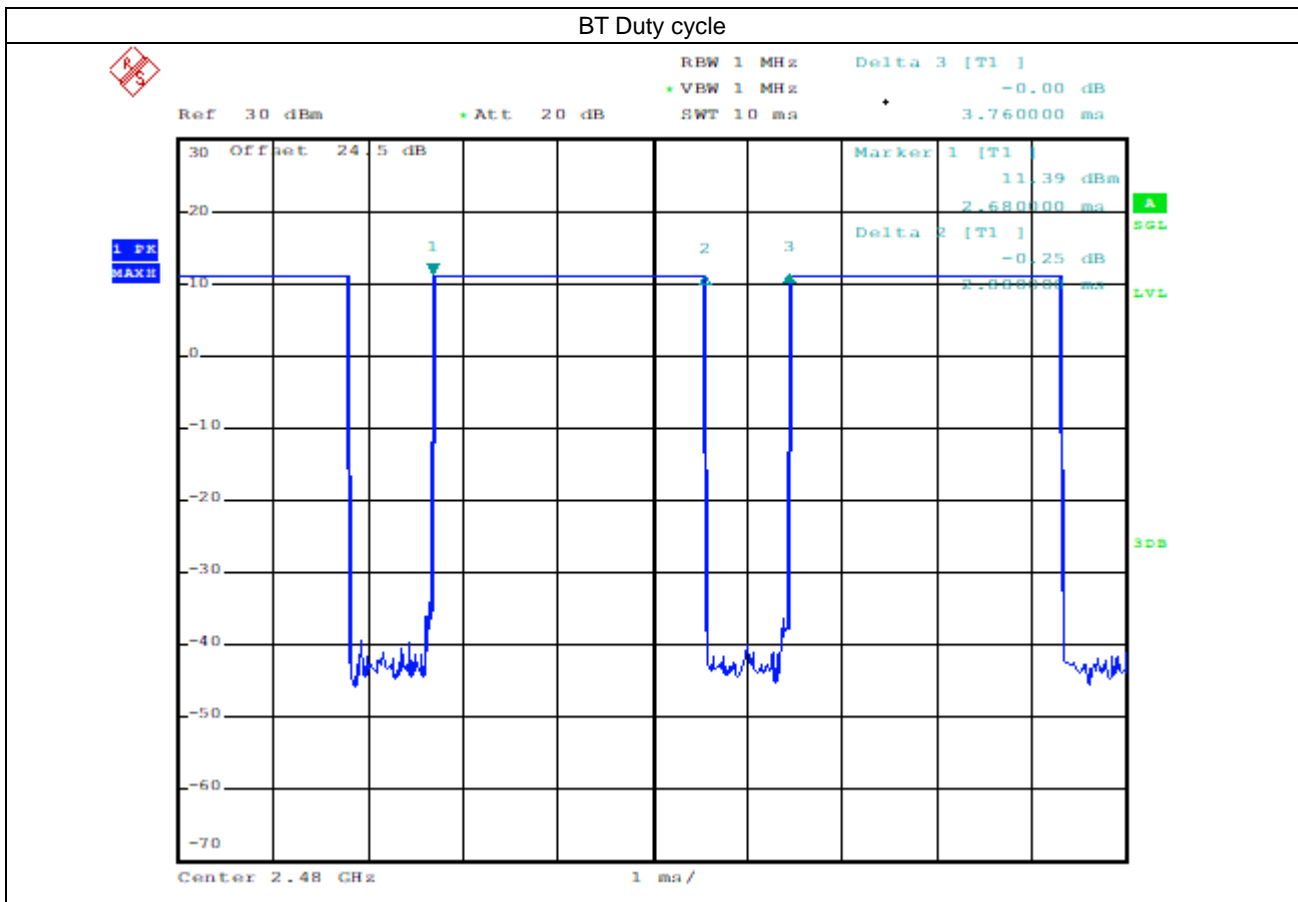
<2.4GHz Bluetooth>

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	10.70	Not required	Not required
	CH 39	2441	10.90		
	CH 78	2480	11.30		
Tune-up Limit			11.5	11	11

Mode	Channel	Frequency (MHz)	Average power (dBm)	
			1Mbps	2Mbps
LE	CH 00	2402	Not required	Not required
	CH 19	2440		
	CH 39	2480		
Tune-up Limit			10	10

