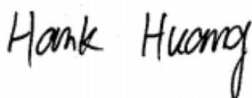


FCC SAR Test Report

APPLICANT : Fibocom Wireless Inc.
EQUIPMENT : 5G Dongle
BRAND NAME : Fibocom
MODEL NAME : ST151L-GL
FCC ID : ZMOST151LGL
STANDARD : FCC 47 CFR Part 2 (2.1093)

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.



Approved by: Hank Huang

Sporton International Inc. (Shenzhen)

**1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055
People's Republic of China**



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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA620905	Rev. 01	Initial issue of report	Apr. 27, 2026

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Fibocom Wireless Inc., 5G Dongle, ST151L-GL**, are as follows.

Highest 1g SAR Summary				
Equipment Class	Frequency Band		Body (Separation 5mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)	
Licensed	LTE	LTE Band 2	0.33	1.52
		LTE Band 7	0.61	
		LTE Band 12/17	0.28	
		LTE Band 13	0.77	
		LTE Band 14	0.54	
		LTE Band 25	0.35	
		LTE Band 26/5	0.27	
		LTE Band 30	0.28	
		LTE Band 66/4	0.91	
		LTE Band 71	0.15	
		LTE Band 41/38	0.02	
		LTE Band 42	0.17	
		LTE Band 43	0.32	
		LTE Band 48	0.21	
	5G NR	FR1 n5	0.41	
		FR1 n7	0.73	
		FR1 n12	0.33	
		FR1 n14	0.52	
		FR1 n25/2	0.51	
		FR1 n30	0.33	
		FR1 n66	0.60	
		FR1 n71	0.16	
		FR1 n41/38	0.98	
		FR1 n48	0.47	
		FR1 n77/78	0.71	
DTS	WLAN	WLAN2.4GHz	0.03	1.05
NII		WLAN5GHz	0.73	1.52
Date of Testing:			2026/3/5 ~ 2026/4/15	

Remark:

- This device supports LTE B4 / B5 / B17 / B38 and B66 / B26 / B12 / B41. Since the supported frequency span for LTE B4 / B5 / B17 / B38 falls completely within the support's frequency span for LTE B66 / B26 / B12 / B41, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B66 / B26 / B12 / B41.
- This device supports 5GNR n2/n38/n78 and n25/n41/n77. Since the supported frequency span for 5GNR n2/n38/n78 falls completely within the support's frequency span for n25/n41/n77, both 5GNR bands have the same target power, and both 5GNR bands share the same transmission path; therefore, SAR was only assessed for n25/n41/n77.

Declaration of Conformity:

The test results with all measurement uncertainty excluded are 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.

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.

2. Administration Data

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-SZ, SAR05-SZ	CN1256	421272

Applicant	
Company Name	Fibocom Wireless Inc.
Address	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China.

Manufacturer	
Company Name	Fibocom Wireless Inc.
Address	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China.

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 447498 D02 SAR Procedures for Dongle Xmtr v02r01
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	5G Dongle
Brand Name	Fibocom
Model Name	ST151L-GL
FCC ID	ZMOST151LGL
S/N Code	62307076, 6110742b, 61F8B971
Wireless Technology and Frequency Range	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 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 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz LTE Band 42: 3450 MHz ~ 3600 MHz LTE Band 43: 3600 MHz ~ 3700 MHz LTE Band 48: 3550 MHz ~ 3700 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 n14: 788 MHz ~ 798 MHz 5G NR n25: 1850 MHz ~ 1915 MHz 5G NR n30: 2305 MHz ~ 2315 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n48: 3550 MHz ~ 3700 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n71: 663 MHz ~ 698 MHz 5G NR n77: 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3980 MHz 5G NR n78: 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3800 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz
Mode	LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: CP-OFDM / DFT-s-OFDM, PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11ac VHT20/VHT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80
EUT Stage	Production Unit
Remark: 1. This device does not support voice function. 2. 5GNR n41/n77/n78 only support HPUE. 3. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission. 4. This device supports 5GNR FR1 bands as following table, including NSA mode and SA mode.	

<5G NR>

Mode	Band	Duplex	SCS(KHz)	Bandwidths(BW)
NSA	n5	FDD	15	5, 10, 15, 20
	n66	FDD	15	5, 10, 15, 20, 25, 30
	n71	FDD	15	5, 10, 15, 20
	n77	TDD	30	20, 30, 40, 60, 80, 100
	n78	TDD	30	20, 30, 40, 50, 60, 70, 80, 90, 100
SA	n2	FDD	15	5, 10, 15, 20
	n5	FDD	15	5, 10, 15, 20
	n7	FDD	15	5, 10, 15, 20
	n12	FDD	15	5, 10, 15
	n14	FDD	15	5, 10
	n25	FDD	15	5, 10, 15, 20, 25, 30
	n30	FDD	15	10
	n66	FDD	15	5, 10, 15, 20, 25, 30
	n71	FDD	15	5, 10, 15, 20
	n38	TDD	30	20, 30, 40
	n41	TDD	30	20, 30, 40, 50, 60, 70, 80, 90, 100
	n48	TDD	30	20, 30, 40
	n77	TDD	30	20, 30, 40, 60, 80, 100
	n78	TDD	30	20, 30, 40, 50, 60, 70, 80, 90, 100

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																																							
FCC ID	ZMOST151LGL																																																																						
Equipment Name	5G Dongle																																																																						
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 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 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz LTE Band 42: 3450 MHz ~ 3600 MHz LTE Band 43: 3600 MHz ~ 3700 MHz LTE Band 48: 3550 MHz ~ 3700 MHz																																																																						
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 14: 5MHz, 10MHz LTE Band 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 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 71: 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																																																																						
Uplink Modulations used	QPSK / 16QAM / 64QAM / 256QAM																																																																						
LTE Voice / Data requirements	Data only																																																																						
LTE Release Version	R16																																																																						
CA Support	Yes, Uplink and Downlink																																																																						
LTE MPR permanently built-in by design	<table><tr><th colspan="8">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</th></tr><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>	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3								Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
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	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																																																	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																																																
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																																																
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																																																
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2																																																																
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3																																																																
256 QAM	≥ 1						≤ 5																																																																
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)																																																																						
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																						
LTE Carrier Aggregation Combinations	Intra-Band and Inter-Band possible combinations and the detail power verification please referred to section 12.																																																																						
LTE Carrier Aggregation Additional Information	(1) This device supports LTE Carrier Aggregation (CA) in the uplink for intra-band and inter-band with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per FCC Guidance. (2) This device supports maximum of 2 carriers in the uplink.																																																																						

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)	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)	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)	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)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5	26790	824.5
M	26865	831.5	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	26940	838.5
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)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580	37875	2582.5	37900	2585
M	38000	2595	38000	2595	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610	38125	2607.5	38100	2605
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)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506	39775	2508.5	39800	2511
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5	40197	2550.7	40210	2552
M	40620	2593	40620	2593	40620	2593	40620	2593	40620	2593	40620	2593
HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5	41042	2635.2	41030	2634
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680	41465	2677.5	41440	2675
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)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	55265	3552.5	55290	3555	55315	3557.5	55340	3560	55365	3562.5	55390	3565
LM	55810	3607	55815	3607.5	55820	3608	55830	3609	55840	3610	55850	3611
MH	56170	3643	56165	3642.5	56160	3642	56150	3641	56140	3640	56130	3639
H	56715	3697.5	56690	3695	56665	3692.5	56640	3690	56615	3687.5	56590	3685
LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770
LTE Band 71												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	133147	665.5	133172	668	133197	670.5	133222	673	133247	675.5	133272	678
M	133247	675.5	133272	678	133297	680.5	133322	683	133347	685.5	133372	688
H	133447	695.5	133422	693	133397	690.5	133372	688	133347	685.5	133322	683

LTE Band 42								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	42115	3452.5	42140	3455	42165	3457.5	42190	3460
M	42590	3500	42590	3500	42590	3500	42590	3500
H	43065	3547.5	43040	3545	43015	3542.5	42990	3540

LTE Band 42								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	43115	3552.5	43140	3555	43165	3557.5	43190	3560
M	43340	3575	43340	3575	43340	3575	43340	3575
H	43565	3597.5	43540	3595	43515	3592.5	43490	3590

LTE Band 43								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	43615	3602.5	43640	3605	43665	3607.5	43690	3610
M	44090	3650	44090	3650	44090	3650	44090	3650
H	44565	3697.5	44540	3695	44515	3692.5	44490	3690

<For LTE Overlap Bands Description>

1) LTE Bands BW

Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
LTE Band 2	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 25	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 4	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 66	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 5	Yes	Yes	Yes	Yes		
LTE Band 26	Yes	Yes	Yes	Yes	Yes	
LTE Band 12	Yes	Yes	Yes	Yes		
LTE Band 17			Yes	Yes		
LTE Band 38			Yes	Yes	Yes	Yes
LTE Band 41			Yes	Yes	Yes	Yes

2) LTE Bands tune up:

Band	Ant	Full Power
		Tune-up Limit
LTE Band 2	Ant 0	23.5
LTE Band 25		23.5
LTE Band 4		23.5
LTE Band 66		23.5
LTE Band 5	Ant 0	23
LTE Band 26		23
LTE Band 12		23
LTE Band 17		23
LTE Band 38	Ant 0	23.5
LTE Band 41		23.5

4.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information	
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 n14: 788 MHz ~ 798 MHz 5G NR n25: 1850 MHz ~ 1915 MHz 5G NR n30: 2305 MHz ~ 2315 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n48: 3550 MHz ~ 3700 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n71: 663 MHz ~ 698 MHz 5G NR n77: 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3980 MHz 5G NR n78: 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3800 MHz
Channel Bandwidth	The detail please refers to section 4.1 5GNR FR1 bands table.
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 n5	LTE B7/66
LTE Anchor Bands for n66	LTE B5/12
LTE Anchor Bands for n71	LTE B2
L TE Anchor Bands for n77	LTE B5
L TE Anchor Bands for n78	LTE B5/38

Transmission (H, M, L) channel numbers and frequencies in each 5G NR band								
NR Band 2								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860
M	376000	1880	376000	1880	376000	1880	376000	1880
H	381500	1907.5	381000	1905	380500	1902.5	380000	1900
NR Band 5								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	165300	826.5	165800	829	166300	831.5	166800	834
M	167300	836.5	167300	836.5	167300	836.5	167300	836.5
H	169300	846.5	168800	844	168300	841.5	167800	839
NR Band 7 SCS15KHz								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	500500	2502.5	501000	2505	501500	2507.5	502000	2510
M	507000	2535	507000	2535	507000	2535	507000	2535
H	513500	2567.5	513000	2565	512500	2562.5	512000	2560
NR Band 12								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	140300	701.5	140800	704	141300	706.5	141800	709
M	141500	707.5	141500	707.5	141500	707.5	141500	707.5
H	142700	713.5	142200	711	141700	708.5	141200	705.5
NR Band 14								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	158100	790.5	158600	793	159100	795.5	158600	793
M	158600	793	158600	793	158600	793	158600	793
H	159100	795.5	158600	793	158100	790.5	157600	787.5



NR Band 25 SCS15KHz												
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz	
	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
M	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

NR Band 30												
	Bandwidth 10MHz											
	Ch. #						Freq. (MHz)					
L	462000						2310					
M												
H												

NR Band 66 SCS15KHz												
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz	
	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
M	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

NR Band 71									
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Freq. (MHz)
L	133100	665.5	133600	668	134100	670.5	134600	673	673
M	136100	680.5	136100	680.5	136100	680.5	136100	680.5	680.5
H	139100	695.5	138600	693	138100	690.5	137600	688	688

NR Band 38						
	Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	516000	2580	517002	2585.01	518004	2590.02
M	519000	2595	519000	2595	519000	2595
H	522000	2610	520998	2604.99	519996	2599.98

NR Band 41																		
	Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	501204	2506.02	502200	2511	503202	2516.01	504204	2521.02	505200	2526	500202	2501.01	507204	2536.02	508200	2541	509202	2546.01
M	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99
H	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	537000	2685	529998	2649.99	528996	2644.98	528000	2640

NR Band 48						
	Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	637334	3560.01	637668	3565.02	638000	3570
M	641666	3624.99	641666	3624.99	641666	3624.99
H	646000	3690	645666	3684.99	645332	3679.98

NR Band 77												
	Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 60MHz		Bandwidth 80MHz		Bandwidth 100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	647334	3710.01	647668	3715.02	648000	3720	648668	3730.02	649334	3740.01	650000	3750
M	656000	3840	656000	3840.00	656000	3840	656000	3840	656000	3840	656000	3840
H	664666	3969.99	664332	3964.98	664000	3960	663332	3949.98	662666	3939.99	662000	3930

NR Band 78																		
	Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz	
	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	647334	3710.01	647668	3715.02	648000	3720	648334	3725.01	648668	3730.02	649000	3735	649334	3740.01	649668	3745.02		
M	650000	3750	650000	3750.00	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750
H	652666	3789.99	652332	3784.98	652000	3780	651666	3774.99	651332	3769.98	651000	3765	650666	3759.99	650332	3754.98		

