FCC SAR TEST REPORT

FCC ID	:	**E2KT99W640**
Equipment	:	**5G WWAN Module**
Brand Name	:	**DELL**
Model Name	:	**DP25-42843-47**
Applicant	:	**Dell Inc. One Dell Way Round Rock, Texas 78682 United States**
Manufacturer	:	**Dell Inc. One Dell Way Round Rock, Texas 78682 United States**
Standard	:	**FCC 47 CFR Part 2 (2.1093)**

The product was installed into Portable Computer (Brand Name DELL, Model Name: P53E) during test.

The product was received on Jan. 03, 2025 and testing was started from Jan. 06, 2025 and completed on Jan. 09, 2025. 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

Testing Laboratory 3786

Sporton International Inc. Wensan Laboratory
No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan

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History of this test report

Report No.	Version	Description	Issued Date
FA4D0506	01	Initial issue of report	Feb. 21, 2025

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for **Dell Inc., 5G WWAN Module, DP25-42843-47**, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary Body 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
Licensed	LTE Band 7	0.75	1.44
	LTE Band 25/2	0.22	
	LTE Band 30	0.23	
	LTE Band 41/38	0.36	
	LTE Band 42	0.59	
	LTE Band 43	0.63	
	LTE Band 48	0.31	
	LTE Band 66	0.36	
	FR1 n7	0.39	
	FR1 n25	0.21	
	FR1 n30	0.19	
	FR1 n41/38	0.71	
	FR1 n48	0.69	
	FR1 n66/4	0.49	
	FR1 n70	0.50	
	FR1 n77/78	0.84	
Date of Testing:		2025/01/06 ~ 2025/01/09	

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: Daisy Peng

2. Guidance Applied

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

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

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	5G WWAN Module
Brand Name	DELL
Model Name	DP25-42843-47
FCC ID	E2KT99W640
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: 3600 MHz ~ 3800 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 70: 1695 MHz ~ 1710 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 n70: 1695 MHz ~ 1710 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 LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM
Remark: 1. This device has two antenna vendors; RF exposure evaluation selects Auden as the main test, WNC will spot check worst case found in Auden. 2. The WWAN Foxconn DP25-42843-47 module integrated into this model. Main/Aux antenna is located at the top of the panel which the distance is larger than 20 cm from the human body (refer to section12). SAR testing is not required. 3. This device support UL MIMO mode for 5G NR bands. and also PC1.5, PC2 and PC3 implemented to n41, n77 and n78. Since the output power from each antenna will be 3dB reduced when UL MIMO activated and hence SAR were performed with the UL SISO mode for worst case. Besides the simultaneous transmission are directly evaluated from SAR performed with SISO mode as most conservative.	

Host Information	
Equipment Name	Portable Computer
Brand Name	DELL
Model Name	P53E
Integrated WLAN Module	Brand Name: Intel® Model Name: BE200NGW
Integrated RFID Module	Brand Name: DELL Model Name: DWRFID2404
Wireless Technology and Frequency Range	WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz WLAN 5.9 GHz Band: 5850 MHz ~ 5895 MHz WLAN 6GHz Band: 5925 MHz ~ 6425 MHz, 6425 MHz ~ 6525 MHz, 6525 MHz ~ 6875 MHz, 6875 MHz ~ 7125 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz RFID : 13.56 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax/be HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160/EHT20/EHT40/EHT80/EHT160/EHT320 Bluetooth BR/EDR/LE RFID: ASK, BPSK
Remark: 1. The Intel BE200NGW WLAN/BT module is integrated into this host. The maximum WLAN/BT output power and evaluation results are referenced from the Intel test report (Report No.: FA4D0220-01, FCC ID: PD9BE200NG). The SAR results are used for simultaneous transmission analysis. 2. The DELL DWRFID2404 RFID module is also integrated into this host, RFID SAR testing data, which can be referred to Sporton Test Report, (Report No.: FA4D0220, FCC ID: E2K-DWRFID2404) and these results are used simultaneous transmission analysis.	

Communication System	Band	Frequency(MHz) from low to high spectrum		1A Cable Assembly Part Number and Information	1B Antenna Manufacturer Name	1C Description of Antenna Type	1D * Peak Gain W/ Cable loss (dBi)
WCDMA/LTE/5G NR FR1	1	1920	1980	(1) Cable P/N: SY113L/50-146 (2) Cable length:605mm, diameter: 13mm, 50 ohm Coaxial (3) Connector P/N: 20565-001R-13	Auden Techno Corp.	Monopole	2.72
WCDMA/LTE/5G NR FR1	2	1850	1910				2.55
LTE/5G NR FR1	3	1710	1785				2.27
WCDMA/ LTE	4	1710	1755				2.27
WCDMA/LTE/5G NR FR1	5	824	849				-0.11
LTE/5G NR FR1	7	2500	2570				1.82
WCDMA/LTE/5G NR FR1	8	880	915				0.75
LTE/5G NR FR1	12	699	716				1.05
LTE/5G NR FR1	13	777	787				1.64
LTE/5G NR FR1	14	788	798				0.23
LTE	17	704	716				1.05
LTE/5G NR FR1	18	815	830				-0.11
LTE	19	830	845				-0.11
LTE/5G NR FR1	20	832	862				-0.11
LTE/5G NR FR1	25	1850	1915				2.67
LTE/5G NR FR1	26	814	849				-0.11
LTE/5G NR FR1	28	703	748				2.28
LTE/5G NR FR1	30	2305	2315				0.69
LTE	34	2010	2050				2.95
LTE/5G NR FR1	38	2570	2620				1.74
LTE	39	1880	1920				2.67
LTE/5G NR FR1	40	2300	2400				1.92
LTE/5G NR FR1	41	2496	2690				2.01
LTE	42	3400	3600				0.86
LTE	43	3600	3800				0.79
LTE	46	5150	5925				0.57
LTE/5G NR FR1	48	3550	3700				0.79
LTE/5G NR FR1	66	1710	1780				2.27
LTE	68	698	728				1.89
LTE/5G NR FR1	70	1695	1710				1.5
LTE/5G NR FR1	71	663	698				-1.05
5G NR FR1	77	3300	4200				0.86
5G NR FR1	78	3300	3800				0.86
5G NR FR1	79	4400	5000				-0.52
5G NR FR1	91	832	862				-0.11
5G NR FR1	92	832	862				-0.11
5G NR FR1	93	880	915				0.75
5G NR FR1	94	880	915				0.75

Communication System	Band	Frequency(MHz) from low to high spectrum		1A Cable Assembly Part Number and Information	1B Antenna Manufacturer Name	1C Description of Antenna Type	1D * Peak Gain W/ Cable loss (dBi)
WCDMA/LTE/5G NR FR1	1	1920	1980	(1) Cable P/N: SY113L/50-146 (2) Cable length: 605mm, diameter: 1.13mm, 50 ohm Coaxial (3) Connector P/N: 20565-001R-13	Wistron Network Corp.	Monopole	2.68
WCDMA/LTE/5G NR FR1	2	1850	1910				2.53
LTE/5G NR FR1	3	1710	1785				2.26
WCDMA/LTE	4	1710	1755				2.26
WCDMA/LTE/5G NR FR1	5	824	849				-0.12
LTE/5G NR FR1	7	2500	2570				1.78
WCDMA/LTE/5G NR FR1	8	880	915				0.7
LTE/5G NR FR1	12	699	716				1.03
LTE/5G NR FR1	13	777	787				1.63
LTE/5G NR FR1	14	788	798				0.19
LTE	17	704	716				1.03
LTE/5G NR FR1	18	815	830				-0.13
LTE	19	830	845				-0.12
LTE/5G NR FR1	20	832	862				-0.12
LTE/5G NR FR1	25	1850	1915				2.65
LTE/5G NR FR1	26	814	849				-0.12
LTE/5G NR FR1	28	703	748				2.27
LTE/5G NR FR1	30	2305	2315				0.67
LTE	34	2010	2050				2.93
LTE/5G NR FR1	38	2570	2620				1.7
LTE	39	1880	1920				2.65
LTE/5G NR FR1	40	2300	2400				1.91
LTE/5G NR FR1	41	2496	2690				1.97
LTE	42	3400	3600				0.84
LTE	43	3600	3800				0.78
LTE	46	5150	5925				0.55
LTE/5G NR FR1	48	3550	3700				0.78
LTE/5G NR FR1	66	1710	1780				2.26
LTE	68	698	728				1.87
LTE/5G NR FR1	70	1695	1710				1.47
LTE/5G NR FR1	71	663	698				-1.09
5G NR FR1	77	3300	4200				0.84
5G NR FR1	78	3300	3800				0.84
5G NR FR1	79	4400	5000				-0.54
5G NR FR1	91	832	862				-0.12
5G NR FR1	92	832	862				-0.12
5G NR FR1	93	880	915				0.7
5G NR FR1	94	880	915				0.7

3.2 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>E2KT99W640</td></tr>
<tr><td>Equipment Name</td><td>5G WWAN Module</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 70: 1695 MHz ~ 1710 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 70: 5MHz, 10MHz, 15MHz
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 Sensor.</td></tr>
<tr><td>LTE Carrier Aggregation Combinations</td><td>Intra-Band UL CA combinations and the detail power measurement please referred to section 11.</td></tr>
<tr><td>LTE Carrier Aggregation Additional Information</td><td>This device supports maximum of 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
L M	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593
H M	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 (3450 MHz ~ 3550 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)
L	42115	3452.5	42140	3455	42165	3457.5	42190	3460
M	42590	3500	42590	3500	42590	3500	42590	3500
H	43065	3547.5	43040	3545	43015	3542.5	42990	3540