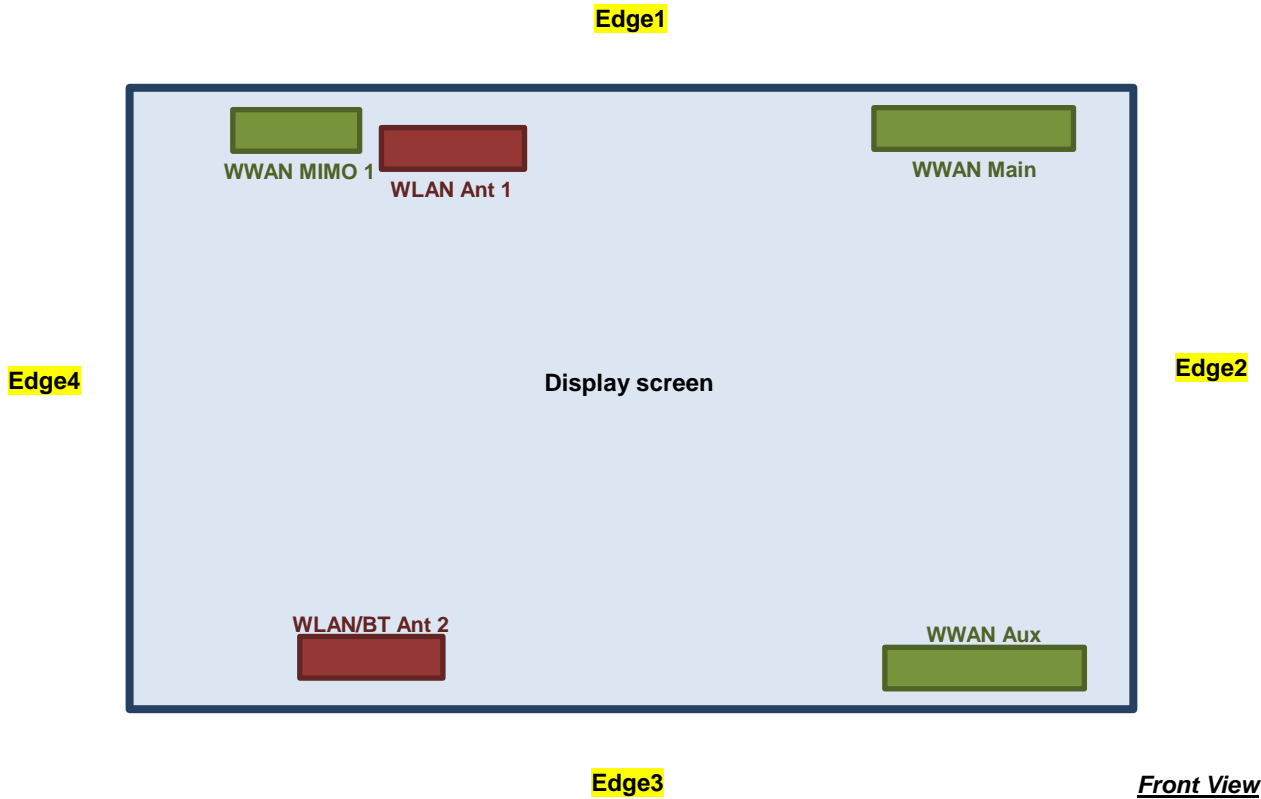
General Note:

- For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 76.6% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.



16. Antenna Location

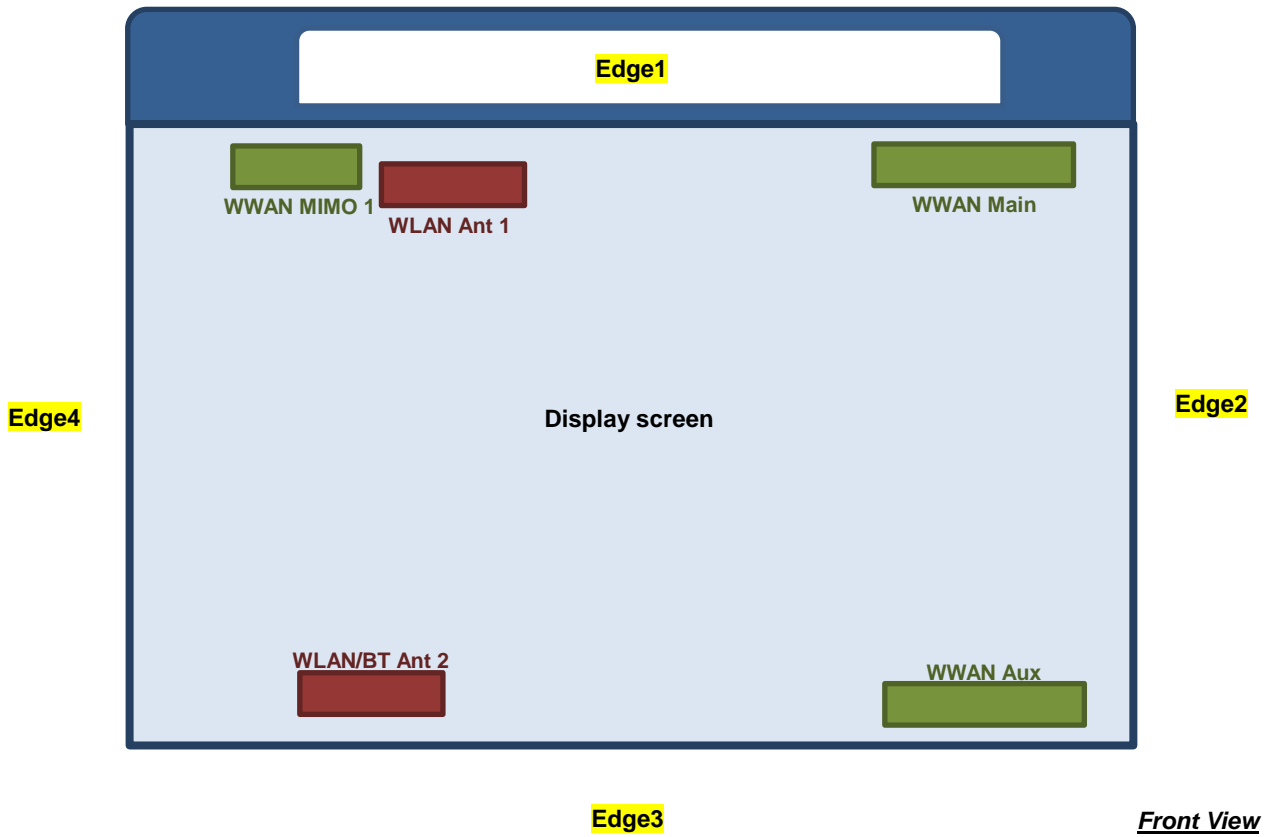
<Xslate>



The separation distance for antenna to edge :