For <3450 MHz ~ 3550 MHz >

NR Band 77												
	Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 60MHz		Bandwidth 80MHz		Bandwidth 100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	630668	3460.02	631000	3465	631334	3470.01	632000	3480	632668	3490.02		
M	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98
H	636000	3540	635668	3535.02	635334	3530.01	634668	3520.02	634000	3510		

NR Band 78																		
	Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz	
	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	630668	3460.02	631000	3465	631334	3470.01	631668	3475.02	632000	3480	632334	3485.01	632668	3490.02	633000	3495		
M	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98
H	636000	3540	635666	3534.99	635332	3529.98	635000	3525	634666	3519.99	634332	3514.98	634000	3510	633666	3504.99		

<For NR Overlap Bands Description>

1) NR Bands BW

Band	Duplex	SCS(KHz)	Bandwidths(BW)
FR1 n2	FDD	15	5/10/15/20
FR1 n25	FDD	15	5/10/15/20/30
FR1 n38	TDD	30	20/30/40
FR1 n41_PC2	TDD	30	20/30/40/50/60/70/80/90/100
FR1 n77_PC2	TDD	30	20/30/40/60/80/100
FR1 n78_PC2	TDD	30	20/30/40/50/60/70/80/90/100

2) NR Bands Tune up:

Band	Ant	Full Power
		Tune-up Limit
FR1 n2	Ant 2	23.5
FR1 n25		23.5
FR1 n38		23.5
FR1 n41_PC2	Ant 2	27
FR1 n77_PC2		27
FR1 n78_PC2		27
FR1 n77_PC2	Ant 1	15.5
FR1 n78_PC2		15.5
FR1 n77_PC2	Ant 0	25.5
FR1 n78_PC2		25.5
FR1 n77_PC2		22.5
FR1 n78_PC2	Ant 3	22.5

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

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

6. Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

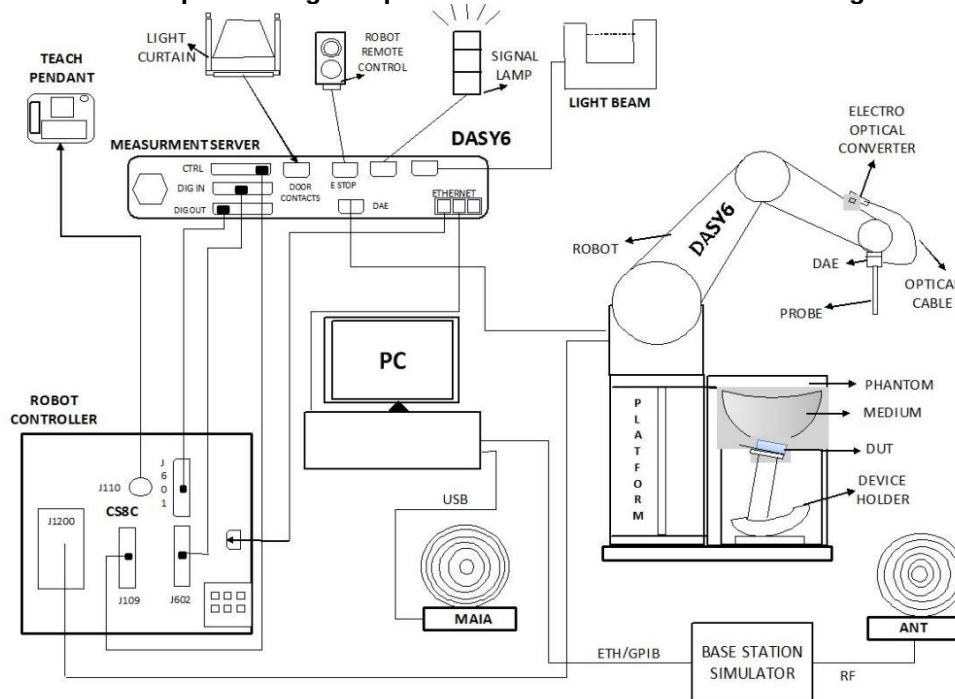
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



- 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 Win7 or Win10 and the DASY5 or DASY6 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

7.1 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.

<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 – 10 GHz Linearity: ± 0.2 dB (30 MHz – 10 GHz)	
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 μ W/g – >100 mW/g Linearity: ± 0.2 dB (noise: typically <1 μ W/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

7.2 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.



Photo of DAE

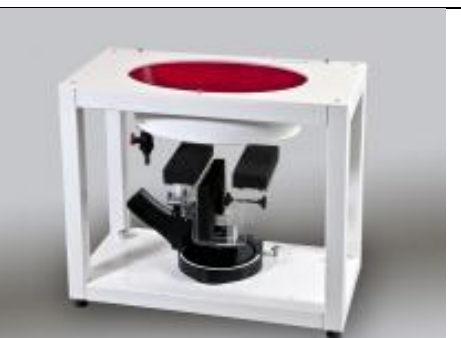
7.3 Phantom

<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 or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

7.4 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 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:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

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 from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g

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	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
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 $\leq$ 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 to 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 whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

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

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

8.5 Volume Scan Procedures

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

8.6 Power Drift Monitoring

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

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1099	Dec. 13, 2024	Dec. 11, 2026
SPEAG	835MHz System Validation Kit	D835V2	4d162	Dec. 13, 2024	Dec. 11, 2026
SPEAG	1750MHz System Validation Kit	D1750V2	1137	Oct. 15, 2024	Oct. 13, 2026
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	Dec. 16, 2024	Dec. 14, 2026
SPEAG	2300MHz System Validation Kit	D2300V2	1056	Oct. 16, 2024	Oct. 14, 2026
SPEAG	2450MHz System Validation Kit	D2450V2	924	Nov. 03, 2023	Nov. 01, 2026
SPEAG	2600MHz System Validation Kit	D2600V2	1070	Dec. 13, 2024	Dec. 11, 2026
SPEAG	3500MHz System Validation Kit	D3500V2	1076	Apr. 16, 2025	Apr. 15, 2026
SPEAG	3700MHz System Validation Kit	D3700V2	1037	Apr. 16, 2025	Apr. 15, 2026
SPEAG	3900MHz System Validation Kit	D3900V2	1022	Aug. 13, 2025	Aug. 12, 2026
SPEAG	5000MHz System Validation Kit	D5GHzV2	1341	Dec. 12, 2024	Dec. 10, 2026
SPEAG	Data Acquisition Electronics	DAE4	1386	Sep. 15, 2025	Sep. 14, 2026
SPEAG	Data Acquisition Electronics	DAE4	1210	Nov. 28, 2025	Nov. 27, 2026
SPEAG	Dosimetric E-Field Probe	EX3DV4	3819	Sep. 11, 2025	Sep. 10, 2026
SPEAG	Dosimetric E-Field Probe	EX3DV4	7641	Jun. 26, 2025	Jun. 25, 2026
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1671	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1670	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P41 AA	2033	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300653	Jul. 03, 2025	Jul. 02, 2026
Anritsu	Radio communication analyzer	MT8821C	6262314715	Jul. 03, 2025	Jul. 02, 2026
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Jul. 04, 2025	Jul. 03, 2026
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 15, 2025	Oct. 14, 2026
Speag	Dielectric Assessment KIT	DAK-3.5	1144	Aug. 26, 2025	Aug. 25, 2026
Agilent	Signal Generator	N5181A	MY50145381	Dec. 25, 2025	Dec. 24, 2026
R&S	Signal Generator	SMB100A	175779	Dec. 24, 2025	Dec. 23, 2026
Anritsu	Power Sensor	MA2411B	1306099	Oct. 15, 2025	Oct. 14, 2026
Anritsu	Power Meter	ML2495A	1349001	Oct. 15, 2025	Oct. 14, 2026
Anritsu	Power Sensor	MA2411B	1218010	Oct. 15, 2025	Oct. 14, 2026
Anritsu	Power Meter	ML2495A	1339473	Dec. 26, 2025	Dec. 25, 2026
R&S	Spectrum Analyzer	FSP7	100818	Jul. 03, 2025	Jul. 02, 2026
TES	Hygrometer	1310	200505600	Jul. 05, 2025	Jul. 04, 2026
Anymetre	Thermo-Hygrometer	JR593	2023110804	Oct. 17, 2025	Oct. 16, 2026
Mini-Circuits	Amplifier	ZVA-183W-S+	726202215	Jul. 04, 2025	Jul. 03, 2026
SPEAG	Device Holder	N/A	N/A	N/A	N/A
ARRA	Power Divider	A3200-2	N/A	Note 1	
ET Industries	Dual Directional Coupler	C-058-10	N/A	Note 1	
Jinkexinhua	Attenuator	10db-8G	N/A	Note 1	

Note:

- 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.
- 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 Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.2.



Fig 10.2 Photo of Liquid Height for Body SAR

10.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ϵ_r)
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ε _r)	Conductivity Target (σ)	Permittivity Target (ε _r)	Delta (σ) (%)	Delta (ε _r) (%)	Limit (%)	Date
750	Head	22.3	0.918	41.043	0.89	41.90	3.15	-2.05	±5	2026/3/5
750	Head	22.6	0.885	43.900	0.89	41.90	-0.56	4.77	±5	2026/3/26
835	Head	22.3	0.939	42.952	0.90	41.50	4.33	3.50	±5	2026/3/13
835	Head	22.6	0.914	43.500	0.90	41.50	1.56	4.82	±5	2026/3/24
1750	Head	22.1	1.358	40.423	1.37	40.10	-0.88	0.81	±5	2026/3/17
1750	Head	22.4	1.340	41.900	1.37	40.10	-2.19	4.49	±5	2026/3/23
1900	Head	22.8	1.431	40.971	1.40	40.00	2.21	2.43	±5	2026/3/19
1900	Head	22.4	1.440	41.700	1.40	40.00	2.86	4.25	±5	2026/4/8
2300	Head	22.6	1.670	38.500	1.67	39.50	0.00	-2.53	±5	2026/4/6
2450	Head	22.6	1.797	40.374	1.80	39.20	-0.17	2.99	±5	2026/4/11
2600	Head	22.5	1.943	39.787	1.96	39.00	-0.87	2.02	±5	2026/3/18
2600	Head	22.6	1.940	40.700	1.96	39.00	-1.02	4.36	±5	2026/4/14
3500	Head	22.4	2.794	37.465	2.91	37.90	-3.99	-1.15	±5	2026/3/14
3500	Head	22.4	2.820	39.200	2.91	37.90	-3.09	3.43	±5	2026/4/13
3700	Head	22.9	2.974	37.098	3.12	37.70	-4.68	-1.60	±5	2026/3/8
3700	Head	22.7	3.100	38.900	3.12	37.70	-0.64	3.18	±5	2026/4/12
3900	Head	22.1	3.261	36.751	3.33	37.51	-2.07	-2.02	±5	2026/3/10
3900	Head	22.6	3.200	38.600	3.33	37.51	-3.90	2.91	±5	2026/4/15
5250	Head	22.5	4.540	36.978	4.71	35.95	-3.61	2.86	±5	2026/4/11
5800	Head	22.4	5.049	36.206	5.27	35.30	-4.19	2.57	±5	2026/4/11

