FCC SAR TEST REPORT

FCC ID	:	**PU5-TP00161A**
Equipment	:	**Notebook Computer**
Brand Name	:	**Lenovo**
Model Name	:	**TP00161A**
Applicant	:	**Wistron Corporation** **21F, No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih Dist, New Taipei City 221,Taiwan**
Manufacturer	:	**Lenovo PC HK Limited.** **23/F, Lincoln House, Taikoo Place, 979 King's Road, Quarry Bay, Hong Kong, P.R. China**
Standard	:	**FCC 47 CFR Part 2 (2.1093)**

Equipment: Quectel RM520N-GL, Qualcomm QCNCM825 tested inside of Lenovo Notebook Computer.

The product was received on Apr. 19, 2024 and testing was started from Apr. 27, 2024 and completed on May 20, 2024. 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. Wensan Laboratory

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History of this test report

Report No.	Version	Description	Issued Date
FA440813	01	Initial issue of report	Jun. 03, 2024

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for Wistron Corporation, Notebook Computer, TP00161A, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary Body 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
Licensed	WCDMA	WCDMA II	0.91	1.19
		WCDMA IV	0.97	
		WCDMA V	1.01	
	LTE	LTE Band 7	1.19	
		LTE Band 12 / 17	1.11	
		LTE Band 13	1.10	
		LTE Band 14	1.15	
		LTE Band 2 / 25	1.09	
		LTE Band 5 / 26	1.08	
		LTE Band 30	1.12	
		LTE Band 38 / 41	0.89	
		LTE Band 42	0.78	
		LTE Band 43	1.16	
		LTE Band 48	1.07	
		LTE Band 4 / 66	1.11	
		LTE Band 71	1.04	
	FR1	FR1 n7	1.12	
		FR1 n12	1.08	
		FR1 n13	1.12	
		FR1 n14	1.09	
		FR1 n2 / n25	1.14	
		FR1 n5 / n26	1.13	
		FR1 n30	1.15	
		FR1 n38 / n41	1.04	
		FR1 n48	1.15	
		FR1 n66	1.09	
		FR1 n71	0.91	
		FR1 n77 / n78	1.19	
Date of Testing:			2024/04/27 ~ 2024/05/20	

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation and the FCC designation No. TW3786 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: Wan Liu

2. Equipment Under Test (EUT) Information

2.1 General Information

Product Feature & Specification	
Equipment Name	Notebook Computer
Brand Name	Lenovo
Model Name	TP00161A
FCC ID	PU5-TP00161A
Integrated WWAN Module	Brand Name: Quectel Model Name: RM520N-GL
Integrated WLAN Module	Brand Name: Qualcomm Model Name: QCNCM825
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3450 MHz ~ 3550 MHz LTE Band 43: 3700 MHz ~ 3800 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n13: 777 MHz ~ 787 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77 : 3700 MHz ~ 3980 MHz, 3450 MHz ~ 3550 MHz 5G NR n78 : 3700 MHz ~ 3800 MHz, 3450 MHz ~ 3550 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM
EUT Stage	Production Unit

Remark:

1. This device has two antenna vendors; RF exposure evaluation selects AWAN as the main test, ICT will spot check worst case found in AWAN.
2. The Qualcomm QCNCM825 WLAN/Bluetooth module is also integrated into this host, WLAN/Bluetooth power and WLAN SAR testing data, which can be referred to Sporton SAR Test Report, Report No.: FA440818 and these results are used simultaneous transmission analysis.

WWAN Antenna Information				
Main Antenna	Manufacturer	AWAN	Peak gain(dBi)	1.99
	Part number	SA31H59590	Type	PIFA
	Manufacturer	ICT	Peak gain(dBi)	-2.4
	Part number	SA31H59591	Type	PIFA
MIMO2 Antenna	Manufacturer	AWAN	Peak gain(dBi)	1.91
	Part number	SA31H59592	Type	PIFA
	Manufacturer	ICT	Peak gain(dBi)	-2.4
	Part number	SA31H59593	Type	PIFA
Auxiliary Antenna	Manufacturer	AWAN	Peak gain(dBi)	-2.50
	Part number	SA31H59592	Type	PIFA
	Manufacturer	ICT	Peak gain(dBi)	-8.4
	Part number	SA31H59593	Type	PIFA

2.2 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>PU5-TP00161A</td></tr>
<tr><td>Equipment Name</td><td>Notebook Computer</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>LTE Band 2: 1850 MHz ~ 1910 MHz
LTE Band 4: 1710 MHz ~ 1755 MHz
LTE Band 5: 824 MHz ~ 849 MHz
LTE Band 7: 2500 MHz ~ 2570 MHz
LTE Band 12: 699 MHz ~ 716 MHz
LTE Band 13: 777 MHz ~ 787 MHz
LTE Band 14: 788 MHz ~ 798 MHz
LTE Band 17: 704 MHz ~ 716 MHz
LTE Band 25: 1850 MHz ~ 1915 MHz
LTE Band 26: 814 MHz ~ 849 MHz
LTE Band 30: 2305 MHz ~ 2315 MHz
LTE Band 38: 2570 MHz ~ 2620 MHz
LTE Band 41: 2496 MHz ~ 2690 MHz
LTE Band 42: 3450 MHz ~ 3550 MHz
LTE Band 43: 3700 MHz ~ 3800 MHz
LTE Band 48: 3550 MHz ~ 3700 MHz
LTE Band 66: 1710 MHz ~ 1780 MHz
LTE Band 71: 663 MHz ~ 698 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 13: 5MHz, 10MHz
LTE Band 14: 5MHz, 10MHz
LTE Band 17: 5MHz, 10MHz
LTE Band 25:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz
LTE Band 30: 5MHz, 10MHz
LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 42: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 43: 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</td></tr>
<tr><td>uplink modulations used</td><td>QPSK / 16QAM / 64QAM / 256QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Data only</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table></td></tr>
<tr><td>LTE A-MPR</td><td>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)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>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.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, Proximity and G-Sensor.</td></tr>
<tr><td>LTE Carrier Aggregation Combinations</td><td>Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to section 12.</td></tr>
<tr><td>LTE Carrier Aggregation Additional Information</td><td>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.</td></tr>
</table>

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 7								
	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	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560
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 14						
	Bandwidth 5 MHz			Bandwidth 10 MHz		
	Channel #	Channel #		Channel #	Freq.(MHz)	
L	23305	790.5		23330	793	
M	23330	793				
H	23355	795.5				
LTE Band 17						
	Bandwidth 5 MHz			Bandwidth 10 MHz		
	Channel #	Freq.(MHz)		Channel #	Freq. (MHz)	
L	23755	706.5		23780	709	
M	23790	710		23790	710	
H	23825	713.5		23800	711	

LTE Band 25												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905

LTE Band 26										
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5

LTE Band 30				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	27685	2307.5	27710	2310
M	27710	2310		
H	27735	2312.5		

LTE Band 38								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610

LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506
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 42								
	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	42115	3452.5	42140	3455	42165	3457.5	42190	3460
M	42590	3500	42590	3500	42590	3500	42590	3500
H	43065	3457.5	43040	3545	43015	3542.5	42990	3540

LTE Band 43								
	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	44615	3702.5	44640	3705	44665	3707.5	44690	3710
M	45090	3750	45090	3750	45090	3750	45090	3750
H	45565	3797.5	45540	3795	45515	3792.5	45490	3790

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

2.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information	
FCC ID	PU5-TP00161A
Equipment Name	Notebook Computer
Operating Frequency Range of each 5G NR transmission band	5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n13: 777 MHz ~ 787 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77 : 3700 MHz ~ 3980 MHz, 3450 MHz ~ 3550 MHz 5G NR n78 : 3700 MHz ~ 3800 MHz, 3450 MHz ~ 3550 MHz
Channel Bandwidth	5G NR n2: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n5: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n7: 5MHz, 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 40MHz 5G NR n12: 5MHz, 10MHz, 15MHz 5G NR n13: 5MHz, 10MHz 5G NR n14: 5MHz, 10MHz 5G NR n25: 5MHz, 10MHz, 15MHz, 20MHz, 25 MHz 30MHz, 40MHz 5G NR n26: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n30: 5MHz, 10MHz 5G NR n38: 10MHz, 15MHz, 20MHz, 30MHz, 40MHz 5G NR n41: 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz 5G NR n48: 10MHz, 20MHz, 30MHz, 40MHz 5G NR n66: 5MHz, 10MHz, 15MHz, 20MHz, 30MHz, 40MHz 5G NR n71: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n77: 10MHz, 15MHz, 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz 5G NR n78: 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 B4/5/7/12/13/14/30/66/71
LTE Anchor Bands for n5	LTE B2/7/30/48/66
LTE Anchor Bands for n7	LTE B2/4/5/12/13/66/71
LTE Anchor Bands for n12	LTE B2/7/30/48/66
LTE Anchor Bands for n14	LTE B2/30/66
LTE Anchor Bands for n25	LTE B5/7/12/13/26/48/66/71
LTE Anchor Bands for n30	LTE B2/5/12/14/66
LTE Anchor Bands for n38	LTE B2/4/5/12/66/71
LTE Anchor Bands for n41	LTE B2/4/5/12/25/26/66/71
LTE Anchor Bands for n48	LTE B2/5/13/66
LTE Anchor Bands for n66	LTE B2/5/7/12/13/14/30/48/71
LTE Anchor Bands for n71	LTE B2/7/48/66
LTE Anchor Bands for n77	LTE B2/5/7/12/13/14/25/30/41/66/71
LTE Anchor Bands for n78	LTE B2/4/5/7/12/13/25/26/38/41/66/71

NR Band 2								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860
M	376000	1880	376000	1880	376000	1880	376000	1880
H	381500	1907.5	381000	1905	380500	1902.5	380000	1900

NR Band 5								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	165300	826.5	165800	829	166300	831.5	166800	834
M	167300	836.5	167300	836.5	167300	836.5	167300	836.5
H	169300	846.5	168800	844	168300	841.5	167800	839

NR Band 7														
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		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	500500	2502.5	501000	2505	501500	2507.5	502000	2510	502500	2512.5	503000	2515	504000	2520
M	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535
H	513500	2567.5	513000	2565	512500	2562.5	512000	2560	511500	2557.5	511000	2555	510000	2550

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 13				
	Bandwidth 5MHz		Bandwidth 10MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	155900	779.5	156400	782
M	156400	782		
H	156900	784.5		

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 26								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	163300	816.5	163800	819	164300	821.5	164800	824
M	166300	831.5	166300	831.5	166300	831.5	166300	831.5
H	169300	846.5	168800	844	168300	841.5	167800	839

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 38										
	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)
L	515004	2575.02	515502	2577.51	516000	2580	517002	2585.01	518004	2590.02
M	519000	2595	519000	2595	519000	2595	519000	2595	519000	2595
H	522996	2614.98	522498	2612.49	522000	2610	520998	2604.99	519996	2599.98

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		Bandwidth30MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	637000	3555	637334	3560.01	637668	3565.02	638000	3570
M	641666	3624.99	641666	3624.99	641666	3624.99	641666	3624.99
H	646332	3694.98	646000	3690	645666	3684.99	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 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

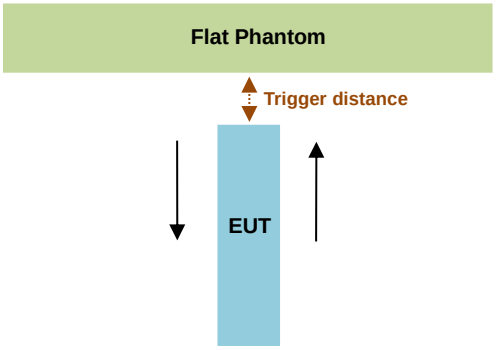
NR Band 78																				
	Bandwidth10MHz		Bandwidth15MHz		Bandwidth 20MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (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		
M	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750
H	653000	3795	652832	3792.48	652666	3789.99	652332	3784.98	652000	3780	651666	3774.99	651332	3769.98	651000	3765	650666	3759.99	650332	3754.98		

NR Band 77/78(3450MHz ~ 3550MHz)																				
	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	630334	3455.01	630500	3457.5	630668	3460.02	631000	3465	631334	3470.01	631668	3475.02	632000	3480	632334	3485.01	632668	3490.02	633000	3495		
M	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98
H	636332	3544.98	636166	3542.49	636000	3540	635666	3534.99	635332	3529.98	635000	3525	634666	3519.99	634332	3514.98	634000	3510	633666	3504.99		

3. Proximity Sensor Verification

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

For the device is fully integrated, touch sensing capacitive sensor. It uses a charge transfer capacitive acquisition method that is capable of near range proximity detection. In this device offers a state of the art capacitive sensing engine with an embedded sampling capacitor and voltage regulator allowing the overall solution cost to be reduced and improving system immunity in noisy environments.
Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed. The details are illustrated as following, and the shortest triggering distances were reported and used for SAR assessment.
In the preliminary triggering distance testing, the tissue-equivalent medium for different frequency bands were used for verification; no other frequency bands tissue-equivalent medium was found to result in shortest triggering distance than that for 1900MHz, and the tissue-equivalent medium for 1900MHz was used for formal proximity sensor triggering testing.



Main Antenna		
Proximity Sensor Trigger Distance (mm)		
Position	Bottom of Laptop	
	moving toward	moving away
Minimum	20	20

MIMO 2 Antenna		
Proximity Sensor Trigger Distance (mm)		
Position	Bottom of Laptop	
	moving toward	moving away
Minimum	21	20

Aux Antenna		
Proximity Sensor Trigger Distance (mm)		
Position	Bottom of Laptop	
	moving toward	moving away
Minimum	21	20

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

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

Proximity sensor power reduction

Exposure Position / wireless mode		Bottom of Laptop [1]
WCDMA II	Main	8.00 dB
WCDMA IV	Main	7.00 dB
WCDMA V	Main	3.00 dB
LTE Band 2	Main	8.00 dB
LTE Band 4	Main	7.50 dB
LTE Band 5	Main	3.00 dB
LTE Band 7	Main	12.00 dB
LTE Band 12	Main	3.50 dB
LTE Band 13	Main	4.00 dB
LTE Band 14	Main	3.50 dB
LTE Band 17	Main	3.50 dB
LTE Band 25	Main	8.00 dB
LTE Band 26	Main	3.00 dB
LTE Band 30	Main	8.00 dB
LTE Band 38	Main	10.00 dB
LTE Band 41	Main	10.00 dB
LTE Band 41_HPUE	Main	10.00 dB
LTE Band 42	Main	6.50 dB
LTE Band 48	Main	6.00 dB
LTE Band 66	Main	7.50 dB
LTE Band 71	Main	2.50 dB
FR1 n2	Main	7.50 dB
FR1 n5	Main	3.00 dB
FR1 n7	Main	12.00 dB
FR1 n12	Main	3.00 dB
FR1 n13	Main	4.00 dB
FR1 n14	Main	3.50 dB
FR1 n25	Main	7.50 dB
FR1 n26	Main	3.00 dB
FR1 n30	Main	7.50 dB
FR1 n38	Main	10.50 dB
FR1 n41	Main	10.50 dB
FR1 n41_HPUE	Main	10.00 dB
FR1 n48	Main	8.00 dB
FR1 n66	Main	7.00 dB
FR1 n71	Main	3.00 dB
FR1 n77	Main	10.00 dB
FR1 n77_HPUE	Main	9.50 dB
FR1 n78	Main	10.00 dB
FR1 n78_HPUE	Main	9.50 dB

Exposure Position / wireless mode		Bottom of Laptop (1)
LTE Band 2	MIMO2	5.00 dB
LTE Band 4	MIMO2	5.50 dB
LTE Band 7	MIMO2	5.50 dB
LTE Band 25	MIMO2	5.00 dB
LTE Band 30	MIMO2	4.50 dB
LTE Band 38	MIMO2	5.50 dB
LTE Band 41	MIMO2	5.50 dB
LTE Band 42	MIMO2	3.50 dB
LTE Band 43	MIMO2	1.50 dB
LTE Band 48	MIMO2	1.50 dB
LTE Band 66	MIMO2	5.50 dB
FR1 n2	MIMO2	4.50 dB
FR1 n7	MIMO2	6.00 dB
FR1 n25	MIMO2	4.50 dB
FR1 n30	MIMO2	4.50 dB
FR1 n38	MIMO2	7.50 dB
FR1 n41	MIMO2	7.50 dB
FR1 n41_HPUE	MIMO2	8.00 dB
FR1 n48	MIMO2	3.50 dB
FR1 n66	MIMO2	5.00 dB
FR1 n77	MIMO2	9.50 dB
FR1 n77_HPUE	MIMO2	9.00 dB
FR1 n78	MIMO2	9.50 dB
FR1 n78_HPUE	MIMO2	9.00 dB
FR1 n38	AUX	5.50 dB
FR1 n41	AUX	5.50 dB
FR1 n41 HPUE	AUX	5.00 dB
FR1 n48	AUX	4.50 dB
FR1 n77	AUX	8.50 dB
FR1 n77_HPUE	AUX	8.00 dB
FR1 n78	AUX	8.50 dB
FR1 n78_HPUE	AUX	8.00 dB

Remark:

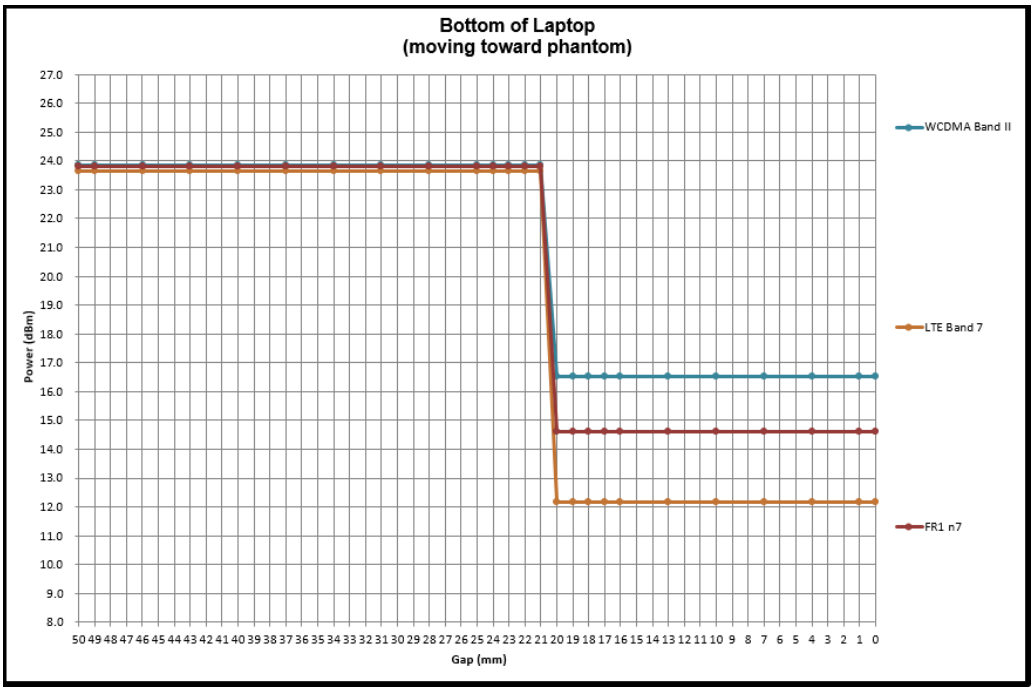
1. (1): Reduced maximum limit applied by activation of proximity sensor.
2. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown as below.
3. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
   (a) Main
   - Bottom of Laptop: 19 mm

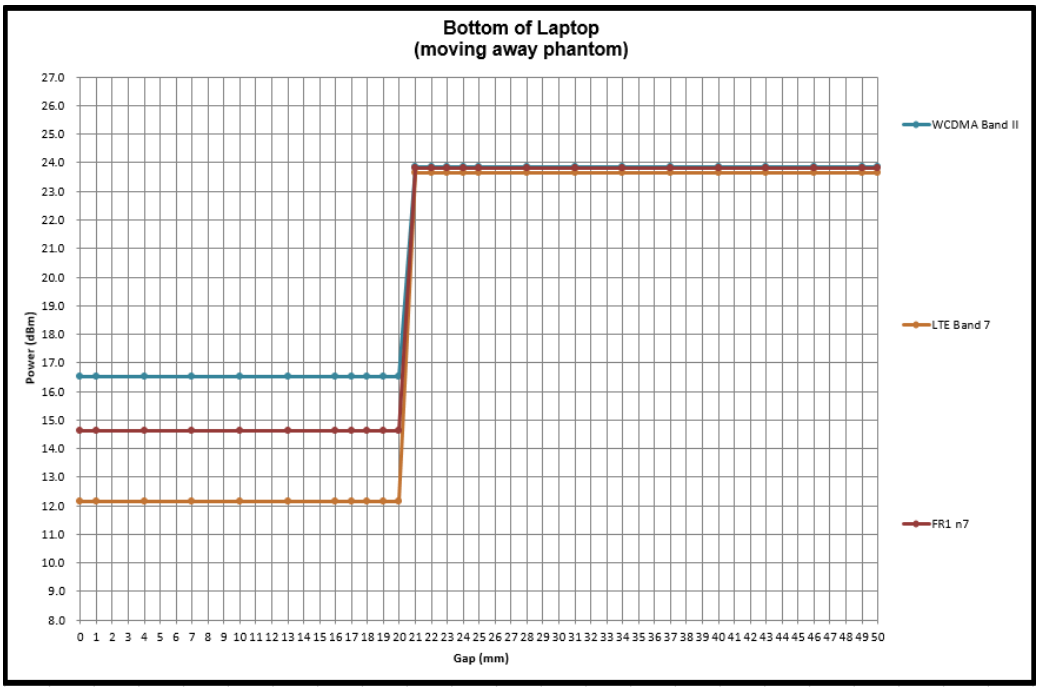
   (b) MIMO 2
   - Bottom of Laptop: 19 mm