LTE Band 43 (3700 MHz ~ 3800 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)
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 70						
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	132997	1697.5	133022	1700	133047	1702.5
M	133047	1702.5	133047	1702.5		
H	133097	1707.5	133072	1705		

LTE Band 71								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	133147	665.5	133172	668	133197	670.5	133222	673
M	133297	680.5	133297	680.5	133297	680.5	133297	680.5
H	133447	695.5	133422	693	133397	690.5	133372	688

3.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information	
FCC ID	E2KT99W640
Equipment Name	5G WWAN Module
Operating Frequency Range of each 5G NR transmission band	5G NR n2: 1850 MHz ~ 1910 MHz 5G NR n5: 824 MHz ~ 849 MHz 5G NR 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 n70: 1695 MHz ~ 1710 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, 25 MHz, 30MHz, 35MHz, 40MHz 5G NR n5: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n7: 5MHz, 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 35MHz, 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, 35MHz, 40MHz 5G NR n26: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n30: 5MHz, 10MHz 5G NR n38: 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 40MHz 5G NR n41: 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz 5G NR n48: 5MHz, 10MHz, 15MHz, 20MHz, 30MHz, 40MHz 5G NR n66: 5MHz, 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 35MHz, 40MHz 5G NR n70: 5MHz, 10MHz, 15MHz 5G NR n71: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n77: 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz 5G NR n78: 10MHz, 15MHz, 20MHz, 25 MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz
SCS	FDD: SCS15KHz, TDD: SCS30KHz
uplink modulations used	DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM CP-OFDM QPSK / 16QAM / 64QAM / 256QAM
A-MPR (Additional MPR) disabled for SAR Testing?	Yes
LTE Anchor Bands for n2	LTE B5/12/14/30/66/71
LTE Anchor Bands for n5	LTE B2/5/7/12/30/48/66
LTE Anchor Bands for n7	LTE B5/12/13/66/71
LTE Anchor Bands for n12	LTE B2/30/66
LTE Anchor Bands for n25	LTE B2/7/12/26/48/66/71
LTE Anchor Bands for n38	LTE B2/4/5/12/66/71
LTE Anchor Bands for n41	LTE B2/5/7/12/25/26/66/71
LTE Anchor Bands for n66	LTE B2/5/12/13/14/30/48/66/71
LTE Anchor Bands for n71	LTE B2/7/66
LTE Anchor Bands for n77	LTE B7/41
LTE Anchor Bands for n78	LTE B7/38/41

NR Band 2

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 35MHz		Bandwidth 40MHz	
	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	370500	1852.5	371000	1855	371500	1857.5	372000	1860	372500	1862.5	373000	1865	373500	1867.5	374000	1870
M	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880
H	381500	1907.5	381000	1905	380500	1902.5	380000	1900	379500	1897.5	379000	1895	378500	1892.5	378000	1890

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 35MHz		Bandwidth 40MHz	
	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	500500	2502.5	501000	2505	501500	2507.5	502000	2510	502500	2512.5	503000	2515	503500	2517.5	504000	2520
M	507000	2535	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	510500	2552.5	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 35MHz		Bandwidth 40MHz	
	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	370500	1852.5	371000	1855	371500	1857.5	372000	1860	372500	1862.5	373000	1865	373500	1867.5	374000	1870
M	376500	1882.5	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	379500	1897.5	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 25MHz		Bandwidth 30MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	515004	2575.02	515502	2577.51	516000	2580	516504	2582.52	517002	2585.01	518004	2590.02
M	519000	2595	519000	2595	519000	2595	519000	2595	519000	2595	519000	2595
H	522996	2614.98	522498	2612.49	522000	2610	521496	2607.48	520998	2604.99	519996	2599.98

NR Band 41																						
	Bandwidth10MHz		Bandwidth15MHz		Bandwidth20MHz		Bandwidth25MHz		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)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	500202	2501.01	500700	2503.5	501204	2506.02	501702	2508.51	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	518598	2592.99	518598	2592.99	518598	2592.99
H	537000	2685	536496	2682.48	535998	2679.99	535500	2677.5	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	531000	2655	529998	2649.99	528996	2644.98	528000	2640

NR Band 48												
	Bandwidth5MHz		Bandwidth10MHz		Bandwidth 15MHz		Bandwidth20MHz		Bandwidth30MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	636834	3552.51	637000	3555	637168	3557.52	637334	3560.01	637668	3565.02	638000	3570
M	641666	3624.99	641666	3624.99	641666	3624.99	641666	3624.99	641666	3624.99	641666	3624.99
H	646500	3697.5	646332	3694.98	646166	3692.49	646000	3690	645666	3684.99	645332	3679.98

NR Band 66																
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 35MHz		Bandwidth 40MHz	
	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	342500	1712.5	343000	1715	343500	1717.5	344000	1720	344500	1722.5	345000	1725	345500	1727.5	346000	1730
M	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745
H	355500	1777.5	355000	1775	354500	1772.5	354000	1770	353500	1767.5	353000	1765	352500	1762.5	352000	1760

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

NR Band 71								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	133100	665.5	133600	668	13410	670.5	134600	673
M	136100	680.5	136100	680.5	136100	680.5	136100	680.5
H	139100	695.5	138600	693	13810	690.5	137600	688

NR Band 77_Part 27O																						
	Bandwidth10MHz		Bandwidth15MHz		Bandwidth 20MHz		Bandwidth25MHz		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)	Ch. #	Freq. (MHz)
L	647000	3705	647168	3707.52	647334	3710.01	647500	3712.5	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	656000	3840
H	665000	3975	664832	3972.48	664666	3969.99	664500	3967.50	664332	3964.98	664000	3960	663666	3954.99	663332	3949.98	663000	3945	662666	3939.99	662332	3934.98	662000	3930

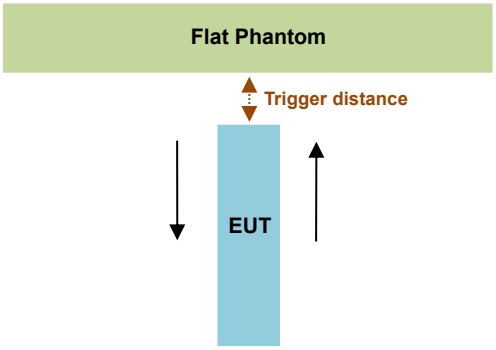
NR Band 78_Part 27O																						
	Bandwidth10MHz		Bandwidth15MHz		Bandwidth 20MHz		Bandwidth25MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	647000	3705	647168	3707.52	647334	3710.01	647500	3712.5	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	650000	3750
H	653000	3795	652832	3792.48	652666	3789.99	652500	3787.50	652332	3784.98	652000	3780	651666	3774.99	651332	3769.98	651000	3765	650666	3759.99	650332	3754.98		

NR Band 77/78_Part 27Q																						
	Bandwidth10MHz		Bandwidth15MHz		Bandwidth 20MHz		Bandwidth25MHz		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)	Ch. #	Freq. (MHz)
L	630334	3455.01	630500	3457.5	630668	3460.02	630834	3462.51	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	633332	3499.98
H	636332	3544.98	636166	3542.49	636000	3540	635832	3537.48	635666	3534.99	635332	3529.98	635000	3525	634666	3519.99	634332	3514.98	634000	3510	633666	3504.99		

4. Proximity Sensor Triggering Test

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

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



MIMO2		
Proximity Sensor Trigger Distance (mm)		
Position	Bottom side	
	moving toward	moving away
Minimum	18	18

<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.