10.3 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)	Tissue Type	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 (%)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2026/3/5	750	Head	250	D750V3-1099	EX3DV4 - SN3819	DAE4 Sn1386	2.190	8.280	8.76	5.80	1.410	5.370	5.64	5.03
2026/3/26	750	Head	250	D750V3-1099	EX3DV4 - SN7641	DAE4 Sn1210	2.120	8.280	8.48	2.42	1.380	5.370	5.52	2.79
2026/3/13	835	Head	250	D835V2-4d162	EX3DV4 - SN3819	DAE4 Sn1386	2.390	9.080	9.56	5.29	1.520	5.850	6.08	3.93
2026/3/24	835	Head	250	D835V2-4d162	EX3DV4 - SN7641	DAE4 Sn1210	2.290	9.080	9.16	0.88	1.510	5.850	6.04	3.25
2026/3/17	1750	Head	250	D1750V2-1137	EX3DV4 - SN3819	DAE4 Sn1386	9.420	36.800	37.68	2.39	5.080	19.600	20.32	3.67
2026/3/23	1750	Head	250	D1750V2-1137	EX3DV4 - SN7641	DAE4 Sn1210	9.610	36.800	38.44	4.46	5.140	19.600	20.56	4.90
2026/3/19	1900	Head	250	D1900V2-5d182	EX3DV4 - SN3819	DAE4 Sn1386	10.100	39.800	40.4	1.51	5.300	21.000	21.2	0.95
2026/4/8	1900	Head	250	D1900V2-5d182	EX3DV4 - SN7641	DAE4 Sn1210	9.800	39.800	39.2	-1.51	5.290	21.000	21.16	0.76
2026/4/6	2300	Head	250	D2300V2-1056	EX3DV4 - SN7641	DAE4 Sn1210	12.800	48.600	51.2	5.35	6.120	23.400	24.48	4.62
2026/4/11	2450	Head	250	D2450V2-924	EX3DV4 - SN3819	DAE4 Sn1386	13.200	52.300	52.8	0.96	6.090	24.500	24.36	-0.57
2026/3/18	2600	Head	250	D2600V2-1070	EX3DV4 - SN3819	DAE4 Sn1386	14.300	56.500	57.2	1.24	6.240	25.200	24.96	-0.95
2026/4/14	2600	Head	250	D2600V2-1070	EX3DV4 - SN7641	DAE4 Sn1210	13.600	56.500	54.4	-3.72	6.130	25.200	24.52	-2.70
2026/3/14	3500	Head	100	D3500V2-1076	EX3DV4 - SN3819	DAE4 Sn1386	6.860	65.800	68.6	4.26	2.630	25.000	26.3	5.20
2026/4/13	3500	Head	100	D3500V2-1076	EX3DV4 - SN7641	DAE4 Sn1210	6.410	65.800	64.1	-2.58	2.470	25.000	24.7	-1.20
2026/3/8	3700	Head	100	D3700V2-1037	EX3DV4 - SN3819	DAE4 Sn1386	7.120	67.000	71.2	6.27	2.590	24.400	25.9	6.15
2026/4/12	3700	Head	100	D3700V2-1037	EX3DV4 - SN7641	DAE4 Sn1210	7.010	67.000	70.1	4.63	2.500	24.400	25	2.46
2026/3/10	3900	Head	100	D3900V2-1022	EX3DV4 - SN3819	DAE4 Sn1386	7.230	70.100	72.3	3.14	2.580	24.600	25.8	4.88
2026/4/15	3900	Head	100	D3900V2-1022	EX3DV4 - SN7641	DAE4 Sn1210	6.950	70.100	69.5	-0.86	2.470	24.600	24.7	0.41
2026/4/11	5250	Head	100	D5GHZV2-1341	EX3DV4 - SN3819	DAE4 Sn1386	8.120	79.100	81.2	2.65	2.320	22.400	23.2	3.57
2026/4/11	5800	Head	100	D5GHZV2-1341	EX3DV4 - SN3819	DAE4 Sn1386	8.280	79.900	82.8	3.63	2.320	22.900	23.2	1.31

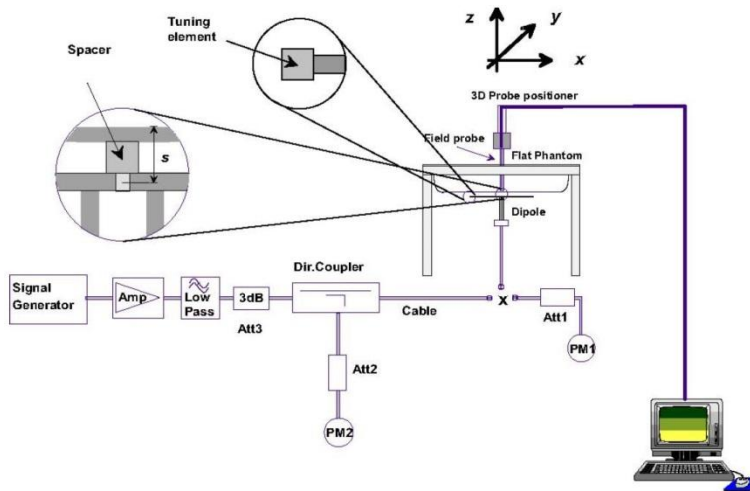


Fig 10.3.1 System Performance Check Setup



Fig 10.3.2 Setup Photo

11. RF Exposure Positions

11.1 SAR Testing for USB Dongle

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

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

Please refer to Appendix D for the test setup photos.

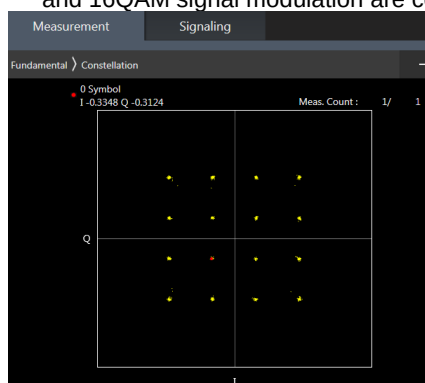
12. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<LTE Conducted Power>

General Note:

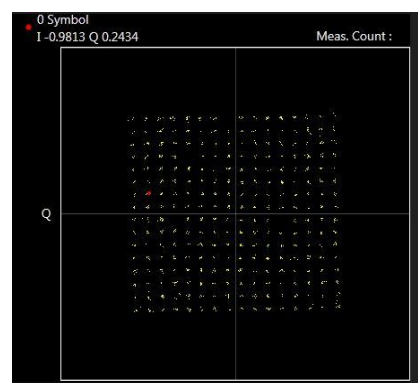
- Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
- Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
- 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.
- Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
- 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.
- Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
- Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
- 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.
- LTE B2 / B4 / B5 / B17 / B38 SAR test was covered by B25 / B66 / B26 / B12 / B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
- According to May 2017 TCB workshop, for 16QAM and 64QAM, 256QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 256QAM, 64QAM and 16QAM signal modulation are correct.



16QAM



64QAM



256QAM

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

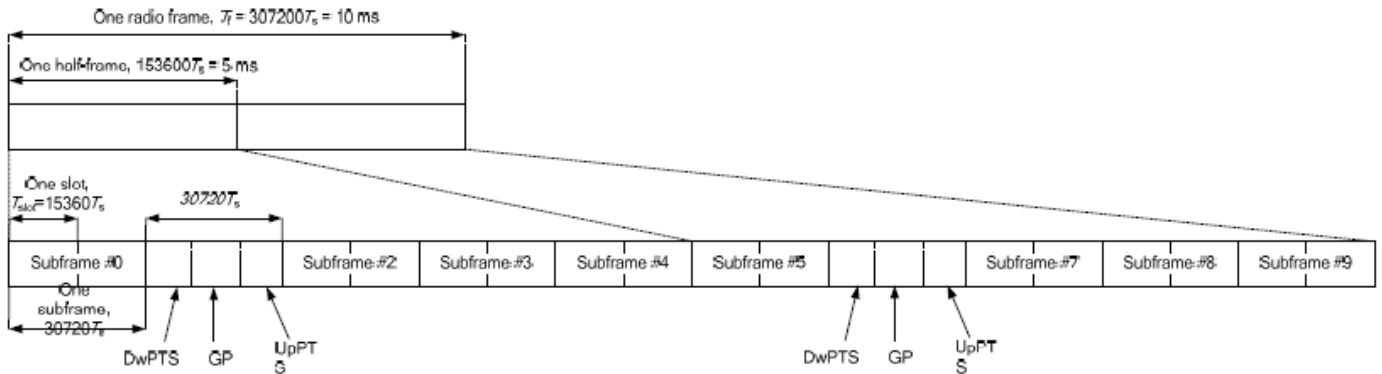


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

For LTE TDD Power class 3

- Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.167)/5 = 63.3\%$
- for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.143)/5 = 62.9\%$
- For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

<LTE Carrier Aggregation>

The detailed LTE Carrier Aggregation conducted power table can refer to Appendix F.

General Note:

1. Per Oct. 2024 TCB workshop, the downlink (DL) pertains to receiver functionality, thus it is not related to RF exposure compliance limits related to cumulative effects of different transmitters.
2. Per Oct. 2024 TCB workshop, equipment authorization applications shall refer to the worst-case UL powers resulting from all the possible modes of operations. Accordingly, CA-DL cases do not need to be analyzed separately, unless pertinent to establishing UL power setting.
3. Per Oct. 2024 TCB workshop, Manufacturer declares that TX power measurement for multiple DL CA configurations is deemed not required as the DL CA has no impact on the TX power according to preliminary scan. TX power measured in LTE standalone operation represents the worst case.
4. This device supports LTE carrier aggregation in the downlink. All uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.

LTE Carrier Aggregation Conducted Power (Uplink)

LTE Uplink CA	2CC Uplink Carrier Aggregation
Intra-band	Antenna Tx
CA_2C	Ant 0
CA_5B	Ant 0
CA_7C	Ant 2
CA_66B	Ant 0
CA_66C	Ant 0
CA_38C	Ant 0
CA_41C	Ant 0
CA_42C	Ant 2

<Intra-band>
General Note:

- The device supports intra-band uplink carrier aggregation for LTE B2/5/7/66/38/41/42 with a maximum of two 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.
- According Nov. 2017 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.
- 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.
- LTE CA_66B test was covered by CA_66C; therefore, SAR was only assessed for CA_66C.

<Inter-band>

LTE Inter CA	LTE TX0	TX0 Ant	LTE TX1	TX1 Ant
12A-66A	12A	Ant 0	66A	Ant 2
5A-66A	5A	Ant 0	66A	Ant 2

General Note:

- For Inter-band CA co-located SAR analysis is performed using standalone SAR summed together and they are more conservatively for inter band CA.

5G NR Output Power (Unit: dBm)**General Note:**

1. 5G NR n2/n5/n7/n12/n14/n25/n30/n66/n71/n38/n41/n48/n77/n78 is SA mode.
2. 5G NR n5/n66/n71/n77/n78 is NSA mode.
3. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
 - a. For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class2 and 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KDB 941225 D05 procedure for other modulation output power for each RB allocation configuration is > not $\frac{1}{2}$ dB higher than the same configuration in DFT-QPSK and the reported SAR for the DFT-QPSK configuration is ≤ 1.45 W/kg; CP-OFDM testing is not required.
 - b. For DFT-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class2 and 3, for 16QAM/64QAM/256QAM and smaller bandwidth output power will spot check largest channel bandwidth worst RB configuration to ensure the 16QAM/64QAM/256QAM and smaller bandwidth output power will not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth.
 - c. SAR testing 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
 - d. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
 - e. 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
 - f. $\pi/2$ BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not $\frac{1}{2}$ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, $\pi/2$ BPSK/16QAM/64QAM/256QAM SAR testing are not required.
 - g. Smaller bandwidth output power for each RB allocation configuration for this device will not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
4. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
5. NSA and SA mode should perform SAR separately. For the maximum power of NSA mode is the same as SA total power level, so SA SAR can represent NSA mode SAR.
6. 5G NR NSA mode, the power level is the same as 5G NR SA mode, so 5G NR NSA mode and SA mode power table only show one time.
7. 5G NR supports CP-OFDM and DFT-s-OFDM modulation, for DFT-s-OFDM power is higher than CP-OFDM, so only show DFT-s-OFDM power table and chose DFT-s-OFDM to perform SAR testing.
8. For DFT-s-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for the CP-OFDM mode will not higher than DFT-s-OFDM mode, therefore, CP-OFDM measurement is unnecessary.
9. For 5G NR EN-DC mode, standalone SAR performed for 5G NR NSA band with the maximum power, EN-DC SAR summed EN-DC mode 5G NR standalone SAR and LTE standalone SAR, the result of EN-DC SAR is more conservatively.

<3GPP 38.101 MPR for EN-DC>

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

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

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

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

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

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

<EN-DC combination>:

ENDC	NR TX	NR Ant	LTE TX	LTE Ant
DC_7A_n5A	n5A	Ant 0	7A	Ant 2
DC_66A_n5A	n5A	Ant 0	66A	Ant 2
DC_5A_n66A	n66A	Ant 2	5A	Ant 0
DC_12A_n66A	n66A	Ant 2	12A	Ant 0
DC_2A_n71A	n71A	Ant 0	2A	Ant 2
DC_5A_n77A	n77A	Ant 2/1/0/3	5A	Ant 0
DC_5A_n78A	n78A	Ant 2/1/0/3	5A	Ant 0
DC_38A_n78A	n78A	Ant 2/1/0/3	38A	Ant 0

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

1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration. Additional output power measurements were not necessary.
2. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
3. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
4. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
5. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.¹⁸ The initial test position procedure is described in the following:
 - a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
 - b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
 - c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.



13. Antenna Location

The detailed antenna location information can refer to SAR Test Setup Photos.

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
 - c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
 - d. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
 - e. For TDD LTE SAR measurement of power class 3, 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 (W/kg) = Measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.
4. Although the distance 1gSAR is greater than 0.8 W/kg at body exposure conditions, the distance SAR verified the worst of the non-distance SAR and less than non-distance SAR, so there is no need to be tested other channels.
5. According to Nov. 2017 TCB workshop, when the reported 1gSAR for UL CA configuration is <1.2 W/kg, UL CA 1gSAR is not required for all required test channels (PCC based).
6. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 447498 D01v06.
7. The following table "n/a" in the result means the SAR cube is too small to be detected.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 / B12 / B17 / 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 B2 /B4 /B5 / B17 / B38 SAR test was covered by B25 / B66 / B26 / B12 / B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if.
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

5G NR Note:

For 5G NR test procedure was following step similar FCC KDB 941225 D05:

- a. SAR testing 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.
- b. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
- c. 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.
- d. PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not $\frac{1}{2}$ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, PI/2 BPSK/16QAM /64QAM/256QAM SAR testing are not required.
- e. Smaller bandwidth output power for each RB allocation configuration for this device will not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device.
- f. For 5G FR1 n5/n12/n25/n66/n71/n38/n41/n77 the maximum bandwidth does not support three non-overlapping channels, 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.