   (c) Aux
   - Bottom of Laptop: 19 mm

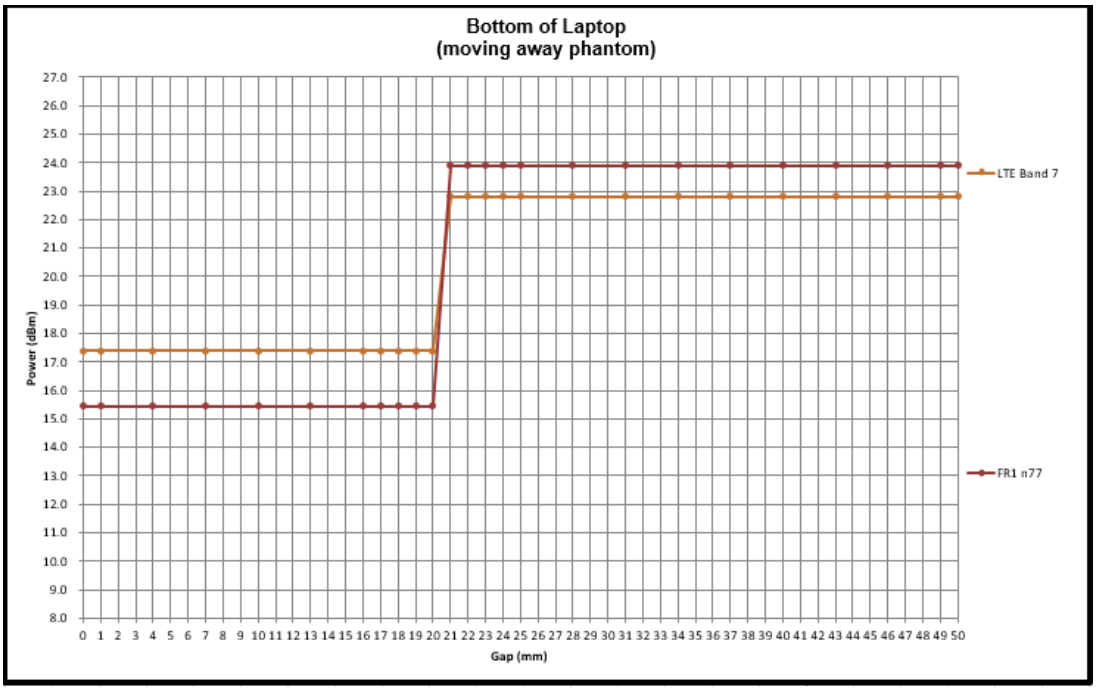
Power Measurement during Sensor Trigger distance testing

<Main Antenna>

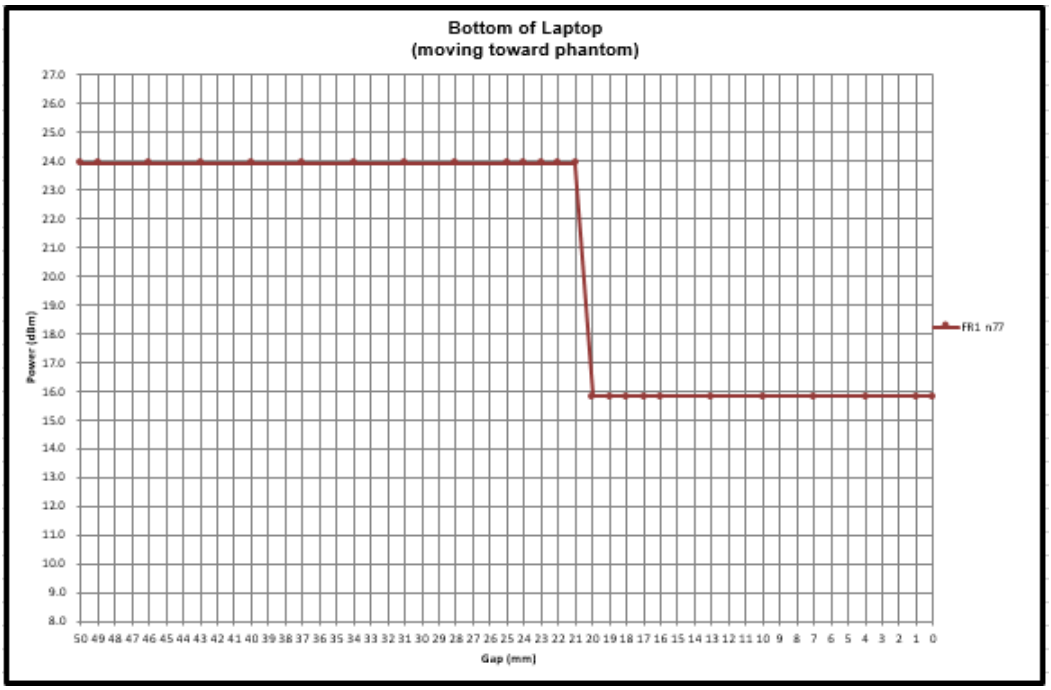


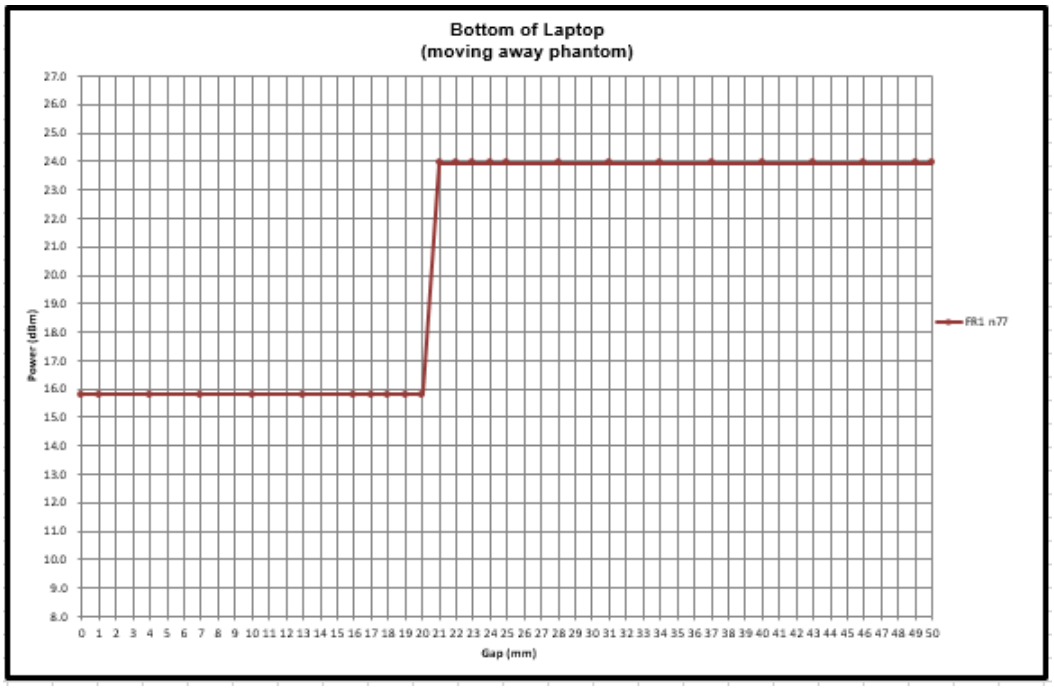


<MIMO2 Antenna>



<Aux Antenna>

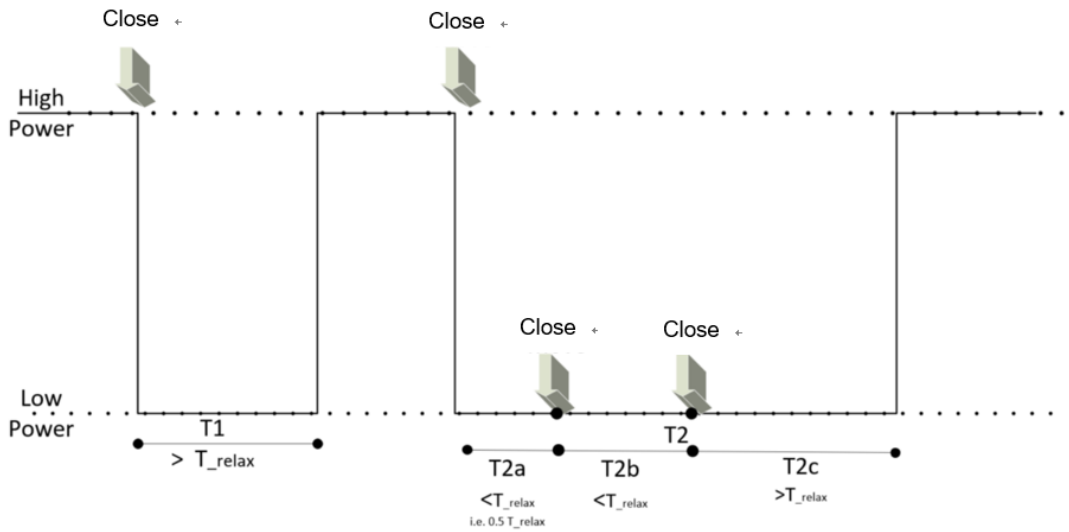

Bottom of Laptop
(moving toward phantom)
Power (dBm)
Gap (mm)
FR1 n77


Bottom of Laptop
(moving away phantom)
Power (dBm)
Gap (mm)
FR1 n77

<Proximity sensor sensitivity verification>:

General Note:

1. Verify the functionality of the proximity sensor with steady/unsteady sensing by measuring the output power in the following steps.
   a. Step 1 The proximity sensor of DUT away any objects
      Record P step 1 (High Power)
   b. Step 2 Hands close to proximity sensor of DUT to trigger proximity sensor and then away the proximity sensor
      Record P step 2 (low power)
   c. For the validation ofT relax, wait a time period T1 > Trelax and confirm DUT restores to high power (Pstep1).
   d. Hands close to proximity sensor of DUT to trigger the proximity sensor.
   e. Hands close to proximity sensor of DUT within Trelax to ensure Trelax resets when DUT is in sensing.
   f. Human hands can close to proximity sensor once or twice within Trelax, (after time periods T2a and T2b in Figure 1.) followed by waiting for a time period greater than Trelax (time period T2c in Figure 1.) for DUT to restore high power. The total time duration of this step is T2, and the power during the whole period T2 shall be reduced (low power – Pstep2).



<Main Antenna>

Bottom of Laptop (mm)													
Exposure Condition		Output Power (data connection)											
		(dBm)											
		The proximity sensor of DUT away any objects		Hand close to proximity sensor of DUT and then away the proximity sensor		Keep the proximity sensor of DUT away any objects		Hand close to proximity sensor of DUT and then away the proximity sensor				Keep the proximity sensor of DUT away any objects	
Power state		Full Power		Low Power		Full Power		Low Power		Low Power		Full Power	
		*P*step1		*P*step2		*P*step1 & *T*1 > *T*relax		*P*step2 & *T*2a < *T*relax		*P*step2 & *T*2b < *T*relax		*P*step1& *T*2c > *T*relax	
Wireless technology	Antenna	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up
WCDMA Band II	WWAN Main	23.85	25.00	16.51	17.00	23.85	25.00	16.51	17.00	16.51	17.00	23.85	25.00
LTE Band 7	WWAN Main	23.63	25.00	12.17	13.00	23.63	25.00	12.17	13.00	12.17	13.00	23.63	25.00
FR1 n7	WWAN Main	23.80	25.00	14.61	15.00	23.80	25.00	14.61	15.00	14.61	15.00	23.80	25.00

<MIMO 2 Antenna>

Bottom of Laptop (mm)													
Exposure Condition		Output Power (data connection)											
		(dBm)											
		The proximity sensor of DUT away any objects		Hand close to proximity sensor of DUT and then away the proximity sensor		Keep the proximity sensor of DUT away any objects		Hand close to proximity sensor of DUT and then away the proximity sensor				Keep the proximity sensor of DUT away any objects	
Power state		Full Power		Low Power		Full Power		Low Power		Low Power		Full Power	
		*P*step1		*P*step2		*P*step1 & *T*1 > *T*relax		*P*step2 & *T*2a < *T*relax		*P*step2 & *T*2b < *T*relax		*P*step1& *T*2c > *T*relax	
Wireless technology	Antenna	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up
LTE Band 7	WWAN MIMO2	22.82	24.00	17.40	18.50	22.82	24.00	17.40	18.50	17.40	18.50	22.82	24.00
FR1 n77	WWAN MIMO2	23.89	25.00	15.45	15.50	23.89	25.00	15.45	15.50	15.45	15.50	23.89	25.00

<Aux Antenna>

Bottom of Laptop (mm)													
Exposure Condition		Output Power (data connection)											
		(dBm)											
		The proximity sensor of DUT away any objects		Hand close to proximity sensor of DUT and then away the proximity sensor		Keep the proximity sensor of DUT away any objects		Hand close to proximity sensor of DUT and then away the proximity sensor				Keep the proximity sensor of DUT away any objects	
Power state		Full Power		Low Power		Full Power		Low Power		Low Power		Full Power	
		*P*step1		*P*step2		*P*step1 & *T*1 > *T*relax		*P*step2 & *T*2a < *T*relax		*P*step2 & *T*2b < *T*relax		*P*step1& *T*2c > *T*relax	
Wireless technology	Antenna	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up	Measured	Max. Tune-up
FR1 n77	WWAN MIMO2	23.94	25.00	15.81	16.50	23.94	25.00	15.81	16.50	15.81	16.50	23.94	25.00

4. 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 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02

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:

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

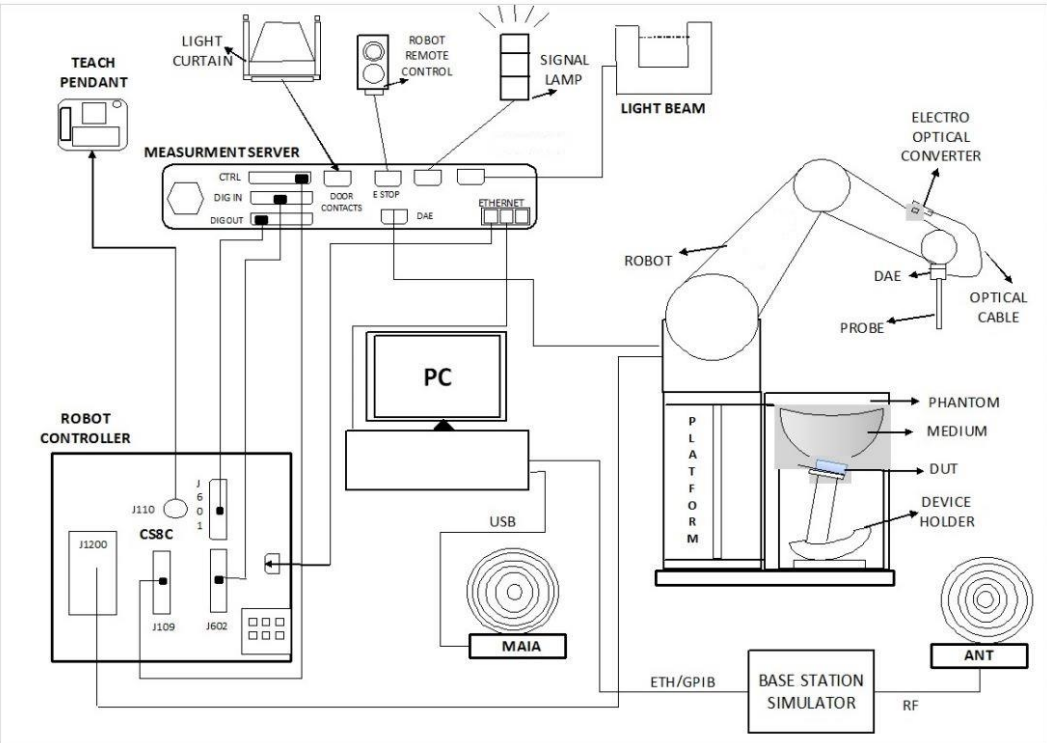
SAR is expressed in units of Watts per kilogram (W/kg)

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

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.

Laboratory	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	SAR18-HY	SAR21-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	SAR16-HY	SAR19-HY	SAR22-HY
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	SAR17-HY	SAR20-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	4 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	4 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.

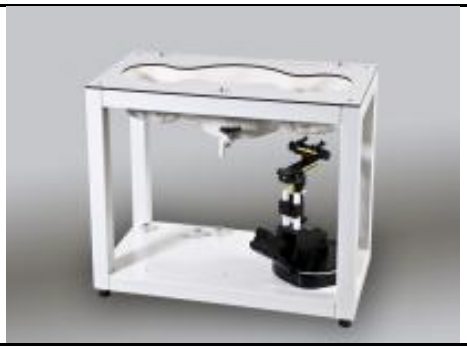
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