Antenna	To Edge1 (mm)	To Edge2 (mm)	To Edge3 (mm)	To Edge4 (mm)
WWAN Main Antenna	7.76	24.45	178.98	179.16
WWAN Aux Antenna	182.2	22.01	7.02	178.16
WWAN MIMO 1 Antenna	7.38	198.15	183.97	39.25
WLAN Antenna 1	12.28	177.5	182.57	89.16
WLAN/BT Antenna 2	186.63	209.66	13.25	57.14

<Xpad>



The separation distance for antenna to edge :

Antenna	To Edge1 (mm)	To Edge2 (mm)	To Edge3 (mm)	To Edge4 (mm)
WWAN Main Antenna	67.93	27.22	180.28	181.93
WWAN Aux Antenna	242.1	23.06	8.86	179.2
WWAN MIMO 1 Antenna	66.97	200.93	185.27	42.03
WLAN Antenna 1	72.18	179.92	183.87	91.93
WLAN/BT Antenna 2	246.53	210.6	14.55	58.3



<SAR test exclusion table>

General Note:

- 1. SAR test exclusion table was using Xslate sample consideration.
2. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
3. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
4. Per KDB 447498 D01v06, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
5. Per KDB 447498 D01v06, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
6. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances <= 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] * [sqrt(f(GHz))] <= 3.0 for 1-g SAR and <= 7.5 for 10-g extremity SAR
- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
7. Per KDB 447498 D01v06, at 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following
a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) * (f(MHz)/150)] mW, at 100 MHz to 1500 MHz
b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) * 10] mW at > 1500 MHz and <= 6 GHz

<WWAN Main Antenna>

Table with 15 columns: Wireless Interface, WCDMA Band V, LTE Band 71, LTE Band n71, LTE Band 12, LTE Band 13, LTE Band 14, LTE Band n12, LTE Band n5, LTE Band 26, 2.4GHz WLAN ANT 1, 2.4GHz WLAN/BT ANT 2, 5GHz WLAN ANT 1, 5GHz WLAN ANT 2. Rows include Exposure Position (Calculated Frequency, Maximum power), Bottom Face, Edge 1, Edge 2, Edge 3, and Edge 4, each with Separation distance, exclusion threshold, and Testing required?



<WWAN Aux Antenna>

Exposure Position	Wireless Interface	LTE Band n41 Aux	LTE Band 48	LTE Band n77
	Calculated Frequency (MHz)	2680	3697	3970
	Maximum power (dBm)	25.0	23.0	25.0
	Maximum rated power(mW)	316.23	199.53	316.23
Bottom Face	Separation distance(mm)	14.75		
	exclusion threshold	35.1	26.0	42.7
	Testing required?	Yes	Yes	Yes
Edge 1	Separation distance(mm)	182.20		
	exclusion threshold	1414.0	1400.0	1397.0
	Testing required?	No	No	No
Edge 2	Separation distance(mm)	22.01		
	exclusion threshold	23.5	17.4	28.6
	Testing required?	Yes	Yes	Yes
Edge 3	Separation distance(mm)	7.02		
	exclusion threshold	73.8	54.7	89.8
	Testing required?	Yes	Yes	Yes
Edge 4	Separation distance(mm)	178.16		
	exclusion threshold	1373.0	1360.0	1357.0
	Testing required?	No	No	No

<WWAN MIMO 1 Antenna>

Exposure Position	Wireless Interface	WCDMA Band IV	WCDMA Band II	LTE Band n66	LTE Band 66	LTE Band n25	LTE Band 25	LTE Band 30	LTE Band 7	LTE Band n7	LTE Band 41	LTE Band n41 MIMO 1
	Calculated Frequency (MHz)	1750	1907	1779	1779	1914	1914	2312	2567	2617	2687	2680
	Maximum power (dBm)	25.0	25.0	25.0	25.0	25.0	25.0	23.0	25.0	25.0	25.0	24.0
	Maximum rated power(mW)	316.23	316.23	316.23	316.23	316.23	316.23	199.53	316.23	316.23	316.23	251.19
Bottom Face	Separation distance(mm)	3.00										
	exclusion threshold	83.7	87.3	84.4	84.4	87.5	87.5	60.7	101.3	102.3	103.7	82.2
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 1	Separation distance(mm)	7.38										
	exclusion threshold	56.7	59.2	57.2	57.2	59.3	59.3	41.1	68.7	69.3	70.2	55.7
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 2	Separation distance(mm)	198.15										
	exclusion threshold	1595.0	1590.0	1594.0	1594.0	1590.0	1590.0	1580.0	1575.0	1574.0	1573.0	1573.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No
Edge 3	Separation distance(mm)	183.97										
	exclusion threshold	1453.0	1448.0	1452.0	1452.0	1448.0	1448.0	1438.0	1433.0	1432.0	1431.0	1431.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No
Edge 4	Separation distance(mm)	39.25										
	exclusion threshold	10.7	11.1	10.8	10.8	11.2	11.2	7.7	12.9	13.0	13.2	10.5
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



17. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
 - c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
 - d. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
 - e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.
4. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in sensor trigger distance was performed according to section 4. The test results just verification the sensor trigger distance to meet KDB 616217 requirement, when in normal usage will not operate at trigger distance, therefore, these results were not using performed Sim-Tx analysis.
5. The device has two Samples and difference is appearance, the appearance of Xpad is based on the addition of a handle above the Xslate edge1, the antenna location was not change, RF exposure evaluation selects Xslate as the main test, Xpad will spot check worst case found in Xslate.

