FCC SAR Test Report

APPLICANT	:	TCL Communication Ltd
EQUIPMENT	:	5G NR/ LTE/WCDMA/GSM Mobile Phone
BRAND NAME	:	TCL
MODEL NAME	:	T790S
FCC ID	:	2ACCJN042
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2013

The product was received on May 19, 2020 and testing was started from Jul. 06, 2020 and completed on Aug. 19, 2020. We, Sporton International (Kunshan) Inc, would like to declare that the tested sample has been evaluated in accordance with the procedures and had 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 (Kunshan) Inc., the test report shall not be reproduced except in full.

Rose Wang

Reviewed by: Rose Wang / Supervisor

Kat Yin

Approved by: Kat Yin / Manager

ACCREDITED Cert #5145.02

Sporton International (Kunshan) Inc.
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA051926	Rev. 01	Initial issue of report	Aug. 12, 2020
FA051926	Rev. 02	Added LTE band 2/66 at Antenna 3 SAR testing for EN-DC mode with FR1 n5 (Antenna 1).	Aug. 24, 2020

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **TCL Communication Ltd, 5G NR/ LTE/WCDMA/GSM Mobile Phone, T790S,** are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 10mm)	Body-worn (Separation 15mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.63	0.74	0.37	1.47
		GSM1900	0.14	0.79	0.47	
	WCDMA	Band II	0.25	0.91	0.63	
		Band IV	0.20	**1.00**	0.49	
		Band V	0.98	0.94	0.29	
	LTE	Band 2	0.99	0.96	0.56	
		Band 5	0.90	**1.00**	0.33	
		Band 7	0.19	0.98	0.67	
		Band 12	0.95	0.95	0.52	
		Band 13	**1.00**	0.91	0.44	
		Band 66/Band 4	0.99	0.99	0.47	
		Band 48	<0.10	0.99	0.65	
	5G NR	n2	0.94	0.99	0.51	
		n5	0.96	0.80	0.38	
		n66	0.98	**1.00**	0.48	
DTS	WLAN	2.4GHz WLAN	<0.10	0.29	0.12	1.29
NII		5GHz WLAN	0.45	0.33	**0.78**	1.47
DSS	Bluetooth	2.4GHz Bluetooth	<0.10	0.14	<0.10	1.47

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	WCDMA	Band II	3.04	3.81
		Band IV	**3.12**	
	LTE	Band 2	3.02	
		Band 7	3.04	
		Band 66/Band 4	3.06	
	5G NR	n2	3.04	
		n66	**3.12**	
NII	WLAN	5GHz WLAN	2.80	3.81
Date of Testing:			2020/7/6~ 2020/8/19	
Remark: This device supports LTE B4 and B66. Since the supported frequency span for LTE B4 falls completely within the supports frequency span for LTE B66, 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.				

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, 4.0 W/kg for Product Specific 10g 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 (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory		
Test Firm	Sporton International (Kunshan) Inc.	
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958	
Test Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CN1257	314309

Applicant	
Company Name	TCL Communication Ltd
Address	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong

Manufacturer	
Company Name	TCL Communication Ltd
Address	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong

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 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	5G NR/ LTE/WCDMA/GSM Mobile Phone
Brand Name	TCL
Model Name	T790S
FCC ID	2ACCJN042
IMEI Code	015749000003512
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz LTE Band 48: 3552.5 MHz ~3697.5 MHz 5G NR n2 :1852.5 MHz ~ 1907.5 MHz 5G NR n5 : 826.5 MHz ~ 846.5 MHz 5G NR n66 : 1712.5 MHz ~ 1777.5 MHz 5G NR n260: 37000 MHz ~ 40000MHz 5G NR n261: 27500 MHz ~ 28350MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM 5G NR : CP-OFDM / DFT-s-OFDM, PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
HW Version	03
SW Version	1B6GTWG0
EUT Stage	Identical Prototype
Remark: 1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation. 2. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications. 3. This device 2.4GHz WLAN/5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only).	

4. This device does not support DTM operation and supports GRPS/EGRPS mode up to multi-slot class 12.
5. The 2.4GHz/5GHz WLAN can transmit in MIMO antenna mode only and it has no SISO antenna mode.
6. WLAN5GHz transmit with WWAN/Bluetooth simultaneously for body, WLAN5GHz will invoke reduced power level.
7. The device implements the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot/extremity) and the Qualcomm smart transmit will manage to ensure the power level not exceeding the associated power table. Details about the power management decision and sensor detection are provided in the operational description.
8. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
9. 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.
10. 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.
11. This device supports 5GNR FR1 bands as following table.

<5G NR>

Mode	Band	Duplex	SCS(KHz)	Bandwidths(BW)
NSA	n2	FDD	15	5, 10, 15, 20
	n5	FDD	15	5, 10, 15, 20
	n66	TDD	15	5, 10, 15, 20

4.3 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>2ACCJN042</td></tr>
<tr><td>Equipment Name</td><td>5G NR/ LTE/WCDMA/GSM Mobile Phone</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>LTE Band 2: 1850.7 MHz ~ 1909.3 MHz
LTE Band 4: 1710.7 MHz ~ 1754.3 MHz
LTE Band 5: 824.7 MHz ~ 848.3 MHz
LTE Band 7: 2502.5 MHz ~ 2567.5 MHz
LTE Band 12: 699.7 MHz ~ 715.3 MHz
LTE Band 13: 779.5 MHz ~ 784.5 MHz
LTE Band 66: 1710.7 MHz ~ 1779.3 MHz
LTE Band 48: 3552.5 MHz ~3697.5 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 13: 5MHz, 10MHz
LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 48: 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>uplink modulations used</td><td>QPSK / 16QAM / 64QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Voice and Data</td></tr>
<tr><td>LTE Release Version</td><td>R15, Cat18</td></tr>
<tr><td>CA Support</td><td>Supported, Uplink and Downlink</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>
</td></tr>
<tr><td>LTE A-MPR</td><td>In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes
The device has several different power modes for body-worn, hotspot/extremity conditions SAR compliance; power selection is determined by the device's positioning and usage scenarios.</td></tr>
<tr><td>LTE Carrier Aggregation Combinations</td><td>Intra/Inter Band possible combinations and the detail power verification please referred to section 14.</td></tr>
<tr><td>LTE Carrier Aggregation Additional Information</td><td>1. This device supports LTE Carrier Aggregation (CA) in the uplink for 5B, 66B, 66C with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per FCC Guidance.
2. This device supports maximum of 4 carriers in the downlink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.</td></tr>
</table>

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	847.5	20625	846.5	20600	844				
LTE Band 7												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510				
M	21100	2535	21100	2535	21100	2535	21100	2535				
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560				
LTE Band 12												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	23017	699.7	23025	700.5	23035	701.5	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5				
H	23173	715.3	23165	714.5	23155	713.5	23130	711				
LTE Band 13												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)					
L	23205		779.5		23230		782					
M	23230		782									
H	23255		784.5									
LTE Band 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 48												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	55265	3552.5	55290	3555	55315	3557.5	55340	3560				
L M	55810	3607	55815	3607.5	55820	3608	55830	3609				
M H	56170	3643	56165	3642.5	56160	3642	56150	3641				
H	56715	3697.5	56690	3695	56665	3692.5	56640	3690				

5G NR Information	
Operating Frequency Range of each 5G NR transmission band	5G NR n2 : 1852.5 MHz ~ 1907.5 MHz 5G NR n5 : 826.5 MHz ~ 846.5 MHz 5G NR n66 : 1712.5 MHz ~ 1777.5 MHz
Channel Bandwidth	5G NR n2: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n5: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n66: 5MHz, 10MHz, 15MHz, 20MHz
SCS	FDD: SCS15KHz
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
L TE Anchor Bands for n2	LTE B66/5/13
LTE Anchor Bands for n5	LTE B66/48/2
LTE Anchor Bands for n66	LTE B2/5/13/48

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 66

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	342500	1712.5	343000	1715	343500	1717.5	344000	1720
M	349000	1745	349000	1745	349000	1745	349000	1745
H	355500	1777.5	355000	1775	354500	1772.5	354000	1770

5. Smart Transmit feature for RF Exposure compliance

The FCC RF exposure limit is defined based on time-averaged RF exposure. The product implements Qualcomm Smart Transmit feature which controls the instantaneous transmitting power for WWAN transmitter to ensure the product in compliance with FCC RF exposure limit over a defined time window for SAR (transmit frequency ≤ 6GHz). To control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is compliant to the regulation requirement.

This report describes the procedures for the SAR char generation, and the parameters obtained from SAR characterization (referred to as SAR char, respectively) will be used as input for Smart Transmit. SAR char will be entered via the Embedded File System (EFS) to enable the Smart Transmit Feature.