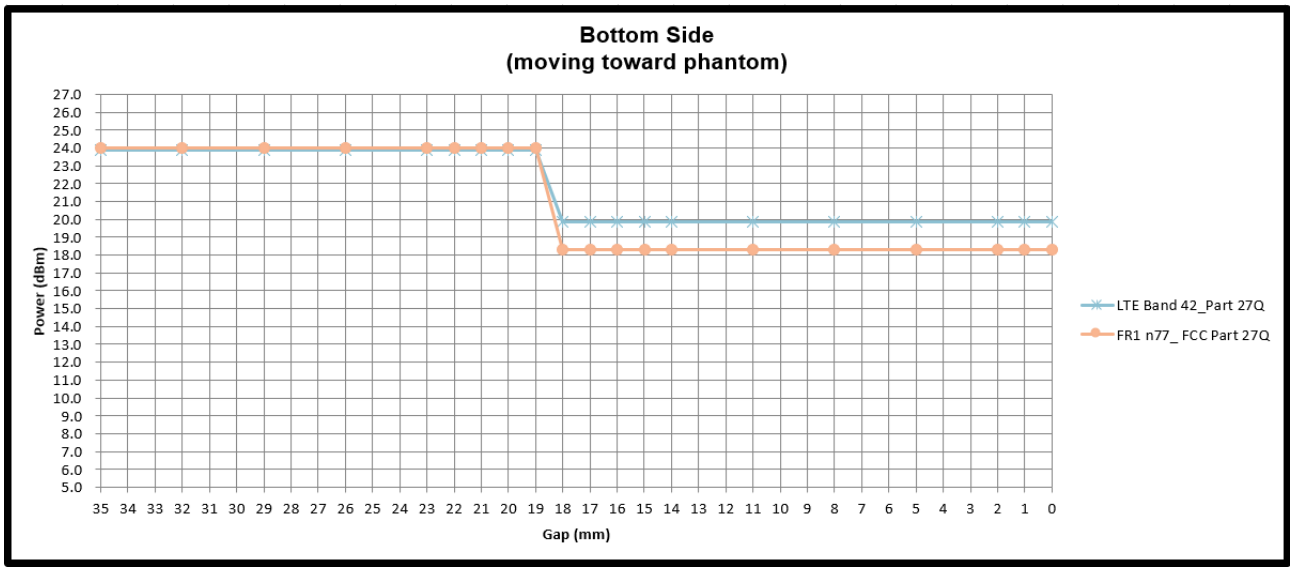
Proximity sensor power reduction

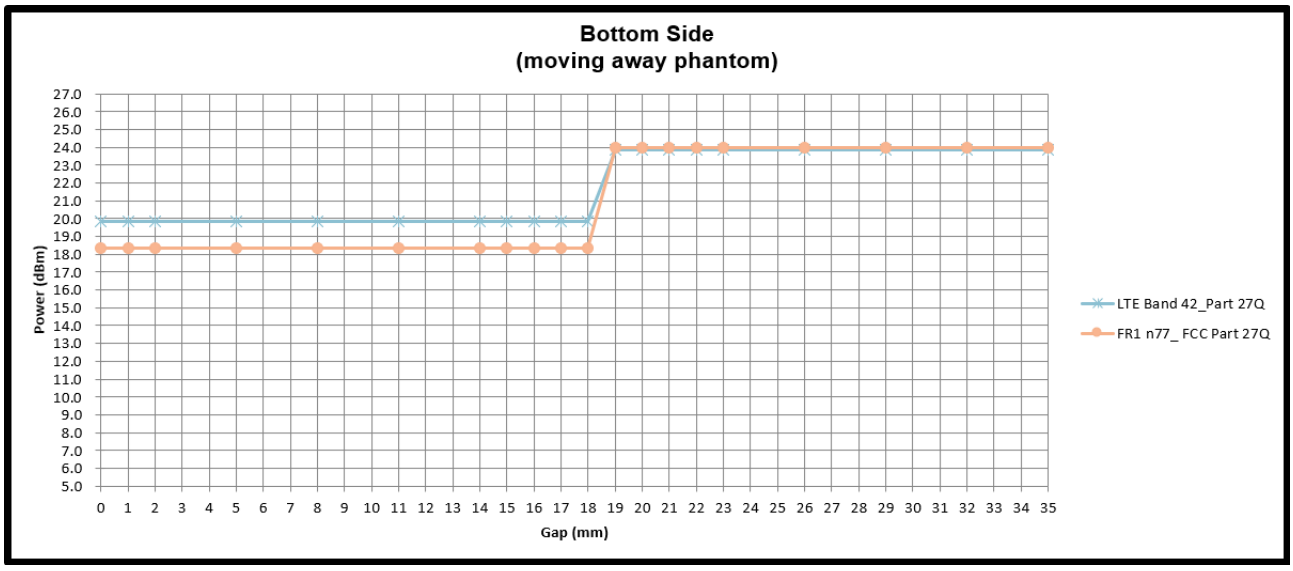
Band	Antenna	Bottom Side(1) (dB)
LTE B42	MIMO2	3.5
LTE B43	MIMO2	1
LTE B48	MIMO2	1.3
FR1 n48	MIMO2	0.8
FR1 n77/78 PC3	MIMO2	6.1
FR1 n77/78 PC2	MIMO2	4

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:
   - Bottom Face: 17 mm

Power Measurement during Sensor Trigger distance testing





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.

5.3 RF Exposure limit for above 6GHz

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Peak Spatially Averaged Power Density was evaluated over a circular area of 4cm^2 per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

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:

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

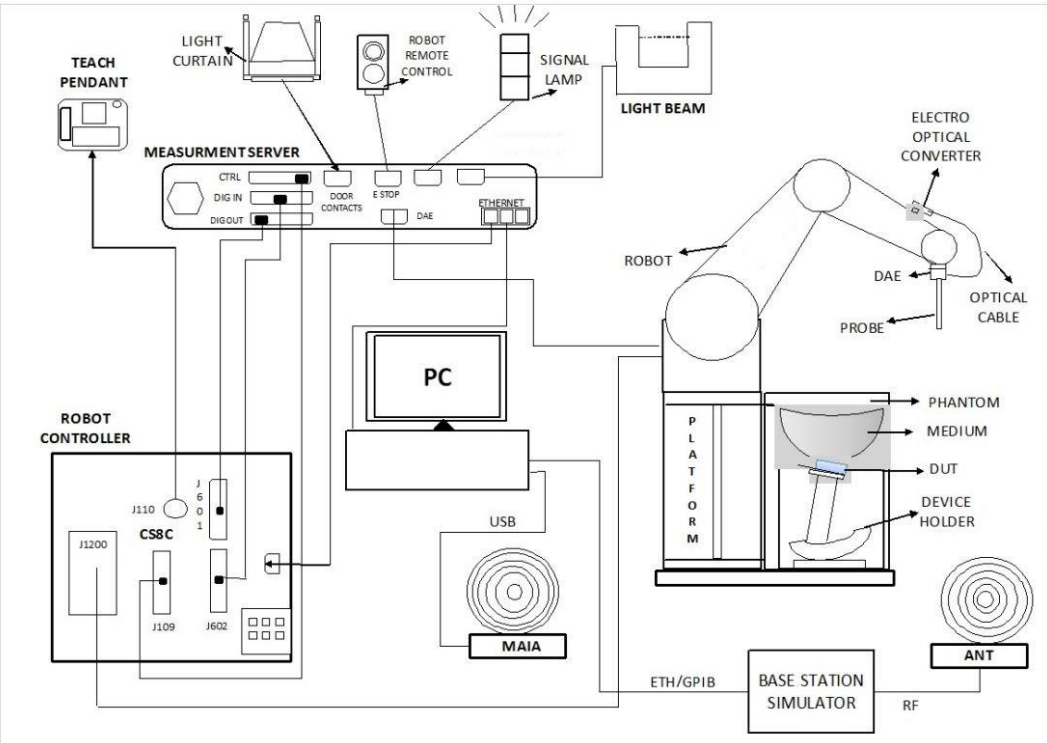
SAR is expressed in units of Watts per kilogram (W/kg)

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

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.

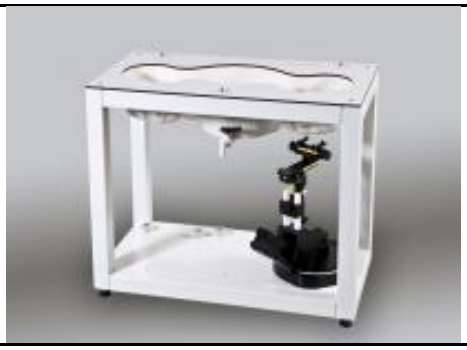
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

7.4 Phantom

<SAM Twin Phantom>

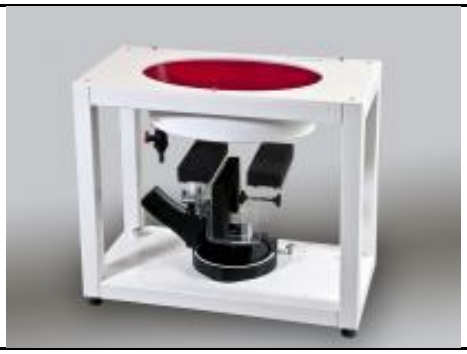
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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. 19, 2025
SPEAG	835MHz System Validation Kit(2)	D835V2	4d167	Nov. 24, 2022	Nov. 21, 2025
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	D2300V2	1088	Jul. 10, 2024	Jul. 09, 2025
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 15, 2024	Aug. 14, 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	D3700V2	1022	Jul. 10, 2024	Jul. 09, 2025
SPEAG	3900MHz System Validation Kit(2)	D3900V2	1092	May. 15, 2023	May. 13, 2025
SPEAG	Data Acquisition Electronics	DAE4ip	1800	Jun. 18, 2024	Jun. 17, 2025
SPEAG	Dosimetric E-Field Probe	EX3DV4	7625	Dec. 13, 2024	Dec. 12, 2025
Testo	Hygro meter	608-H1	45196600	Oct. 28, 2024	Oct. 27, 2025
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Nov. 12, 2024	Nov. 11, 2025
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. 24, 2024	Sep. 23, 2025
Keysight	ENA Network Analyzer	E5071C	MY46104758	Oct. 20, 2024	Oct. 19, 2025
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 17, 2024	Sep. 16, 2025
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3690	Aug. 07, 2024	Aug. 06, 2025
Anritsu	Power Meter	ML2495A	1419002	Aug. 13, 2024	Aug. 12, 2025
Anritsu	Power Sensor	MA2411B	1911176	Aug. 13, 2024	Aug. 12, 2025
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 09, 2024	Jul. 08, 2025
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 23, 2024	Oct. 22, 2025
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	22.5	0.903	43.400	0.89	41.90	1.46	3.58	±5	2025/1/8
835	22.5	0.939	43.100	0.90	41.50	4.33	3.86	±5	2025/1/8
1750	22.5	1.370	40.800	1.37	40.10	0.00	1.75	±5	2025/1/8
1900	22.5	1.420	39.400	1.40	40.00	1.43	-1.50	±5	2025/1/8
2300	22.3	1.630	39.300	1.67	39.50	-2.40	-0.51	±5	2025/1/6
2600	22.3	1.970	38.100	1.96	39.00	0.51	-2.31	±5	2025/1/6
2600	22.6	1.970	39.700	1.96	39.00	0.51	1.79	±5	2025/1/9
3500	22.4	2.950	37.100	2.91	37.90	1.37	-2.11	±5	2025/1/7
3500	22.6	3.010	37.900	2.91	37.90	3.44	0.00	±5	2025/1/9
3700	22.4	3.130	36.900	3.12	37.70	0.32	-2.12	±5	2025/1/7
3700	22.6	3.200	37.600	3.12	37.70	2.56	-0.27	±5	2025/1/9
3900	22.4	3.330	36.600	3.33	37.51	0.00	-2.43	±5	2025/1/7
3900	22.6	3.410	37.300	3.33	37.51	2.40	-0.56	±5	2025/1/9