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.



14.1 Body SAR

Plot No.	Note	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
750MHz																				
01		LTE Band 71	20M	QPSK	1	0	-	Front	5mm	Ant 0	133297	680.5	21.68	23.00	1.355	-	-	-0.03	0.089	0.121
		LTE Band 71	20M	QPSK	1	0	-	Back	5mm	Ant 0	133297	680.5	21.68	23.00	1.355	-	-	-0.03	0.112	0.152
		LTE Band 71	20M	QPSK	1	0	-	Right Side	5mm	Ant 0	133297	680.5	21.68	23.00	1.355	-	-	0.07	0.019	0.026
		LTE Band 71	20M	QPSK	1	0	-	Top Side	5mm	Ant 0	133297	680.5	21.68	23.00	1.355	-	-	-0.14	0.049	0.066
		LTE Band 71	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	133297	680.5	21.68	23.00	1.355	-	-	0.14	0.042	0.057
		LTE Band 71	20M	QPSK	50	24	-	Front	5mm	Ant 0	133297	680.5	20.75	22.00	1.334	-	-	-0.06	0.081	0.108
		LTE Band 71	20M	QPSK	50	24	-	Back	5mm	Ant 0	133297	680.5	20.75	22.00	1.334	-	-	-0.08	0.105	0.140
		LTE Band 71	20M	QPSK	50	24	-	Right Side	5mm	Ant 0	133297	680.5	20.75	22.00	1.334	-	-	-0.1	0.018	0.024
		LTE Band 71	20M	QPSK	50	24	-	Top Side	5mm	Ant 0	133297	680.5	20.75	22.00	1.334	-	-	-0.16	0.044	0.059
		LTE Band 71	20M	QPSK	50	24	-	Bottom Side	5mm	Ant 0	133297	680.5	20.75	22.00	1.334	-	-	-0.17	0.039	0.052
02		LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	23095	707.5	21.86	23.00	1.300	-	-	0.14	0.170	0.221
		LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	23095	707.5	21.86	23.00	1.300	-	-	-0.06	0.214	0.278
		LTE Band 12	10M	QPSK	1	0	-	Right Side	5mm	Ant 0	23095	707.5	21.86	23.00	1.300	-	-	0.07	0.035	0.046
		LTE Band 12	10M	QPSK	1	0	-	Top Side	5mm	Ant 0	23095	707.5	21.86	23.00	1.300	-	-	0.12	0.089	0.116
		LTE Band 12	10M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	23095	707.5	21.86	23.00	1.300	-	-	0.1	0.076	0.099
		LTE Band 12	10M	QPSK	25	12	-	Front	5mm	Ant 0	23095	707.5	20.90	22.00	1.288	-	-	0.05	0.157	0.202
		LTE Band 12	10M	QPSK	25	12	-	Back	5mm	Ant 0	23095	707.5	20.90	22.00	1.288	-	-	0.04	0.202	0.260
		LTE Band 12	10M	QPSK	25	12	-	Right Side	5mm	Ant 0	23095	707.5	20.90	22.00	1.288	-	-	-0.18	0.032	0.041
		LTE Band 12	10M	QPSK	25	12	-	Top Side	5mm	Ant 0	23095	707.5	20.90	22.00	1.288	-	-	-0.13	0.083	0.107
		LTE Band 12	10M	QPSK	25	12	-	Bottom Side	5mm	Ant 0	23095	707.5	20.90	22.00	1.288	-	-	0.06	0.070	0.090
03		LTE Band 13	10M	QPSK	1	0	-	Front	5mm	Ant 0	23230	782	21.86	23.00	1.300	-	-	-0.16	0.450	0.585
		LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	23230	782	21.86	23.00	1.300	-	-	-0.01	0.595	0.774
		LTE Band 13	10M	QPSK	1	0	-	Right Side	5mm	Ant 0	23230	782	21.86	23.00	1.300	-	-	-0.14	0.092	0.120
		LTE Band 13	10M	QPSK	1	0	-	Top Side	5mm	Ant 0	23230	782	21.86	23.00	1.300	-	-	0.16	0.240	0.312
		LTE Band 13	10M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	23230	782	21.86	23.00	1.300	-	-	-0.16	0.203	0.264
		LTE Band 13	10M	QPSK	25	12	-	Front	5mm	Ant 0	23230	782	20.84	22.00	1.306	-	-	-0.1	0.416	0.543
		LTE Band 13	10M	QPSK	25	12	-	Back	5mm	Ant 0	23230	782	20.84	22.00	1.306	-	-	-0.1	0.531	0.694
		LTE Band 13	10M	QPSK	25	12	-	Right Side	5mm	Ant 0	23230	782	20.84	22.00	1.306	-	-	-0.02	0.088	0.115
		LTE Band 13	10M	QPSK	25	12	-	Top Side	5mm	Ant 0	23230	782	20.84	22.00	1.306	-	-	0.11	0.233	0.304
		LTE Band 13	10M	QPSK	25	12	-	Bottom Side	5mm	Ant 0	23230	782	20.84	22.00	1.306	-	-	0.06	0.196	0.256
04		LTE Band 14	10M	QPSK	1	0	-	Front	5mm	Ant 0	23330	793	21.89	23.00	1.291	-	-	0.14	0.362	0.467
		LTE Band 14	10M	QPSK	1	0	-	Back	5mm	Ant 0	23330	793	21.89	23.00	1.291	-	-	0.16	0.415	0.536
		LTE Band 14	10M	QPSK	1	0	-	Right Side	5mm	Ant 0	23330	793	21.89	23.00	1.291	-	-	-0.05	0.074	0.096
		LTE Band 14	10M	QPSK	1	0	-	Top Side	5mm	Ant 0	23330	793	21.89	23.00	1.291	-	-	0.06	0.185	0.239
		LTE Band 14	10M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	23330	793	21.89	23.00	1.291	-	-	-0.04	0.157	0.203
		LTE Band 14	10M	QPSK	25	12	-	Front	5mm	Ant 0	23330	793	20.86	22.00	1.300	-	-	0.1	0.332	0.432
		LTE Band 14	10M	QPSK	25	12	-	Back	5mm	Ant 0	23330	793	20.86	22.00	1.300	-	-	-0.07	0.400	0.520
		LTE Band 14	10M	QPSK	25	12	-	Right Side	5mm	Ant 0	23330	793	20.86	22.00	1.300	-	-	0	0.070	0.091
		LTE Band 14	10M	QPSK	25	12	-	Top Side	5mm	Ant 0	23330	793	20.86	22.00	1.300	-	-	-0.13	0.168	0.218
		LTE Band 14	10M	QPSK	25	12	-	Bottom Side	5mm	Ant 0	23330	793	20.86	22.00	1.300	-	-	0.12	0.147	0.191
05		FR1 n71	20M	QPSK	1	1	DFT-15	Front	5mm	Ant 0	136100	680.5	22.04	23.50	1.400	-	-	-0.05	0.089	0.125
		FR1 n71	20M	QPSK	1	1	DFT-15	Back	5mm	Ant 0	136100	680.5	22.04	23.50	1.400	-	-	-0.12	0.117	0.164
		FR1 n71	20M	QPSK	1	1	DFT-15	Right Side	5mm	Ant 0	136100	680.5	22.04	23.50	1.400	-	-	-0.14	0.018	0.025
		FR1 n71	20M	QPSK	1	1	DFT-15	Top Side	5mm	Ant 0	136100	680.5	22.04	23.50	1.400	-	-	0.02	0.049	0.069
		FR1 n71	20M	QPSK	1	1	DFT-15	Bottom Side	5mm	Ant 0	136100	680.5	22.04	23.50	1.400	-	-	0.07	0.041	0.057
		FR1 n71	20M	QPSK	50	28	DFT-15	Front	5mm	Ant 0	136100	680.5	22.02	23.50	1.406	-	-	-0.17	0.085	0.120
		FR1 n71	20M	QPSK	50	28	DFT-15	Back	5mm	Ant 0	136100	680.5	22.02	23.50	1.406	-	-	0.16	0.113	0.159
		FR1 n71	20M	QPSK	50	28	DFT-15	Right Side	5mm	Ant 0	136100	680.5	22.02	23.50	1.406	-	-	0.02	0.017	0.024
		FR1 n71	20M	QPSK	50	28	DFT-15	Top Side	5mm	Ant 0	136100	680.5	22.02	23.50	1.406	-	-	0.16	0.046	0.065