7.4 Phantom

<SAM Twin Phantom>

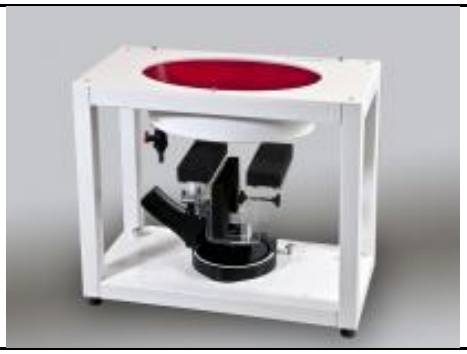
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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(2)	D750V3	1107	Jun. 22, 2022	Jun. 20, 2024
SPEAG	835MHz System Validation Kit(2)	D835V2	4d060	Mar. 24, 2022	Mar. 21, 2025
SPEAG	835MHz System Validation Kit(2)	D835V2	4d167	Nov. 24, 2022	Nov. 22, 2024
SPEAG	1750MHz System Validation Kit(2)	D1750V2	1112	Jun. 22, 2022	Jun. 19, 2025
SPEAG	1900MHz System Validation Kit(2)	D1900V2	5d185	Jun. 17, 2022	Jun. 14, 2025
SPEAG	2300MHz System Validation Kit(2)	D2300V2	1006	Jan. 18, 2022	Jan. 15, 2025
SPEAG	2600MHz System Validation Kit(2)	D2600V2	1078	Jun. 23, 2022	Jun. 20, 2025
SPEAG	3500MHz System Validation Kit(2)	D3500V2	1036	Mar. 23, 2022	Mar. 20, 2025
SPEAG	3700MHz System Validation Kit(2)	D3700V2	1006	Jun. 20, 2022	Jun. 18, 2024
SPEAG	3900MHz System Validation Kit(2)	D3900V2	1017	Apr. 22, 2022	Apr. 19, 2025
SPEAG	3900MHz System Validation Kit	D3900V2	1092	May. 15, 2023	May. 14, 2024
SPEAG	Data Acquisition Electronics	DAE4	656	Jan. 18, 2024	Jan. 17, 2025
SPEAG	Data Acquisition Electronics	DAE4	1707	Dec. 06, 2023	Dec. 05, 2024
SPEAG	Data Acquisition Electronics	DAE4ip	1800	May. 31, 2023	May. 30, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7625	Dec. 14, 2023	Dec. 13, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7694	Oct. 26, 2023	Oct. 25, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7700	Feb. 01, 2024	Jan. 31, 2025
SPEAG	Dosimetric E-Field Probe	EX3DV4	7791	Feb. 21, 2024	Feb. 20, 2025
Testo	Hygro meter	608-H1	45196600	Nov. 02, 2023	Nov. 01, 2024
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Nov. 13, 2023	Nov. 12, 2024
Keysight	5G Wireless Test Platform	E7515B	MY59321826	Apr. 26, 2023	Apr. 25, 2024
Keysight	5G Wireless Test Platform	E7515B	MY58300712	Apr. 22, 2024	Apr. 21, 2025
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Sep. 27, 2023	Sep. 26, 2024
Keysight	ENA Network Analyzer	E5071C	MY46104758	Oct. 30, 2023	Oct. 29, 2024
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 19, 2023	Sep. 18, 2024
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3690	Aug. 09, 2023	Aug. 08, 2024
Anritsu	Power Meter	ML2495A	1419002	Aug. 17, 2023	Aug. 16, 2024
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2023	Aug. 17, 2024
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 10, 2023	Jul. 09, 2024
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 16, 2023	Oct. 15, 2024
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	22.9	0.893	43.400	0.89	41.90	0.34	3.58	±5	2024/5/6
750	22.9	0.906	42.100	0.89	41.90	1.80	0.48	±5	2024/5/7
750	22.2	0.893	42.900	0.89	41.90	0.34	2.39	±5	2024/5/9
750	22.9	0.897	43.000	0.89	41.90	0.79	2.63	±5	2024/5/19
835	22.2	0.927	42.600	0.90	41.50	3.00	2.65	±5	2024/5/9
835	22.9	0.932	42.700	0.90	41.50	3.56	2.89	±5	2024/5/19
835	22.9	0.942	41.800	0.90	41.50	4.67	0.72	±5	2024/5/20
1750	22.5	1.370	40.300	1.37	40.10	0.00	0.50	±5	2024/4/27
1750	22.2	1.340	40.900	1.37	40.10	-2.19	2.00	±5	2024/5/8
1750	22.3	1.360	40.800	1.37	40.10	-0.73	1.75	±5	2024/5/10
1750	22.8	1.350	40.500	1.37	40.10	-1.46	1.00	±5	2024/5/18
1900	22.4	1.390	39.600	1.40	40.00	-0.71	-1.00	±5	2024/4/28
1900	22.5	1.440	39.100	1.40	40.00	2.86	-2.25	±5	2024/5/9
1900	22.3	1.430	39.300	1.40	40.00	2.14	-1.75	±5	2024/5/10
1900	22.8	1.420	39.000	1.40	40.00	1.43	-2.50	±5	2024/5/18
2300	22.7	1.640	39.400	1.67	39.50	-1.80	-0.25	±5	2024/4/29
2300	22.5	1.630	39.200	1.67	39.50	-2.40	-0.76	±5	2024/5/1
2300	22.6	1.680	39.000	1.67	39.50	0.60	-1.27	±5	2024/5/7
2300	22.6	1.650	38.900	1.67	39.50	-1.20	-1.52	±5	2024/5/17
2600	22.6	1.990	38.500	1.96	39.00	1.53	-1.28	±5	2024/4/30
2600	22.6	1.940	38.400	1.96	39.00	-1.02	-1.54	±5	2024/5/2
2600	22.6	2.010	37.900	1.96	39.00	2.55	-2.82	±5	2024/5/7
2600	22.8	1.930	38.200	1.96	39.00	-1.53	-2.05	±5	2024/5/12
2600	22.3	1.970	39.700	1.96	39.00	0.51	1.79	±5	2024/5/13
2600	22.6	1.980	37.900	1.96	39.00	1.02	-2.82	±5	2024/5/17
3500	22.8	2.950	37.600	2.91	37.90	1.37	-0.79	±5	2024/5/8
3500	22.5	2.940	37.600	2.91	37.90	1.03	-0.79	±5	2024/5/11
3500	22.6	2.930	37.800	2.91	37.90	0.69	-0.26	±5	2024/5/11
3500	22.4	2.970	38.300	2.91	37.90	2.06	1.06	±5	2024/5/14
3500	22.5	2.960	37.700	2.91	37.90	1.72	-0.53	±5	2024/5/15
3700	22.8	3.100	37.300	3.12	37.70	-0.64	-1.06	±5	2024/5/8
3700	22.8	3.170	37.500	3.12	37.70	1.60	-0.53	±5	2024/5/10
3700	22.5	3.130	37.300	3.12	37.70	0.32	-1.06	±5	2024/5/11
3700	22.4	3.190	38.100	3.12	37.70	2.24	1.06	±5	2024/5/12
3700	22.8	3.080	37.500	3.12	37.70	-1.28	-0.53	±5	2024/5/15
3700	22.3	3.200	37.500	3.12	37.70	2.56	-0.53	±5	2024/5/17
3700	22.7	3.110	37.500	3.12	37.70	-0.32	-0.53	±5	2024/5/19
3900	22.8	3.270	37.100	3.33	37.51	-1.80	-1.09	±5	2024/5/8
3900	22.5	3.270	37.200	3.33	37.51	-1.80	-0.83	±5	2024/5/11
3900	22.9	3.380	37.200	3.33	37.51	1.50	-0.83	±5	2024/5/16
3900	22.3	3.390	37.300	3.33	37.51	1.80	-0.56	±5	2024/5/18
3900	22.1	3.400	37.900	3.33	37.51	2.10	1.04	±5	2024/5/19

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)	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 (%)
2024/5/6	750	50	D750V3-1107	EX3DV4 - SN7791	DAE4ip Sn1800	0.400	8.540	8	-6.32
2024/5/7	750	50	D750V3-1107	EX3DV4 - SN7791	DAE4ip Sn1800	0.409	8.540	8.18	-4.22
2024/5/9	750	50	D750V3-1107	EX3DV4 - SN7700	DAE4 Sn656	0.421	8.540	8.42	-1.41
2024/5/19	750	50	D750V3-1107	EX3DV4 - SN7700	DAE4 Sn656	0.424	8.540	8.48	-0.70
2024/5/9	835	50	D835V2-4d060	EX3DV4 - SN7700	DAE4 Sn656	0.479	9.730	9.58	-1.54
2024/5/19	835	50	D835V2-4d060	EX3DV4 - SN7700	DAE4 Sn656	0.485	9.730	9.7	-0.31
2024/5/20	835	50	D835V2-4d167	EX3DV4 - SN7791	DAE4ip Sn1800	0.477	9.800	9.54	-2.65
2024/4/27	1750	50	D1750V2-1112	EX3DV4 - SN7694	DAE4ip Sn1800	1.670	36.900	33.4	-9.49
2024/5/8	1750	50	D1750V2-1112	EX3DV4 - SN7791	DAE4ip Sn1800	1.690	36.900	33.8	-8.40
2024/5/10	1750	50	D1750V2-1112	EX3DV4 - SN7700	DAE4 Sn656	1.810	36.900	36.2	-1.90
2024/5/18	1750	50	D1750V2-1112	EX3DV4 - SN7700	DAE4 Sn656	1.820	36.900	36.4	-1.36
2024/4/28	1900	50	D1900V2-5d185	EX3DV4 - SN7694	DAE4ip Sn1800	1.800	39.000	36	-7.69
2024/5/9	1900	50	D1900V2-5d185	EX3DV4 - SN7791	DAE4ip Sn1800	1.800	39.000	36	-7.69
2024/5/10	1900	50	D1900V2-5d185	EX3DV4 - SN7700	DAE4 Sn656	2.020	39.000	40.4	3.59
2024/5/18	1900	50	D1900V2-5d185	EX3DV4 - SN7700	DAE4 Sn656	2.040	39.000	40.8	4.62
2024/4/29	2300	50	D2300V2-1006	EX3DV4 - SN7694	DAE4ip Sn1800	2.550	48.300	51	5.59
2024/5/1	2300	50	D2300V2-1006	EX3DV4 - SN7625	DAE4 Sn1707	2.180	48.300	43.6	-9.73
2024/5/7	2300	50	D2300V2-1006	EX3DV4 - SN7700	DAE4 Sn656	2.440	48.300	48.8	1.04
2024/5/17	2300	50	D2300V2-1006	EX3DV4 - SN7700	DAE4 Sn656	2.440	48.300	48.8	1.04
2024/4/30	2600	50	D2600V2-1078	EX3DV4 - SN7694	DAE4ip Sn1800	2.670	55.400	53.4	-3.61
2024/5/2	2600	50	D2600V2-1078	EX3DV4 - SN7625	DAE4 Sn1707	2.700	55.400	54	-2.53
2024/5/7	2600	50	D2600V2-1078	EX3DV4 - SN7700	DAE4 Sn656	2.860	55.400	57.2	3.25
2024/5/12	2600	50	D2600V2-1078	EX3DV4 - SN7625	DAE4 Sn1707	2.670	55.400	53.4	-3.61
2024/5/13	2600	50	D2600V2-1078	EX3DV4 - SN7791	DAE4ip Sn1800	2.690	55.400	53.8	-2.89
2024/5/17	2600	50	D2600V2-1078	EX3DV4 - SN7700	DAE4 Sn656	2.890	55.400	57.8	4.33
2024/5/8	3500	50	D3500V2-1036	EX3DV4 - SN7700	DAE4 Sn656	3.280	67.400	65.6	-2.67
2024/5/11	3500	50	D3500V2-1036	EX3DV4 - SN7700	DAE4 Sn656	3.200	67.400	64	-5.04
2024/5/11	3500	50	D3500V2-1036	EX3DV4 - SN7694	DAE4ip Sn1800	3.570	67.400	71.4	5.93
2024/5/14	3500	50	D3500V2-1036	EX3DV4 - SN7791	DAE4ip Sn1800	3.260	67.400	65.2	-3.26
2024/5/15	3500	50	D3500V2-1036	EX3DV4 - SN7625	DAE4 Sn1707	3.130	67.400	62.6	-7.12
2024/5/8	3700	50	D3700V2-1006	EX3DV4 - SN7700	DAE4 Sn656	3.340	65.600	66.8	1.83
2024/5/10	3700	50	D3700V2-1006	EX3DV4 - SN7791	DAE4ip Sn1800	3.170	65.600	63.4	-3.35
2024/5/11	3700	50	D3700V2-1006	EX3DV4 - SN7700	DAE4 Sn656	3.220	65.600	64.4	-1.83
2024/5/12	3700	50	D3700V2-1006	EX3DV4 - SN7791	DAE4ip Sn1800	3.320	65.600	66.4	1.22
2024/5/15	3700	50	D3700V2-1006	EX3DV4 - SN7694	DAE4ip Sn1800	3.260	65.600	65.2	-0.61
2024/5/17	3700	50	D3700V2-1006	EX3DV4 - SN7694	DAE4ip Sn1800	3.380	65.600	67.6	3.05
2024/5/19	3700	50	D3700V2-1006	EX3DV4 - SN7625	DAE4 Sn1707	3.250	65.600	65	-0.91
2024/5/8	3900	50	D3900V2-1092	EX3DV4 - SN7700	DAE4 Sn656	3.270	67.000	65.4	-2.39
2024/5/11	3900	50	D3900V2-1092	EX3DV4 - SN7700	DAE4 Sn656	3.110	67.000	62.2	-7.16
2024/5/16	3900	50	D3900V2-1017-3900	EX3DV4 - SN7791	DAE4ip Sn1800	3.300	68.700	66	-3.93
2024/5/18	3900	50	D3900V2-1017-3900	EX3DV4 - SN7694	DAE4ip Sn1800	3.430	68.700	68.6	-0.15
2024/5/19	3900	50	D3900V2-1017-3900	EX3DV4 - SN7791	DAE4ip Sn1800	3.160	68.700	63.2	-8.01

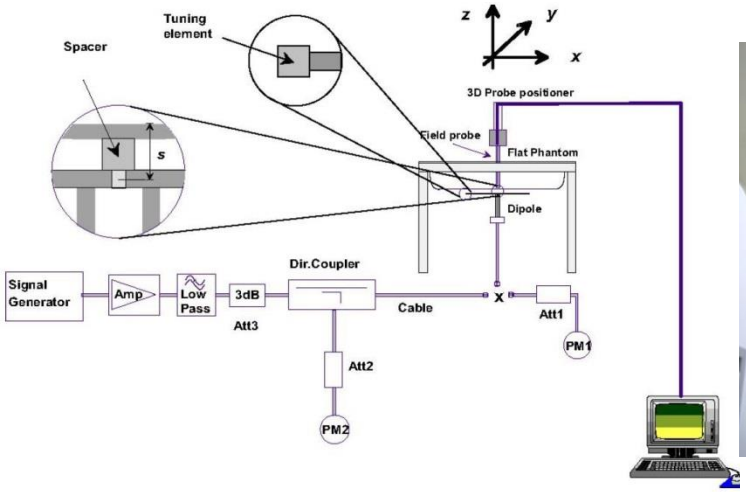


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

11. Measurement procedure for output power and SAR

Detail output power measurement data is in the appendix D

<WCDMA Note>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.
4. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
5. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

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

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

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

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

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

Setup Configuration

HSUPA Setup Configuration:

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

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

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

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

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

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

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

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

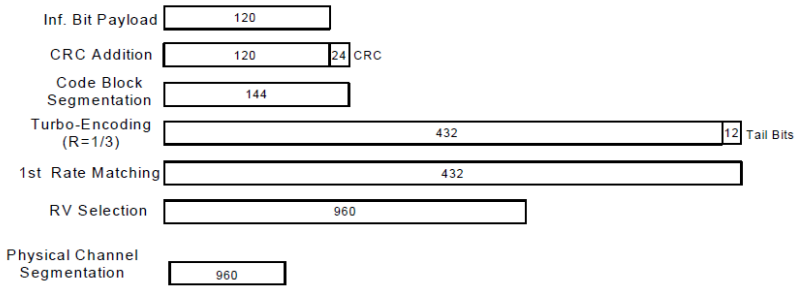


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<LTE Note>

1. A 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/B17/B26/B38/B71 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 2/4/5/17/38 SAR test was covered by Band 25/66/26/12/41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
    a. the maximum output power, including tolerance, for the smaller band is ≤ 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

<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 Base station simulator was used for LTE output power measurements and SAR testing.

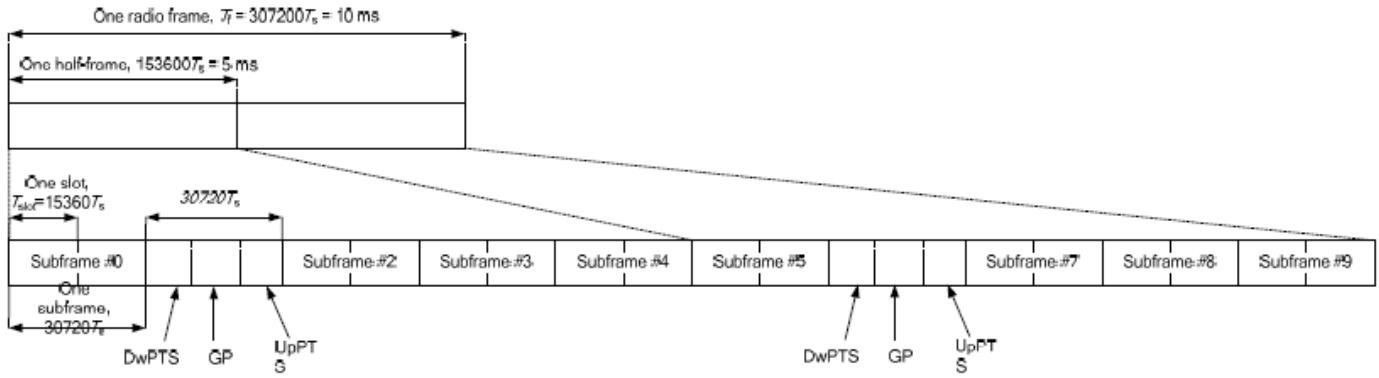


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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.

<5G NR 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. For NR FDD was establishing connections via a base station simulator to use for output power measurement and SAR testing

<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		

12. DL/UL carrier aggregation

<LTE Carrier Aggregation combinations>

General Note:

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

2CC Downlink Carrier Aggregation			3CC Downlink Carrier Aggregation		
Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset
1	CA_43C		61	CA_48D	417
2	CA_48B	417	62	CA_66D	417
3	CA_48C	417	63	CA_25A-25A-25A	418
4	CA_66B	417	64	CA_48A-48C	417
5	CA_2A-2A	409	65	CA_66A-66A-66A	417
6	CA_4A-4A	410	66	CA_66A-66B	417
7	CA_25A-25A	418	67	CA_66A-66C	417
8	CA_43A-43A		68	CA_2A-2A-4A	290
9	CA_48A-48A	417	69	CA_2A-2A-5A	398
10	CA_2A-4A	290	70	CA_2A-2A-7A	402
11	CA_2A-5A	398	71	CA_2A-2A-12A	389
12	CA_2A-12A	389	72	CA_2A-2A-13A	407
13	CA_2A-13A	407	73	CA_2A-2A-14A	392
14	CA_2A-14A	392	74	CA_2A-2A-29A	393
15	CA_2A-26A	180	75	CA_2A-2A-30A	394
16	CA_2A-29A	393	76	CA_2A-2A-46A	408
17	CA_2A-30A	394	77	CA_2A-2A-66A	409
18	CA_2A-46A	408	78	CA_2A-2A-71A	325
19	CA_2A-48A	409	79	CA_2A-4A-4A	290
20	CA_2A-66A	409	80	CA_2A-5B	398
21	CA_2A-71A	325	81	CA_2C-5A	398
22	CA_4A-12A	327	82	CA_2A-7A-7A	402
23	CA_4A-13A	158	83	CA_2A-7C	402
24	CA_4A-29A	328	84	CA_2A-12A-12A	389
25	CA_4A-30A	410	85	CA_2C-12A	389
26	CA_4A-46A	365	86	CA_2C-29A	393
27	CA_4A-48A	366	87	CA_2C-30A	394
28	CA_4A-71A	271	88	CA_2A-46A-46A	408
29	CA_5A-25A		89	CA_2A-46C	408
30	CA_5A-30A	412	90	CA_2A-48A-48A	409
31	CA_5A-38A		91	CA_2A-48C	409
32	CA_5A-41A		92	CA_2A-66A-66A	409
33	CA_5A-48A	336	93	CA_2A-66B	409
34	CA_7A-12A	340	94	CA_2A-66C	409
35	CA_7A-13A	388	95	CA_2C-66A	409
36	CA_7A-25A	415	96	CA_4A-4A-5A	410
37	CA_7A-26A	198	97	CA_4A-4A-7A	290
38	CA_7A-29A	344	98	CA_4A-4A-12A	327
39	CA_7A-66A	415	99	CA_4A-4A-13A	158
40	CA_12A-25A		100	CA_4A-4A-29A	328
41	CA_12A-30A	345	101	CA_4A-4A-30A	410
42	CA_12A-66A	389	102	CA_4A-4A-71A	271
43	CA_13A-48A	417	103	CA_4A-5B	410

44	CA_13A-66A	417	104	CA_4A-7A-7A	290
45	CA_14A-30A	351	105	CA_4A-12A-12A	327
46	CA_14A-66A	392	106	CA_4A-46A-46A	365
47	CA_25A-26A	418	107	CA_4A-46C	365
48	CA_25A-41A	418	108	CA_4A-48C	366
49	CA_25A-46A	256	109	CA_5A-5A-66A	413
50	CA_25A-66A	415	110	CA_5B-30A	412
51	CA_26A-41A	418	111	CA_5A-66A-66A	413
52	CA_29A-30A	354	112	CA_5A-66B	413
53	CA_29A-66A	393	113	CA_5A-66C	413
54	CA_30A-66A	412	114	CA_5B-66A	413
55	CA_41A-46A	374	115	CA_7A-7A-13A	388
56	CA_41A-48A		116	CA_7A-7A-25A	415
57	CA_46A-66A	416	117	CA_7A-7A-26A	198
58	CA_48A-66A	417	118	CA_7A-7A-29A	344
59	CA_48A-71A	154	119	CA_7A-7A-46A	411
60	CA_66A-71A	325	120	CA_7A-7A-66A	415
			121	CA_7C-13A	388
			122	CA_7A-25A-25A	415
			123	CA_7C-25A	415
			124	CA_7C-29A	344
			125	CA_7A-66A-66A	415
			126	CA_7C-66A	415
			127	CA_12A-66A-66A	389
			128	CA_12A-66C	389
			129	CA_13A-48A-48A	417
			130	CA_13A-48C	417
			131	CA_13A-66A-66A	417
			132	CA_13A-66B	417
			133	CA_13A-66C	417
			134	CA_14A-66A-66A	392
			135	CA_25A-25A-26A	418
			136	CA_25A-25A-41A	418
			137	CA_25A-25A-66A	415
			138	CA_25A-41C	418
			139	CA_25A-46C	256
			140	CA_26A-41C	418
			141	CA_29A-66A-66A	393
			142	CA_30A-66A-66A	412
			143	CA_41A-46C	374
			144	CA_46A-46A-66A	416
			145	CA_46A-66A-66A	416
			146	CA_46A-66C	416
			147	CA_46C-66A	416
			148	CA_48A-48A-66A	417
			149	CA_48A-48A-71A	154
			150	CA_48A-66A-66A	417
			151	CA_48A-66B	417
			152	CA_48A-66C	417
			153	CA_48C-66A	417
			154	CA_48C-71A	
			155	CA_66A-66A-71A	325
			156	CA_66C-71A	325
			157	CA_2A-4A-12A	287
			158	CA_2A-4A-13A	
			159	CA_2A-4A-29A	