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 (%)	Test Site
2025/1/8	750	50	D750V3-1107	EX3DV4 - SN7625	DAE4ip Sn1800	0.426	8.540	8.52	-0.23	SAR-18
2025/1/8	835	50	D835V2-4d167	EX3DV4 - SN7625	DAE4ip Sn1800	0.515	9.800	10.3	5.10	SAR-18
2025/1/8	1750	50	D1750V2-1112	EX3DV4 - SN7625	DAE4ip Sn1800	1.870	36.900	37.4	1.36	SAR-18
2025/1/8	1900	50	D1900V2-5d185	EX3DV4 - SN7625	DAE4ip Sn1800	1.940	39.000	38.8	-0.51	SAR-18
2025/1/6	2300	50	D2300V2-1088	EX3DV4 - SN7625	DAE4ip Sn1800	2.290	48.200	45.8	-4.98	SAR-18
2025/1/6	2600	50	D2600V2-1078	EX3DV4 - SN7625	DAE4ip Sn1800	2.900	55.400	58	4.69	SAR-18
2025/1/9	2600	50	D2600V2-1008	EX3DV4 - SN7625	DAE4ip Sn1800	2.740	55.700	54.8	-1.62	SAR-18
2025/1/7	3500	50	D3500V2-1036	EX3DV4 - SN7625	DAE4ip Sn1800	3.290	67.400	65.8	-2.37	SAR-18
2025/1/9	3500	50	D3500V2-1036	EX3DV4 - SN7625	DAE4ip Sn1800	3.270	67.400	65.4	-2.97	SAR-18
2025/1/7	3700	50	D3700V2-1022	EX3DV4 - SN7625	DAE4ip Sn1800	3.410	68.100	68.2	0.15	SAR-18
2025/1/9	3700	50	D3700V2-1022	EX3DV4 - SN7625	DAE4ip Sn1800	3.430	68.100	68.6	0.73	SAR-18
2025/1/7	3900	50	D3900V2-1092	EX3DV4 - SN7625	DAE4ip Sn1800	3.350	67.000	67	0.00	SAR-18
2025/1/9	3900	50	D3900V2-1092	EX3DV4 - SN7625	DAE4ip Sn1800	3.120	67.000	62.4	-6.87	SAR-18

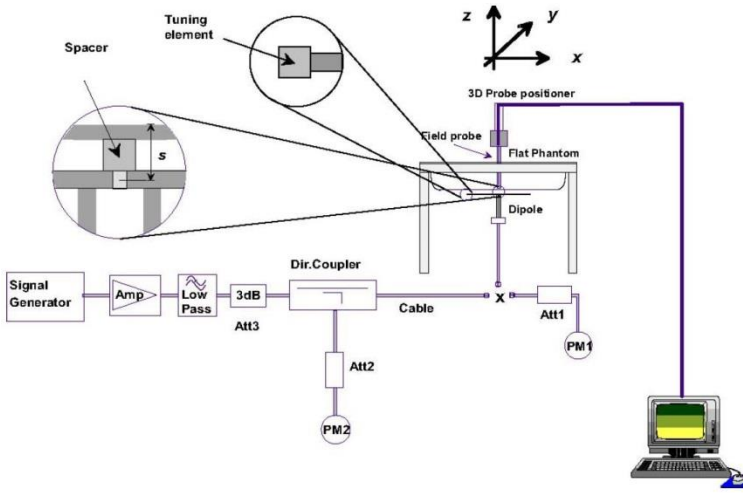


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

11. UL carrier aggregation

<LTE UL carrier aggregation>

General Note:

i. The device supports intra-band uplink carrier aggregation with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre 3GPP requirement.

ii. The device supports uplink carrier aggregation with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre the 3GPP requirement.

iii. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

iv. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

v. Additional SAR measurement for LTE UL CA whit other DL CA combinations active were not required since the maximum output power for this configuration was not > 0.25dB higher than the maximum output power for UL CA active.

2CC Uplink Carrier Aggregation	
Number	Combination
1	2C
2	5B
3	7B
4	7C
5	12B
6	66B
7	66C
8	38C
6	41C
9	42C
10	43C
11	48B
12	48C

Main Sensor Off

CA_2C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
18700	18898	QPSK	1	0	0	0	1	0	23.33	24.5
18900	18702	QPSK	1	0	0	0	1	0	23.35	24.5
19100	18902	QPSK	1	0	0	0	1	0	23.21	24.5

CA_5B										
Combination 10MHz+10MHz (50RB+50RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20450	20549	QPSK	1	0	0	0	1	0	23.44	24.5
20475	20574	QPSK	1	0	0	0	1	0	23.45	24.5
20600	20501	QPSK	1	0	0	0	1	0	23.41	24.5

CA_7B										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20825	20918	QPSK	1	0	0	0	1	0	22.66	24.5
21076	21169	QPSK	1	0	0	0	1	0	22.79	24.5
21327	21420	QPSK	1	0	0	0	1	0	22.54	24.5

CA_7C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20850	21048	QPSK	1	0	0	0	1	0	22.64	24.5
21100	20902	QPSK	1	0	0	0	1	0	22.85	24.5
21350	21152	QPSK	1	0	0	0	1	0	22.66	24.5

CA_12B										
Combination 5MHz+10MHz (25RB+50RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
23038	23110	QPSK	0	0	1	0	1	0	23.61	24.5
23048	23120	QPSK	0	0	1	0	1	0	23.62	24.5
23058	23130	QPSK	0	0	1	0	1	0	23.54	24.5

CA_66B										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132047	132140	QPSK	1	0	0	0	1	0	23.22	24.5
132322	132229	QPSK	1	0	0	0	1	0	23.27	24.5
132597	132504	QPSK	1	0	0	0	1	0	23.25	24.5

CA_66C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132072	132270	QPSK	1	0	0	0	1	0	23.25	24.5
132322	132124	QPSK	1	0	0	0	1	0	23.29	24.5
132572	132374	QPSK	1	0	0	0	1	0	23.26	24.5

CA_38C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
37850	38048	QPSK	1	0	0	0	1	0	23.22	24.5
37901	38099	QPSK	1	0	0	0	1	0	23.25	24.5
38150	37952	QPSK	1	0	0	0	1	0	23.14	24.5

CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	0	0	0	1	0	23.25	25
40185	39987	QPSK	1	0	0	0	1	0	23.41	25
40620	40422	QPSK	1	0	0	0	1	0	23.31	25
41055	40857	QPSK	1	0	0	0	1	0	23.19	25
41490	41292	QPSK	1	0	0	0	1	0	23.25	25

CA_42C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
42190	42388	QPSK	1	0	0	0	1	0	22.98	24.5
42590	42788	QPSK	1	0	0	0	1	0	22.99	24.5
42990	42792	QPSK	1	0	0	0	1	0	22.97	24.5

CA_43C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
44190	44388	QPSK	1	0	0	0	1	0	23.01	24.5
44215	44017	QPSK	1	0	0	0	1	0	23.02	24.5
44240	44042	QPSK	1	0	0	0	1	0	22.99	24.5

CA_43C_Part 27O										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
44690	44888	QPSK	1	0	0	0	1	0	23	24.5
45090	44689	QPSK	1	0	0	0	1	0	23.02	24.5
45490	45292	QPSK	1	0	0	0	1	0	22.88	24.5

CA_48B										
Combination 10MHz+10MHz (50RB+50RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55439	QPSK	1	0	0	0	1	0	20.65	21.8
55830	55731	QPSK	1	0	0	0	1	0	20.64	21.8
56150	56051	QPSK	1	0	0	0	1	0	20.59	21.8
56640	56441	QPSK	1	0	0	0	1	0	20.45	21.8

CA_48C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55538	QPSK	1	0	0	0	1	0	20.66	21.8
55830	55632	QPSK	1	0	0	0	1	0	20.65	21.8
56150	55952	QPSK	1	0	0	0	1	0	20.56	21.8
56640	56442	QPSK	1	0	0	0	1	0	20.43	21.8

MIMO2 Sensor Off

CA_2C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	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	24.5
18900	18702	QPSK	1	0	0	0	1	0	23.29	24.5
19100	18902	QPSK	1	0	0	0	1	0	23.22	24.5

CA_7B										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20825	20918	QPSK	1	0	0	0	1	0	22.74	24.5
21076	21169	QPSK	1	0	0	0	1	0	22.8	24.5
21327	21420	QPSK	1	0	0	0	1	0	22.6	24.5