<Terminologies in this report>

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

<SAR Characterization>

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

<SAR design target and uncertainty>

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

	Uncertainty dB (k=2)
Total uncertainty	1.0

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

$$SAR\_design\_target < SAR_{regulatory\_limit} \times 10^{\frac{-total\ uncertainty}{10}}$$

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

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

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

For FCC					
Band	Antenna	Head	Hotspot	Body-Worn/ Extremity	Pmax*
		DSI 3	DSI 2	DSI 1	
GSM850 (4 Tx slots)**	1	19.50	24.80	27.90	23.50
GSM1900 (2 Tx slots)**	2	28.40	24.00	21.60	20.00
WCDMA II	2	30.00	19.90	21.50	24.00
WCDMA IV	2	30.90	20.60	21.40	24.00
WCDMA V	1	22.30	24.20	27.60	24.00
LTE Band 2	2	30.60	20.00	21.50	24.00
LTE Band 2	3	19.00	20.00	20.50	22.50
LTE Band 66&4	2	31.20	20.40	21.40	24.00
LTE Band 66	3	19.00	21.50	21.00	23.00
LTE Band 5	1	22.80	24.00	27.70	24.00
LTE Band 7	2	31.10	20.20	22.20	24.00
LTE Band 12	1	21.60	24.20	26.70	24.00
LTE Band 13	1	21.00	24.40	26.90	24.00
LTE Band 48**	2	35.10	20.60	20.60	21.30
FR1 N2	3	19.00	20.50	22.00	24.00
FR1 N5	1	21.80	24.90	28.20	24.00
FR1 N66	3	21.00	22.50	23.50	24.00

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

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

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

6. RF Exposure Limits

6.1 Uncontrolled Environment

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

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

7. Specific Absorption Rate (SAR)

7.1 Introduction

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

7.2 SAR Definition

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

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

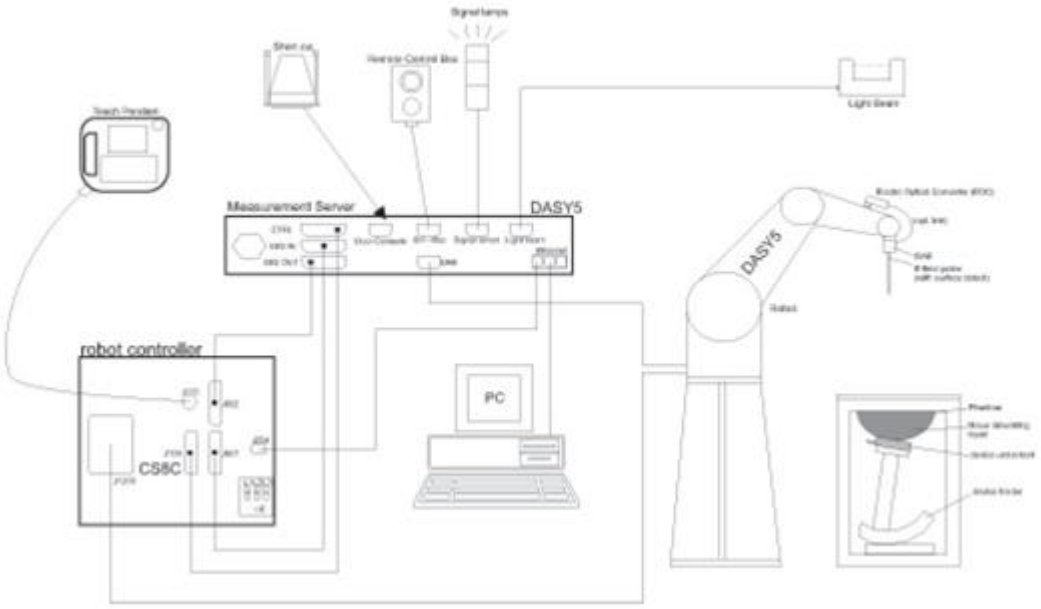
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

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

8.1 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	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

8.2 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.

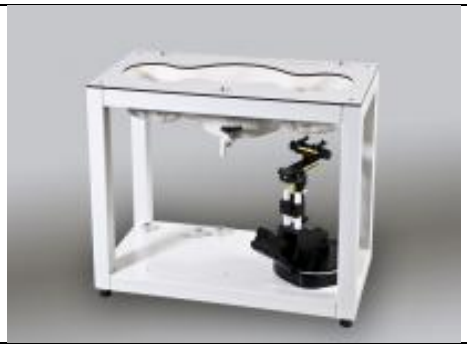
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

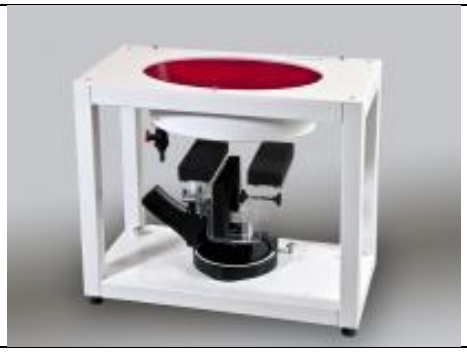
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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 in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

8.4 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-Worn Transmitters>

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

Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 Power Reference Measurement

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

9.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

9.4 Zoom Scan

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

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

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

9.5 Volume Scan Procedures

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

9.6 Power Drift Monitoring

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

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1087	2019/3/27	2022/3/26
SPEAG	835MHz System Validation Kit	D835V2	4d151	2019/3/27	2022/3/26
SPEAG	1750MHz System Validation Kit	D1750V2	1090	2019/3/27	2022/3/26
SPEAG	1900MHz System Validation Kit	D1900V2	5d170	2019/3/26	2022/3/25
SPEAG	2450MHz System Validation Kit	D2450V2	908	2019/3/25	2022/3/24
SPEAG	2600MHz System Validation Kit	D2600V2	1061	2018/12/7	2021/12/6
SPEAG	3700MHz System Validation Kit	D3700V2	1008	2018/11/27	2021/11/26
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2019/9/24	2020/9/23
SPEAG	Data Acquisition Electronics	DAE4	1338	2019/11/20	2020/11/19
SPEAG	Data Acquisition Electronics	DAE4	656	2019/12/17	2020/12/16
SPEAG	Dosimetric E-Field Probe	EX3DV4	3976	2020/1/27	2021/1/26
SPEAG	Dosimetric E-Field Probe	EX3DV4	7592	2020/5/22	2021/5/21
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1503	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1697	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio Communication Analyzer	MT8821C	6201432831	2020/4/16	2021/4/15
Agilent	Wireless Communication Test Set	E5515C	MY52102706	2020/4/16	2021/4/15
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2020/4/16	2021/4/15
SPEAG	Dielectric Probe Kit	DAK-3.5	1071	2019/10/28	2020/10/27
Rohde & Schwarz	Power Meter	NRVD	102081	2019/8/15	2020/8/14
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2019/8/14	2020/8/13
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2019/8/14	2020/8/13
Rohde & Schwarz	Power Meter	NRVD	102081	2020/8/14	2021/8/13
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2020/8/13	2021/8/12
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2020/8/13	2021/8/12
R&S	CBT BLUETOOTH TESTER	CBT	101641	2020/1/8	2021/1/7
EXA	Spectrum Analyzer	FSV7	101631	2020/1/8	2021/1/7
Testo	Hygrometer	608-H1	1241332088	2020/1/8	2021/1/7
FLUKE	DIGITAC THERMOMETER	51II	97240029	2019/8/15	2020/8/14
FLUKE	DIGITAC THERMOMETER	51II	97240029	2020/8/14	2021/8/13
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
MCL	Attenuation1	BW-S10W5+	N/A	Note 1	
MCL	Attenuation2	BW-S10W5+	N/A	Note 1	
MCL	Attenuation3	BW-S10W5+	N/A	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note 1	

Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check
2. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

11. System Verification

11.1 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 head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.1. 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. 11.2.

