FCC SAR TEST REPORT

FCC ID	:	VUIMD100
Equipment	:	Module
Brand Name	:	PEGATRON
Model Name	:	MD100-Q62
Applicant	:	PEGATRON CORPORATION 5F., NO. 76, LIGONG ST., BEITOU DISTRICT,TAIPEI CITY,Taiwan
Standard	:	FCC 47 CFR Part 2 (2.1093)

The product was received on Feb. 24, 2023 and testing was started from Mar. 20, 2023 and completed on Apr. 17, 2023. 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. Laboratory, the test report shall not be reproduced except in full.

Cona Huang

Approved by: Cona Huang / Deputy Manager

Sporton International Inc. EMC & Wireless Communications Laboratory
No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FA2O0623-01B	01	Initial issue of report	May 24, 2023

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for **PEGATRON CORPORATION, Module, MD100-Q62**, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary Body (Separation 5mm) 1g SAR (W/kg)
Licensed	LTE	LTE Band 2	1.19
		LTE Band 5	1.07
		LTE Band 12	1.13
		LTE Band 13	1.17
		LTE Band 30	1.20
		LTE Band 4/66	1.11
		LTE Band 71	1.13
		LTE Band 41	1.03
		LTE Band 48	1.18
	FR1	FR1 n5	1.18
		FR1 n12	1.19
		FR1 n14	1.17
		FR1 n2/n25	1.10
		FR1 n30	1.17
		FR1 n66	1.18
		FR1 n70	1.06
		FR1 n71	1.18
		FR1 n41	1.19
		FR1 n48	1.18
		FR1 n77	1.18
Date of Testing:			2023/3/20 ~ 2023/4/17

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation 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: Daisy Peng

2. 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 447498 D02 SAR Procedures for Dongle Xmtr v02r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Module
Brand Name	PEGATRON
Model Name	MD100-Q62
FCC ID	VUIMD100
Wireless Technology and Frequency Range	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 30: 2305 MHz ~ 2315 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 n12 : 699 MHz ~ 716 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n70 : 1695 MHz ~ 1710 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz
Mode	LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM
EUT Stage	Production Unit
Remark: 1. The device implements the power management for SAR compliance and the Qualcomm smart transmit will manage to ensure the power level not exceeding the associated power table	

Host Information	
Equipment Name	5G Dongle
Brand Name	PEGATRON
Model Name	MD100-Q62

3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	VUIMD100
Equipment Name	Module
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 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 30: 2305 MHz ~ 2315 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 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 30: 5MHz, 10MHz 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	**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3** 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
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.
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to section 12.
LTE Carrier Aggregation Additional Information	This device supports maximum of 5 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	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)

L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 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
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 13

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		

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 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
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593
HM	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
LM	55810	3607	55815	3607.5	55820	3608	55830	3609
MH	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

3.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information	
FCC ID	VUIMD100
Equipment Name	Module
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 n12: 699 MHz ~ 716 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n25: 1850 MHz ~ 1915 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n70 : 1695 MHz ~ 1710 MHz 5G NR n71: 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz
Channel Bandwidth	5G NR n2: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n5: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n12: 5MHz, 10MHz, 15MHz 5G NR n14: 5MHz, 10MHz 5G NR n25: 5MHz, 10MHz, 15MHz, 20MHz, 25 MHz 30MHz, 40MHz 5G NR n30: 5MHz, 10MHz 5G NR n41: 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz 5G NR n48: 10MHz, 20MHz, 40MHz 5G NR n66: 5MHz, 10MHz, 15MHz, 20MHz, 30MHz, 40MHz 5G NR n70: 5MHz, 10MHz, 15MHz 5G NR n71: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n77: 10MHz, 15MHz, 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 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 B5/12/13/30/48/66
LTE Anchor Bands for n5	LTE B2/12/13/30/48/66
LTE Anchor Bands for n25	LTE B2/12/66/48
LTE Anchor Bands for n41	LTE B2/66
LTE Anchor Bands for n66	LTE B2/5/12/13/30/48
LTE Anchor Bands for n71	LTE B2/66
LTE Anchor Bands for n77	LTE B2/5/12/13/30/66

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 12

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	140300	701.5	140800	704	141300	706.5
M	141500	707.5	141500	707.5	141500	707.5
H	142700	713.5	142200	711	141700	708.5

NR Band 14				
	Bandwidth 5MHz		Bandwidth 10MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	158100	790.5	158600	793
M	158600	793		
H	159100	795.5		

NR Band 25														
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860	372500	1862.5	373000	1865	374000	1870
M	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5
H	382500	1912.5	382000	1910	381500	1907.5	381000	1905	380500	1902.5	380000	1900	379000	1895

NR Band 30				
	Bandwidth 5MHz		Bandwidth 10MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	461500	2307.5	462000	2310
M	462000	2310		
H	462500	2312.5		

NR Band 41																		
	Bandwidth20MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	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	506202	2531.01	507204	2536.02	508200	2541	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	518598	2592.99	518598	2592.99
H	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	531000	2655	529998	2649.99	528996	2644.98	528000	2640

NR Band 48						
	Bandwidth10MHz		Bandwidth20MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	637000	3555	637334	3560.01	638000	3570
M	641666	3624.99	641666	3624.99	641666	3624.99
H	646332	3694.98	646000	3690	645332	3679.98

NR Band 66												
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz	
	Ch. #	Freq.(MHz)	Ch. #	Freq.(MHz)	Ch. #	Freq.(MHz)	Ch. #	Freq.(MHz)	Ch. #	Freq.(MHz)	Ch. #	Freq.(MHz)
L	342500	1712.5	343000	1715	343500	1717.5	344000	1720	345000	1725	346000	1730
M	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745
H	355500	1777.5	355000	1775	354500	1772.5	354000	1770	353000	1765	352000	1760

NR Band 70						
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	339500	1697.5	340000	1700	340500	1702.5
M	340500	1702.5	340500	1702.5		
H	341500	1707.5	341000	1705		

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																				
	Bandwidth10MHz		Bandwidth15MHz		Bandwidth 20MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	647000	3705	647168	3707.52	647334	3710.01	647668	3715.02	648000	3720	648334	3725.01	648668	3730.02	649000	3735	649334	3740.01	649668	3745.02	650000	3750
M	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840
H	665000	3975	664832	3972.48	664666	3969.99	664332	3964.98	664000	3960	663666	3954.99	663332	3949.98	663000	3945	662666	3939.99	662332	3934.98	662000	3930

4. 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.

4.1 SAR design target and uncertainty

<SAR design target and uncertainty>

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

Band	Antenna	Device Uncertainty (dB)	1g SAR design target (W/kg)
LTE Band 2	0	1.5	0.85
LTE Band 2	3	1.5	0.85
LTE Band 5	3	1.5	0.85
LTE Band 12	3	1.5	0.85
LTE Band 13	3	1.5	0.85
LTE Band 30	0	1.5	0.85
LTE Band 66/4	0	1.5	0.85
LTE Band 66	3	1.5	0.85
LTE Band 71	3	1.5	0.85
LTE Band 41(PC3)	0	1.5	0.85
LTE Band 41(PC2)	0	1.5	0.85
LTE Band B48	0	1	0.95
FR1 n5	0	1.5	0.85
FR1 n5	3	1.5	0.85
FR1 n12	3	1.5	0.85
FR1 n14	3	1.5	0.85
FR1 n25 / FR1 n2	0	1.5	0.85
FR1 n25 / FR1 n2	3	1.5	0.85
FR1 n30	0	1.5	0.85
FR1 n66	0	1.5	0.85
FR1 n66	3	1.5	0.85
FR1 n70	0	1.5	0.85
FR1 n71	3	1.5	0.85
FR1 n41(PC3)	0	1.5	0.85
FR1 n41(PC2)	0	1.5	0.85
FR1 n41(PC3)	3	1.5	0.85
FR1 n41(PC2)	3	1.5	0.85
FR1 n48	0	1	0.95
FR1 n77(PC3)	0	1.5	0.85
FR1 n77(PC2)	0	1.5	0.85
FR1 n77(PC3)	3	1.5	0.85
FR1 n77(PC2)	3	1.5	0.85

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)>

*P_{max} is used for RF tune up procedure. The maximum allowed output power is equal to Pmax + 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} + device uncertainty, and if P_{limit} is higher than P_{max}, the device output power will be P_{max} instead.

Band	Antenna	TDD duty cycle	Plimit**	Pmax * (dBm)
			Body	
LTE Band 2	0	100.00%	19.1	23.0
LTE Band 2	3	100.00%	20.5	23.0
LTE Band 5	3	100.00%	23.4	23.0
LTE Band 12	3	100.00%	23.2	23.0
LTE Band 13	3	100.00%	22.1	23.0
LTE Band 30	0	100.00%	18.5	23.0
LTE Band 66/4	0	100.00%	19.3	23.0
LTE Band 66	3	100.00%	23.3	23.0
LTE Band 71	3	100.00%	23.2	23.0
LTE Band 41(PC3)	0	63.30%	13.1	21.0
LTE Band 41(PC2)	0	43.30%		21.4
LTE Band B48	0	63.30%	16.7	18.5
FR1 n5	0	100.00%	26.4	21.5
FR1 n5	3	100.00%	22.7	23.5
FR1 n12	3	100.00%	22.8	23.0
FR1 n14	3	100.00%	23.1	23.0
FR1 n25 / FR1 n2	0	100.00%	19.0	23.0
FR1 n25 / FR1 n2	3	100.00%	21.2	23.0
FR1 n30	0	100.00%	19.2	23.0
FR1 n66	0	100.00%	19.9	23.0
FR1 n66	3	100.00%	22.3	23.0
FR1 n70	0	100.00%	21.9	23.0
FR1 n71	3	100.00%	22.9	23.0
FR1 n41(PC3)	0	100.00%	14.5	23.0
FR1 n41(PC2)	0	50.00%		21.5
FR1 n41(PC3)	3	100.00%	16.7	23.0
FR1 n41(PC2)	3	50.00%		21.5
FR1 n48	0	100.00%	16.5	21.0
FR1 n77(PC3)	0	100.00%	15.4	21.8
FR1 n77(PC2)	0	50.00%		21.2
FR1 n77(PC3)	3	100.00%	15.6	21.8
FR1 n77(PC2)	3	50.00%		21.2

5. RF Exposure Limits

5.1 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.

5.2 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.

6. Specific Absorption Rate (SAR)

6.1 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.

6.2 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:

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

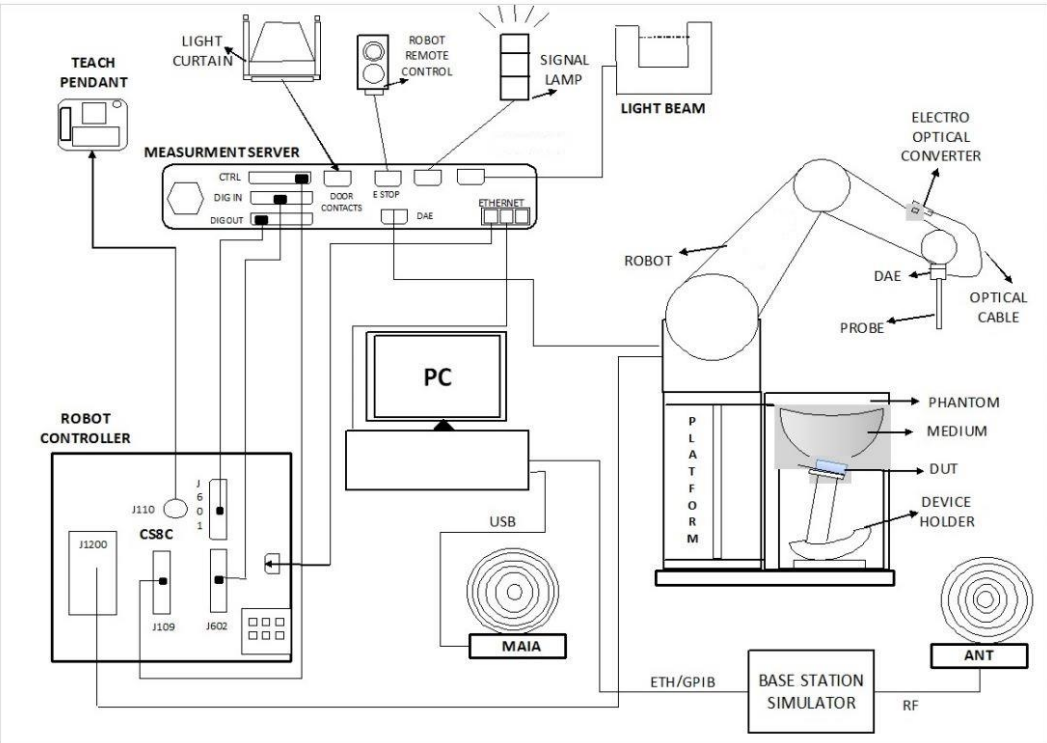
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



- The DASY system in 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 DASY 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.

7.1 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.

Test Site	EMC & Wireless Communications Laboratory		Wensan Laboratory		
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 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	SAR16-HY
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	SAR17-HY

7.2 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 µW/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 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/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	

7.3 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.

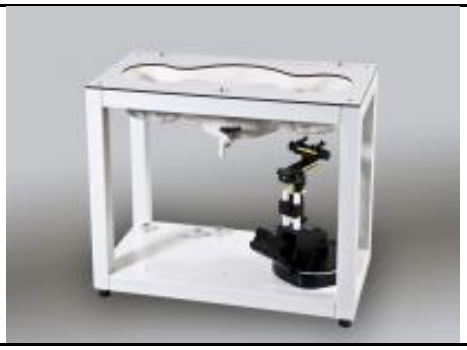
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

7.4 Phantom

<SAM Twin Phantom>

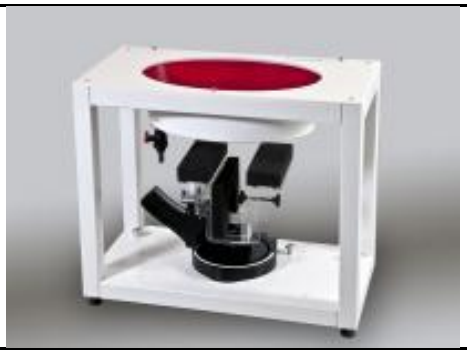
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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.

7.5 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

8. Measurement Procedures

The measurement procedures are as follows:

(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

8.1 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 form 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

8.2 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.

8.3 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 dB0 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	½·δ·ln(2) ± 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: Δx_{Area}, Δy_{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.	

8.4 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: Δx_{Zoom}, Δy_{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 1st 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	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
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 *reported* SAR from the *area scan based 1-g SAR estimation* 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.

8.5 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.

8.6 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.

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1107	Jun. 22, 2022	Jun. 21, 2023
SPEAG	835MHz System Validation Kit	D835V2	4d167	Nov. 24, 2022	Nov. 23, 2023
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 21, 2022	Nov. 20, 2023
SPEAG	1900MHz System Validation Kit	D1900V2	5d185	Jun. 17, 2022	Jun. 16, 2023
SPEAG	2300MHz System Validation Kit(2)	D2300V2	1006	Jan. 18, 2022	Jan. 16, 2024
SPEAG	2600MHz System Validation Kit(2)	D2600V2	1008	Aug. 17, 2021	Aug. 15, 2023
SPEAG	3500MHz System Validation Kit(2)	D3500V2	1014	Jan. 17, 2022	Jan. 15, 2024
SPEAG	3700MHz System Validation Kit	D3700V2	1006	Jun. 20, 2022	Jun. 19, 2023
SPEAG	3700MHz System Validation Kit(2)	D3700V2	1022	Jul. 14, 2021	Jul. 12, 2023
SPEAG	3900MHz System Validation Kit	D3900V2	1017	Apr. 22, 2022	Apr. 21, 2023
SPEAG	Data Acquisition Electronics	DAE4	376	Oct. 19, 2022	Oct. 18, 2023
SPEAG	Data Acquisition Electronics	DAE4	853	Jul. 20, 2022	Jul. 19, 2023
SPEAG	Data Acquisition Electronics	DAE4	1512	Mar. 20, 2023	Mar. 19, 2024
SPEAG	Data Acquisition Electronics	DAE4	1694	Nov. 18, 2022	Nov. 17, 2023
SPEAG	Dosimetric E-Field Probe	ES3DV3	3184	Sep. 26, 2022	Sep. 25, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	3728	Mar. 22, 2023	Mar. 21, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7306	Jul. 28, 2022	Jul. 27, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7439	Feb. 21, 2023	Feb. 20, 2024
Testo	Hygro meter	608-H1	45196600	Nov. 02, 2022	Nov. 01, 2023
Testo	Hygro meter	608-H1	45207528	Nov. 02, 2022	Nov. 01, 2023
RCPTWN	Thermometer	HTC-1	TM685-1	Jun. 27, 2022	Jun. 26, 2023
RCPTWN	Thermometer	HTC-1	TM560-2	Mar. 21, 2023	Mar. 20, 2024
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Oct. 31, 2022	Oct. 30, 2023
Keysight	Wireless Communication Test Set	E5515C	MY50266977	May. 10, 2022	May. 09, 2023
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Oct. 12, 2022	Oct. 11, 2023
Keysight	ENA Network Analyzer	E5071C	MY46104758	Sep. 22, 2022	Sep. 21, 2023
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 28, 2022	Sep. 27, 2023
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3796	Jan. 13, 2023	Jan. 12, 2024
Anritsu	Power Meter	ML2495A	1419002	Aug. 16, 2022	Aug. 15, 2023
Anritsu	Power Sensor	MA2411B	1911176	Aug. 16, 2022	Aug. 15, 2023
Anritsu	Power Meter	ML2495A	1804003	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Power Sensor	MA2411B	1726150	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 21, 2022	Jul. 20, 2023
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 10, 2023	Jan. 09, 2024
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 14, 2022	Oct. 13, 2023
Mini-Circuits	Power Amplifier	ZVE-8G+	479102029	Sep. 15, 2022	Sep. 14, 2023
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.

10. System Verification

10.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18℃ to 25℃, 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℃ to 25℃ and within ± 2℃ 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. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	22.6	0.883	42.119	0.89	41.90	-0.79	0.52	±5	2023/3/21
835	22.5	0.920	42.710	0.90	41.50	2.22	2.92	±5	2023/3/20
1750	22.7	1.356	40.599	1.37	40.10	-1.02	1.24	±5	2023/3/22
1750	22.6	1.371	40.079	1.37	40.10	0.07	-0.05	±5	2023/3/25
1900	22.4	1.437	40.789	1.40	40.00	2.64	1.97	±5	2023/3/23
1900	22.5	1.431	40.733	1.40	40.00	2.21	1.83	±5	2023/4/16
2300	22.3	1.611	39.067	1.67	39.50	-3.53	-1.10	±5	2023/3/24
2300	22.5	1.644	39.238	1.67	39.50	-1.56	-0.66	±5	2023/4/16
2600	22.4	1.958	39.111	1.96	39.00	-0.10	0.28	±5	2023/4/17
3500	22.3	2.954	38.005	2.91	37.90	1.51	0.28	±5	2023/3/27
3500	22.3	2.890	37.833	2.91	37.90	-0.69	-0.18	±5	2023/4/15
3500	22.5	2.944	37.958	2.91	37.90	1.17	0.15	±5	2023/4/16
3700	22.3	3.097	37.750	3.12	37.70	-0.74	0.13	±5	2023/3/27
3700	22.5	3.087	37.704	3.12	37.70	-1.06	0.01	±5	2023/4/16
3900	22.3	3.297	37.372	3.33	37.51	-0.99	-0.37	±5	2023/4/15

10.2 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.

Date	Frequency (MHz)2	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 (%)	Test Site
2023/3/21	750	250	D750V3-1107	ES3DV3 - SN3184	DAE4 Sn376	2.140	8.540	8.56	0.23	SAR03
2023/3/20	835	250	D835V2-4d167	ES3DV3 - SN3184	DAE4 Sn376	2.470	9.800	9.88	0.82	SAR03
2023/3/22	1750	250	D1750V2-1068	ES3DV3 - SN3184	DAE4 Sn376	8.860	36.700	35.44	-3.43	SAR03
2023/3/25	1750	250	D1750V2-1068	ES3DV3 - SN3184	DAE4 Sn376	8.320	36.700	33.28	-9.32	SAR03
2023/3/23	1900	250	D1900V2-5d185	ES3DV3 - SN3184	DAE4 Sn376	10.100	39.000	40.4	3.59	SAR03
2023/4/16	1900	250	D1900V2-5d185	ES3DV3 - SN3184	DAE4 Sn376	9.140	39.000	36.56	-6.26	SAR03
2023/3/24	2300	250	D2300V2-1006	ES3DV3 - SN3184	DAE4 Sn376	11.300	48.300	45.2	-6.42	SAR03
2023/4/16	2300	50	D2300V2-1006	ES3DV3 - SN3184	DAE4 Sn376	2.320	48.300	46.4	-3.93	SAR03
2023/4/17	2600	50	D2600V2-1008	ES3DV3 - SN3184	DAE4 Sn376	2.840	58.000	56.8	-2.07	SAR03
2023/3/27	3500	100	D3500V2-1014	EX3DV4 - SN7439	DAE4 Sn853	6.260	67.200	62.6	-6.85	SAR04
2023/4/15	3500	100	D3500V2-1014	EX3DV4 - SN7306	DAE4 Sn1694	6.240	67.200	62.4	-7.14	SAR05
2023/4/16	3500	100	D3500V2-1014	EX3DV4 - SN3728	DAE4 Sn1512	7.010	67.200	70.1	4.32	SAR06
2023/3/27	3700	50	D3700V2-1006	EX3DV4 - SN7439	DAE4 Sn853	3.090	65.600	61.8	-5.79	SAR04
2023/4/16	3700	100	D3700V2-1022	EX3DV4 - SN3728	DAE4 Sn1512	7.270	68.200	72.7	6.60	SAR06
2023/4/15	3900	50	D3900V2-1017-3900	EX3DV4 - SN7306	DAE4 Sn1694	3.450	68.700	69	0.44	SAR05

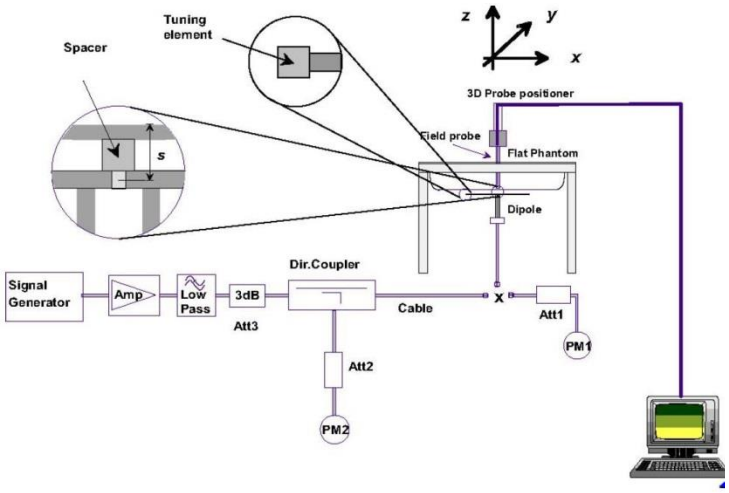


Fig 8.3.1 System Performance Check Setup

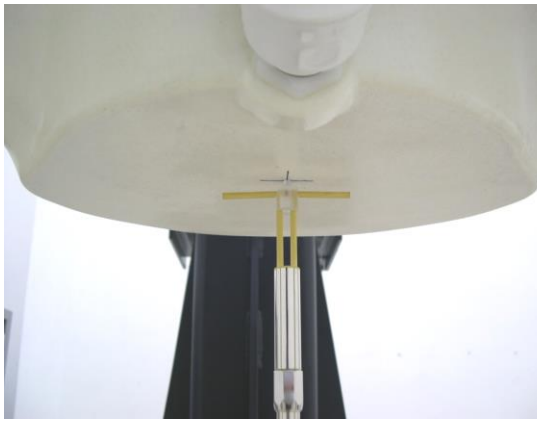


Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 SAR Testing for USB Dongle

Test all USB orientations [see figure below: (A) Horizontal-Up, (B) Horizontal-Down, (C) Vertical-Front, and (D) Vertical-Back] with a device-to-phantom separation distance of 5 mm or less, according to KDB Publication 447498 D02 requirements. These test orientations are intended for the exposure conditions found in typical laptop/notebook/netbook or tablet computers with either horizontal or vertical USB connector configurations at various locations in the keyboard section of the computer. Current generation portable host computers should be used to establish the required SAR measurement separation distance. The same test separation distance must be used to test all frequency bands and modes in each USB orientation. The typical Horizontal-Up USB connection (A), found in the majority of host computers, must be tested using an appropriate host computer. A host computer with either Vertical-Front (C) or Vertical Back (D) USB connection should be used to test one of the vertical USB orientations. If a suitable host computer is not available for testing the Horizontal-Down (B) or the remaining Vertical USB orientation, a high quality USB cable, 12 inches or less, may be used for testing these other orientations. It must be documented that the USB cable does not influence the radiating characteristics and output power of the transmitter.

			
Configuration 1 (Horizontal Up)	Configuration 2 (Horizontal Down)	Configuration 3 (Vertical Front)	Configuration 4 (Vertical Back)

12. LTE Output Power (Unit: dBm)

<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 ½ 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 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; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4/B5/B12/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 4 SAR test was covered by Band 66; 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 ≤ 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

<LTE Band 2 _Ant 0>

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	20.25	20.33	20.32	20.6
20	QPSK	1	49	19.99	20.01	19.96	
20	QPSK	1	99	19.92	20.01	20.04	
20	QPSK	50	0	19.13	19.20	19.19	19.6
20	QPSK	50	24	19.11	19.07	19.15	
20	QPSK	50	50	18.92	19.06	19.17	
20	QPSK	100	0	19.03	19.16	19.15	
20	16QAM	1	0	19.27	19.14	19.28	19.6
20	16QAM	1	49	19.51	19.15	19.57	
20	16QAM	1	99	19.36	18.98	19.56	
20	16QAM	50	0	18.08	17.99	18.19	18.6
20	16QAM	50	24	18.05	18.06	18.26	
20	16QAM	50	50	17.94	17.96	18.14	
20	16QAM	100	0	18.04	18.05	18.26	
20	64QAM	1	0	18.51	18.16	17.94	18.6
20	64QAM	1	49	17.94	18.32	18.56	
20	64QAM	1	99	17.97	18.08	18.56	
20	64QAM	50	0	17.06	17.04	17.15	17.6
20	64QAM	50	24	17.12	17.07	17.25	
20	64QAM	50	50	17.01	17.01	17.18	
20	64QAM	100	0	17.01	17.07	17.07	
20	256QAM	1	0	15.01	15.04	15.11	15.6
20	256QAM	1	49	15.10	15.09	15.23	
20	256QAM	1	99	15.00	15.01	15.16	
20	256QAM	50	0	15.01	15.06	15.06	15.6
20	256QAM	50	24	15.04	15.08	15.11	
20	256QAM	50	50	15.03	15.01	15.24	
20	256QAM	100	0	15.09	15.07	15.17	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	19.86	19.91	20.15	20.6
15	QPSK	1	37	19.95	19.84	19.93	
15	QPSK	1	74	19.75	19.92	19.96	
15	QPSK	36	0	19.01	18.94	19.13	19.6
15	QPSK	36	20	19.10	19.01	19.22	
15	QPSK	36	39	18.75	18.97	19.17	
15	QPSK	75	0	18.91	19.00	19.14	
15	16QAM	1	0	19.07	19.07	19.25	19.6
15	16QAM	1	37	19.81	18.99	19.41	
15	16QAM	1	74	19.23	18.78	19.49	
15	16QAM	36	0	17.89	17.85	18.10	18.6
15	16QAM	36	20	17.92	17.92	18.10	
15	16QAM	36	39	17.93	17.94	18.13	
15	16QAM	75	0	17.88	17.88	18.06	
15	64QAM	1	0	18.47	18.16	17.74	18.6
15	64QAM	1	37	17.91	18.24	18.79	
15	64QAM	1	74	17.84	18.01	18.47	
15	64QAM	36	0	16.90	16.99	17.05	17.6
15	64QAM	36	20	17.09	16.88	17.23	
15	64QAM	36	39	16.94	16.92	17.06	
15	64QAM	75	0	16.81	16.87	16.88	
15	256QAM	1	0	14.84	14.85	15.09	15.6
15	256QAM	1	37	14.95	14.94	15.14	
15	256QAM	1	74	14.90	14.86	15.14	
15	256QAM	36	0	14.85	14.98	14.93	15.6
15	256QAM	36	20	14.89	15.07	15.07	

15	256QAM	36	39	14.94	14.95	15.13	
15	256QAM	75	0	15.09	14.99	15.08	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	20.01	19.85	20.25	20.6
10	QPSK	1	25	19.88	19.96	19.96	
10	QPSK	1	49	19.87	19.97	19.98	
10	QPSK	25	0	18.89	18.86	19.08	19.6
10	QPSK	25	12	19.02	19.02	19.17	
10	QPSK	25	25	18.76	18.95	19.01	
10	QPSK	50	0	18.87	19.06	19.05	
10	16QAM	1	0	19.21	19.07	19.11	19.6
10	16QAM	1	25	18.56	19.07	19.40	
10	16QAM	1	49	19.36	18.88	19.40	
10	16QAM	25	0	17.91	17.88	18.15	18.6
10	16QAM	25	12	18.05	18.03	18.07	
10	16QAM	25	25	17.90	17.81	17.97	
10	16QAM	50	0	17.90	18.01	18.09	
10	64QAM	1	0	18.40	18.01	17.85	18.6
10	64QAM	1	25	17.91	18.30	18.60	
10	64QAM	1	49	17.93	17.96	18.56	
10	64QAM	25	0	17.03	16.94	17.13	17.6
10	64QAM	25	12	17.11	17.05	17.20	
10	64QAM	25	25	16.85	16.83	17.05	
10	64QAM	50	0	16.97	17.04	17.01	
10	256QAM	1	0	14.92	14.94	14.91	15.6
10	256QAM	1	25	14.91	15.00	15.20	
10	256QAM	1	49	14.93	14.96	15.16	
10	256QAM	25	0	14.98	15.02	15.06	15.6
10	256QAM	25	12	14.87	15.07	15.04	
10	256QAM	25	25	14.85	14.85	15.09	
10	256QAM	50	0	14.89	14.92	15.01	
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	19.99	19.87	20.20	20.6
5	QPSK	1	12	19.97	19.95	19.79	
5	QPSK	1	24	19.85	19.85	20.00	
5	QPSK	12	0	18.90	18.80	19.07	19.6
5	QPSK	12	7	19.11	19.04	19.31	
5	QPSK	12	13	18.84	18.99	19.07	
5	QPSK	25	0	18.89	18.95	19.05	
5	16QAM	1	0	19.22	19.04	19.21	19.6
5	16QAM	1	12	18.55	18.95	19.57	
5	16QAM	1	24	19.27	18.85	19.41	
5	16QAM	12	0	17.91	17.88	18.10	18.6
5	16QAM	12	7	18.02	17.97	18.08	
5	16QAM	12	13	17.81	17.96	17.98	
5	16QAM	25	0	17.94	18.03	18.14	
5	64QAM	1	0	18.44	17.98	17.79	18.6
5	64QAM	1	12	17.85	18.12	18.60	
5	64QAM	1	24	17.92	17.91	18.39	
5	64QAM	12	0	16.92	16.85	17.11	17.6
5	64QAM	12	7	17.11	16.97	17.06	
5	64QAM	12	13	16.83	16.91	17.09	
5	64QAM	25	0	16.81	16.93	17.01	
5	256QAM	1	0	14.93	14.98	14.95	15.6
5	256QAM	1	12	15.04	14.95	15.04	
5	256QAM	1	24	14.85	14.97	15.16	
5	256QAM	12	0	14.82	15.05	14.90	15.6
5	256QAM	12	7	14.92	15.07	14.99	
5	256QAM	12	13	14.92	14.87	15.24	
5	256QAM	25	0	15.07	14.92	15.02	
Channel				18615	18900	19185	