CA_7C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20850	21048	QPSK	1	0	0	0	1	0	22.89	24.5
21100	20902	QPSK	1	0	0	0	1	0	22.91	24.5
21350	21152	QPSK	1	0	0	0	1	0	22.84	24.5

CA_66B										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132047	132140	QPSK	1	0	0	0	1	0	23.84	24.5
132322	132229	QPSK	1	0	0	0	1	0	23.88	24.5
132597	132504	QPSK	1	0	0	0	1	0	23.86	24.5

CA_66C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132072	132270	QPSK	1	0	0	0	1	0	23.91	24.5
132322	132124	QPSK	1	0	0	0	1	0	23.94	24.5
132572	132374	QPSK	1	0	0	0	1	0	23.92	24.5

CA_38C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
37850	38048	QPSK	1	0	0	0	1	0	22.94	24.5
37901	38099	QPSK	1	0	0	0	1	0	22.95	24.5
38150	37952	QPSK	1	0	0	0	1	0	22.92	24.5

CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	0	0	0	1	0	23.04	25
40185	39987	QPSK	1	0	0	0	1	0	23.11	25
40620	40422	QPSK	1	0	0	0	1	0	23.09	25
41055	40857	QPSK	1	0	0	0	1	0	23.02	25
41490	41292	QPSK	1	0	0	0	1	0	23.05	25

CA_42C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
42190	42388	QPSK	1	0	0	0	1	0	23.66	24.5
42590	42788	QPSK	1	0	0	0	1	0	23.67	24.5
42990	42792	QPSK	1	0	0	0	1	0	23.64	24.5

CA_43C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
44190	44388	QPSK	1	0	0	0	1	0	23.11	24.5
44215	44017	QPSK	1	0	0	0	1	0	23.18	24.5
44240	44042	QPSK	1	0	0	0	1	0	23.08	24.5

CA_43C_Part 27O										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
44690	44888	QPSK	1	0	0	0	1	0	23.08	24.5
45090	44689	QPSK	1	0	0	0	1	0	23.11	24.5
45490	45292	QPSK	1	0	0	0	1	0	23.1	24.5

CA_48B										
Combination 10MHz+10MHz (50RB+50RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55439	QPSK	1	0	0	0	1	0	21.04	21.8
55830	55731	QPSK	1	0	0	0	1	0	21.02	21.8
56150	56051	QPSK	1	0	0	0	1	0	20.92	21.8
56640	56441	QPSK	1	0	0	0	1	0	20.88	21.8

CA_48C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55538	QPSK	1	0	0	0	1	0	21.02	21.8
55830	55632	QPSK	1	0	0	0	1	0	21.09	21.8
56150	55952	QPSK	1	0	0	0	1	0	20.99	21.8
56640	56442	QPSK	1	0	0	0	1	0	20.92	21.8

MIMO2 Sensor On

CA_2C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	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	24.5
18900	18702	QPSK	1	0	0	0	1	0	23.29	24.5
19100	18902	QPSK	1	0	0	0	1	0	23.22	24.5

CA_7B										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20825	20918	QPSK	1	0	0	0	1	0	22.74	24.5
21076	21169	QPSK	1	0	0	0	1	0	22.8	24.5
21327	21420	QPSK	1	0	0	0	1	0	22.6	24.5

CA_7C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
20850	21048	QPSK	1	0	0	0	1	0	22.89	24.5
21100	20902	QPSK	1	0	0	0	1	0	22.91	24.5
21350	21152	QPSK	1	0	0	0	1	0	22.84	24.5

CA_66B										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132047	132140	QPSK	1	0	0	0	1	0	23.84	24.5
132322	132229	QPSK	1	0	0	0	1	0	23.88	24.5
132597	132504	QPSK	1	0	0	0	1	0	23.86	24.5

CA_66C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132072	132270	QPSK	1	0	0	0	1	0	23.91	24.5
132322	132124	QPSK	1	0	0	0	1	0	23.94	24.5
132572	132374	QPSK	1	0	0	0	1	0	23.92	24.5

CA_38C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
37850	38048	QPSK	1	0	0	0	1	0	22.94	24.5
37901	38099	QPSK	1	0	0	0	1	0	22.95	24.5
38150	37952	QPSK	1	0	0	0	1	0	22.92	24.5

CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	0	0	0	1	0	23.04	25
40185	39987	QPSK	1	0	0	0	1	0	23.11	25
40620	40422	QPSK	1	0	0	0	1	0	23.09	25
41055	40857	QPSK	1	0	0	0	1	0	23.02	25
41490	41292	QPSK	1	0	0	0	1	0	23.05	25

CA_42C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
42190	42388	QPSK	1	0	0	0	1	0	19.77	21
42590	42788	QPSK	1	0	0	0	1	0	19.84	21
42990	42792	QPSK	1	0	0	0	1	0	19.71	21

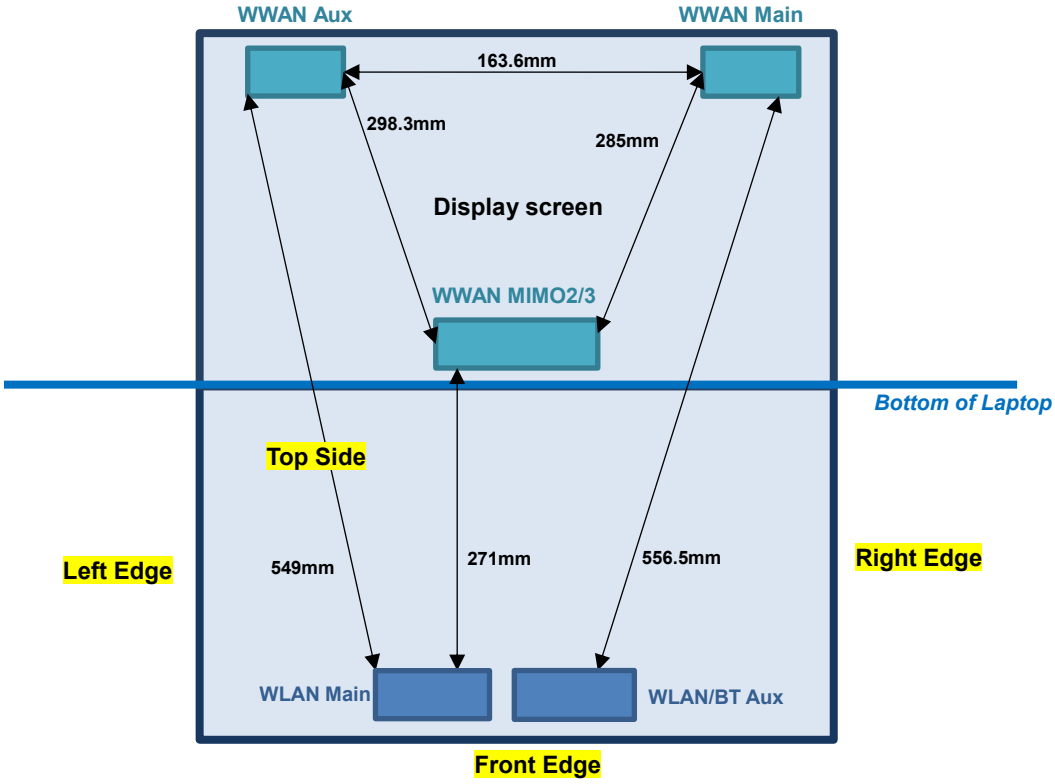
CA_43C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
44190	44388	QPSK	1	0	0	0	1	0	22.21	23.5
44215	44017	QPSK	1	0	0	0	1	0	22.32	23.5
44240	44042	QPSK	1	0	0	0	1	0	22.19	23.5

CA_43C_Part 27O										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
44690	44888	QPSK	1	0	0	0	1	0	22.21	23.5
45090	44689	QPSK	1	0	0	0	1	0	22.25	23.5
45490	45292	QPSK	1	0	0	0	1	0	22.15	23.5

CA_48B										
Combination 10MHz+10MHz (50RB+50RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55439	QPSK	1	0	0	0	1	0	19.04	20.5
55830	55731	QPSK	1	0	0	0	1	0	19.05	20.5
56150	56051	QPSK	1	0	0	0	1	0	19.1	20.5
56640	56441	QPSK	1	0	0	0	1	0	19.09	20.5

CA_48C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dBm)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55538	QPSK	1	0	0	0	1	0	19.1	20.5
55830	55632	QPSK	1	0	0	0	1	0	19.15	20.5
56150	55952	QPSK	1	0	0	0	1	0	19.08	20.5
56640	56442	QPSK	1	0	0	0	1	0	19.09	20.5

12. Antenna Location



The separation distance for antenna to edge :

Antenna	To Bottom Side (mm)
WWAN Main	297.2
WWAN Aux	297.2
WWAN MIMO2/3	29.7
WLAN Main	10
WLAN/BT Aux	10