UMTS Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is $\leq 1/4$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than $1/4$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4/B5/B12/B26/B38/B71 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 2/4/5/38 SAR test was covered by Band 25/66/26/41; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. The maximum output power, including tolerance, for the smaller band is \leq the larger band to qualify for the SAR test exclusion.
 - b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

5G NR Note:

1. Referencing the procedure in KDB 941225, the test procedures are outlined as below:
 - a. To start SAR test for the largest channel bandwidth for PI/2 BPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. Also do SAR test for 50% RB allocation for PI/2 BPSK SAR testing using 1RB PI/2 BPSK allocation procedure
 - b. For PI/2 BPSK with 100% RB allocation, SAR test is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
 - c. For higher modulation QPSK/16QAM/64QAM/256QAM, according to tune-up document the power level is not $\frac{1}{2}$ dB higher than the same configuration in PI/2 BPSK, also reported SAR for the PI/2 BPSK configuration is less than 1.45 W/kg, QPSK/16QAM/64QAM/256QAM SAR testing are not required.
 - d. Smaller bandwidth output power for each RB allocation configuration for this device is not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
 - e. For 5G FR1 n5/n12/n41/n71/n77, the maximum channel bandwidth does not support three non-overlapping channels in the frequency band, the middle channel of the group of overlapping channels were selected for testing.
 - f. the 5G NR n2 SAR test was covered by n25; according to TCB workshop, SAR test for overlapping LTE bands can be reduced when the maximum output power including tolerance for the smaller band is \leq the larger band and the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
 - g. Due to test setup limitations, SAR testing for NR was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission. And only for TDD power class2 was performed using Factory Test Mode software to establish the connection and perform SAR with 50% transmission



Table with 17 columns: Plot No., Band, BW (MHz), Modulation, RB Size, RB offset, Test Position, Gap (mm), Power Reduction, Ch., Freq. (MHz), Sample, Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows are categorized by plot number (07, 08, 09, 10) and include various LTE band configurations.



Table with 18 columns: Plot No., Band, BW (MHz), Modulation, RB Size, RB offset, Test Position, Gap (mm), Power Reduction, Ch., Freq. (MHz), Sample, Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include LTE Band 66_MIMO 1 and LTE Band 71_Main configurations.



<TDD LTE SAR>

Table with 19 columns: Plot No., Band, BW (MHz), Modulation, RB Size, RB offset, Test Position, Gap (mm), Power Reduction, Ch., Freq. (MHz), Sample, Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Duty Cycle %, Duty Cycle Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include various LTE bands (41, 41C, 48) and test configurations.



Table with columns: Plot No., Band, BW (MHz), Modulation, RB Size, RB offset, Test Position, Gap (mm), Power Reduction, Ch., Freq. (MHz), Sample, Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include test configurations for bands FR1 n25_MIMO 1, FR1 n66_MIMO 1, and FR1 n71_Main.



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Table with columns: Plot No., Band, BW (MHz), Modulation, RB Size, RB offset, Test Position, Gap (mm), Power Reduction, Ch., Freq. (MHz), Sample, Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include various test configurations for FR1 n41_MIMO 1, FR1 n41_HPUE_MIMO 1, FR1 n41_Aux, and FR1 n77_Aux.



<WLAN SAR>

Table with 17 columns: Plot No., Band, Mode, Test Position, Gap (mm), Antenna, Ch., Freq. (MHz), Sample, Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Duty Cycle %, Duty Cycle Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include WLAN2.4GHz and WLAN5GHz tests with various configurations and SAR values.

<Bluetooth SAR>

Table with 17 columns: Plot No., Band, Mode, Test Position, Gap (mm), Antenna, Ch., Freq. (MHz), Sample, Average Power (dBm), Tune-Up Limit (dBm), Tune-up Scaling Factor, Duty Cycle %, Duty Cycle Scaling Factor, Power Drift (dB), Measured 1g SAR (W/kg), Reported 1g SAR (W/kg). Rows include Bluetooth 1Mbps tests with various configurations and SAR values.