Frequency (MHz)				1851.5	1880	1908.5	Tune-up limit (dBm)
3	QPSK	1	0	19.92	19.84	20.27	20.6
3	QPSK	1	8	19.99	19.97	19.88	
3	QPSK	1	14	19.86	19.82	19.94	
3	QPSK	8	0	18.86	18.88	19.11	19.6
3	QPSK	8	4	19.11	18.95	19.31	
3	QPSK	8	7	18.86	18.91	19.08	
3	QPSK	15	0	18.94	19.13	19.00	
3	16QAM	1	0	19.21	18.94	19.24	19.6
3	16QAM	1	8	18.59	19.11	19.46	
3	16QAM	1	14	19.18	18.98	19.47	
3	16QAM	8	0	18.06	17.80	18.07	18.6
3	16QAM	8	4	17.94	18.01	18.11	
3	16QAM	8	7	17.91	17.83	18.03	
3	16QAM	15	0	17.97	17.94	18.14	
3	64QAM	1	0	18.36	18.05	17.75	18.6
3	64QAM	1	8	17.86	18.21	18.59	
3	64QAM	1	14	17.77	17.88	18.44	
3	64QAM	8	0	16.86	16.86	17.09	17.6
3	64QAM	8	4	16.92	16.92	17.13	
3	64QAM	8	7	16.92	16.95	17.13	
3	64QAM	15	0	16.94	17.03	16.89	
3	256QAM	1	0	14.97	14.96	15.10	15.6
3	256QAM	1	8	14.92	15.03	15.03	
3	256QAM	1	14	14.85	14.81	15.11	
3	256QAM	8	0	14.92	14.98	15.06	15.6
3	256QAM	8	4	14.87	14.93	14.97	
3	256QAM	8	7	14.94	14.96	15.15	
3	256QAM	15	0	14.90	14.95	15.17	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	19.85	19.72	20.20	20.6
1.4	QPSK	1	3	19.82	19.99	19.94	
1.4	QPSK	1	5	19.80	20.01	20.03	
1.4	QPSK	3	0	19.87	19.76	20.18	
1.4	QPSK	3	1	19.97	19.94	19.83	
1.4	QPSK	3	3	19.79	19.82	19.92	
1.4	QPSK	6	0	19.03	18.82	19.05	19.6
1.4	16QAM	1	0	19.08	18.99	19.30	19.6
1.4	16QAM	1	3	18.77	18.95	19.14	
1.4	16QAM	1	5	19.01	19.14	19.01	
1.4	16QAM	3	0	19.21	18.97	19.15	
1.4	16QAM	3	1	18.59	19.12	19.38	
1.4	16QAM	3	3	19.33	18.97	19.52	
1.4	16QAM	6	0	17.88	17.99	18.08	18.6
1.4	64QAM	1	0	17.94	17.86	18.07	18.6
1.4	64QAM	1	3	17.80	17.82	17.97	
1.4	64QAM	1	5	17.97	17.88	18.24	
1.4	64QAM	3	0	18.34	18.06	17.83	
1.4	64QAM	3	1	17.74	18.32	18.56	
1.4	64QAM	3	3	17.79	18.08	18.48	
1.4	64QAM	6	0	16.86	16.91	16.98	17.6
1.4	256QAM	1	0	14.88	14.86	14.96	15.6
1.4	256QAM	1	3	14.92	15.02	15.06	
1.4	256QAM	1	5	14.94	14.97	14.99	
1.4	256QAM	3	0	14.89	14.88	15.03	
1.4	256QAM	3	1	14.85	15.06	15.07	
1.4	256QAM	3	3	14.99	14.83	15.05	
1.4	256QAM	6	0	14.93	14.88	14.98	15.6

<LTE Band 2 _Ant 3>

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	21.50	21.56	21.70	22
20	QPSK	1	49	21.29	21.49	21.35	
20	QPSK	1	99	21.29	21.47	21.47	
20	QPSK	50	0	21.55	21.57	21.60	22
20	QPSK	50	24	21.35	21.55	21.48	
20	QPSK	50	50	21.39	21.52	21.38	
20	QPSK	100	0	21.54	21.57	21.37	
20	16QAM	1	0	21.52	21.64	21.48	22
20	16QAM	1	49	21.58	21.57	21.55	
20	16QAM	1	99	21.46	21.66	21.53	
20	16QAM	50	0	21.66	21.66	21.63	22
20	16QAM	50	24	21.67	21.51	21.50	
20	16QAM	50	50	21.54	21.62	21.60	
20	16QAM	100	0	21.65	21.40	21.67	
20	64QAM	1	0	21.41	21.50	21.35	22
20	64QAM	1	49	21.29	21.46	21.40	
20	64QAM	1	99	21.24	21.43	21.35	
20	64QAM	50	0	20.52	20.62	20.52	22
20	64QAM	50	24	20.66	20.72	20.54	
20	64QAM	50	50	20.40	20.51	20.53	
20	64QAM	100	0	20.52	20.55	20.51	
20	256QAM	1	0	18.42	18.59	18.59	19
20	256QAM	1	49	18.52	18.58	18.51	
20	256QAM	1	99	18.29	18.47	18.32	
20	256QAM	50	0	18.43	18.60	18.43	19
20	256QAM	50	24	18.50	18.62	18.61	
20	256QAM	50	50	18.35	18.51	18.47	
20	256QAM	100	0	18.65	18.67	18.47	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	21.50	21.37	21.56	22
15	QPSK	1	37	21.28	21.39	21.21	
15	QPSK	1	74	21.29	21.34	21.28	
15	QPSK	36	0	21.39	21.44	21.41	22
15	QPSK	36	20	21.19	21.51	21.47	
15	QPSK	36	39	21.21	21.50	21.38	
15	QPSK	75	0	21.36	21.51	21.26	
15	16QAM	1	0	21.35	21.58	21.32	22
15	16QAM	1	37	21.55	21.51	21.35	
15	16QAM	1	74	21.37	21.66	21.41	
15	16QAM	36	0	21.51	21.63	21.48	22
15	16QAM	36	20	21.49	21.42	21.38	
15	16QAM	36	39	21.54	21.54	21.60	
15	16QAM	75	0	21.58	21.33	21.53	
15	64QAM	1	0	21.32	21.44	21.26	22
15	64QAM	1	37	21.26	21.34	21.38	
15	64QAM	1	74	21.13	21.27	21.19	
15	64QAM	36	0	20.49	20.50	20.33	22
15	64QAM	36	20	20.61	20.59	20.35	
15	64QAM	36	39	20.24	20.41	20.35	
15	64QAM	75	0	20.35	20.53	20.40	
15	256QAM	1	0	18.22	18.41	18.58	19
15	256QAM	1	37	18.43	18.43	18.43	
15	256QAM	1	74	18.18	18.39	18.28	
15	256QAM	36	0	18.23	18.55	18.23	19

15	256QAM	36	20	18.43	18.42	18.59	
15	256QAM	36	39	18.24	18.43	18.46	
15	256QAM	75	0	18.50	18.58	18.31	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	21.42	21.54	21.66	22
10	QPSK	1	25	21.27	21.48	21.18	
10	QPSK	1	49	21.25	21.43	21.41	
10	QPSK	25	0	21.50	21.41	21.53	22
10	QPSK	25	12	21.28	21.46	21.40	
10	QPSK	25	25	21.36	21.37	21.37	
10	QPSK	50	0	21.48	21.52	21.27	
10	16QAM	1	0	21.42	21.60	21.47	22
10	16QAM	1	25	21.51	21.52	21.35	
10	16QAM	1	49	21.26	21.55	21.41	
10	16QAM	25	0	21.63	21.50	21.54	22
10	16QAM	25	12	21.61	21.36	21.40	
10	16QAM	25	25	21.41	21.43	21.54	
10	16QAM	50	0	21.46	21.35	21.54	
10	64QAM	1	0	21.40	21.30	21.28	22
10	64QAM	1	25	21.25	21.34	21.26	
10	64QAM	1	49	21.21	21.29	21.19	
10	64QAM	25	0	20.40	20.46	20.46	22
10	64QAM	25	12	20.49	20.57	20.42	
10	64QAM	25	25	20.29	20.49	20.42	
10	64QAM	50	0	20.40	20.42	20.47	
10	256QAM	1	0	18.27	18.52	18.49	19
10	256QAM	1	25	18.52	18.50	18.43	
10	256QAM	1	49	18.21	18.46	18.32	
10	256QAM	25	0	18.29	18.45	18.30	19
10	256QAM	25	12	18.35	18.53	18.54	
10	256QAM	25	25	18.32	18.49	18.36	
10	256QAM	50	0	18.45	18.54	18.34	
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	21.68	21.52	21.55	22
5	QPSK	1	12	21.09	21.37	21.34	
5	QPSK	1	24	21.29	21.40	21.28	
5	QPSK	12	0	21.37	21.55	21.48	22
5	QPSK	12	7	21.30	21.52	21.36	
5	QPSK	12	13	21.24	21.38	21.36	
5	QPSK	25	0	21.37	21.41	21.18	
5	16QAM	1	0	21.42	21.48	21.32	22
5	16QAM	1	12	21.57	21.56	21.45	
5	16QAM	1	24	21.28	21.66	21.45	
5	16QAM	12	0	21.54	21.51	21.52	22
5	16QAM	12	7	21.59	21.31	21.42	
5	16QAM	12	13	21.42	21.61	21.43	
5	16QAM	25	0	21.60	21.22	21.54	
5	64QAM	1	0	21.25	21.47	21.34	22
5	64QAM	1	12	21.19	21.38	21.35	
5	64QAM	1	24	21.11	21.35	21.28	
5	64QAM	12	0	20.33	20.56	20.42	22
5	64QAM	12	7	20.46	20.60	20.40	
5	64QAM	12	13	20.23	20.40	20.41	
5	64QAM	25	0	20.36	20.41	20.32	
5	256QAM	1	0	18.23	18.48	18.47	19
5	256QAM	1	12	18.45	18.44	18.35	
5	256QAM	1	24	18.15	18.41	18.26	
5	256QAM	12	0	18.28	18.50	18.28	19
5	256QAM	12	7	18.47	18.46	18.42	
5	256QAM	12	13	18.32	18.49	18.34	
5	256QAM	25	0	18.49	18.66	18.38	

Channel				18615	18900	19185	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	21.64	21.68	21.57	22
3	QPSK	1	8	21.18	21.41	21.34	
3	QPSK	1	14	21.14	21.38	21.37	
3	QPSK	8	0	21.45	21.50	21.56	22
3	QPSK	8	4	21.19	21.37	21.40	
3	QPSK	8	7	21.22	21.39	21.30	
3	QPSK	15	0	21.42	21.56	21.22	
3	16QAM	1	0	21.35	21.52	21.28	22
3	16QAM	1	8	21.53	21.48	21.37	
3	16QAM	1	14	21.40	21.56	21.50	
3	16QAM	8	0	21.63	21.52	21.56	22
3	16QAM	8	4	21.62	21.40	21.38	
3	16QAM	8	7	21.54	21.44	21.46	
3	16QAM	15	0	21.51	21.34	21.59	
3	64QAM	1	0	21.31	21.49	21.32	22
3	64QAM	1	8	21.09	21.45	21.21	
3	64QAM	1	14	21.23	21.23	21.19	
3	64QAM	8	0	20.43	20.57	20.50	22
3	64QAM	8	4	20.65	20.58	20.45	
3	64QAM	8	7	20.24	20.43	20.49	
3	64QAM	15	0	20.35	20.49	20.40	
3	256QAM	1	0	18.38	18.47	18.52	19
3	256QAM	1	8	18.41	18.52	18.45	
3	256QAM	1	14	18.16	18.39	18.32	
3	256QAM	8	0	18.23	18.49	18.40	19
3	256QAM	8	4	18.31	18.62	18.44	
3	256QAM	8	7	18.28	18.51	18.40	
3	256QAM	15	0	18.51	18.49	18.47	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	21.50	21.68	21.69	22
1.4	QPSK	1	3	21.28	21.47	21.19	
1.4	QPSK	1	5	21.20	21.32	21.41	
1.4	QPSK	3	0	21.52	21.55	21.48	
1.4	QPSK	3	1	21.25	21.42	21.39	
1.4	QPSK	3	3	21.33	21.42	21.20	
1.4	QPSK	6	0	21.38	21.54	21.19	22
1.4	16QAM	1	0	21.42	21.51	21.30	22
1.4	16QAM	1	3	21.50	21.57	21.36	
1.4	16QAM	1	5	21.37	21.54	21.38	
1.4	16QAM	3	0	21.57	21.56	21.51	
1.4	16QAM	3	1	21.61	21.46	21.31	
1.4	16QAM	3	3	21.49	21.59	21.44	
1.4	16QAM	6	0	21.61	21.22	21.64	22
1.4	64QAM	1	0	21.36	21.48	21.34	22
1.4	64QAM	1	3	21.28	21.34	21.35	
1.4	64QAM	1	5	21.14	21.29	21.18	
1.4	64QAM	3	0	20.33	20.58	20.39	
1.4	64QAM	3	1	20.63	20.71	20.52	
1.4	64QAM	3	3	20.20	20.37	20.35	
1.4	64QAM	6	0	20.33	20.54	20.40	22
1.4	256QAM	1	0	18.36	18.52	18.59	19
1.4	256QAM	1	3	18.33	18.41	18.42	
1.4	256QAM	1	5	18.24	18.33	18.18	
1.4	256QAM	3	0	18.23	18.59	18.25	
1.4	256QAM	3	1	18.31	18.48	18.59	
1.4	256QAM	3	3	18.35	18.41	18.43	
1.4	256QAM	6	0	18.57	18.58	18.37	19

<LTE Band 4_Ant 0>

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	
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	20.41	20.50	20.43	20.8
20	QPSK	1	49	20.46	20.45	20.48	
20	QPSK	1	99	20.31	20.35	20.33	
20	QPSK	50	0	20.43	20.47	20.45	20.8
20	QPSK	50	24	20.42	20.46	20.44	
20	QPSK	50	50	20.39	20.43	20.41	
20	QPSK	100	0	20.38	20.42	20.40	
20	16QAM	1	0	20.28	20.32	20.30	20.8
20	16QAM	1	49	20.32	20.36	20.34	
20	16QAM	1	99	20.21	20.25	20.23	
20	16QAM	50	0	20.36	20.40	20.38	20.8
20	16QAM	50	24	20.42	20.46	20.44	
20	16QAM	50	50	20.40	20.44	20.42	
20	16QAM	100	0	20.43	20.47	20.45	
20	64QAM	1	0	20.19	20.23	20.21	20.8
20	64QAM	1	49	20.26	20.30	20.28	
20	64QAM	1	99	20.24	20.28	20.26	
20	64QAM	50	0	20.43	20.47	20.45	20.8
20	64QAM	50	24	20.45	20.49	20.47	
20	64QAM	50	50	20.44	20.48	20.46	
20	64QAM	100	0	20.42	20.46	20.44	
20	256QAM	1	0	18.58	18.62	18.60	19.8
20	256QAM	1	49	18.74	18.78	18.76	
20	256QAM	1	99	18.56	18.60	18.58	
20	256QAM	50	0	18.88	18.92	18.90	19.8
20	256QAM	50	24	18.92	18.96	18.94	
20	256QAM	50	50	18.90	18.94	18.92	
20	256QAM	100	0	18.89	18.93	18.91	
Channel				20025	20175	20325	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	20.39	20.44	20.42	20.8
15	QPSK	1	37	20.43	20.41	20.46	
15	QPSK	1	74	20.27	20.32	20.28	
15	QPSK	36	0	20.41	20.43	20.39	20.8
15	QPSK	36	20	20.35	20.40	20.43	
15	QPSK	36	39	20.36	20.37	20.37	
15	QPSK	75	0	20.37	20.39	20.30	
15	16QAM	1	0	20.26	20.26	20.24	20.8
15	16QAM	1	37	20.28	20.36	20.34	
15	16QAM	1	74	20.14	20.17	20.14	
15	16QAM	36	0	20.26	20.31	20.33	20.8
15	16QAM	36	20	20.40	20.39	20.38	
15	16QAM	36	39	20.30	20.43	20.39	
15	16QAM	75	0	20.40	20.40	20.35	
15	64QAM	1	0	20.11	20.13	20.14	20.8
15	64QAM	1	37	20.24	20.20	20.25	
15	64QAM	1	74	20.16	20.19	20.21	
15	64QAM	36	0	20.35	20.45	20.36	20.8
15	64QAM	36	20	20.38	20.41	20.42	
15	64QAM	36	39	20.34	20.44	20.45	
15	64QAM	75	0	20.34	20.42	20.37	
15	256QAM	1	0	18.54	18.53	18.57	19.8
15	256QAM	1	37	18.68	18.72	18.68	
15	256QAM	1	74	18.46	18.54	18.58	
15	256QAM	36	0	18.79	18.83	18.90	19.8

15	256QAM	36	20	18.84	18.91	18.89	
15	256QAM	36	39	18.87	18.85	18.90	
15	256QAM	75	0	18.81	18.88	18.86	
Channel				20000	20175	20350	Tune-up limit (dBm)
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	20.41	20.39	20.40	20.8
10	QPSK	1	25	20.42	20.45	20.45	
10	QPSK	1	49	20.28	20.33	20.29	
10	QPSK	25	0	20.33	20.41	20.43	20.8
10	QPSK	25	12	20.35	20.43	20.43	
10	QPSK	25	25	20.36	20.37	20.32	
10	QPSK	50	0	20.32	20.38	20.39	
10	16QAM	1	0	20.23	20.24	20.26	20.8
10	16QAM	1	25	20.22	20.27	20.26	
10	16QAM	1	49	20.21	20.21	20.20	
10	16QAM	25	0	20.32	20.39	20.36	20.8
10	16QAM	25	12	20.39	20.45	20.43	
10	16QAM	25	25	20.40	20.43	20.34	
10	16QAM	50	0	20.34	20.47	20.38	
10	64QAM	1	0	20.18	20.21	20.21	20.8
10	64QAM	1	25	20.20	20.23	20.28	
10	64QAM	1	49	20.17	20.18	20.20	
10	64QAM	25	0	20.43	20.43	20.38	20.8
10	64QAM	25	12	20.35	20.49	20.45	
10	64QAM	25	25	20.34	20.45	20.37	
10	64QAM	50	0	20.40	20.44	20.36	
10	256QAM	1	0	18.50	18.57	18.50	19.8
10	256QAM	1	25	18.70	18.71	18.76	
10	256QAM	1	49	18.47	18.50	18.52	
10	256QAM	25	0	18.87	18.86	18.80	19.8
10	256QAM	25	12	18.82	18.96	18.86	
10	256QAM	25	25	18.90	18.93	18.82	
10	256QAM	50	0	18.86	18.93	18.85	
Channel				19975	20175	20375	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	20.35	20.40	20.38	20.8
5	QPSK	1	12	20.39	20.49	20.48	
5	QPSK	1	24	20.24	20.27	20.26	
5	QPSK	12	0	20.33	20.41	20.35	20.8
5	QPSK	12	7	20.41	20.44	20.37	
5	QPSK	12	13	20.35	20.35	20.35	
5	QPSK	25	0	20.36	20.34	20.35	
5	16QAM	1	0	20.28	20.26	20.28	20.8
5	16QAM	1	12	20.30	20.31	20.25	
5	16QAM	1	24	20.16	20.19	20.17	
5	16QAM	12	0	20.30	20.30	20.29	20.8
5	16QAM	12	7	20.40	20.46	20.35	
5	16QAM	12	13	20.32	20.42	20.39	
5	16QAM	25	0	20.42	20.39	20.38	
5	64QAM	1	0	20.10	20.21	20.21	20.8
5	64QAM	1	12	20.19	20.28	20.24	
5	64QAM	1	24	20.22	20.22	20.16	
5	64QAM	12	0	20.38	20.37	20.41	20.8
5	64QAM	12	7	20.42	20.44	20.42	
5	64QAM	12	13	20.38	20.39	20.46	
5	64QAM	25	0	20.35	20.42	20.39	
5	256QAM	1	0	18.52	18.54	18.53	19.8
5	256QAM	1	12	18.64	18.75	18.68	
5	256QAM	1	24	18.49	18.57	18.56	
5	256QAM	12	0	18.85	18.83	18.85	19.8
5	256QAM	12	7	18.86	18.91	18.90	
5	256QAM	12	13	18.90	18.87	18.85	
5	256QAM	25	0	18.86	18.91	18.91	

Channel				19965	20175	20385	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	20.38	20.42	20.34	20.8
3	QPSK	1	8	20.40	20.40	20.48	
3	QPSK	1	14	20.21	20.32	20.31	
3	QPSK	8	0	20.41	20.46	20.35	20.8
3	QPSK	8	4	20.33	20.40	20.39	
3	QPSK	8	7	20.35	20.36	20.33	
3	QPSK	15	0	20.29	20.36	20.31	
3	16QAM	1	0	20.25	20.31	20.25	20.8
3	16QAM	1	8	20.22	20.35	20.26	
3	16QAM	1	14	20.20	20.19	20.15	
3	16QAM	8	0	20.31	20.37	20.34	20.8
3	16QAM	8	4	20.32	20.44	20.34	
3	16QAM	8	7	20.30	20.38	20.42	
3	16QAM	15	0	20.40	20.43	20.43	
3	64QAM	1	0	20.19	20.14	20.12	20.8
3	64QAM	1	8	20.20	20.27	20.23	
3	64QAM	1	14	20.17	20.19	20.26	
3	64QAM	8	0	20.36	20.41	20.44	20.8
3	64QAM	8	4	20.42	20.45	20.42	
3	64QAM	8	7	20.39	20.40	20.43	
3	64QAM	15	0	20.36	20.43	20.34	
3	256QAM	1	0	18.50	18.58	18.59	19.8
3	256QAM	1	8	18.65	18.70	18.73	
3	256QAM	1	14	18.55	18.52	18.48	
3	256QAM	8	0	18.83	18.84	18.90	19.8
3	256QAM	8	4	18.87	18.88	18.90	
3	256QAM	8	7	18.81	18.87	18.85	
3	256QAM	15	0	18.85	18.89	18.87	
Channel				19957	20175	20393	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	20.35	20.44	20.34	20.8
1.4	QPSK	1	3	20.44	20.46	20.39	
1.4	QPSK	1	5	20.30	20.34	20.26	
1.4	QPSK	3	0	20.39	20.40	20.44	
1.4	QPSK	3	1	20.39	20.39	20.40	
1.4	QPSK	3	3	20.36	20.33	20.36	
1.4	QPSK	6	0	20.31	20.39	20.32	20.8
1.4	16QAM	1	0	20.22	20.32	20.26	20.8
1.4	16QAM	1	3	20.28	20.32	20.32	
1.4	16QAM	1	5	20.21	20.25	20.18	
1.4	16QAM	3	0	20.33	20.31	20.33	
1.4	16QAM	3	1	20.39	20.43	20.39	
1.4	16QAM	3	3	20.36	20.43	20.41	
1.4	16QAM	6	0	20.40	20.40	20.38	20.8
1.4	64QAM	1	0	20.19	20.19	20.18	20.8
1.4	64QAM	1	3	20.21	20.27	20.24	
1.4	64QAM	1	5	20.17	20.24	20.23	
1.4	64QAM	3	0	20.38	20.42	20.41	
1.4	64QAM	3	1	20.45	20.47	20.42	
1.4	64QAM	3	3	20.37	20.43	20.42	
1.4	64QAM	6	0	20.35	20.45	20.44	20.8
1.4	256QAM	1	0	18.58	18.59	18.53	19.8
1.4	256QAM	1	3	18.73	18.78	18.73	
1.4	256QAM	1	5	18.46	18.55	18.57	
1.4	256QAM	3	0	18.84	18.83	18.88	
1.4	256QAM	3	1	18.92	18.86	18.87	
1.4	256QAM	3	3	18.80	18.93	18.91	
1.4	256QAM	6	0	18.83	18.89	18.91	19.8

<LTE Band 5_Ant 3>

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	
Frequency (MHz)				829	836.5	844	
10	QPSK	1	0	22.71	22.74	22.68	24.5
10	QPSK	1	25	22.69	22.67	22.61	
10	QPSK	1	49	22.66	22.65	22.55	
10	QPSK	25	0	21.82	21.86	21.72	23.5
10	QPSK	25	12	21.80	21.70	21.64	
10	QPSK	25	25	21.79	21.76	21.69	
10	QPSK	50	0	21.70	21.72	21.64	
10	16QAM	1	0	22.05	22.02	21.90	23.5
10	16QAM	1	25	22.05	22.02	21.87	
10	16QAM	1	49	22.11	22.00	22.09	
10	16QAM	25	0	20.74	20.68	20.63	22.5
10	16QAM	25	12	20.81	20.70	20.65	
10	16QAM	25	25	20.79	20.76	20.69	
10	16QAM	50	0	20.80	20.70	20.60	
10	64QAM	1	0	20.93	20.85	20.78	22.5
10	64QAM	1	25	20.85	20.91	20.84	
10	64QAM	1	49	20.96	20.91	20.85	
10	64QAM	25	0	19.73	19.70	19.62	21.5
10	64QAM	25	12	19.81	19.71	19.66	
10	64QAM	25	25	19.78	19.77	19.70	
10	64QAM	50	0	19.79	19.68	19.64	
10	256QAM	1	0	18.10	18.25	18.13	19.5
10	256QAM	1	25	18.03	18.34	18.22	
10	256QAM	1	49	18.05	18.33	18.24	
10	256QAM	25	0	18.16	18.18	18.27	19.5
10	256QAM	25	12	18.22	18.14	18.31	
10	256QAM	25	25	18.01	18.16	18.21	
10	256QAM	50	0	17.99	18.22	18.20	
Channel				20425	20525	20625	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	QPSK	1	0	22.71	22.69	22.59	24.5
5	QPSK	1	12	22.62	22.67	22.53	
5	QPSK	1	24	22.58	22.62	22.55	
5	QPSK	12	0	21.64	21.62	21.58	23.5
5	QPSK	12	7	21.79	21.62	21.55	
5	QPSK	12	13	21.75	21.76	21.64	
5	QPSK	25	0	21.81	21.61	21.58	
5	16QAM	1	0	21.99	21.98	21.83	23.5
5	16QAM	1	12	21.99	22.00	21.83	
5	16QAM	1	24	22.04	21.93	22.05	
5	16QAM	12	0	20.71	20.62	20.62	22.5
5	16QAM	12	7	20.75	20.70	20.63	
5	16QAM	12	13	20.69	20.66	20.59	
5	16QAM	25	0	20.78	20.69	20.51	
5	64QAM	1	0	20.87	20.77	20.70	22.5
5	64QAM	1	12	20.81	20.84	20.81	
5	64QAM	1	24	20.96	20.83	20.80	
5	64QAM	12	0	19.63	19.61	19.59	21.5
5	64QAM	12	7	19.78	19.61	19.58	
5	64QAM	12	13	19.74	19.72	19.65	
5	64QAM	25	0	19.71	19.58	19.60	
5	256QAM	1	0	18.10	18.23	18.12	19.5
5	256QAM	1	12	18.01	18.28	18.13	
5	256QAM	1	24	18.03	18.24	18.19	
5	256QAM	12	0	18.14	18.10	18.20	19.5
5	256QAM	12	7	18.14	18.12	18.24	

5	256QAM	12	13	17.91	18.08	18.13	
5	256QAM	25	0	17.98	18.13	18.10	
Channel				20415	20525	20635	Tune-up limit (dBm)
Frequency (MHz)				825.5	836.5	847.5	
3	QPSK	1	0	22.70	22.72	22.60	24.5
3	QPSK	1	8	22.67	22.58	22.57	
3	QPSK	1	14	22.62	22.64	22.53	
3	QPSK	8	0	21.67	21.64	21.54	23.5
3	QPSK	8	4	21.80	21.69	21.56	
3	QPSK	8	7	21.77	21.70	21.66	
3	QPSK	15	0	21.73	21.59	21.56	
3	16QAM	1	0	22.05	22.01	21.89	23.5
3	16QAM	1	8	21.95	22.01	21.83	
3	16QAM	1	14	22.02	22.00	22.04	
3	16QAM	8	0	20.73	20.62	20.56	22.5
3	16QAM	8	4	20.76	20.65	20.65	
3	16QAM	8	7	20.75	20.71	20.67	
3	16QAM	15	0	20.73	20.68	20.50	
3	64QAM	1	0	20.86	20.82	20.69	22.5
3	64QAM	1	8	20.78	20.81	20.74	
3	64QAM	1	14	20.86	20.91	20.78	
3	64QAM	8	0	19.72	19.64	19.55	21.5
3	64QAM	8	4	19.81	19.61	19.63	
3	64QAM	8	7	19.73	19.75	19.65	
3	64QAM	15	0	19.77	19.61	19.59	
3	256QAM	1	0	18.02	18.25	18.13	19.5
3	256QAM	1	8	17.96	18.33	18.22	
3	256QAM	1	14	18.04	18.29	18.22	
3	256QAM	8	0	18.14	18.14	18.23	19.5
3	256QAM	8	4	18.17	18.11	18.29	
3	256QAM	8	7	17.98	18.15	18.21	
3	256QAM	15	0	17.96	18.20	18.10	
Channel				20407	20525	20643	Tune-up limit (dBm)
Frequency (MHz)				824.7	836.5	848.3	
1.4	QPSK	1	0	22.70	22.68	22.66	24.5
1.4	QPSK	1	3	22.71	22.64	22.53	
1.4	QPSK	1	5	22.56	22.55	22.54	
1.4	QPSK	3	0	22.69	22.66	22.68	
1.4	QPSK	3	1	22.64	22.63	22.53	
1.4	QPSK	3	3	22.57	22.62	22.50	
1.4	QPSK	6	0	21.80	21.58	21.59	23.5
1.4	16QAM	1	0	21.99	21.96	21.86	23.5
1.4	16QAM	1	3	22.03	21.94	21.83	
1.4	16QAM	1	5	22.03	21.94	22.04	
1.4	16QAM	3	0	21.99	21.96	21.86	
1.4	16QAM	3	1	22.04	21.95	21.82	
1.4	16QAM	3	3	22.02	21.95	22.01	
1.4	16QAM	6	0	20.80	20.70	20.59	22.5
1.4	64QAM	1	0	20.91	20.84	20.77	22.5
1.4	64QAM	1	3	20.82	20.81	20.77	
1.4	64QAM	1	5	20.94	20.91	20.76	
1.4	64QAM	3	0	20.83	20.76	20.74	
1.4	64QAM	3	1	20.79	20.86	20.79	
1.4	64QAM	3	3	20.90	20.83	20.77	
1.4	64QAM	6	0	19.78	19.58	19.60	21.5
1.4	256QAM	1	0	18.02	18.24	18.12	19.5
1.4	256QAM	1	3	17.95	18.34	18.15	
1.4	256QAM	1	5	17.98	18.24	18.21	
1.4	256QAM	3	0	18.09	18.15	18.10	
1.4	256QAM	3	1	17.97	18.25	18.17	
1.4	256QAM	3	3	17.99	18.26	18.18	
1.4	256QAM	6	0	17.94	18.19	18.18	19.5

<LTE Band 12_Ant 3>

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	
Frequency (MHz)				704	707.5	711	
10	QPSK	1	0	22.81	22.89	22.83	24.5
10	QPSK	1	25	22.77	22.87	22.78	
10	QPSK	1	49	22.84	22.82	22.83	
10	QPSK	25	0	21.92	21.93	21.90	23.5
10	QPSK	25	12	21.90	21.87	21.92	
10	QPSK	25	25	21.92	21.90	21.90	
10	QPSK	50	0	21.92	21.93	21.92	
10	16QAM	1	0	22.29	22.19	22.32	23.5
10	16QAM	1	25	22.20	22.20	22.27	
10	16QAM	1	49	22.30	22.22	22.21	
10	16QAM	25	0	20.85	20.86	20.86	22.5
10	16QAM	25	12	20.96	20.88	20.94	
10	16QAM	25	25	20.92	20.91	20.91	
10	16QAM	50	0	20.95	20.86	20.90	
10	64QAM	1	0	21.06	20.97	21.07	22.5
10	64QAM	1	25	21.05	21.10	21.11	
10	64QAM	1	49	21.12	21.09	21.08	
10	64QAM	25	0	19.83	19.85	19.84	21.5
10	64QAM	25	12	19.94	19.86	19.92	
10	64QAM	25	25	19.95	19.92	19.91	
10	64QAM	50	0	19.95	19.85	19.89	
10	256QAM	1	0	18.09	18.22	18.22	19.5
10	256QAM	1	25	18.01	18.30	18.25	
10	256QAM	1	49	18.05	18.28	18.28	
10	256QAM	25	0	18.10	18.17	18.24	19.5
10	256QAM	25	12	18.21	18.14	18.29	
10	256QAM	25	25	18.04	18.13	18.21	
10	256QAM	50	0	17.94	18.24	18.11	
Channel				23035	23095	23155	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	QPSK	1	0	22.89	22.87	22.86	24.5
5	QPSK	1	12	22.74	22.77	22.70	
5	QPSK	1	24	22.74	22.74	22.79	
5	QPSK	12	0	21.78	21.82	21.83	23.5
5	QPSK	12	7	21.88	21.87	21.87	
5	QPSK	12	13	21.90	21.80	21.82	
5	QPSK	25	0	21.89	21.85	21.90	
5	16QAM	1	0	22.19	22.19	22.26	23.5
5	16QAM	1	12	22.18	22.18	22.17	
5	16QAM	1	24	22.24	22.20	22.17	
5	16QAM	12	0	20.75	20.83	20.78	22.5
5	16QAM	12	7	20.89	20.88	20.93	
5	16QAM	12	13	20.92	20.86	20.87	
5	16QAM	25	0	20.89	20.76	20.85	
5	64QAM	1	0	21.03	20.97	21.03	22.5
5	64QAM	1	12	21.04	21.06	21.04	
5	64QAM	1	24	21.08	21.08	21.05	
5	64QAM	12	0	19.75	19.77	19.78	21.5
5	64QAM	12	7	19.87	19.77	19.91	
5	64QAM	12	13	19.85	19.83	19.91	
5	64QAM	25	0	19.92	19.84	19.89	
5	256QAM	1	0	18.04	18.21	18.16	19.5
5	256QAM	1	12	17.94	18.30	18.23	
5	256QAM	1	24	17.98	18.23	18.28	
5	256QAM	12	0	18.03	18.16	18.15	19.5