<SAR test exclusion table>

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	LTE Band 12	LTE Band 13	LTE Band 14	LTE Band 17	LTE Band 5	LTE Band 26	LTE Band 4	LTE Band 66	LTE Band 2	LTE Band 25	LTE Band 30	LTE Band 7	LTE Band 38	LTE Band 41	LTE Band 42	LTE Band 48	LTE Band n77	LTE Band n78
Exposure Position	Calculated Frequency (MHz)	846	1750	1907	695	715	784	795	713	848	848	1754	1779	1909	1914	2312	2567	2617	2687	3597	3697	3650	3650
	Maximum power (dBm)	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	23.0	24.5	25.0	25.0	24.5	21.8	25.1	25.1
	Maximum rated power(mW)	281.84	281.84	281.84	281.84	281.84	281.84	281.84	281.84	281.84	281.84	281.84	281.84	281.84	281.84	199.53	281.84	316.23	316.23	281.84	151.36	323.59	323.59
Bottom Side	Separation distance(mm)	297.2																					
	exclusion threshold	1557.0	2585.0	2580.0	1325.0	1355.0	1461.0	1478.0	1352.0	1560.0	1560.0	2585.0	2584.0	2580.0	2580.0	2570.0	2565.0	2564.0	2563.0	2551.0	2550.0	2550.0	2550.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

<MIMO2 Ant>

	Wireless Interface	LTE Band 4	LTE Band 66	LTE Band 2	LTE Band 25	LTE Band 30	LTE Band 7	LTE Band 38	LTE Band 41	LTE Band 42	LTE Band 48	LTE Band n77	LTE Band n78
Exposure Position	Calculated Frequency (MHz)	1754	1779	1909	1914	2312	2567	2617	2687	3597	3697	3650	3650
	Maximum power (dBm)	24.5	24.5	24.5	24.5	23.0	24.5	25.0	25.0	24.5	21.8	25.1	25.1
	Maximum rated power(mW)	281.84	281.84	281.84	281.84	199.53	281.84	316.23	316.23	281.84	151.36	323.59	323.59
Bottom Side	Separation distance(mm)	29.7											
	exclusion threshold	12.6	12.7	13.1	13.1	10.2	15.2	17.2	17.5	18.0	9.8	20.8	20.8
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

<MIMO3 Ant>

Exposure Position	Wireless Interface	LTE Band 41	LTE Band n77	LTE Band n78
	Calculated Frequency (MHz)	2687	3650	3650
	Maximum power (dBm)	25.0	25.1	25.1
	Maximum rated power(mW)	316.23	323.59	323.59
Bottom Side	Separation distance(mm)	29.7		
	exclusion threshold	17.5	20.8	20.8
	Testing required?	**Yes**	**Yes**	**Yes**

<Aux Ant>

Exposure Position	Wireless Interface	LTE Band 41	LTE Band n77	LTE Band n78
	Calculated Frequency (MHz)	2687	3650	3650
	Maximum power (dBm)	25.0	25.1	25.1
	Maximum rated power(mW)	316.23	323.59	323.59
Bottom Side	Separation distance(mm)	297.2		
	exclusion threshold	2563.0	2550.0	2550.0
	Testing required?	**No**	**No**	**No**

13. 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.

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 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 to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA, 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.

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 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

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

13.1 Body SAR

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	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)
01	LTE Band 7_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	21100	2535	Auden	23.22	24.50	1.343			0.11	0.555	0.745
	LTE Band 7_Ant MIMO2	20M	QPSK	50	0	Bottom Side	0mm	OFF	21100	2535	Auden	22.12	23.50	1.374			0.01	0.463	0.636
	LTE Band 7B_Ant MIMO2	15M	QPSK	1	0	Bottom Side	0mm	OFF	21076+21169	2535	Auden	22.80	24.50	1.479			0.09	0.484	0.716
	LTE Band 7C_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	21100+20902	2535	Auden	22.91	24.50	1.442			0.01	0.500	0.721
	LTE Band 7_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	21100	2535	WNC	23.22	24.50	1.343			-0.01	0.431	0.579
02	LTE Band 25_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	26340	1880	Auden	23.53	24.50	1.250			0.14	0.173	0.216
	LTE Band 25_Ant MIMO2	20M	QPSK	50	0	Bottom Side	0mm	OFF	26340	1880	Auden	22.59	23.50	1.233			0.03	0.136	0.168
	LTE Band 2C_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	18900+18702	1880	Auden	23.29	24.50	1.321			0.02	0.155	0.205
	LTE Band 25_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	26340	1880	WNC	23.53	24.50	1.250			-0.08	0.087	0.109
03	LTE Band 30_Ant MIMO2	10M	QPSK	1	0	Bottom Side	0mm	OFF	27710	2310	Auden	22.21	23.00	1.199			-0.1	0.188	0.226
	LTE Band 30_Ant MIMO2	10M	QPSK	25	0	Bottom Side	0mm	OFF	27710	2310	Auden	21.38	22.00	1.153			-0.18	0.153	0.176
	LTE Band 30_Ant MIMO2	10M	QPSK	1	0	Bottom Side	0mm	OFF	27710	2310	WNC	22.21	23.00	1.199			0.1	0.074	0.089
	LTE Band 41_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	40185	2549.5	Auden	23.16	25.00	1.528	62.9	1.006	0.11	0.232	0.357
04	LTE Band 41_Ant MIMO2	20M	QPSK	50	0	Bottom Side	0mm	OFF	40185	2549.5	Auden	22.24	24.00	1.500	62.9	1.006	0.02	0.213	0.321
	LTE Band 41C_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	40185+39987	2549.5	Auden	23.11	25.00	1.545	62.9	1.006	0.07	0.201	0.312
	LTE Band 41_HPUE_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	40185	2549.5	Auden	25.18	27.00	1.521	42.9	1.009	0.16	0.229	0.351
	LTE Band 41_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	40185	2549.5	WNC	23.16	25.00	1.528	62.9	1.006	-0.03	0.209	0.321
	LTE Band 42_Ant MIMO2	20M	QPSK	1	0	Bottom Side	17mm	OFF	42590	3500	Auden	23.85	24.50	1.161	62.9	1.006	-0.15	0.286	0.334
	LTE Band 42_Ant MIMO2	20M	QPSK	50	50	Bottom Side	17mm	OFF	42590	3500	Auden	22.94	23.50	1.138	62.9	1.006	0.02	0.235	0.269
05	LTE Band 42_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	42590	3500	Auden	19.86	21.00	1.300	62.9	1.006	0.02	0.454	0.594
	LTE Band 42_Ant MIMO2	20M	QPSK	50	50	Bottom Side	0mm	ON	42590	3500	Auden	19.55	21.00	1.396	62.9	1.006	0.07	0.367	0.516
	LTE Band 42C_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	42590+42788	3500	Auden	19.84	21.00	1.306	62.9	1.006	-0.05	0.418	0.549
	LTE Band 42_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	42590	3500	WNC	19.86	21.00	1.300	62.9	1.006	0.16	0.263	0.344
	LTE Band 43_Ant MIMO2	20M	QPSK	1	0	Bottom Side	17mm	OFF	44090	3650	Auden	23.36	24.50	1.300	62.9	1.006	-0.07	0.191	0.250
	LTE Band 43_Ant MIMO2	20M	QPSK	50	24	Bottom Side	17mm	OFF	44090	3650	Auden	22.51	23.50	1.256	62.9	1.006	0.05	0.158	0.200
	LTE Band 43_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	44090	3650	Auden	22.50	23.50	1.259	62.9	1.006	0.08	0.468	0.593
	LTE Band 43_Ant MIMO2	20M	QPSK	50	24	Bottom Side	0mm	ON	44090	3650	Auden	22.23	23.50	1.340	62.9	1.006	-0.11	0.431	0.581
	LTE Band 43C_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	44215+44017	3662.5	Auden	22.32	23.50	1.312	62.9	1.006	-0.01	0.411	0.543
	LTE Band 43_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	44090	3650	WNC	22.50	23.50	1.259	62.9	1.006	-0.12	0.460	0.583
	LTE Band 43_Ant MIMO2	20M	QPSK	1	0	Bottom Side	17mm	OFF	45090	3750	Auden	23.19	24.50	1.352	62.9	1.006	0.18	0.200	0.272
	LTE Band 43_Ant MIMO2	20M	QPSK	50	0	Bottom Side	17mm	OFF	45090	3750	Auden	22.37	23.50	1.297	62.9	1.006	0.16	0.168	0.219
	LTE Band 43_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	45090	3750	Auden	22.40	23.50	1.288	62.9	1.006	-0.1	0.462	0.599
	LTE Band 43_Ant MIMO2	20M	QPSK	50	0	Bottom Side	0mm	ON	45090	3750	Auden	22.11	23.50	1.377	62.9	1.006	0.07	0.431	0.597
	LTE Band 43C_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	45090+44689	3750	Auden	22.25	23.50	1.334	62.9	1.006	-0.08	0.422	0.566
	LTE Band 43_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	45090	3750	WNC	22.40	23.50	1.288	62.9	1.006	0.18	0.466	0.604
	LTE Band 43_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	45490	3790	WNC	22.24	23.50	1.337	62.9	1.006	-0.1	0.420	0.565
06	LTE Band 43_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	44690	3710	WNC	22.32	23.50	1.312	62.9	1.006	0.18	0.479	0.632
	LTE Band 48_Ant MIMO2	20M	QPSK	1	0	Bottom Side	17mm	OFF	55830	3609	Auden	21.13	21.80	1.167	62.9	1.006	-0.08	0.088	0.103
	LTE Band 48_Ant MIMO2	20M	QPSK	50	24	Bottom Side	17mm	OFF	55830	3609	Auden	20.26	20.80	1.132	62.9	1.006	0.05	0.073	0.083
	LTE Band 48_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	55830	3609	Auden	19.30	20.50	1.318	62.9	1.006	0.06	0.182	0.241
	LTE Band 48_Ant MIMO2	20M	QPSK	50	24	Bottom Side	0mm	ON	55830	3609	Auden	19.11	20.50	1.377	62.9	1.006	-0.09	0.172	0.238
	LTE Band 48B_Ant MIMO2	10M	QPSK	1	0	Bottom Side	0mm	ON	55830+55731	3609	Auden	19.05	20.50	1.396	62.9	1.006	0.09	0.115	0.162
	LTE Band 48C_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	55830+55632	3609	Auden	19.15	20.50	1.365	62.9	1.006	0.09	0.122	0.167
07	LTE Band 48_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	ON	55340	3560	WNC	19.22	20.50	1.343	62.9	1.006	0.16	0.229	0.309
08	LTE Band 66_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	132322	1745	Auden	24.00	24.50	1.122			0.04	0.316	0.355
	LTE Band 66_Ant MIMO2	20M	QPSK	50	0	Bottom Side	0mm	OFF	132322	1745	Auden	23.00	23.50	1.122			0.12	0.269	0.302
	LTE Band 66B_Ant MIMO2	15M	QPSK	1	0	Bottom Side	0mm	OFF	132322+132229	1745	Auden	23.88	24.50	1.153			0.09	0.251	0.290
	LTE Band 66C_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	132322+132124	1745	Auden	23.94	24.50	1.138			0.08	0.266	0.303
	LTE Band 66_Ant MIMO2	20M	QPSK	1	0	Bottom Side	0mm	OFF	132322	1745	WNC	24.00	24.50	1.122			0.03	0.294	0.330