			160	CA_2A-4A-30A	
			161	CA_2A-4A-71A	271
			162	CA_2A-5A-7A	292
			163	CA_2A-5A-30A	394
			164	CA_2A-5A-46A	395
			165	CA_2A-5A-48A	
			166	CA_2A-5A-66A	398
			167	CA_2A-7A-12A	274
			168	CA_2A-7A-13A	388
			169	CA_2A-7A-26A	
			170	CA_2A-7A-29A	305
			171	CA_2A-7A-46A	401
			172	CA_2A-7A-66A	402
			173	CA_2A-12A-30A	309
			174	CA_2A-12A-66A	389
			175	CA_2A-13A-46A	403
			176	CA_2A-13A-48A	404
			177	CA_2A-13A-66A	407
			178	CA_2A-14A-30A	280
			179	CA_2A-14A-66A	392
			180	CA_2A-26A-66A	
			181	CA_2A-29A-30A	318
			182	CA_2A-29A-66A	393
			183	CA_2A-30A-66A	320
			184	CA_2A-46A-66A	408
			185	CA_2A-48A-66A	409
			186	CA_2A-66A-71A	325
			187	CA_4A-5A-30A	410
			188	CA_4A-7A-12A	
			189	CA_4A-12A-30A	327
			190	CA_4A-29A-30A	328
			191	CA_5A-7A-46A	411
			192	CA_5A-30A-66A	412
			193	CA_5A-46A-66A	413
			194	CA_5A-48A-66A	336
			195	CA_7A-12A-66A	340
			196	CA_7A-13A-66A	341
			197	CA_7A-25A-66A	415
			198	CA_7A-26A-66A	
			199	CA_7A-29A-66A	344
			200	CA_7A-46A-66A	
			201	CA_12A-30A-66A	345
			202	CA_13A-46A-66A	416
			203	CA_13A-48A-66A	417
			204	CA_14A-30A-66A	351
			205	CA_25A-26A-41A	418
			206	CA_29A-30A-66A	354
			207	CA_29A-46A-66A	

4CC Downlink Carrier Aggregation			5CC Downlink Carrier Aggregation		
Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset
208	CA_48E	417	355	CA_48A-48E	417
209	CA_48A-48D	417	356	CA_48C-48D	417
210	CA_48C-48C	417	357	CA_2A-2A-46D	408
211	CA_2A-2A-4A-4A	290	358	CA_2A-2A-66A-66B	409
212	CA_2A-2A-5B	398	359	CA_2A-2A-66A-66C	409
213	CA_2A-2A-7A-7A	402	360	CA_2A-46A-46D	408
214	CA_2A-2A-7C	402	361	CA_2A-46E	408
215	CA_2A-2A-12A-12A	389	362	CA_2A-48A-48D	409
216	CA_2A-2A-46C	408	363	CA_2A-48C-48C	409
217	CA_2A-2A-66A-66A	409	364	CA_2A-48E	409
218	CA_2A-2A-66B	409	365	CA_4A-46A-46D	
219	CA_2A-2A-66C	409	366	CA_4A-48E	
220	CA_2A-46A-46C	408	367	CA_5B-66A-66B	413
221	CA_2A-46D	408	368	CA_5B-66A-66C	413
222	CA_2A-48A-48C	409	369	CA_7A-7A-46D	411
223	CA_2A-48D	409	370	CA_13A-48A-48D	417
224	CA_2A-66A-66A-66A	409	371	CA_13A-48C-48C	417
225	CA_2A-66A-66B	409	372	CA_25A-25A-41D	418
226	CA_2A-66A-66C	409	373	CA_25A-41E	418
227	CA_2C-66A-66A	409	374	CA_41A-46E	
228	CA_2A-66D	409	375	CA_46A-46D-66A	416
229	CA_4A-4A-5B	410	376	CA_46D-66A-66A	416
230	CA_4A-4A-12A-12A	327	377	CA_46E-66A	416
231	CA_4A-46A-46C	365	378	CA_48A-48C-66B	417
232	CA_4A-46D	365	379	CA_48A-48C-66C	417
233	CA_4A-48D	366	380	CA_48A-48D-66A	417
234	CA_5A-5A-66A-66A	413	381	CA_48C-48C-66A	417
235	CA_5A-5A-66B	413	382	CA_48E-66A	417
236	CA_5A-5A-66C	413	383	CA_2A-2A-5A-66A-66A	398
237	CA_5A-48D	336	384	CA_2A-2A-5A-66B	398
238	CA_5A-66A-66B	413	385	CA_2A-2A-5A-66C	398
239	CA_5A-66A-66C	413	386	CA_2A-2A-5B-66A	398
240	CA_5B-66A-66A	413	387	CA_2A-2A-7A-7A-13A	388
241	CA_5A-66D	413	388	CA_2A-2A-7C-13A	
242	CA_5B-66B	413	389	CA_2A-2A-12A-66A-66A	
243	CA_5B-66C	413	390	CA_2A-2A-13A-66A-66A	407
244	CA_7A-7A-25A-25A	415	391	CA_2A-2A-13A-66B	407
245	CA_7A-7A-46C	411	392	CA_2A-2A-14A-66A-66A	
246	CA_7A-7A-66A-66A	415	393	CA_2A-2A-29A-66A-66A	
247	CA_7C-25A-25A	415	394	CA_2C-5B-30A	
248	CA_13A-48A-48C	417	395	CA_2A-5A-46D	
249	CA_13A-48D	417	396	CA_2A-5B-66A-66A	398
250	CA_13A-66A-66B	417	397	CA_2A-5B-66B	398
251	CA_13A-66A-66C	417	398	CA_2A-5B-66C	
252	CA_13A-66D	417	399	CA_2A-7A-7A-46C	401
253	CA_14A-66A-66A-66A	392	400	CA_2A-7A-7A-66A-66A	402
254	CA_25A-25A-41C	418	401	CA_2A-7A-46D	
255	CA_25A-41D	418	402	CA_2A-7C-66A-66A	
256	CA_25A-46D		403	CA_2A-13A-46D	
257	CA_41A-46D	374	404	CA_2A-13A-48D	
258	CA_46A-46C-66A	416	405	CA_2A-13A-66A-66B	407
259	CA_46C-66A-66A	416	406	CA_2A-13A-66A-66C	407

260	CA_46D-66A	416	407	CA_2A-13A-66D	
261	CA_48A-48A-66A-66A	417	408	CA_2A-46D-66A	
262	CA_48A-48A-66B	417	409	CA_2A-48D-66A	
263	CA_48A-48A-66C	417	410	CA_4A-4A-5B-30A	
264	CA_48A-48C-66A	417	411	CA_5A-7A-46D	
265	CA_48C-66A-66A	417	412	CA_5B-30A-66A-66A	
266	CA_48C-66B	417	413	CA_5A-46D-66A	
267	CA_48C-66C	417	414	CA_7A-7A-25A-25A-66A	415
268	CA_48D-66A	417	415	CA_7C-25A-25A-66A	
269	CA_2A-2A-4A-5A	288	416	CA_13A-46D-66A	
270	CA_2A-2A-4A-12A	287	417	CA_13A-48D-66A	
271	CA_2A-2A-4A-71A		418	CA_25A-25A-26A-41C	
272	CA_2A-2A-5A-30A	394			
273	CA_2A-2A-5A-66A	398			
274	CA_2A-2A-7A-12A				
275	CA_2A-2A-7A-13A	388			
276	CA_2A-2A-7A-66A	402			
277	CA_2A-2A-12A-30A	309			
278	CA_2A-2A-12A-66A	389			
279	CA_2A-2A-13A-66A	407			
280	CA_2A-2A-14A-30A				
281	CA_2A-2A-14A-66A	392			
282	CA_2A-2A-29A-30A	318			
283	CA_2A-2A-29A-66A	393			
284	CA_2A-2A-30A-66A	320			
285	CA_2A-2A-66A-71A	325			
286	CA_2A-4A-4A-5A	288			
287	CA_2A-4A-4A-12A				
288	CA_2A-4A-5B				
289	CA_2A-4A-7A-7A	290			
290	CA_2A-4A-7C				
291	CA_2A-5A-7A-7A	292			
292	CA_2A-5A-7C				
293	CA_2A-5B-30A	394			
294	CA_2C-5A-30A	394			
295	CA_2A-5A-46C	395			
296	CA_2A-5A-66A-66A	398			
297	CA_2A-5A-66B	398			
298	CA_2A-5A-66C	398			
299	CA_2A-5B-66A	398			
300	CA_2A-7A-7A-13A	388			
301	CA_2A-7A-7A-29A	305			
302	CA_2A-7A-7A-46A	401			
303	CA_2A-7A-7A-66A	402			
304	CA_2A-7C-13A	388			
305	CA_2A-7C-29A				
306	CA_2A-7A-46C	401			
307	CA_2A-7A-66A-66A	402			
308	CA_2A-7C-66A	402			
309	CA_2C-12A-30A				
310	CA_2A-12A-66A-66A	389			
311	CA_2A-12A-66C	389			
312	CA_2A-13A-46C	403			
313	CA_2A-13A-48C	404			
314	CA_2A-13A-66A-66A	407			
315	CA_2A-13A-66B	407			

316	CA_2A-13A-66C	407			
317	CA_2A-14A-66A-66A	392			
318	CA_2C-29A-30A				
319	CA_2A-29A-66A-66A	393			
320	CA_2A-30A-66A-66A				
321	CA_2A-46C-66A	408			
322	CA_2A-48A-66A-66A	409			
323	CA_2A-48C-66A	409			
324	CA_2A-66A-66A-71A	325			
325	CA_2A-66C-71A				
326	CA_4A-4A-5A-30A	410			
327	CA_4A-4A-12A-30A				
328	CA_4A-4A-29A-30A				
329	CA_4A-5B-30A	410			
330	CA_5A-7A-7A-66A	332			
331	CA_5A-7A-46C	411			
332	CA_5A-7A-66A-66A				
333	CA_5A-30A-66A-66A	412			
334	CA_5B-30A-66A	412			
335	CA_5A-46C-66A	413			
336	CA_5A-48A-66A-66A				
337	CA_7A-7A-13A-66A	341			
338	CA_7A-7A-25A-66A	415			
339	CA_7A-7A-29A-66A	344			
340	CA_7A-12A-66A-66A				
341	CA_7C-13A-66A				
342	CA_7A-25A-25A-66A	415			
343	CA_7C-25A-66A	415			
344	CA_7C-29A-66A				
345	CA_12A-30A-66A-66A				
346	CA_13A-46C-66A	416			
347	CA_13A-48A-66A-66A	417			
348	CA_13A-48A-66B	417			
349	CA_13A-48A-66C	417			
350	CA_13A-48C-66A	417			
351	CA_14A-30A-66A-66A				
352	CA_25A-25A-26A-41A	418			
353	CA_25A-26A-41C	418			
354	CA_29A-30A-66A-66A				

<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		5	10	844	20600	QPSK	1	0	25	20	1960	8340	23.61	23.80
		5	10	844	20600	QPSK	1	0	38	20	2595	38000	23.67	23.80
		5	10	844	20600	QPSK	1	0	41	20	2593	40620	23.77	23.80
		12	10	707.5	23095	QPSK	1	0	25	20	1960	8340	23.55	23.75
		41	20	2636.5	41055	QPSK	1	0	48	20	3641	56150	23.37	23.53
Intra-Band	Non-Contiguous	43	20	3610	43690	QPSK	1	0	43	20	3665	44240	20.22	20.42
	Contiguous	43	20	3610	43690	QPSK	1	0	43	20	3629.80	43888	20.23	20.42

<Three Carrier power verification>

Configure	PCC							SCC1				SCC2				Power	
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	13	10	751	5230	23.40	23.54
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	29	10	722.5	9715	23.49	23.54
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	30	10	2355	9820	23.40	23.54
	2	20	1860	18700	QPSK	1	0	5	10	881.5	2525	48	20	3641	56150	23.49	23.54
	2	20	1860	18700	QPSK	1	0	7	20	2655	3100	26	15	876.5	8865	20.48	23.54
	2	20	1860	18700	QPSK	1	0	26	15	876.5	8865	66	20	2155	66886	23.47	23.54
	4	20	1745	20300	QPSK	1	0	7	20	2655	3100	12	10	737.5	5095	23.46	23.64
	7	20	2560	21350	QPSK	1	0	26	15	876.5	8865	66	20	2155	66886	23.56	23.63
	7	20	2560	21350	QPSK	1	0	46	20	5537.5	50665	66	20	2155	66886	23.59	23.63
	48	20	3609	55830	QPSK	1	0	48	20	3670.2	56442	71	20	634.5	68761	20.26	20.46
	66	20	1745	132322	QPSK	1	0	29	10	722.5	9715	46	20	5537.5	50665	23.50	23.68

<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	2	20	1860	18700	QPSK	1	0	2	5	1987.5	1175	14	10	763	5330	30	10	2355	9820	23.46	23.54
	2	20	1860	18700	QPSK	1	0	2	5	1987.5	1175	4	20	2132.5	2175	71	20	634.5	68761	23.47	23.54
	2	20	1860	18700	QPSK	1	0	2	5	1987.5	1175	7	20	2655	3100	12	10	737.5	5095	23.44	23.54
	2	20	1860	18700	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	66	5	2197.5	67311	23.31	23.54
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	4	5	2132.5	2175	12	10	737.5	5095	23.29	23.54
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	5	10	881.5	2525	5	10	891.4	2624	23.42	23.54
	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	7	20	2655	3100	7	20	2635.2	2902	23.42	23.54
	2	20	1860	18700	QPSK	1	0	5	10	881.5	2525	7	20	2655	3100	7	20	2635.2	2902	23.32	23.54
	2	20	1860	18700	QPSK	1	0	66	20	2155	66886	66	20	2155	66886	71	20	634.5	68761	23.47	23.54
	2	20	1860	18700	QPSK	1	0	7	20	2655	3100	7	20	2655	3100	29	10	722.5	9715	23.43	23.54
	2	20	1860	18700	QPSK	1	0	2	20	1959.8	898	12	10	737.5	5095	30	10	2355	9820	23.37	23.54
	2	20	1860	18700	QPSK	1	0	2	20	1959.8	898	29	10	722.5	9715	30	10	2355	9820	23.37	23.54
	4	20	1745	20300	QPSK	1	0	4	5	2132.5	2175	12	10	737.5	5095	30	10	2355	9820	23.58	23.64
	4	20	1745	20300	QPSK	1	0	4	5	2132.5	2175	29	10	722.5	9715	30	10	2355	9820	23.52	23.64
	5	10	844	20600	QPSK	1	0	48	20	3670.2	56442	66	20	2155	66886	66	5	2197.5	67311	23.67	23.80
	5	10	844	20600	QPSK	1	0	7	20	2655	3100	66	20	2155	66886	66	5	2197.5	67311	23.55	23.80
	7	20	2560	21350	QPSK	1	0	12	10	737.5	5095	66	20	2155	66886	66	5	2197.5	67311	23.46	23.63
	7	20	2560	21350	QPSK	1	0	7	20	2660.2	3152	13	10	751	5230	66	20	2155	66886	23.50	23.63
	7	20	2560	21350	QPSK	1	0	7	20	2660.2	3152	29	10	722.5	9715	66	20	2155	66886	23.48	23.63
	12	10	707.5	23095	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	66	5	2197.5	67311	23.61	23.75
	14	10	793	23330	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	66	5	2197.5	67311	23.57	23.75
	25	20	1860	26140	QPSK	1	0	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	23.25	23.42
	30	10	2310	27710	QPSK	1	0	29	10	722.5	9715	66	20	2155	66886	66	5	2197.5	67311	21.40	21.64

<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	2	20	1860	18700	QPSK	1	0	13	10	751	5230	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	23.38	23.54
	2	20	1860	18700	QPSK	1	0	13	10	751	5230	48	20	3641	56150	48	20	3621.2	55952	48	20	3601.4	55754	23.40	23.54
	2	20	1860	18700	QPSK	1	0	13	10	751	5230	66	20	2155	66886	66	20	2135.2	66688	66	20	2115.4	66490	23.39	23.54
	2	20	1860	18700	QPSK	1	0	2	5	1960	900	12	10	737.5	5095	66	20	2155	66886	66	5	2197.5	67311	23.29	23.54
	2	20	1860	18700	QPSK	1	0	2	5	1960	900	4	5	2132.5	2175	66	20	2155	66886	66	5	2197.5	67311	23.41	23.54
	2	20	1860	18700	QPSK	1	0	2	5	1960	900	5	10	881.5	2525	66	20	2155	66886	66	5	2197.5	67311	23.31	23.54
	2	20	1860	18700	QPSK	1	0	2	5	1960	900	7	20	2655	3100	7	20	2635.2	2902	13	10	751	5230	23.36	23.54
	2	20	1860	18700	QPSK	1	0	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	66	20	2155	66886	23.39	23.54
	2	20	1860	18700	QPSK	1	0	48	20	3641	56150	48	20	3621.2	55952	48	20	3601.4	55754	66	20	2155	66886	23.41	23.54
	2	20	1860	18700	QPSK	1	0	5	10	881.5	2525	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	23.30	23.54
	2	20	1860	18700	QPSK	1	0	5	10	881.5	2525	5	10	881.5	2525	66	20	2155	66886	66	20	2135.2	66688	23.32	23.54
	2	20	1860	18700	QPSK	1	0	7	20	2655	3100	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	23.34	23.54
	2	20	1860	18700	QPSK	1	0	7	20	2655	3100	7	20	2655	3100	66	20	2155	66886	66	5	2197.5	67311	23.47	23.54
	2	20	1860	18700	QPSK	1	0	2	20	1959.8	898	5	10	881.5	2525	5	10	891.4	2624	30	10	2355	9820	23.36	23.54
	4	20	1745	20300	QPSK	1	0	46	20	5537.5	50665	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	23.41	23.64
	4	20	1745	20300	QPSK	1	0	48	20	3641	56150	48	20	3621.2	55952	48	20	3601.4	55754	48	20	3581.6	55556	23.56	23.64
	4	20	1745	20300	QPSK	1	0	4	5	2132.5	2175	5	10	881.5	2525	5	10	891.4	2624	30	10	2355	9820	23.54	23.64
	5	10	844	20600	QPSK	1	0	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	66	20	2155	66886	23.57	23.80
	5	10	844	20600	QPSK	1	0	7	20	2655	3100	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	23.67	23.80
	5	10	844	20600	QPSK	1	0	5	10	879.1	2501	30	10	2355	9820	66	20	2155	66886	66	5	2197.5	67311	23.57	23.80
	7	20	2560	21350	QPSK	1	0	7	20	2660.2	3152	25	20	1960	8340	25	5	1932.5	8065	66	20	2155	66886	23.41	23.63
	13	10	782	23230	QPSK	1	0	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	66	20	2155	66886	23.53	23.68
	13	10	782	23230	QPSK	1	0	48	20	3641	56150	48	20	3621.2	55952	48	20	3601.4	55754	66	20	2155	66886	23.54	23.68
	25	20	1860	26140	QPSK	1	0	25	5	1992.5	8665	26	15	876.5	8865	41	20	2593	40620	41	20	2612.8	40818	23.36	23.42
	41	20	2636.5	41055	QPSK	1	0	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	46	20	5596.9	51259	23.34	23.53

<LTE Uplink carrier aggregation>

2CC Uplink Carrier Aggregation	
Number	Combination
1	2C
2	5B
3	7C
4	66B
5	66C
6	38C
7	41C
8	42C
9	43C
10	48C

<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. 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.