5	256QAM	12	7	18.20	18.10	18.21	
5	256QAM	12	13	17.97	18.10	18.16	
5	256QAM	25	0	17.94	18.17	18.03	
Channel				23025	23095	23165	Tune-up limit (dBm)
Frequency (MHz)				700.5	707.5	714.5	
3	QPSK	1	0	22.88	22.88	22.92	24.5
3	QPSK	1	8	22.73	22.82	22.73	
3	QPSK	1	14	22.74	22.73	22.73	
3	QPSK	8	0	21.77	21.73	21.74	23.5
3	QPSK	8	4	21.90	21.81	21.90	
3	QPSK	8	7	21.84	21.81	21.87	
3	QPSK	15	0	21.88	21.81	21.83	
3	16QAM	1	0	22.25	22.17	22.31	23.5
3	16QAM	1	8	22.18	22.10	22.26	
3	16QAM	1	14	22.25	22.20	22.11	
3	16QAM	8	0	20.85	20.79	20.86	22.5
3	16QAM	8	4	20.96	20.81	20.87	
3	16QAM	8	7	20.86	20.87	20.81	
3	16QAM	15	0	20.94	20.83	20.88	
3	64QAM	1	0	21.04	20.95	21.02	22.5
3	64QAM	1	8	21.04	21.04	21.06	
3	64QAM	1	14	21.09	21.08	21.08	
3	64QAM	8	0	19.83	19.78	19.78	21.5
3	64QAM	8	4	19.87	19.84	19.89	
3	64QAM	8	7	19.86	19.91	19.84	
3	64QAM	15	0	19.92	19.85	19.87	
3	256QAM	1	0	18.01	18.16	18.12	19.5
3	256QAM	1	8	17.93	18.23	18.25	
3	256QAM	1	14	17.99	18.22	18.19	
3	256QAM	8	0	18.07	18.14	18.18	19.5
3	256QAM	8	4	18.17	18.04	18.22	
3	256QAM	8	7	17.98	18.10	18.15	
3	256QAM	15	0	17.87	18.16	18.06	
Channel				23017	23095	23173	Tune-up limit (dBm)
Frequency (MHz)				699.7	707.5	715.3	
1.4	QPSK	1	0	22.94	22.88	22.86	24.5
1.4	QPSK	1	3	22.70	22.85	22.78	
1.4	QPSK	1	5	22.83	22.80	22.79	
1.4	QPSK	3	0	22.91	22.83	22.87	
1.4	QPSK	3	1	22.68	22.83	22.74	
1.4	QPSK	3	3	22.78	22.79	22.73	
1.4	QPSK	6	0	21.83	21.79	21.82	23.5
1.4	16QAM	1	0	22.20	22.18	22.26	23.5
1.4	16QAM	1	3	22.17	22.20	22.22	
1.4	16QAM	1	5	22.26	22.18	22.18	
1.4	16QAM	3	0	22.23	22.19	22.28	
1.4	16QAM	3	1	22.10	22.14	22.21	
1.4	16QAM	3	3	22.24	22.18	22.13	
1.4	16QAM	6	0	20.94	20.83	20.81	22.5
1.4	64QAM	1	0	21.02	20.93	21.01	22.5
1.4	64QAM	1	3	20.99	21.05	21.04	
1.4	64QAM	1	5	21.11	21.03	21.08	
1.4	64QAM	3	0	20.98	20.90	21.02	
1.4	64QAM	3	1	21.05	21.09	21.10	
1.4	64QAM	3	3	21.12	21.06	21.07	
1.4	64QAM	6	0	19.86	19.80	19.88	21.5
1.4	256QAM	1	0	18.01	18.20	18.12	19.5
1.4	256QAM	1	3	17.94	18.29	18.20	
1.4	256QAM	1	5	18.02	18.25	18.25	
1.4	256QAM	3	0	18.04	18.18	18.19	
1.4	256QAM	3	1	17.96	18.23	18.19	
1.4	256QAM	3	3	18.05	18.19	18.27	
1.4	256QAM	6	0	17.91	18.16	18.03	19.5

<LTE Band 13_Ant 3>

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		
Frequency (MHz)					782		
10	QPSK	1	0		22.88		23.6
10	QPSK	1	25		22.81		
10	QPSK	1	49		22.75		
10	QPSK	25	0		21.82		22.6
10	QPSK	25	12		21.76		
10	QPSK	25	25		21.81		
10	QPSK	50	0		21.76		
10	16QAM	1	0		22.22		22.6
10	16QAM	1	25		22.16		
10	16QAM	1	49		22.09		
10	16QAM	25	0		20.77		21.6
10	16QAM	25	12		20.78		
10	16QAM	25	25		20.83		
10	16QAM	50	0		20.80		
10	64QAM	1	0		21.02		21.6
10	64QAM	1	25		21.10		
10	64QAM	1	49		21.03		
10	64QAM	25	0		19.76		20.6
10	64QAM	25	12		19.79		
10	64QAM	25	25		19.82		
10	64QAM	50	0		19.78		
10	256QAM	1	0		18.31		18.6
10	256QAM	1	25		18.35		
10	256QAM	1	49		18.31		
10	256QAM	25	0		18.26		18.6
10	256QAM	25	12		18.14		
10	256QAM	25	25		18.10		
10	256QAM	50	0		18.23		
Channel				23205	23230	23255	Tune-up limit (dBm)
Frequency (MHz)				779.5	782	784.5	
5	QPSK	1	0	22.83	22.77	22.82	23.6
5	QPSK	1	12	22.79	22.73	22.73	
5	QPSK	1	24	22.67	22.73	22.73	
5	QPSK	12	0	21.64	21.70	21.66	22.6
5	QPSK	12	7	21.74	21.76	21.66	
5	QPSK	12	13	21.76	21.73	21.71	
5	QPSK	25	0	21.74	21.73	21.66	
5	16QAM	1	0	22.21	22.16	22.20	22.6
5	16QAM	1	12	22.13	22.13	22.09	
5	16QAM	1	24	22.07	22.08	22.03	
5	16QAM	12	0	20.75	20.74	20.77	21.6
5	16QAM	12	7	20.75	20.70	20.77	
5	16QAM	12	13	20.77	20.83	20.79	
5	16QAM	25	0	20.75	20.79	20.80	
5	64QAM	1	0	20.99	20.98	20.98	21.6
5	64QAM	1	12	21.06	21.01	21.10	
5	64QAM	1	24	20.96	20.93	20.99	
5	64QAM	12	0	19.73	19.66	19.76	20.6
5	64QAM	12	7	19.70	19.77	19.69	
5	64QAM	12	13	19.77	19.76	19.76	
5	64QAM	25	0	19.71	19.69	19.74	
5	256QAM	1	0	18.30	18.22	18.23	18.6
5	256QAM	1	12	18.34	18.25	18.25	
5	256QAM	1	24	18.25	18.25	18.31	
5	256QAM	12	0	18.17	18.17	18.24	18.6

5	256QAM	12	7	18.08	18.08	18.13	
5	256QAM	12	13	18.08	18.07	18.05	
5	256QAM	25	0	18.13	18.21	18.14	

<LTE Band 30_Ant 0>

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		
Frequency (MHz)					2310		
10	QPSK	1	0		19.51		20
10	QPSK	1	25		19.43		
10	QPSK	1	49		19.28		
10	QPSK	25	0		18.41		19
10	QPSK	25	12		18.34		
10	QPSK	25	25		18.25		
10	QPSK	50	0		18.35		
10	16QAM	1	0		18.70		19
10	16QAM	1	25		18.75		
10	16QAM	1	49		18.67		
10	16QAM	25	0		17.40		18
10	16QAM	25	12		17.37		
10	16QAM	25	25		17.32		
10	16QAM	50	0		17.31		
10	64QAM	1	0		17.68		18
10	64QAM	1	25		17.64		
10	64QAM	1	49		17.59		
10	64QAM	25	0		16.44		17
10	64QAM	25	12		16.37		
10	64QAM	25	25		16.28		
10	64QAM	50	0		16.27		
10	256QAM	1	0		14.47		15
10	256QAM	1	25		14.52		
10	256QAM	1	49		14.61		
10	256QAM	25	0		14.48		15
10	256QAM	25	12		14.42		
10	256QAM	25	25		14.35		
10	256QAM	50	0		14.32		
Channel				27685	27710	27735	Tune-up limit (dBm)
Frequency (MHz)				2307.5	2310	2312.5	
5	QPSK	1	0	19.32	19.34	19.39	20
5	QPSK	1	12	19.40	19.41	19.39	
5	QPSK	1	24	19.10	19.22	19.23	
5	QPSK	12	0	18.24	18.33	18.39	19
5	QPSK	12	7	18.28	18.30	18.33	
5	QPSK	12	13	18.16	18.08	18.24	
5	QPSK	25	0	18.21	18.26	18.19	
5	16QAM	1	0	18.70	18.63	18.56	19
5	16QAM	1	12	18.69	18.62	18.71	
5	16QAM	1	24	18.48	18.58	18.47	
5	16QAM	12	0	17.29	17.28	17.38	18
5	16QAM	12	7	17.35	17.23	17.25	
5	16QAM	12	13	17.19	17.28	17.23	
5	16QAM	25	0	17.31	17.25	17.16	
5	64QAM	1	0	17.60	17.66	17.58	18
5	64QAM	1	12	17.44	17.47	17.59	
5	64QAM	1	24	17.45	17.48	17.40	
5	64QAM	12	0	16.38	16.36	16.26	17
5	64QAM	12	7	16.27	16.37	16.18	
5	64QAM	12	13	16.08	16.20	16.09	
5	64QAM	25	0	16.09	16.23	16.10	
5	256QAM	1	0	14.44	14.37	14.30	15

5	256QAM	1	12	14.37	14.37	14.34	
5	256QAM	1	24	14.44	14.60	14.46	
5	256QAM	12	0	14.29	14.30	14.47	15
5	256QAM	12	7	14.27	14.29	14.36	
5	256QAM	12	13	14.30	14.31	14.31	
5	256QAM	25	0	14.19	14.14	14.17	

<LTE Band 66_Ant 0>

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	20.63	20.78	20.76	20.8
20	QPSK	1	49	20.56	20.72	20.66	
20	QPSK	1	99	20.60	20.63	20.69	
20	QPSK	50	0	19.71	19.80	19.73	19.8
20	QPSK	50	24	19.64	19.64	19.71	
20	QPSK	50	50	19.66	19.72	19.66	
20	QPSK	100	0	19.60	19.75	19.73	
20	16QAM	1	0	19.73	19.74	19.72	19.8
20	16QAM	1	49	19.72	19.76	19.78	
20	16QAM	1	99	19.77	19.50	19.48	
20	16QAM	50	0	18.74	18.71	18.70	18.8
20	16QAM	50	24	18.47	18.73	18.70	
20	16QAM	50	50	18.64	18.68	18.51	
20	16QAM	100	0	18.59	18.73	18.78	
20	64QAM	1	0	18.77	18.78	18.68	18.8
20	64QAM	1	49	18.74	18.77	18.72	
20	64QAM	1	99	18.73	18.76	18.68	
20	64QAM	50	0	17.72	17.71	17.72	17.8
20	64QAM	50	24	17.57	17.76	17.77	
20	64QAM	50	50	17.63	17.70	17.55	
20	64QAM	100	0	17.54	17.71	17.78	
20	256QAM	1	0	15.77	15.67	15.71	15.8
20	256QAM	1	49	15.55	15.71	15.77	
20	256QAM	1	99	15.55	15.69	15.50	
20	256QAM	50	0	15.47	15.62	15.77	15.8
20	256QAM	50	24	15.73	15.61	15.72	
20	256QAM	50	50	15.51	15.76	15.70	
20	256QAM	100	0	15.62	15.61	15.47	
Channel				132047	132322	132597	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	QPSK	1	0	20.63	20.73	20.69	20.8
15	QPSK	1	37	20.51	20.67	20.62	
15	QPSK	1	74	20.54	20.63	20.59	
15	QPSK	36	0	19.65	19.73	19.68	19.8
15	QPSK	36	20	19.64	19.62	19.77	
15	QPSK	36	39	19.57	19.71	19.66	
15	QPSK	75	0	19.57	19.71	19.65	
15	16QAM	1	0	19.65	19.66	19.70	19.8
15	16QAM	1	37	19.64	19.76	19.70	
15	16QAM	1	74	19.72	19.44	19.41	
15	16QAM	36	0	18.68	18.71	18.70	18.8
15	16QAM	36	20	18.39	18.71	18.65	
15	16QAM	36	39	18.55	18.63	18.41	
15	16QAM	75	0	18.54	18.65	18.77	
15	64QAM	1	0	18.77	18.69	18.60	18.8
15	64QAM	1	37	18.67	18.71	18.66	
15	64QAM	1	74	18.65	18.74	18.64	
15	64QAM	36	0	17.68	17.70	17.64	17.8
15	64QAM	36	20	17.57	17.72	17.70	

15	64QAM	36	39	17.61	17.62	17.52	
15	64QAM	75	0	17.46	17.64	17.75	
15	256QAM	1	0	15.73	15.57	15.68	15.8
15	256QAM	1	37	15.46	15.64	15.68	
15	256QAM	1	74	15.51	15.69	15.42	
15	256QAM	36	0	15.39	15.60	15.67	15.8
15	256QAM	36	20	15.71	15.60	15.65	
15	256QAM	36	39	15.42	15.67	15.69	
15	256QAM	75	0	15.55	15.56	15.44	
Channel				132022	132322	132622	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	QPSK	1	0	20.61	20.76	20.71	20.8
10	QPSK	1	25	20.55	20.66	20.57	
10	QPSK	1	49	20.58	20.58	20.65	
10	QPSK	25	0	19.62	19.63	19.67	19.8
10	QPSK	25	12	19.63	19.60	19.76	
10	QPSK	25	25	19.60	19.72	19.61	
10	QPSK	50	0	19.60	19.69	19.66	
10	16QAM	1	0	19.72	19.66	19.71	19.8
10	16QAM	1	25	19.69	19.69	19.76	
10	16QAM	1	49	19.77	19.49	19.45	
10	16QAM	25	0	18.74	18.68	18.64	18.8
10	16QAM	25	12	18.41	18.68	18.60	
10	16QAM	25	25	18.57	18.63	18.49	
10	16QAM	50	0	18.58	18.69	18.72	
10	64QAM	1	0	18.73	18.74	18.68	18.8
10	64QAM	1	25	18.64	18.75	18.68	
10	64QAM	1	49	18.63	18.69	18.68	
10	64QAM	25	0	17.71	17.68	17.69	17.8
10	64QAM	25	12	17.47	17.70	17.73	
10	64QAM	25	25	17.55	17.67	17.47	
10	64QAM	50	0	17.44	17.71	17.72	
10	256QAM	1	0	15.77	15.63	15.70	15.8
10	256QAM	1	25	15.48	15.64	15.77	
10	256QAM	1	49	15.45	15.65	15.50	
10	256QAM	25	0	15.44	15.55	15.67	15.8
10	256QAM	25	12	15.68	15.51	15.65	
10	256QAM	25	25	15.44	15.76	15.66	
10	256QAM	50	0	15.52	15.54	15.46	
Channel				131997	132322	132647	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	QPSK	1	0	20.63	20.75	20.66	20.8
5	QPSK	1	12	20.54	20.69	20.64	
5	QPSK	1	24	20.57	20.56	20.63	
5	QPSK	12	0	19.70	19.70	19.63	19.8
5	QPSK	12	7	19.60	19.56	19.74	
5	QPSK	12	13	19.63	19.71	19.63	
5	QPSK	25	0	19.52	19.74	19.73	
5	16QAM	1	0	19.67	19.68	19.66	19.8
5	16QAM	1	12	19.64	19.69	19.76	
5	16QAM	1	24	19.77	19.44	19.44	
5	16QAM	12	0	18.72	18.70	18.64	18.8
5	16QAM	12	7	18.37	18.66	18.69	
5	16QAM	12	13	18.58	18.61	18.42	
5	16QAM	25	0	18.59	18.64	18.74	
5	64QAM	1	0	18.75	18.75	18.59	18.8
5	64QAM	1	12	18.70	18.71	18.69	
5	64QAM	1	24	18.66	18.68	18.59	
5	64QAM	12	0	17.65	17.61	17.67	17.8
5	64QAM	12	7	17.49	17.74	17.75	
5	64QAM	12	13	17.53	17.68	17.52	
5	64QAM	25	0	17.52	17.61	17.75	
5	256QAM	1	0	15.68	15.67	15.69	15.8

5	256QAM	1	12	15.48	15.61	15.76	
5	256QAM	1	24	15.46	15.67	15.50	
5	256QAM	12	0	15.41	15.53	15.71	15.8
5	256QAM	12	7	15.67	15.61	15.72	
5	256QAM	12	13	15.43	15.68	15.66	
5	256QAM	25	0	15.58	15.59	15.37	
Channel				131987	132322	132657	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1745	1778.5	
3	QPSK	1	0	20.59	20.72	20.73	20.8
3	QPSK	1	8	20.46	20.66	20.59	
3	QPSK	1	14	20.55	20.59	20.61	
3	QPSK	8	0	19.62	19.70	19.66	19.8
3	QPSK	8	4	19.60	19.57	19.79	
3	QPSK	8	7	19.65	19.64	19.64	
3	QPSK	15	0	19.52	19.72	19.64	
3	16QAM	1	0	19.66	19.72	19.69	19.8
3	16QAM	1	8	19.70	19.75	19.70	
3	16QAM	1	14	19.69	19.43	19.45	
3	16QAM	8	0	18.73	18.62	18.65	18.8
3	16QAM	8	4	18.45	18.63	18.62	
3	16QAM	8	7	18.59	18.68	18.51	
3	16QAM	15	0	18.50	18.64	18.77	
3	64QAM	1	0	18.77	18.68	18.64	18.8
3	64QAM	1	8	18.71	18.73	18.72	
3	64QAM	1	14	18.67	18.69	18.59	
3	64QAM	8	0	17.69	17.70	17.62	17.8
3	64QAM	8	4	17.53	17.67	17.74	
3	64QAM	8	7	17.55	17.63	17.45	
3	64QAM	15	0	17.52	17.70	17.74	
3	256QAM	1	0	15.77	15.66	15.68	15.8
3	256QAM	1	8	15.47	15.70	15.69	
3	256QAM	1	14	15.50	15.66	15.49	
3	256QAM	8	0	15.40	15.56	15.68	15.8
3	256QAM	8	4	15.67	15.54	15.65	
3	256QAM	8	7	15.48	15.74	15.63	
3	256QAM	15	0	15.60	15.53	15.45	
Channel				131979	132322	132665	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1745	1779.3	
1.4	QPSK	1	0	20.58	20.70	20.70	20.8
1.4	QPSK	1	3	20.50	20.64	20.56	
1.4	QPSK	1	5	20.51	20.62	20.63	
1.4	QPSK	3	0	19.64	19.70	19.69	
1.4	QPSK	3	1	19.60	19.56	19.77	
1.4	QPSK	3	3	19.63	19.68	19.65	
1.4	QPSK	6	0	19.60	19.75	19.66	19.8
1.4	16QAM	1	0	19.69	19.70	19.67	19.8
1.4	16QAM	1	3	19.71	19.70	19.70	
1.4	16QAM	1	5	19.69	19.49	19.39	
1.4	16QAM	3	0	18.68	18.69	18.64	
1.4	16QAM	3	1	18.43	18.67	18.61	
1.4	16QAM	3	3	18.56	18.61	18.48	
1.4	16QAM	6	0	18.52	18.65	18.70	18.8
1.4	64QAM	1	0	18.76	18.77	18.67	18.8
1.4	64QAM	1	3	18.64	18.68	18.68	
1.4	64QAM	1	5	18.69	18.72	18.58	
1.4	64QAM	3	0	17.62	17.63	17.66	
1.4	64QAM	3	1	17.53	17.73	17.69	
1.4	64QAM	3	3	17.55	17.68	17.50	
1.4	64QAM	6	0	17.46	17.63	17.68	17.8
1.4	256QAM	1	0	15.69	15.66	15.65	15.8
1.4	256QAM	1	3	15.52	15.69	15.70	
1.4	256QAM	1	5	15.53	15.61	15.48	
1.4	256QAM	3	0	15.43	15.56	15.67	

1.4	256QAM	3	1	15.72	15.51	15.69	
1.4	256QAM	3	3	15.46	15.68	15.65	
1.4	256QAM	6	0	15.57	15.54	15.46	15.8

<LTE Band 66_Ant 3>

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	23.57	23.47	23.89	24.5
20	QPSK	1	49	23.67	23.59	23.77	
20	QPSK	1	99	23.57	23.47	23.87	
20	QPSK	50	0	22.62	22.70	22.74	23.5
20	QPSK	50	24	22.61	22.58	22.68	
20	QPSK	50	50	22.56	22.55	22.54	
20	QPSK	100	0	22.54	22.68	22.49	
20	16QAM	1	0	22.25	22.24	22.34	23.5
20	16QAM	1	49	22.31	22.31	22.46	
20	16QAM	1	99	22.36	22.33	22.46	
20	16QAM	50	0	21.52	21.52	21.62	22.5
20	16QAM	50	24	21.55	21.54	21.67	
20	16QAM	50	50	21.67	21.58	21.71	
20	16QAM	100	0	21.57	21.54	21.67	
20	64QAM	1	0	21.58	21.53	21.67	22.5
20	64QAM	1	49	21.67	21.60	21.78	
20	64QAM	1	99	21.57	21.53	21.68	
20	64QAM	50	0	20.53	20.50	20.68	21.5
20	64QAM	50	24	20.54	20.53	20.71	
20	64QAM	50	50	20.58	20.52	20.72	
20	64QAM	100	0	20.51	20.50	20.69	
20	256QAM	1	0	18.35	18.35	18.48	19.5
20	256QAM	1	49	18.48	18.47	18.63	
20	256QAM	1	99	18.44	18.44	18.56	
20	256QAM	50	0	18.48	18.45	18.55	19.5
20	256QAM	50	24	18.59	18.51	18.63	
20	256QAM	50	50	18.59	18.57	18.75	
20	256QAM	100	0	18.49	18.47	18.60	
Channel				132047	132322	132597	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	QPSK	1	0	23.55	23.37	23.59	24.5
15	QPSK	1	37	23.60	23.50	23.70	
15	QPSK	1	74	23.68	23.58	23.78	
15	QPSK	36	0	22.56	22.46	22.66	23.5
15	QPSK	36	20	22.63	22.53	22.73	
15	QPSK	36	39	22.60	22.50	22.70	
15	QPSK	75	0	22.52	22.42	22.62	
15	16QAM	1	0	22.31	22.21	22.41	23.5
15	16QAM	1	37	22.32	22.22	22.42	
15	16QAM	1	74	22.34	22.24	22.44	
15	16QAM	36	0	21.62	21.52	21.72	22.5
15	16QAM	36	20	21.59	21.49	21.69	
15	16QAM	36	39	21.64	21.54	21.74	
15	16QAM	75	0	21.55	21.45	21.65	
15	64QAM	1	0	21.59	21.49	21.69	22.5
15	64QAM	1	37	21.65	21.55	21.75	
15	64QAM	1	74	21.59	21.49	21.69	
15	64QAM	36	0	20.50	20.40	20.60	21.5
15	64QAM	36	20	20.55	20.45	20.65	
15	64QAM	36	39	20.62	20.52	20.72	
15	64QAM	75	0	20.59	20.49	20.69	
15	256QAM	1	0	18.43	18.33	18.53	19.5

15	256QAM	1	37	18.51	18.41	18.61	
15	256QAM	1	74	18.44	18.34	18.54	
15	256QAM	36	0	18.53	18.43	18.63	19.5
15	256QAM	36	20	18.53	18.43	18.63	
15	256QAM	36	39	18.65	18.55	18.75	
15	256QAM	75	0	18.55	18.45	18.65	
Channel				132022	132322	132622	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	QPSK	1	0	23.51	23.40	23.66	24.5
10	QPSK	1	25	23.59	23.49	23.69	
10	QPSK	1	49	23.71	23.61	23.81	
10	QPSK	25	0	22.63	22.53	22.73	23.5
10	QPSK	25	12	22.64	22.54	22.74	
10	QPSK	25	25	22.56	22.46	22.66	
10	QPSK	50	0	22.56	22.46	22.66	
10	16QAM	1	0	22.27	22.17	22.37	23.5
10	16QAM	1	25	22.35	22.25	22.45	
10	16QAM	1	49	22.40	22.30	22.50	
10	16QAM	25	0	21.56	21.46	21.66	22.5
10	16QAM	25	12	21.55	21.45	21.65	
10	16QAM	25	25	21.61	21.51	21.71	
10	16QAM	50	0	21.63	21.53	21.73	
10	64QAM	1	0	21.54	21.44	21.64	22.5
10	64QAM	1	25	21.68	21.58	21.78	
10	64QAM	1	49	21.62	21.52	21.72	
10	64QAM	25	0	20.59	20.49	20.69	21.5
10	64QAM	25	12	20.63	20.53	20.73	
10	64QAM	25	25	20.60	20.50	20.70	
10	64QAM	50	0	20.51	20.41	20.61	
10	256QAM	1	0	18.44	18.34	18.54	19.5
10	256QAM	1	25	18.55	18.45	18.65	
10	256QAM	1	49	18.46	18.36	18.56	
10	256QAM	25	0	18.50	18.40	18.60	19.5
10	256QAM	25	12	18.55	18.45	18.65	
10	256QAM	25	25	18.57	18.47	18.67	
10	256QAM	50	0	18.49	18.39	18.59	
Channel				131997	132322	132647	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	QPSK	1	0	23.57	23.38	23.67	24.5
5	QPSK	1	12	23.63	23.53	23.73	
5	QPSK	1	24	23.75	23.65	23.85	
5	QPSK	12	0	22.53	22.43	22.63	23.5
5	QPSK	12	7	22.62	22.52	22.72	
5	QPSK	12	13	22.57	22.47	22.67	
5	QPSK	25	0	22.52	22.42	22.62	
5	16QAM	1	0	22.27	22.17	22.37	23.5
5	16QAM	1	12	22.40	22.30	22.50	
5	16QAM	1	24	22.37	22.27	22.47	
5	16QAM	12	0	21.57	21.47	21.67	22.5
5	16QAM	12	7	21.59	21.49	21.69	
5	16QAM	12	13	21.67	21.57	21.77	
5	16QAM	25	0	21.55	21.45	21.65	
5	64QAM	1	0	21.62	21.52	21.72	22.5
5	64QAM	1	12	21.62	21.52	21.72	
5	64QAM	1	24	21.61	21.51	21.71	
5	64QAM	12	0	20.55	20.45	20.65	21.5
5	64QAM	12	7	20.61	20.51	20.71	
5	64QAM	12	13	20.61	20.51	20.71	
5	64QAM	25	0	20.51	20.41	20.61	
5	256QAM	1	0	18.40	18.30	18.50	19.5
5	256QAM	1	12	18.56	18.46	18.66	
5	256QAM	1	24	18.50	18.40	18.60	
5	256QAM	12	0	18.49	18.39	18.59	19.5

5	256QAM	12	7	18.58	18.48	18.68	
5	256QAM	12	13	18.58	18.48	18.68	
5	256QAM	25	0	18.57	18.47	18.67	
Channel				131987	132322	132657	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1745	1778.5	
3	QPSK	1	0	23.55	23.40	23.65	24.5
3	QPSK	1	8	23.63	23.53	23.73	
3	QPSK	1	14	23.77	23.67	23.87	
3	QPSK	8	0	22.55	22.45	22.65	23.5
3	QPSK	8	4	22.61	22.51	22.71	
3	QPSK	8	7	22.61	22.51	22.71	
3	QPSK	15	0	22.49	22.39	22.59	
3	16QAM	1	0	22.25	22.15	22.35	23.5
3	16QAM	1	8	22.31	22.21	22.41	
3	16QAM	1	14	22.40	22.30	22.50	
3	16QAM	8	0	21.52	21.42	21.62	22.5
3	16QAM	8	4	21.60	21.50	21.70	
3	16QAM	8	7	21.59	21.49	21.69	
3	16QAM	15	0	21.64	21.54	21.74	
3	64QAM	1	0	21.53	21.43	21.63	22.5
3	64QAM	1	8	21.60	21.50	21.70	
3	64QAM	1	14	21.54	21.44	21.64	
3	64QAM	8	0	20.56	20.46	20.66	21.5
3	64QAM	8	4	20.54	20.44	20.64	
3	64QAM	8	7	20.60	20.50	20.70	
3	64QAM	15	0	20.54	20.44	20.64	
3	256QAM	1	0	18.42	18.32	18.52	19.5
3	256QAM	1	8	18.52	18.42	18.62	
3	256QAM	1	14	18.46	18.36	18.56	
3	256QAM	8	0	18.54	18.44	18.64	19.5
3	256QAM	8	4	18.53	18.43	18.63	
3	256QAM	8	7	18.57	18.47	18.67	
3	256QAM	15	0	18.51	18.41	18.61	
Channel				131979	132322	132665	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1745	1779.3	
1.4	QPSK	1	0	23.53	23.42	23.58	24.5
1.4	QPSK	1	3	23.64	23.54	23.74	
1.4	QPSK	1	5	23.75	23.65	23.85	
1.4	QPSK	3	0	22.62	22.52	22.72	
1.4	QPSK	3	1	22.63	22.53	22.73	
1.4	QPSK	3	3	22.61	22.51	22.71	
1.4	QPSK	6	0	22.51	22.41	22.61	23.5
1.4	16QAM	1	0	22.24	22.14	22.34	23.5
1.4	16QAM	1	3	22.31	22.21	22.41	
1.4	16QAM	1	5	22.42	22.32	22.52	
1.4	16QAM	3	0	21.55	22.20	21.65	
1.4	16QAM	3	1	21.62	21.52	21.72	
1.4	16QAM	3	3	21.63	21.53	21.73	
1.4	16QAM	6	0	21.60	21.50	21.70	22.5
1.4	64QAM	1	0	21.62	21.52	21.72	22.5
1.4	64QAM	1	3	21.64	21.54	21.74	
1.4	64QAM	1	5	21.59	21.49	21.69	
1.4	64QAM	3	0	20.56	21.23	20.66	
1.4	64QAM	3	1	20.60	20.50	20.70	
1.4	64QAM	3	3	20.52	20.55	20.62	
1.4	64QAM	6	0	20.50	20.40	20.60	21.5
1.4	256QAM	1	0	18.37	18.27	18.47	19.5
1.4	256QAM	1	3	18.49	18.39	18.59	
1.4	256QAM	1	5	18.46	18.36	18.56	
1.4	256QAM	3	0	18.48	18.38	18.58	
1.4	256QAM	3	1	18.58	18.48	18.68	
1.4	256QAM	3	3	18.62	18.52	18.72	
1.4	256QAM	6	0	18.55	18.45	18.65	19.5

<LTE Band 71_Ant 3>

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	133297	133372	
Frequency (MHz)				673	680.5	688	
20	QPSK	1	0	22.71	22.77	22.74	24.5
20	QPSK	1	49	22.74	22.71	22.68	
20	QPSK	1	99	22.68	22.61	22.63	
20	QPSK	50	0	21.69	21.73	21.67	23.5
20	QPSK	50	24	21.68	21.67	21.62	
20	QPSK	50	50	21.69	21.68	21.66	
20	QPSK	100	0	21.76	21.78	21.73	
20	16QAM	1	0	22.02	22.02	21.94	23.5
20	16QAM	1	49	22.06	22.09	22.10	
20	16QAM	1	99	22.00	21.97	21.99	
20	16QAM	50	0	20.73	20.70	20.67	22.5
20	16QAM	50	24	20.82	20.69	20.65	
20	16QAM	50	50	20.73	20.72	20.66	
20	16QAM	100	0	20.80	20.80	20.74	
20	64QAM	1	0	20.93	20.95	20.85	22.5
20	64QAM	1	49	20.92	21.01	20.90	
20	64QAM	1	99	20.89	20.82	20.83	
20	64QAM	50	0	19.74	19.69	19.66	21.5
20	64QAM	50	24	19.80	19.69	19.65	
20	64QAM	50	50	19.70	19.68	19.67	
20	64QAM	100	0	19.79	19.76	19.73	
20	256QAM	1	0	18.15	18.31	18.22	19.5
20	256QAM	1	49	18.08	18.39	18.26	
20	256QAM	1	99	18.12	18.35	18.31	
20	256QAM	50	0	18.17	18.26	18.27	19.5
20	256QAM	50	24	18.22	18.24	18.39	
20	256QAM	50	50	18.06	18.18	18.26	
20	256QAM	100	0	18.02	18.32	18.20	
Channel				133197	133297	133397	Tune-up limit (dBm)
Frequency (MHz)				670.5	680.5	690.5	
15	QPSK	1	0	22.69	22.71	22.73	24.5
15	QPSK	1	37	22.66	22.65	22.65	
15	QPSK	1	74	22.65	22.52	22.62	
15	QPSK	36	0	21.70	21.62	21.66	23.5
15	QPSK	36	20	21.74	21.57	21.56	
15	QPSK	36	39	21.65	21.63	21.63	
15	QPSK	75	0	21.66	21.74	21.68	
15	16QAM	1	0	21.94	21.96	21.86	23.5
15	16QAM	1	37	22.00	22.04	22.08	
15	16QAM	1	74	21.92	21.89	21.94	
15	16QAM	36	0	20.66	20.67	20.57	22.5
15	16QAM	36	20	20.73	20.59	20.62	
15	16QAM	36	39	20.65	20.71	20.64	
15	16QAM	75	0	20.79	20.72	20.69	
15	64QAM	1	0	20.83	20.90	20.80	22.5
15	64QAM	1	37	20.83	20.92	20.81	
15	64QAM	1	74	20.79	20.73	20.78	
15	64QAM	36	0	19.74	19.60	19.61	21.5
15	64QAM	36	20	19.75	19.67	19.56	
15	64QAM	36	39	19.63	19.59	19.67	
15	64QAM	75	0	19.73	19.68	19.70	
15	256QAM	1	0	18.10	18.28	18.19	19.5
15	256QAM	1	37	18.02	18.31	18.26	
15	256QAM	1	74	18.07	18.30	18.24	
15	256QAM	36	0	18.17	18.25	18.26	19.5

15	256QAM	36	20	18.22	18.14	18.35	
15	256QAM	36	39	17.97	18.09	18.18	
15	256QAM	75	0	17.93	18.29	18.16	
Channel				133172	133297	133422	Tune-up limit (dBm)
Frequency (MHz)				668	680.5	693	
10	QPSK	1	0	22.71	22.68	22.74	24.5
10	QPSK	1	25	22.73	22.65	22.63	
10	QPSK	1	49	22.59	22.54	22.62	
10	QPSK	25	0	21.72	21.62	21.61	23.5
10	QPSK	25	12	21.69	21.64	21.57	
10	QPSK	25	25	21.65	21.60	21.56	
10	QPSK	50	0	21.74	21.64	21.68	
10	16QAM	1	0	21.93	21.94	21.90	23.5
10	16QAM	1	25	21.96	22.07	22.02	
10	16QAM	1	49	21.94	21.94	21.95	
10	16QAM	25	0	20.73	20.70	20.57	22.5
10	16QAM	25	12	20.82	20.67	20.55	
10	16QAM	25	25	20.67	20.70	20.64	
10	16QAM	50	0	20.80	20.72	20.73	
10	64QAM	1	0	20.92	20.95	20.82	22.5
10	64QAM	1	25	20.90	20.97	20.84	
10	64QAM	1	49	20.89	20.78	20.78	
10	64QAM	25	0	19.69	19.69	19.64	21.5
10	64QAM	25	12	19.71	19.62	19.63	
10	64QAM	25	25	19.69	19.63	19.67	
10	64QAM	50	0	19.69	19.76	19.65	
10	256QAM	1	0	18.08	18.23	18.19	19.5
10	256QAM	1	25	18.04	18.30	18.23	
10	256QAM	1	49	18.02	18.31	18.22	
10	256QAM	25	0	18.08	18.26	18.20	19.5
10	256QAM	25	12	18.13	18.20	18.37	
10	256QAM	25	25	18.03	18.08	18.24	
10	256QAM	50	0	18.00	18.22	18.15	
Channel				133147	133297	133447	Tune-up limit (dBm)
Frequency (MHz)				665.5	680.5	695.5	
5	QPSK	1	0	22.75	22.67	22.73	24.5
5	QPSK	1	12	22.69	22.62	22.62	
5	QPSK	1	24	22.62	22.52	22.53	
5	QPSK	12	0	21.72	21.62	21.61	23.5
5	QPSK	12	7	21.71	21.61	21.55	
5	QPSK	12	13	21.65	21.59	21.66	
5	QPSK	25	0	21.73	21.73	21.70	
5	16QAM	1	0	22.00	22.01	21.93	23.5
5	16QAM	1	12	22.02	22.09	22.04	
5	16QAM	1	24	21.93	21.94	21.94	
5	16QAM	12	0	20.72	20.64	20.57	22.5
5	16QAM	12	7	20.81	20.67	20.59	
5	16QAM	12	13	20.67	20.66	20.60	
5	16QAM	25	0	20.75	20.75	20.68	
5	64QAM	1	0	20.83	20.85	20.77	22.5
5	64QAM	1	12	20.84	20.96	20.86	
5	64QAM	1	24	20.81	20.78	20.74	
5	64QAM	12	0	19.70	19.60	19.62	21.5
5	64QAM	12	7	19.74	19.65	19.64	
5	64QAM	12	13	19.70	19.61	19.60	
5	64QAM	25	0	19.77	19.75	19.65	
5	256QAM	1	0	18.13	18.23	18.14	19.5
5	256QAM	1	12	18.05	18.31	18.19	
5	256QAM	1	24	18.06	18.29	18.23	
5	256QAM	12	0	18.07	18.18	18.20	19.5
5	256QAM	12	7	18.20	18.24	18.31	
5	256QAM	12	13	18.00	18.09	18.22	
5	256QAM	25	0	17.95	18.32	18.18	

<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.