<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	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)
09	FR1 n7_Ant MIMO2	40M	BPSK	1	1	Bottom Side	0mm	OFF	507000	2535	Auden	23.40	24.50	1.288	0.13	0.300	0.386
	FR1 n7_Ant MIMO2	40M	BPSK	108	54	Bottom Side	0mm	OFF	507000	2535	Auden	23.07	24.50	1.390	0.03	0.263	0.366
	FR1 n7_Ant MIMO2	40M	BPSK	1	1	Bottom Side	0mm	OFF	507000	2535	WNC	23.40	24.50	1.288	-0.08	0.286	0.368
10	FR1 n25_Ant MIMO2	40M	BPSK	1	1	Bottom Side	0mm	OFF	376500	1882.5	Auden	23.90	24.60	1.175	0.14	0.175	0.206
	FR1 n25_Ant MIMO2	40M	BPSK	108	54	Bottom Side	0mm	OFF	376500	1882.5	Auden	23.84	24.60	1.191	0.12	0.146	0.174
	FR1 n25_Ant MIMO2	40M	BPSK	1	1	Bottom Side	0mm	OFF	376500	1882.5	WNC	23.90	24.60	1.175	0.03	0.166	0.195
11	FR1 n30_Ant MIMO2	10M	BPSK	1	1	Bottom Side	0mm	OFF	462000	2310	Auden	21.79	23.00	1.321	0.15	0.140	0.185
	FR1 n30_Ant MIMO2	10M	BPSK	25	14	Bottom Side	0mm	OFF	462000	2310	Auden	21.64	23.00	1.368	0.12	0.134	0.183
	FR1 n30_Ant MIMO2	10M	BPSK	1	1	Bottom Side	0mm	OFF	462000	2310	WNC	21.79	23.00	1.321	0.08	0.114	0.151
12	FR1 n66_Ant MIMO2	40M	BPSK	1	1	Bottom Side	0mm	OFF	349000	1745	Auden	23.99	24.50	1.125	0.04	0.437	0.491
	FR1 n66_Ant MIMO2	40M	BPSK	108	54	Bottom Side	0mm	OFF	349000	1745	Auden	23.97	24.50	1.130	0.03	0.403	0.455
	FR1 n66_Ant MIMO2	40M	BPSK	1	1	Bottom Side	0mm	OFF	349000	1745	WNC	23.99	24.50	1.125	-0.08	0.436	0.490
	FR1 n70_Ant MIMO2	15M	BPSK	1	1	Bottom Side	0mm	OFF	340500	1702.5	Auden	23.31	24.60	1.346	0.01	0.270	0.363
13	FR1 n70_Ant MIMO2	15M	BPSK	36	22	Bottom Side	0mm	OFF	340500	1702.5	Auden	23.25	24.60	1.365	0.04	0.365	0.498
	FR1 n70_Ant MIMO2	15M	BPSK	36	22	Bottom Side	0mm	OFF	340500	1702.5	WNC	23.25	24.60	1.365	0.06	0.353	0.482
14	FR1 n41_Ant MIMO2	100M	BPSK	1	1	Bottom Side	0mm	OFF	518598	2592.99	Auden	23.92	25.00	1.282	0.05	0.552	0.708
	FR1 n41_Ant MIMO2	100M	BPSK	135	69	Bottom Side	0mm	OFF	518598	2592.99	Auden	23.12	25.00	1.542	-0.17	0.425	0.655
	FR1 n41_Ant MIMO2	100M	BPSK	270	0	Bottom Side	0mm	OFF	518598	2592.99	Auden	22.59	24.50	1.552	-0.03	0.392	0.609
	FR1 n41_HPUE_Ant MIMO2	100M	BPSK	1	1	Bottom Side	0mm	OFF	518598	2592.99	Auden	25.96	27.00	1.271	0.14	0.418	0.531
	FR1 n41_Ant MIMO2	100M	BPSK	1	1	Bottom Side	0mm	OFF	518598	2592.99	WNC	23.92	25.00	1.282	0.11	0.309	0.396
	FR1 n41_Ant MIMO 3	100M	BPSK	1	1	Bottom Side	0mm	OFF	518598	2592.99	Auden	23.38	25.00	1.452	0.13	0.339	0.492
	FR1 n41_Ant MIMO 3	100M	BPSK	135	69	Bottom Side	0mm	OFF	518598	2592.99	Auden	23.25	25.00	1.496	0.18	0.230	0.344
	FR1 n41_HPUE_Ant MIMO 3	100M	BPSK	1	1	Bottom Side	0mm	OFF	518598	2592.99	Auden	25.86	27.00	1.300	0.14	0.316	0.411
	FR1 n41_Ant MIMO 3	100M	BPSK	1	1	Bottom Side	0mm	OFF	518598	2592.99	WNC	23.38	25.00	1.452	-0.17	0.161	0.234
	FR1 n48_Ant MIMO2	40M	BPSK	1	1	Bottom Side	17mm	OFF	641666	3624.99	Auden	20.72	21.80	1.282	-0.1	0.184	0.236
	FR1 n48_Ant MIMO2	40M	BPSK	50	28	Bottom Side	17mm	OFF	641666	3624.99	Auden	20.69	21.80	1.291	0.07	0.181	0.234
15	FR1 n48_Ant MIMO2	40M	BPSK	1	1	Bottom Side	0mm	ON	641666	3624.99	Auden	19.52	21.00	1.406	0.05	0.492	0.692
	FR1 n48_Ant MIMO2	40M	BPSK	50	28	Bottom Side	0mm	ON	641666	3624.99	Auden	19.42	21.00	1.439	0.18	0.475	0.683
	FR1 n48_Ant MIMO2	40M	BPSK	1	1	Bottom Side	0mm	ON	641666	3624.99	WNC	19.52	21.00	1.406	-0.1	0.475	0.668
16	FR1 n77_Ant MIMO2	100M	BPSK	1	1	Bottom Side	17mm	OFF	656000	3840	Auden	23.61	25.10	1.409	0.04	0.596	0.840
	FR1 n77_Ant MIMO2	100M	BPSK	135	0	Bottom Side	17mm	OFF	656000	3840	Auden	22.82	24.60	1.507	0.19	0.554	0.835
	FR1 n77_Ant MIMO2	100M	BPSK	1	1	Bottom Side	0mm	ON	656000	3840	Auden	18.05	19.00	1.245	0.03	0.436	0.543
	FR1 n77_Ant MIMO2	100M	BPSK	135	0	Bottom Side	0mm	ON	656000	3840	Auden	17.91	19.00	1.285	-0.15	0.453	0.582
	FR1 n77_HPUE_Ant MIMO2	100M	BPSK	1	1	Bottom Side	17mm	OFF	656000	3840	Auden	25.75	26.00	1.059	-0.15	0.455	0.482
	FR1 n77_Ant MIMO2	100M	BPSK	1	1	Bottom Side	17mm	OFF	656000	3840	WNC	23.61	25.10	1.409	0.11	0.531	0.748
	FR1 n77_Ant MIMO 3	100M	BPSK	1	1	Bottom Side	0mm	ON	656000	3840	Auden	19.40	20.00	1.148	-0.13	0.392	0.450
	FR1 n77_Ant MIMO 3	100M	BPSK	135	138	Bottom Side	0mm	ON	656000	3840	Auden	18.83	20.00	1.309	0.06	0.338	0.443
	FR1 n77_HPUE_Ant MIMO 3	100M	BPSK	1	1	Bottom Side	0mm	ON	656000	3840	Auden	22.40	23.00	1.148	-0.03	0.375	0.431
	FR1 n77_Ant MIMO 3	100M	BPSK	1	1	Bottom Side	0mm	ON	656000	3840	WNC	19.40	20.00	1.148	-0.05	0.510	0.586
	FR1 n77_Ant MIMO2	100M	BPSK	1	1	Bottom Side	17mm	OFF	633332	3499.98	Auden	23.99	25.10	1.291	-0.08	0.592	0.764
	FR1 n77_Ant MIMO2	100M	BPSK	135	0	Bottom Side	17mm	OFF	633332	3499.98	Auden	23.12	24.60	1.406	-0.01	0.571	0.803
	FR1 n77_Ant MIMO2	100M	BPSK	270	0	Bottom Side	17mm	OFF	633332	3499.98	Auden	23.02	24.60	1.439	-0.17	0.556	0.800
	FR1 n77_Ant MIMO2	100M	BPSK	1	1	Bottom Side	0mm	ON	633332	3499.98	Auden	18.32	19.00	1.169	-0.08	0.516	0.603
	FR1 n77_Ant MIMO2	100M	BPSK	135	0	Bottom Side	0mm	ON	633332	3499.98	Auden	18.18	19.00	1.208	-0.04	0.547	0.661
	FR1 n77_HPUE_Ant MIMO2	100M	BPSK	1	1	Bottom Side	17mm	OFF	633332	3499.98	Auden	25.99	26.00	1.002	-0.08	0.493	0.494
	FR1 n77_Ant MIMO2	100M	BPSK	135	0	Bottom Side	17mm	OFF	633332	3499.98	WNC	23.12	24.60	1.406	0.17	0.535	0.752
	FR1 n77_Ant MIMO 3	100M	BPSK	1	1	Bottom Side	0mm	ON	633332	3499.98	Auden	18.90	20.00	1.288	0.18	0.538	0.693
	FR1 n77_Ant MIMO 3	100M	BPSK	135	0	Bottom Side	0mm	ON	633332	3499.98	Auden	18.77	20.00	1.327	-0.05	0.563	0.747
	FR1 n77_HPUE_Ant MIMO 3	100M	BPSK	1	1	Bottom Side	0mm	ON	633332	3499.98	Auden	21.92	23.00	1.282	-0.04	0.531	0.681
	FR1 n77_Ant MIMO 3	100M	BPSK	135	0	Bottom Side	0mm	ON	633332	3499.98	WNC	18.77	20.00	1.327	-0.08	0.563	0.747