Sensor OFF

CA_2C_Main										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
18700	18898	QPSK	1	0	0	0	1	0	23.25	25
18900	18702	QPSK	1	0	0	0	1	0	23.42	25
19100	18902	QPSK	1	0	0	0	1	0	23.27	25

CA_5B_Main										
Combination 10MHz+10MHz (50RB+50RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20450	20549	QPSK	1	0	0	0	1	0	23.62	25
20475	20574	QPSK	1	49	1	0	2	0	23.68	25
20600	20501	QPSK	1	0	1	49	2	0	23.58	25

CA_7C_Main										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20850	21048	QPSK	1	0	0	0	1	0	23.44	25
21100	20902	QPSK	1	0	1	99	2	0	23.48	25
21350	21152	QPSK	1	0	1	99	2	0	23.55	25

CA_66B_Main										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132047	132140	QPSK	1	0	0	0	1	0	23.41	25
132229	132322	QPSK	1	0	0	0	2	0	23.55	25
132504	132597	QPSK	1	0	0	0	2	0	23.38	25

CA_66C_Main										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132072	132270	QPSK	1	0	0	0	1	0	23.37	25
132322	132124	QPSK	1	0	1	99	2	0	23.52	25
132572	132374	QPSK	1	0	1	99	2	0	23.29	25

CA_38C_Main										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
37850	38048	QPSK	1	0	0	0	1	0	23.42	25
37802	38000	QPSK	1	0	0	0	1	0	23.33	25
38150	37952	QPSK	1	0	0	0	1	0	23.35	25

CA_41C_Main										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	0	0	0	1	0	23.33	25
40185	39987	QPSK	1	0	1	99	2	0	23.34	25
40620	40422	QPSK	1	0	1	99	2	0	23.32	25
41055	40857	QPSK	1	0	1	99	2	0	23.45	25
41490	41292	QPSK	1	0	1	99	2	0	23.11	25

CA_41C_HPUE_Main										
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	25.25	27
40185	39987	QPSK	1	0	1	99	2	0	25.23	27
40620	40422	QPSK	1	0	1	99	2	0	25.21	27
41055	40857	QPSK	1	0	1	99	2	0	25.28	27
41490	41292	QPSK	1	0	1	99	2	0	25.12	27

CA_42C_MIMO2										
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				
42190	42388	QPSK	1	0	0	0	1	0	20.42	22
42392	42590	QPSK	1	0	0	0	2	0	20.45	22
42792	42990	QPSK	1	0	0	0	2	0	20.28	22

CA_43C_MIMO2 (3700-3800MHz)										
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				
44690	44888	QPSK	1	0	0	0	1	0	20.41	22
45090	44892	QPSK	1	0	1	99	2	0	20.28	22
45490	45292	QPSK	1	0	1	99	2	0	20.18	22

CA_48C_MIMO2										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55538	QPSK	1	0	0	0	1	0	20.31	22
55632	55830	QPSK	1	0	0	0	2	0	20.42	22
55952	56150	QPSK	1	0	0	0	2	0	20.38	22
56442	56640	QPSK	1	0	0	0	2	0	20.35	22

Sensor ON

CA_2C_Main										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
18700	18898	QPSK	1	0	0	0	1	0	16.05	17
18900	18702	QPSK	1	0	0	0	1	0	16.08	17
19100	18902	QPSK	1	0	0	0	1	0	16.01	17

CA_5B_Main										
Combination 10MHz+10MHz (50RB+50RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20450	20549	QPSK	1	0	0	0	1	0	21.55	22
20475	20574	QPSK	1	0	1	49	2	0	21.59	22
20600	20501	QPSK	1	0	1	49	2	0	21.58	22

CA_7C_Main										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20850	21048	QPSK	1	0	0	0	1	0	12.08	13
21100	20902	QPSK	1	0	1	99	2	0	12.02	13
21350	21152	QPSK	1	0	1	99	2	0	12.11	13

CA_66B_Main										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132047	132140	QPSK	1	0	0	0	1	0	16.65	17.5
132229	132322	QPSK	1	0	0	0	2	0	16.77	17.5
132504	132597	QPSK	1	0	0	0	2	0	16.68	17.5

CA_66C_Main										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132072	132270	QPSK	1	0	0	0	1	0	16.58	17.5
132322	132124	QPSK	1	0	1	99	2	0	16.68	17.5
132572	132374	QPSK	1	0	1	99	2	0	16.63	17.5

CA_38C_Main										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
37850	38048	QPSK	1	0	0	0	1	0	14.08	15
37802	38000	QPSK	1	0	0	0	1	0	14.11	15
38150	37952	QPSK	1	0	0	0	1	0	14.02	15

CA_41C_Main										
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	14.08	15
40185	39987	QPSK	1	0	1	99	2	0	14.02	15
40620	40422	QPSK	1	0	1	99	2	0	14.03	15
41055	40857	QPSK	1	0	1	99	2	0	14.08	15
41490	41292	QPSK	1	0	1	99	2	0	13.91	15

CA_41C_HPUE_Main										
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	16.08	17
40185	39987	QPSK	1	0	1	99	2	0	16.05	17
40620	40422	QPSK	1	0	1	99	2	0	16.02	17
41055	40857	QPSK	1	0	1	99	2	0	16.09	17
41490	41292	QPSK	1	0	1	99	2	0	15.91	17

CA_42C_MIMO2										
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				
42190	42388	QPSK	1	0	0	0	1	0	17.75	18.5
42392	42590	QPSK	1	0	0	0	2	0	17.72	18.5
42792	42990	QPSK	1	0	0	0	2	0	17.68	18.5

CA_43C_MIMO2 (3700-3800MHz)										
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				
44690	44888	QPSK	1	0	0	0	1	0	20.37	20.5
45090	44892	QPSK	1	0	1	99	2	0	20.28	20.5
45490	45292	QPSK	1	0	1	99	2	0	20.21	20.5

CA_48C_MIMO2										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55538	QPSK	1	0	0	0	1	0	20.28	20.5
55632	55830	QPSK	1	0	0	0	2	0	20.33	20.5
55952	56150	QPSK	1	0	0	0	2	0	20.29	20.5
56442	56640	QPSK	1	0	0	0	2	0	20.31	20.5

13. RF Exposure position consideration

General Note:

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

<Main Ant>

	Wireless Interface	WCDMA Band V	WCDMA Band IV	WCDMA Band II	LTE Band 71/n71	LTE Band 12/17/n12/n17	LTE Band 13/n13	LTE Band 14/n14	LTE Band 5/26/n5/n26	LTE Band 4/66/n4/n66	LTE Band 2/5/n2/n25	LTE Band 30/n30	LTE Band 7/n7	LTE Band 38/41/n38/n41	LTE Band 42	LTE Band 48/n48	LTE Band n77	LTE Band n78
Exposure Position	Calculated Frequency (MHz)	846	1750	1907	695	715	784	795	848	1779	1914	2312	2567	2690	**3550**	**3700**	**3980**	**3800**
	Maximum power (dBm)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	23.0	25.0	27.5	22.0	22.0	27.5	27.5
	Maximum rated power(mW)	316.23	316.23	316.23	316.23	316.23	316.23	316.23	316.23	316.23	316.23	199.53	316.23	562.34	158.49	158.49	562.34	562.34
Bottom of Laptop	Separation distance(mm)	8.4																
	exclusion threshold	34.6	49.8	52.0	31.4	31.8	33.3	33.6	34.7	50.2	52.1	36.1	60.3	109.8	35.6	36.3	133.6	130.5
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

<Aux Ant>

	Wireless Interface	FR1 Band n38/n41	FR1 Band n48	FR1 Band n77	FR1 Band n78
Exposure Position	Calculated Frequency (MHz)	2690	3700	3980	3800
	Maximum power (dBm)	27.5	22.0	27.5	27.5
	Maximum rated power(mW)	562.34	158.49	562.34	562.34
Bottom of Laptop	Separation distance(mm)	5.0			
	exclusion threshold	184.5	61.0	224.4	219.2
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**

<MIMO1 Ant>

Exposure Position	Wireless Interface	FR1 Band n38/n41	FR1 Band n48	FR1 Band n77	FR1 Band n78
	Calculated Frequency (MHz)	2690	**3700**	**3980**	**3800**
	Maximum power (dBm)	22.0	17.5	20.5	20.5
	Maximum rated power(mW)	158.49	56.23	112.20	112.20
Bottom of Laptop	Separation distance(mm)	5.0			
	exclusion threshold	52.0	21.6	44.8	43.7
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**

<MIMO2 Ant>

Exposure Position	Wireless Interface	LTE Band 4/66/n4/n66	LTE Band 2/25/n2/n25	LTE Band 30/n30	LTE Band 7/n7	LTE Band 38/41/n38/n41	LTE Band 42	LTE Band 43	LTE Band 48/n48	LTE Band n77	LTE Band n78
	Calculated Frequency (MHz)	1779	1914	2312	2567	2690	**3550**	**3800**	**3700**	**3980**	**3800**
	Maximum power (dBm)	24.0	24.0	23.0	24.0	27.5	22.0	22.0	22.0	27.5	27.5
	Maximum rated power(mW)	251.19	251.19	199.53	251.19	562.34	158.49	158.49	158.49	562.34	562.34
Bottom of Laptop	Separation distance(mm)	5.0									
	exclusion threshold	67.0	69.5	60.7	80.5	184.5	59.7	61.8	61.0	224.4	219.2
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

14. 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 WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   c. 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.
4. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in sensor trigger distance was performed according to section 4. The test results just verification the sensor trigger distance to meet KDB 616217 requirement, when in normal usage will not operate at trigger distance, therefore, these results were not using performed Sim-Tx analysis.

UMTS Note:

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

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/B17/B26/B38/B71 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 2/4/5/17/38 SAR test was covered by Band 25/66/26/12/41; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. The maximum output power, including tolerance, for the smaller band is ≤ 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.
   g. For NR FDD was establishing connections via a base station simulator to use for output power measurement and SAR testing.
   h. 5G FR1 n2/5/38/78 SAR test was covered by 5G FR1 n25/26/41/77; due to the maximum output power, including tolerance, for the smaller band is ≤ the larger band, and the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

14.1 Body SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Antenna Vendor	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	9400	1880	AWAN	16.51	17.00	1.119	-0.18	0.812	0.909
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	9262	1852.4	AWAN	16.41	17.00	1.146	0.1	0.778	0.891
01	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	9538	1907.6	AWAN	16.45	17.00	1.135	-0.01	0.804	0.913
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	19mm	Main	OFF	9400	1880	AWAN	23.85	25.00	1.303	0.08	0.255	0.332
	WCDMA II	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	9538	1907.6	ICT	16.45	17.00	1.135	0.12	0.517	0.587
02	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	1513	1752.6	AWAN	17.60	18.00	1.096	0.14	0.886	0.971
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	1413	1732.6	AWAN	17.59	18.00	1.099	-0.03	0.852	0.936
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	1312	1712.4	AWAN	17.59	18.00	1.099	0.14	0.774	0.851
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	19mm	Main	OFF	1413	1732.6	AWAN	23.93	25.00	1.279	0.03	0.088	0.113
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	1513	1752.6	ICT	17.60	18.00	1.096	0.11	0.736	0.807
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	1312	1712.4	ICT	17.59	18.00	1.099	-0.05	0.807	0.887
	WCDMA IV	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	1413	1732.6	ICT	17.59	18.00	1.099	0.18	0.792	0.870
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	4182	836.4	AWAN	21.26	22.00	1.186	0.12	0.816	0.968
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	4132	826.4	AWAN	21.22	22.00	1.197	0.08	0.745	0.892
03	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	4233	846.6	AWAN	21.25	22.00	1.189	0.1	0.848	1.008
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	19mm	Main	OFF	4182	836.4	AWAN	24.08	25.00	1.236	-0.08	0.055	0.068
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	4233	846.6	ICT	21.25	22.00	1.189	-0.17	0.804	0.956
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	4132	826.4	ICT	21.22	22.00	1.197	-0.03	0.777	0.930
	WCDMA V	RMC 12.2Kbps	Bottom of Laptop	0mm	Main	ON	4182	836.4	ICT	21.26	22.00	1.186	0.14	0.785	0.931

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Antenna Vendor	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 7	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	21350	2560	AWAN	12.17	13.00	1.211	0.09	0.194	0.235
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	21350	2560	AWAN	11.31	12.00	1.172	0.03	0.158	0.185
	LTE Band 7C	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	20850+21048	2510	AWAN	12.08	13.00	1.236	0.01	0.183	0.226
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	21350	2560	AWAN	23.63	25.00	1.371	-0.18	0.053	0.073
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	19mm	Main	OFF	21350	2560	AWAN	22.67	24.00	1.358	0.1	0.001	0.001
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	21350	2560	ICT	12.17	13.00	1.211	0.08	0.344	0.416
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	21350	2560	AWAN	17.40	18.50	1.288	0.03	0.851	1.096
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	20850	2510	AWAN	17.37	18.50	1.297	-0.08	0.882	1.144
04	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	21100	2535	AWAN	17.26	18.50	1.330	0.05	0.895	1.191
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	21350	2560	AWAN	17.34	18.50	1.306	-0.08	0.836	1.092
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	20850	2510	AWAN	17.26	18.50	1.330	0.1	0.863	1.148
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	21100	2535	AWAN	17.16	18.50	1.361	-0.18	0.859	1.169
	LTE Band 7	20M	QPSK	100	0	Bottom of Laptop	0mm	MIMO2	ON	21350	2560	AWAN	17.24	18.50	1.337	0.1	0.823	1.100
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	19mm	MIMO2	OFF	21350	2560	AWAN	22.82	24.00	1.312	-0.17	0.263	0.345
	LTE Band 7	20M	QPSK	50	0	Bottom of Laptop	19mm	MIMO2	OFF	21350	2560	AWAN	21.79	23.00	1.321	-0.03	0.202	0.267
	LTE Band 7	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	21100	2535	ICT	17.26	18.50	1.330	0.12	0.389	0.518
	LTE Band 12	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	23095	707.5	AWAN	21.03	21.50	1.114	0.08	0.584	0.651
	LTE Band 12	10M	QPSK	25	0	Bottom of Laptop	0mm	Main	ON	23095	707.5	AWAN	20.06	20.50	1.107	-0.17	0.461	0.510
	LTE Band 12	10M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	23095	707.5	AWAN	23.75	25.00	1.334	-0.05	0.139	0.185
	LTE Band 12	10M	QPSK	25	0	Bottom of Laptop	19mm	Main	OFF	23095	707.5	AWAN	22.82	24.00	1.312	0.18	0.112	0.147
05	LTE Band 12	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	23095	707.5	ICT	21.03	21.50	1.114	0.09	1.000	1.114
	LTE Band 12	10M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	23095	707.5	ICT	19.99	20.50	1.125	-0.03	0.801	0.901
	LTE Band 13	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	23230	782	AWAN	20.41	21.00	1.146	0.14	0.621	0.711
	LTE Band 13	10M	QPSK	25	0	Bottom of Laptop	0mm	Main	ON	23230	782	AWAN	19.42	20.00	1.143	0.11	0.509	0.582

	LTE Band 13	10M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	23230	782	AWAN	23.68	25.00	1.355	0.17	0.211	0.286
	LTE Band 13	10M	QPSK	25	0	Bottom of Laptop	19mm	Main	OFF	23230	782	AWAN	22.68	24.00	1.355	-0.05	0.179	0.243
06	LTE Band 13	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	23230	782	ICT	20.41	21.00	1.146	0.06	0.964	1.104
	LTE Band 13	10M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	23230	782	ICT	19.42	20.00	1.143	-0.05	0.792	0.905
	LTE Band 14	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	23330	793	AWAN	21.03	21.50	1.114	0.18	0.739	0.823
	LTE Band 14	10M	QPSK	25	0	Bottom of Laptop	0mm	Main	ON	23330	793	AWAN	20.00	20.50	1.122	0.14	0.578	0.649
	LTE Band 14	10M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	23330	793	AWAN	19.99	20.50	1.125	-0.17	0.587	0.660
	LTE Band 14	10M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	23330	793	AWAN	23.75	25.00	1.334	-0.17	0.169	0.225
	LTE Band 14	10M	QPSK	25	0	Bottom of Laptop	19mm	Main	OFF	23330	793	AWAN	22.72	24.00	1.343	0.04	0.137	0.184
07	LTE Band 14	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	23330	793	ICT	21.03	21.50	1.114	0.05	1.030	1.148
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26340	1880	AWAN	16.14	17.00	1.219	0.03	0.767	0.935
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26140	1860	AWAN	16.05	17.00	1.245	-0.08	0.737	0.917
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26590	1905	AWAN	16.09	17.00	1.233	0.16	0.778	0.959
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	26340	1880	AWAN	15.23	16.00	1.194	-0.08	0.619	0.739
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	26140	1860	AWAN	15.20	16.00	1.202	0.1	0.598	0.719
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	26590	1905	AWAN	15.18	16.00	1.208	-0.18	0.627	0.757
	LTE Band 25	20M	QPSK	100	0	Bottom of Laptop	0mm	Main	ON	26340	1880	AWAN	15.22	16.00	1.197	0.1	0.624	0.747
	LTE Band 2C	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	18700+18898	1860	AWAN	16.05	17.00	1.245	0.08	0.719	0.895
	LTE Band 2C	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	18900+18702	1880	AWAN	16.08	17.00	1.236	-0.17	0.691	0.854
	LTE Band 2C	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	19100+18902	1900	AWAN	16.01	17.00	1.256	-0.03	0.729	0.916
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	26340	1880	AWAN	23.42	25.00	1.439	0.05	0.191	0.275
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	19mm	Main	OFF	26340	1880	AWAN	22.51	24.00	1.409	0.06	0.153	0.216
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26590	1905	ICT	16.09	17.00	1.233	0.12	0.724	0.893
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26140	1860	ICT	16.05	17.00	1.245	0.08	0.701	0.872
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26340	1880	ICT	16.14	17.00	1.219	-0.17	0.715	0.872
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	26590	1905	AWAN	18.35	19.00	1.161	0.01	0.824	0.957
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	26140	1860	AWAN	18.27	19.00	1.183	0.06	0.835	0.988
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	26340	1880	AWAN	18.34	19.00	1.164	0.08	0.852	0.992
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	26590	1905	AWAN	18.29	19.00	1.178	-0.08	0.806	0.949
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	26140	1860	AWAN	18.16	19.00	1.213	-0.08	0.812	0.985
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	26340	1880	AWAN	18.28	19.00	1.180	0.03	0.815	0.962
	LTE Band 25	20M	QPSK	100	0	Bottom of Laptop	0mm	MIMO2	ON	26590	1905	AWAN	18.25	19.00	1.189	0.1	0.811	0.964
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	19mm	MIMO2	OFF	26340	1880	AWAN	22.84	24.00	1.306	0.13	0.242	0.316
	LTE Band 25	20M	QPSK	50	0	Bottom of Laptop	19mm	MIMO2	OFF	26340	1880	AWAN	21.79	23.00	1.321	0.12	0.189	0.250
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	26340	1880	ICT	18.34	19.00	1.164	0.1	0.764	0.889
08	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	26590	1905	ICT	18.35	19.00	1.161	0.05	0.942	1.094
	LTE Band 25	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	26140	1860	ICT	18.27	19.00	1.183	0.04	0.612	0.724
	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26865	831.5	AWAN	21.45	22.00	1.135	-0.18	0.945	1.073
	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	0mm	Main	ON	26865	831.5	AWAN	20.50	21.00	1.122	0.1	0.769	0.863
	LTE Band 26	15M	QPSK	75	0	Bottom of Laptop	0mm	Main	ON	26865	831.5	AWAN	20.43	21.00	1.140	0.12	0.768	0.876
	LTE Band 5B	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	20475+20574	831.5	AWAN	21.59	22.00	1.099	0.03	0.919	1.010
	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	26865	831.5	AWAN	23.66	25.00	1.361	-0.06	0.180	0.245
	LTE Band 26	15M	QPSK	36	0	Bottom of Laptop	19mm	Main	OFF	26865	831.5	AWAN	22.76	24.00	1.330	-0.04	0.157	0.209
09	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26865	831.5	ICT	21.45	22.00	1.135	-0.03	0.950	1.078
	LTE Band 30	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	27710	2310	AWAN	14.67	15.00	1.079	0.07	0.455	0.491
	LTE Band 30	10M	QPSK	25	0	Bottom of Laptop	0mm	Main	ON	27710	2310	AWAN	13.63	14.00	1.089	0.08	0.359	0.391
	LTE Band 30	10M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	27710	2310	AWAN	21.64	23.00	1.368	-0.1	0.161	0.220
	LTE Band 30	10M	QPSK	25	0	Bottom of Laptop	19mm	Main	OFF	27710	2310	AWAN	20.59	22.00	1.384	0.01	0.109	0.151
	LTE Band 30	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	27710	2310	ICT	14.67	15.00	1.079	0.03	0.435	0.469
10	LTE Band 30	10M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	27710	2310	AWAN	17.85	18.50	1.161	0.05	0.960	1.115
	LTE Band 30	10M	QPSK	25	0	Bottom of Laptop	0mm	MIMO2	ON	27710	2310	AWAN	17.79	18.50	1.178	0.08	0.941	1.108
	LTE Band 30	10M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	27710	2310	AWAN	17.83	18.50	1.167	-0.17	0.944	1.101
	LTE Band 30	10M	QPSK	1	0	Bottom of Laptop	19mm	MIMO2	OFF	27710	2310	AWAN	21.92	23.00	1.282	0.07	0.264	0.339
	LTE Band 30	10M	QPSK	25	0	Bottom of Laptop	19mm	MIMO2	OFF	27710	2310	AWAN	20.87	22.00	1.297	-0.18	0.211	0.274
	LTE Band 30	10M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	27710	2310	ICT	17.85	18.50	1.161	-0.03	0.539	0.626
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	132322	1745	AWAN	16.84	17.50	1.164	0.05	0.672	0.782

	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	132322	1745	AWAN	15.83	16.50	1.167	0.08	0.536	0.625
	LTE Band 66B	15M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	132229+132322	1735.7	AWAN	16.77	17.50	1.183	-0.08	0.614	0.726
	LTE Band 66C	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	132322+132124	1745	AWAN	16.68	17.50	1.208	-0.05	0.626	0.756
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	132322	1745	AWAN	23.68	25.00	1.355	0.03	0.383	0.519
	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	19mm	Main	OFF	132322	1745	AWAN	22.67	24.00	1.358	-0.16	0.290	0.394
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	132322	1745	ICT	16.84	17.50	1.164	0.12	0.791	0.921
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	132072	1720	ICT	16.75	17.50	1.189	0.08	0.832	0.989
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	132572	1770	ICT	16.71	17.50	1.199	0.1	0.738	0.885
	LTE Band 66	20M	QPSK	100	0	Bottom of Laptop	0mm	Main	ON	132322	1745	ICT	15.81	16.50	1.172	0.01	0.680	0.797
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	132322	1745	AWAN	18.45	18.50	1.012	0.14	0.905	0.915
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	132072	1720	AWAN	18.31	18.50	1.045	0.11	0.811	0.847
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	132572	1770	AWAN	18.27	18.50	1.054	0.08	1.010	1.065
	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	132322	1745	AWAN	18.34	18.50	1.038	-0.05	0.922	0.957
	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	132072	1720	AWAN	18.18	18.50	1.076	0.18	0.872	0.939
11	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	132572	1770	AWAN	18.15	18.50	1.084	0.03	1.020	1.106
	LTE Band 66	20M	QPSK	100	0	Bottom of Laptop	0mm	MIMO2	ON	132322	1745	AWAN	18.23	18.50	1.064	0.14	0.880	0.936
	LTE Band 66	20M	QPSK	1	0	Bottom of Laptop	19mm	MIMO2	OFF	132322	1745	AWAN	22.92	24.00	1.282	-0.09	0.233	0.299
	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	19mm	MIMO2	OFF	132322	1745	AWAN	21.87	23.00	1.297	0.11	0.168	0.218
	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	132572	1770	ICT	18.15	18.50	1.084	-0.17	0.509	0.552
	LTE Band 71	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	133297	680.5	AWAN	21.57	22.50	1.239	0.06	0.582	0.721
	LTE Band 71	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	133297	680.5	AWAN	20.60	21.50	1.230	0.08	0.482	0.593
	LTE Band 71	20M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	133297	680.5	AWAN	23.86	25.00	1.300	0.16	0.132	0.172
	LTE Band 71	20M	QPSK	50	0	Bottom of Laptop	19mm	Main	OFF	133297	680.5	AWAN	22.93	24.00	1.279	0.05	0.109	0.139
12	LTE Band 71	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	133297	680.5	ICT	21.57	22.50	1.239	0.15	0.843	1.044
	LTE Band 71	20M	QPSK	100	0	Bottom of Laptop	0mm	Main	ON	133297	680.5	ICT	20.54	21.50	1.247	0.01	0.691	0.862