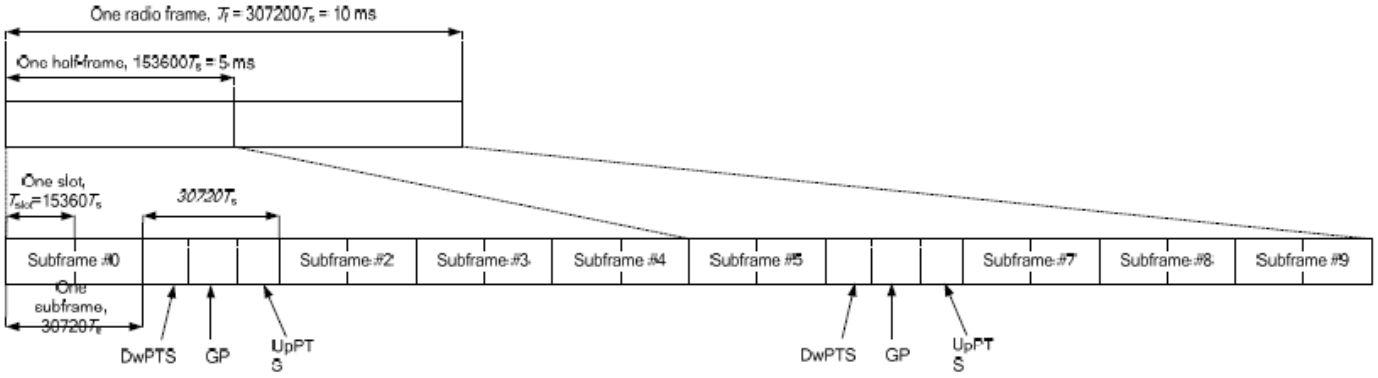


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

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 subfames, 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.

<LTE Band 41_Ant 0>

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	14.66	14.72	14.90	14.81	14.65	16.6
20	QPSK	1	49	14.62	14.62	14.89	14.78	14.60	
20	QPSK	1	99	14.68	14.68	14.86	14.86	14.66	
20	QPSK	50	0	14.68	14.81	14.89	14.88	14.74	16.6
20	QPSK	50	24	14.69	14.63	14.88	14.72	14.63	
20	QPSK	50	50	14.63	14.68	14.86	14.76	14.61	
20	QPSK	100	0	14.63	14.70	14.88	14.83	14.63	
20	16QAM	1	0	14.64	14.63	14.80	14.75	14.64	16.6
20	16QAM	1	49	14.76	14.88	14.87	14.83	14.87	
20	16QAM	1	99	14.81	14.81	14.86	14.88	14.81	
20	16QAM	50	0	14.62	14.64	14.80	14.77	14.66	16.6
20	16QAM	50	24	14.86	14.73	14.81	14.81	14.68	
20	16QAM	50	50	14.69	14.76	14.89	14.87	14.73	
20	16QAM	100	0	14.65	14.75	14.89	14.80	14.68	
20	64QAM	1	0	14.67	14.74	14.82	14.82	14.64	16.6
20	64QAM	1	49	14.65	14.66	14.87	14.76	14.67	
20	64QAM	1	99	14.63	14.64	14.82	14.83	14.67	
20	64QAM	50	0	14.67	14.65	14.88	14.71	14.63	16.6
20	64QAM	50	24	14.64	14.64	14.81	14.78	14.63	
20	64QAM	50	50	14.63	14.77	14.89	14.89	14.67	
20	64QAM	100	0	14.67	14.78	14.87	14.78	14.64	
20	256QAM	1	0	14.69	14.64	14.88	14.69	14.63	16.6
20	256QAM	1	49	14.64	14.64	14.84	14.65	14.69	
20	256QAM	1	99	14.65	14.70	14.80	14.78	14.60	
20	256QAM	50	0	14.68	14.61	14.83	14.71	14.69	16.6
20	256QAM	50	24	14.68	14.65	14.89	14.77	14.62	
20	256QAM	50	50	14.60	14.74	14.88	14.79	14.67	
20	256QAM	100	0	14.62	14.74	14.82	14.83	14.69	
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	14.56	14.62	14.83	14.74	14.61	16.60
15	QPSK	1	37	14.53	14.60	14.79	14.77	14.55	
15	QPSK	1	74	14.67	14.59	14.76	14.86	14.62	
15	QPSK	36	0	14.60	14.60	14.76	14.67	14.55	16.6
15	QPSK	36	20	14.62	14.55	14.88	14.66	14.54	
15	QPSK	36	39	14.63	14.79	14.84	14.84	14.72	
15	QPSK	75	0	14.58	14.70	14.87	14.77	14.54	
15	16QAM	1	0	14.59	14.60	14.78	14.66	14.60	16.6
15	16QAM	1	37	14.74	14.78	14.85	14.83	14.84	
15	16QAM	1	74	14.78	14.81	14.84	14.82	14.77	
15	16QAM	36	0	14.53	14.55	14.76	14.71	14.62	16.6
15	16QAM	36	20	14.76	14.71	14.80	14.77	14.58	
15	16QAM	36	39	14.62	14.71	14.88	14.87	14.64	
15	16QAM	75	0	14.60	14.65	14.87	14.70	14.60	
15	64QAM	1	0	14.63	14.73	14.82	14.73	14.58	16.6
15	64QAM	1	37	14.57	14.65	14.83	14.74	14.66	
15	64QAM	1	74	14.59	14.61	14.81	14.79	14.57	
15	64QAM	36	0	14.66	14.63	14.83	14.61	14.55	16.6
15	64QAM	36	20	14.54	14.57	14.72	14.68	14.56	
15	64QAM	36	39	14.63	14.68	14.85	14.81	14.65	
15	64QAM	75	0	14.58	14.70	14.77	14.78	14.64	
15	256QAM	1	0	14.61	14.60	14.83	14.61	14.60	16.6
15	256QAM	1	37	14.54	14.59	14.80	14.62	14.62	
15	256QAM	1	74	14.62	14.61	14.75	14.70	14.50	
15	256QAM	36	0	14.58	14.57	14.81	14.63	14.60	16.6
15	256QAM	36	20	14.63	14.63	14.82	14.68	14.62	

15	256QAM	36	39	14.57	14.68	14.80	14.73	14.64	
15	256QAM	75	0	14.62	14.64	14.72	14.80	14.62	
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	14.64	14.64	14.81	14.77	14.64	16.60
10	QPSK	1	25	14.52	14.62	14.85	14.69	14.52	
10	QPSK	1	49	14.61	14.59	14.79	14.84	14.56	
10	QPSK	25	0	14.62	14.58	14.79	14.66	14.58	16.6
10	QPSK	25	12	14.67	14.60	14.85	14.66	14.59	
10	QPSK	25	25	14.61	14.73	14.80	14.87	14.67	
10	QPSK	50	0	14.56	14.61	14.88	14.78	14.63	
10	16QAM	1	0	14.60	14.57	14.80	14.71	14.58	16.6
10	16QAM	1	25	14.76	14.82	14.82	14.81	14.85	
10	16QAM	1	49	14.75	14.80	14.80	14.78	14.81	
10	16QAM	25	0	14.59	14.63	14.71	14.70	14.64	16.6
10	16QAM	25	12	14.84	14.68	14.72	14.71	14.68	
10	16QAM	25	25	14.66	14.69	14.84	14.87	14.63	
10	16QAM	50	0	14.61	14.70	14.87	14.74	14.66	
10	64QAM	1	0	14.60	14.68	14.82	14.81	14.58	16.6
10	64QAM	1	25	14.64	14.59	14.80	14.76	14.64	
10	64QAM	1	49	14.54	14.63	14.72	14.79	14.58	
10	64QAM	25	0	14.65	14.56	14.87	14.66	14.60	16.6
10	64QAM	25	12	14.54	14.61	14.75	14.69	14.62	
10	64QAM	25	25	14.60	14.76	14.85	14.79	14.65	
10	64QAM	50	0	14.57	14.70	14.77	14.77	14.57	
10	256QAM	1	0	14.60	14.56	14.81	14.68	14.63	16.6
10	256QAM	1	25	14.57	14.58	14.77	14.56	14.63	
10	256QAM	1	49	14.57	14.66	14.70	14.76	14.60	
10	256QAM	25	0	14.65	14.60	14.81	14.71	14.66	16.6
10	256QAM	25	12	14.59	14.60	14.80	14.73	14.54	
10	256QAM	25	25	14.59	14.74	14.86	14.75	14.62	
10	256QAM	50	0	14.56	14.71	14.81	14.75	14.59	
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	14.66	14.62	14.88	14.73	14.56	16.60
5	QPSK	1	12	14.60	14.57	14.89	14.75	14.58	
5	QPSK	1	24	14.64	14.61	14.83	14.83	14.57	
5	QPSK	12	0	14.55	14.61	14.84	14.69	14.52	16.6
5	QPSK	12	7	14.59	14.62	14.85	14.71	14.55	
5	QPSK	12	13	14.68	14.78	14.80	14.86	14.69	
5	QPSK	25	0	14.56	14.60	14.82	14.80	14.56	
5	16QAM	1	0	14.60	14.56	14.75	14.65	14.58	16.6
5	16QAM	1	12	14.75	14.81	14.79	14.75	14.85	
5	16QAM	1	24	14.78	14.73	14.85	14.78	14.80	
5	16QAM	12	0	14.56	14.64	14.72	14.70	14.65	16.6
5	16QAM	12	7	14.81	14.71	14.75	14.75	14.63	
5	16QAM	12	13	14.65	14.67	14.85	14.87	14.67	
5	16QAM	25	0	14.62	14.67	14.89	14.70	14.66	
5	64QAM	1	0	14.64	14.71	14.80	14.82	14.56	16.6
5	64QAM	1	12	14.61	14.56	14.83	14.67	14.65	
5	64QAM	1	24	14.61	14.63	14.82	14.74	14.67	
5	64QAM	12	0	14.67	14.59	14.85	14.67	14.60	16.6
5	64QAM	12	7	14.55	14.60	14.81	14.74	14.54	
5	64QAM	12	13	14.63	14.69	14.79	14.83	14.57	
5	64QAM	25	0	14.60	14.70	14.84	14.72	14.56	
5	256QAM	1	0	14.59	14.57	14.81	14.59	14.57	16.6
5	256QAM	1	12	14.64	14.64	14.76	14.59	14.68	
5	256QAM	1	24	14.58	14.63	14.74	14.71	14.53	
5	256QAM	12	0	14.63	14.55	14.78	14.68	14.59	16.6
5	256QAM	12	7	14.65	14.58	14.79	14.75	14.62	
5	256QAM	12	13	14.56	14.73	14.83	14.69	14.67	
5	256QAM	25	0	14.61	14.70	14.76	14.78	14.59	

<LTE Band 41_HPUE_Ant 0>

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	16.36	16.37	16.57	16.55	16.31	18.2
20	QPSK	1	49	16.32	16.35	16.55	16.52	16.20	
20	QPSK	1	99	16.41	16.42	16.38	16.34	16.33	
20	QPSK	50	0	16.42	16.46	16.47	16.43	16.46	18.2
20	QPSK	50	24	16.41	16.43	16.37	16.40	16.43	
20	QPSK	50	50	16.39	16.41	16.40	16.38	16.36	
20	QPSK	100	0	16.51	16.53	16.48	16.45	16.47	
20	16QAM	1	0	16.28	16.29	16.50	16.45	16.24	18.2
20	16QAM	1	49	16.27	16.25	16.48	16.50	16.28	
20	16QAM	1	99	16.36	16.41	16.30	16.56	16.24	
20	16QAM	50	0	16.40	16.33	16.38	16.48	16.32	18.2
20	16QAM	50	24	16.49	16.53	16.44	16.39	16.40	
20	16QAM	50	50	16.57	16.52	16.40	16.38	16.46	
20	16QAM	100	0	16.41	16.53	16.41	16.45	16.41	
20	64QAM	1	0	16.31	16.32	16.51	16.53	16.30	18.2
20	64QAM	1	49	16.26	16.25	16.49	16.47	16.24	
20	64QAM	1	99	16.31	16.32	16.35	16.31	16.27	
20	64QAM	50	0	16.40	16.37	16.34	16.52	16.27	18.2
20	64QAM	50	24	16.44	16.53	16.36	16.30	16.41	
20	64QAM	50	50	16.55	16.47	16.43	16.36	16.44	
20	64QAM	100	0	16.43	16.49	16.47	16.40	16.46	
20	256QAM	1	0	16.34	16.28	16.48	16.50	16.27	18.2
20	256QAM	1	49	16.23	16.35	16.55	16.45	16.22	
20	256QAM	1	99	16.39	16.32	16.38	16.57	16.33	
20	256QAM	50	0	16.33	16.41	16.34	16.49	16.23	18.2
20	256QAM	50	24	16.46	16.47	16.34	16.30	16.42	
20	256QAM	50	50	16.52	16.55	16.43	16.40	16.50	
20	256QAM	100	0	16.47	16.45	16.45	16.36	16.43	
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	16.27	16.30	16.56	16.52	16.26	18.20
15	QPSK	1	37	16.25	16.30	16.54	16.50	16.24	
15	QPSK	1	74	16.35	16.38	16.37	16.25	16.31	
15	QPSK	36	0	16.31	16.36	16.37	16.31	16.30	18.2
15	QPSK	36	20	16.48	16.52	16.43	16.36	16.40	
15	QPSK	36	39	16.29	16.56	16.34	16.37	16.40	
15	QPSK	75	0	16.47	16.47	16.48	16.41	16.42	
15	16QAM	1	0	16.26	16.28	16.50	16.42	16.23	18.2
15	16QAM	1	37	16.25	16.26	16.47	16.40	16.20	
15	16QAM	1	74	16.36	16.38	16.22	16.47	16.24	
15	16QAM	36	0	16.30	16.29	16.37	16.44	16.26	18.2
15	16QAM	36	20	16.45	16.43	16.40	16.35	16.37	
15	16QAM	36	39	16.57	16.46	16.31	16.36	16.40	
15	16QAM	75	0	16.33	16.52	16.35	16.42	16.36	
15	64QAM	1	0	16.28	16.24	16.41	16.48	16.28	18.2
15	64QAM	1	37	16.24	16.23	16.41	16.46	16.22	
15	64QAM	1	74	16.26	16.31	16.29	16.31	16.26	
15	64QAM	36	0	16.35	16.36	16.32	16.46	16.24	18.2
15	64QAM	36	20	16.43	16.45	16.29	16.21	16.34	
15	64QAM	36	39	16.53	16.47	16.33	16.32	16.37	
15	64QAM	75	0	16.36	16.48	16.41	16.33	16.43	
15	256QAM	1	0	16.34	16.20	16.46	16.46	16.27	18.2
15	256QAM	1	37	16.22	16.26	16.53	16.37	16.20	
15	256QAM	1	74	16.32	16.30	16.38	16.53	16.27	
15	256QAM	36	0	16.29	16.36	16.31	16.39	16.23	18.2

15	256QAM	36	20	16.39	16.37	16.24	16.29	16.41	
15	256QAM	36	39	16.47	16.53	16.35	16.37	16.44	
15	256QAM	75	0	16.46	16.38	16.45	16.27	16.41	
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	16.30	16.28	16.55	16.52	16.27	18.20
10	QPSK	1	25	16.30	16.34	16.53	16.49	16.26	
10	QPSK	1	49	16.38	16.32	16.33	16.27	16.29	
10	QPSK	25	0	16.37	16.35	16.30	16.38	16.23	18.2
10	QPSK	25	12	16.44	16.52	16.34	16.39	16.40	
10	QPSK	25	25	16.34	16.51	16.36	16.38	16.44	
10	QPSK	50	0	16.47	16.44	16.42	16.35	16.38	
10	16QAM	1	0	16.24	16.27	16.44	16.45	16.24	18.2
10	16QAM	1	25	16.23	16.24	16.38	16.49	16.23	
10	16QAM	1	49	16.30	16.37	16.24	16.53	16.22	
10	16QAM	25	0	16.36	16.33	16.32	16.48	16.27	18.2
10	16QAM	25	12	16.43	16.45	16.36	16.33	16.34	
10	16QAM	25	25	16.56	16.45	16.39	16.37	16.38	
10	16QAM	50	0	16.40	16.47	16.33	16.44	16.35	
10	64QAM	1	0	16.23	16.29	16.41	16.44	16.21	18.2
10	64QAM	1	25	16.22	16.25	16.40	16.45	16.21	
10	64QAM	1	49	16.24	16.26	16.26	16.29	16.26	
10	64QAM	25	0	16.33	16.34	16.28	16.48	16.28	18.2
10	64QAM	25	12	16.34	16.53	16.36	16.21	16.35	
10	64QAM	25	25	16.51	16.44	16.39	16.36	16.36	
10	64QAM	50	0	16.41	16.40	16.44	16.34	16.41	
10	256QAM	1	0	16.31	16.20	16.48	16.50	16.25	18.2
10	256QAM	1	25	16.20	16.34	16.50	16.35	16.20	
10	256QAM	1	49	16.37	16.30	16.35	16.51	16.24	
10	256QAM	25	0	16.30	16.35	16.28	16.40	16.35	18.2
10	256QAM	25	12	16.45	16.37	16.24	16.25	16.32	
10	256QAM	25	25	16.52	16.49	16.33	16.39	16.43	
10	256QAM	50	0	16.41	16.35	16.37	16.30	16.43	
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	16.31	16.32	16.55	16.54	16.27	18.20
5	QPSK	1	12	16.24	16.33	16.48	16.51	16.28	
5	QPSK	1	24	16.41	16.37	16.31	16.34	16.25	
5	QPSK	12	0	16.32	16.41	16.34	16.34	16.29	18.2
5	QPSK	12	7	16.47	16.43	16.44	16.38	16.44	
5	QPSK	12	13	16.29	16.46	16.36	16.33	16.42	
5	QPSK	25	0	16.46	16.50	16.38	16.43	16.42	
5	16QAM	1	0	16.28	16.28	16.42	16.45	16.20	18.2
5	16QAM	1	12	16.20	16.24	16.40	16.40	16.21	
5	16QAM	1	24	16.28	16.36	16.29	16.53	16.23	
5	16QAM	12	0	16.32	16.23	16.37	16.45	16.24	18.2
5	16QAM	12	7	16.47	16.44	16.36	16.32	16.37	
5	16QAM	12	13	16.50	16.49	16.32	16.34	16.43	
5	16QAM	25	0	16.41	16.45	16.36	16.43	16.37	
5	64QAM	1	0	16.28	16.29	16.51	16.45	16.20	18.2
5	64QAM	1	12	16.26	16.23	16.49	16.40	16.26	
5	64QAM	1	24	16.21	16.29	16.27	16.23	16.28	
5	64QAM	12	0	16.34	16.37	16.26	16.52	16.22	18.2
5	64QAM	12	7	16.41	16.48	16.29	16.28	16.33	
5	64QAM	12	13	16.50	16.44	16.35	16.28	16.43	
5	64QAM	25	0	16.40	16.48	16.38	16.40	16.42	
5	256QAM	1	0	16.34	16.23	16.48	16.45	16.23	18.2
5	256QAM	1	12	16.33	16.32	16.45	16.44	16.20	
5	256QAM	1	24	16.32	16.25	16.29	16.52	16.27	
5	256QAM	12	0	16.30	16.35	16.24	16.40	16.24	18.2
5	256QAM	12	7	16.42	16.43	16.26	16.28	16.38	
5	256QAM	12	13	16.48	16.45	16.36	16.30	16.48	
5	256QAM	25	0	16.43	16.39	16.43	16.36	16.38	

<LTE Band 48_Ant 0>

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	19.65	19.68	19.69	19.35	19.7
20	QPSK	1	49	19.51	19.57	19.62	19.11	
20	QPSK	1	99	19.60	19.41	19.41	19.15	
20	QPSK	50	0	18.61	18.60	18.63	18.29	18.7
20	QPSK	50	24	18.48	18.50	18.52	18.18	
20	QPSK	50	50	18.41	18.62	18.63	18.14	
20	QPSK	100	0	18.42	18.63	18.65	18.23	
20	16QAM	1	0	18.64	18.55	18.65	18.53	18.7
20	16QAM	1	49	18.58	18.52	18.63	18.68	
20	16QAM	1	99	18.29	18.37	18.54	18.30	
20	16QAM	50	0	17.65	17.59	17.44	17.18	17.7
20	16QAM	50	24	17.61	17.69	17.54	17.17	
20	16QAM	50	50	17.41	17.55	17.56	17.15	
20	16QAM	100	0	17.43	17.67	17.53	17.13	
20	64QAM	1	0	17.61	17.65	17.56	17.21	17.7
20	64QAM	1	49	17.47	17.53	17.38	17.36	
20	64QAM	1	99	17.67	17.34	17.33	17.34	
20	64QAM	50	0	16.55	16.58	16.58	16.47	16.7
20	64QAM	50	24	16.51	16.65	16.70	16.46	
20	64QAM	50	50	16.62	16.52	16.58	16.36	
20	64QAM	100	0	16.60	16.64	16.53	16.43	
20	256QAM	1	0	14.65	14.50	14.50	14.37	14.7
20	256QAM	1	49	14.50	14.44	14.52	14.44	
20	256QAM	1	99	14.46	14.32	14.50	14.16	
20	256QAM	50	0	14.44	14.55	14.50	14.35	14.7
20	256QAM	50	24	14.60	14.57	14.48	14.42	
20	256QAM	50	50	14.45	14.42	14.65	14.46	
20	256QAM	100	0	14.57	14.36	14.40	14.16	
Channel				55315	55820	56160	56665	Tune-up limit (dBm)
Frequency (MHz)				3557.5	3608	3642	3692.5	
15	QPSK	1	0	19.54	19.48	19.48	19.10	19.7
15	QPSK	1	37	19.38	19.55	19.58	19.01	
15	QPSK	1	74	19.58	19.28	19.33	18.99	
15	QPSK	36	0	18.40	18.57	18.55	18.19	18.7
15	QPSK	36	20	18.39	18.48	18.52	18.16	
15	QPSK	36	39	18.27	18.53	18.55	17.98	
15	QPSK	75	0	18.40	18.43	18.45	18.05	
15	16QAM	1	0	18.62	18.65	18.62	18.45	18.7
15	16QAM	1	37	18.46	18.54	18.54	18.50	
15	16QAM	1	74	18.09	18.36	18.32	18.12	
15	16QAM	36	0	17.49	17.40	17.28	17.04	17.7
15	16QAM	36	20	17.59	17.56	17.37	17.17	
15	16QAM	36	39	17.23	17.51	17.49	16.97	
15	16QAM	75	0	17.42	17.48	17.37	16.98	
15	64QAM	1	0	17.56	17.64	17.64	17.58	17.7
15	64QAM	1	37	17.46	17.55	17.67	17.29	
15	64QAM	1	74	17.61	17.18	17.62	17.30	
15	64QAM	36	0	16.43	16.47	16.50	16.38	16.7
15	64QAM	36	20	16.41	16.66	16.65	16.35	
15	64QAM	36	39	16.54	16.51	16.42	16.27	
15	64QAM	75	0	16.52	16.55	16.51	16.33	
15	256QAM	1	0	14.46	14.45	14.30	14.35	14.7
15	256QAM	1	37	14.39	14.63	14.36	14.41	
15	256QAM	1	74	14.40	14.32	14.32	14.11	
15	256QAM	36	0	14.38	14.49	14.32	14.18	14.7

15	256QAM	36	20	14.49	14.54	14.45	14.22	
15	256QAM	36	39	14.32	14.45	14.45	14.28	
15	256QAM	75	0	14.45	14.20	14.23	14.11	
Channel				55290	55815	56165	56690	Tune-up limit (dBm)
Frequency (MHz)				3555	3607.5	3642.5	3695	
10	QPSK	1	0	19.51	19.45	19.61	19.04	19.7
10	QPSK	1	25	19.50	19.57	19.52	19.09	
10	QPSK	1	49	19.59	19.26	19.26	18.96	
10	QPSK	25	0	18.37	18.46	18.62	18.10	18.7
10	QPSK	25	12	18.42	18.34	18.33	18.06	
10	QPSK	25	25	18.40	18.45	18.51	17.98	
10	QPSK	50	0	18.23	18.59	18.59	18.09	
10	16QAM	1	0	18.49	18.70	18.59	18.44	18.7
10	16QAM	1	25	18.40	18.56	18.69	18.55	
10	16QAM	1	49	18.13	18.19	18.62	18.27	
10	16QAM	25	0	17.59	17.47	17.40	17.17	17.7
10	16QAM	25	12	17.62	17.56	17.44	17.03	
10	16QAM	25	25	17.40	17.52	17.56	17.10	
10	16QAM	50	0	17.39	17.47	17.50	17.00	
10	64QAM	1	0	17.58	17.64	17.57	17.70	17.7
10	64QAM	1	25	17.42	17.64	17.51	17.35	
10	64QAM	1	49	17.57	17.23	17.12	17.18	
10	64QAM	25	0	16.68	16.40	16.57	16.27	16.7
10	64QAM	25	12	16.50	16.69	16.68	16.43	
10	64QAM	25	25	16.43	16.40	16.49	16.32	
10	64QAM	50	0	16.45	16.47	16.43	16.42	
10	256QAM	1	0	14.46	14.30	14.33	14.18	14.7
10	256QAM	1	25	14.49	14.59	14.52	14.35	
10	256QAM	1	49	14.43	14.25	14.30	14.13	
10	256QAM	25	0	14.44	14.51	14.36	14.29	14.7
10	256QAM	25	12	14.46	14.45	14.43	14.28	
10	256QAM	25	25	14.41	14.65	14.45	14.36	
10	256QAM	50	0	14.42	14.16	14.30	14.14	
Channel				55265	55810	56170	56715	Tune-up limit (dBm)
Frequency (MHz)				3552.5	3607	3643	3697.5	
5	QPSK	1	0	19.54	19.41	19.53	19.02	19.7
5	QPSK	1	12	19.49	19.40	19.59	19.10	
5	QPSK	1	24	19.58	19.33	19.35	18.98	
5	QPSK	12	0	18.43	18.60	18.66	18.27	18.7
5	QPSK	12	7	18.41	18.48	18.46	17.98	
5	QPSK	12	13	18.35	18.58	18.59	17.97	
5	QPSK	25	0	18.29	18.45	18.45	18.08	
5	16QAM	1	0	18.55	18.64	18.57	18.37	18.7
5	16QAM	1	12	18.42	18.66	18.64	18.63	
5	16QAM	1	24	18.25	18.25	18.32	18.23	
5	16QAM	12	0	17.47	17.55	17.27	17.17	17.7
5	16QAM	12	7	17.42	17.54	17.51	17.01	
5	16QAM	12	13	17.32	17.39	17.48	16.96	
5	16QAM	25	0	17.41	17.64	17.53	17.01	
5	64QAM	1	0	17.55	17.57	17.43	17.69	17.7
5	64QAM	1	12	17.45	17.70	17.63	17.16	
5	64QAM	1	24	17.51	17.21	17.69	17.15	
5	64QAM	12	0	16.69	16.58	16.56	16.32	16.7
5	64QAM	12	7	16.51	16.69	16.65	16.29	
5	64QAM	12	13	16.50	16.36	16.39	16.32	
5	64QAM	25	0	16.60	16.63	16.39	16.24	
5	256QAM	1	0	14.47	14.39	14.31	14.34	14.7
5	256QAM	1	12	14.33	14.60	14.35	14.26	
5	256QAM	1	24	14.34	14.19	14.42	13.98	
5	256QAM	12	0	14.44	14.44	14.39	14.17	14.7
5	256QAM	12	7	14.43	14.57	14.36	14.29	
5	256QAM	12	13	14.37	14.54	14.60	14.27	
5	256QAM	25	0	14.42	14.35	14.23	14.15	

<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			4CC Downlink Carrier Aggregation		
Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset
1	CA_12A-30A	37	36	CA_13A-48A-48A	56	56	CA_13A-48A-48A-66A	77
2	CA_12A-66A	40	37	CA_2A-2A-30A	40	57	CA_13A-48A-48C	77
3	CA_13A-48A	36	38	CA_2A-2A-4A	61	58	CA_13A-48A-66C	77
4	CA_13A-66A	56	39	CA_2A-2A-66A	62	59	CA_13A-48C-66A	77
5	CA_2A-12A		40	CA_2A-30A-66A		60	CA_2A-13A-48A-48A	80
6	CA_2A-13A	80	41	CA_2A-4A-4A	61	61	CA_2A-2A-4A-4A	
7	CA_2A-2A	37	42	CA_2A-66A-66A	82	62	CA_2A-48A-48A-66A	82
8	CA_2A-30A	37	43	CA_2A-66C	82	63	CA_2A-48A-48C	80
9	CA_2A-48A	80	44	CA_2C-66A	66	64	CA_2A-48C-66A	82
10	CA_2A-4A	61	45	CA_30A-66A-66A	40	65	CA_2A-48D	80
11	CA_2A-5A		46	CA_41D		66	CA_2C-66A-66A	82
12	CA_2A-66A	82	47	CA_48A-48A-66A	77	67	CA_48A-48A-66A-66A	77
13	CA_2A-71A		48	CA_48A-48C	77	68	CA_48A-48A-66C	77
14	CA_2C	44	49	CA_48A-66A-66A	77	69	CA_48A-48C-66A	77
15	CA_30A-66A	40	50	CA_48A-66C	77	70	CA_48A-48D	77
16	CA_41A-41A	46	51	CA_48C-66A	77	71	CA_48C-48C	77
17	CA_41C	46	52	CA_48D	77	72	CA_48C-66A-66A	77
18	CA_48A-48A	77	53	CA_4A-48C	93	73	CA_48C-66C	77
19	CA_48A-66A	77	54	CA_66A-66C	49	74	CA_48D-66A	77
20	CA_48C	51	55			75	CA_48E	77
21	CA_4A-12A					76	CA_4A-48D	93
22	CA_4A-13A							
23	CA_4A-30A							
24	CA_4A-48A	93						
25	CA_4A-4A	61						
26	CA_4A-5A							
27	CA_4A-71A							
28	CA_5A-30A							
29	CA_5A-5A	28						
30	CA_5A-66A							
31	CA_66A-66A	45						
32	CA_66A-71A							
33	CA_66B	34						
34	CA_66C	43						
35								

5CC Downlink Carrier Aggregation		
Number	Combination	Covered by Measurement Superset
77	CA_13A-48A-48C-66A	
78	CA_13A-48A-48D	77
79	CA_13A-48C-48C	77
80	CA_2A-13A-48A-48C	
81	CA_2A-13A-48D	80
82	CA_2A-48A-48C-66A	

						83	CA_2A-48A-48D	80
						84	CA_2A-48C-48C	80
						85	CA_2A-48D-66A	82
						86	CA_2A-48E	82
						87	CA_48A-48C-66C	77
						88	CA_48A-48D-66A	77
						89	CA_48A-48E	77
						90	CA_48C-48C-66A	77
						91	CA_48C-48D	77
						92	CA_48E-66A	77
						93	CA_4A-48E	

<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.