13.2 Power Class 2 and Power Class 3 Linearity

General Note:
This device support Power Class 2 and Power Class 3 operations. 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 and 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%

	LTE Band 41_Ant Main	LTE Band 41_Ant Main
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	25	27
Reported 1g SAR (W/kg)	0.357	0.351
Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	200.17	217.01
Linearity SAR(W/kg)	0.39	
% deviation from expected linearity		-9.31%

	FR1 n41_Ant MIMO2	FR1 n41_Ant MIMO2
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	25	27
Reported 1g SAR (W/kg)	0.708	0.531
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	316.23	250.59
Linearity SAR(W/kg)	0.56	
% deviation from expected linearity		-5.36%

	FR1 n77_Ant MIMO2	FR1 n77_Ant MIMO2
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	25.1	26
Reported 1g SAR (W/kg)	0.84	0.482
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	323.59	199.05
Linearity SAR(W/kg)	0.52	
% deviation from expected linearity		-6.72%

	FR1 n41_Ant MIMO3	FR1 n41_Ant MIMO3
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	25	27
Reported 1g SAR (W/kg)	0.492	0.411
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	316.23	250.59
Linearity SAR(W/kg)	0.39	
% deviation from expected linearity		5.42%

	FR1 n77_Ant MIMO3	FR1 n77_Ant MIMO3
	(Power Class 3)	(Power Class 2)
Maximum Tune up Power (dBm)	20	23
Reported 1g SAR (W/kg)	0.747	0.681
Duty Cycle	100.00%	50.00%
Frame Averaged (mW)	100.00	99.76
Linearity SAR(W/kg)	0.75	
% deviation from expected linearity		-8.62%

14. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Body
1.	WWAN Main + WWAN MIMO2 + WLAN2.4GHz Main / WLAN2.4GHz Aux + NFC	Yes
2.	WWAN Main + WWAN MIMO2 + WLAN2.4GHz Main + Bluetooth Aux + NFC	Yes
3.	WWAN Main + WWAN MIMO2 + WLAN5/6GHz Main / WLAN5/6GHz Aux + Bluetooth Aux + NFC	Yes
4.	WWAN Main + WWAN MIMO2 + WLAN2.4GHz MIMO + NFC	Yes
5.	WWAN Main + WWAN MIMO2 + WLAN5/6GHz MIMO + Bluetooth Aux + NFC	Yes
6.	WWAN Main + WWAN MIMO3 + WLAN2.4GHz Main / WLAN2.4GHz Aux + NFC	Yes
7.	WWAN Main + WWAN MIMO3 + WLAN2.4GHz Main + Bluetooth Aux + NFC	Yes
8.	WWAN Main + WWAN MIMO3 + WLAN5/6GHz Main / WLAN5/6GHz Aux + Bluetooth Aux + NFC	Yes
9.	WWAN Main + WWAN MIMO3 + WLAN2.4GHz MIMO + NFC	Yes
10.	WWAN Main + WWAN MIMO3 + WLAN5/6GHz MIMO + Bluetooth Aux + NFC	Yes

General Note:

1. The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
2. WLAN RF exposure assessment of MIMO mode simultaneous transmission exclusion analysis was performed with SAR test results of each antenna in SISO mode. Therefore SPLSR calculation was choose worst case with SAR test results of each antenna in SISO mode perform evaluation.
3. The Scaled SAR summation is calculated based on the same configuration and test position.
4. 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 14.2.

14.1 Body Exposure Conditions

Exposure Position	1	2	3	4	5	6	7	8	9	10	1+2+3+9+10 Summed 1g SAR (W/kg)	1+2+5+9+10 Summed 1g SAR (W/kg)	1+2+6+9+10 Summed 1g SAR (W/kg)	1+2+8+10 Summed 1g SAR (W/kg)	1+2+7+9+10 Summed 1g SAR (W/kg)	SPLSR	Case No.
	WWAN Main	WWAN MIMO2	WLAN2.4GHz Main	WLAN2.4GHz Aux	WLAN5/6GHz Main	WLAN5/6GHz Aux	WLAN5/6GHz MIMO	WLAN2.4GHz MIMO	Bluetooth Aux	NFC							
	Estimated 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)	1g SAR (W/kg)	1g SAR (W/kg)							
Bottom Side	0.400	0.840	0.338	0.385	0.689	0.726	0.523	0.194	0.112	0.001	1.691	2.042	2.079	1.435	1.876	0.01	Case 1, 2, 5, 6

Exposure Position	1	2	3	4	5	6	7	8	9	10	1+2+3+9+10 Summed 1g SAR (W/kg)	1+2+5+9+10 Summed 1g SAR (W/kg)	1+2+6+9+10 Summed 1g SAR (W/kg)	1+2+8+10 Summed 1g SAR (W/kg)	1+2+7+9+10 Summed 1g SAR (W/kg)	SPLSR	Case No
	WWAN Aux	WWAN MIMO3	WLAN2.4GHz Main	WLAN2.4GHz Aux	WLAN5/6GHz Main	WLAN5/6GHz Aux	WLAN5/6GHz MIMO	WLAN2.4GHz MIMO	Bluetooth Aux	NFC							
	Estimated 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)	1g SAR (W/kg)	1g SAR (W/kg)							
Bottom Side	0.400	0.747	0.338	0.385	0.689	0.726	0.523	0.194	0.112	0.001	1.598	1.949	1.986	1.342	1.783	0.01	Case 3, 4, 7, 8

14.2 SPLSR Evaluation and Analysis

General Note:

1. According to antenna location the minimum distance between each transmit antenna is using 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
4. The detail hotspot point for each transmitter in each exposure condition are showing as below figure and the minimum 3D distance for each sum combination is used for SPLSR analysis.

	Band	Position	SAR (W/kg)	Minimum distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 1	Max WWAN Main + Max WWAN MIMO2	Bottom Side	1.24	271.0	1.88	0.01	Not required
	WLAN5/6GHz MIMO+Bluetooth Ant Aux+NFC		0.636				
Case 2	Max WWAN Main + Max WWAN MIMO2	Bottom Side	1.24	271.0	1.69	0.01	Not required
	WLAN2.4GHz Main +Bluetooth Aux+NFC		0.451				
Case 3	Max WWAN Aux + Max WWAN MIMO3	Bottom Side	1.147	271.0	1.78	0.01	Not required
	WLAN5/6GHz MIMO+Bluetooth Ant Aux+NFC		0.636				
Case 4	Max WWAN Aux + Max WWAN MIMO3	Bottom Side	1.147	271.0	1.60	0.01	Not required
	WLAN2.4GHz Main +Bluetooth Aux+NFC		0.451				
Case 5	Max WWAN Main + Max WWAN MIMO2	Bottom Side	1.24	271.0	2.04	0.01	Not required
	WLAN5GHz Main +Bluetooth Aux+NFC		0.802				
Case 6	Max WWAN Main + Max WWAN MIMO2	Bottom Side	1.24	271.0	2.08	0.01	Not required
	WLAN5GHz Aux +Bluetooth Aux+NFC		0.839				
Case 7	Max WWAN Aux + Max WWAN MIMO3	Bottom Side	1.147	271.0	1.95	0.01	Not required
	WLAN5GHz Main +Bluetooth Aux+NFC		0.802				
Case 8	Max WWAN Aux + Max WWAN MIMO3	Bottom Side	1.147	271.0	1.99	0.01	Not required
	WLAN5GHz Aux +Bluetooth Aux+NFC		0.839				

Test Engineer： Kevin Guo and John Fan

15. 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.

16. 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.