17.2 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 25_MIMO 1	20M	QPSK	1	0	Bottom Face	0mm	ON	26140	1860	Xslate	20.85	21.20	1.084	-0.09	0.862	-	0.934
2nd	LTE Band 25_MIMO 1	20M	QPSK	1	0	Bottom Face	0mm	ON	26140	1860	Xslate	20.85	21.20	1.084	-0.06	0.855	1.01	0.927
1st	LTE Band 30_MIMO 1	10M	QPSK	1	0	Edge 1	0mm	ON	27710	2310	Xslate	17.36	17.70	1.081	-0.18	0.920	-	0.995
2nd	LTE Band 30_MIMO 1	10M	QPSK	1	0	Edge 1	0mm	ON	27710	2310	Xslate	17.36	17.70	1.081	-0.01	0.881	1.04	0.953
1st	LTE Band 66_MIMO 1	20M	QPSK	1	0	Bottom Face	0mm	ON	132572	1770	Xslate	20.08	20.20	1.028	-0.06	0.954	-	0.981
2nd	LTE Band 66_MIMO 1	20M	QPSK	1	0	Bottom Face	0mm	ON	132572	1770	Xslate	20.08	20.20	1.028	-0.02	0.901	1.06	0.926
1st	FR1 n5_Main	20M	BPSK	1	1	Edge 1	0mm	OFF	167300	836.5	Xslate	24.61	25.00	1.094	-0.18	0.996	-	1.090
2nd	FR1 n5_Main	20M	BPSK	1	1	Edge 1	0mm	OFF	167300	836.5	Xslate	24.61	25.00	1.094	-0.05	0.954	1.04	1.044
1st	FR1 n12_Main	15M	BPSK	36	22	Bottom Face	0mm	OFF	141500	707.5	Xpad	24.15	25.00	1.216	-0.06	0.971	-	1.181
2nd	FR1 n12_Main	15M	BPSK	36	22	Bottom Face	0mm	OFF	141500	707.5	Xpad	24.15	25.00	1.216	0.03	0.925	1.05	1.125
1st	FR1 n41_HPUE_MIMO 1	100M	BPSK	135	69	Edge 1	0mm	ON	518598	2592.99	Xslate	18.24	18.30	1.014	-0.11	0.951	-	0.964
2nd	FR1 n41_MIMO 1	100M	BPSK	135	69	Edge 1	0mm	ON	518598	2592.99	Xslate	18.24	18.30	1.014	-0.02	0.866	1.10	0.878
1st	FR1 n77_HPUE_Aux	100M	BPSK	135	69	Edge 3	0mm	ON	656000	3840	Xslate	24.60	24.60	1.000	0.03	1.060	-	1.060
2nd	FR1 n77_HPUE_Aux	100M	BPSK	135	69	Edge 3	0mm	ON	656000	3840	Xslate	24.60	24.60	1.000	0.09	0.998	1.06	0.998

General Note:

- Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.
- Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR < 1.45 W/kg, only one repeated measurement is required.
- The ratio is the difference in percentage between original and repeated *measured* SAR.
- All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

17.3 LTE Band 41 Power Class 2 and Power Class 3 Linearity

This device support Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operation is 43.3% using UL-DL configuration 1. Per FCC Guidance based on the device behavior, all SAR tests were performed using Power Class 3. Power Class 2 is tested using the highest SAR test configuration in Power Class 3 for each LTE configuration and exposure condition combination, according to the highest time averaged power for all applicable uplink-downlink configurations in Power Class 2. When the reported SAR vs. output power is linearly scaled with $< 10\%$ discrepancy between power classes and all reported SAR are < 1.4 W/kg, Separate SAR testing for Power Class 2 is not required

Use PC3 power level and SAR to estimated PC2 SAR linearly, and check if the deviation from the measured PC2 SAR is $< 10\%$

	LTE Band 41_MIMO 1 (Power Class 3)	LTE Band 41_MIMO 1 (Power Class 2)
Maximum Tune up Power (dBm)	18.2	18.8
Reported 1g SAR (W/kg)	0.997	0.749
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	41.82	32.85
Linearity SAR(W/kg)	0.78	
% deviation from expected linearity		-4.35%



17.4 FR1 n41/n77 Power Class 2 and Power Class 3 Linearity

This device support Power Class 2 and Power Class 3 operations for FR1 n41/n77. The highest available duty cycle for Power Class 2 operation is 50% using UL-DL configuration 1. Per FCC Guidance based on the device behavior, all SAR tests were performed using Power Class 3. Power Class 2 is tested using the highest SAR test configuration in Power Class 3 for each FR1 configuration and exposure condition combination, according to the highest time averaged power for all applicable uplink-downlink configurations in Power Class 2. When the reported SAR vs. output power is linearly scaled with < 10% discrepancy between power classes and all reported SAR are < 1.4 W/kg, Separate SAR testing for Power Class 2 is not required. Use PC3 power level and SAR to estimated PC2 SAR linearly, and check if the deviation from the measured PC2 SAR is <10%.

Table with 3 columns: Test Parameters, FR1 n41_MIMO 1 (Power Class 3), and FR1 n41_MIMO 1 (Power Class 2). Rows include Maximum Tune up Power (dBm), Reported 1g SAR (W/kg), Duty Cycle, Frame Averaged (mW), Linearity SAR(W/kg), and % deviation from expected linearity.

Table with 3 columns: Test Parameters, FR1 n41_Aux (Power Class 3), and FR1 n41_Aux (Power Class 2). Rows include Maximum Tune up Power (dBm), Reported 1g SAR (W/kg), Duty Cycle, Frame Averaged (mW), Linearity SAR(W/kg), and % deviation from expected linearity.

Table with 3 columns: Test Parameters, FR1 n77_Aux (Power Class 3), and FR1 n77_Aux (Power Class 2). Rows include Maximum Tune up Power (dBm), Reported 1g SAR (W/kg), Duty Cycle, Frame Averaged (mW), Linearity SAR(W/kg), and % deviation from expected linearity.

18. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Body
1.	WWAN + 2.4GHz WLAN Ant 1 + 2.4GHz WLAN Ant 2	Yes
2.	WWAN + 2.4GHz WLAN Ant 1 + Bluetooth Ant 2	Yes
3.	WWAN + 5GHz WLAN Ant 1 + 5GHz WLAN Ant 2 + Bluetooth Ant 2	Yes

General Note:

1. WLAN RF exposure assessment of MIMO mode simultaneous transmission exclusion analysis was performed with SAR test results of each antenna in SISO mode. Therefore SPLSR calculation was choose worst case with SAR test results of each antenna in SISO mode perform evaluation.
2. The Scaled SAR summation is calculated based on the same configuration and test position from each transmit antenna.
3. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - i) Scalar SAR summation < 1.6W/kg.
 - ii) $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 - iii) If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary.
 - iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
 - v) The SPLSR calculated results please refer to section 18.3.

18.1 5G NR + LTE + WLAN + BT Sim-Tx analysis

In 5G NR + LTE + WLAN + BT simultaneous transmission, 5G NR and LTE transmission are managed and controlled by Qualcomm® Smart Transmit, while the RF exposure from WLAN and BT radios is managed using legacy approach, i.e., through a fixed power back-off if needed.

Since WLAN and BT do not employ time-averaging, 1gSAR and 10gSAR measurement for WLAN and BT need to be conducted at their corresponding rated power following current FCC test procedures to determine reported SAR values.

Smart Transmit current implementation assumes hotspots from 5G NR and LTE are collocated. Therefore, for a total of 100% exposure margin, if LTE uses x%, then the exposure margin left for 5G NR is capped to (100-x)%. Thus, the compliance equation for LTE + 5G NR is

$$x\% * A + (100-x)\% * B \leq 1.0,$$

Where, A is normalized reported time-averaged SAR exposure ratio from LTE, and $A \leq 1.0$; B is normalized reported time-averaged exposure ratio from 5G NR (i.e., PD exposure for 5G FR2 or SAR exposure for 5G FR1), and $B \leq 1.0$.

Let C = normalized reported SAR exposure ratio from WLAN+BT, then for compliance,

$$x\% * A + (100-x)\% * B + C \leq 1.0 \quad (1)$$

$$x\% * A + (100-x)\% * B \leq x\% * \max(A, B) + (100-x)\% * \max(A, B) \leq \max(A, B)$$

$$x\% * A + (100-x)\% * B + C \leq \max(A, B) + C \leq 1.0 \quad (2)$$

if $A + C \leq 1.0$ and $B + C \leq 1.0$ can be proven, then “ $x\% * A + (100-x)\% * B + C \leq 1.0$ ”. Therefore simultaneous transmission analysis for 5G NR + LTE + WLAN + BT can be performed in two steps

- Step 1: Prove total exposure ratio (TER) of LTE + WLAN + BT < 1
- Step 2: Prove total exposure ratio (TER) of 5G NR + WLAN + BT < 1