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

<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	1880	18900	QPSK	1	0	12	10	737.5	5095	20.21	20.33
	2	20	1880	18900	QPSK	1	0	5	10	881.5	2525	20.24	20.33
	2	20	1880	18900	QPSK	1	0	71	20	634.5	68761	20.18	20.33
	4	20	1720	20050	QPSK	1	0	12	10	737.5	5095	20.78	20.89
	4	20	1720	20050	QPSK	1	0	13	10	751	5230	20.73	20.89
	4	20	1720	20050	QPSK	1	0	30	10	2355	9820	20.74	20.89
	4	20	1720	20050	QPSK	1	0	5	10	881.5	2525	20.70	20.89
	4	20	1720	20050	QPSK	1	0	71	20	634.5	68761	20.75	20.89
	5	10	829	20450	QPSK	1	0	30	10	2355	9820	22.65	22.78
	5	10	829	20450	QPSK	1	0	66	20	2155	66886	22.67	22.78
	66	20	1745	132322	QPSK	1	0	71	20	634.5	68761	20.84	20.92

<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		Band 2	20	1880	18900	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	20.23	20.33
Intra-Band	Contiguous	Band 41	20	2593	40620	QPSK	1	0	41	20	2612.8	40818	41	20	2632.6	41016	16.41	16.55

<Four Carrier power verification>

Configure	PCC							SCC1				SCC2				SCC3				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	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band	Band 2	20	1880	18900	QPSK	1	0	Band 2	5	1932.5	625	Band 4	20	2132.5	2175	Band 4	5	2112.5	1975	20.18	20.33

<Five Carrier power verification>

Configure	PCC							SCC1				SCC2				SCC3				SCC4				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	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	Band 13	10	782	23230	QPSK	1	0	Band 48	5	3552.5	55265	Band 48	20	3690	56640	Band 48	20	3670.2	56442	Band 66	20	2155	66886	22.69	22.88
	Band 2	20	1880	18900	QPSK	1	0	Band 13	10	751	5230	Band 48	5	3552.5	55265	Band 48	20	3690	56640	Band 48	20	3670.2	56442	20.20	20.33
	Band 2	20	1880	18900	QPSK	1	0	Band 48	5	3552.5	55265	Band 48	20	3690	56640	Band 48	20	3670.2	56442	Band 66	20	2155	66886	20.27	20.33
	Band 4	20	1720	20050	QPSK	1	0	Band 48	20	3690	56640	Band 48	20	3670.2	56442	Band 48	20	3650.4	56244	Band 48	20	3630.6	56046	22.74	22.89

<LTE Uplink carrier aggregation>

2CC Uplink Carrier Aggregation	
Number	Combination
1	41C

<Intra-band>

General Note:

i. The device supports intra-band 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 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.

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	14.88	16.6
40185	39987	QPSK	1	0	1	99	2	0	14.86	16.6
40620	40422	QPSK	1	0	1	99	2	0	14.95	16.6
41055	40857	QPSK	1	0	1	99	2	0	14.71	16.6
41490	41292	QPSK	1	0	1	99	2	0	14.77	16.6

CA_41C_HPUE									
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	16.58	18.2
40185	39987	QPSK	1	0	1	99	2	0	16.61	18.2
40620	40422	QPSK	1	0	1	99	2	0	16.63	18.2
41055	40857	QPSK	1	0	1	99	2	0	16.37	18.2
41490	41292	QPSK	1	0	1	99	2	0	16.46	18.2

13. 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
3. The device implanted DPS (Dynamic Power Share) function to achieve higher uplink data rate keeping the total power unchanged in 5G NR NSA EN-DC mode according to 3GPP 38.213, when the equipment has a dynamic power sharing capability, it adjusts the LTE or NR transmission power so that the instantaneous total power does not exceed the specified value, when the maximum transmission power of NR (P LTE, P NR) and the specified total power (P total) have been set and the instantaneous calculated total transmission power exceeds P total, the NR transmission power is reduced so that the actual transmission power of the user equipment will not exceed Ptotal power.

<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		
	256 QAM	≤ 4.5		
CP-OFDM	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		

<FR1 n2_Ant 0>

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	20.32	22.38	20.36	20.5
20	PI/2 BPSK	1	53	20.12	20.39	20.30	
20	PI/2 BPSK	1	104	20.08	20.36	20.20	
20	PI/2 BPSK	50	0	20.01	20.26	20.05	20.5
20	PI/2 BPSK	50	28	20.10	20.32	20.12	20.5
20	PI/2 BPSK	50	56	20.04	20.29	20.22	20.5
20	PI/2 BPSK	100	0	20.20	20.31	20.25	
20	QPSK	1	1	20.07	20.32	20.15	20.5
20	QPSK	1	53	20.20	20.39	20.24	
20	QPSK	1	104	20.22	20.36	20.29	
20	QPSK	50	0	20.01	20.21	20.15	20.5
20	QPSK	50	28	20.07	20.28	20.11	20.5
20	QPSK	50	56	20.00	20.26	20.06	20.5
20	QPSK	100	0	20.00	20.27	20.09	
20	16QAM	1	1	20.18	20.39	20.26	20.5
20	64QAM	1	1	20.16	20.37	20.30	20.5
20	256QAM	1	1	18.42	18.48	18.43	18.5
Channel				371500	376000	380500	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	PI/2 BPSK	1	1	20.15	20.28	20.28	20.5
Channel				371000	376000	381000	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	PI/2 BPSK	1	1	20.27	20.22	20.13	20.5
Channel				370500	376000	381500	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	PI/2 BPSK	1	1	20.24	20.25	20.24	20.5

<FR1 n2_Ant 3>

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	22.43	22.33	22.30	22.7
20	PI/2 BPSK	1	53	22.41	22.36	22.15	
20	PI/2 BPSK	1	104	22.32	22.34	22.14	
20	PI/2 BPSK	50	0	22.18	22.19	22.11	22.2
20	PI/2 BPSK	50	28	22.27	22.23	22.18	22.7
20	PI/2 BPSK	50	56	22.17	22.18	22.07	22.2
20	PI/2 BPSK	100	0	22.12	22.13	22.05	
20	QPSK	1	1	22.37	22.36	22.24	22.7
20	QPSK	1	53	22.36	22.42	22.25	
20	QPSK	1	104	22.34	22.28	22.05	
20	QPSK	50	0	21.63	21.65	21.59	21.7
20	QPSK	50	28	22.25	22.27	22.19	22.7
20	QPSK	50	56	21.63	21.68	21.69	21.7
20	QPSK	100	0	21.63	21.59	21.64	
20	16QAM	1	1	21.56	21.67	21.63	21.7
20	64QAM	1	1	21.00	21.02	20.88	21.7
20	256QAM	1	1	18.18	18.14	18.13	18.2
Channel				371500	376000	380500	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	PI/2 BPSK	1	1	22.25	22.27	22.28	22.7
Channel				371000	376000	381000	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	PI/2 BPSK	1	1	22.41	22.30	22.37	22.7
Channel				370500	376000	381500	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	PI/2 BPSK	1	1	22.38	22.32	22.36	22.7

<FR1 n5_Ant 0>

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	
Frequency (MHz)				834	836.5	839	
20	PI/2 BPSK	1	1	22.85	22.84	22.97	23.0
20	PI/2 BPSK	1	53	22.76	22.85	22.80	
20	PI/2 BPSK	1	104	22.76	22.80	22.76	
20	PI/2 BPSK	50	0	22.28	22.32	22.25	22.5
20	PI/2 BPSK	50	28	22.82	22.93	22.94	23.0
20	PI/2 BPSK	50	56	22.24	22.33	22.32	22.5
20	PI/2 BPSK	100	0	22.32	22.39	22.38	
20	QPSK	1	1	22.76	22.81	22.77	23.0
20	QPSK	1	53	22.80	22.87	22.85	
20	QPSK	1	104	22.76	22.75	22.69	
20	QPSK	50	0	21.77	21.86	21.89	22.0
20	QPSK	50	28	22.90	22.86	22.88	23.0
20	QPSK	50	56	21.83	21.87	21.86	22.0
20	QPSK	100	0	21.94	21.96	21.89	
20	16QAM	1	1	21.93	22.00	21.94	22.0
20	64QAM	1	1	20.46	20.48	20.42	20.5
20	256QAM	1	1	18.29	18.33	18.30	18.5
Channel				166300	167300	168300	Tune-up limit (dBm)
Frequency (MHz)				831.5	836.5	841.5	
15	PI/2 BPSK	1	1	22.75	22.74	22.85	23.0
Channel				165800	167300	168800	Tune-up limit (dBm)
Frequency (MHz)				829	836.5	844	
10	PI/2 BPSK	1	1	22.76	22.83	22.77	23.0
Channel				165300	167300	169300	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	PI/2 BPSK	1	1	22.84	22.77	22.85	23.0

<FR1 n5_Ant 3>

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	
Frequency (MHz)				834	836.5	839	
20	PI/2 BPSK	1	1	23.32	23.52	23.35	24.2
20	PI/2 BPSK	1	53	23.17	23.32	23.17	
20	PI/2 BPSK	1	104	23.12	23.28	23.13	
20	PI/2 BPSK	50	0	22.66	22.82	22.68	23.7
20	PI/2 BPSK	50	28	23.23	23.41	23.29	24.2
20	PI/2 BPSK	50	56	22.63	22.83	22.68	23.7
20	PI/2 BPSK	100	0	22.65	22.80	22.69	
20	QPSK	1	1	23.12	23.27	23.14	24.2
20	QPSK	1	53	23.23	23.39	23.26	
20	QPSK	1	104	23.18	23.32	23.22	
20	QPSK	50	0	22.20	22.34	22.17	23.2
20	QPSK	50	28	23.20	23.40	23.24	24.2
20	QPSK	50	56	22.14	22.36	22.19	23.2
20	QPSK	100	0	22.16	22.33	22.22	
20	16QAM	1	1	22.06	22.19	22.09	23.2
20	64QAM	1	1	20.79	20.98	20.88	21.7
20	256QAM	1	1	18.79	18.92	18.79	19.7
Channel				166300	167300	168300	Tune-up limit (dBm)
Frequency (MHz)				831.5	836.5	841.5	
15	PI/2 BPSK	1	1	23.23	23.41	23.29	24.2
Channel				165800	167300	168800	Tune-up limit (dBm)
Frequency (MHz)				829	836.5	844	
10	PI/2 BPSK	1	1	23.25	23.44	23.28	24.2
Channel				165300	167300	169300	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	PI/2 BPSK	1	1	23.26	23.38	23.35	24.2

<FR1 n12_Ant 3>

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	
Frequency (MHz)				706.5	707.5	708.5	
15	PI/2 BPSK	1	1	23.24	23.27	23.26	24.3
15	PI/2 BPSK	1	40	23.20	23.25	23.21	
15	PI/2 BPSK	1	77	23.10	23.21	23.10	
15	PI/2 BPSK	36	0	22.61	22.70	22.67	23.8
15	PI/2 BPSK	36	22	23.09	23.19	23.18	24.3
15	PI/2 BPSK	36	43	22.68	22.71	22.65	23.8
15	PI/2 BPSK	75	0	22.70	22.73	22.72	
15	QPSK	1	1	23.18	23.22	23.13	24.3
15	QPSK	1	40	23.21	23.24	23.17	
15	QPSK	1	77	23.07	23.19	23.08	
15	QPSK	36	0	22.15	22.18	22.08	23.3
15	QPSK	36	22	23.10	23.17	23.08	24.3
15	QPSK	36	43	22.16	22.20	22.18	23.3
15	QPSK	75	0	22.13	22.17	22.07	
15	16QAM	1	1	22.40	22.49	22.42	23.3
15	64QAM	1	1	20.80	20.92	20.84	21.8
	256QAM	1	1	18.76	18.82	18.81	19.8
Channel				140800	141500	142200	Tune-up limit (dBm)
Frequency (MHz)				704	707.5	711	
10	PI/2 BPSK	1	1	23.15	23.20	23.22	24.3
Channel				140300	141500	142700	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	PI/2 BPSK	1	1	23.21	23.17	23.26	24.3

<FR1 n14_Ant 3>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					158600		
Frequency (MHz)					793		
10	PI/2 BPSK	1	1		23.15		24.5
10	PI/2 BPSK	1	26		23.05		
10	PI/2 BPSK	1	50		22.99		
10	PI/2 BPSK	25	0		22.54		24.0
10	PI/2 BPSK	25	14		23.03		24.5
10	PI/2 BPSK	25	27		22.53		24.0
10	PI/2 BPSK	50	0		22.58		
10	QPSK	1	1		23.06		24.5
10	QPSK	1	26		23.07		
10	QPSK	1	50		22.95		
10	QPSK	25	0		22.05		23.5
10	QPSK	25	14		23.08		24.5
10	QPSK	25	27		22.07		23.5
10	QPSK	50	0		22.03		
10	16QAM	1	1		22.35		23.5
10	64QAM	1	1		20.76		22.0
10	256QAM	1	1		18.45		20.0
Channel				158100	158600	159100	Tune-up limit (dBm)
Frequency (MHz)				790.5	793	795.5	
5	PI/2 BPSK	1	1	23.10	23.13	23.07	24.5

<FR1 n25_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				374000	376500	379000	
Frequency (MHz)				1870	1882.5	1895	
40	PI/2 BPSK	1	1	20.35	20.39	20.33	20.5
40	PI/2 BPSK	1	108	20.13	20.29	20.06	
40	PI/2 BPSK	1	214	20.07	20.28	20.22	
40	PI/2 BPSK	108	0	20.15	20.28	20.05	20.5
40	PI/2 BPSK	108	54	20.16	20.30	20.21	20.5
40	PI/2 BPSK	108	108	20.16	20.29	20.16	20.5
40	PI/2 BPSK	216	0	20.16	20.25	20.10	
40	QPSK	1	1	20.18	20.27	20.02	20.5
40	QPSK	1	108	20.24	20.31	20.07	
40	QPSK	1	214	20.16	20.25	20.08	
40	QPSK	108	0	20.12	20.23	19.97	20.5
40	QPSK	108	54	20.17	20.21	20.10	20.5
40	QPSK	108	108	20.18	20.32	20.25	20.5
40	QPSK	216	0	20.01	20.25	20.13	
40	16QAM	1	1	20.06	20.30	20.08	20.5
40	64QAM	1	1	20.20	20.28	20.10	20.5
40	256QAM	1	1	18.45	18.43	18.49	18.5
Channel				373000	376500	380000	Tune-up limit (dBm)
Frequency (MHz)				1865	1882.5	1900	
30	PI/2 BPSK	1	1	20.32	20.33	20.26	20.5
Channel				372500	376500	380500	Tune-up limit (dBm)
Frequency (MHz)				1862.5	1882.5	1902.5	
25	PI/2 BPSK	1	1	20.18	20.18	20.34	20.5
Channel				372000	376500	381000	Tune-up limit (dBm)
Frequency (MHz)				1860	1882.5	1905	
20	PI/2 BPSK	1	1	20.28	20.23	20.18	20.5
Channel				371500	376500	381500	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1882.5	1907.5	
15	PI/2 BPSK	1	1	20.35	20.25	20.34	20.5
Channel				371000	376500	382000	Tune-up limit (dBm)
Frequency (MHz)				1855	1882.5	1910	
10	PI/2 BPSK	1	1	20.23	20.31	20.35	20.5
Channel				370500	376500	382500	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1882.5	1912.5	
5	PI/2 BPSK	1	1	20.30	20.15	20.29	20.5

<FR1 n25_Ant 3>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				374000	376500	379000	
Frequency (MHz)				1870	1882.5	1895	
40	PI/2 BPSK	1	1	22.06	22.31	22.12	
40	PI/2 BPSK	1	108	22.07	22.18	22.07	22.7
40	PI/2 BPSK	1	214	22.00	22.15	22.24	
40	PI/2 BPSK	108	0	22.12	22.19	22.12	22.7
40	PI/2 BPSK	108	54	22.15	22.26	22.21	22.7
40	PI/2 BPSK	108	108	21.96	22.21	22.21	
40	PI/2 BPSK	216	0	22.16	22.21	22.19	22.7
40	QPSK	1	1	22.05	22.18	22.16	
40	QPSK	1	108	22.10	22.22	22.22	22.7
40	QPSK	1	214	21.94	22.17	22.16	
40	QPSK	108	0	22.18	22.05	22.06	22.7
40	QPSK	108	54	21.98	22.18	22.22	22.7
40	QPSK	108	108	22.09	22.18	22.17	
40	QPSK	216	0	22.20	22.06	22.09	22.7
40	16QAM	1	1	21.61	21.65	21.68	22.7
40	64QAM	1	1	20.18	20.14	20.16	21.7
40	256QAM	1	1	18.19	18.17	18.13	19.2
Channel				373000	376500	380000	Tune-up limit (dBm)
Frequency (MHz)				1865	1882.5	1900	
30	PI/2 BPSK	1	1	22.05	22.25	22.04	22.7
Channel				372500	376500	380500	Tune-up limit (dBm)
Frequency (MHz)				1862.5	1882.5	1902.5	
25	PI/2 BPSK	1	1	22.01	22.24	22.10	22.7
Channel				372000	376500	381000	Tune-up limit (dBm)
Frequency (MHz)				1860	1882.5	1905	
20	PI/2 BPSK	1	1	21.99	22.22	22.05	22.7
Channel				371500	376500	381500	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1882.5	1907.5	
15	PI/2 BPSK	1	1	22.04	22.00	22.02	22.7
Channel				371000	376500	382000	Tune-up limit (dBm)
Frequency (MHz)				1855	1882.5	1910	
10	PI/2 BPSK	1	1	21.88	21.89	21.89	22.7
Channel				370500	376500	382500	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1882.5	1912.5	
5	PI/2 BPSK	1	1	21.91	22.06	22.01	22.7

<FR1 n30_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					462000		
Frequency (MHz)					2310		
10	PI/2 BPSK	1	1		20.13		20.7
10	PI/2 BPSK	1	26		19.76		
10	PI/2 BPSK	1	50		19.69		
10	PI/2 BPSK	25	0		19.64		20.7
10	PI/2 BPSK	25	14		19.72		20.7
10	PI/2 BPSK	25	27		19.56		20.7
10	PI/2 BPSK	50	0		19.72		
10	QPSK	1	1		19.82		20.7
10	QPSK	1	26		19.86		
10	QPSK	1	50		19.76		
10	QPSK	25	0		19.78		20.7
10	QPSK	25	14		19.76		20.7
10	QPSK	25	27		19.64		20.7
10	QPSK	50	0		19.74		
10	16QAM	1	1		19.76		20.7
10	64QAM	1	1		20.12		20.7
10	256QAM	1	1		18.17		18.2
Channel				461500	462000	462500	Tune-up limit (dBm)
Frequency (MHz)				2307.5	2310	2312.5	
5	PI/2 BPSK	1	1	19.56	19.57	19.45	20.7

<FR1 n66_Ant 0>

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	
Frequency (MHz)				1730	1745	1760	
40	PI/2 BPSK	1	1	20.94	21.10	20.90	21.4
40	PI/2 BPSK	1	108	20.93	20.82	20.65	
40	PI/2 BPSK	1	214	21.01	20.93	20.75	
40	PI/2 BPSK	108	0	20.81	20.75	20.69	20.9
40	PI/2 BPSK	108	54	20.85	20.86	20.71	21.4
40	PI/2 BPSK	108	108	20.79	20.79	20.65	20.9
40	PI/2 BPSK	216	0	20.86	20.88	20.76	
40	QPSK	1	1	20.88	20.84	20.81	21.4
40	QPSK	1	108	21.00	20.79	20.76	
40	QPSK	1	214	21.09	20.90	20.84	
40	QPSK	108	0	20.11	20.36	20.32	20.9
40	QPSK	108	54	20.84	20.73	20.57	21.4
40	QPSK	108	108	20.90	20.83	20.65	20.9
40	QPSK	216	0	20.84	20.75	20.56	
40	16QAM	1	1	20.32	20.38	20.23	20.4
40	64QAM	1	1	19.95	19.97	19.98	20.4
40	256QAM	1	1	18.89	18.86	18.69	18.9
Channel				345000	349000	353000	Tune-up limit (dBm)
Frequency (MHz)				1725	1745	1765	
30	PI/2 BPSK	1	1	20.85	20.95	20.86	21.4
Channel				344000	349000	354000	Tune-up limit (dBm)
Frequency (MHz)				1720	1745	1770	
20	PI/2 BPSK	1	1	20.96	20.93	21.00	21.4
Channel				343500	349000	354500	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	PI/2 BPSK	1	1	20.88	20.82	20.96	21.4
Channel				343000	349000	355000	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	PI/2 BPSK	1	1	20.93	20.83	20.87	21.4
Channel				342500	349000	355500	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	PI/2 BPSK	1	1	20.88	20.81	20.96	21.4

<FR1 n66_Ant 3>

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	
Frequency (MHz)				1730	1745	1760	
40	PI/2 BPSK	1	1	23.13	23.14	23.02	23.8
40	PI/2 BPSK	1	108	22.93	23.01	22.88	
40	PI/2 BPSK	1	214	23.00	23.02	22.84	
40	PI/2 BPSK	108	0	22.60	22.74	22.43	23.3
40	PI/2 BPSK	108	54	23.04	23.06	22.87	23.8
40	PI/2 BPSK	108	108	22.46	22.56	22.35	23.3
40	PI/2 BPSK	216	0	22.41	22.55	22.25	
40	QPSK	1	1	22.99	23.08	22.85	23.8
40	QPSK	1	108	22.91	23.10	22.98	
40	QPSK	1	214	22.94	23.12	22.93	
40	QPSK	108	0	21.88	22.03	21.79	22.8
40	QPSK	108	54	23.02	23.05	22.87	23.8
40	QPSK	108	108	21.98	22.17	21.87	22.8
40	QPSK	216	0	22.00	22.08	21.91	
40	16QAM	1	1	22.10	22.26	22.12	22.8
40	64QAM	1	1	20.57	20.72	20.60	21.3
40	256QAM	1	1	18.49	18.57	18.29	19.3
Channel				345000	349000	353000	Tune-up limit (dBm)
Frequency (MHz)				1725	1745	1765	
30	PI/2 BPSK	1	1	23.13	23.10	23.02	23.8
Channel				344000	349000	354000	Tune-up limit (dBm)
Frequency (MHz)				1720	1745	1770	
20	PI/2 BPSK	1	1	22.96	23.09	22.87	23.8
Channel				343500	349000	354500	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	PI/2 BPSK	1	1	23.06	23.11	22.91	23.8
Channel				343000	349000	355000	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	PI/2 BPSK	1	1	23.05	22.94	22.92	23.8
Channel				342500	349000	355500	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	PI/2 BPSK	1	1	23.05	23.12	22.99	23.8

<FR1 n70_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					340500		
Frequency (MHz)					1702.5		
15	PI/2 BPSK	1	1		23.11		23.4
15	PI/2 BPSK	1	40		23.06		
15	PI/2 BPSK	1	77		23.02		
15	PI/2 BPSK	36	0		22.51		23.4
15	PI/2 BPSK	36	22		23.00		23.4
15	PI/2 BPSK	36	43		22.49		23.4
15	PI/2 BPSK	75	0		22.54		
15	QPSK	1	1		23.09		23.4
15	QPSK	1	40		23.04		
15	QPSK	1	77		23.01		
15	QPSK	36	0		21.98		22.4
15	QPSK	36	22		22.97		23.4
15	QPSK	36	43		21.99		22.4
15	QPSK	75	0		22.07		
15	16QAM	1	1		22.32		22.4
15	64QAM	1	1		20.79		20.9
15	256QAM	1	1		18.53		18.9
Channel				340000	340500	341000	Tune-up limit (dBm)
Frequency (MHz)				1700	1702.5	1705	
10	PI/2 BPSK	1	1	23.07	22.90	22.96	23.4
Channel				339500	340500	341500	Tune-up limit (dBm)
Frequency (MHz)				1697.5	1702.5	1707.5	
5	PI/2 BPSK	1	1	23.06	23.01	23.10	23.4

<FR1 n71_Ant 3>

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	
Frequency (MHz)				673	680.5	688	
20	PI/2 BPSK	1	1	23.29	23.33	23.25	24.4
20	PI/2 BPSK	1	53	23.08	23.17	23.07	
20	PI/2 BPSK	1	104	23.11	23.20	23.04	
20	PI/2 BPSK	50	0	22.63	22.75	22.61	23.9
20	PI/2 BPSK	50	28	23.12	23.20	23.11	24.4
20	PI/2 BPSK	50	56	22.62	22.70	22.61	23.9
20	PI/2 BPSK	100	0	22.64	22.76	22.59	
20	QPSK	1	1	23.11	23.23	23.06	24.4
20	QPSK	1	53	23.10	23.15	23.02	
20	QPSK	1	104	23.16	23.25	23.10	
20	QPSK	50	0	22.13	22.27	22.10	23.4
20	QPSK	50	28	23.13	23.26	23.11	24.4
20	QPSK	50	56	22.06	22.18	22.07	23.4
20	QPSK	100	0	22.14	22.22	22.11	
20	16QAM	1	1	22.44	22.48	22.36	23.4
20	64QAM	1	1	20.75	20.89	20.72	21.9
20	256QAM	1	1	18.62	18.70	18.58	19.9
Channel				134100	136100	138100	Tune-up limit (dBm)
Frequency (MHz)				670.5	680.5	690.5	
15	PI/2 BPSK	1	1	23.23	23.28	23.21	24.4
Channel				133600	136100	138600	Tune-up limit (dBm)
Frequency (MHz)				668	680.5	693	
10	PI/2 BPSK	1	1	23.19	23.24	23.20	24.4
Channel				133100	136100	139100	Tune-up limit (dBm)
Frequency (MHz)				665.5	680.5	695.5	
5	PI/2 BPSK	1	1	23.21	23.27	23.15	24.4

<FR1 n41_Ant 0>

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	
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	15.56	16.00	15.47	
100	PI/2 BPSK	1	137	15.10	15.30	15.41	16.0
100	PI/2 BPSK	1	271	15.64	15.84	15.95	
100	PI/2 BPSK	135	0	15.17	15.37	15.45	16.0
100	PI/2 BPSK	135	69	15.50	15.70	15.48	16.0
100	PI/2 BPSK	135	138	15.30	15.50	15.43	
100	PI/2 BPSK	270	0	15.31	15.51	15.62	16.0
100	QPSK	1	1	15.20	15.40	15.51	
100	QPSK	1	137	15.33	15.53	15.64	16.0
100	QPSK	1	271	15.54	15.74	15.85	
100	QPSK	135	0	15.15	15.35	15.46	
100	QPSK	135	69	15.32	15.52	15.63	16.0
100	QPSK	135	138	15.36	15.56	15.67	
100	QPSK	270	0	15.34	15.54	15.65	16.0
100	16QAM	1	1	15.40	15.60	15.71	16.0
100	64QAM	1	1	15.35	15.55	15.66	16.0
100	256QAM	1	1	15.14	15.34	15.45	16.0
Channel				508200	518598	528996	Tune-up limit (dBm)
Frequency (MHz)				2541	2592.99	2644.98	
90	PI/2 BPSK	1	1	15.48	15.93	15.38	16.0
Channel				507204	518598	529998	Tune-up limit (dBm)
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	15.56	15.93	15.41	16.0
Channel				506202	518598	531000	Tune-up limit (dBm)
Frequency (MHz)				2531.01	2592.99	2655	
70	PI/2 BPSK	1	1	15.54	15.90	15.45	16.0
Channel				505200	518598	531996	Tune-up limit (dBm)
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	15.53	15.96	15.46	16.0
Channel				504204	518598	532998	Tune-up limit (dBm)
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	15.51	15.90	15.46	16.0
Channel				503202	518598	534000	Tune-up limit (dBm)
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	15.48	15.98	15.37	16.0
Channel				502200	518598	534996	Tune-up limit (dBm)
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	15.51	15.90	15.42	16.0
Channel				501204	518598	535998	Tune-up limit (dBm)
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	15.47	15.91	15.47	16.0

<FR1 n41_Ant 3>

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	
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	17.86	18.00	17.55	
100	PI/2 BPSK	1	137	17.63	17.60	17.26	18.2
100	PI/2 BPSK	1	271	17.88	17.85	17.51	
100	PI/2 BPSK	135	0	17.54	17.58	17.30	18.2
100	PI/2 BPSK	135	69	17.59	17.61	17.41	18.2
100	PI/2 BPSK	135	138	17.52	17.60	17.27	
100	PI/2 BPSK	270	0	17.71	17.68	17.34	18.2
100	QPSK	1	1	17.72	17.69	17.35	
100	QPSK	1	137	17.63	17.60	17.26	18.2
100	QPSK	1	271	17.86	17.83	17.49	
100	QPSK	135	0	17.62	17.59	17.25	
100	QPSK	135	69	17.64	17.61	17.27	18.2
100	QPSK	135	138	17.61	17.58	17.24	
100	QPSK	270	0	17.68	17.65	17.31	18.2
100	16QAM	1	1	17.78	17.75	17.41	18.2
100	64QAM	1	1	17.86	17.83	17.49	18.2
100	256QAM	1	1	17.70	17.67	17.33	18.2
Channel				508200	518598	528996	Tune-up limit (dBm)
Frequency (MHz)				2541	2592.99	2644.98	
90	PI/2 BPSK	1	1	17.96	17.97	17.58	18.2
Channel				507204	518598	529998	Tune-up limit (dBm)
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	17.93	17.89	17.60	18.2
Channel				506202	518598	531000	Tune-up limit (dBm)
Frequency (MHz)				2531.01	2592.99	2655	
70	PI/2 BPSK	1	1	17.86	17.98	17.61	18.2
Channel				505200	518598	531996	Tune-up limit (dBm)
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	17.96	17.89	17.65	18.2
Channel				504204	518598	532998	Tune-up limit (dBm)
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	17.90	17.91	17.60	18.2
Channel				503202	518598	534000	Tune-up limit (dBm)
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	17.90	17.93	17.61	18.2
Channel				502200	518598	534996	Tune-up limit (dBm)
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	17.87	17.92	17.59	18.2
Channel				501204	518598	535998	Tune-up limit (dBm)
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	17.86	17.97	17.57	18.2

<FR1 n41_HPUE_Ant 0>

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	
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	18.37	18.98	18.32	19.0
100	PI/2 BPSK	1	137	18.96	18.35	17.69	
100	PI/2 BPSK	1	271	18.54	18.72	18.06	
100	PI/2 BPSK	135	0	18.30	18.25	17.59	19.0
100	PI/2 BPSK	135	69	18.33	18.36	17.80	19.0
100	PI/2 BPSK	135	138	18.32	18.32	17.70	19.0
100	PI/2 BPSK	270	0	18.93	18.32	17.66	
100	QPSK	1	1	18.89	18.28	17.62	19.0
100	QPSK	1	137	18.79	18.43	17.77	
100	QPSK	1	271	18.95	18.65	17.99	
100	QPSK	135	0	18.87	18.26	17.60	19.0
100	QPSK	135	69	18.97	18.36	17.70	
100	QPSK	135	138	18.45	18.47	17.81	
100	QPSK	270	0	18.89	18.28	17.62	19.0
100	16QAM	1	1	18.78	18.17	17.51	19.0
100	64QAM	1	1	18.65	18.42	17.76	19.0
100	256QAM	1	1	18.91	18.30	17.64	19.0
Channel				508200	518598	528996	Tune-up limit (dBm)
Frequency (MHz)				2541	2592.99	2644.98	
90	PI/2 BPSK	1	1	18.29	18.88	18.23	19.0
Channel				507204	518598	529998	Tune-up limit (dBm)
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	18.27	18.96	18.22	19.0
Channel				506202	518598	531000	Tune-up limit (dBm)
Frequency (MHz)				2531.01	2592.99	2655	
70	PI/2 BPSK	1	1	18.37	18.92	18.31	19.0
Channel				505200	518598	531996	Tune-up limit (dBm)
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	18.37	18.88	18.30	19.0
Channel				504204	518598	532998	Tune-up limit (dBm)
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	18.30	18.94	18.23	19.0
Channel				503202	518598	534000	Tune-up limit (dBm)
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	18.32	18.92	18.27	19.0
Channel				502200	518598	534996	Tune-up limit (dBm)
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	18.33	18.97	18.31	19.0
Channel				501204	518598	535998	Tune-up limit (dBm)
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	18.31	18.94	18.23	19.0