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Antenna Vendor	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)
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	39750	2506	AWAN	14.16	15.00	1.213	62.9	1.006	0.09	0.160	0.195
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	39750	2506	AWAN	13.29	14.00	1.178	62.9	1.006	0.08	0.130	0.154
	LTE Band 41C	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	39750+39948	2506	AWAN	14.08	15.00	1.236	62.9	1.006	0.02	0.143	0.178
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	41055	2636.5	AWAN	23.53	25.00	1.403	62.9	1.006	-0.09	0.137	0.193
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	19mm	Main	OFF	41055	2636.5	AWAN	22.59	24.00	1.384	62.9	1.006	-0.17	0.112	0.156
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	39750	2506	ICT	14.16	15.00	1.213	62.9	1.006	-0.08	0.375	0.458
	LTE Band 41_HPUE	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	39750	2506	ICT	16.13	17.00	1.222	42.9	1.009	0.06	0.392	0.483
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	41055	2636.5	AWAN	18.45	18.50	1.012	62.9	1.006	-0.04	0.703	0.715
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	39750	2506	AWAN	18.33	18.50	1.040	62.9	1.006	-0.05	0.833	0.871
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	40185	2549.5	AWAN	18.31	18.50	1.045	62.9	1.006	0	0.818	0.860
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	40620	2593	AWAN	18.41	18.50	1.021	62.9	1.006	-0.13	0.768	0.789
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	41490	2680	AWAN	18.18	18.50	1.076	62.9	1.006	-0.01	0.616	0.667
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	41055	2636.5	AWAN	18.34	18.50	1.038	62.9	1.006	-0.09	0.695	0.725
13	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	39750	2506	AWAN	18.19	18.50	1.074	62.9	1.006	0.01	0.820	0.886
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	40185	2549.5	AWAN	18.17	18.50	1.079	62.9	1.006	0.05	0.794	0.862
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	40620	2593	AWAN	18.28	18.50	1.052	62.9	1.006	0.02	0.754	0.798
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	41490	2680	AWAN	18.04	18.50	1.112	62.9	1.006	-0.13	0.642	0.718
	LTE Band 41	20M	QPSK	100	0	Bottom of Laptop	0mm	MIMO2	ON	41055	2636.5	AWAN	18.20	18.50	1.072	62.9	1.006	0.17	0.670	0.722
	LTE Band 41	20M	QPSK	1	0	Bottom of Laptop	19mm	MIMO2	OFF	41055	2636.5	AWAN	22.82	24.00	1.312	62.9	1.006	0.01	0.101	0.133
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	19mm	MIMO2	OFF	41055	2636.5	AWAN	21.84	23.00	1.306	62.9	1.006	0.06	0.084	0.110
	LTE Band 41	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	39750	2506	ICT	18.19	18.50	1.074	62.9	1.006	0.06	0.391	0.422
	LTE Band 42	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	42990	3540	AWAN	15.07	15.50	1.104	62.9	1.006	0.04	0.176	0.195
	LTE Band 42	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	42990	3540	AWAN	14.97	15.50	1.130	62.9	1.006	0.09	0.189	0.215
	LTE Band 42	20M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	42590	3500	AWAN	20.75	22.00	1.334	62.9	1.006	0.03	0.158	0.212
	LTE Band 42	20M	QPSK	50	0	Bottom of Laptop	19mm	Main	OFF	42590	3500	AWAN	19.79	21.00	1.321	62.9	1.006	-0.17	0.116	0.154
14	LTE Band 42	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	42990	3540	ICT	14.97	15.50	1.130	62.9	1.006	0.03	0.690	0.784

	LTE Band 42	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	42190	3460	ICT	14.79	15.50	1.178	62.9	1.006	0.08	0.459	0.544
	LTE Band 42	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	42590	3500	ICT	14.83	15.50	1.167	62.9	1.006	0.01	0.519	0.609
	LTE Band 42	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	42590	3500	AWAN	17.98	18.50	1.127	62.9	1.006	-0.01	0.507	0.575
	LTE Band 42	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	42590	3500	AWAN	17.01	17.50	1.119	62.9	1.006	0.02	0.418	0.471
	LTE Band 42C	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	42190+42388	3460	AWAN	17.75	18.50	1.189	62.9	1.006	0.03	0.446	0.533
	LTE Band 42	20M	QPSK	1	0	Bottom of Laptop	19mm	MIMO2	OFF	42590	3500	AWAN	20.48	22.00	1.419	62.9	1.006	0.16	0.069	0.099
	LTE Band 42	20M	QPSK	50	0	Bottom of Laptop	19mm	MIMO2	OFF	42590	3500	AWAN	19.51	21.00	1.409	62.9	1.006	0.13	0.057	0.081
	LTE Band 42	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	42590	3500	ICT	17.98	18.50	1.127	62.9	1.006	0.07	0.493	0.559
	LTE Band 43	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	44690	3710	AWAN	20.45	20.50	1.012	62.9	1.006	0.08	1.060	1.079
	LTE Band 43	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	45090	3750	AWAN	20.32	20.50	1.042	62.9	1.006	0.11	1.010	1.059
15	LTE Band 43	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	45490	3790	AWAN	20.23	20.50	1.064	62.9	1.006	-0.04	1.080	1.156
	LTE Band 43	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	44690	3710	AWAN	19.33	19.50	1.040	62.9	1.006	-0.05	0.905	0.947
	LTE Band 43	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	45090	3750	AWAN	19.25	19.50	1.059	62.9	1.006	0.18	0.876	0.933
	LTE Band 43	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	45490	3790	AWAN	19.22	19.50	1.067	62.9	1.006	0.14	0.900	0.966
	LTE Band 43	20M	QPSK	100	0	Bottom of Laptop	0mm	MIMO2	ON	44690	3710	AWAN	19.28	19.50	1.052	62.9	1.006	-0.17	0.902	0.955
	LTE Band 43C	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	44690+4888	3710	AWAN	20.37	20.50	1.030	62.9	1.006	0.03	0.998	1.034
	LTE Band 43C	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	45090+44892	3750	AWAN	20.28	20.50	1.052	62.9	1.006	-0.08	0.953	1.009
	LTE Band 43C	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	45490+45292	3790	AWAN	20.21	20.50	1.069	62.9	1.006	-0.08	1.000	1.075
	LTE Band 43	20M	QPSK	1	0	Bottom of Laptop	19mm	MIMO2	OFF	44690	3710	AWAN	20.45	22.00	1.429	62.9	1.006	0.18	0.082	0.118
	LTE Band 43	20M	QPSK	50	0	Bottom of Laptop	19mm	MIMO2	OFF	44690	3710	AWAN	19.33	21.00	1.469	62.9	1.006	-0.17	0.067	0.099
	LTE Band 43	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	45490	3790	ICT	20.23	20.50	1.064	62.9	1.006	0.17	1.050	1.124
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	56150	3641	AWAN	15.75	16.00	1.059	62.9	1.006	0.04	0.133	0.142
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	56150	3641	AWAN	15.73	16.00	1.064	62.9	1.006	0.02	0.148	0.158
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	19mm	Main	OFF	55830	3609	AWAN	20.75	22.00	1.334	62.9	1.006	0.06	0.087	0.117
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	19mm	Main	OFF	55830	3609	AWAN	19.75	21.00	1.334	62.9	1.006	-0.03	0.067	0.090
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	56150	3641	ICT	15.73	16.00	1.064	62.9	1.006	0.08	0.564	0.604
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	55340	3560	ICT	15.62	16.00	1.091	62.9	1.006	0.03	0.693	0.761
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	55830	3609	ICT	15.51	16.00	1.119	62.9	1.006	0.01	0.597	0.672
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	0mm	Main	ON	56640	3690	ICT	15.61	16.00	1.094	62.9	1.006	0.03	0.303	0.333
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	55830	3609	AWAN	20.46	20.50	1.009	62.9	1.006	0.1	0.748	0.759
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	56150	3641	AWAN	20.40	20.50	1.023	62.9	1.006	0.12	0.841	0.866
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	55340	3560	AWAN	20.36	20.50	1.033	62.9	1.006	0.08	0.778	0.808
16	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	56640	3690	AWAN	20.41	20.50	1.021	62.9	1.006	0.03	1.040	1.068
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	55830	3609	AWAN	19.44	19.50	1.014	62.9	1.006	-0.17	0.613	0.625
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	56150	3641	AWAN	19.36	19.50	1.033	62.9	1.006	-0.03	0.681	0.708
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	55340	3560	AWAN	19.35	19.50	1.035	62.9	1.006	0.14	0.619	0.645
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	56640	3690	AWAN	19.38	19.50	1.028	62.9	1.006	0.11	0.818	0.846
	LTE Band 48	20M	QPSK	100	0	Bottom of Laptop	0mm	MIMO2	ON	55830	3609	AWAN	19.44	19.50	1.014	62.9	1.006	-0.05	0.702	0.716
	LTE Band 48C	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	55340+55538	3560	AWAN	20.28	20.50	1.052	62.9	1.006	0.1	0.712	0.753
	LTE Band 48C	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	55632+55830	3589	AWAN	20.33	20.50	1.040	62.9	1.006	-0.18	0.801	0.838
	LTE Band 48C	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	55952+56150	3621	AWAN	20.29	20.50	1.050	62.9	1.006	0.1	0.741	0.782
	LTE Band 48C	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	56442+56640	3670	AWAN	20.31	20.50	1.045	62.9	1.006	0.12	0.990	1.040
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	19mm	MIMO2	OFF	55830	3609	AWAN	20.46	22.00	1.426	62.9	1.006	-0.07	0.064	0.092
	LTE Band 48	20M	QPSK	50	0	Bottom of Laptop	19mm	MIMO2	OFF	55830	3609	AWAN	19.44	21.00	1.432	62.9	1.006	0.05	0.050	0.072
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	56640	3690	ICT	20.41	20.50	1.021	62.9	1.006	0.18	0.941	0.966
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	55830	3609	ICT	20.46	20.50	1.009	62.9	1.006	0.02	0.734	0.745
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	56150	3641	ICT	20.40	20.50	1.023	62.9	1.006	0.15	0.818	0.842
	LTE Band 48	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	55340	3560	ICT	20.36	20.50	1.033	62.9	1.006	-0.13	0.758	0.788

<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Antenna Vendor	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 n7	40M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	507000	2535	AWAN	12.06	13.00	1.242	0.02	0.139	0.173
	FR1 n7	40M	BPSK	108	54	Bottom of Laptop	0mm	Main	ON	507000	2535	AWAN	11.99	13.00	1.262	-0.05	0.133	0.168

	FR1 n7	40M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	507000	2535	AWAN	24.05	25.00	1.245	0.01	0.277	0.345
	FR1 n7	40M	BPSK	108	54	Bottom of Laptop	19mm	Main	OFF	507000	2535	AWAN	24.03	25.00	1.250	0.16	0.258	0.323
	FR1 n7	40M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	507000	2535	ICT	24.05	25.00	1.245	-0.05	0.441	0.549
17	FR1 n7	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	507000	2535	AWAN	17.99	18.00	1.002	0.05	1.120	1.123
	FR1 n7	40M	BPSK	108	54	Bottom of Laptop	0mm	MIMO2	ON	507000	2535	AWAN	17.96	18.00	1.009	0.08	1.050	1.060
	FR1 n7	40M	BPSK	216	0	Bottom of Laptop	0mm	MIMO2	ON	507000	2535	AWAN	17.94	18.00	1.014	0.01	1.060	1.075
	FR1 n7	40M	BPSK	1	1	Bottom of Laptop	19mm	MIMO2	OFF	507000	2535	AWAN	23.11	24.00	1.227	0.08	0.241	0.296
	FR1 n7	40M	BPSK	108	54	Bottom of Laptop	19mm	MIMO2	OFF	507000	2535	AWAN	23.08	24.00	1.236	0.01	0.210	0.260
	FR1 n7	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	507000	2535	ICT	17.99	18.00	1.002	-0.08	0.542	0.543
	FR1 n12	15M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	141500	707.5	AWAN	21.15	22.00	1.216	0.01	0.560	0.681
	FR1 n12	15M	BPSK	36	22	Bottom of Laptop	0mm	Main	ON	141500	707.5	AWAN	21.06	22.00	1.242	0.03	0.558	0.693
	FR1 n12	15M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	141500	707.5	AWAN	24.22	25.00	1.197	-0.08	0.078	0.093
	FR1 n12	15M	BPSK	36	22	Bottom of Laptop	19mm	Main	OFF	141500	707.5	AWAN	24.11	25.00	1.227	0.1	0.107	0.131
18	FR1 n12	15M	BPSK	36	22	Bottom of Laptop	0mm	Main	ON	141500	707.5	ICT	21.06	22.00	1.242	0.07	0.870	1.080
	FR1 n12	15M	BPSK	75	0	Bottom of Laptop	0mm	Main	ON	141500	707.5	ICT	21.02	22.00	1.253	0.04	0.860	1.078
	FR1 n13	10M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	156400	782	AWAN	20.35	21.00	1.161	0.05	0.619	0.719
	FR1 n13	10M	BPSK	25	14	Bottom of Laptop	0mm	Main	ON	156400	782	AWAN	20.19	21.00	1.205	-0.02	0.629	0.758
	FR1 n13	10M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	156400	782	AWAN	24.04	25.00	1.247	0.12	0.133	0.166
	FR1 n13	10M	BPSK	25	14	Bottom of Laptop	19mm	Main	OFF	156400	782	AWAN	23.91	25.00	1.285	0.08	0.148	0.190
19	FR1 n13	10M	BPSK	25	14	Bottom of Laptop	0mm	Main	ON	156400	782	ICT	20.19	21.00	1.205	0.04	0.927	1.117
	FR1 n13	10M	BPSK	50	0	Bottom of Laptop	0mm	Main	ON	156400	782	ICT	20.17	21.00	1.211	0.03	0.917	1.110
	FR1 n14	10M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	158600	793	AWAN	20.77	21.50	1.183	0.05	0.721	0.853
	FR1 n14	10M	BPSK	25	14	Bottom of Laptop	0mm	Main	ON	158600	793	AWAN	20.61	21.50	1.227	-0.03	0.695	0.853
	FR1 n14	10M	BPSK	50	0	Bottom of Laptop	0mm	Main	ON	158600	793	AWAN	20.59	21.50	1.233	0.02	0.685	0.845
	FR1 n14	10M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	158600	793	AWAN	24.22	25.00	1.197	0.14	0.159	0.190
	FR1 n14	10M	BPSK	25	14	Bottom of Laptop	19mm	Main	OFF	158600	793	AWAN	24.07	25.00	1.239	0.11	0.171	0.212
20	FR1 n14	10M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	158600	793	ICT	20.77	21.50	1.183	0.11	0.918	1.086
	FR1 n25	40M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	376500	1882.5	AWAN	17.25	17.50	1.059	0.01	0.863	0.914
	FR1 n25	40M	BPSK	108	54	Bottom of Laptop	0mm	Main	ON	376500	1882.5	AWAN	17.16	17.50	1.081	-0.05	0.859	0.929
	FR1 n25	40M	BPSK	216	0	Bottom of Laptop	0mm	Main	ON	376500	1882.5	AWAN	17.15	17.50	1.084	0.02	0.868	0.941
	FR1 n25	40M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	376500	1882.5	AWAN	24.21	25.00	1.199	0.14	0.227	0.272
	FR1 n25	40M	BPSK	108	54	Bottom of Laptop	19mm	Main	OFF	376500	1882.5	AWAN	24.20	25.00	1.202	-0.17	0.207	0.249
	FR1 n25	40M	BPSK	216	0	Bottom of Laptop	0mm	Main	ON	376500	1882.5	ICT	17.15	17.50	1.084	-0.09	0.814	0.882
	FR1 n25	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	376500	1882.5	AWAN	18.76	19.50	1.186	0.08	0.936	1.110
	FR1 n25	40M	BPSK	108	54	Bottom of Laptop	0mm	MIMO2	ON	376500	1882.5	AWAN	18.70	19.50	1.202	0.01	0.940	1.130
21	FR1 n25	40M	BPSK	216	0	Bottom of Laptop	0mm	MIMO2	ON	376500	1882.5	AWAN	18.74	19.50	1.191	0.04	0.960	1.144
	FR1 n25	40M	BPSK	1	1	Bottom of Laptop	19mm	MIMO2	OFF	376500	1882.5	AWAN	23.15	24.00	1.216	0.01	0.290	0.353
	FR1 n25	40M	BPSK	108	54	Bottom of Laptop	19mm	MIMO2	OFF	376500	1882.5	AWAN	23.14	24.00	1.219	0.1	0.212	0.258
	FR1 n25	40M	BPSK	216	0	Bottom of Laptop	0mm	MIMO2	ON	376500	1882.5	ICT	18.74	19.50	1.191	-0.08	0.911	1.085
	FR1 n26	20M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	166300	831.5	AWAN	21.05	22.00	1.245	0.01	0.837	1.042
	FR1 n26	20M	BPSK	50	28	Bottom of Laptop	0mm	Main	ON	166300	831.5	AWAN	20.92	22.00	1.282	0.05	0.830	1.064
	FR1 n26	20M	BPSK	100	0	Bottom of Laptop	0mm	Main	ON	166300	831.5	AWAN	20.91	22.00	1.285	-0.02	0.845	1.086
	FR1 n26	20M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	166300	831.5	AWAN	24.18	25.00	1.208	-0.16	0.167	0.202
	FR1 n26	20M	BPSK	50	28	Bottom of Laptop	19mm	Main	OFF	166300	831.5	AWAN	23.94	25.00	1.276	-0.12	0.172	0.220
22	FR1 n26	20M	BPSK	100	0	Bottom of Laptop	0mm	Main	ON	166300	831.5	ICT	20.91	22.00	1.285	0.04	0.875	1.125
	FR1 n30	10M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	462000	2310	AWAN	15.39	15.50	1.026	-0.06	0.500	0.513
	FR1 n30	10M	BPSK	25	14	Bottom of Laptop	0mm	Main	ON	462000	2310	AWAN	15.36	15.50	1.033	0.01	0.474	0.490
	FR1 n30	10M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	462000	2310	AWAN	21.97	23.00	1.268	-0.09	0.132	0.167
	FR1 n30	10M	BPSK	25	14	Bottom of Laptop	19mm	Main	OFF	462000	2310	AWAN	21.87	23.00	1.297	-0.08	0.126	0.163
	FR1 n30	10M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	462000	2310	ICT	15.39	15.50	1.026	0.06	0.471	0.483
	FR1 n30	10M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	462000	2310	AWAN	17.88	18.50	1.153	0.18	0.965	1.113
	FR1 n30	10M	BPSK	25	14	Bottom of Laptop	0mm	MIMO2	ON	462000	2310	AWAN	17.78	18.50	1.180	0.14	0.973	1.148
23	FR1 n30	10M	BPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	462000	2310	AWAN	17.78	18.50	1.180	0.03	0.978	1.154
	FR1 n30	10M	BPSK	1	1	Bottom of Laptop	19mm	MIMO2	OFF	462000	2310	AWAN	21.88	23.00	1.294	0.03	0.223	0.289
	FR1 n30	10M	BPSK	25	14	Bottom of Laptop	19mm	MIMO2	OFF	462000	2310	AWAN	21.82	23.00	1.312	0.18	0.237	0.311