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		FR1 n71	20M	QPSK	50	28	DFT-15	Bottom Side	5mm	Ant 0	136100	680.5	22.02	23.50	1.406	-	-	-0.07	0.038	0.053
		FR1 n12	15M	QPSK	1	1	DFT-15	Front	5mm	Ant 0	141500	707.5	22.12	23.50	1.374	-	-	-0.02	0.173	0.238
06		FR1 n12	15M	QPSK	1	1	DFT-15	Back	5mm	Ant 0	141500	707.5	22.12	23.50	1.374	-	-	0.08	0.239	0.328
		FR1 n12	15M	QPSK	1	1	DFT-15	Right Side	5mm	Ant 0	141500	707.5	22.12	23.50	1.374	-	-	0.14	0.038	0.052
		FR1 n12	15M	QPSK	1	1	DFT-15	Top Side	5mm	Ant 0	141500	707.5	22.12	23.50	1.374	-	-	0.18	0.094	0.129
		FR1 n12	15M	QPSK	1	1	DFT-15	Bottom Side	5mm	Ant 0	141500	707.5	22.12	23.50	1.374	-	-	0.07	0.078	0.107
		FR1 n12	15M	QPSK	36	22	DFT-15	Front	5mm	Ant 0	141500	707.5	22.03	23.50	1.403	-	-	-0.18	0.160	0.224
		FR1 n12	15M	QPSK	36	22	DFT-15	Back	5mm	Ant 0	141500	707.5	22.03	23.50	1.403	-	-	-0.07	0.220	0.309
		FR1 n12	15M	QPSK	36	22	DFT-15	Right Side	5mm	Ant 0	141500	707.5	22.03	23.50	1.403	-	-	-0.01	0.034	0.048
		FR1 n12	15M	QPSK	36	22	DFT-15	Top Side	5mm	Ant 0	141500	707.5	22.03	23.50	1.403	-	-	0	0.088	0.123
		FR1 n12	15M	QPSK	36	22	DFT-15	Bottom Side	5mm	Ant 0	141500	707.5	22.03	23.50	1.403	-	-	0.1	0.073	0.102
		FR1 n14	10M	QPSK	1	1	DFT-15	Front	5mm	Ant 0	158600	793	22.05	23.50	1.396	-	-	-0.1	0.278	0.388
07		FR1 n14	10M	QPSK	1	1	DFT-15	Back	5mm	Ant 0	158600	793	22.05	23.50	1.396	-	-	-0.08	0.372	0.519
		FR1 n14	10M	QPSK	1	1	DFT-15	Right Side	5mm	Ant 0	158600	793	22.05	23.50	1.396	-	-	0.08	0.058	0.081
		FR1 n14	10M	QPSK	1	1	DFT-15	Top Side	5mm	Ant 0	158600	793	22.05	23.50	1.396	-	-	-0.07	0.152	0.212
		FR1 n14	10M	QPSK	1	1	DFT-15	Bottom Side	5mm	Ant 0	158600	793	22.05	23.50	1.396	-	-	-0.08	0.127	0.177
		FR1 n14	10M	QPSK	25	14	DFT-15	Front	5mm	Ant 0	158600	793	21.89	23.50	1.449	-	-	-0.15	0.260	0.377
		FR1 n14	10M	QPSK	25	14	DFT-15	Back	5mm	Ant 0	158600	793	21.89	23.50	1.449	-	-	0.18	0.349	0.506
		FR1 n14	10M	QPSK	25	14	DFT-15	Right Side	5mm	Ant 0	158600	793	21.89	23.50	1.449	-	-	0.16	0.053	0.077
		FR1 n14	10M	QPSK	25	14	DFT-15	Top Side	5mm	Ant 0	158600	793	21.89	23.50	1.449	-	-	0.07	0.137	0.198
		FR1 n14	10M	QPSK	25	14	DFT-15	Bottom Side	5mm	Ant 0	158600	793	21.89	23.50	1.449	-	-	-0.12	0.122	0.177
835MHz																				
		LTE Band 26	15M	QPSK	1	0	-	Front	5mm	Ant 0	26865	831.5	21.89	23.00	1.291	-	-	0.11	0.192	0.248
08		LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	26865	831.5	21.89	23.00	1.291	-	-	0.02	0.205	0.265
	ULCA_5B	LTE Band 5B	10M	QPSK	1 1	0 99	-	Back	5mm	Ant 0	20575 20476	841.5 831.6	21.82	23.00	1.312	-	-	-0.06	0.188	0.247
		LTE Band 26	15M	QPSK	1	0	-	Right Side	5mm	Ant 0	26865	831.5	21.89	23.00	1.291	-	-	-0.09	0.040	0.052
		LTE Band 26	15M	QPSK	1	0	-	Top Side	5mm	Ant 0	26865	831.5	21.89	23.00	1.291	-	-	-0.1	0.095	0.123
		LTE Band 26	15M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	26865	831.5	21.89	23.00	1.291	-	-	-0.03	0.151	0.195
		LTE Band 26	15M	QPSK	36	20	-	Front	5mm	Ant 0	26865	831.5	21.00	22.00	1.259	-	-	0	0.199	0.251
		LTE Band 26	15M	QPSK	36	20	-	Back	5mm	Ant 0	26865	831.5	21.00	22.00	1.259	-	-	0.15	0.200	0.252
		LTE Band 26	15M	QPSK	36	20	-	Right Side	5mm	Ant 0	26865	831.5	21.00	22.00	1.259	-	-	-0.03	0.039	0.049
		LTE Band 26	15M	QPSK	36	20	-	Top Side	5mm	Ant 0	26865	831.5	21.00	22.00	1.259	-	-	0.18	0.091	0.115
		LTE Band 26	15M	QPSK	36	20	-	Bottom Side	5mm	Ant 0	26865	831.5	21.00	22.00	1.259	-	-	-0.13	0.144	0.181
		FR1 n5	20M	QPSK	1	1	DFT-15	Front	5mm	Ant 0	167300	836.5	22.65	23.50	1.216	-	-	0.06	0.251	0.305
		FR1 n5	20M	QPSK	1	1	DFT-15	Back	5mm	Ant 0	167300	836.5	22.65	23.50	1.216	-	-	0.07	0.288	0.350
		FR1 n5	20M	QPSK	1	1	DFT-15	Right Side	5mm	Ant 0	167300	836.5	22.65	23.50	1.216	-	-	0.09	0.047	0.057
		FR1 n5	20M	QPSK	1	1	DFT-15	Top Side	5mm	Ant 0	167300	836.5	22.65	23.50	1.216	-	-	0	0.114	0.139
		FR1 n5	20M	QPSK	1	1	DFT-15	Bottom Side	5mm	Ant 0	167300	836.5	22.65	23.50	1.216	-	-	-0.19	0.181	0.220
		FR1 n5	20M	QPSK	50	28	DFT-15	Front	5mm	Ant 0	167300	836.5	22.19	23.50	1.352	-	-	-0.08	0.241	0.326
09		FR1 n5	20M	QPSK	50	28	DFT-15	Back	5mm	Ant 0	167300	836.5	22.19	23.50	1.352	-	-	0.16	0.304	0.411
		FR1 n5	20M	QPSK	50	28	DFT-15	Right Side	5mm	Ant 0	167300	836.5	22.19	23.50	1.352	-	-	0.1	0.043	0.058
		FR1 n5	20M	QPSK	50	28	DFT-15	Top Side	5mm	Ant 0	167300	836.5	22.19	23.50	1.352	-	-	-0.14	0.110	0.149
		FR1 n5	20M	QPSK	50	28	DFT-15	Bottom Side	5mm	Ant 0	167300	836.5	22.19	23.50	1.352	-	-	0.08	0.163	0.220
1750MHz																				
		LTE Band 66	20M	QPSK	1	0	-	Front	5mm	Ant 0	132322	1745	22.42	23.50	1.282	-	-	-0.16	0.394	0.505
10		LTE Band 66	20M	QPSK	1	0	-	Back	5mm	Ant 0	132322	1745	22.42	23.50	1.282	-	-	-0.03	0.713	0.914
	ULCA_66C	LTE Band 66C	10M	QPSK	1 1	0 99	-	Back	5mm	Ant 0	132322 132520	1745	22.40	23.50	1.288	-	-	0.04	0.637	0.821
		LTE Band 66	20M	QPSK	1	0	-	Right Side	5mm	Ant 0	132322	1745	22.42	23.50	1.282	-	-	0.12	0.595	0.763
		LTE Band 66	20M	QPSK	1	0	-	Top Side	5mm	Ant 0	132322	1745	22.42	23.50	1.282	-	-	0.01	0.096	0.123
		LTE Band 66	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	132322	1745	22.42	23.50	1.282	-	-	0	0.226	0.290
		LTE Band 66	20M	QPSK	50	24	-	Front	5mm	Ant 0	132322	1745	21.46	22.50	1.271	-	-	-0.01	0.357	0.454
		LTE Band 66	20M	QPSK	50	24	-	Back	5mm	Ant 0	132322	1745	21.46	22.50	1.271	-	-	-0.09	0.628	0.798
		LTE Band 66	20M	QPSK	50	24	-	Right Side	5mm	Ant 0	132322	1745	21.46	22.50	1.271	-	-	-0.12	0.570	0.724
		LTE Band 66	20M	QPSK	50	24	-	Top Side	5mm	Ant 0	132322	1745	21.46	22.50	1.271	-	-	-0.03	0.089	0.113
		LTE Band 66	20M	QPSK	50	24	-	Bottom Side	5mm	Ant 0	132322	1745	21.46	22.50	1.271	-	-	-0.09	0.218	0.277



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		LTE Band 66	20M	QPSK	100	0	-	Bottom Side	5mm	Ant 0	132322	1745	21.42	22.50	1.282	-	-	0.08	0.614	0.787
		LTE Band 66	20M	QPSK	1	0	-	Front	5mm	Ant 2	132322	1745	22.98	23.50	1.127	-	-	0.05	0.150	0.169
		LTE Band 66	20M	QPSK	1	0	-	Back	5mm	Ant 2	132322	1745	22.98	23.50	1.127	-	-	0.1	0.284	0.320
		LTE Band 66	20M	QPSK	1	0	-	Top Side	5mm	Ant 2	132322	1745	22.98	23.50	1.127	-	-	0.12	0.159	0.179
		LTE Band 66	20M	QPSK	50	24	-	Front	5mm	Ant 2	132322	1745	21.97	22.50	1.130	-	-	0.12	0.178	0.201
		LTE Band 66	20M	QPSK	50	24	-	Back	5mm	Ant 2	132322	1745	21.97	22.50	1.130	-	-	0.07	0.364	0.411
		LTE Band 66	20M	QPSK	50	24	-	Top Side	5mm	Ant 2	132322	1745	21.97	22.50	1.130	-	-	0.06	0.204	0.230
		FR1 n66	30M	QPSK	1	1	DFT-15	Front	5mm	Ant 2	349000	1745	22.70	23.50	1.202	-	-	0.13	0.199	0.239
		FR1 n66	30M	QPSK	1	1	DFT-15	Back	5mm	Ant 2	349000	1745	22.70	23.50	1.202	-	-	0.15	0.401	0.482
		FR1 n66	30M	QPSK	1	1	DFT-15	Top Side	5mm	Ant 2	349000	1745	22.70	23.50	1.202	-	-	-0.06	0.222	0.267
		FR1 n66	30M	QPSK	80	40	DFT-15	Front	5mm	Ant 2	349000	1745	22.26	23.50	1.330	-	-	0.13	0.181	0.241
11		FR1 n66	30M	QPSK	80	40	DFT-15	Back	5mm	Ant 2	349000	1745	22.26	23.50	1.330	-	-	-0.17	0.449	0.597
		FR1 n66	30M	QPSK	80	40	DFT-15	Top Side	5mm	Ant 2	349000	1745	22.26	23.50	1.330	-	-	-0.14	0.205	0.273
1900MHz																				
		LTE Band 25	20M	QPSK	1	0	-	Front	5mm	Ant 0	26340	1880	22.48	23.50	1.265	-	-	-	n/a	n/a
12		LTE Band 25	20M	QPSK	1	0	-	Back	5mm	Ant 0	26340	1880	22.48	23.50	1.265	-	-	0.12	0.273	0.345
	ULCA_2C	LTE Band 2C	20M	QPSK	1 1	0 99	-	Back	5mm	Ant 0	18900 19098	1880	22.36	23.50	1.300	-	-	0.04	0.254	0.330
		LTE Band 25	20M	QPSK	1	0	-	Right Side	5mm	Ant 0	26340	1880	22.48	23.50	1.265	-	-	0.14	0.218	0.276
		LTE Band 25	20M	QPSK	1	0	-	Top Side	5mm	Ant 0	26340	1880	22.48	23.50	1.265	-	-	0.15	0.080	0.101
		LTE Band 25	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	26340	1880	22.48	23.50	1.265	-	-	0.08	0.138	0.175
		LTE Band 25	20M	QPSK	50	24	-	Front	5mm	Ant 0	26340	1880	21.52	22.50	1.253	-	-	-	n/a	n/a
		LTE Band 25	20M	QPSK	50	24	-	Back	5mm	Ant 0	26340	1880	21.52	22.50	1.253	-	-	0.16	0.237	0.297
		LTE Band 25	20M	QPSK	50	24	-	Right Side	5mm	Ant 0	26340	1880	21.52	22.50	1.253	-	-	-0.07	0.209	0.262
		LTE Band 25	20M	QPSK	50	24	-	Top Side	5mm	Ant 0	26340	1880	21.52	22.50	1.253	-	-	0.02	0.076	0.095
		LTE Band 25	20M	QPSK	50	24	-	Bottom Side	5mm	Ant 0	26340	1880	21.52	22.50	1.253	-	-	-0.04	0.131	0.164
		LTE Band 2	20M	QPSK	1	0	-	Front	5mm	Ant 2	18900	1880	22.90	23.50	1.148	-	-	-0.04	0.150	0.172
13		LTE Band 2	20M	QPSK	1	0	-	Back	5mm	Ant 2	18900	1880	22.90	23.50	1.148	-	-	-0.12	0.279	0.320
		LTE Band 2	20M	QPSK	1	0	-	Top Side	5mm	Ant 2	18900	1880	22.90	23.50	1.148	-	-	-0.16	0.184	0.211
		LTE Band 2	20M	QPSK	50	24	-	Front	5mm	Ant 2	18900	1880	21.96	22.50	1.132	-	-	0.02	0.139	0.157
		LTE Band 2	20M	QPSK	50	24	-	Back	5mm	Ant 2	18900	1880	21.96	22.50	1.132	-	-	0.08	0.261	0.296
		LTE Band 2	20M	QPSK	50	24	-	Top Side	5mm	Ant 2	18900	1880	21.96	22.50	1.132	-	-	0.12	0.170	0.193
		FR1 n25	30M	QPSK	1	1	DFT-15	Front	5mm	Ant 2	376500	1882.5	22.50	23.50	1.259	-	-	0.09	0.167	0.210
14		FR1 n25	30M	QPSK	1	1	DFT-15	Back	5mm	Ant 2	376500	1882.5	22.50	23.50	1.259	-	-	0.07	0.406	0.511
		FR1 n25	30M	QPSK	1	1	DFT-15	Top Side	5mm	Ant 2	376500	1882.5	22.50	23.50	1.259	-	-	-0.04	0.206	0.259
		FR1 n25	30M	QPSK	80	40	DFT-15	Front	5mm	Ant 2	376500	1882.5	22.24	23.50	1.337	-	-	0.16	0.151	0.202
		FR1 n25	30M	QPSK	80	40	DFT-15	Back	5mm	Ant 2	376500	1882.5	22.24	23.50	1.337	-	-	-0.15	0.298	0.398
		FR1 n25	30M	QPSK	80	40	DFT-15	Top Side	5mm	Ant 2	376500	1882.5	22.24	23.50	1.337	-	-	-0.02	0.187	0.250
2300MHz																				
		LTE Band 30	10M	QPSK	1	0	-	Front	5mm	Ant 2	27710	2310	22.30	23.50	1.318	-	-	-0.19	0.101	0.133
15		LTE Band 30	10M	QPSK	1	0	-	Back	5mm	Ant 2	27710	2310	22.30	23.50	1.318	-	-	0.11	0.209	0.276
		LTE Band 30	10M	QPSK	1	0	-	Top Side	5mm	Ant 2	27710	2310	22.30	23.50	1.318	-	-	0.04	0.142	0.187
		LTE Band 30	10M	QPSK	25	12	-	Front	5mm	Ant 2	27710	2310	21.37	22.50	1.297	-	-	-0.07	0.096	0.125
		LTE Band 30	10M	QPSK	25	12	-	Back	5mm	Ant 2	27710	2310	21.37	22.50	1.297	-	-	0.13	0.195	0.253
		LTE Band 30	10M	QPSK	25	12	-	Top Side	5mm	Ant 2	27710	2310	21.37	22.50	1.297	-	-	0.06	0.135	0.175
		FR1 n30	10M	QPSK	1	1	DFT-15	Front	5mm	Ant 2	462000	2310	22.10	23.50	1.380	-	-	0.12	0.099	0.137
16		FR1 n30	10M	QPSK	1	1	DFT-15	Back	5mm	Ant 2	462000	2310	22.10	23.50	1.380	-	-	-0.05	0.242	0.334
		FR1 n30	10M	QPSK	1	1	DFT-15	Top Side	5mm	Ant 2	462000	2310	22.10	23.50	1.380	-	-	0.19	0.149	0.206
		FR1 n30	10M	QPSK	25	14	DFT-15	Front	5mm	Ant 2	462000	2310	21.94	23.50	1.432	-	-	-0.16	0.095	0.136
		FR1 n30	10M	QPSK	25	14	DFT-15	Back	5mm	Ant 2	462000	2310	21.94	23.50	1.432	-	-	-0.03	0.191	0.274
		FR1 n30	10M	QPSK	25	14	DFT-15	Top Side	5mm	Ant 2	462000	2310	21.94	23.50	1.432	-	-	0.16	0.139	0.199
2600MHz																				
		LTE Band 7	20M	QPSK	1	0	-	Front	5mm	Ant 2	21100	2535	22.68	23.50	1.208	-	-	-0.14	0.231	0.279
17		LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 2	21100	2535	22.68	23.50	1.208	-	-	0.05	0.506	0.611
	ULCA_7C	LTE Band 7C	20M	QPSK	1 1	0 99	-	Back	5mm	Ant 2	21100 21298	2535 2554.8	22.63	23.50	1.222	-	-	-0.13	0.487	0.595
		LTE Band 7	20M	QPSK	1	0	-	Top Side	5mm	Ant 2	21100	2535	22.68	23.50	1.208	-	-	0.12	0.482	0.582