<FR1 n41_HPUE_Ant 3>

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	
Frequency (MHz)				2546.01	2592.99	2640	
100	PI/2 BPSK	1	1	20.92	21.10	20.56	
100	PI/2 BPSK	1	137	20.69	20.69	20.36	21.2
100	PI/2 BPSK	1	271	20.93	20.90	20.61	
100	PI/2 BPSK	135	0	20.58	20.58	20.32	21.2
100	PI/2 BPSK	135	69	20.60	20.62	20.33	21.2
100	PI/2 BPSK	135	138	20.54	20.61	20.46	
100	PI/2 BPSK	270	0	20.71	20.68	20.40	21.2
100	QPSK	1	1	20.82	20.77	20.36	
100	QPSK	1	137	20.65	20.68	20.33	21.2
100	QPSK	1	271	20.92	20.93	20.58	
100	QPSK	135	0	20.70	20.62	20.34	
100	QPSK	135	69	20.70	20.69	20.30	21.2
100	QPSK	135	138	20.64	20.68	20.26	
100	QPSK	270	0	20.71	20.70	20.31	21.2
100	16QAM	1	1	20.80	20.79	20.45	21.2
100	64QAM	1	1	20.90	20.86	20.59	21.2
100	256QAM	1	1	20.80	20.70	20.38	21.2
Channel				508200	518598	528996	Tune-up limit (dBm)
Frequency (MHz)				2541	2592.99	2644.98	
90	PI/2 BPSK	1	1	20.96	21.09	20.65	21.2
Channel				507204	518598	529998	Tune-up limit (dBm)
Frequency (MHz)				2536.02	2592.99	2649.99	
80	PI/2 BPSK	1	1	20.92	21.04	20.63	21.2
Channel				506202	518598	531000	Tune-up limit (dBm)
Frequency (MHz)				2531.01	2592.99	2655	
70	PI/2 BPSK	1	1	20.94	21.03	20.57	21.2
Channel				505200	518598	531996	Tune-up limit (dBm)
Frequency (MHz)				2526	2592.99	2659.98	
60	PI/2 BPSK	1	1	20.95	21.00	20.58	21.2
Channel				504204	518598	532998	Tune-up limit (dBm)
Frequency (MHz)				2521.02	2592.99	2664.99	
50	PI/2 BPSK	1	1	20.96	21.07	20.59	21.2
Channel				503202	518598	534000	Tune-up limit (dBm)
Frequency (MHz)				2516.01	2592.99	2670	
40	PI/2 BPSK	1	1	20.96	21.06	20.56	21.2
Channel				502200	518598	534996	Tune-up limit (dBm)
Frequency (MHz)				2511	2592.99	2674.98	
30	PI/2 BPSK	1	1	20.88	21.09	20.64	21.2
Channel				501204	518598	535998	Tune-up limit (dBm)
Frequency (MHz)				2506.02	2592.99	2679.99	
20	PI/2 BPSK	1	1	20.89	21.02	20.60	21.2

<FR1 n48_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				638000	641666	645332	
Frequency (MHz)				3570	3624.99	3679.98	
40	PI/2 BPSK	1	1	16.56	16.91	16.34	17.5
40	PI/2 BPSK	1	53	16.23	16.58	16.01	
40	PI/2 BPSK	1	104	16.22	16.57	16.00	
40	PI/2 BPSK	50	0	16.14	16.21	15.98	17.5
40	PI/2 BPSK	50	28	16.20	16.24	16.01	17.5
40	PI/2 BPSK	50	56	16.08	16.23	15.86	17.5
40	PI/2 BPSK	100	0	16.20	16.55	15.98	
40	QPSK	1	1	16.30	16.65	16.08	17.5
40	QPSK	1	53	16.32	16.67	16.10	
40	QPSK	1	104	16.23	16.58	16.01	
40	QPSK	50	0	16.25	16.60	16.03	17.5
40	QPSK	50	28	16.22	16.57	16.00	
40	QPSK	50	56	16.15	16.50	15.93	
40	QPSK	100	0	16.19	16.54	15.97	17.5
40	16QAM	1	1	16.18	16.53	15.96	17.5
40	64QAM	1	1	16.47	16.82	16.25	17.5
40	256QAM	1	1	15.05	15.40	14.83	16.5
Channel				637334	641666	646000	Tune-up limit (dBm)
Frequency (MHz)				3560.01	3624.99	3690	
20	PI/2 BPSK	1	1	16.52	16.85	16.30	17.5
Channel				637000	641666	646332	Tune-up limit (dBm)
Frequency (MHz)				3555	3624.99	3694.98	
10	PI/2 BPSK	1	1	16.47	16.83	16.32	17.5

<FR1 n77 Part 27O_Ant 0>

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	15.71	16.12	15.81	
100	PI/2 BPSK	1	137	15.83	15.72	15.73	16.9
100	PI/2 BPSK	1	271	15.76	15.65	15.66	
100	PI/2 BPSK	135	0	15.31	15.58	15.33	16.9
100	PI/2 BPSK	135	69	15.32	15.60	15.57	16.9
100	PI/2 BPSK	135	138	15.30	15.56	15.21	
100	PI/2 BPSK	270	0	15.77	15.66	15.67	16.9
100	QPSK	1	1	15.95	15.84	15.85	
100	QPSK	1	137	15.90	15.79	15.80	16.9
100	QPSK	1	271	15.91	15.80	15.81	
100	QPSK	135	0	15.79	15.68	15.69	
100	QPSK	135	69	15.72	15.61	15.62	16.9
100	QPSK	135	138	15.64	15.53	15.54	
100	QPSK	270	0	15.80	15.69	15.70	16.9
100	16QAM	1	1	15.82	15.71	15.72	16.9
100	64QAM	1	1	15.98	16.00	16.01	16.9
100	256QAM	1	1	16.00	15.89	15.90	16.9
Channel				649668	656000	662332	Tune-up limit (dBm)
Frequency (MHz)				3745.02	3840	3934.98	
90	PI/2 BPSK	1	1	15.70	15.78	15.76	16.9
Channel				649334	656000	662666	Tune-up limit (dBm)
Frequency (MHz)				3740.01	3840	3939.99	
80	PI/2 BPSK	1	1	15.64	15.77	15.76	16.9
Channel				649000	656000	663000	Tune-up limit (dBm)
Frequency (MHz)				3735	3840	3945	
70	PI/2 BPSK	1	1	15.68	15.73	15.78	16.9
Channel				648668	656000	663332	Tune-up limit (dBm)
Frequency (MHz)				3730.02	3840	3949.98	
60	PI/2 BPSK	1	1	15.68	15.74	15.74	16.9
Channel				648334	656000	663666	Tune-up limit (dBm)
Frequency (MHz)				3725.01	3840	3954.99	
50	PI/2 BPSK	1	1	15.61	15.82	15.77	16.9
Channel				648000	656000	664000	Tune-up limit (dBm)
Frequency (MHz)				3720	3840	3960	
40	PI/2 BPSK	1	1	15.66	15.74	15.79	16.9
Channel				647668	656000	664332	Tune-up limit (dBm)
Frequency (MHz)				3715.02	3840.00	3964.98	
30	PI/2 BPSK	1	1	15.67	15.81	15.76	16.9
Channel				647334	656000	664666	Tune-up limit (dBm)
Frequency (MHz)				3710.01	3840	3969.99	
20	PI/2 BPSK	1	1	15.61	15.72	15.75	16.9
Channel				647168	656000	664832	Tune-up limit (dBm)
Frequency (MHz)				3707.52	3840	3972.48	
15	PI/2 BPSK	1	1	15.70	15.72	15.76	16.9
Channel				647000	656000	665000	Tune-up limit (dBm)
Frequency (MHz)				3705	3840	3975	
10	PI/2 BPSK	1	1	15.71	15.76	15.74	16.9

<FR1 n77 Part 27O_Ant 3>

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	16.73	16.75	15.92	
100	PI/2 BPSK	1	137	16.57	16.55	15.72	17.1
100	PI/2 BPSK	1	271	16.27	16.25	15.42	
100	PI/2 BPSK	135	0	16.61	16.67	15.84	17.1
100	PI/2 BPSK	135	69	16.65	16.68	15.85	17.1
100	PI/2 BPSK	135	138	16.58	16.66	15.83	17.1
100	PI/2 BPSK	270	0	16.65	16.63	15.80	
100	QPSK	1	1	16.70	16.68	15.85	
100	QPSK	1	137	16.73	16.73	15.90	17.1
100	QPSK	1	271	16.71	16.74	15.94	
100	QPSK	135	0	16.66	16.64	15.81	
100	QPSK	135	69	16.72	16.70	15.87	17.1
100	QPSK	135	138	16.67	16.65	15.82	
100	QPSK	270	0	16.67	16.65	15.82	17.1
100	16QAM	1	1	16.66	16.64	16.02	17.1
100	64QAM	1	1	16.72	16.62	16.01	17.1
100	256QAM	1	1	16.69	16.67	15.84	17.1
Channel				649668	656000	662332	Tune-up limit (dBm)
Frequency (MHz)				3745.02	3840	3934.98	
90	PI/2 BPSK	1	1	16.63	16.70	15.91	17.1
Channel				649334	656000	662666	Tune-up limit (dBm)
Frequency (MHz)				3740.01	3840	3939.99	
80	PI/2 BPSK	1	1	16.63	16.72	15.91	17.1
Channel				649000	656000	663000	Tune-up limit (dBm)
Frequency (MHz)				3735	3840	3945	
70	PI/2 BPSK	1	1	16.65	16.70	15.87	17.1
Channel				648668	656000	663332	Tune-up limit (dBm)
Frequency (MHz)				3730.02	3840	3949.98	
60	PI/2 BPSK	1	1	16.71	16.65	15.83	17.1
Channel				648334	656000	663666	Tune-up limit (dBm)
Frequency (MHz)				3725.01	3840	3954.99	
50	PI/2 BPSK	1	1	16.72	16.73	15.84	17.1
Channel				648000	656000	664000	Tune-up limit (dBm)
Frequency (MHz)				3720	3840	3960	
40	PI/2 BPSK	1	1	16.70	16.74	15.88	17.1
Channel				647668	656000	664332	Tune-up limit (dBm)
Frequency (MHz)				3715.02	3840.00	3964.98	
30	PI/2 BPSK	1	1	16.69	16.73	15.92	17.1
Channel				647334	656000	664666	Tune-up limit (dBm)
Frequency (MHz)				3710.01	3840	3969.99	
20	PI/2 BPSK	1	1	16.71	16.66	15.89	17.1
Channel				647168	656000	664832	Tune-up limit (dBm)
Frequency (MHz)				3707.52	3840	3972.48	
15	PI/2 BPSK	1	1	16.70	16.68	15.92	17.1
Channel				647000	656000	665000	Tune-up limit (dBm)
Frequency (MHz)				3705	3840	3975	
10	PI/2 BPSK	1	1	16.63	16.66	15.90	17.1

<FR1 n77 Part 27O _HPUE_Ant 0>

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	18.66	18.82	18.71	
100	PI/2 BPSK	1	137	18.67	18.61	18.69	19.9
100	PI/2 BPSK	1	271	18.67	18.70	18.67	
100	PI/2 BPSK	135	0	18.61	18.60	18.63	19.9
100	PI/2 BPSK	135	69	18.62	18.65	18.64	19.9
100	PI/2 BPSK	135	138	18.60	18.61	18.63	
100	PI/2 BPSK	270	0	18.69	18.63	18.64	19.9
100	QPSK	1	1	18.68	18.68	18.69	
100	QPSK	1	137	18.69	18.70	18.71	19.9
100	QPSK	1	271	18.69	18.63	18.69	
100	QPSK	135	0	18.69	18.66	18.61	
100	QPSK	135	69	18.71	18.64	18.62	19.9
100	QPSK	135	138	18.67	18.71	18.62	
100	QPSK	270	0	18.67	18.70	18.67	19.9
100	16QAM	1	1	18.70	18.69	18.62	19.9
100	64QAM	1	1	18.65	18.64	18.65	19.9
100	256QAM	1	1	18.68	18.61	18.70	19.9
Channel				649668	656000	662332	Tune-up limit (dBm)
Frequency (MHz)				3745.02	3840	3934.98	
90	PI/2 BPSK	1	1	18.64	18.66	18.70	19.9
Channel				649334	656000	662666	Tune-up limit (dBm)
Frequency (MHz)				3740.01	3840	3939.99	
80	PI/2 BPSK	1	1	18.67	18.62	18.68	19.9
Channel				649000	656000	663000	Tune-up limit (dBm)
Frequency (MHz)				3735	3840	3945	
70	PI/2 BPSK	1	1	18.63	18.61	18.67	19.9
Channel				648668	656000	663332	Tune-up limit (dBm)
Frequency (MHz)				3730.02	3840	3949.98	
60	PI/2 BPSK	1	1	18.62	18.71	18.66	19.9
Channel				648334	656000	663666	Tune-up limit (dBm)
Frequency (MHz)				3725.01	3840	3954.99	
50	PI/2 BPSK	1	1	18.61	18.65	18.70	19.9
Channel				648000	656000	664000	Tune-up limit (dBm)
Frequency (MHz)				3720	3840	3960	
40	PI/2 BPSK	1	1	18.63	18.67	18.62	19.9
Channel				647668	656000	664332	Tune-up limit (dBm)
Frequency (MHz)				3715.02	3840.00	3964.98	
30	PI/2 BPSK	1	1	18.63	18.70	18.63	19.9
Channel				647334	656000	664666	Tune-up limit (dBm)
Frequency (MHz)				3710.01	3840	3969.99	
20	PI/2 BPSK	1	1	18.62	18.64	18.65	19.9
Channel				647168	656000	664832	Tune-up limit (dBm)
Frequency (MHz)				3707.52	3840	3972.48	
15	PI/2 BPSK	1	1	18.65	18.66	18.70	19.9
Channel				647000	656000	665000	Tune-up limit (dBm)
Frequency (MHz)				3705	3840	3975	
10	PI/2 BPSK	1	1	18.69	18.62	18.62	19.9

<FR1 n77 Part 27O_HPUE_Ant 3>

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	19.69	19.78	18.82	
100	PI/2 BPSK	1	137	19.53	19.50	18.65	20.1
100	PI/2 BPSK	1	271	19.18	19.16	18.41	
100	PI/2 BPSK	135	0	19.60	19.63	18.74	20.1
100	PI/2 BPSK	135	69	19.62	19.64	18.84	20.1
100	PI/2 BPSK	135	138	19.58	19.61	18.83	
100	PI/2 BPSK	270	0	19.55	19.55	18.71	20.1
100	QPSK	1	1	19.63	19.67	18.84	
100	QPSK	1	137	19.66	19.68	18.85	20.1
100	QPSK	1	271	19.66	19.74	18.84	
100	QPSK	135	0	19.61	19.59	18.79	
100	QPSK	135	69	19.64	19.64	18.85	20.1
100	QPSK	135	138	19.67	19.63	18.78	
100	QPSK	270	0	19.64	19.65	18.73	20.1
100	16QAM	1	1	19.64	19.64	18.92	20.1
100	64QAM	1	1	19.68	19.53	18.93	20.1
100	256QAM	1	1	19.65	19.65	18.82	20.1
Channel				649668	656000	662332	Tune-up limit (dBm)
Frequency (MHz)				3745.02	3840	3934.98	
90	PI/2 BPSK	1	1	19.68	19.75	18.91	20.1
Channel				649334	656000	662666	Tune-up limit (dBm)
Frequency (MHz)				3740.01	3840	3939.99	
80	PI/2 BPSK	1	1	19.69	19.66	18.91	20.1
Channel				649000	656000	663000	Tune-up limit (dBm)
Frequency (MHz)				3735	3840	3945	
70	PI/2 BPSK	1	1	19.68	19.66	18.84	20.1
Channel				648668	656000	663332	Tune-up limit (dBm)
Frequency (MHz)				3730.02	3840	3949.98	
60	PI/2 BPSK	1	1	19.70	19.70	18.91	20.1
Channel				648334	656000	663666	Tune-up limit (dBm)
Frequency (MHz)				3725.01	3840	3954.99	
50	PI/2 BPSK	1	1	19.65	19.72	18.85	20.1
Channel				648000	656000	664000	Tune-up limit (dBm)
Frequency (MHz)				3720	3840	3960	
40	PI/2 BPSK	1	1	19.66	19.67	18.92	20.1
Channel				647668	656000	664332	Tune-up limit (dBm)
Frequency (MHz)				3715.02	3840.00	3964.98	
30	PI/2 BPSK	1	1	19.68	19.72	18.82	20.1
Channel				647334	656000	664666	Tune-up limit (dBm)
Frequency (MHz)				3710.01	3840	3969.99	
20	PI/2 BPSK	1	1	19.71	19.75	18.85	20.1
Channel				647168	656000	664832	Tune-up limit (dBm)
Frequency (MHz)				3707.52	3840	3972.48	
15	PI/2 BPSK	1	1	19.63	19.71	18.90	20.1
Channel				647000	656000	665000	Tune-up limit (dBm)
Frequency (MHz)				3705	3840	3975	
10	PI/2 BPSK	1	1	19.72	19.73	18.84	20.1

<FR1 n77 Part 27Q_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					633332		
Frequency (MHz)					3499.98		
100	PI/2 BPSK	1	1		16.42		
100	PI/2 BPSK	1	137		16.29		16.9
100	PI/2 BPSK	1	271		16.38		
100	PI/2 BPSK	135	0		16.15		16.9
100	PI/2 BPSK	135	69		16.29		16.9
100	PI/2 BPSK	135	138		16.18		
100	PI/2 BPSK	270	0		16.18		16.9
100	QPSK	1	1		16.10		
100	QPSK	1	137		16.30		16.9
100	QPSK	1	271		16.38		
100	QPSK	135	0		16.16		
100	QPSK	135	69		16.23		16.9
100	QPSK	135	138		16.30		
100	QPSK	270	0		16.22		16.9
100	16QAM	1	1		16.37		16.9
100	64QAM	1	1		16.29		16.9
100	256QAM	1	1		16.13		16.9
Channel				633000	633332	633666	Tune-up limit (dBm)
Frequency (MHz)				3495	3499.98	3504.99	
90	PI/2 BPSK	1	1	16.07	16.10	16.21	16.9
Channel				632668	633332	634000	Tune-up limit (dBm)
Frequency (MHz)				3490.02	3499.98	3510	
80	PI/2 BPSK	1	1	16.04	16.13	16.15	16.9
Channel				632334	633332	634332	Tune-up limit (dBm)
Frequency (MHz)				3485.01	3499.98	3514.98	
70	PI/2 BPSK	1	1	15.98	16.12	16.18	16.9
Channel				632000	633332	634666	Tune-up limit (dBm)
Frequency (MHz)				3480	3499.98	3519.99	
60	PI/2 BPSK	1	1	16.04	16.11	16.14	16.9
Channel				631668	633332	635000	Tune-up limit (dBm)
Frequency (MHz)				3475.02	3499.98	3525	
50	PI/2 BPSK	1	1	15.98	16.14	16.20	16.9
Channel				631334	633332	635332	Tune-up limit (dBm)
Frequency (MHz)				3470.01	3499.98	3529.98	
40	PI/2 BPSK	1	1	15.98	16.04	16.20	16.9
Channel				631000	633332	635666	Tune-up limit (dBm)
Frequency (MHz)				3465	3499.98	3534.99	
30	PI/2 BPSK	1	1	16.07	16.13	16.17	16.9
Channel				630668	633332	636000	Tune-up limit (dBm)
Frequency (MHz)				3460.02	3499.98	3540	
20	PI/2 BPSK	1	1	16.00	16.09	16.15	16.9
Channel				630500	633332	636166	Tune-up limit (dBm)
Frequency (MHz)				3457.5	3499.98	3542.49	
15	PI/2 BPSK	1	1	16.02	16.11	16.15	16.9
Channel				630334	633332	636332	Tune-up limit (dBm)
Frequency (MHz)				3455.01	3499.98	3544.98	
10	PI/2 BPSK	1	1	15.97	16.05	16.16	16.9

<FR1 n77 Part 27Q_Ant 3>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					633332		
Frequency (MHz)					3499.98		
100	PI/2 BPSK	1	1		17.08		
100	PI/2 BPSK	1	137		16.98		17.1
100	PI/2 BPSK	1	271		16.88		
100	PI/2 BPSK	135	0		17.02		17.1
100	PI/2 BPSK	135	69		17.03		17.1
100	PI/2 BPSK	135	138		16.93		17.1
100	PI/2 BPSK	270	0		16.80		
100	QPSK	1	1		16.97		
100	QPSK	1	137		16.84		17.1
100	QPSK	1	271		16.82		
100	QPSK	135	0		16.97		
100	QPSK	135	69		17.05		17.1
100	QPSK	135	138		17.03		
100	QPSK	270	0		16.94		17.1
100	16QAM	1	1		16.81		17.1
100	64QAM	1	1		17.05		17.1
100	256QAM	1	1		16.99		17.1
Channel				633000	633332	633666	Tune-up limit (dBm)
Frequency (MHz)				3495	3499.98	3504.99	
90	PI/2 BPSK	1	1	16.90	16.92	16.88	17.1
Channel				632668	633332	634000	Tune-up limit (dBm)
Frequency (MHz)				3490.02	3499.98	3510	
80	PI/2 BPSK	1	1	16.87	16.99	16.92	17.1
Channel				632334	633332	634332	Tune-up limit (dBm)
Frequency (MHz)				3485.01	3499.98	3514.98	
70	PI/2 BPSK	1	1	16.85	16.91	16.94	17.1
Channel				632000	633332	634666	Tune-up limit (dBm)
Frequency (MHz)				3480	3499.98	3519.99	
60	PI/2 BPSK	1	1	16.88	16.90	16.95	17.1
Channel				631668	633332	635000	Tune-up limit (dBm)
Frequency (MHz)				3475.02	3499.98	3525	
50	PI/2 BPSK	1	1	16.83	16.95	16.87	17.1
Channel				631334	633332	635332	Tune-up limit (dBm)
Frequency (MHz)				3470.01	3499.98	3529.98	
40	PI/2 BPSK	1	1	16.82	16.91	16.96	17.1
Channel				631000	633332	635666	Tune-up limit (dBm)
Frequency (MHz)				3465	3499.98	3534.99	
30	PI/2 BPSK	1	1	16.83	16.97	16.90	17.1
Channel				630668	633332	636000	Tune-up limit (dBm)
Frequency (MHz)				3460.02	3499.98	3540	
20	PI/2 BPSK	1	1	16.87	16.92	16.87	17.1
Channel				630500	633332	636166	Tune-up limit (dBm)
Frequency (MHz)				3457.5	3499.98	3542.49	
15	PI/2 BPSK	1	1	16.82	16.99	16.93	17.1
Channel				630334	633332	636332	Tune-up limit (dBm)
Frequency (MHz)				3455.01	3499.98	3544.98	
10	PI/2 BPSK	1	1	16.89	16.91	16.97	17.1

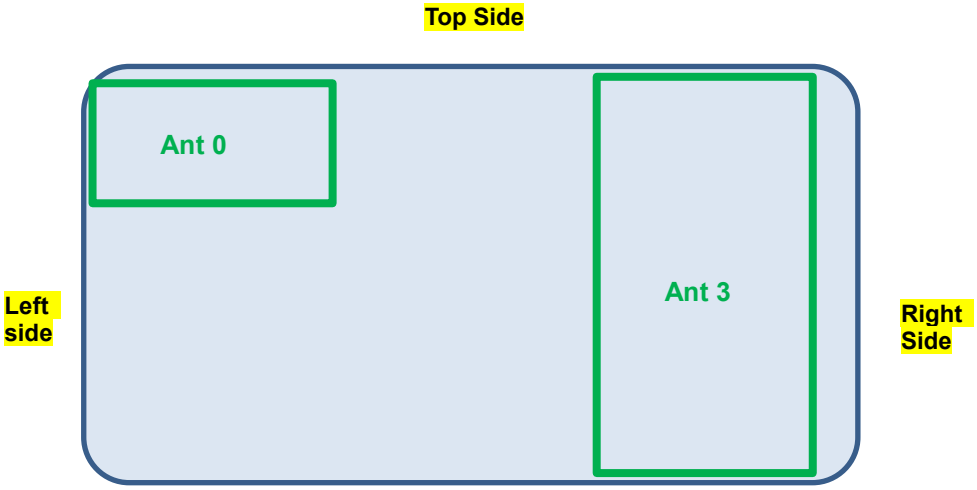
<FR1 n77 Part 27Q_HPUE_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					633332		
Frequency (MHz)					3499.98		
100	PI/2 BPSK	1	1		19.45		
100	PI/2 BPSK	1	137		19.20		19.9
100	PI/2 BPSK	1	271		19.37		
100	PI/2 BPSK	135	0		19.18		19.9
100	PI/2 BPSK	135	69		19.20		19.9
100	PI/2 BPSK	135	138		19.16		
100	PI/2 BPSK	270	0		19.05		19.9
100	QPSK	1	1		19.16		
100	QPSK	1	137		19.22		19.9
100	QPSK	1	271		19.11		
100	QPSK	135	0		19.09		
100	QPSK	135	69		19.26		19.9
100	QPSK	135	138		19.35		
100	QPSK	270	0		19.12		19.9
100	16QAM	1	1		19.15		19.9
100	64QAM	1	1		19.26		19.9
100	256QAM	1	1		19.17		19.9
Channel				633000	633332	633666	Tune-up limit (dBm)
Frequency (MHz)				3495	3499.98	3504.99	
90	PI/2 BPSK	1	1	19.03	19.05	19.10	19.9
Channel				632668	633332	634000	Tune-up limit (dBm)
Frequency (MHz)				3490.02	3499.98	3510	
80	PI/2 BPSK	1	1	19.07	19.37	19.16	19.9
Channel				632334	633332	634332	Tune-up limit (dBm)
Frequency (MHz)				3485.01	3499.98	3514.98	
70	PI/2 BPSK	1	1	19.08	19.32	19.20	19.9
Channel				632000	633332	634666	Tune-up limit (dBm)
Frequency (MHz)				3480	3499.98	3519.99	
60	PI/2 BPSK	1	1	19.06	19.42	19.20	19.9
Channel				631668	633332	635000	Tune-up limit (dBm)
Frequency (MHz)				3475.02	3499.98	3525	
50	PI/2 BPSK	1	1	19.04	19.33	19.21	19.9
Channel				631334	633332	635332	Tune-up limit (dBm)
Frequency (MHz)				3470.01	3499.98	3529.98	
40	PI/2 BPSK	1	1	19.05	19.38	19.16	19.9
Channel				631000	633332	635666	Tune-up limit (dBm)
Frequency (MHz)				3465	3499.98	3534.99	
30	PI/2 BPSK	1	1	19.13	19.32	19.25	19.9
Channel				630668	633332	636000	Tune-up limit (dBm)
Frequency (MHz)				3460.02	3499.98	3540	
20	PI/2 BPSK	1	1	19.11	19.38	19.19	19.9
Channel				630500	633332	636166	Tune-up limit (dBm)
Frequency (MHz)				3457.5	3499.98	3542.49	
15	PI/2 BPSK	1	1	19.04	19.34	19.17	19.9
Channel				630334	633332	636332	Tune-up limit (dBm)
Frequency (MHz)				3455.01	3499.98	3544.98	
10	PI/2 BPSK	1	1	19.04	19.36	19.16	19.9

<FR1 n77 Part 27Q_HPUE_Ant 3>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					633332		
Frequency (MHz)					3499.98		
100	PI/2 BPSK	1	1		20.07		20.1
100	PI/2 BPSK	1	137		19.88		
100	PI/2 BPSK	1	271		19.85		
100	PI/2 BPSK	135	0		19.87		20.1
100	PI/2 BPSK	135	69		19.96		20.1
100	PI/2 BPSK	135	138		19.93		20.1
100	PI/2 BPSK	270	0		19.73		
100	QPSK	1	1		19.92		20.1
100	QPSK	1	137		19.82		
100	QPSK	1	271		19.80		
100	QPSK	135	0		19.97		20.1
100	QPSK	135	69		20.04		
100	QPSK	135	138		19.95		
100	QPSK	270	0		19.86		20.1
100	16QAM	1	1		19.77		20.1
100	64QAM	1	1		19.98		20.1
100	256QAM	1	1		19.94		20.1
Channel				633000	633332	633666	Tune-up limit (dBm)
Frequency (MHz)				3495	3499.98	3504.99	
90	PI/2 BPSK	1	1	19.90	19.54	19.86	20.1
Channel				632668	633332	634000	Tune-up limit (dBm)
Frequency (MHz)				3490.02	3499.98	3510	
80	PI/2 BPSK	1	1	19.81	19.99	19.80	20.1
Channel				632334	633332	634332	Tune-up limit (dBm)
Frequency (MHz)				3485.01	3499.98	3514.98	
70	PI/2 BPSK	1	1	19.81	18.97	19.78	20.1
Channel				632000	633332	634666	Tune-up limit (dBm)
Frequency (MHz)				3480	3499.98	3519.99	
60	PI/2 BPSK	1	1	19.82	20.04	19.88	20.1
Channel				631668	633332	635000	Tune-up limit (dBm)
Frequency (MHz)				3475.02	3499.98	3525	
50	PI/2 BPSK	1	1	19.89	19.94	19.83	20.1
Channel				631334	633332	635332	Tune-up limit (dBm)
Frequency (MHz)				3470.01	3499.98	3529.98	
40	PI/2 BPSK	1	1	19.80	20.03	19.78	20.1
Channel				631000	633332	635666	Tune-up limit (dBm)
Frequency (MHz)				3465	3499.98	3534.99	
30	PI/2 BPSK	1	1	19.87	19.97	19.88	20.1
Channel				630668	633332	636000	Tune-up limit (dBm)
Frequency (MHz)				3460.02	3499.98	3540	
20	PI/2 BPSK	1	1	19.88	19.98	19.88	20.1
Channel				630500	633332	636166	Tune-up limit (dBm)
Frequency (MHz)				3457.5	3499.98	3542.49	
15	PI/2 BPSK	1	1	19.84	20.04	19.85	20.1
Channel				630334	633332	636332	Tune-up limit (dBm)
Frequency (MHz)				3455.01	3499.98	3544.98	
10	PI/2 BPSK	1	1	19.85	20.06	19.81	20.1

14. Antenna Location



Front View

15. 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 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 ≥0.8W/kg.