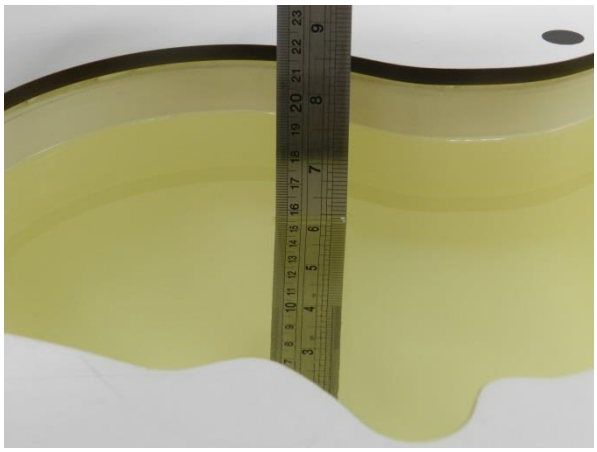


Fig 11.1 Photo of Liquid Height for Head SAR

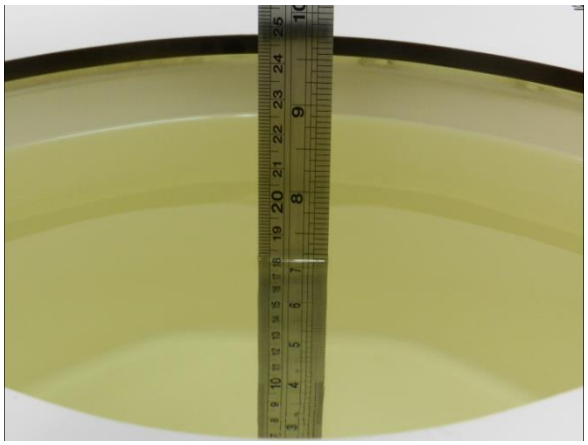


Fig 11.2 Photo of Liquid Height for Body SAR

11.2 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 (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

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. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Head	22.8	0.895	41.703	0.89	41.90	0.56	-0.47	±5	2020/7/6
835	Head	22.6	0.902	41.240	0.90	41.50	0.22	-0.63	±5	2020/7/23
835	Head	22.7	0.913	41.937	0.90	41.50	1.44	1.05	±5	2020/8/5
1750	Head	22.6	1.356	39.061	1.37	40.10	-1.02	-2.59	±5	2020/7/9
1900	Head	22.7	1.397	39.035	1.40	40.00	-0.21	-2.41	±5	2020/7/25
2450	Head	22.8	1.854	39.100	1.80	39.20	3.00	-0.26	±5	2020/7/14
2600	Head	22.6	2.023	37.790	1.96	39.00	3.21	-3.10	±5	2020/7/12
3700	Head	22.7	3.218	38.674	3.12	37.70	3.14	2.58	±5	2020/7/20
5250	Head	22.6	4.678	36.999	4.71	35.90	-0.68	3.06	±5	2020/7/15
5600	Head	22.6	5.037	36.493	5.07	35.50	-0.65	2.80	±5	2020/7/15
5750	Head	22.7	5.200	36.307	5.22	35.40	-0.38	2.56	±5	2020/7/16
1750	Head	22.7	1.354	39.382	1.37	40.10	-1.17	-1.79	±5	2020/8/19
1900	Head	22.8	1.435	39.121	1.40	40.00	2.50	-2.20	±5	2020/8/18

11.3 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.

<1g SAR>

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 (%)
2020/7/6	750	Head	250	1087	3976	1338	2.00	8.36	8.00	-4.31
2020/7/23	835	Head	250	4d151	3976	1338	2.43	9.30	9.72	4.52
2020/8/5	835	Head	250	4d151	3976	1338	2.44	9.30	9.76	4.95
2020/7/9	1750	Head	250	1090	3976	1338	8.63	36.40	34.52	-5.16
2020/7/25	1900	Head	250	5d170	3976	1338	9.29	39.00	37.16	-4.72
2020/7/14	2450	Head	250	908	3976	1338	13.80	52.80	55.20	4.55
2020/7/12	2600	Head	250	1061	3976	1338	14.10	57.70	56.40	-2.25
2020/7/20	3700	Head	100	1008	3976	1338	7.10	67.00	71.00	5.97
2020/7/15	5250	Head	100	1113	3976	1338	8.63	80.50	86.30	7.20
2020/7/15	5600	Head	100	1113	3976	1338	8.74	83.40	87.40	4.80
2020/7/16	5750	Head	100	1113	3976	1338	8.59	80.00	85.90	7.38
2020/8/19	1750	Head	250	1090	7592	656	9.15	36.40	36.6	0.55
2020/8/18	1900	Head	250	5d170	7592	656	10.10	39.00	40.4	3.59

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2020/7/9	1750	Head	250	1090	3976	1338	4.58	19.20	18.32	-4.58
2020/7/25	1900	Head	250	5d170	3976	1338	4.96	20.30	19.84	-2.27
2020/7/12	2600	Head	250	1061	3976	1338	6.34	25.90	25.36	-2.08
2020/7/15	5250	Head	100	1113	3976	1338	2.52	23.10	25.2	9.09
2020/7/15	5600	Head	100	1113	3976	1338	2.52	23.80	25.2	5.88
2020/7/16	5750	Head	100	1113	3976	1338	2.48	22.80	24.8	8.77
2020/8/19	1750	Head	250	1090	7592	656	4.99	19.20	19.96	3.96
2020/8/18	1900	Head	250	5d170	7592	656	5.33	20.30	21.32	5.02

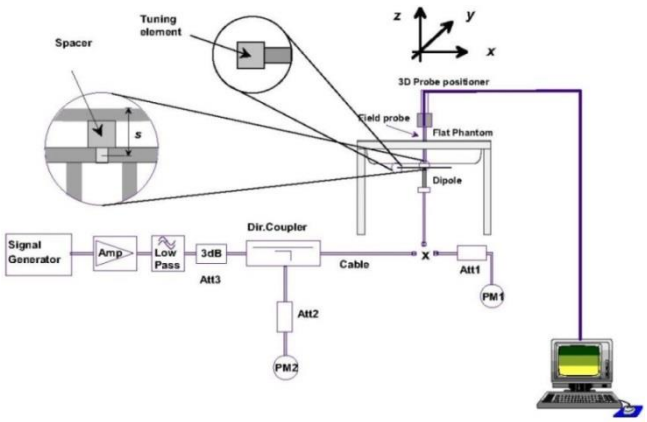


Fig 11.3.1 System Performance Check Setup

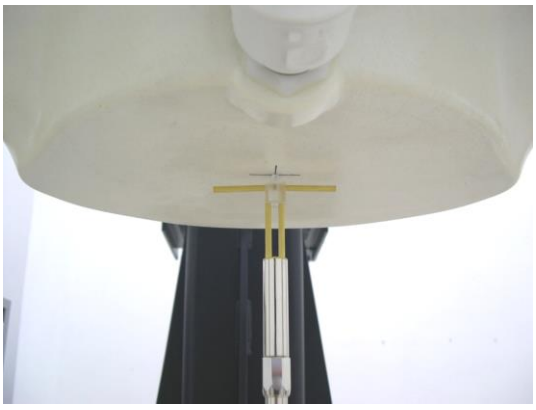


Fig 11.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

Figure 12.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 15mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 12.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 12.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 12.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

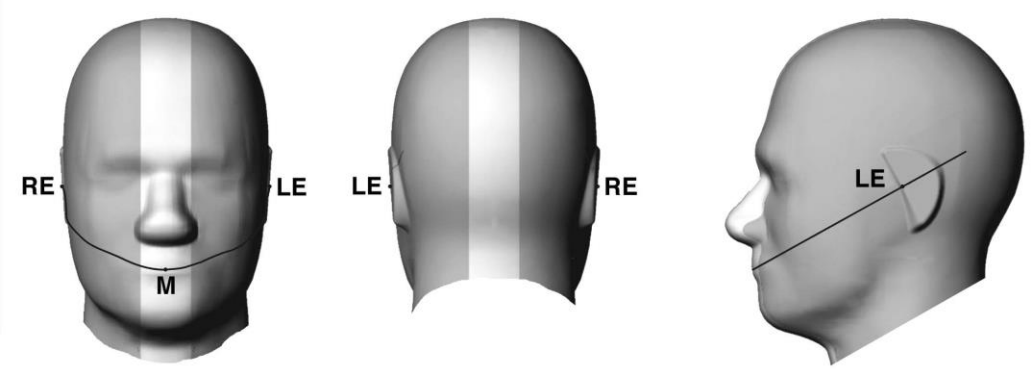


Fig 12.1.1 Front, back, and side views of SAM twin phantom

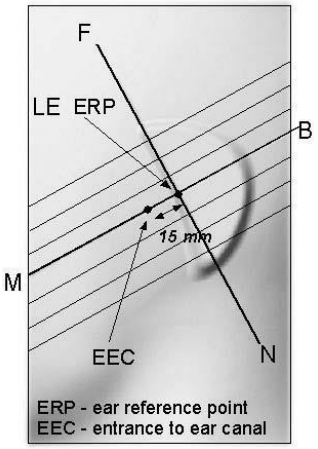


Fig 12.1.2 Close-up side view of phantom showing the ear region.

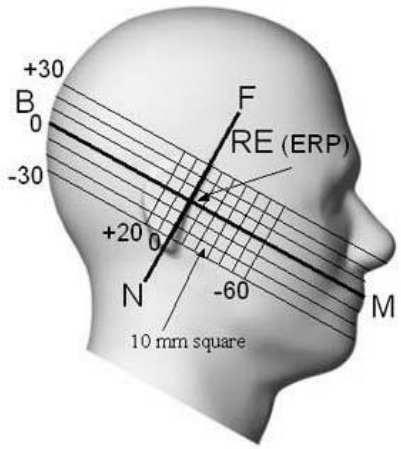


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 12.2.1 and Figure 12.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 12.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 12.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 12.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 12.2.3. The actual rotation angles should be documented in the test report.