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		LTE Band 7	20M	QPSK	50	24	-	Front	5mm	Ant 2	21100	2535	21.68	22.50	1.208	-	-	0.06	0.218	0.263
		LTE Band 7	20M	QPSK	50	24	-	Back	5mm	Ant 2	21100	2535	21.68	22.50	1.208	-	-	0.08	0.488	0.589
		LTE Band 7	20M	QPSK	50	24	-	Top Side	5mm	Ant 2	21100	2535	21.68	22.50	1.208	-	-	0.18	0.475	0.574
18		LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 0	40185	2549.5	22.40	23.50	1.288	62.9	1.006	-0.06	0.014	0.018
	ULCA_41C	LTE Band 41C	20M	QPSK	1	0	-	Back	5mm	Ant 0	40185	2549.5	22.38	23.50	1.294	62.9	1.006	0.04	0.012	0.016
		LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 0	40185	2549.5	22.40	23.50	1.288	62.9	1.006	-0.04	0.008	0.010
		LTE Band 41	20M	QPSK	1	0	-	Right Side	5mm	Ant 0	40185	2549.5	22.40	23.50	1.288	62.9	1.006	0.1	0.002	0.003
		LTE Band 41	20M	QPSK	1	0	-	Top Side	5mm	Ant 0	40185	2549.5	22.40	23.50	1.288	62.9	1.006	-0.16	0.006	0.008
		LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	40185	2549.5	22.40	23.50	1.288	62.9	1.006	-0.14	0.006	0.008
		LTE Band 41	20M	QPSK	50	24	-	Front	5mm	Ant 0	40185	2549.5	21.50	22.50	1.259	62.9	1.006	-0.04	0.008	0.010
		LTE Band 41	20M	QPSK	50	24	-	Back	5mm	Ant 0	40185	2549.5	21.50	22.50	1.259	62.9	1.006	0.11	0.007	0.009
		LTE Band 41	20M	QPSK	50	24	-	Right Side	5mm	Ant 0	40185	2549.5	21.50	22.50	1.259	62.9	1.006	0.1	0.002	0.003
		LTE Band 41	20M	QPSK	50	24	-	Top Side	5mm	Ant 0	40185	2549.5	21.50	22.50	1.259	62.9	1.006	-0.09	0.006	0.008
		LTE Band 41	20M	QPSK	50	24	-	Bottom Side	5mm	Ant 0	40185	2549.5	21.50	22.50	1.259	62.9	1.006	0.16	0.006	0.008
		FR1 n7	20M	QPSK	1	1	DFT-15	Front	5mm	Ant 2	507000	2535	22.30	23.50	1.318	-	-	-0.07	0.184	0.243
19		FR1 n7	20M	QPSK	1	1	DFT-15	Back	5mm	Ant 2	507000	2535	22.30	23.50	1.318	-	-	0.16	0.557	0.734
		FR1 n7	20M	QPSK	1	1	DFT-15	Top Side	5mm	Ant 2	507000	2535	22.30	23.50	1.318	-	-	-0.03	0.487	0.642
		FR1 n7	20M	QPSK	50	28	DFT-15	Front	5mm	Ant 2	507000	2535	22.18	23.50	1.355	-	-	-0.07	0.173	0.234
		FR1 n7	20M	QPSK	50	28	DFT-15	Back	5mm	Ant 2	507000	2535	22.18	23.50	1.355	-	-	-0.14	0.486	0.659
		FR1 n7	20M	QPSK	50	28	DFT-15	Top Side	5mm	Ant 2	507000	2535	22.18	23.50	1.355	-	-	0.01	0.474	0.642
	PC2	FR1 n41	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 2	518598	2592.99	25.32	27.00	1.472	-	-	-0.16	0.158	0.233
	PC2	FR1 n41	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 2	518598	2592.99	25.32	27.00	1.472	-	-	-0.02	0.325	0.479
	PC2	FR1 n41	100M	QPSK	1	137	DFT-30	Top Side	5mm	Ant 2	518598	2592.99	25.32	27.00	1.472	-	-	0.18	0.531	0.782
	PC2	FR1 n41	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 2	518598	2592.99	25.15	27.00	1.531	-	-	0.02	0.149	0.228
	PC2	FR1 n41	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 2	518598	2592.99	25.15	27.00	1.531	-	-	0.07	0.307	0.470
	PC2	FR1 n41	100M	QPSK	135	69	DFT-30	Top Side	5mm	Ant 2	518598	2592.99	25.15	27.00	1.531	-	-	0.18	0.502	0.769
	PC2	FR1 n41	100M	QPSK	270	0	DFT-30	Top Side	5mm	Ant 2	518598	2592.99	24.86	26.00	1.300	-	-	0.02	0.409	0.532
	PC2	FR1 n41	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 3	518598	2592.99	16.13	17.50	1.371	-	-	0.01	0.426	0.584
20	PC2	FR1 n41	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 3	518598	2592.99	16.13	17.50	1.371	-	-	0.15	0.712	0.976
	PC2	FR1 n41	100M	QPSK	1	137	DFT-30	Right Side	5mm	Ant 3	518598	2592.99	16.13	17.50	1.371	-	-	0.17	0.051	0.070
	PC2	FR1 n41	100M	QPSK	1	137	DFT-30	Top Side	5mm	Ant 3	518598	2592.99	16.13	17.50	1.371	-	-	0.1	0.146	0.200
	PC2	FR1 n41	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 3	518598	2592.99	16.09	17.50	1.384	-	-	-0.16	0.419	0.580
	PC2	FR1 n41	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 3	518598	2592.99	16.09	17.50	1.384	-	-	-0.17	0.673	0.931
	PC2	FR1 n41	100M	QPSK	135	69	DFT-30	Right Side	5mm	Ant 3	518598	2592.99	16.09	17.50	1.384	-	-	0.06	0.049	0.068
	PC2	FR1 n41	100M	QPSK	135	69	DFT-30	Top Side	5mm	Ant 3	518598	2592.99	16.09	17.50	1.384	-	-	-0.02	0.141	0.195
	PC2	FR1 n41	100M	QPSK	270	0	DFT-30	Top Side	5mm	Ant 3	518598	2592.99	16.03	17.50	1.403	-	-	-0.07	0.681	0.955
3000-4200MHz																				
	Part 27Q	LTE Band 42	20M	QPSK	1	0	-	Front	5mm	Ant 2	42990	3540	21.93	23.00	1.279	62.9	1.006	-0.13	0.072	0.093
	Part 27Q	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 2	42990	3540	21.93	23.00	1.279	62.9	1.006	-0.04	0.109	0.140
	Part 27Q	LTE Band 42	20M	QPSK	1	0	-	Top Side	5mm	Ant 2	42990	3540	21.93	23.00	1.279	62.9	1.006	-0.07	0.115	0.148
	Part 27Q	LTE Band 42	20M	QPSK	50	24	-	Front	5mm	Ant 2	42990	3540	20.90	22.00	1.288	62.9	1.006	0.01	0.071	0.092
	Part 27Q	LTE Band 42	20M	QPSK	50	24	-	Back	5mm	Ant 2	42990	3540	20.90	22.00	1.288	62.9	1.006	0.19	0.106	0.137
	Part 27Q	LTE Band 42	20M	QPSK	50	24	-	Top Side	5mm	Ant 2	42990	3540	20.90	22.00	1.288	62.9	1.006	-0.06	0.116	0.150
	Part 96	LTE Band 42	20M	QPSK	1	0	-	Front	5mm	Ant 2	43340	3575	21.61	23.00	1.377	62.9	1.006	-0.05	0.082	0.114
	Part 96	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 2	43340	3575	21.61	23.00	1.377	62.9	1.006	0.18	0.112	0.155
21	Part 96	LTE Band 42	20M	QPSK	1	0	-	Top Side	5mm	Ant 2	43340	3575	21.61	23.00	1.377	62.9	1.006	-0.13	0.121	0.168
	ULCA_42C	LTE Band 42C	20M	QPSK	1	0	-	Top Side	5mm	Ant 2	43241	3565.1	21.59	23.00	1.384	62.9	1.006	0.18	0.118	0.164
	Part 96	LTE Band 42	20M	QPSK	50	24	-	Front	5mm	Ant 2	43340	3575	20.62	22.00	1.374	62.9	1.006	0.03	0.076	0.105
	Part 96	LTE Band 42	20M	QPSK	50	24	-	Back	5mm	Ant 2	43340	3575	20.62	22.00	1.374	62.9	1.006	-0.08	0.105	0.145
	Part 96	LTE Band 42	20M	QPSK	50	24	-	Top Side	5mm	Ant 2	43340	3575	20.62	22.00	1.374	62.9	1.006	0.15	0.111	0.153
		LTE Band 43	20M	QPSK	1	0	-	Front	5mm	Ant 2	44090	3650	21.75	23.00	1.334	62.9	1.006	-0.02	0.112	0.150
		LTE Band 43	20M	QPSK	1	0	-	Back	5mm	Ant 2	44090	3650	21.75	23.00	1.334	62.9	1.006	-0.04	0.176	0.236
22		LTE Band 43	20M	QPSK	1	0	-	Top Side	5mm	Ant 2	44090	3650	21.75	23.00	1.334	62.9	1.006	-0.04	0.236	0.317
		LTE Band 43	20M	QPSK	50	24	-	Front	5mm	Ant 2	44090	3650	20.70	22.00	1.349	62.9	1.006	0.04	0.105	0.142
		LTE Band 43	20M	QPSK	50	24	-	Back	5mm	Ant 2	44090	3650	20.70	22.00	1.349	62.9	1.006	-0.18	0.159	0.216