	FR1 n30	10M	BPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	462000	2310	ICT	17.78	18.50	1.180	0.06	0.547	0.646
	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	518598	2592.99	AWAN	13.44	14.50	1.276	0.08	0.261	0.333
	FR1 n41	100M	BPSK	135	69	Bottom of Laptop	0mm	Main	ON	518598	2592.99	AWAN	13.40	14.50	1.288	0.1	0.255	0.329
	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	518598	2592.99	AWAN	23.60	25.00	1.380	0.15	0.218	0.301
	FR1 n41	100M	BPSK	135	69	Bottom of Laptop	19mm	Main	OFF	518598	2592.99	AWAN	23.55	25.00	1.396	-0.09	0.201	0.281
	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	518598	2592.99	ICT	13.44	14.50	1.276	0.09	0.455	0.581
	FR1 n41_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	518598	2592.99	ICT	17.00	17.50	1.122	0.02	0.503	0.564
24	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	518598	2592.99	AWAN	17.45	19.00	1.429	0.09	0.727	1.039
	FR1 n41	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO1	ON	518598	2592.99	AWAN	17.40	19.00	1.445	0.08	0.681	0.984
	FR1 n41	100M	BPSK	270	0	Bottom of Laptop	0mm	MIMO1	ON	518598	2592.99	AWAN	17.36	19.00	1.459	0.01	0.686	1.001
	FR1 n41_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	518598	2592.99	AWAN	20.97	22.00	1.268	0.03	0.819	1.038
	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	518598	2592.99	ICT	17.45	19.00	1.429	-0.08	0.355	0.507
	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	518598	2592.99	AWAN	16.16	16.50	1.081	0.12	0.770	0.833
	FR1 n41	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO2	ON	518598	2592.99	AWAN	16.13	16.50	1.089	0.08	0.682	0.743
	FR1 n41	100M	BPSK	270	0	Bottom of Laptop	0mm	MIMO2	ON	518598	2592.99	AWAN	16.09	16.50	1.099	0.01	0.679	0.746
	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	19mm	MIMO2	OFF	518598	2592.99	AWAN	23.05	24.00	1.245	0.07	0.236	0.294
	FR1 n41	100M	BPSK	135	69	Bottom of Laptop	19mm	MIMO2	OFF	518598	2592.99	AWAN	23.03	24.00	1.250	0.18	0.180	0.225
	FR1 n41_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	518598	2592.99	AWAN	19.24	19.50	1.062	-0.06	0.778	0.826
	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	518598	2592.99	ICT	16.16	16.50	1.081	0.11	0.389	0.421
	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	0mm	Aux	ON	518598	2592.99	AWAN	18.96	19.50	1.132	-0.1	0.823	0.932
	FR1 n41	100M	BPSK	135	69	Bottom of Laptop	0mm	Aux	ON	518598	2592.99	AWAN	18.92	19.50	1.143	0.07	0.894	1.022
	FR1 n41	100M	BPSK	270	0	Bottom of Laptop	0mm	Aux	ON	518598	2592.99	AWAN	18.86	19.50	1.159	0.07	0.868	1.006
	FR1 n41	100M	BPSK	1	1	Bottom of Laptop	19mm	Aux	OFF	518598	2592.99	AWAN	23.34	25.00	1.466	-0.15	0.157	0.230
	FR1 n41	100M	BPSK	135	69	Bottom of Laptop	19mm	Aux	OFF	518598	2592.99	AWAN	23.16	25.00	1.528	0.19	0.233	0.356
	FR1 n41_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	Aux	ON	518598	2592.99	AWAN	22.04	22.50	1.112	0.18	0.835	0.928
	FR1 n41	100M	BPSK	135	69	Bottom of Laptop	0mm	Aux	ON	518598	2592.99	ICT	18.92	19.50	1.143	0.07	0.486	0.555
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	641666	3624.99	AWAN	13.78	14.00	1.052	0.08	0.183	0.193
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	Main	ON	641666	3624.99	AWAN	13.64	14.00	1.086	-0.17	0.165	0.179
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	641666	3624.99	AWAN	20.70	22.00	1.349	-0.01	0.137	0.185
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	19mm	Main	OFF	641666	3624.99	AWAN	20.63	22.00	1.371	-0.15	0.116	0.159
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	641666	3624.99	ICT	13.78	14.00	1.052	0.11	0.785	0.826
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	638000	3570	ICT	13.77	14.00	1.054	0.12	0.899	0.948
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	645332	3679.98	ICT	13.58	14.00	1.102	-0.05	0.480	0.529
	FR1 n48	40M	BPSK	100	0	Bottom of Laptop	0mm	Main	ON	641666	3624.99	ICT	13.52	14.00	1.117	0.1	0.736	0.822
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	641666	3624.99	AWAN	16.85	17.50	1.161	-0.17	0.980	1.138
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	638000	3570	AWAN	16.78	17.50	1.180	0.04	0.755	0.891
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	645332	3679.98	AWAN	16.79	17.50	1.178	-0.01	0.971	1.143
25	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO1	ON	641666	3624.99	AWAN	16.79	17.50	1.178	-0.16	0.980	1.154
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO1	ON	638000	3570	AWAN	16.72	17.50	1.197	-0.08	0.821	0.983
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO1	ON	645332	3679.98	AWAN	16.73	17.50	1.194	0.05	0.911	1.088
	FR1 n48	40M	BPSK	100	0	Bottom of Laptop	0mm	MIMO1	ON	641666	3624.99	AWAN	16.76	17.50	1.186	0.06	0.919	1.090
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO1	ON	641666	3624.99	ICT	16.79	17.50	1.178	-0.09	0.712	0.838
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO1	ON	638000	3570	ICT	16.72	17.50	1.197	-0.08	0.649	0.777
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO1	ON	645332	3679.98	ICT	16.73	17.50	1.194	0.13	0.495	0.591
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	641666	3624.99	AWAN	17.75	18.50	1.189	0.14	0.666	0.792
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	638000	3570	AWAN	17.74	18.50	1.191	-0.17	0.762	0.908
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	645332	3679.98	AWAN	17.54	18.50	1.247	0.17	0.815	1.017
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO2	ON	641666	3624.99	AWAN	17.49	18.50	1.262	-0.05	0.674	0.850
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO2	ON	638000	3570	AWAN	17.46	18.50	1.271	0.01	0.715	0.908
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO2	ON	645332	3679.98	AWAN	17.46	18.50	1.271	0.1	0.838	1.065
	FR1 n48	40M	BPSK	100	0	Bottom of Laptop	0mm	MIMO2	ON	641666	3624.99	AWAN	17.42	18.50	1.282	-0.17	0.681	0.873
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	19mm	MIMO2	OFF	641666	3624.99	AWAN	20.97	22.00	1.268	-0.08	0.131	0.166
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	19mm	MIMO2	OFF	641666	3624.99	AWAN	20.81	22.00	1.315	-0.17	0.130	0.171
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO2	ON	645332	3679.98	ICT	17.46	18.50	1.271	0.06	0.879	1.117
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO2	ON	641666	3624.99	ICT	17.49	18.50	1.262	-0.01	0.629	0.794

	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	MIMO2	ON	638000	3570	ICT	17.46	18.50	1.271	0.04	0.623	0.792
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	0mm	Aux	ON	641666	3624.99	AWAN	16.82	17.50	1.169	0.03	0.327	0.382
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	Aux	ON	641666	3624.99	AWAN	16.79	17.50	1.178	-0.09	0.359	0.423
	FR1 n48	40M	BPSK	1	1	Bottom of Laptop	19mm	Aux	OFF	641666	3624.99	AWAN	21.23	22.00	1.194	-0.08	0.087	0.104
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	19mm	Aux	OFF	641666	3624.99	AWAN	21.11	22.00	1.227	0.17	0.101	0.124
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	Aux	ON	641666	3624.99	ICT	16.79	17.50	1.178	0.08	0.629	0.741
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	Aux	ON	638000	3570	ICT	16.68	17.50	1.208	0.09	0.608	0.734
	FR1 n48	40M	BPSK	50	28	Bottom of Laptop	0mm	Aux	ON	645332	3679.98	ICT	16.69	17.50	1.205	0.08	0.242	0.292
	FR1 n66	40M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	349000	1745	AWAN	17.60	18.00	1.096	0.01	0.783	0.859
	FR1 n66	40M	BPSK	108	54	Bottom of Laptop	0mm	Main	ON	349000	1745	AWAN	17.51	18.00	1.119	-0.02	0.815	0.912
	FR1 n66	40M	BPSK	216	0	Bottom of Laptop	0mm	Main	ON	349000	1745	AWAN	17.59	18.00	1.099	-0.05	0.822	0.903
	FR1 n66	40M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	349000	1745	AWAN	24.03	25.00	1.250	-0.08	0.301	0.376
	FR1 n66	40M	BPSK	108	54	Bottom of Laptop	19mm	Main	OFF	349000	1745	AWAN	23.98	25.00	1.265	-0.13	0.278	0.352
	FR1 n66	40M	BPSK	108	54	Bottom of Laptop	0mm	Main	ON	349000	1745	ICT	17.51	18.00	1.119	0.14	0.947	1.060
	FR1 n66	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	349000	1745	AWAN	18.65	19.00	1.084	0.08	0.898	0.973
	FR1 n66	40M	BPSK	108	54	Bottom of Laptop	0mm	MIMO2	ON	349000	1745	AWAN	18.60	19.00	1.096	0.01	0.979	1.073
26	FR1 n66	40M	BPSK	216	0	Bottom of Laptop	0mm	MIMO2	ON	349000	1745	AWAN	18.59	19.00	1.099	0.02	0.989	1.087
	FR1 n66	40M	BPSK	1	1	Bottom of Laptop	19mm	MIMO2	OFF	349000	1745	AWAN	23.15	24.00	1.216	-0.03	0.233	0.283
	FR1 n66	40M	BPSK	108	54	Bottom of Laptop	19mm	MIMO2	OFF	349000	1745	AWAN	23.12	24.00	1.225	-0.03	0.262	0.321
	FR1 n66	40M	BPSK	216	0	Bottom of Laptop	0mm	MIMO2	ON	349000	1745	ICT	18.59	19.00	1.099	-0.08	0.528	0.580
	FR1 n71	20M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	136100	680.5	AWAN	21.32	22.00	1.169	-0.17	0.505	0.591
	FR1 n71	20M	BPSK	50	28	Bottom of Laptop	0mm	Main	ON	136100	680.5	AWAN	21.18	22.00	1.208	-0.03	0.496	0.599
	FR1 n71	20M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	136100	680.5	AWAN	24.44	25.00	1.138	0.05	0.134	0.152
	FR1 n71	20M	BPSK	50	28	Bottom of Laptop	19mm	Main	OFF	136100	680.5	AWAN	24.25	25.00	1.189	-0.11	0.131	0.156
27	FR1 n71	20M	BPSK	50	28	Bottom of Laptop	0mm	Main	ON	136100	680.5	ICT	21.18	22.00	1.208	0.02	0.755	0.912
	FR1 n71	20M	BPSK	100	0	Bottom of Laptop	0mm	Main	ON	136100	680.5	ICT	21.08	22.00	1.236	0.11	0.663	0.819
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	656000	3840	AWAN	14.25	15.00	1.189	0.08	0.276	0.328
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	Main	ON	656000	3840	AWAN	13.98	15.00	1.265	0.01	0.210	0.266
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	656000	3840	AWAN	24.11	25.00	1.227	-0.02	0.463	0.568
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	19mm	Main	OFF	656000	3840	AWAN	24.03	25.00	1.250	-0.09	0.363	0.454
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	656000	3840	ICT	24.11	25.00	1.227	0.04	0.516	0.633
	FR1 n77_HPUE	100M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	656000	3840	ICT	26.21	27.50	1.346	0.04	0.411	0.553
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	656000	3840	AWAN	16.87	17.50	1.156	-0.08	0.959	1.109
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO1	ON	656000	3840	AWAN	16.84	17.50	1.164	0.07	0.974	1.134
	FR1 n77	100M	BPSK	270	0	Bottom of Laptop	0mm	MIMO1	ON	656000	3840	AWAN	16.75	17.50	1.189	0.1	0.949	1.128
	FR1 n77_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	656000	3840	AWAN	19.98	20.50	1.127	-0.18	0.964	1.087
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO1	ON	656000	3840	ICT	16.84	17.50	1.164	0.12	0.770	0.896
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	656000	3840	AWAN	15.49	15.50	1.002	0.08	0.612	0.613
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO2	ON	656000	3840	AWAN	15.40	15.50	1.023	-0.17	0.591	0.605
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	19mm	MIMO2	OFF	656000	3840	AWAN	23.75	25.00	1.334	0.08	0.356	0.475
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	19mm	MIMO2	OFF	656000	3840	AWAN	23.74	25.00	1.337	0.01	0.334	0.446
	FR1 n77_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	656000	3840	AWAN	18.37	18.50	1.030	0.11	0.613	0.632
	FR1 n77_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	656000	3840	ICT	18.37	18.50	1.030	0.11	0.509	0.524
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	Aux	ON	656000	3840	AWAN	15.47	16.50	1.268	0.15	0.538	0.682
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	Aux	ON	656000	3840	AWAN	15.46	16.50	1.271	0.17	0.461	0.586
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	19mm	Aux	OFF	656000	3840	AWAN	23.75	25.00	1.334	-0.08	0.291	0.388
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	19mm	Aux	OFF	656000	3840	AWAN	23.66	25.00	1.361	0.1	0.243	0.331
	FR1 n77_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	Aux	ON	656000	3840	AWAN	18.52	19.50	1.253	0.01	0.499	0.625
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	Aux	ON	656000	3840	ICT	15.47	16.50	1.268	0.05	0.267	0.338
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	Main	ON	633332	3499.98	AWAN	14.61	15.00	1.094	0.12	0.778	0.851
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	Main	ON	633332	3499.98	AWAN	14.52	15.00	1.117	0.08	0.478	0.534
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	633332	3499.98	AWAN	23.80	25.00	1.318	0.11	0.802	1.057
28	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	19mm	Main	OFF	633332	3499.98	AWAN	23.79	25.00	1.321	-0.08	0.901	1.190
	FR1 n77_HPUE	100M	BPSK	1	1	Bottom of Laptop	19mm	Main	OFF	633332	3499.98	AWAN	26.55	27.50	1.245	-0.05	0.815	1.014
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	19mm	Main	OFF	633332	3499.98	ICT	23.79	25.00	1.321	0.16	0.668	0.883

	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	633332	3499.98	AWAN	16.99	17.50	1.125	0.08	0.677	0.763
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO1	ON	633332	3499.98	AWAN	16.98	17.50	1.127	-0.02	0.710	0.800
	FR1 n77	100M	BPSK	270	0	Bottom of Laptop	0mm	MIMO1	ON	633332	3499.98	AWAN	16.97	17.50	1.130	0.01	0.708	0.798
	FR1 n77_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO1	ON	633332	3499.98	AWAN	20.06	20.50	1.107	0.03	0.695	0.783
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO1	ON	633332	3499.98	ICT	16.98	17.50	1.127	-0.08	0.652	0.735
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	633332	3499.98	AWAN	15.45	15.50	1.012	-0.08	0.508	0.514
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO2	ON	633332	3499.98	AWAN	15.31	15.50	1.045	0.01	0.493	0.515
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	19mm	MIMO2	OFF	633332	3499.98	AWAN	23.89	25.00	1.291	0.1	0.280	0.362
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	19mm	MIMO2	OFF	633332	3499.98	AWAN	23.77	25.00	1.327	0.12	0.257	0.341
	FR1 n77_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	633332	3499.98	AWAN	18.44	18.50	1.014	0.1	0.498	0.505
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO2	ON	633332	3499.98	ICT	15.31	15.50	1.045	-0.07	0.470	0.491
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	Aux	ON	633332	3499.98	AWAN	15.81	16.50	1.172	0.03	0.729	0.855
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	Aux	ON	633332	3499.98	AWAN	15.73	16.50	1.194	0.12	0.701	0.837
	FR1 n77	100M	BPSK	270	0	Bottom of Laptop	0mm	Aux	ON	633332	3499.98	AWAN	15.72	16.50	1.197	0.03	0.628	0.752
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	19mm	Aux	OFF	633332	3499.98	AWAN	23.94	25.00	1.276	-0.17	0.393	0.502
	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	19mm	Aux	OFF	633332	3499.98	AWAN	23.82	25.00	1.312	-0.03	0.262	0.344
	FR1 n77_HPUE	100M	BPSK	1	1	Bottom of Laptop	0mm	Aux	ON	633332	3499.98	AWAN	18.89	19.50	1.151	0.18	0.742	0.854
	FR1 n77	100M	BPSK	1	1	Bottom of Laptop	0mm	Aux	ON	633332	3499.98	ICT	15.81	16.50	1.172	0.16	0.298	0.349

14.2 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Antenna Vendor	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)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 14	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	23330	793	ICT	21.03	21.50	1.114	-	1.000	0.05	1.030	-	1.148
2nd	LTE Band 14	10M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	23330	793	ICT	21.03	21.50	1.114	-	1.000	-0.09	0.979	1.05	1.091
1st	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26865	831.5	ICT	21.45	22.00	1.135	-	1.000	-0.03	0.950	-	1.078
2nd	LTE Band 26	15M	QPSK	1	0	Bottom of Laptop	0mm	Main	ON	26865	831.5	ICT	21.45	22.00	1.135	-	1.000	0.08	0.911	1.04	1.034
1st	LTE Band 43	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	45490	3790	AWAN	20.23	20.50	1.064	62.9	1.006	-0.04	1.080	-	1.156
2nd	LTE Band 43	20M	QPSK	1	0	Bottom of Laptop	0mm	MIMO2	ON	45490	3790	AWAN	20.23	20.50	1.064	62.9	1.006	0.02	1.040	1.04	1.113
1st	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	132572	1770	AWAN	18.15	18.50	1.084	-	1.000	0.03	1.020	-	1.106
2nd	LTE Band 66	20M	QPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	132572	1770	AWAN	18.15	18.50	1.084	-	1.000	0.06	0.966	1.06	1.047
1st	FR1 n7	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	507000	2535	AWAN	17.99	18.00	1.002	-	1.000	0.05	1.120	-	1.123
2nd	FR1 n7	40M	BPSK	1	1	Bottom of Laptop	0mm	MIMO2	ON	507000	2535	AWAN	17.99	18.00	1.002	-	1.000	-0.03	1.080	1.04	1.082
1st	FR1 n25	40M	BPSK	216	0	Bottom of Laptop	0mm	MIMO2	ON	376500	1882.5	AWAN	18.74	19.50	1.191	-	1.000	0.04	0.960	-	1.144
2nd	FR1 n25	40M	BPSK	216	0	Bottom of Laptop	0mm	MIMO2	ON	376500	1882.5	AWAN	18.74	19.50	1.191	-	1.000	0.01	0.913	1.05	1.088
1st	FR1 n30	10M	BPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	462000	2310	AWAN	17.78	18.50	1.180	-	1.000	0.03	0.978	-	1.154
2nd	FR1 n30	10M	BPSK	50	0	Bottom of Laptop	0mm	MIMO2	ON	462000	2310	AWAN	17.78	18.50	1.180	-	1.000	0.03	0.941	1.04	1.111
1st	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO1	ON	656000	3840	AWAN	16.84	17.50	1.164	-	1.000	0.07	0.974	-	1.134
2nd	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	0mm	MIMO1	ON	656000	3840	AWAN	16.84	17.5	1.164	-	1.000	0.07	0.920	1.06	1.071
1st	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	19mm	Main	OFF	633332	3499.98	AWAN	23.79	25.00	1.321	-	1.000	-0.08	0.901	-	1.190
2nd	FR1 n77	100M	BPSK	135	69	Bottom of Laptop	19mm	Main	OFF	633332	3499.98	AWAN	23.79	25.00	1.321	-	1.000	-0.08	0.867	1.04	1.146

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.