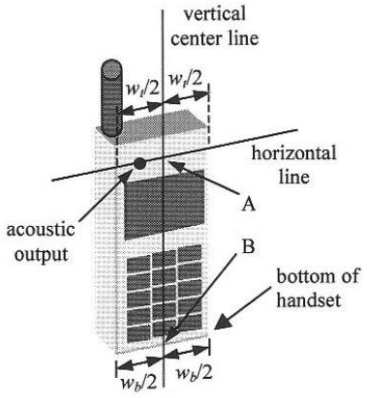


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case

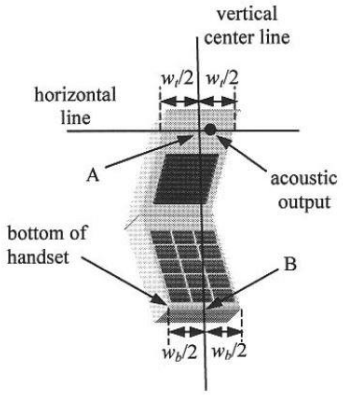


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

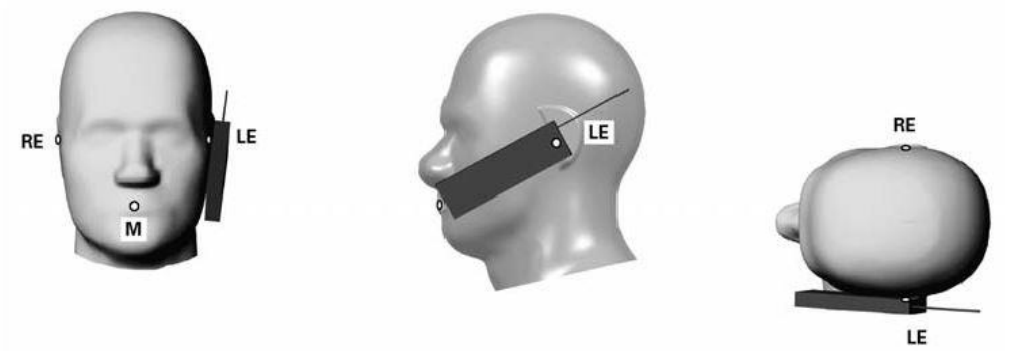


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 12.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

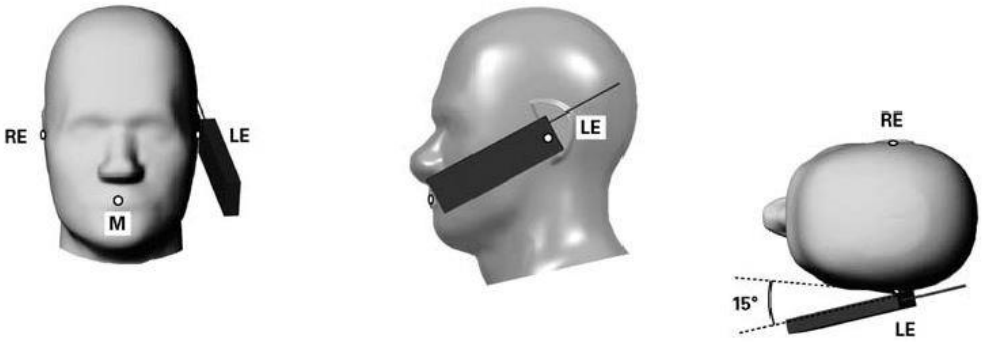


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 12.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

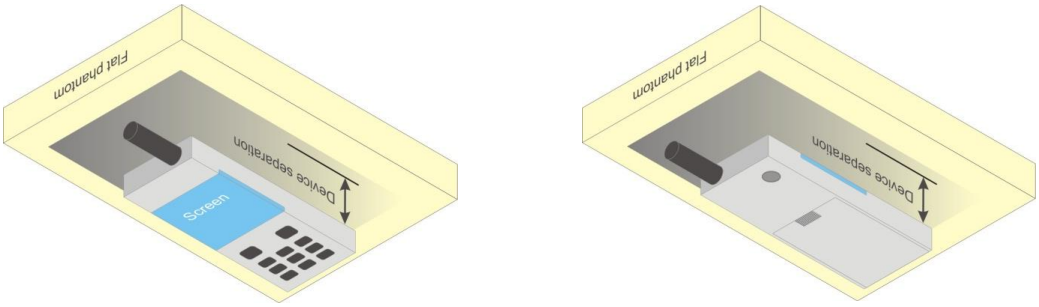


Fig 12.4 Body Worn Position

12.5 Product Specific 10g SAR Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

12.6 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

13. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<GSM Conducted Power>

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS 1Tx slots for GSM850 and GPRS 2Tx slots for GSM1900 are considered as the primary mode.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

<WCDMA Conducted Power>

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

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

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

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

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

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .

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

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

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

Setup Configuration

HSUPA Setup Configuration:

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

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

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

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

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

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

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

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

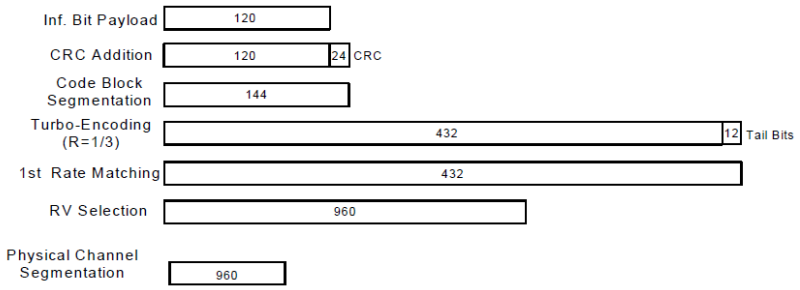


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

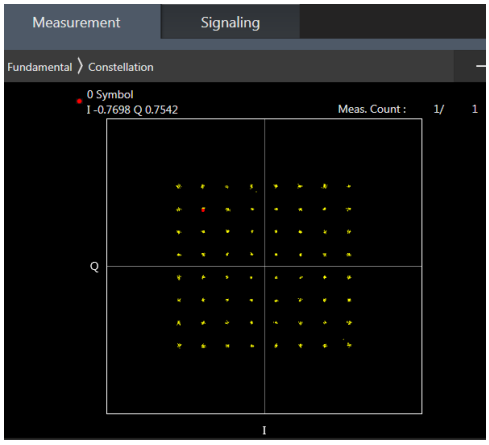
General Note:

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

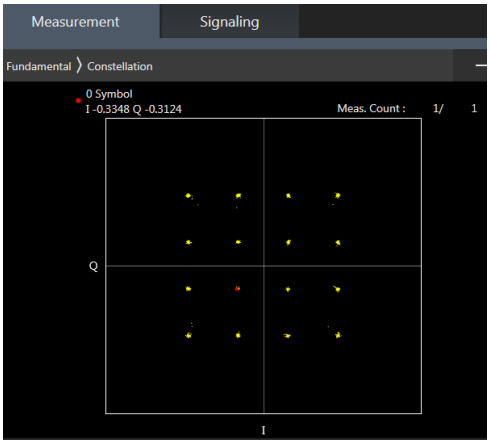
<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B12 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE B4 SAR test was covered by B66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
   b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64 QAM and 16 QAM 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 64QAM and 16QAM signal modulation are correct.



64QAM



16QAM

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

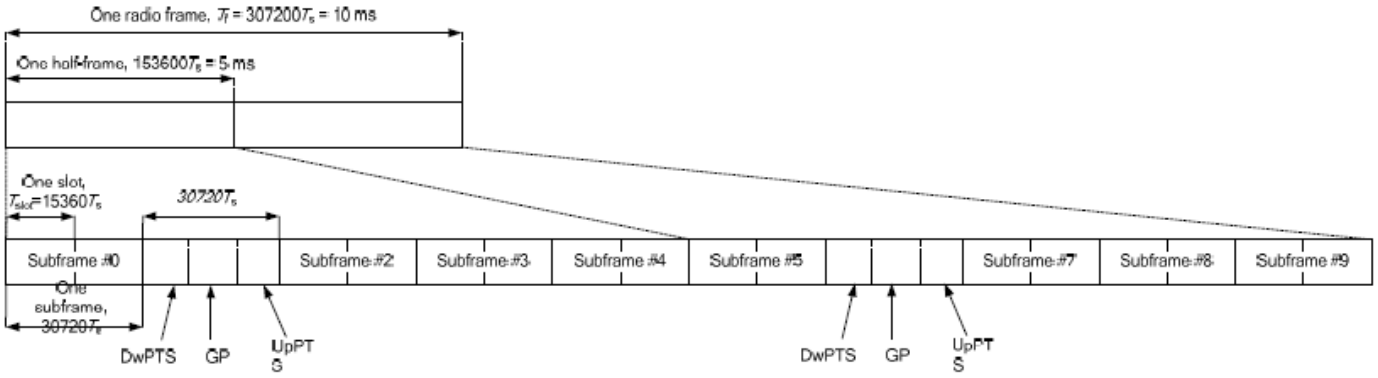


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

Power class 3

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

<LTE Carrier Aggregation>

General Note:

1. This device supports Carrier Aggregation on downlink for inter and intra band. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.
2. In applying the existing power measurement procedures of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of frequency bands and CCs in each row need combination, and for this device that all the configurations were choose to power measurement.
3. The gray color table is covered by other combinations and no need to verify power.