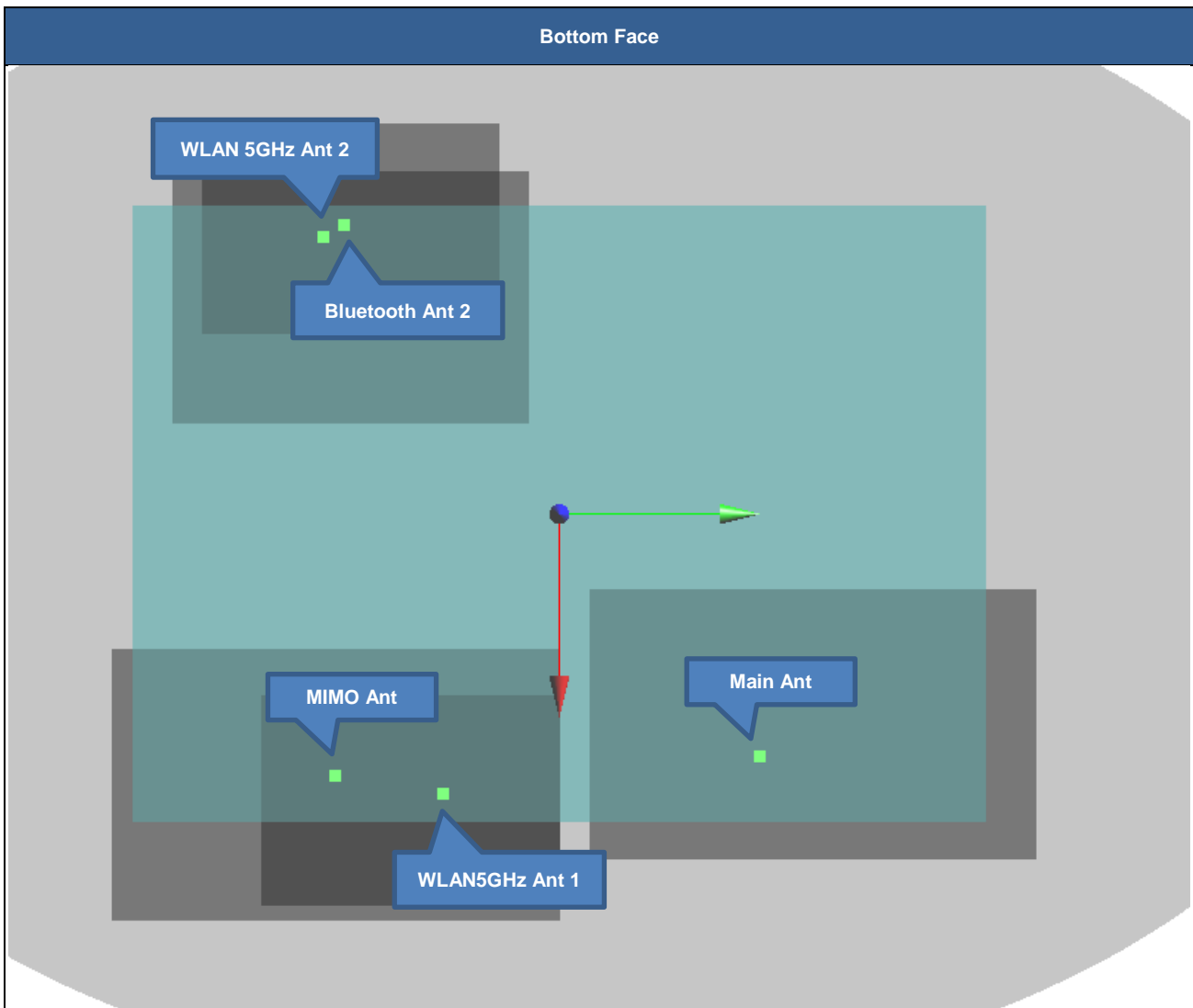
18.2 Body Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	5	6	1+2+3 Summed 1g SAR (W/kg)	1+2+6 Summed 1g SAR (W/kg)	1+4+5+6 Summed 1g SAR (W/kg)	SPLSR	Case No
		WWAN 1g SAR (W/kg)	WLAN2.4GHz Ant 1 1g SAR (W/kg)	WLAN2.4GHz Ant 2 1g SAR (W/kg)	WLAN5GHz Ant 1 1g SAR (W/kg)	WLAN5GHz Ant 2 1g SAR (W/kg)	Bluetooth Ant 2 1g SAR (W/kg)					
MAX MAIN ANT	Bottom Face at 0mm	1.181	0.162	0.124	0.252	0.213	0.019	1.467	1.362	1.665	0.02	Case1
	Edge 1 at 0mm	1.180	0.322		0.506			1.502	1.502	1.686	0.02	Case2
	Edge 2 at 0mm	0.232						0.232	0.232	0.232		
	Edge 3 at 0mm			0.365		0.580	0.071	0.365	0.071	0.651		
	Edge 4 at 0mm							0.000	0.000	0.000		
MAX MIMO ANT	Bottom Face at 0mm	0.993	0.162	0.124	0.252	0.213	0.019	1.279	1.174	1.477	0.04	
	Edge 1 at 0mm	0.997	0.322		0.506			1.319	1.319	1.503		
	Edge 2 at 0mm							0.000	0.000	0.000		
	Edge 3 at 0mm			0.365		0.580	0.071	0.365	0.071	0.651		
	Edge 4 at 0mm	0.281						0.281	0.281	0.281		
MAX AUX ANT	Bottom Face at 0mm	0.412	0.162	0.124	0.252	0.213	0.019	0.698	0.593	0.896		
	Edge 1 at 0mm		0.322		0.506			0.322	0.322	0.506		
	Edge 2 at 0mm	0.124						0.124	0.124	0.124		
	Edge 3 at 0mm	1.179		0.365		0.580	0.071	1.544	1.250	1.830	0.02	Case3
	Edge 4 at 0mm							0.000	0.000	0.000		