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		LTE Band 43	20M	QPSK	50	24	-	Top Side	5mm	Ant 2	44090	3650	20.70	22.00	1.349	62.9	1.006	-0.14	0.186	0.252
		LTE Band 48	20M	QPSK	1	0	-	Front	5mm	Ant 2	55830	3609	22.01	23.00	1.256	62.9	1.006	-0.15	0.094	0.119
		LTE Band 48	20M	QPSK	1	0	-	Back	5mm	Ant 2	55830	3609	22.01	23.00	1.256	62.9	1.006	0.06	0.139	0.176
23		LTE Band 48	20M	QPSK	1	0	-	Top Side	5mm	Ant 2	55830	3609	22.01	23.00	1.256	62.9	1.006	-0.09	0.163	0.206
		LTE Band 48	20M	QPSK	50	24	-	Front	5mm	Ant 2	55830	3609	21.07	22.00	1.239	62.9	1.006	-0.19	0.085	0.106
		LTE Band 48	20M	QPSK	50	24	-	Back	5mm	Ant 2	55830	3609	21.07	22.00	1.239	62.9	1.006	0.15	0.130	0.162
		LTE Band 48	20M	QPSK	50	24	-	Top Side	5mm	Ant 2	55830	3609	21.07	22.00	1.239	62.9	1.006	-0.13	0.153	0.191
		FR1 n48	40M	QPSK	1	53	DFT-30	Front	5mm	Ant 2	641666	3624.99	20.79	22.00	1.321	-	-	-0.18	0.158	0.209
		FR1 n48	40M	QPSK	1	53	DFT-30	Back	5mm	Ant 2	641666	3624.99	20.79	22.00	1.321	-	-	0.06	0.312	0.412
		FR1 n48	40M	QPSK	1	53	DFT-30	Top Side	5mm	Ant 2	641666	3624.99	20.79	22.00	1.321	-	-	0.07	0.335	0.443
		FR1 n48	40M	QPSK	50	28	DFT-30	Front	5mm	Ant 2	641666	3624.99	20.64	22.00	1.368	-	-	-0.18	0.151	0.207
		FR1 n48	40M	QPSK	50	28	DFT-30	Back	5mm	Ant 2	641666	3624.99	20.64	22.00	1.368	-	-	0.19	0.298	0.408
24		FR1 n48	40M	QPSK	50	28	DFT-30	Top Side	5mm	Ant 2	641666	3624.99	20.64	22.00	1.368	-	-	-0.12	0.342	0.468
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 2	633332	3499.98	26.34	27.00	1.164	-	-	0.04	0.067	0.078
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 2	633332	3499.98	26.34	27.00	1.164	-	-	0.18	0.154	0.179
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Top Side	5mm	Ant 2	633332	3499.98	26.34	27.00	1.164	-	-	-0.1	0.160	0.186
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 2	633332	3499.98	26.15	27.00	1.216	-	-	0.19	0.058	0.071
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 2	633332	3499.98	26.15	27.00	1.216	-	-	0.09	0.133	0.162
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Top Side	5mm	Ant 2	633332	3499.98	26.15	27.00	1.216	-	-	-0.08	0.138	0.168
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 2	656000	3840	26.24	27.00	1.191	-	-	0.01	0.228	0.272
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 2	656000	3840	26.24	27.00	1.191	-	-	-0.19	0.520	0.619
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Top Side	5mm	Ant 2	656000	3840	26.24	27.00	1.191	-	-	-0.17	0.540	0.643
	Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 2	656000	3840	26.05	27.00	1.245	-	-	0.17	0.244	0.304
	Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 2	656000	3840	26.05	27.00	1.245	-	-	0.06	0.548	0.682
	Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Top Side	5mm	Ant 2	656000	3840	26.05	27.00	1.245	-	-	-0.07	0.569	0.708
	Part27O_PC2	FR1 n77	100M	QPSK	270	0	DFT-30	Back	5mm	Ant 2	656000	3840	25.50	26.00	1.122	-	-	0.05	0.445	0.499
	Part27O_PC2	FR1 n77	100M	QPSK	270	0	DFT-30	Top Side	5mm	Ant 2	656000	3840	25.50	26.00	1.122	-	-	-0.12	0.439	0.493
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 1	633332	3499.98	14.94	15.50	1.138	-	-	-0.08	0.126	0.143
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 1	633332	3499.98	14.94	15.50	1.138	-	-	-0.06	0.364	0.414
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Bottom Side	5mm	Ant 1	633332	3499.98	14.94	15.50	1.138	-	-	0.04	0.563	0.640
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 1	633332	3499.98	14.76	15.50	1.186	-	-	-0.06	0.134	0.159
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 1	633332	3499.98	14.76	15.50	1.186	-	-	-0.07	0.369	0.438
25	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Bottom Side	5mm	Ant 1	633332	3499.98	14.76	15.50	1.186	-	-	-0.01	0.601	0.713
	Part27Q_PC2	FR1 n77	100M	QPSK	270	0	DFT-30	Bottom Side	5mm	Ant 1	633332	3499.98	14.79	15.50	1.178	-	-	-0.11	0.584	0.688
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 1	656000	3840	14.41	15.50	1.285	-	-	0	0.029	0.037
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 1	656000	3840	14.41	15.50	1.285	-	-	-0.09	0.092	0.118
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Bottom Side	5mm	Ant 1	656000	3840	14.41	15.50	1.285	-	-	-0.08	0.151	0.194
	Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 1	656000	3840	14.32	15.50	1.312	-	-	-0.13	0.031	0.041
	Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 1	656000	3840	14.32	15.50	1.312	-	-	0.18	0.095	0.125
	Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Bottom Side	5mm	Ant 1	656000	3840	14.32	15.50	1.312	-	-	-0.01	0.155	0.203
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 0	633332	3499.98	24.75	25.50	1.189	-	-	0.19	0.021	0.025
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 0	633332	3499.98	24.75	25.50	1.189	-	-	0.12	0.046	0.055
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Right Side	5mm	Ant 0	633332	3499.98	24.75	25.50	1.189	-	-	-0.19	0.048	0.057
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Top Side	5mm	Ant 0	633332	3499.98	24.75	25.50	1.189	-	-	0.17	0.015	0.018
	Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Bottom Side	5mm	Ant 0	633332	3499.98	24.75	25.50	1.189	-	-	-	n/a	n/a
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 0	633332	3499.98	24.43	25.50	1.279	-	-	-0.09	0.018	0.023
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 0	633332	3499.98	24.43	25.50	1.279	-	-	-0.13	0.042	0.054
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Right Side	5mm	Ant 0	633332	3499.98	24.43	25.50	1.279	-	-	-0.04	0.045	0.058
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Top Side	5mm	Ant 0	633332	3499.98	24.43	25.50	1.279	-	-	0.14	0.012	0.015
	Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Bottom Side	5mm	Ant 0	633332	3499.98	24.43	25.50	1.279	-	-	-	n/a	n/a
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 0	656000	3840	24.05	25.50	1.396	-	-	-0.02	0.018	0.025
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 0	656000	3840	24.05	25.50	1.396	-	-	-0.17	0.038	0.053
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Right Side	5mm	Ant 0	656000	3840	24.05	25.50	1.396	-	-	0.04	0.041	0.057
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Top Side	5mm	Ant 0	656000	3840	24.05	25.50	1.396	-	-	-0.05	0.013	0.018
	Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Bottom Side	5mm	Ant 0	656000	3840	24.05	25.50	1.396	-	-	-	n/a	n/a
	Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 0	656000	3840	23.75	25.50	1.496	-	-	0.01	0.012	0.018



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Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 0	656000	3840	23.75	25.50	1.496	-	-	-0.06	0.034	0.051
Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Right Side	5mm	Ant 0	656000	3840	23.75	25.50	1.496	-	-	0.08	0.039	0.058
Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Top Side	5mm	Ant 0	656000	3840	23.75	25.50	1.496	-	-	-0.15	0.012	0.018
Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Bottom Side	5mm	Ant 0	656000	3840	23.75	25.50	1.496	-	-	-	n/a	n/a
Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 3	633332	3499.98	21.79	22.50	1.178	-	-	-0.15	0.044	0.052
Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 3	633332	3499.98	21.79	22.50	1.178	-	-	0	0.115	0.135
Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Right Side	5mm	Ant 3	633332	3499.98	21.79	22.50	1.178	-	-	0.12	0.007	0.008
Part27Q_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Top Side	5mm	Ant 3	633332	3499.98	21.79	22.50	1.178	-	-	0.06	0.085	0.100
Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 3	633332	3499.98	21.63	22.50	1.222	-	-	0.12	0.041	0.050
Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 3	633332	3499.98	21.63	22.50	1.222	-	-	-0.17	0.112	0.137
Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Right Side	5mm	Ant 3	633332	3499.98	21.63	22.50	1.222	-	-	-0.1	0.007	0.009
Part27Q_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Top Side	5mm	Ant 3	633332	3499.98	21.63	22.50	1.222	-	-	0.03	0.084	0.103
Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Front	5mm	Ant 3	656000	3840	21.40	22.50	1.288	-	-	0.18	0.013	0.017
Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Back	5mm	Ant 3	656000	3840	21.40	22.50	1.288	-	-	-0.18	0.033	0.043
Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Right Side	5mm	Ant 3	656000	3840	21.40	22.50	1.288	-	-	-0.16	0.002	0.003
Part27O_PC2	FR1 n77	100M	QPSK	1	137	DFT-30	Top Side	5mm	Ant 3	656000	3840	21.40	22.50	1.288	-	-	-0.19	0.024	0.031
Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Front	5mm	Ant 3	656000	3840	21.31	22.50	1.315	-	-	-0.03	0.013	0.017
Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Back	5mm	Ant 3	656000	3840	21.31	22.50	1.315	-	-	-0.13	0.031	0.041
Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Right Side	5mm	Ant 3	656000	3840	21.31	22.50	1.315	-	-	-0.09	0.002	0.003
Part27O_PC2	FR1 n77	100M	QPSK	135	69	DFT-30	Top Side	5mm	Ant 3	656000	3840	21.31	22.50	1.315	-	-	0.13	0.023	0.030

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
WLAN & BT															
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 4	11	2462	15.10	17.00	1.549	100	1.000	-	n/a	n/a
26	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 4	11	2462	15.10	17.00	1.549	100	1.000	-0.18	0.018	0.027
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	5mm	Ant 4	11	2462	15.10	17.00	1.549	100	1.000	-0.02	0.013	0.020
	WLAN5GHz	802.11a 6Mbps	Front	5mm	Ant 4	36	5180	17.30	19.00	1.478	98.54	1.015	0.13	0.027	0.040
	WLAN5GHz	802.11a 6Mbps	Back	5mm	Ant 4	36	5180	17.30	19.00	1.478	98.54	1.015	0.06	0.092	0.137
27	WLAN5GHz	802.11a 6Mbps	Bottom Side	5mm	Ant 4	36	5180	17.30	19.00	1.478	98.54	1.015	0.13	0.168	0.252
	WLAN5GHz	802.11a 6Mbps	Front	5mm	Ant 4	149	5745	17.29	19.00	1.481	98.54	1.015	-0.16	0.172	0.259
	WLAN5GHz	802.11a 6Mbps	Back	5mm	Ant 4	149	5745	17.29	19.00	1.481	98.54	1.015	0.01	0.333	0.501
28	WLAN5GHz	802.11a 6Mbps	Bottom Side	5mm	Ant 4	149	5745	17.29	19.00	1.481	98.54	1.015	0.19	0.482	0.725

15. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	5G Dongle
		Body
1.	WWAN + WLAN2.4GHz	Yes
2.	WWAN + WLAN5GHz	Yes

General Note:

- EUT will choose each LTE and 5G NR according to the network signal condition; therefore, they will not operate simultaneously at any moment.
- WWAN above includes 5G NR bands and EN-DC combination.
- EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment though they have independent antenna.
- For 5G NR EN-DC mode, standalone SAR performed for 5G NR NSA band with the maximum power, EN-DC SAR summed EN-DC mode 5G NR standalone SAR and LTE standalone SAR, the result of EN-DC SAR is more conservatively.
- For standalone WWAN, always choose the highest SAR among all WWAN bands within the selected antenna for each exposure position to perform simultaneous transmission analysis with WLAN. This is the worst co-located analysis and can represent each bands.
- For inter-band UL CA SAR co-located with WLAN, chose the worst SAR among selected LTE bands within the selected antenna per each test position to do co-located with WLAN/Bluetooth. This is the worst co-located analysis and can represent each LTE bands.
- For EN-DC SAR co-located with WLAN/Bluetooth, chose the worst SAR among the selected LTE bands within the selected antenna per each test position and also the worst SAR of the selected/all 5G NR Bands within all antennas/ the selected antenna to do co-located with WLAN/Bluetooth. This is the worst co-located analysis and can represent each LTE bands and each 5G NR bands.
- All licensed modes share the same antenna part and cannot transmit simultaneously.
- The reported SAR summation is calculated based on the same configuration and test position
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
 - $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 - If $SPLSR \leq 0.04$ for 1g SAR and $SPLSR \leq 0.10$ for 10g SAR, simultaneously transmission SAR measurement is not necessary.
 - Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.



15.1 Body Exposure Conditions

WWAN Band	Exposure Position	1	3	4	1+3	1+4
		WWAN	WLAN2.4GHz Ant 4	WLAN5GHz Ant 4	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
LTE Band 2 Ant 2	Front	0.172		0.259	0.17	0.43
	Back	0.320	0.027	0.501	0.35	0.82
	Left side					
	Right side					
	Top side	0.211			0.21	0.21
	Bottom side		0.020	0.725	0.02	0.73
LTE Band 7 Ant 2	Front	0.279		0.259	0.28	0.54
	Back	0.611	0.027	0.501	0.64	1.11
	Left side					
	Right side					
	Top side	0.582			0.58	0.58
	Bottom side		0.020	0.725	0.02	0.73
LTE Band 12 Ant 0	Front	0.221		0.259	0.22	0.48
	Back	0.278	0.027	0.501	0.31	0.78
	Left side					
	Right side	0.046			0.05	0.05
	Top side	0.116			0.12	0.12
	Bottom side	0.099	0.020	0.725	0.12	0.82
LTE Band 13 Ant 0	Front	0.585		0.259	0.59	0.84
	Back	0.774	0.027	0.501	0.80	1.28
	Left side					
	Right side	0.120			0.12	0.12
	Top side	0.312			0.31	0.31
	Bottom side	0.264	0.020	0.725	0.28	0.99
LTE Band 14 Ant 0	Front	0.467		0.259	0.47	0.73
	Back	0.536	0.027	0.501	0.56	1.04
	Left side					
	Right side	0.096			0.10	0.10
	Top side	0.239			0.24	0.24
	Bottom side	0.203	0.020	0.725	0.22	0.93
LTE Band 25 Ant 0	Front			0.259		0.26
	Back	0.345	0.027	0.501	0.37	0.85
	Left side					
	Right side	0.276			0.28	0.28
	Top side	0.101			0.10	0.10
	Bottom side	0.175	0.020	0.725	0.20	0.90
LTE Band 26 Ant 0	Front	0.251		0.259	0.25	0.51
	Back	0.265	0.027	0.501	0.29	0.77
	Left side					
	Right side	0.052			0.05	0.05
	Top side	0.123			0.12	0.12
	Bottom side	0.195	0.020	0.725	0.22	0.92
LTE Band 30 Ant 2	Front	0.133		0.259	0.13	0.39
	Back	0.276	0.027	0.501	0.30	0.78
	Left side					
	Right side					
	Top side	0.187			0.19	0.19
	Bottom side		0.020	0.725	0.02	0.73
LTE Band 66 Ant 0	Front	0.505		0.259	0.51	0.76