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 ½ 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 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; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4/B5/B12/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 4 SAR test was covered by Band 66; 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 ≤ 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 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.
   d. 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
   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. 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

15.1 Body SAR

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	5mm	Ant 0	18900	1880	20.33	20.6	1.064	-0.15	0.914	0.973
	LTE Band 2	20M	QPSK	1	0	Front	5mm	Ant 0	18700	1860	20.25	20.6	1.084	-0.03	1.010	1.095
	LTE Band 2	20M	QPSK	1	0	Front	5mm	Ant 0	19100	1900	20.32	20.6	1.067	-0.04	0.926	0.988
	LTE Band 2	20M	QPSK	50	0	Front	5mm	Ant 0	18900	1880	19.2	19.6	1.096	-0.09	0.788	0.864
	LTE Band 2	20M	QPSK	50	0	Front	5mm	Ant 0	18700	1860	19.13	19.6	1.114	-0.04	0.945	1.053
	LTE Band 2	20M	QPSK	50	0	Front	5mm	Ant 0	19100	1900	19.19	19.6	1.099	-0.11	0.732	0.804
	LTE Band 2	20M	QPSK	100	0	Front	5mm	Ant 0	18900	1880	19.16	19.6	1.107	0.03	0.723	0.800
	LTE Band 2	20M	QPSK	1	0	Back	5mm	Ant 0	18900	1880	20.33	20.6	1.064	-0.12	0.186	0.198
	LTE Band 2	20M	QPSK	50	0	Back	5mm	Ant 0	18900	1880	19.2	19.6	1.096	-0.08	0.145	0.159
	LTE Band 2	20M	QPSK	1	0	Left Side	5mm	Ant 0	18900	1880	20.33	20.6	1.064	-0.17	0.562	0.598
	LTE Band 2	20M	QPSK	50	0	Left Side	5mm	Ant 0	18900	1880	19.2	19.6	1.096	-0.04	0.440	0.482
	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	Ant 0	18900	1880	20.33	20.6	1.064	-0.01	1.060	1.128
	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	Ant 0	18700	1860	20.25	20.6	1.084	-0.03	1.040	1.127
	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	Ant 0	19100	1900	20.32	20.6	1.067	-0.04	1.030	1.099
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	Ant 0	18900	1880	19.2	19.6	1.096	0.11	0.784	0.860
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	Ant 0	18700	1860	19.13	19.6	1.114	-0.04	0.921	1.026
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	Ant 0	19100	1900	19.19	19.6	1.099	-0.11	0.824	0.906
	LTE Band 2	20M	QPSK	100	0	Right Side	5mm	Ant 0	18900	1880	19.16	19.6	1.107	0.11	0.786	0.870
	LTE Band 2	20M	QPSK	1	0	Top Side	5mm	Ant 0	18900	1880	20.33	20.6	1.064	0.03	0.050	0.053
	LTE Band 2	20M	QPSK	50	0	Top Side	5mm	Ant 0	18900	1880	19.2	19.6	1.096	0.1	0.001	0.001
	LTE Band 2	20M	QPSK	1	0	Front	5mm	Ant 3	19100	1900	21.7	22	1.072	-0.16	0.775	0.830
	LTE Band 2	20M	QPSK	1	0	Front	5mm	Ant 3	18700	1860	21.5	22	1.122	0.05	0.734	0.824
	LTE Band 2	20M	QPSK	1	0	Front	5mm	Ant 3	18900	1880	21.56	22	1.107	0.03	0.731	0.809
	LTE Band 2	20M	QPSK	50	0	Front	5mm	Ant 3	19100	1900	21.6	22	1.096	-0.06	0.751	0.823
	LTE Band 2	20M	QPSK	50	0	Front	5mm	Ant 3	18700	1860	21.55	22	1.109	-0.15	0.743	0.824
	LTE Band 2	20M	QPSK	50	0	Front	5mm	Ant 3	18900	1880	21.57	22	1.104	-0.05	0.724	0.799
	LTE Band 2	20M	QPSK	100	0	Front	5mm	Ant 3	19100	1900	21.37	22	1.156	-0.07	0.705	0.815
	LTE Band 2	20M	QPSK	1	0	Back	5mm	Ant 3	19100	1900	21.7	22	1.072	-0.12	0.848	0.909
	LTE Band 2	20M	QPSK	1	0	Back	5mm	Ant 3	18700	1860	21.5	22	1.122	0.13	0.832	0.934
	LTE Band 2	20M	QPSK	1	0	Back	5mm	Ant 3	18900	1880	21.56	22	1.107	-0.19	0.815	0.902
	LTE Band 2	20M	QPSK	50	0	Back	5mm	Ant 3	19100	1900	21.6	22	1.096	0.15	0.810	0.888
	LTE Band 2	20M	QPSK	50	0	Back	5mm	Ant 3	18700	1860	21.55	22	1.109	-0.05	0.805	0.893
	LTE Band 2	20M	QPSK	50	0	Back	5mm	Ant 3	18900	1880	21.57	22	1.104	-0.11	0.800	0.883
	LTE Band 2	20M	QPSK	100	0	Back	5mm	Ant 3	19100	1900	21.37	22	1.156	-0.12	0.785	0.908
	LTE Band 2	20M	QPSK	1	0	Left Side	5mm	Ant 3	19100	1900	21.7	22	1.072	0.18	0.501	0.537
	LTE Band 2	20M	QPSK	50	0	Left Side	5mm	Ant 3	19100	1900	21.6	22	1.096	-0.14	0.497	0.545
01	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	Ant 3	19100	1900	21.7	22	1.072	0.01	1.110	1.189
	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	Ant 3	18700	1860	21.5	22	1.122	0.06	0.940	1.055
	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	Ant 3	18900	1880	21.56	22	1.107	-0.05	1.040	1.151
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	Ant 3	19100	1900	21.6	22	1.096	0.1	1.050	1.151
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	Ant 3	18700	1860	21.55	22	1.109	0.14	1.043	1.157
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	Ant 3	18900	1880	21.57	22	1.104	-0.05	1.032	1.139
	LTE Band 2	20M	QPSK	100	0	Right Side	5mm	Ant 3	19100	1900	21.37	22	1.156	0.19	0.954	1.103
	LTE Band 2	20M	QPSK	1	0	Top Side	5mm	Ant 3	19100	1900	21.7	22	1.072	-0.05	0.322	0.345
	LTE Band 2	20M	QPSK	50	0	Top Side	5mm	Ant 3	19100	1900	21.6	22	1.096	0.11	0.313	0.343

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 5	10M	QPSK	1	0	Front	5mm	Ant 3	20525	836.5	22.74	24.5	1.500	0.11	0.703	1.054
	LTE Band 5	10M	QPSK	25	0	Front	5mm	Ant 3	20525	836.5	21.86	23.5	1.459	-0.07	0.592	0.864
	LTE Band 5	10M	QPSK	50	0	Front	5mm	Ant 3	20525	836.5	21.72	23.5	1.507	-0.03	0.543	0.818
02	LTE Band 5	10M	QPSK	1	0	Back	5mm	Ant 3	20525	836.5	22.74	24.5	1.500	0	0.715	1.072
	LTE Band 5	10M	QPSK	25	0	Back	5mm	Ant 3	20525	836.5	21.86	23.5	1.459	0.04	0.602	0.878
	LTE Band 5	10M	QPSK	50	0	Back	5mm	Ant 3	20525	836.5	21.72	23.5	1.507	0.07	0.554	0.835
	LTE Band 5	10M	QPSK	1	0	Left Side	5mm	Ant 3	20525	836.5	22.74	24.5	1.500	-0.11	0.426	0.639
	LTE Band 5	10M	QPSK	25	0	Left Side	5mm	Ant 3	20525	836.5	21.86	23.5	1.459	0.09	0.301	0.439
	LTE Band 5	10M	QPSK	1	0	Right Side	5mm	Ant 3	20525	836.5	22.74	24.5	1.500	0.06	0.507	0.760
	LTE Band 5	10M	QPSK	25	0	Right Side	5mm	Ant 3	20525	836.5	21.86	23.5	1.459	0.07	0.329	0.480
	LTE Band 5	10M	QPSK	1	0	Top Side	5mm	Ant 3	20525	836.5	22.74	24.5	1.500	-0.16	0.083	0.124
	LTE Band 5	10M	QPSK	25	0	Top Side	5mm	Ant 3	20525	836.5	21.86	23.5	1.459	0.09	0.065	0.095
03	LTE Band 12	10M	QPSK	1	0	Front	5mm	Ant 3	23095	707.5	22.89	24.5	1.449	-0.04	0.778	1.127
	LTE Band 12	10M	QPSK	25	0	Front	5mm	Ant 3	23095	707.5	21.93	23.5	1.435	-0.16	0.741	1.064
	LTE Band 12	10M	QPSK	50	0	Front	5mm	Ant 3	23095	707.5	21.93	23.5	1.435	0.01	0.606	0.870
	LTE Band 12	10M	QPSK	1	0	Back	5mm	Ant 3	23095	707.5	22.89	24.5	1.449	-0.11	0.569	0.824
	LTE Band 12	10M	QPSK	25	0	Back	5mm	Ant 3	23095	707.5	21.93	23.5	1.435	-0.17	0.531	0.762
	LTE Band 12	10M	QPSK	50	0	Back	5mm	Ant 3	23095	707.5	21.93	23.5	1.435	0.04	0.446	0.640
	LTE Band 12	10M	QPSK	1	0	Left Side	5mm	Ant 3	23095	707.5	22.89	24.5	1.449	-0.17	0.450	0.652
	LTE Band 12	10M	QPSK	25	0	Left Side	5mm	Ant 3	23095	707.5	21.93	23.5	1.435	0	0.510	0.732
	LTE Band 12	10M	QPSK	1	0	Right Side	5mm	Ant 3	23095	707.5	22.89	24.5	1.449	-0.18	0.235	0.340
	LTE Band 12	10M	QPSK	25	0	Right Side	5mm	Ant 3	23095	707.5	21.93	23.5	1.435	0.03	0.364	0.523
	LTE Band 12	10M	QPSK	1	0	Top Side	5mm	Ant 3	23095	707.5	22.89	24.5	1.449	0.09	0.125	0.181
	LTE Band 12	10M	QPSK	25	0	Top Side	5mm	Ant 3	23095	707.5	21.93	23.5	1.435	0.09	0.129	0.185
04	LTE Band 13	10M	QPSK	1	0	Front	5mm	Ant 3	23230	782	22.88	23.6	1.180	-0.08	0.995	1.174
	LTE Band 13	10M	QPSK	25	0	Front	5mm	Ant 3	23230	782	21.82	22.6	1.197	0.02	0.948	1.135
	LTE Band 13	10M	QPSK	50	0	Front	5mm	Ant 3	23230	782	21.76	22.6	1.213	0.03	0.748	0.908
	LTE Band 13	10M	QPSK	1	0	Back	5mm	Ant 3	23230	782	22.88	23.6	1.180	-0.18	0.952	1.124
	LTE Band 13	10M	QPSK	25	0	Back	5mm	Ant 3	23230	782	21.82	22.6	1.197	-0.05	0.966	1.156
	LTE Band 13	10M	QPSK	50	0	Back	5mm	Ant 3	23230	782	21.76	22.6	1.213	-0.1	0.726	0.881
	LTE Band 13	10M	QPSK	1	0	Left Side	5mm	Ant 3	23230	782	22.88	23.6	1.180	0.04	0.506	0.597
	LTE Band 13	10M	QPSK	25	0	Left Side	5mm	Ant 3	23230	782	21.82	22.6	1.197	-0.13	0.488	0.584
	LTE Band 13	10M	QPSK	1	0	Right Side	5mm	Ant 3	23230	782	22.88	23.6	1.180	-0.02	0.531	0.627
	LTE Band 13	10M	QPSK	25	0	Right Side	5mm	Ant 3	23230	782	21.82	22.6	1.197	-0.03	0.554	0.663
	LTE Band 13	10M	QPSK	50	0	Right Side	5mm	Ant 3	23230	782	21.76	22.6	1.213	-0.03	0.481	0.584
	LTE Band 13	10M	QPSK	1	0	Top Side	5mm	Ant 3	23230	782	22.88	23.6	1.180	-0.07	0.114	0.135
	LTE Band 13	10M	QPSK	25	0	Top Side	5mm	Ant 3	23230	782	21.82	22.6	1.197	0.02	0.135	0.162
05	LTE Band 30	10M	QPSK	1	0	Front	5mm	Ant 0	27710	2310	19.51	20	1.119	0.12	1.070	1.198
	LTE Band 30	10M	QPSK	25	0	Front	5mm	Ant 0	27710	2310	18.41	19	1.146	0.03	0.827	0.947
	LTE Band 30	10M	QPSK	50	0	Front	5mm	Ant 0	27710	2310	18.35	19	1.161	-0.06	0.825	0.958
	LTE Band 30	10M	QPSK	1	0	Back	5mm	Ant 0	27710	2310	19.51	20	1.119	0.09	0.165	0.185
	LTE Band 30	10M	QPSK	25	0	Back	5mm	Ant 0	27710	2310	18.41	19	1.146	-0.06	0.120	0.137
	LTE Band 30	10M	QPSK	1	0	Left Side	5mm	Ant 0	27710	2310	19.51	20	1.119	0	0.720	0.806
	LTE Band 30	10M	QPSK	25	0	Left Side	5mm	Ant 0	27710	2310	18.41	19	1.146	0.13	0.548	0.628
	LTE Band 30	10M	QPSK	50	0	Left Side	5mm	Ant 0	27710	2310	18.35	19	1.161	-0.13	0.550	0.639
	LTE Band 30	10M	QPSK	1	0	Right Side	5mm	Ant 0	27710	2310	19.51	20	1.119	0	0.027	0.030
	LTE Band 30	10M	QPSK	25	0	Right Side	5mm	Ant 0	27710	2310	18.41	19	1.146	0.1	0.020	0.023
	LTE Band 30	10M	QPSK	1	0	Top Side	5mm	Ant 0	27710	2310	19.51	20	1.119	0.12	0.239	0.268
	LTE Band 30	10M	QPSK	25	0	Top Side	5mm	Ant 0	27710	2310	18.41	19	1.146	-0.09	0.187	0.214

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 66	20M	QPSK	1	0	Front	5mm	Ant 0	132322	1745	20.78	20.8	1.005	0.07	1.000	1.005
	LTE Band 66	20M	QPSK	1	0	Front	5mm	Ant 0	132072	1720	20.63	20.8	1.040	-0.17	1.010	1.050
	LTE Band 66	20M	QPSK	1	0	Front	5mm	Ant 0	132572	1770	20.76	20.8	1.009	-0.03	0.959	0.968
	LTE Band 66	20M	QPSK	50	0	Front	5mm	Ant 0	132322	1745	19.8	19.8	1.000	-0.13	0.754	0.754
	LTE Band 66	20M	QPSK	50	0	Front	5mm	Ant 0	132072	1720	19.71	19.8	1.021	-0.11	0.753	0.769
	LTE Band 66	20M	QPSK	50	0	Front	5mm	Ant 0	132572	1770	19.73	19.8	1.016	0.11	0.814	0.827
	LTE Band 66	20M	QPSK	100	0	Front	5mm	Ant 0	132322	1745	19.75	19.8	1.012	0.11	0.716	0.724
	LTE Band 66	20M	QPSK	1	0	Back	5mm	Ant 0	132322	1745	20.78	20.8	1.005	-0.14	0.134	0.135
	LTE Band 66	20M	QPSK	50	0	Back	5mm	Ant 0	132322	1745	19.8	19.8	1.000	-0.06	0.099	0.099
	LTE Band 66	20M	QPSK	1	0	Left Side	5mm	Ant 0	132322	1745	20.78	20.8	1.005	0.11	0.628	0.631
	LTE Band 66	20M	QPSK	50	0	Left Side	5mm	Ant 0	132322	1745	19.8	19.8	1.000	0	0.558	0.558
	LTE Band 66	20M	QPSK	1	0	Right Side	5mm	Ant 0	132322	1745	20.78	20.8	1.005	-0.17	0.383	0.385
	LTE Band 66	20M	QPSK	50	0	Right Side	5mm	Ant 0	132322	1745	19.8	19.8	1.000	0.02	0.306	0.306
	LTE Band 66	20M	QPSK	1	0	Top Side	5mm	Ant 0	132322	1745	20.78	20.8	1.005	0.05	0.038	0.038
	LTE Band 66	20M	QPSK	50	0	Top Side	5mm	Ant 0	132322	1745	19.8	19.8	1.000	-0.06	0.032	0.032
	LTE Band 66	20M	QPSK	1	0	Front	5mm	Ant 3	132572	1770	23.89	24.5	1.151	-0.14	0.539	0.620
	LTE Band 66	20M	QPSK	50	0	Front	5mm	Ant 3	132572	1770	22.74	23.5	1.191	0.02	0.447	0.532
06	LTE Band 66	20M	QPSK	1	0	Back	5mm	Ant 3	132572	1770	23.89	24.5	1.151	0.02	0.961	1.106
	LTE Band 66	20M	QPSK	1	0	Back	5mm	Ant 3	132072	1720	23.57	24.5	1.239	-0.01	0.868	1.075
	LTE Band 66	20M	QPSK	1	0	Back	5mm	Ant 3	132322	1745	23.47	24.5	1.268	-0.14	0.859	1.089
	LTE Band 66	20M	QPSK	50	0	Back	5mm	Ant 3	132572	1770	22.74	23.5	1.191	0.06	0.686	0.817
	LTE Band 66	20M	QPSK	50	0	Back	5mm	Ant 3	132072	1720	22.62	23.5	1.225	0.03	0.767	0.939
	LTE Band 66	20M	QPSK	50	0	Back	5mm	Ant 3	132322	1745	22.7	23.5	1.202	0.03	0.694	0.834
	LTE Band 66	20M	QPSK	100	0	Back	5mm	Ant 3	132322	1745	22.68	23.5	1.208	0.06	0.697	0.842
	LTE Band 66	20M	QPSK	1	0	Left Side	5mm	Ant 3	132572	1770	23.89	24.5	1.151	-0.06	0.277	0.319
	LTE Band 66	20M	QPSK	50	0	Left Side	5mm	Ant 3	132572	1770	22.74	23.5	1.191	-0.11	0.227	0.270
	LTE Band 66	20M	QPSK	1	0	Right Side	5mm	Ant 3	132572	1770	23.89	24.5	1.151	0.03	0.692	0.796
	LTE Band 66	20M	QPSK	50	0	Right Side	5mm	Ant 3	132572	1770	22.74	23.5	1.191	0.11	0.556	0.662
	LTE Band 66	20M	QPSK	1	0	Top Side	5mm	Ant 3	132572	1770	23.89	24.5	1.151	0.11	0.162	0.186
	LTE Band 66	20M	QPSK	50	0	Top Side	5mm	Ant 3	132572	1770	22.74	23.5	1.191	-0.13	0.135	0.161
07	LTE Band 71	20M	QPSK	1	0	Front	5mm	Ant 3	133297	680.5	22.77	24.5	1.489	-0.02	0.756	1.126
	LTE Band 71	20M	QPSK	50	0	Front	5mm	Ant 3	133297	680.5	21.73	23.5	1.503	0	0.660	0.992
	LTE Band 71	20M	QPSK	100	0	Front	5mm	Ant 3	133297	680.5	21.78	23.5	1.486	0.08	0.568	0.844
	LTE Band 71	20M	QPSK	1	0	Back	5mm	Ant 3	133297	680.5	22.77	24.5	1.489	0.01	0.531	0.791
	LTE Band 71	20M	QPSK	50	0	Back	5mm	Ant 3	133297	680.5	21.73	23.5	1.503	-0.13	0.415	0.624
	LTE Band 71	20M	QPSK	1	0	Left Side	5mm	Ant 3	133297	680.5	22.77	24.5	1.489	-0.07	0.402	0.599
	LTE Band 71	20M	QPSK	50	0	Left Side	5mm	Ant 3	133297	680.5	21.73	23.5	1.503	0.03	0.339	0.510
	LTE Band 71	20M	QPSK	1	0	Right Side	5mm	Ant 3	133297	680.5	22.77	24.5	1.489	0.03	0.345	0.514
	LTE Band 71	20M	QPSK	50	0	Right Side	5mm	Ant 3	133297	680.5	21.73	23.5	1.503	0.1	0.283	0.425
	LTE Band 71	20M	QPSK	1	0	Top Side	5mm	Ant 3	133297	680.5	22.77	24.5	1.489	-0.11	0.137	0.204
	LTE Band 71	20M	QPSK	50	0	Top Side	5mm	Ant 3	133297	680.5	21.73	23.5	1.503	0	0.100	0.150

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	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)
08	LTE Band 41	20M	QPSK	1	0	Front	5mm	Ant 0	40620	2593	14.9	16.6	1.479	62.9	1.006	0.05	0.695	1.034
	LTE Band 41	20M	QPSK	1	0	Front	5mm	Ant 0	39750	2506	14.66	16.6	1.563	62.9	1.006	-0.09	0.291	0.458
	LTE Band 41	20M	QPSK	1	0	Front	5mm	Ant 0	40185	2549.5	14.72	16.6	1.542	62.9	1.006	0.04	0.502	0.779
	LTE Band 41	20M	QPSK	1	0	Front	5mm	Ant 0	41055	2636.5	14.81	16.6	1.510	62.9	1.006	-0.02	0.455	0.691
	LTE Band 41	20M	QPSK	1	0	Front	5mm	Ant 0	41490	2680	14.65	16.6	1.567	62.9	1.006	-0.04	0.344	0.542
	LTE Band 41	20M	QPSK	50	0	Front	5mm	Ant 0	40620	2593	14.89	16.6	1.483	62.9	1.006	-0.01	0.508	0.758
	LTE Band 41	20M	QPSK	50	0	Front	5mm	Ant 0	39750	2506	14.68	16.6	1.556	62.9	1.006	-0.1	0.244	0.382
	LTE Band 41	20M	QPSK	50	0	Front	5mm	Ant 0	40185	2549.5	14.81	16.6	1.510	62.9	1.006	-0.11	0.454	0.690
	LTE Band 41	20M	QPSK	50	0	Front	5mm	Ant 0	41055	2636.5	14.88	16.6	1.486	62.9	1.006	0.1	0.398	0.595
	LTE Band 41	20M	QPSK	50	0	Front	5mm	Ant 0	41490	2680	14.74	16.6	1.535	62.9	1.006	-0.08	0.265	0.409
	LTE Band 41	20M	QPSK	100	0	Front	5mm	Ant 0	40620	2593	14.88	16.6	1.486	62.9	1.006	-0.02	0.473	0.707
	LTE Band 41	20M	QPSK	1	0	Back	5mm	Ant 0	40620	2593	14.9	16.6	1.479	62.9	1.006	0.02	0.048	0.071
	LTE Band 41	20M	QPSK	50	0	Back	5mm	Ant 0	40620	2593	14.89	16.6	1.483	62.9	1.006	0.09	0.040	0.060
	LTE Band 41	20M	QPSK	1	0	Left Side	5mm	Ant 0	40620	2593	14.9	16.6	1.479	62.9	1.006	-0.02	0.213	0.317
	LTE Band 41	20M	QPSK	50	0	Left Side	5mm	Ant 0	40620	2593	14.89	16.6	1.483	62.9	1.006	-0.01	0.180	0.268
	LTE Band 41	20M	QPSK	1	0	Right Side	5mm	Ant 0	40620	2593	14.9	16.6	1.479	62.9	1.006	-0.01	0.001	0.001
	LTE Band 41	20M	QPSK	50	0	Right Side	5mm	Ant 0	40620	2593	14.89	16.6	1.483	62.9	1.006	0.05	0.001	0.001
	LTE Band 41	20M	QPSK	1	0	Top Side	5mm	Ant 0	40620	2593	14.9	16.6	1.479	62.9	1.006	-0.02	0.003	0.004
	LTE Band 41	20M	QPSK	50	0	Top Side	5mm	Ant 0	40620	2593	14.89	16.6	1.483	62.9	1.006	-0.05	0.001	0.001
	LTE Band 41C	20M	QPSK	1	0	Front	5mm	Ant 0	40620	2593	14.9500	16.60	1.462	62.9	1.006	-0.09	0.674	0.991
	LTE Band 41_HPUE	20M	QPSK	1	0	Front	5mm	Ant 0	40620	2593	16.57	18.2	1.455	42.9	1.009	-0.08	0.684	1.004
	LTE Band 41_HPUE	20M	QPSK	1	0	Front	5mm	Ant 0	39750	2506	16.36	18.2	1.528	42.9	1.009	0.09	0.323	0.498
	LTE Band 41_HPUE	20M	QPSK	1	0	Front	5mm	Ant 0	40185	2549.5	16.37	18.2	1.524	42.9	1.009	0.07	0.486	0.747
	LTE Band 41_HPUE	20M	QPSK	1	0	Front	5mm	Ant 0	41055	2636.5	16.55	18.2	1.462	42.9	1.009	-0.01	0.544	0.803
	LTE Band 41_HPUE	20M	QPSK	1	0	Front	5mm	Ant 0	41490	2680	16.31	18.2	1.545	42.9	1.009	-0.08	0.377	0.588
	LTE Band 41C_HPUE	20M	QPSK	1	0	Front	5mm	Ant 0	40620	2593	16.6300	18.20	1.435	62.9	1.006	0.05	0.513	0.741
	LTE Band 48	20M	QPSK	1	0	Front	5mm	Ant 0	56150	3641	19.69	19.7	1.002	62.9	1.006	-0.14	1.140	1.149
09	LTE Band 48	20M	QPSK	1	0	Front	5mm	Ant 0	55340	3560	19.65	19.7	1.012	62.9	1.006	-0.06	1.160	1.180
	LTE Band 48	20M	QPSK	1	0	Front	5mm	Ant 0	55830	3609	19.68	19.7	1.005	62.9	1.006	0.09	1.100	1.112
	LTE Band 48	20M	QPSK	1	0	Front	5mm	Ant 0	56640	3690	19.35	19.7	1.084	62.9	1.006	-0.02	1.050	1.145
	LTE Band 48	20M	QPSK	50	0	Front	5mm	Ant 0	56150	3641	18.63	18.7	1.016	62.9	1.006	-0.13	0.921	0.942
	LTE Band 48	20M	QPSK	50	0	Front	5mm	Ant 0	55340	3560	18.61	18.7	1.021	62.9	1.006	0	0.983	1.010
	LTE Band 48	20M	QPSK	50	0	Front	5mm	Ant 0	55830	3609	18.6	18.7	1.023	62.9	1.006	-0.05	1.040	1.071
	LTE Band 48	20M	QPSK	50	0	Front	5mm	Ant 0	56640	3690	18.29	18.7	1.099	62.9	1.006	-0.17	0.918	1.015
	LTE Band 48	20M	QPSK	100	0	Front	5mm	Ant 0	56150	3641	18.65	18.7	1.012	62.9	1.006	-0.11	0.983	1.000
	LTE Band 48	20M	QPSK	1	0	Back	5mm	Ant 0	56150	3641	19.69	19.7	1.002	62.9	1.006	0.05	0.295	0.297
	LTE Band 48	20M	QPSK	50	0	Back	5mm	Ant 0	56150	3641	18.63	18.7	1.016	62.9	1.006	-0.03	0.236	0.241
	LTE Band 48	20M	QPSK	1	0	Left Side	5mm	Ant 0	56150	3641	19.69	19.7	1.002	62.9	1.006	-0.07	0.867	0.874
	LTE Band 48	20M	QPSK	1	0	Left Side	5mm	Ant 0	55340	3560	19.65	19.7	1.012	62.9	1.006	0.06	0.887	0.903
	LTE Band 48	20M	QPSK	1	0	Left Side	5mm	Ant 0	55830	3609	19.68	19.7	1.005	62.9	1.006	0.09	0.850	0.859
	LTE Band 48	20M	QPSK	1	0	Left Side	5mm	Ant 0	56640	3690	19.35	19.7	1.084	62.9	1.006	0.04	0.832	0.907
	LTE Band 48	20M	QPSK	50	0	Left Side	5mm	Ant 0	56150	3641	18.63	18.7	1.016	62.9	1.006	0.18	0.709	0.725
	LTE Band 48	20M	QPSK	50	0	Left Side	5mm	Ant 0	55340	3560	18.61	18.7	1.021	62.9	1.006	0	0.760	0.781
	LTE Band 48	20M	QPSK	50	0	Left Side	5mm	Ant 0	55830	3609	18.6	18.7	1.023	62.9	1.006	-0.05	0.695	0.715
	LTE Band 48	20M	QPSK	50	0	Left Side	5mm	Ant 0	56640	3690	18.29	18.7	1.099	62.9	1.006	-0.17	0.646	0.714
	LTE Band 48	20M	QPSK	100	0	Left Side	5mm	Ant 0	56150	3641	18.65	18.7	1.012	62.9	1.006	0.18	0.714	0.727
	LTE Band 48	20M	QPSK	1	0	Right Side	5mm	Ant 0	56150	3641	19.69	19.7	1.002	62.9	1.006	0.16	0.062	0.063
	LTE Band 48	20M	QPSK	50	0	Right Side	5mm	Ant 0	56150	3641	18.63	18.7	1.016	62.9	1.006	-0.17	0.049	0.050
	LTE Band 48	20M	QPSK	1	0	Top Side	5mm	Ant 0	56150	3641	19.69	19.7	1.002	62.9	1.006	-0.06	0.001	0.001
	LTE Band 48	20M	QPSK	50	0	Top Side	5mm	Ant 0	56150	3641	18.63	18.7	1.016	62.9	1.006	-0.03	0.001	0.001

<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n5	20M	BPSK	1	1	Front	5mm	Ant 0	167300	836.5	22.84	23	1.038	0.04	0.369	0.383
	FR1 n5	20M	BPSK	50	28	Front	5mm	Ant 0	167300	836.5	22.93	23	1.016	-0.1	0.285	0.290
	FR1 n5	20M	BPSK	1	1	Back	5mm	Ant 0	167300	836.5	22.84	23	1.038	-0.17	0.079	0.082
	FR1 n5	20M	BPSK	50	28	Back	5mm	Ant 0	167300	836.5	22.93	23	1.016	-0.1	0.077	0.078
	FR1 n5	20M	BPSK	1	1	Left Side	5mm	Ant 0	167300	836.5	22.84	23	1.038	-0.1	0.155	0.161
	FR1 n5	20M	BPSK	50	28	Left Side	5mm	Ant 0	167300	836.5	22.93	23	1.016	-0.08	0.115	0.117
	FR1 n5	20M	BPSK	1	1	Right Side	5mm	Ant 0	167300	836.5	22.84	23	1.038	-0.05	0.105	0.109
	FR1 n5	20M	BPSK	50	28	Right Side	5mm	Ant 0	167300	836.5	22.93	23	1.016	-0.18	0.101	0.103
	FR1 n5	20M	BPSK	1	1	Top Side	5mm	Ant 0	167300	836.5	22.84	23	1.038	-0.04	0.001	0.001
	FR1 n5	20M	BPSK	50	28	Top Side	5mm	Ant 0	167300	836.5	22.93	23	1.016	-0.15	0.001	0.001
10	FR1 n5	20M	BPSK	1	1	Front	5mm	Ant 3	167300	836.5	23.52	24.2	1.169	-0.06	1.010	1.181
	FR1 n5	20M	BPSK	50	28	Front	5mm	Ant 3	167300	836.5	23.41	24.2	1.199	0.08	0.982	1.178
	FR1 n5	20M	BPSK	100	0	Front	5mm	Ant 3	167300	836.5	22.8	23.7	1.230	-0.18	0.840	1.033
	FR1 n5	20M	BPSK	1	1	Back	5mm	Ant 3	167300	836.5	23.52	24.2	1.169	-0.17	0.942	1.102
	FR1 n5	20M	BPSK	50	28	Back	5mm	Ant 3	167300	836.5	23.41	24.2	1.199	0.04	0.917	1.100
	FR1 n5	20M	BPSK	100	0	Back	5mm	Ant 3	167300	836.5	22.8	23.7	1.230	-0.14	0.791	0.973
	FR1 n5	20M	BPSK	1	1	Left Side	5mm	Ant 3	167300	836.5	23.52	24.2	1.169	-0.07	0.551	0.644
	FR1 n5	20M	BPSK	50	28	Left Side	5mm	Ant 3	167300	836.5	23.41	24.2	1.199	0.02	0.549	0.659
	FR1 n5	20M	BPSK	1	1	Right Side	5mm	Ant 3	167300	836.5	23.52	24.2	1.169	-0.03	0.633	0.740
	FR1 n5	20M	BPSK	50	28	Right Side	5mm	Ant 3	167300	836.5	23.41	24.2	1.199	-0.12	0.623	0.747
	FR1 n5	20M	BPSK	1	1	Top Side	5mm	Ant 3	167300	836.5	23.52	24.2	1.169	0.03	0.117	0.137
	FR1 n5	20M	BPSK	50	28	Top Side	5mm	Ant 3	167300	836.5	23.41	24.2	1.199	0.08	0.110	0.132
11	FR1 n12	15M	BPSK	1	1	Front	5mm	Ant 3	141500	707.5	23.27	24.3	1.268	-0.05	0.942	1.194
	FR1 n12	15M	BPSK	36	22	Front	5mm	Ant 3	141500	707.5	23.19	24.3	1.291	-0.09	0.838	1.082
	FR1 n12	15M	BPSK	75	0	Front	5mm	Ant 3	141500	707.5	22.73	23.8	1.279	0	0.818	1.047
	FR1 n12	15M	BPSK	1	1	Back	5mm	Ant 3	141500	707.5	23.27	24.3	1.268	0.04	0.492	0.624
	FR1 n12	15M	BPSK	36	22	Back	5mm	Ant 3	141500	707.5	23.19	24.3	1.291	-0.09	0.496	0.640
	FR1 n12	15M	BPSK	1	1	Left Side	5mm	Ant 3	141500	707.5	23.27	24.3	1.268	0.11	0.436	0.553
	FR1 n12	15M	BPSK	36	22	Left Side	5mm	Ant 3	141500	707.5	23.19	24.3	1.291	-0.19	0.468	0.604
	FR1 n12	15M	BPSK	1	1	Right Side	5mm	Ant 3	141500	707.5	23.27	24.3	1.268	0.03	0.399	0.506
	FR1 n12	15M	BPSK	36	22	Right Side	5mm	Ant 3	141500	707.5	23.19	24.3	1.291	0.02	0.362	0.467
	FR1 n12	15M	BPSK	1	1	Top Side	5mm	Ant 3	141500	707.5	23.27	24.3	1.268	0.01	0.128	0.162
	FR1 n12	15M	BPSK	36	22	Top Side	5mm	Ant 3	141500	707.5	23.19	24.3	1.291	-0.05	0.124	0.160
12	FR1 n14	10M	BPSK	1	1	Front	5mm	Ant 3	158600	793	23.15	24.5	1.365	0	0.856	1.168
	FR1 n14	10M	BPSK	25	14	Front	5mm	Ant 3	158600	793	23.03	24.5	1.403	-0.04	0.828	1.162
	FR1 n14	10M	BPSK	50	0	Front	5mm	Ant 3	158600	793	22.58	24	1.387	0	0.727	1.008
	FR1 n14	10M	BPSK	1	1	Back	5mm	Ant 3	158600	793	23.15	24.5	1.365	0.02	0.818	1.116
	FR1 n14	10M	BPSK	25	14	Back	5mm	Ant 3	158600	793	23.03	24.5	1.403	-0.13	0.790	1.108
	FR1 n14	10M	BPSK	50	0	Back	5mm	Ant 3	158600	793	22.58	24	1.387	0.01	0.704	0.976
	FR1 n14	10M	BPSK	1	1	Left Side	5mm	Ant 3	158600	793	23.15	24.5	1.365	0.06	0.450	0.614
	FR1 n14	10M	BPSK	25	14	Left Side	5mm	Ant 3	158600	793	23.03	24.5	1.403	0	0.467	0.655
	FR1 n14	10M	BPSK	1	1	Right Side	5mm	Ant 3	158600	793	23.15	24.5	1.365	0.03	0.475	0.648
	FR1 n14	10M	BPSK	25	14	Right Side	5mm	Ant 3	158600	793	23.03	24.5	1.403	-0.14	0.464	0.651
	FR1 n14	10M	BPSK	1	1	Top Side	5mm	Ant 3	158600	793	23.15	24.5	1.365	-0.12	0.163	0.222
	FR1 n14	10M	BPSK	25	14	Top Side	5mm	Ant 3	158600	793	23.03	24.5	1.403	0	0.158	0.222