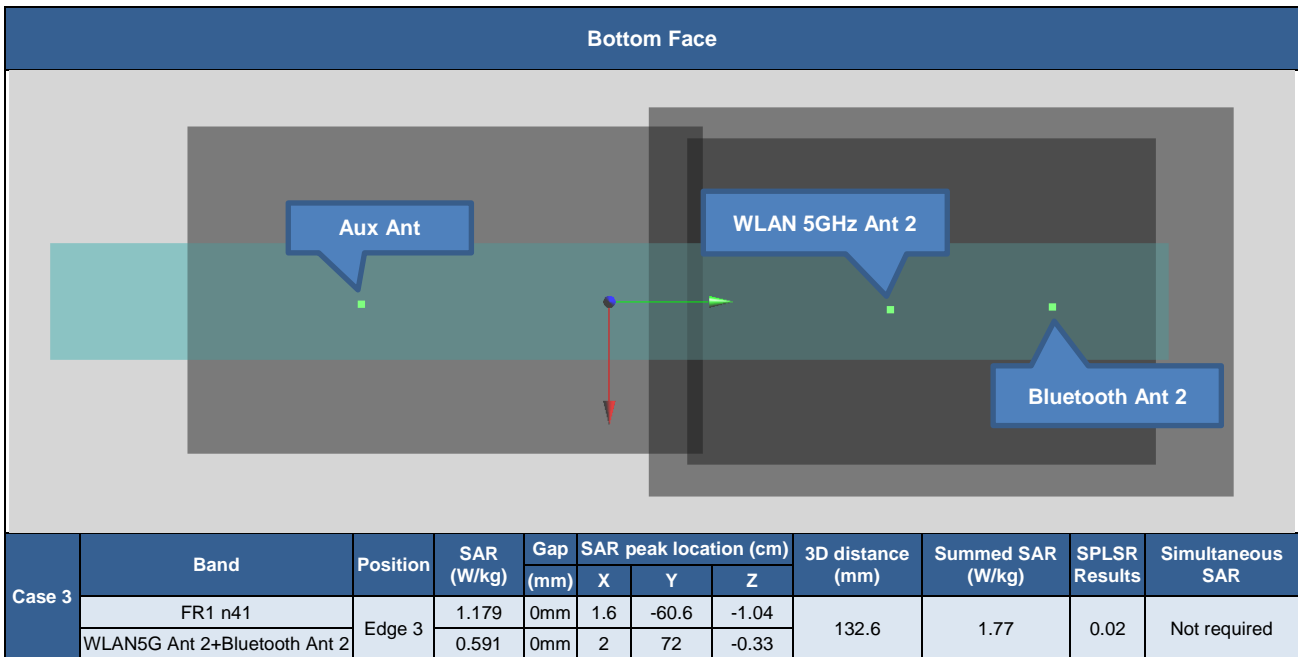
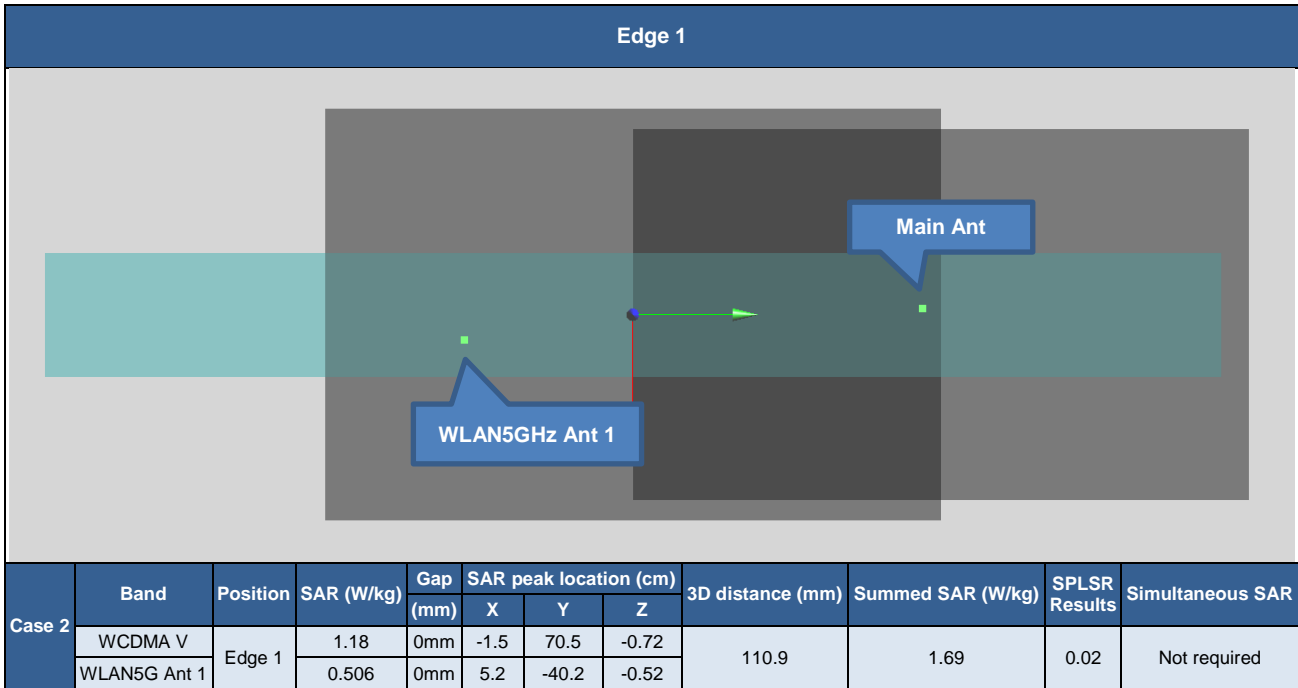
18.3 SPLSR Evaluation and Analysis

General Note:

1. $SPLSR = (SAR_1 + SAR_2)^{1.5} / (min. \text{ separation distance, mm})$. If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary
2. The hotspot point in each exposure condition are showing as below figure and the minimum 3D distance for each sum combination is used for SPLSR analysis.
3. Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneously transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration. Therefore, the adjacent transmit antennas will be summed first, and then the SPLSR calculation will be evaluated with the farther transmitted antennas.



Case 1	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
FR1 n12	WLAN5G Ant 1	Bottom Face	1.181	0mm	82.1	67	-0.12	106.6	1.56	0.02	Not required
			0.383	0mm	93	-39	-0.1				
FR1 n12	WLAN5G Ant 2+Bluetooth Ant 2	Bottom Face	1.181	0mm	82.1	67	-0.12	224.3	1.41	0.01	Not required
			0.232	0mm	-88.8	-78.2	-0.05				
WLAN5G Ant 1	WLAN5G Ant 2+Bluetooth Ant 2	Bottom Face	0.383	0mm	93	-39	-0.1	186.0	0.62	0.00	Not required
			0.232	0mm	-88.8	-78.2	-0.05				



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19. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be $\leq 30\%$, for a confidence interval of $k = 2$. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg. Therefore, the measurement uncertainty table is not required in this report.

Declaration of Conformity:

The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

20. References

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992
- [3] IEEE Std. 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [6] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [7] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [8] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [9] FCC KDB 941225 D05A v01r02, "Rel. 10 LTE SAR Test Guidance and KDB Inquiries", Oct 2015
- [10] FCC KDB 616217 D04 v01r02, "SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers", Oct 2015
- [11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [12] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.