14.3 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 Main	LTE Band 41_Ant Main
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	15	17
Reported 1g SAR (W/kg)	0.458	0.483
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	20.02	21.70
Linearity SAR(W/kg)	0.50	
% deviation from expected linearity		-2.73%

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

This device support Power Class 2 and Power Class 3 operations for FR1 n41/n77. The highest available duty cycle for Power Class 2 operation is 50%. Per FCC Guidance based on the device behavior, all SAR tests were performed using Power Class 3. Power Class 2 is tested using the highest SAR test configuration in Power Class 3 for each FR1 configuration and exposure condition combination, according to the highest time averaged power for 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%

	FR1 n41_Ant Main	FR1 n41_Ant Main
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	14.5	17.5
Reported 1g SAR (W/kg)	0.581	0.564
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	28.18	28.12
Linearity SAR(W/kg)	0.58	
% deviation from expected linearity		-2.70%

	FR1 n41_Ant MIMO 1	FR1 n41_Ant MIMO 1
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	19	22
Reported 1g SAR (W/kg)	1.039	1.038
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	79.43	79.24
Linearity SAR(W/kg)	1.04	
% deviation from expected linearity		0.14%

	FR1 n41_Ant MIMO 2	FR1 n41_Ant MIMO 2
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	16.5	19.5
Reported 1g SAR (W/kg)	0.833	0.826
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	44.67	44.56
Linearity SAR(W/kg)	0.83	
% deviation from expected linearity		-0.60%

	FR1 n41_Ant Aux	FR1 n41_Ant Aux
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	19.5	22.5
Reported 1g SAR (W/kg)	1.022	0.928
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	89.13	88.91
Linearity SAR(W/kg)	1.02	
% deviation from expected linearity		-8.98%

	FR1 n77_Ant Main	FR1 n77_Ant Main
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	25	27.5
Reported 1g SAR (W/kg)	1.190	1.014
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	316.23	281.17
Linearity SAR(W/kg)	1.06	
% deviation from expected linearity		-4.17%

	FR1 n77_Ant MIMO 1	FR1 n77_Ant MIMO 1
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	17.5	20.5
Reported 1g SAR (W/kg)	1.134	1.087
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	56.23	56.10
Linearity SAR(W/kg)	1.13	
% deviation from expected linearity		-3.92%

	FR1 n77_Ant MIMO 2	FR1 n77_Ant MIMO 2
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	15.5	18.5
Reported 1g SAR (W/kg)	0.613	0.632
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	35.48	35.40
Linearity SAR(W/kg)	0.61	
% deviation from expected linearity		3.34%

	FR1 n77_Ant Aux	FR1 n77_Ant Aux
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	16.5	19.5
Reported 1g SAR (W/kg)	0.855	0.854
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	44.67	44.56
Linearity SAR(W/kg)	0.85	
% deviation from expected linearity		0.12%

15. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Body
	Non-DBS	
1.	WWAN Main + WWAN MIMO 2 + WLAN 2.4GHz Ant Main + Aux	Yes
2.	WWAN MIMO 1 + WLAN 2.4GHz Ant Main + Aux	Yes
3.	WWAN Aux + WLAN 2.4GHz Ant Main + Aux	Yes
4.	WWAN Main + WWAN MIMO 2 + BT Ant Main + Aux	Yes
5.	WWAN MIMO 1 + BT Ant Main + Aux	Yes
6.	WWAN Aux + BT Ant Main + Aux	Yes
7.	WWAN Main + WWAN MIMO 2 + WLAN 2.4GHz Ant Aux + BT Ant Main	Yes
8.	WWAN MIMO 1 + WLAN 2.4GHz Ant Aux + BT Ant Main	Yes
9.	WWAN Aux + WLAN 2.4GHz Ant Aux + BT Ant Main	Yes
10.	WWAN Main + WWAN MIMO 2 + WLAN 5/6GHz Ant Main + Aux + BT Ant Main	Yes
11.	WWAN MIMO 1 + WLAN 5/6GHz Ant Main + Aux + BT Ant Main	Yes
12.	WWAN Aux + WLAN 5/6GHz Ant Main + Aux + BT Ant Main	Yes
13.	WWAN Main + WWAN MIMO 2 + WLAN 5/6GHz Ant Main + Aux + BT Ant Aux	Yes
14.	WWAN MIMO 1 + WLAN 5/6GHz Ant Main + Aux + BT Ant Aux	Yes
15.	WWAN Aux + WLAN 5/6GHz Ant Main + Aux + BT Ant Aux	Yes
	DBS	
16.	WWAN Main + WWAN MIMO 2 + WLAN 2.4GHz Ant Main + Aux + WLAN 5/6GHz Ant Main + Aux	Yes
17.	WWAN MIMO 1 + WLAN 2.4GHz Ant Main + Aux + WLAN 5/6GHz Ant Main + Aux	Yes
18.	WWAN Aux + WLAN 2.4GHz Ant Main + Aux + WLAN 5/6GHz Ant Main + Aux	Yes

General Note:

1. The Qualcomm QCNCM825 WLAN/Bluetooth module is also integrated into this host, WLAN/Bluetooth power and WLAN SAR testing data, which can be referred to Sporton SAR Test Report, Report No.: FA440818 and these results are used simultaneous transmission analysis.
2. The Scaled SAR summation is calculated based on the same configuration and test position.
3. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
   v) The SPLSR calculated results please refer to section 15.2.

15.1 Body Exposure Conditions

<Non-DBS>

Exposure Position	0	1	2	3	4	5	6	7	0+1+2+3 Summed 1g SAR (W/kg)	0+1+6+7 Summed 1g SAR (W/kg)	0+1+2+3 SPLSR	0+1+2+3 Case No	0+1+6+7 SPLSR	0+1+6+7 Case No
	Maximum WWAN Main Ant	Maximum WWAN MIMO2 Ant	WLAN2.4GHz Main	WLAN2.4GHz Aux	WLAN5/6GHz Main	WLAN5/6GHz Aux	Bluetooth Main	Bluetooth Aux						
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)						
Bottom of Laptop at 0mm	1.148	1.191	0.614	0.743	1.085	1.040	0.324	0.379	3.696	3.042	0.020	Case 1	0.010	Case 2

Exposure Position	0	1	2	3	4	5	6	7	0+1+3+6 Summed 1g SAR (W/kg)	0+1+4+5+6 Summed 1g SAR (W/kg)	0+1+3+6 SPLSR	0+1+3+6 Case No	0+1+4+5+6 SPLSR	0+1+4+5+6 Case No
	Maximum WWAN Main Ant	Maximum WWAN MIMO2 Ant	WLAN2.4GHz Main	WLAN2.4GHz Aux	WLAN5/6GHz Main	WLAN5/6GHz Aux	Bluetooth Main	Bluetooth Aux						
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)						
Bottom of Laptop at 0mm	1.148	1.191	0.614	0.743	1.085	1.040	0.324	0.379	3.406	4.788	0.010	Case 3	0.040	Case 4

Exposure Position	0	1	2	3	4	5	6	7	0+1+4+5+7 Summed 1g SAR (W/kg)	0+1+4+5+7 SPLSR	0+1+4+5+7 Case No
	Maximum WWAN Main Ant	Maximum WWAN MIMO2 Ant	WLAN2.4GHz Main	WLAN2.4GHz Aux	WLAN5/6GHz Main	WLAN5/6GHz Aux	Bluetooth Main	Bluetooth Aux			
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
Bottom of Laptop at 0mm	1.148	1.191	0.614	0.743	1.085	1.040	0.324	0.379	4.843	0.040	Case 5

Exposure Position	1	2	3	4	5	6	7	1+2+3 Summed 1g SAR (W/kg)	1+6+7 Summed 1g SAR (W/kg)	1+3+6 Summed 1g SAR (W/kg)	1+4+5+6 Summed 1g SAR (W/kg)	1+4+5+7 Summed 1g SAR (W/kg)	SPLSR	1+2+3 Case No	SPLSR	1+6+7 Case No	SPLSR	1+3+6 Case No	SPLSR	1+4+5+6 Case No	SPLSR	1+4+5+7 Case No
	Maximum WWAN MIMO1 Ant	WLAN2.4 GHz Main	WLAN2.4 GHz Aux	WLAN5/6 GHz Main	WLAN5/6 GHz Aux	Bluetooth Main	Bluetooth Aux															
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)															
Bottom of Laptop at 0mm	1.154	0.614	0.743	1.085	1.040	0.324	0.379	2.511	1.857	2.221	3.603	3.658	0.020	Case 6	0.010	Case 7	0.010	Case 8	0.040	Case 9	0.040	Case 10

Exposure Position	1	2	3	4	5	6	7	1+2+3 Summed 1g SAR (W/kg)	1+6+7 Summed 1g SAR (W/kg)	1+3+6 Summed 1g SAR (W/kg)	1+4+5+6 Summed 1g SAR (W/kg)	1+4+5+7 Summed 1g SAR (W/kg)	SPLSR	1+2+3 Case No	SPLSR	1+6+7 Case No	SPLSR	1+3+6 Case No	SPLSR	1+4+5+6 Case No	SPLSR	1+4+5+7 Case No
	Maximum WWAN Aux Ant	WLAN2.4 GHz Main	WLAN2.4 GHz Aux	WLAN5/6 GHz Main	WLAN5/6 GHz Aux	Bluetooth Main	Bluetooth Aux															
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)															
Bottom of Laptop at 0mm	1.022	0.614	0.743	1.085	1.040	0.324	0.379	2.379	1.725	2.089	3.471	3.526	0.020	Case 11	0.010	Case 12	0.010	Case 13	0.040	Case 14	0.040	Case 15

<DBS>

Exposure Position	0	1	2	3	4	5	0+1+2+3+4+5 Summed 1g SAR (W/kg)	SPLSR	Case No
	Maximum WWAN Main Ant	Maximum WWAN MIMO2 Ant	WLAN2.4GHz Main	WLAN2.4GHz Aux	WLAN5/6GHz Main	WLAN5/6GHz Aux			
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
Bottom of Laptop at 0mm	1.148	1.191	0.345	0.399	0.490	0.420	3.993	0.020	Case 16

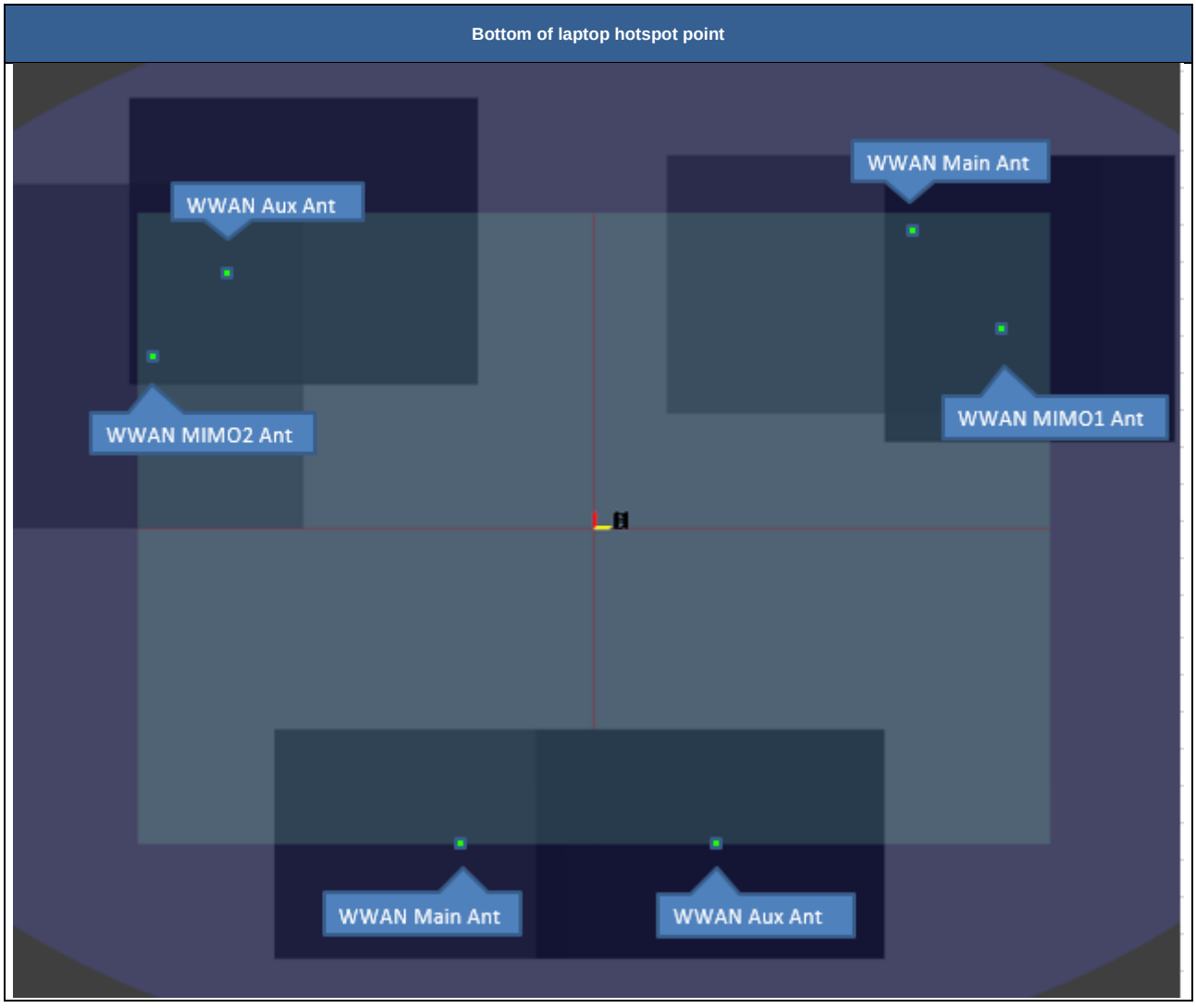
Exposure Position	1	2	3	4	5	1+2+3+4+5 Summed 1g SAR (W/kg)	SPLSR	Case No
	Maximum WWAN MIMO1 Ant	WLAN2.4GHz Main	WLAN2.4GHz Aux	WLAN5/6GHz Main	WLAN5/6GHz Aux			
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
Bottom of Laptop at 0mm	1.154	0.345	0.399	0.490	0.420	2.808	0.020	Case 17

Exposure Position	1	2	3	4	5	1+2+3+4+5 Summed 1g SAR (W/kg)	SPLSR	Case No
	Maximum WWAN Aux Ant	WLAN2.4GHz Main	WLAN2.4GHz Aux	WLAN5/6GHz Main	WLAN5/6GHz Aux			
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
Bottom of Laptop at 0mm	1.022	0.345	0.399	0.490	0.420	2.676	0.020	Case 18

15.2 SPLSR Evaluation and Analysis

General Note:

1. According to antenna location of Appendix E, the minimum distance between WWAN and WLAN/BT transmit antenna is using for SPLSR analysis. for WWAN Main to WWAN MIMO2 hotspot point showing as below figure and the minimum 3D distance for each sum combination is used for SPLSR analysis
2. Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneously transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration. Therefore, the adjacent transmit antennas will be summed first, and then the SPLSR calculation will be evaluated with the farther transmitted antennas.
3. SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*). If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary



	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 1	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	262.4	2.34	0.01	Not required
	Maxmum WWAN MIMO2 Ant		1.191	0mm	-42.5	-151.5	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	260.7	1.76	0.01	Not required
	WLAN2.4GHz Main Ant		0.614	0mm	108	-46	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	226.6	1.89	0.01	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	183.8	1.81	0.01	Not required
	WLAN2.4GHz Main Ant		0.614	0mm	108	-46	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	243.5	1.93	0.01	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				
	WLAN2.4GHz Main Ant	Bottom of Laptop	0.614	0mm	108	-46	-177	83.6	1.36	0.02	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				

	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 2	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	262.4	2.34	0.01	Not required
	Maxmum WWAN MIMO2 Ant		1.191	0mm	-42.5	-151.5	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	259.9	1.47	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	220.3	1.53	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	184.7	1.52	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	246.2	1.57	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	Bluetooth Main Ant	Bottom of Laptop	0.324	0mm	108	-44.5	-177	89.0	0.70	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				

	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 3	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	262.4	2.34	0.01	Not required
	Maxmum WWAN MIMO2 Ant		1.191	0mm	-42.5	-151.5	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	226.6	1.89	0.01	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	259.9	1.47	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	243.5	1.93	0.01	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	184.7	1.52	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	WLAN2.4GHz Aux Ant	Bottom of Laptop	0.743	0mm	111	37.5	-177	82.1	1.07	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				

	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 4	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	262.4	2.34	0.01	Not required
	Maxmum WWAN MIMO2 Ant		1.191	0mm	-42.5	-151.5	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	259.8	2.23	0.01	Not required
	WLAN5/6GHz Main Ant		1.085	0mm	106.3	-46.8	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	222.6	2.19	0.01	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	259.9	1.47	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	181.9	2.28	0.02	Not required
	WLAN5/6GHz Main Ant		1.085	0mm	106.3	-46.8	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	246.8	2.23	0.01	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	184.7	1.52	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	WLAN5/6GHz Main Ant+Bluetooth Main Ant	Bottom of Laptop	1.409	0mm	108	-44.5	-177	88.2	2.45	0.04	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	WLAN5/6GHz Aux Ant	Bottom of Laptop	1.04	0mm	108.6	43.7	-177	88.2	1.36	0.02	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				

	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 5	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	262.4	2.34	0.01	Not required
	Maxmum WWAN MIMO2 Ant		1.191	0mm	-42.5	-151.5	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	259.8	2.23	0.01	Not required
	WLAN5/6GHz Main Ant		1.085	0mm	106.3	-46.8	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	222.6	2.19	0.01	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	Maximum WWAN Main Ant	Bottom of Laptop	1.148	0mm	-105.9	103.1	-177	220.3	1.53	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	181.9	2.28	0.02	Not required
	WLAN5/6GHz Main Ant		1.085	0mm	106.3	-46.8	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	246.8	2.23	0.01	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	Maxmum WWAN MIMO2 Ant	Bottom of Laptop	1.191	0mm	-42.5	-151.5	-177	246.2	1.57	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	WLAN5/6GHz Main Ant	Bottom of Laptop	1.085	0mm	106.3	-46.8	-177	91.3	1.46	0.02	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	WLAN5/6GHz Main Ant	Bottom of Laptop	1.085	0mm	106.3	-46.8	-177	90.5	2.50	0.04	Not required
	WLAN5/6GHz Aux Ant+Bluetooth Aux Ant		1.419	0mm	108.6	43.7	-177				

	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 6	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	258.6	1.77	0.01	Not required
	WLAN2.4GHz Main Ant		0.614	0mm	108	-46	-177				
	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	208.6	1.90	0.01	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				
	WLAN2.4GHz Main Ant	Bottom of Laptop	0.614	0mm	108	-46	-177	83.6	1.36	0.02	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				

	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 7	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	257.5	1.48	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	201.2	1.53	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	Bluetooth Main Ant	Bottom of Laptop	0.324	0mm	108	-44.5	-177	89.0	0.70	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
Case 8	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	208.6	1.90	0.01	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				
	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	257.5	1.48	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	WLAN2.4GHz Aux Ant	Bottom of Laptop	0.743	0mm	111	37.5	-177	82.1	1.07	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
Case 9	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	258.0	2.24	0.01	Not required
	WLAN5/6GHz Main Ant		1.085	0mm	106.3	-46.8	-177				
	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	203.4	2.19	0.02	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	257.5	1.48	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	WLAN5/6GHz Main Ant+Bluetooth Main Ant	Bottom of Laptop	1.409	0mm	108	-44.5	-177	88.2	2.45	0.04	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	WLAN5/6GHz Aux Ant	Bottom of Laptop	1.04	0mm	108.6	43.7	-177	88.2	1.36	0.02	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
Case 10	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	258.0	2.24	0.01	Not required
	WLAN5/6GHz Main Ant		1.085	0mm	106.3	-46.8	-177				
	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	203.4	2.19	0.02	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	Maximum WWAN MIMO1 Ant	Bottom of Laptop	1.154	0mm	-69.5	142	-177	201.2	1.53	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	WLAN5/6GHz Main Ant	Bottom of Laptop	1.085	0mm	106.3	-46.8	-177	91.3	1.46	0.02	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	WLAN5/6GHz Main Ant	Bottom of Laptop	1.085	0mm	106.3	-46.8	-177	90.5	2.50	0.04	Not required
	WLAN5/6GHz Aux Ant+Bluetooth Aux Ant		1.419	0mm	108.6	43.7	-177				
Case 11	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	213.8	1.64	0.01	Not required
	WLAN2.4GHz Main Ant		0.614	0mm	108	-46	-177				
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	259.2	1.77	0.01	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				
	WLAN2.4GHz Main Ant	Bottom of Laptop	0.614	0mm	108	-46	-177	83.6	1.36	0.02	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				

	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 12	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	214.4	1.35	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	260.2	1.40	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	Bluetooth Main Ant	Bottom of Laptop	0.324	0mm	108	-44.5	-177	89.0	0.70	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
Case 13	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	259.2	1.77	0.01	Not required
	WLAN2.4GHz Aux Ant		0.743	0mm	111	37.5	-177				
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	214.4	1.35	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	WLAN2.4GHz Aux Ant	Bottom of Laptop	0.743	0mm	111	37.5	-177	82.1	1.07	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
Case 14	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	212.0	2.11	0.01	Not required
	WLAN5/6GHz Main Ant		1.085	0mm	106.3	-46.8	-177				
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	261.3	2.06	0.01	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	214.4	1.35	0.01	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
	WLAN5/6GHz Main Ant+Bluetooth Main Ant	Bottom of Laptop	1.409	0mm	108	-44.5	-177	88.2	2.45	0.04	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	WLAN5/6GHz Aux Ant	Bottom of Laptop	1.04	0mm	108.6	43.7	-177	88.2	1.36	0.02	Not required
	Bluetooth Main Ant		0.324	0mm	108	-44.5	-177				
Case 15	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	212.0	2.11	0.01	Not required
	WLAN5/6GHz Main Ant		1.085	0mm	106.3	-46.8	-177				
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	261.3	2.06	0.01	Not required
	WLAN5/6GHz Aux Ant		1.04	0mm	108.6	43.7	-177				
	Maximum WWAN Aux Ant	Bottom of Laptop	1.022	0mm	-90.5	-125.5	-177	260.2	1.40	0.01	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	WLAN5/6GHz Main Ant	Bottom of Laptop	1.085	0mm	106.3	-46.8	-177	91.3	1.46	0.02	Not required
	Bluetooth Aux Ant		0.379	0mm	106.5	44.5	-177				
	WLAN5/6GHz Main Ant	Bottom of Laptop	1.085	0mm	106.3	-46.8	-177	90.5	2.50	0.04	Not required
	WLAN5/6GHz Aux Ant+Bluetooth Aux Ant		1.419	0mm	108.6	43.7	-177				

Test Engineer： Randy Lin, Barry Huang and Sing Lim

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 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, 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 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

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

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