	Back	0.914	0.027	0.501	0.94	1.42
	Left side					
	Right side	0.763			0.76	0.76
	Top side	0.123			0.12	0.12
	Bottom side	0.787	0.020	0.725	0.81	1.51
LTE Band 66 Ant 2	Front	0.201		0.259	0.20	0.46
	Back	0.411	0.027	0.501	0.44	0.91
	Left side					
	Right side					
	Top side	0.230			0.23	0.23
LTE Band 71 Ant 0	Bottom side		0.020	0.725	0.02	0.73
	Front	0.121		0.259	0.12	0.38
	Back	0.152	0.027	0.501	0.18	0.65
	Left side					
	Right side	0.026			0.03	0.03
LTE Band 41 Ant 0	Top side	0.066			0.07	0.07
	Bottom side	0.057	0.020	0.725	0.08	0.78
	Front	0.018		0.259	0.02	0.28
	Back	0.016	0.027	0.501	0.04	0.52
	Left side					
LTE Band 42 Ant 2	Right side	0.003			0.00	0.00
	Top side	0.008			0.01	0.01
	Bottom side	0.008	0.020	0.725	0.03	0.73
	Front	0.114		0.259	0.11	0.37
	Back	0.155	0.027	0.501	0.18	0.66
LTE Band 43 Ant 2	Left side					
	Right side					
	Top side	0.317			0.32	0.32
	Bottom side		0.020	0.725	0.02	0.73
	Front	0.150		0.259	0.15	0.41
LTE Band 48 Ant 2	Back	0.236	0.027	0.501	0.26	0.74
	Left side					
	Right side					
	Top side	0.119		0.259	0.12	0.38
	Back	0.176	0.027	0.501	0.20	0.68
FR1 n5 Ant 0	Left side					
	Right side					
	Top side	0.206			0.21	0.21
	Bottom side		0.020	0.725	0.02	0.73
	Front	0.326		0.259	0.33	0.59
FR1 n7 Ant 2	Back	0.411	0.027	0.501	0.44	0.91
	Left side					
	Right side	0.058			0.06	0.06
	Top side	0.149			0.15	0.15
	Bottom side	0.220	0.020	0.725	0.24	0.95
FR1 n12 Ant 0	Front	0.243		0.259	0.24	0.50
	Back	0.734	0.027	0.501	0.76	1.24
	Left side					
	Right side					
	Top side	0.642			0.64	0.64
	Bottom side		0.020	0.725	0.02	0.73
	Front	0.238		0.259	0.24	0.50
	Back	0.328	0.027	0.501	0.36	0.83
	Left side					



	Right side	0.052			0.05	0.05
	Top side	0.129			0.13	0.13
	Bottom side	0.107	0.020	0.725	0.13	0.83
FR1 n14 Ant 0	Front	0.388		0.259	0.39	0.65
	Back	0.519	0.027	0.501	0.55	1.02
	Left side					
	Right side	0.081			0.08	0.08
	Top side	0.212			0.21	0.21
	Bottom side	0.177	0.020	0.725	0.20	0.90
FR1 n25 Ant 2	Front	0.210		0.259	0.21	0.47
	Back	0.511	0.027	0.501	0.54	1.01
	Left side					
	Right side					
	Top side	0.259			0.26	0.26
	Bottom side		0.020	0.725	0.02	0.73
FR1 n30 Ant 2	Front	0.137		0.259	0.14	0.40
	Back	0.334	0.027	0.501	0.36	0.84
	Left side					
	Right side					
	Top side	0.206			0.21	0.21
	Bottom side		0.020	0.725	0.02	0.73
FR1 n66 Ant 2	Front	0.241		0.259	0.24	0.50
	Back	0.597	0.027	0.501	0.62	1.10
	Left side					
	Right side					
	Top side	0.273			0.27	0.27
	Bottom side		0.020	0.725	0.02	0.73
FR1 n71 Ant 0	Front	0.125		0.259	0.13	0.38
	Back	0.164	0.027	0.501	0.19	0.67
	Left side					
	Right side	0.025			0.03	0.03
	Top side	0.069			0.07	0.07
	Bottom side	0.057	0.020	0.725	0.08	0.78
FR1 n41 Ant 2	Front	0.233		0.259	0.23	0.49
	Back	0.479	0.027	0.501	0.51	0.98
	Left side					
	Right side					
	Top side	0.782			0.78	0.78
	Bottom side		0.020	0.725	0.02	0.73
FR1 n41 Ant 3	Front	0.584		0.259	0.58	0.84
	Back	0.976	0.027	0.501	1.00	1.48
	Left side					
	Right side	0.070			0.07	0.07
	Top side	0.955			0.96	0.96
	Bottom side		0.020	0.725	0.02	0.73
FR1 n48 Ant 2	Front	0.209		0.259	0.21	0.47
	Back	0.412	0.027	0.501	0.44	0.91
	Left side					
	Right side					
	Top side	0.468			0.47	0.47
	Bottom side		0.020	0.725	0.02	0.73
FR1 n77 Ant 2	Front	0.304		0.259	0.30	0.56
	Back	0.682	0.027	0.501	0.71	1.18
	Left side					
	Right side					
	Top side	0.708			0.71	0.71



	Bottom side		0.020	0.725	0.02	0.73
FR1 n77 Ant 1	Front	0.159		0.259	0.16	0.42
	Back	0.438	0.027	0.501	0.47	0.94
	Left side					
	Right side					
	Top side					
	Bottom side	0.713	0.020	0.725	0.73	1.44
FR1 n77 Ant 0	Front	0.025		0.259	0.03	0.28
	Back	0.055	0.027	0.501	0.08	0.56
	Left side					
	Right side	0.058			0.06	0.06
	Top side	0.018			0.02	0.02
	Bottom side		0.020	0.725	0.02	0.73
FR1 n77 Ant 3	Front	0.052		0.259	0.05	0.31
	Back	0.137	0.027	0.501	0.16	0.64
	Left side					
	Right side	0.009			0.01	0.01
	Top side	0.103			0.10	0.10
	Bottom side		0.020	0.725	0.02	0.73

WWAN Band	FR1 Band	Exposure Position	1	2	3	4	1+2+3	1+2+4
			WWAN	FR1 Band	WLAN2.4GHz Ant 4	WLAN5GHz Ant 4	Summed	Summed
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
LTE Band 7 Ant 2	FR1 n5 Ant 0	Front	0.279	0.326		0.259	0.61	0.86
		Back	0.611	0.411	0.027	0.501	1.05	1.52
		Left side					0.00	0.00
		Right side		0.058			0.06	0.06
		Top side	0.582	0.149			0.73	0.73
		Bottom side		0.220	0.020	0.725	0.24	0.95
LTE Band 66 Ant 2	FR1 n5 Ant 0	Front	0.201	0.326		0.259	0.53	0.79
		Back	0.411	0.411	0.027	0.501	0.85	1.32
		Left side					0.00	0.00
		Right side		0.058			0.06	0.06
		Top side	0.230	0.149			0.38	0.38
		Bottom side		0.220	0.020	0.725	0.24	0.95
LTE Band 5 Ant 0	FR1 n66 Ant 2	Front		0.241		0.259	0.24	0.50
		Back	0.247	0.597	0.027	0.501	0.87	1.35
		Left side					0.00	0.00
		Right side					0.00	0.00
		Top side		0.273			0.27	0.27
		Bottom side			0.020	0.725	0.02	0.73
LTE Band 12 Ant 0	FR1 n66 Ant 2	Front	0.221	0.241		0.259	0.46	0.72
		Back	0.278	0.597	0.027	0.501	0.90	1.38
		Left side					0.00	0.00
		Right side	0.046				0.05	0.05
		Top side	0.116	0.273			0.39	0.39
		Bottom side	0.099		0.020	0.725	0.12	0.82
LTE Band 2 Ant 2	FR1 n71 Ant 0	Front	0.172	0.125		0.259	0.30	0.56
		Back	0.320	0.164	0.027	0.501	0.51	0.99
		Left side					0.00	0.00
		Right side		0.025			0.03	0.03
		Top side	0.211	0.069			0.28	0.28
		Bottom side		0.057	0.020	0.725	0.08	0.78
LTE Band 5 Ant 0	FR1 n77 Ant 2	Front		0.304		0.259	0.30	0.56
		Back	0.247	0.682	0.027	0.501	0.96	1.43



		Left side					0.00	0.00
		Right side					0.00	0.00
		Top side		0.708			0.71	0.71
		Bottom side			0.020	0.725	0.02	0.73
LTE Band 5 Ant 0	FR1 n77 Ant 1	Front		0.159		0.259	0.16	0.42
		Back	0.247	0.438	0.027	0.501	0.71	1.19
		Left side					0.00	0.00
		Right side					0.00	0.00
		Top side					0.00	0.00
		Bottom side		0.713	0.020	0.725	0.73	1.44
LTE Band 5 Ant 0	FR1 n77 Ant 0	Front		0.025		0.259	0.03	0.28
		Back	0.247	0.055	0.027	0.501	0.33	0.80
		Left side					0.00	0.00
		Right side		0.058			0.06	0.06
		Top side		0.018			0.02	0.02
		Bottom side			0.020	0.725	0.02	0.73
LTE Band 5 Ant 0	FR1 n77 Ant 3	Front		0.052		0.259	0.05	0.31
		Back	0.247	0.137	0.027	0.501	0.41	0.89
		Left side					0.00	0.00
		Right side		0.009			0.01	0.01
		Top side		0.103			0.10	0.10
		Bottom side			0.020	0.725	0.02	0.73
LTE Band 41 Ant 0	FR1 n77 Ant 2	Front	0.018	0.304		0.259	0.32	0.58
		Back	0.016	0.682	0.027	0.501	0.73	1.20
		Left side					0.00	0.00
		Right side	0.003				0.00	0.00
		Top side	0.008	0.708			0.72	0.72
		Bottom side	0.008		0.020	0.725	0.03	0.73
LTE Band 41 Ant 0	FR1 n77 Ant 1	Front	0.018	0.159		0.259	0.18	0.44
		Back	0.016	0.438	0.027	0.501	0.48	0.96
		Left side					0.00	0.00
		Right side	0.003				0.00	0.00
		Top side	0.008				0.01	0.01
		Bottom side	0.008	0.713	0.020	0.725	0.74	1.45
LTE Band 41 Ant 0	FR1 n77 Ant 0	Front	0.018	0.025		0.259	0.04	0.30
		Back	0.016	0.055	0.027	0.501	0.10	0.57
		Left side					0.00	0.00
		Right side	0.003	0.058			0.06	0.06
		Top side	0.008	0.018			0.03	0.03
		Bottom side	0.008		0.020	0.725	0.03	0.73
LTE Band 41 Ant 0	FR1 n77 Ant 3	Front	0.018	0.052		0.259	0.07	0.33
		Back	0.016	0.137	0.027	0.501	0.18	0.65
		Left side					0.00	0.00
		Right side	0.003	0.009			0.01	0.01
		Top side	0.008	0.103			0.11	0.11
		Bottom side	0.008		0.020	0.725	0.03	0.73



WWAN Band	WWAN Band	Exposure Position	1	2	3	4	1+2+3	1+2+4
			WWAN	FR1	WLAN2.4GHz Ant 4	WLAN5GHz Ant 4	Summed	Summed
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
LTE Band 12 Ant 0	LTE Band 66 Ant 2	Front	0.221	0.201		0.259	0.42	0.68
		Back	0.278	0.411	0.027	0.501	0.72	1.19
		Left side					0.00	0.00
		Right side	0.046				0.05	0.05
		Top side	0.116	0.230			0.35	0.35
		Bottom side	0.099		0.020	0.725	0.12	0.82
LTE Band 26 Ant 0	LTE Band 66 Ant 2	Front	0.251	0.201		0.259	0.45	0.71
		Back	0.265	0.411	0.027	0.501	0.70	1.18
		Left side					0.00	0.00
		Right side	0.052				0.05	0.05
		Top side	0.123	0.230			0.35	0.35
		Bottom side	0.195		0.020	0.725	0.22	0.92

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16. Uncertainty Assessment

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

17. References

- [1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”
- [2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992
- [3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015
- [6] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.
- [7] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015
- [8] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015
- [9] FCC KDB 865664 D01 v01r04, “SAR Measurement Requirements for 100 MHz to 6 GHz”, Aug 2015.
- [10] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.
- [11] FCC KDB 447498 D02 v02r01, “SAR Measurement Procedures for USB Dongle Transmitters”, Oct 2015.

Appendixes

Please refer to separated files for the following appendixes

Appendix A. Plots of System Performance Check

Appendix B. Plots of High SAR Measurement

Appendix C. DASY Calibration Certificate

Appendix D. Test Setup Photos

Appendix E. Conducted RF Output Power Table

Appendix F. Power measurement connection diagram and CA Conducted RF Output Power Table

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