2CC Downlink Carrier Aggregation			3CC Downlink Carrier Aggregation			4CC Downlink Carrier Aggregation		
Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset
2CC #1	CA_2A-2A	3CC #1	3CC #1	CA_2A-2A-4A		4CC #1	CA_2A-2A-66B	
2CC #2	CA_2A-4A	3CC #1	3CC #2	CA_2A-2A-5A		4CC #2	CA_2A-2A-66C	
2CC #3	CA_2A-5A	3CC #2	3CC #3	CA_2A-2A-13A		4CC #3	CA_2A-4A-5B	
2CC #4	CA_2A-48A	3CC #13	3CC #4	CA_2A-2A-66A		4CC #4	CA_2A-5A-66B	
2CC #5	CA_2A-66A	3CC #4	3CC #5	CA_2A-4A-4A		4CC #5	CA_2A-5A-66C	
2CC #6	CA_4A-4A	3CC #17	3CC #6	CA_2A-4A-5A		4CC #6	CA_2A-5B-66A	
2CC #7	CA_4A-5A	3CC #6	3CC #7	CA_2A-4A-13A		4CC #7	CA_2A-13A-48C	
2CC #8	CA_4A-48A		3CC #8	CA_2A-5A-66A		4CC #8	CA_2A-13A-66B	
2CC #9	CA_5A-5A	3CC #21	3CC #9	CA_2A-5B	4CC #3	4CC #9	CA_2A-13A-66C	
2CC #10	CA_5A-66A	3CC #21	3CC #10	CA_2A-13A-48A		4CC #10	CA_2A-48A-48C	
2CC #11	CA_5B	3CC #25	3CC #11	CA_2A-13A-66A		4CC #11	CA_2A-48D	
2CC #12	CA_13A-2A	3CC #7	3CC #12	CA_2A-48A-48A		4CC #12	CA_4A-4A-5B	
2CC #13	CA_13A-4A	3CC #7	3CC #13	CA_2A-48C	4CC #7	4CC #13	CA_4A-48D	
2CC #14	CA_13A-48A	3CC #10	3CC #14	CA_2A-66A-66A		4CC #14	CA_5A-5A-66B	
2CC #15	CA_13A-66A	3CC #11	3CC #15	CA_2A-66B	4CC #4	4CC #15	CA_5A-5A-66C	
2CC #16	CA_48A-66A	3CC #32	3CC #16	CA_2A-66C	4CC #5	4CC #16	CA_5B-66A-66A	
2CC #17	CA_48C	3CC #36	3CC #17	CA_4A-4A-5A		4CC #17	CA_5B-66B	
2CC #18	CA_66A-66A	3CC #33	3CC #18	CA_4A-4A-13A		4CC #18	CA_5B-66C	
2CC #19	CA_66B	3CC #34	3CC #19	CA_4A-5B	4CC #3	4CC #19	CA_13A-48A-48C	
2CC #20	CA_66C	3CC #35	3CC #20	CA_4A-48C		4CC #20	CA_13A-48A-66B	
			3CC #21	CA_5A-5A-66A		4CC #21	CA_13A-48A-66C	
			3CC #22	CA_5A-66A-66A		4CC #22	CA_13A-48C-66A	
			3CC #23	CA_5A-66B	4CC #4	4CC #23	CA_13A-48D	
			3CC #24	CA_5A-66C	4CC #5	4CC #24	CA_48A-48A-66B	
			3CC #25	CA_5B-66A	4CC #6	4CC #25	CA_48A-48A-66C	
			3CC #26	CA_13A-48A-48A		4CC #26	CA_48A-48C-66A	
			3CC #27	CA_13A-48A-66A		4CC #27	CA_48C-66A-66A	
			3CC #28	CA_13A-48C	4CC #22	4CC #28	CA_48C-66B	
			3CC #29	CA_13A-66A-66A		4CC #29	CA_48C-66C	
			3CC #30	CA_13A-66B	4CC #20	4CC #30	CA_48D-66A	
			3CC #31	CA_13A-66C	4CC #21	4CC #31	CA_48E	
			3CC #32	CA_48A-48A-66A				
			3CC #33	CA_48A-66A-66A				
			3CC #34	CA_48A-66B	4CC #24			
			3CC #35	CA_48A-66C	4CC #25			
			3CC #36	CA_48C-66A	4CC #26			
			3CC #37	CA_48D	4CC #30			
			3CC #38	CA_66A-66A-66A				
			3CC #39	CA_66A-66C				

4X4 MIMO	Band
	LTE Band2/4/48/66

LTE Carrier Aggregation Conducted Power (Downlink)

i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.

ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.

iii. The device supports downlink two carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.

iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

v. For inter-band CA, the SCC selected highest bandwidth and near the middle of its transmission band. For SCC DL RB size and offset will base on the PCC corresponding RB allocation.

vi. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.

vii. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

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

LTE Carrier Aggregation Conducted Power (Uplink)

1. This device supports uplink carrier aggregation for LTE CA_5B, CA_48C, CA_66B and CA_66C with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 Table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. For the non-contiguously allocated resource blocks which the MPR level is determined by various RB separation and RB sizes requirement, and the allowed MPR levels, settings and the conducted powers are permanently implemented in this device per the 3GPP 36.36.101 section 6.2.3A.1.3 requirements.
2. According to FCC guidance, the output power with uplink CA active was measured for the high / middle / low channel configuration with the highest reported SAR for each exposure condition, the power was measured with wideband signal integration over both component carriers.
3. In applying the power measurement procedures of KDB 941225 D05A for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the subset in each row with the largest combination of frequency bands and CCs
4. Maximum output power measurement is required for each UL CA configuration for the required test channels described in KDB 941225 D05. The required test channel should be associated with the UL PCC. For channels at the ends of a frequency band, the SCC and subsequent CCs are added to the side within the transmission band. Otherwise, the CCs should be added alternatively to either side of the PCC.

<Power Measurement Setup>

5G NR Output Power (Unit: dBm)

General Note:

1. Following 5G NR n2/n5/n66 support SCS 15KHz DFT/CP-OFDM, PI/2 BPSK/QPSK/16QAM/64QAM/ 256QAM, Bandwidth 5M/10M/15M/20M.
2. 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 ½ 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. SAR testing start with the largest channel bandwidth and measure SAR for PI/2 BPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel
   c. 50% RB allocation for PI/2 BPSK SAR testing follows 1RB PI/2 BPSK allocation procedure
   d. PI/2 BPSK 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
   e. QPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in PI/2 BPSK, also reported SAR for the PI/2 BPSK configuration is less than 1.45 W/kg, QPSK/16QAM/64QAM/256QAM SAR testing are not required.
   f. Smaller bandwidth output power for each RB allocation configuration for this device will not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
3. Due to test setup limitations, SAR testing for NR was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.

<3GPP 38.101 MPR for EN-DC>

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

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

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

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

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

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

EN-DC configuration	Uplink EN-DC configuration	E-UTRA configuration	NR configuration
DC_5A_n2A	DC_5A_n2A	5A	n2A
DC_13A_n2A	DC_13A_n2A	13A	n2A
DC_66A_n2A	DC_66A_n2A	66A	n2A
DC_2A_n5A	DC_2A_n5A	2A	n5A
DC_48A_n5A	DC_48A_n5A	48A	n5A
DC_66A_n5A	DC_66A_n5A	66A	n5A
DC_2A_n66A	DC_2A_n66A	2A	n66A
DC_5A_n66A	DC_5A_n66A	5A	n66A
DC_13A_n66A	DC_13A_n66A	13A	n66A
DC_48A_n66A	DC_48A_n66A	48A	n66A

<WLAN Conducted Power>

General Note:

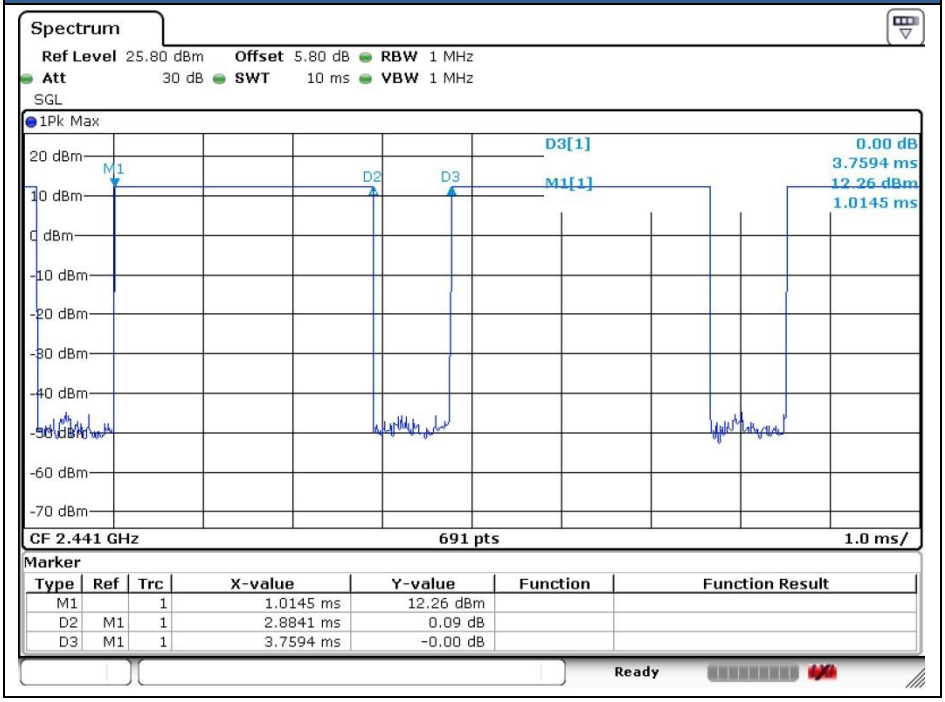
1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. 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.
2. 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).
3. 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.
4. 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.