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
13	FR1 n25	40M	BPSK	1	1	Front	5mm	Ant 0	376500	1882.5	20.39	20.5	1.026	0.08	1.070	1.097
	FR1 n25	40M	BPSK	108	54	Front	5mm	Ant 0	376500	1882.5	20.3	20.5	1.047	-0.05	0.851	0.891
	FR1 n25	40M	BPSK	216	0	Front	5mm	Ant 0	376500	1882.5	20.25	20.5	1.059	-0.04	0.851	0.901
	FR1 n25	40M	BPSK	1	1	Back	5mm	Ant 0	376500	1882.5	20.39	20.5	1.026	-0.13	0.183	0.188
	FR1 n25	40M	BPSK	108	54	Back	5mm	Ant 0	376500	1882.5	20.3	20.5	1.047	-0.1	0.129	0.135
	FR1 n25	40M	BPSK	1	1	Left Side	5mm	Ant 0	376500	1882.5	20.39	20.5	1.026	0.1	0.415	0.426
	FR1 n25	40M	BPSK	108	54	Left Side	5mm	Ant 0	376500	1882.5	20.3	20.5	1.047	-0.17	0.436	0.457
	FR1 n25	40M	BPSK	1	1	Right Side	5mm	Ant 0	376500	1882.5	20.39	20.5	1.026	-0.11	1.000	1.026
	FR1 n25	40M	BPSK	108	54	Right Side	5mm	Ant 0	376500	1882.5	20.3	20.5	1.047	-0.02	0.829	0.868
	FR1 n25	40M	BPSK	216	0	Right Side	5mm	Ant 0	376500	1882.5	20.25	20.5	1.059	0.09	0.893	0.946
	FR1 n25	40M	BPSK	1	1	Top Side	5mm	Ant 0	376500	1882.5	20.39	20.5	1.026	0.02	0.100	0.103
	FR1 n25	40M	BPSK	108	54	Top Side	5mm	Ant 0	376500	1882.5	20.3	20.5	1.047	-0.17	0.078	0.082
	FR1 n25	40M	BPSK	1	1	Front	5mm	Ant 3	376500	1882.5	22.31	22.7	1.094	0.06	0.836	0.915
	FR1 n25	40M	BPSK	108	54	Front	5mm	Ant 3	376500	1882.5	22.26	22.7	1.107	-0.01	0.778	0.861
	FR1 n25	40M	BPSK	216	0	Front	5mm	Ant 3	376500	1882.5	22.21	22.7	1.119	-0.13	0.829	0.928
	FR1 n25	40M	BPSK	1	1	Back	5mm	Ant 3	376500	1882.5	22.31	22.7	1.094	-0.03	0.989	1.082
	FR1 n25	40M	BPSK	108	54	Back	5mm	Ant 3	376500	1882.5	22.26	22.7	1.107	0.05	0.955	1.057
	FR1 n25	40M	BPSK	216	0	Back	5mm	Ant 3	376500	1882.5	22.21	22.7	1.119	-0.02	0.972	1.088
	FR1 n25	40M	BPSK	1	1	Left Side	5mm	Ant 3	376500	1882.5	22.31	22.7	1.094	-0.06	0.379	0.415
	FR1 n25	40M	BPSK	108	54	Left Side	5mm	Ant 3	376500	1882.5	22.26	22.7	1.107	0.05	0.394	0.436
	FR1 n25	40M	BPSK	1	1	Right Side	5mm	Ant 3	376500	1882.5	22.31	22.7	1.094	0.1	0.878	0.960
	FR1 n25	40M	BPSK	108	54	Right Side	5mm	Ant 3	376500	1882.5	22.26	22.7	1.107	-0.16	0.929	1.028
	FR1 n25	40M	BPSK	216	0	Right Side	5mm	Ant 3	376500	1882.5	22.21	22.7	1.119	-0.01	0.810	0.907
	FR1 n25	40M	BPSK	1	1	Top Side	5mm	Ant 3	376500	1882.5	22.31	22.7	1.094	-0.12	0.203	0.222
	FR1 n25	40M	BPSK	108	54	Top Side	5mm	Ant 3	376500	1882.5	22.26	22.7	1.107	0.08	0.163	0.180
14	FR1 n30	10M	BPSK	1	1	Front	5mm	Ant 0	462000	2310	20.13	20.7	1.140	0.09	1.030	1.174
	FR1 n30	10M	BPSK	25	14	Front	5mm	Ant 0	462000	2310	19.72	20.7	1.253	-0.12	0.901	1.129
	FR1 n30	10M	BPSK	50	0	Front	5mm	Ant 0	462000	2310	19.72	20.7	1.253	-0.12	0.927	1.162
	FR1 n30	10M	BPSK	1	1	Back	5mm	Ant 0	462000	2310	20.13	20.7	1.140	-0.11	0.188	0.214
	FR1 n30	10M	BPSK	25	14	Back	5mm	Ant 0	462000	2310	19.72	20.7	1.253	-0.07	0.203	0.254
	FR1 n30	10M	BPSK	1	1	Left Side	5mm	Ant 0	462000	2310	20.13	20.7	1.140	-0.01	0.832	0.949
	FR1 n30	10M	BPSK	25	14	Left Side	5mm	Ant 0	462000	2310	19.72	20.7	1.253	0.04	0.748	0.937
	FR1 n30	10M	BPSK	50	0	Left Side	5mm	Ant 0	462000	2310	19.72	20.7	1.253	-0.12	0.733	0.919
	FR1 n30	10M	BPSK	1	1	Right Side	5mm	Ant 0	462000	2310	20.13	20.7	1.140	0.1	0.007	0.008
	FR1 n30	10M	BPSK	25	14	Right Side	5mm	Ant 0	462000	2310	19.72	20.7	1.253	0.06	0.004	0.005
	FR1 n30	10M	BPSK	1	1	Top Side	5mm	Ant 0	462000	2310	20.13	20.7	1.140	-0.03	0.239	0.273
	FR1 n30	10M	BPSK	25	14	Top Side	5mm	Ant 0	462000	2310	19.72	20.7	1.253	-0.17	0.201	0.252

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n66	40M	BPSK	1	1	Front	5mm	Ant 0	349000	1745	21.1	21.4	1.072	-0.01	0.967	1.036
	FR1 n66	40M	BPSK	108	54	Front	5mm	Ant 0	349000	1745	20.86	21.4	1.132	-0.07	1.010	1.144
	FR1 n66	40M	BPSK	216	0	Front	5mm	Ant 0	349000	1745	20.88	20.9	1.005	-0.12	0.993	0.998
	FR1 n66	40M	BPSK	1	1	Back	5mm	Ant 0	349000	1745	21.1	21.4	1.072	0.07	0.115	0.123
	FR1 n66	40M	BPSK	108	54	Back	5mm	Ant 0	349000	1745	20.86	21.4	1.132	-0.16	0.104	0.118
	FR1 n66	40M	BPSK	1	1	Left Side	5mm	Ant 0	349000	1745	21.1	21.4	1.072	-0.18	0.461	0.494
	FR1 n66	40M	BPSK	108	54	Left Side	5mm	Ant 0	349000	1745	20.86	21.4	1.132	0.11	0.443	0.502
	FR1 n66	40M	BPSK	1	1	Right Side	5mm	Ant 0	349000	1745	21.1	21.4	1.072	-0.16	0.714	0.765
	FR1 n66	40M	BPSK	108	54	Right Side	5mm	Ant 0	349000	1745	20.86	21.4	1.132	-0.05	0.639	0.724
	FR1 n66	40M	BPSK	1	1	Top Side	5mm	Ant 0	349000	1745	21.1	21.4	1.072	0.02	0.001	0.001
	FR1 n66	40M	BPSK	108	54	Top Side	5mm	Ant 0	349000	1745	20.86	21.4	1.132	-0.05	0.001	0.001
	FR1 n66	40M	BPSK	1	1	Front	5mm	Ant 3	349000	1745	23.14	23.8	1.164	-0.04	0.815	0.949
	FR1 n66	40M	BPSK	108	54	Front	5mm	Ant 3	349000	1745	23.06	23.8	1.186	0.02	0.958	1.136
	FR1 n66	40M	BPSK	216	0	Front	5mm	Ant 3	349000	1745	22.55	23.3	1.189	-0.13	0.706	0.839
	FR1 n66	40M	BPSK	1	1	Back	5mm	Ant 3	349000	1745	23.14	23.8	1.164	0.02	0.906	1.055
15	FR1 n66	40M	BPSK	108	54	Back	5mm	Ant 3	349000	1745	23.06	23.8	1.186	0.05	0.992	1.176
	FR1 n66	40M	BPSK	216	0	Back	5mm	Ant 3	349000	1745	22.55	23.3	1.189	0.04	0.762	0.906
	FR1 n66	40M	BPSK	1	1	Left Side	5mm	Ant 3	349000	1745	23.14	23.8	1.164	-0.15	0.357	0.416
	FR1 n66	40M	BPSK	108	54	Left Side	5mm	Ant 3	349000	1745	23.06	23.8	1.186	-0.18	0.400	0.474
	FR1 n66	40M	BPSK	1	1	Right Side	5mm	Ant 3	349000	1745	23.14	23.8	1.164	0.1	0.956	1.113
	FR1 n66	40M	BPSK	108	54	Right Side	5mm	Ant 3	349000	1745	23.06	23.8	1.186	-0.14	0.923	1.094
	FR1 n66	40M	BPSK	216	0	Right Side	5mm	Ant 3	349000	1745	22.55	23.3	1.189	-0.14	0.900	1.070
	FR1 n66	40M	BPSK	1	1	Top Side	5mm	Ant 3	349000	1745	23.14	23.8	1.164	0.03	0.156	0.182
	FR1 n66	40M	BPSK	108	54	Top Side	5mm	Ant 3	349000	1745	23.06	23.8	1.186	-0.1	0.213	0.253
	FR1 n70	15M	BPSK	1	1	Front	5mm	Ant 0	340500	1702.5	23.11	23.4	1.069	-0.06	0.984	1.052
16	FR1 n70	15M	BPSK	36	22	Front	5mm	Ant 0	340500	1702.5	23	23.4	1.096	-0.11	0.965	1.058
	FR1 n70	15M	BPSK	75	0	Front	5mm	Ant 0	340500	1702.5	22.54	23.4	1.219	-0.11	0.863	1.052
	FR1 n70	15M	BPSK	1	1	Back	5mm	Ant 0	340500	1702.5	23.11	23.4	1.069	-0.05	0.158	0.169
	FR1 n70	15M	BPSK	36	22	Back	5mm	Ant 0	340500	1702.5	23	23.4	1.096	0.01	0.181	0.198
	FR1 n70	15M	BPSK	1	1	Left Side	5mm	Ant 0	340500	1702.5	23.11	23.4	1.069	-0.08	0.568	0.607
	FR1 n70	15M	BPSK	36	22	Left Side	5mm	Ant 0	340500	1702.5	23	23.4	1.096	-0.1	0.558	0.612
	FR1 n70	15M	BPSK	1	1	Right Side	5mm	Ant 0	340500	1702.5	23.11	23.4	1.069	-0.14	0.775	0.829
	FR1 n70	15M	BPSK	36	22	Right Side	5mm	Ant 0	340500	1702.5	23	23.4	1.096	0.05	0.766	0.840
	FR1 n70	15M	BPSK	75	0	Right Side	5mm	Ant 0	340500	1702.5	22.54	23.4	1.219	-0.1	0.770	0.939
	FR1 n70	15M	BPSK	1	1	Top Side	5mm	Ant 0	340500	1702.5	23.11	23.4	1.069	0.11	0.001	0.001
	FR1 n70	15M	BPSK	36	22	Top Side	5mm	Ant 0	340500	1702.5	23	23.4	1.096	-0.09	0.001	0.001
	FR1 n71	20M	BPSK	1	1	Front	5mm	Ant 3	136100	680.5	23.33	24.4	1.279	-0.16	0.884	1.131
17	FR1 n71	20M	BPSK	50	28	Front	5mm	Ant 3	136100	680.5	23.2	24.4	1.318	-0.07	0.897	1.182
	FR1 n71	20M	BPSK	100	0	Front	5mm	Ant 3	136100	680.5	22.76	23.9	1.300	-0.16	0.763	0.992
	FR1 n71	20M	BPSK	1	1	Back	5mm	Ant 3	136100	680.5	23.33	24.4	1.279	-0.01	0.635	0.812
	FR1 n71	20M	BPSK	50	28	Back	5mm	Ant 3	136100	680.5	23.2	24.4	1.318	0.07	0.665	0.877
	FR1 n71	20M	BPSK	100	0	Back	5mm	Ant 3	136100	680.5	22.76	23.9	1.300	0.09	0.586	0.762
	FR1 n71	20M	BPSK	1	1	Left Side	5mm	Ant 3	136100	680.5	23.33	24.4	1.279	-0.17	0.462	0.591
	FR1 n71	20M	BPSK	50	28	Left Side	5mm	Ant 3	136100	680.5	23.2	24.4	1.318	0.05	0.484	0.638
	FR1 n71	20M	BPSK	1	1	Right Side	5mm	Ant 3	136100	680.5	23.33	24.4	1.279	0.06	0.431	0.551
	FR1 n71	20M	BPSK	50	28	Right Side	5mm	Ant 3	136100	680.5	23.2	24.4	1.318	-0.15	0.342	0.451
	FR1 n71	20M	BPSK	1	1	Top Side	5mm	Ant 3	136100	680.5	23.33	24.4	1.279	0.03	0.128	0.164
	FR1 n71	20M	BPSK	50	28	Top Side	5mm	Ant 3	136100	680.5	23.2	24.4	1.318	0.1	0.117	0.154

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	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)
18	FR1 n41	100M	BPSK	1	1	Front	5mm	Ant 0	518598	2592.99	16	16	1.000			0.01	1.190	1.190
	FR1 n41	100M	BPSK	135	69	Front	5mm	Ant 0	518598	2592.99	15.7	16	1.072			-0.04	1.033	1.107
	FR1 n41	100M	BPSK	270	0	Front	5mm	Ant 0	518598	2592.99	15.51	16	1.119			-0.15	1.059	1.185
	FR1 n41	100M	BPSK	1	1	Back	5mm	Ant 0	518598	2592.99	16	16	1.000			0.03	0.159	0.159
	FR1 n41	100M	BPSK	135	69	Back	5mm	Ant 0	518598	2592.99	15.7	16	1.072			-0.19	0.145	0.155
	FR1 n41	100M	BPSK	1	1	Left Side	5mm	Ant 0	518598	2592.99	16	16	1.000			-0.05	0.657	0.657
	FR1 n41	100M	BPSK	135	69	Left Side	5mm	Ant 0	518598	2592.99	15.7	16	1.072			-0.04	0.694	0.744
	FR1 n41	100M	BPSK	1	1	Right Side	5mm	Ant 0	518598	2592.99	16	16	1.000			-0.11	0.033	0.033
	FR1 n41	100M	BPSK	135	69	Right Side	5mm	Ant 0	518598	2592.99	15.7	16	1.072			-0.01	0.038	0.041
	FR1 n41	100M	BPSK	1	1	Top Side	5mm	Ant 0	518598	2592.99	16	16	1.000			-0.12	0.060	0.060
	FR1 n41	100M	BPSK	135	69	Top Side	5mm	Ant 0	518598	2592.99	15.7	16	1.072			-0.18	0.050	0.054
	FR1 n41_HPUE	100M	BPSK	1	1	Front	5mm	Ant 0	518598	2592.99	18.98	19	1.005	50	1.000	-0.09	1.100	1.105
	FR1 n41	100M	BPSK	1	1	Front	5mm	Ant 3	518598	2592.99	18	18.2	1.047			-0.1	0.739	0.774
	FR1 n41	100M	BPSK	135	69	Front	5mm	Ant 3	518598	2592.99	17.61	18.2	1.146			-0.13	0.601	0.688
	FR1 n41	100M	BPSK	1	1	Back	5mm	Ant 3	518598	2592.99	18	18.2	1.047			-0.15	0.486	0.509
	FR1 n41	100M	BPSK	135	69	Back	5mm	Ant 3	518598	2592.99	17.61	18.2	1.146			-0.19	0.458	0.525
	FR1 n41	100M	BPSK	1	1	Left Side	5mm	Ant 3	518598	2592.99	18	18.2	1.047			-0.11	0.356	0.373
	FR1 n41	100M	BPSK	135	69	Left Side	5mm	Ant 3	518598	2592.99	17.61	18.2	1.146			-0.07	0.464	0.532
	FR1 n41	100M	BPSK	1	1	Right Side	5mm	Ant 3	518598	2592.99	18	18.2	1.047			-0.12	0.348	0.364
	FR1 n41	100M	BPSK	135	69	Right Side	5mm	Ant 3	518598	2592.99	17.61	18.2	1.146			-0.18	0.231	0.265
	FR1 n41	100M	BPSK	1	1	Top Side	5mm	Ant 3	518598	2592.99	18	18.2	1.047			0.14	0.956	1.001
	FR1 n41	100M	BPSK	135	69	Top Side	5mm	Ant 3	518598	2592.99	17.61	18.2	1.146			-0.13	0.872	0.999
	FR1 n41	100M	BPSK	270	0	Top Side	5mm	Ant 3	518598	2592.99	17.68	18.2	1.127			-0.16	0.797	0.898
	FR1 n41_HPUE	100M	BPSK	1	1	Top Side	5mm	Ant 3	518598	2592.99	21.1	21.2	1.023	50	1.000	-0.04	0.931	0.953
19	FR1 n48	40M	BPSK	1	1	Front	5mm	Ant 0	641666	3624.99	16.91	17.5	1.146			0.06	1.030	1.180
	FR1 n48	40M	BPSK	1	1	Front	5mm	Ant 0	638000	3570	16.56	17.5	1.242			-0.03	0.899	1.116
	FR1 n48	40M	BPSK	1	1	Front	5mm	Ant 0	645332	3679.98	16.34	17.5	1.306			-0.02	0.882	1.152
	FR1 n48	40M	BPSK	50	28	Front	5mm	Ant 0	641666	3624.99	16.24	17.5	1.337			0.11	0.882	1.179
	FR1 n48	40M	BPSK	50	28	Front	5mm	Ant 0	638000	3570	16.2	17.5	1.349			-0.16	0.865	1.167
	FR1 n48	40M	BPSK	50	28	Front	5mm	Ant 0	645332	3679.98	16.01	17.5	1.409			-0.1	0.814	1.147
	FR1 n48	40M	BPSK	100	0	Front	5mm	Ant 0	641666	3624.99	16.55	17.5	1.245			-0.08	0.873	1.086
	FR1 n48	40M	BPSK	1	1	Back	5mm	Ant 0	641666	3624.99	16.91	17.5	1.146			-0.08	0.272	0.312
	FR1 n48	40M	BPSK	50	28	Back	5mm	Ant 0	641666	3624.99	16.24	17.5	1.337			-0.19	0.278	0.372
	FR1 n48	40M	BPSK	1	1	Left Side	5mm	Ant 0	641666	3624.99	16.91	17.5	1.146			-0.13	0.706	0.809
	FR1 n48	40M	BPSK	1	1	Left Side	5mm	Ant 0	638000	3570	16.56	17.5	1.242			-0.03	0.730	0.906
	FR1 n48	40M	BPSK	1	1	Left Side	5mm	Ant 0	645332	3679.98	16.34	17.5	1.306			-0.07	0.782	1.021
	FR1 n48	40M	BPSK	50	28	Left Side	5mm	Ant 0	641666	3624.99	16.24	17.5	1.337			0.04	0.685	0.916
	FR1 n48	40M	BPSK	50	28	Left Side	5mm	Ant 0	638000	3570	16.2	17.5	1.349			-0.03	0.642	0.866
	FR1 n48	40M	BPSK	50	28	Left Side	5mm	Ant 0	645332	3679.98	16.01	17.5	1.409			-0.03	0.760	1.071
	FR1 n48	40M	BPSK	100	0	Left Side	5mm	Ant 0	641666	3624.99	16.55	17.5	1.245			-0.13	0.645	0.803
	FR1 n48	40M	BPSK	1	1	Right Side	5mm	Ant 0	641666	3624.99	16.91	17.5	1.146			0	0.049	0.056
	FR1 n48	40M	BPSK	50	28	Right Side	5mm	Ant 0	641666	3624.99	16.24	17.5	1.337			-0.14	0.053	0.071
	FR1 n48	40M	BPSK	1	1	Top Side	5mm	Ant 0	641666	3624.99	16.91	17.5	1.146			0.06	0.035	0.040
	FR1 n48	40M	BPSK	50	28	Top Side	5mm	Ant 0	641666	3624.99	16.24	17.5	1.337			-0.01	0.048	0.064

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	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)
	FR1 n77	100M	BPSK	1	1	Front	5mm	Ant 0	656000	3840	16.12	16.9	1.197			-0.12	0.471	0.564
	FR1 n77	100M	BPSK	135	69	Front	5mm	Ant 0	656000	3840	15.6	16.9	1.349			-0.12	0.521	0.703
	FR1 n77	100M	BPSK	1	1	Back	5mm	Ant 0	656000	3840	16.12	16.9	1.197			-0.11	0.148	0.177
	FR1 n77	100M	BPSK	135	69	Back	5mm	Ant 0	656000	3840	15.6	16.9	1.349			-0.05	0.146	0.197
	FR1 n77	100M	BPSK	1	1	Left Side	5mm	Ant 0	656000	3840	16.12	16.9	1.197			-0.16	0.368	0.440
	FR1 n77	100M	BPSK	135	69	Left Side	5mm	Ant 0	656000	3840	15.6	16.9	1.349			-0.06	0.361	0.487
	FR1 n77	100M	BPSK	1	1	Right Side	5mm	Ant 0	656000	3840	16.12	16.9	1.197			0.07	0.013	0.016
	FR1 n77	100M	BPSK	135	69	Right Side	5mm	Ant 0	656000	3840	15.6	16.9	1.349			0.01	0.014	0.019
	FR1 n77	100M	BPSK	1	1	Top Side	5mm	Ant 0	656000	3840	16.12	16.9	1.197			0.03	0.017	0.020
	FR1 n77	100M	BPSK	135	69	Top Side	5mm	Ant 0	656000	3840	15.6	16.9	1.349			0.1	0.016	0.022
	FR1 n77_HPUE	100M	BPSK	135	69	Front	5mm	Ant 0	656000	3840	18.65	19.9	1.334	50	1.000	-0.03	0.505	0.673
	FR1 n77	100M	BPSK	1	1	Front	5mm	Ant 0	633332	3499.98	16.42	16.9	1.117			0.02	1.000	1.117
	FR1 n77	100M	BPSK	135	69	Front	5mm	Ant 0	633332	3499.98	16.29	16.9	1.151			0.05	0.869	1.000
	FR1 n77	100M	BPSK	270	0	Front	5mm	Ant 0	633332	3499.98	16.18	16.9	1.180			-0.12	0.769	0.908
	FR1 n77	100M	BPSK	1	1	Back	5mm	Ant 0	633332	3499.98	16.42	16.9	1.117			-0.19	0.152	0.170
	FR1 n77	100M	BPSK	135	69	Back	5mm	Ant 0	633332	3499.98	16.29	16.9	1.151			-0.15	0.172	0.198
	FR1 n77	100M	BPSK	1	1	Left Side	5mm	Ant 0	633332	3499.98	16.42	16.9	1.117			-0.02	0.164	0.183
	FR1 n77	100M	BPSK	135	69	Left Side	5mm	Ant 0	633332	3499.98	16.29	16.9	1.151			-0.03	0.375	0.432
	FR1 n77	100M	BPSK	1	1	Right Side	5mm	Ant 0	633332	3499.98	16.42	16.9	1.117			0.03	0.091	0.102
	FR1 n77	100M	BPSK	135	69	Right Side	5mm	Ant 0	633332	3499.98	16.29	16.9	1.151			-0.16	0.061	0.070
	FR1 n77	100M	BPSK	1	1	Top Side	5mm	Ant 0	633332	3499.98	16.42	16.9	1.117			-0.14	0.027	0.030
	FR1 n77	100M	BPSK	135	69	Top Side	5mm	Ant 0	633332	3499.98	16.29	16.9	1.151			-0.02	0.028	0.032
	FR1 n77_HPUE	100M	BPSK	1	1	Front	5mm	Ant 0	633332	3499.98	19.45	19.9	1.109	50	1.000	0.11	0.948	1.051
	FR1 n77	100M	BPSK	1	1	Front	5mm	Ant 3	656000	3840	16.75	17.1	1.084			-0.16	0.382	0.414
	FR1 n77	100M	BPSK	135	69	Front	5mm	Ant 3	656000	3840	16.68	17.1	1.102			0	0.158	0.174
	FR1 n77	100M	BPSK	1	1	Back	5mm	Ant 3	656000	3840	16.75	17.1	1.084			-0.04	0.515	0.558
	FR1 n77	100M	BPSK	135	69	Back	5mm	Ant 3	656000	3840	16.68	17.1	1.102			-0.11	0.378	0.416
	FR1 n77	100M	BPSK	1	1	Left Side	5mm	Ant 3	656000	3840	16.75	17.1	1.084			0.11	0.452	0.490
	FR1 n77	100M	BPSK	135	69	Left Side	5mm	Ant 3	656000	3840	16.68	17.1	1.102			-0.1	0.414	0.456
	FR1 n77	100M	BPSK	1	1	Right Side	5mm	Ant 3	656000	3840	16.75	17.1	1.084			0.06	0.289	0.313
	FR1 n77	100M	BPSK	135	69	Right Side	5mm	Ant 3	656000	3840	16.68	17.1	1.102			-0.09	0.152	0.167
	FR1 n77	100M	BPSK	1	1	Top Side	5mm	Ant 3	656000	3840	16.75	17.1	1.084			0	0.314	0.340
	FR1 n77	100M	BPSK	135	69	Top Side	5mm	Ant 3	656000	3840	16.68	17.1	1.102			-0.13	0.219	0.241
	FR1 n77_HPUE	100M	BPSK	1	1	Back	5mm	Ant 3	656000	3840	19.78	20.1	1.076	50	1.000	-0.02	0.525	0.565
	FR1 n77	100M	BPSK	1	1	Front	5mm	Ant 3	633332	3499.98	17.08	17.1	1.005			-0.09	0.312	0.313
	FR1 n77	100M	BPSK	135	69	Front	5mm	Ant 3	633332	3499.98	17.03	17.1	1.016			0.07	0.311	0.316
	FR1 n77	100M	BPSK	1	1	Back	5mm	Ant 3	633332	3499.98	17.08	17.1	1.005			0	0.183	0.184
	FR1 n77	100M	BPSK	135	69	Back	5mm	Ant 3	633332	3499.98	17.03	17.1	1.016			0.1	0.165	0.168
	FR1 n77	100M	BPSK	1	1	Left Side	5mm	Ant 3	633332	3499.98	17.08	17.1	1.005			-0.19	0.059	0.059
	FR1 n77	100M	BPSK	135	69	Left Side	5mm	Ant 3	633332	3499.98	17.03	17.1	1.016			0.1	0.044	0.045
	FR1 n77	100M	BPSK	1	1	Right Side	5mm	Ant 3	633332	3499.98	17.08	17.1	1.005			0.09	0.051	0.051
	FR1 n77	100M	BPSK	135	69	Right Side	5mm	Ant 3	633332	3499.98	17.03	17.1	1.016			0.02	0.035	0.036
	FR1 n77	100M	BPSK	1	1	Top Side	5mm	Ant 3	633332	3499.98	17.08	17.1	1.005			-0.01	1.043	1.048
20	FR1 n77	100M	BPSK	135	69	Top Side	5mm	Ant 3	633332	3499.98	17.03	17.1	1.016			-0.06	1.160	1.179
	FR1 n77	100M	BPSK	270	0	Top Side	5mm	Ant 3	633332	3499.98	16.8	17.1	1.072			-0.01	1.028	1.102
	FR1 n77_HPUE	100M	BPSK	135	69	Top Side	5mm	Ant 3	633332	3499.98	19.96	20.1	1.033	50	1.000	0.05	1.040	1.074

15.2 Repeated SAR Measurement

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	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 2	20M	QPSK	1	0	Right Side	5mm	Ant 3	19100	1900	21.7	22	1.072	0.01	1.110	-	1.189
2nd	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	Ant 3	19100	1900	21.7	22	1.072	0.02	1.010	1.10	1.082
1st	LTE Band 13	10M	QPSK	1	0	Front	5mm	Ant 3	23230	782	22.88	23.6	1.180	-0.08	0.995	-	1.174
2nd	LTE Band 13	10M	QPSK	1	0	Front	5mm	Ant 3	23230	782	22.88	23.6	1.180	0.04	0.978	1.02	1.154
1st	LTE Band 30	10M	QPSK	1	0	Front	5mm	Ant 0	27710	2310	19.51	20	1.119	0.12	1.070	-	1.198
2nd	LTE Band 30	10M	QPSK	1	0	Front	5mm	Ant 0	27710	2310	19.51	20	1.119	0.06	1.020	1.05	1.142
1st	FR1 n5	20M	BPSK	1	1	Front	5mm	Ant 3	167300	836.5	23.52	24.2	1.169	-0.06	1.010	-	1.181
2nd	FR1 n5	20M	BPSK	1	1	Front	5mm	Ant 3	167300	836.5	23.52	24.2	1.169	-0.08	0.984	1.03	1.151
1st	FR1 n66	40M	BPSK	108	54	Front	5mm	Ant 0	349000	1745	20.86	21.4	1.132	-0.07	1.010	-	1.144
2nd	FR1 n66	40M	BPSK	108	54	Front	5mm	Ant 0	349000	1745	20.86	21.4	1.132	0.02	0.995	1.02	1.127
1st	FR1 n41	100M	BPSK	1	1	Front	5mm	Ant 0	518598	2592.99	16	16	1.000	0.01	1.190	-	1.190
2nd	FR1 n41	100M	BPSK	1	1	Front	5mm	Ant 0	518598	2592.99	16	16	1.000	0.08	1.080	1.10	1.080
1st	FR1 n48	40M	BPSK	1	1	Front	5mm	Ant 0	641666	3624.99	16.91	17.5	1.146	0.06	1.030	-	1.180
2nd	FR1 n48	40M	BPSK	1	1	Front	5mm	Ant 0	641666	3624.99	16.91	17.5	1.146	0.06	1.010	1.02	1.157
1st	FR1 n77	100M	BPSK	135	69	Top Side	5mm	Ant 3	633332	3499.98	17.03	17.1	1.016	-0.06	1.160	-	1.179
2nd	FR1 n77	100M	BPSK	135	69	Top Side	5mm	Ant 3	633332	3499.98	17.03	17.1	1.016	0.04	1.110	1.05	1.128

General Note:

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

15.3 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_Ant 0	LTE Band 41_Ant 0
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	16.6	18.2
Reported 1g SAR (W/kg)	1.034	1.004
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	28.93	28.61
Linearity SAR(W/kg)	1.02	
% deviation from expected linearity		-1.80%

	FR1 n41_Ant 0	FR1 n41_Ant 0
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	16	19
Reported 1g SAR (W/kg)	1.19	1.105
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	39.81	39.72
Linearity SAR(W/kg)	1.19	
% deviation from expected linearity		-6.92%

	FR1 n41_Ant 3	FR1 n41_Ant 3
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	18.2	21.2
Reported 1g SAR (W/kg)	1.001	0.953
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	66.07	65.91
Linearity SAR(W/kg)	1.00	
% deviation from expected linearity		-4.57%

	FR1 n77 Part 27Q_Ant 0	FR1 n77_Ant 0
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	16.9	19.9
Reported 1g SAR (W/kg)	1.117	1.051
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	48.98	48.86
Linearity SAR(W/kg)	1.11	
% deviation from expected linearity		-5.69%

	FR1 n77 Part 27Q_Ant	FR1 n77_Ant
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	17.1	20.1
Reported 1g SAR (W/kg)	1.179	1.074
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	51.29	51.16
Linearity SAR(W/kg)	1.18	
% deviation from expected linearity		-8.69%

Test Engineer： Elio Wei, Putzie Chen and Rain Chiu

16. 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 ≤ 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.

17. 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 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[6] FCC KDB 447498 D02 v02r01, “SAR Measurement Procedures for USB Dongle Transmitters”, Oct 2015.

[7] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[8] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015

[9] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[10] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.