<2.4GHz Bluetooth>

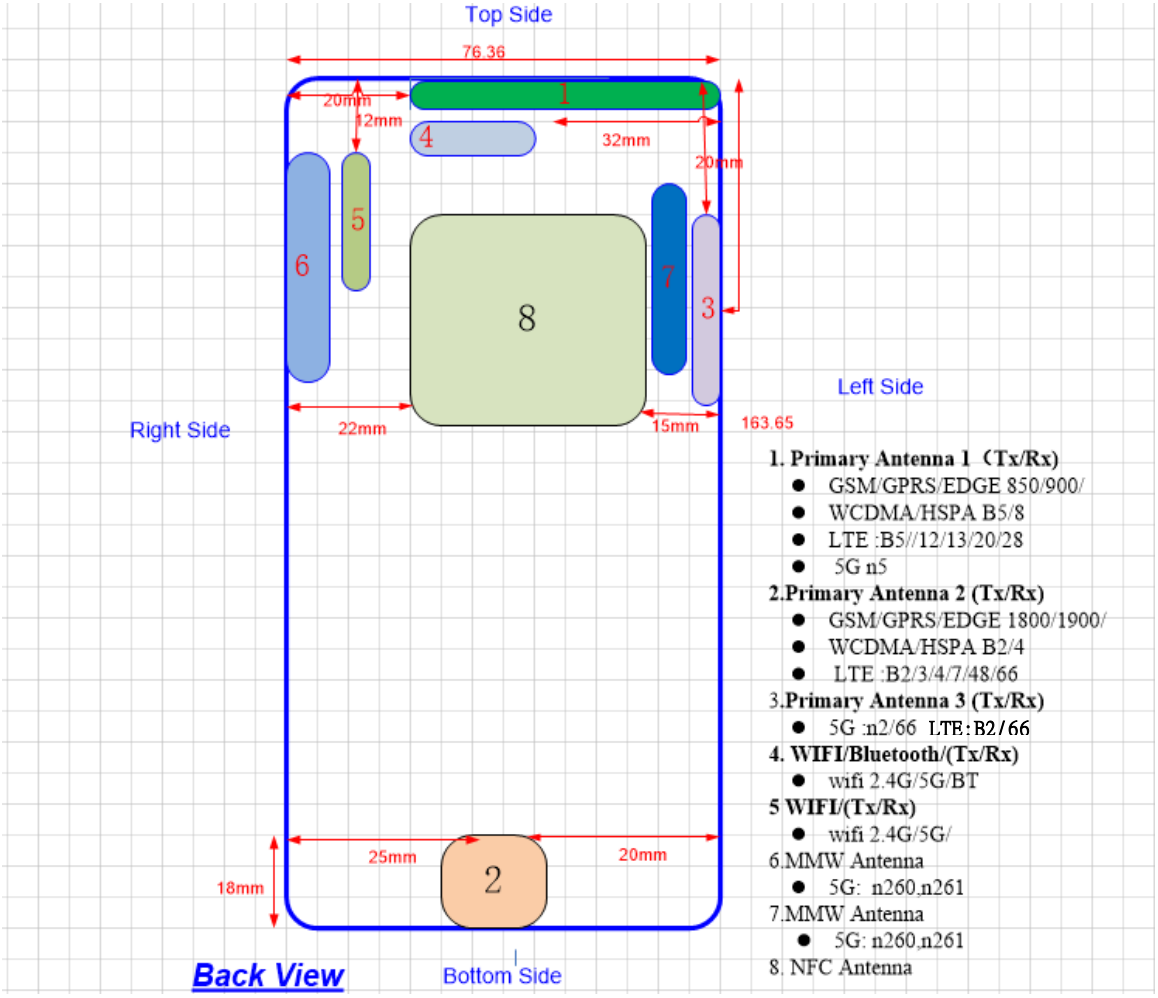
General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle is 76.72 % as following figure, according to 2016 Oct. TCB workshop for Bluetooth SAR scaling need further consideration and the theoretical duty cycle is 83.3%, therefore the actual duty cycle will be scaled up to the theoretical value of Bluetooth reported SAR calculation

Bluetooth time-domain plot



14. Antenna Location



Length: 76.36 mm
Width: 163.65 mm
Diagonal: 171.50mm

Antenna	Support Band
WWAN Antenna 1	GSM: 850 WCDMA: B5 LTE: B5 / B12 / B13 5GNR FR1: n5
WWAN Antenna 2	GSM: 1900 WCDMA: B2 / B4 LTE: B2 / B4 / / B7 / B66 / B48
WWAN Antenna 3	5GNR FR1: n2 / n66 LTE: B2 / B66
WLAN 2.4GHz/5GHz/BT Antenna 4	WLAN 2.4GHz WLAN 5GHz Bluetooth
WLAN 2.4GHz/5GHz Antenna 5	WLAN 2.4GHz WLAN 5GHz
Antenna 6	5GNR FR2: n260 / n261
Antenna 7	5GNR FR2: n260 / n261
NFC Antenna 8	NFC

Note: LTE band 2/66 at WWAN antenna 3 is actived only EN-DC mode with 5GNR n5(WWAN antenna 1).

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna 1	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm
WWAN Antenna 2	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
WWAN Antenna 3	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	>25mm	≤ 25mm
WLAN 2.4GHz/5GHz/BT Antenna 4	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm
WLAN 2.4GHz/5GHz Antenna 5	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna 1	Yes	Yes	Yes	No	Yes	Yes
WWAN Antenna 2	Yes	Yes	No	Yes	Yes	Yes
WWAN Antenna 3	Yes	Yes	Yes	No	No	Yes
WLAN 2.4GHz/5GHz/BT Antenna 4	Yes	Yes	Yes	No	Yes	No
WLAN 2.4GHz/5GHz Antenna 5	Yes	Yes	Yes	No	Yes	No

General Note:
Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. Pre KDB648474 D04v01r03, when the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset. When headset SAR is less than or equal than without headset SAR, no need to verify the remaining channels for headset SAR.
5. The device will invoke corresponding work scenarios power level, which are provided in the operational description.
6. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power (for handheld on state, the maximum full power means reduced power), including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
   a. For this device SAR for WWAN/WLAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of WCDMA Band II/IV, LTE Band 2/4/7/66 and 5GNR n2/n66 therefore product specific 10g SAR is necessary.
   b. WLAN 5.3/5.5GHz tested the product specific 10g SAR since it has no hotspot mode.
   c. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS 1Tx slots for GSM850 and GPRS 2Tx slots for GSM1900 are considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

WCDMA Note:

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

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. This device supports HPUE for LTE band 41 with class 2 level, so HPUE SAR has been performed.
7. For LTE B4 / B5 / B12 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.
8. LTE B4 SAR test was covered by LTE B66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   c. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
   d. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

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.
6. Bluetooth and WLAN share the same antenna, with similar work frequency, so for Bluetooth SAR testing, we chose the worst positon of WLAN to perform.
7. WLAN5GHz transmit with WWAN/Bluetooth simultaneously for body, WLAN5GHz will invoke reduced power level.

15.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS 4Tx slots	Right Cheek	Ant1	DSI3	189	836.4	22.63	23.50	1.222	0.03	0.408	0.498
01	GSM850	GPRS 4Tx slots	Right Tilted	Ant1	DSI3	189	836.4	22.63	23.50	1.222	-0.01	0.516	**0.630**
	GSM850	GPRS 4Tx slots	Left Cheek	Ant1	DSI3	189	836.4	22.63	23.50	1.222	0.01	0.413	0.505
	GSM850	GPRS 4Tx slots	Left Tilted	Ant1	DSI3	189	836.4	22.63	23.50	1.222	0.05	0.368	0.450
	GSM1900	GPRS 2Tx slots	Right Cheek	Ant2	DSI3	661	1880	26.27	27.00	1.183	0.01	0.061	0.072
	GSM1900	GPRS 2Tx slots	Right Tilted	Ant2	DSI3	661	1880	26.27	27.00	1.183	0.06	0.080	0.095
02	GSM1900	GPRS 2Tx slots	Left Cheek	Ant2	DSI3	661	1880	26.27	27.00	1.183	0.06	0.121	**0.143**
	GSM1900	GPRS 2Tx slots	Left Tilted	Ant2	DSI3	661	1880	26.27	27.00	1.183	0.07	0.067	0.079

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Right Cheek	Ant2	DSI3	9400	1880	24.43	25.00	1.140	0.06	0.198	0.226
	WCDMA II	RMC 12.2Kbps	Right Tilted	Ant2	DSI3	9400	1880	24.43	25.00	1.140	0.08	0.204	0.233
03	WCDMA II	RMC 12.2Kbps	Left Cheek	Ant2	DSI3	9400	1880	24.43	25.00	1.140	-0.04	0.220	**0.251**
	WCDMA II	RMC 12.2Kbps	Left Tilted	Ant2	DSI3	9400	1880	24.43	25.00	1.140	-0.02	0.074	0.084
04	WCDMA IV	RMC 12.2Kbps	Right Cheek	Ant2	DSI3	1413	1732.6	24.47	25.00	1.130	0.19	0.179	**0.202**
	WCDMA IV	RMC 12.2Kbps	Right Tilted	Ant2	DSI3	1413	1732.6	24.47	25.00	1.130	0.01	0.116	0.131
	WCDMA IV	RMC 12.2Kbps	Left Cheek	Ant2	DSI3	1413	1732.6	24.47	25.00	1.130	0.09	0.068	0.077
	WCDMA IV	RMC 12.2Kbps	Left Tilted	Ant2	DSI3	1413	1732.6	24.47	25.00	1.130	0.12	0.102	0.115
	WCDMA V	RMC 12.2Kbps	Right Cheek	Ant1	DSI3	4182	836.4	22.28	23.30	1.265	0.01	0.630	0.797
	WCDMA V	RMC 12.2Kbps	Right Tilted	Ant1	DSI3	4182	836.4	22.28	23.30	1.265	0.01	0.705	0.892
	WCDMA V	RMC 12.2Kbps	Left Cheek	Ant1	DSI3	4182	836.4	22.28	23.30	1.265	0.05	0.563	0.712
	WCDMA V	RMC 12.2Kbps	Left Tilted	Ant1	DSI3	4182	836.4	22.28	23.30	1.265	0.06	0.531	0.672
	WCDMA V	RMC 12.2Kbps	Right Tilted	Ant1	DSI3	4132	826.4	22.06	23.30	1.330	0.08	0.677	0.901
05	WCDMA V	RMC 12.2Kbps	Right Tilted	Ant1	DSI3	4233	846.6	22.23	23.30	1.279	-0.05	0.769	**0.984**

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Right Cheek	Ant2	DSI3	18900	1880	24.31	25.00	1.172	0.03	0.131	0.154
	LTE Band 2	20M	QPSK	50	0	Right Cheek	Ant2	DSI3	18900	1880	23.39	24.00	1.151	0.01	0.132	0.152
	LTE Band 2	20M	QPSK	1	0	Right Tilted	Ant2	DSI3	18900	1880	24.31	25.00	1.172	0.06	0.127	0.149
	LTE Band 2	20M	QPSK	50	0	Right Tilted	Ant2	DSI3	18900	1880	23.39	24.00	1.151	0.05	0.099	0.114
06	LTE Band 2	20M	QPSK	1	0	Left Cheek	Ant2	DSI3	18900	1880	24.31	25.00	1.172	-0.07	0.187	**0.219**
	LTE Band 2	20M	QPSK	50	0	Left Cheek	Ant2	DSI3	18900	1880	23.39	24.00	1.151	0.07	0.175	0.201
	LTE Band 2	20M	QPSK	1	0	Left Tilted	Ant2	DSI3	18900	1880	24.31	25.00	1.172	0.02	0.119	0.139
	LTE Band 2	20M	QPSK	50	0	Left Tilted	Ant2	DSI3	18900	1880	23.39	24.00	1.151	-0.05	0.105	0.121
	LTE Band 2	20M	QPSK	1	0	Right Cheek	Ant3	DSI3	18900	1880	19.25	20.00	1.189	0.03	0.769	0.914
	LTE Band 2	20M	QPSK	1	0	Right Cheek	Ant3	DSI3	18700	1860	19.17	20.00	1.211	0.04	0.747	0.904
	LTE Band 2	20M	QPSK	1	0	Right Cheek	Ant3	DSI3	19100	1900	18.92	20.00	1.282	0.06	0.646	0.828
	LTE Band 2	20M	QPSK	50	0	Right Cheek	Ant3	DSI3	18900	1880	19.12	20.00	1.225	0.01	0.728	0.892
69	LTE Band 2	20M	QPSK	50	0	Right Cheek	Ant3	DSI3	18700	1860	18.95	20.00	1.274	0.02	0.776	**0.988**
	LTE Band 2	20M	QPSK	50	0	Right Cheek	Ant3	DSI3	19100	1900	18.93	20.00	1.279	-0.09	0.687	0.879
	LTE Band 2	20M	QPSK	100	0	Right Cheek	Ant3	DSI3	18900	1880	19.03	20.00	1.250	0.08	0.731	0.914
	LTE Band 2	20M	QPSK	1	0	Right Tilted	Ant3	DSI3	18900	1880	19.25	20.00	1.189	-0.11	0.337	0.401
	LTE Band 2	20M	QPSK	50	0	Right Tilted	Ant3	DSI3	18900	1880	19.12	20.00	1.225	-0.18	0.311	0.381
	LTE Band 2	20M	QPSK	1	0	Left Cheek	Ant3	DSI3	18900	1880	19.25	20.00	1.189	0.09	0.286	0.340
	LTE Band 2	20M	QPSK	50	0	Left Cheek	Ant3	DSI3	18900	1880	19.12	20.00	1.225	0.06	0.329	0.403
	LTE Band 2	20M	QPSK	1	0	Left Tilted	Ant3	DSI3	18900	1880	19.25	20.00	1.189	0.04	0.209	0.248
	LTE Band 2	20M	QPSK	50	0	Left Tilted	Ant3	DSI3	18900	1880	19.12	20.00	1.225	0.16	0.208	0.255
	LTE Band 5	10M	QPSK	1	0	Right Cheek	Ant1	DSI3	20525	836.5	22.74	23.80	1.276	0.01	0.567	0.724
	LTE Band 5	10M	QPSK	25	0	Right Cheek	Ant1	DSI3	20525	836.5	22.49	23.80	1.352	0.08	0.474	0.641
07	LTE Band 5	10M	QPSK	1	0	Right Tilted	Ant1	DSI3	20525	836.5	22.74	23.80	1.276	-0.19	0.707	**0.902**
	LTE CA_5B	10M+10M	QPSK	1	0	Right Tilted	Ant1	DSI3	20575+20476	841.5	22.59	23.80	1.321	0.11	0.671	0.887
	LTE Band 5	10M	QPSK	25	0	Right Tilted	Ant1	DSI3	20525	836.5	22.49	23.80	1.352	0.06	0.626	0.846
	LTE Band 5	10M	QPSK	50	0	Right Tilted	Ant1	DSI3	20525	836.5	22.53	23.80	1.340	-0.02	0.625	0.837
	LTE Band 5	10M	QPSK	1	0	Left Cheek	Ant1	DSI3	20525	836.5	22.74	23.80	1.276	-0.02	0.495	0.632
	LTE Band 5	10M	QPSK	25	0	Left Cheek	Ant1	DSI3	20525	836.5	22.49	23.80	1.352	0.01	0.405	0.548
	LTE Band 5	10M	QPSK	1	0	Left Tilted	Ant1	DSI3	20525	836.5	22.74	23.80	1.276	0.07	0.503	0.642
	LTE Band 5	10M	QPSK	25	0	Left Tilted	Ant1	DSI3	20525	836.5	22.49	23.80	1.352	0.02	0.495	0.669
	LTE Band 7	20M	QPSK	1	0	Right Cheek	Ant2	DSI3	21100	2535	24.47	25.00	1.130	0.06	0.068	0.077
	LTE Band 7	20M	QPSK	50	0	Right Cheek	Ant2	DSI3	21100	2535	23.77	24.00	1.054	0.05	0.051	0.054
	LTE Band 7	20M	QPSK	1	0	Right Tilted	Ant2	DSI3	21100	2535	24.47	25.00	1.130	0.05	0.052	0.059
	LTE Band 7	20M	QPSK	50	0	Right Tilted	Ant2	DSI3	21100	2535	23.77	24.00	1.054	0.07	0.043	0.045
08	LTE Band 7	20M	QPSK	1	0	Left Cheek	Ant2	DSI3	21100	2535	24.47	25.00	1.130	0.09	0.171	**0.193**
	LTE Band 7	20M	QPSK	50	0	Left Cheek	Ant2	DSI3	21100	2535	23.77	24.00	1.054	0.01	0.105	0.111
	LTE Band 7	20M	QPSK	1	0	Left Tilted	Ant2	DSI3	21100	2535	24.47	25.00	1.130	0.02	0.088	0.099
	LTE Band 7	20M	QPSK	50	0	Left Tilted	Ant2	DSI3	21100	2535	23.77	24.00	1.054	-0.03	0.067	0.071
	LTE Band 12	10M	QPSK	1	0	Right Cheek	Ant1	DSI3	23095	707.5	21.75	22.60	1.216	0.01	0.612	0.744
	LTE Band 12	10M	QPSK	25	0	Right Cheek	Ant1	DSI3	23095	707.5	21.50	22.60	1.288	0.08	0.504	0.649
09	LTE Band 12	10M	QPSK	1	0	Right Tilted	Ant1	DSI3	23095	707.5	21.75	22.60	1.216	0.03	0.780	**0.949**
	LTE Band 12	10M	QPSK	25	0	Right Tilted	Ant1	DSI3	23095	707.5	21.50	22.60	1.288	0.06	0.720	0.928
	LTE Band 12	10M	QPSK	50	0	Right Tilted	Ant1	DSI3	23095	707.5	21.53	22.60	1.279	0.07	0.711	0.910
	LTE Band 12	10M	QPSK	1	0	Left Cheek	Ant1	DSI3	23095	707.5	21.75	22.60	1.216	0.06	0.523	0.636
	LTE Band 12	10M	QPSK	25	0	Left Cheek	Ant1	DSI3	23095	707.5	21.50	22.60	1.288	0.08	0.436	0.562
	LTE Band 12	10M	QPSK	1	0	Left Tilted	Ant1	DSI3	23095	707.5	21.75	22.60	1.216	0.11	0.482	0.586
	LTE Band 12	10M	QPSK	25	0	Left Tilted	Ant1	DSI3	23095	707.5	21.50	22.60	1.288	0.09	0.499	0.643

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 13	10M	QPSK	1	0	Right Cheek	Ant1	DSI3	23230	782	21.34	22.00	1.164	0.06	0.535	0.623
	LTE Band 13	10M	QPSK	25	0	Right Cheek	Ant1	DSI3	23230	782	21.17	22.00	1.211	0.08	0.458	0.554
10	LTE Band 13	10M	QPSK	1	0	Right Tilted	Ant1	DSI3	23230	782	21.34	22.00	1.164	-0.05	0.856	**0.996**
	LTE Band 13	10M	QPSK	25	0	Right Tilted	Ant1	DSI3	23230	782	21.17	22.00	1.211	0.05	0.810	0.981
	LTE Band 13	10M	QPSK	50	0	Right Tilted	Ant1	DSI3	23230	782	21.18	22.00	1.208	0.04	0.799	0.965
	LTE Band 13	10M	QPSK	1	0	Left Cheek	Ant1	DSI3	23230	782	21.34	22.00	1.164	0.13	0.447	0.520
	LTE Band 13	10M	QPSK	25	0	Left Cheek	Ant1	DSI3	23230	782	21.17	22.00	1.211	0.05	0.382	0.462
	LTE Band 13	10M	QPSK	1	0	Left Tilted	Ant1	DSI3	23230	782	21.34	22.00	1.164	0.04	0.419	0.488
	LTE Band 13	10M	QPSK	25	0	Left Tilted	Ant1	DSI3	23230	782	21.17	22.00	1.211	0.13	0.454	0.550
	LTE Band 66	20M	QPSK	1	0	Right Cheek	Ant2	DSI3	132322	1745	24.49	25.00	1.125	0.04	0.108	0.121
	LTE Band 66	20M	QPSK	50	0	Right Cheek	Ant2	DSI3	132322	1745	23.59	24.00	1.099	0.13	0.112	0.123
	LTE Band 66	20M	QPSK	1	0	Right Tilted	Ant2	DSI3	132322	1745	24.49	25.00	1.125	0.05	0.089	0.100
	LTE Band 66	20M	QPSK	50	0	Right Tilted	Ant2	DSI3	132322	1745	23.59	24.00	1.099	-0.01	0.063	0.069
11	LTE Band 66	20M	QPSK	1	0	Left Cheek	Ant2	DSI3	132322	1745	24.49	25.00	1.125	0.02	0.167	**0.188**
	LTE CA_66B	15M+5M	QPSK	1	0	Left Cheek	Ant2	DSI3	132322+132229	1745	23.97	25.00	1.268	-0.03	0.143	0.181
	LTE CA_66C	20M+20M	QPSK	1	0	Left Cheek	Ant2	DSI3	132322+132124	1745	24.24	25.00	1.191	0.11	0.145	0.173
	LTE Band 66	20M	QPSK	50	0	Left Cheek	Ant2	DSI3	132322	1745	23.59	24.00	1.099	0.03	0.149	0.164
	LTE Band 66	20M	QPSK	1	0	Left Tilted	Ant2	DSI3	132322	1745	24.49	25.00	1.125	0.05	0.102	0.115
	LTE Band 66	20M	QPSK	50	0	Left Tilted	Ant2	DSI3	132322	1745	23.59	24.00	1.099	-0.01	0.082	0.090
	LTE Band 66	20M	QPSK	1	0	Right Cheek	Ant3	DSI3	132322	1745	18.83	20.00	1.309	0.06	0.731	0.957
	LTE Band 66	20M	QPSK	1	0	Right Cheek	Ant3	DSI3	132072	1720	18.66	20.00	1.361	0.04	0.719	0.979
	LTE Band 66	20M	QPSK	1	0	Right Cheek	Ant3	DSI3	132572	1770	18.68	20.00	1.355	0.03	0.730	0.989
70	LTE Band 66	20M	QPSK	50	0	Right Cheek	Ant3	DSI3	132322	1745	18.74	20.00	1.337	-0.03	0.743	**0.993**
	LTE Band 66	20M	QPSK	50	0	Right Cheek	Ant3	DSI3	132072	1720	18.73	20.00	1.340	0.01	0.721	0.966
	LTE Band 66	20M	QPSK	50	0	Right Cheek	Ant3	DSI3	132572	1770	18.72	20.00	1.343	0.03	0.736	0.988
	LTE Band 66	20M	QPSK	100	0	Right Cheek	Ant3	DSI3	132322	1745	18.77	20.00	1.327	0.07	0.718	0.953
	LTE Band 66	20M	QPSK	1	0	Right Tilted	Ant3	DSI3	132322	1745	18.83	20.00	1.309	0.03	0.283	0.370
	LTE Band 66	20M	QPSK	50	0	Right Tilted	Ant3	DSI3	132322	1745	18.74	20.00	1.337	0.01	0.327	0.437
	LTE Band 66	20M	QPSK	1	0	Left Cheek	Ant3	DSI3	132322	1745	18.83	20.00	1.309	0.06	0.307	0.402
	LTE Band 66	20M	QPSK	50	0	Left Cheek	Ant3	DSI3	132322	1745	18.74	20.00	1.337	-0.09	0.288	0.385
	LTE Band 66	20M	QPSK	1	0	Left Tilted	Ant3	DSI3	132322	1745	18.83	20.00	1.309	0.18	0.263	0.344
	LTE Band 66	20M	QPSK	50	0	Left Tilted	Ant3	DSI3	132322	1745	18.74	20.00	1.337	0.07	0.247	0.330

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Antenna	Output Power State	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)
	LTE Band 48	20M	QPSK	1	0	Right Cheek	Ant2	DSI3	55830	3609	23.33	24.30	1.250	62.9	1.006	0.05	0.028	0.035
	LTE Band 48	20M	QPSK	50	0	Right Cheek	Ant2	DSI3	55830	3609	22.36	23.30	1.242	62.9	1.006	0.03	0.033	0.041
	LTE Band 48	20M	QPSK	1	0	Right Tilted	Ant2	DSI3	55830	3609	23.33	24.30	1.250	62.9	1.006	0.13	0.023	0.029
	LTE Band 48	20M	QPSK	50	0	Right Tilted	Ant2	DSI3	55830	3609	22.36	23.30	1.242	62.9	1.006	0.05	0.021	0.026
12	LTE Band 48	20M	QPSK	1	0	Left Cheek	Ant2	DSI3	55830	3609	23.33	24.30	1.250	62.9	1.006	-0.04	0.033	**0.042**
	LTE CA_48C	20M+20M	QPSK	100	0	Left Cheek	Ant2	DSI3	55830+55632	3609	19.69	20.00	1.074	62.9	1.006	0.05	0.016	0.017
	LTE Band 48	20M	QPSK	50	0	Left Cheek	Ant2	DSI3	55830	3609	22.36	23.30	1.242	62.9	1.006	0.08	0.033	0.041
	LTE Band 48	20M	QPSK	1	0	Left Tilted	Ant2	DSI3	55830	3609	23.33	24.30	1.250	62.9	1.006	0.06	0.025	0.031
	LTE Band 48	20M	QPSK	50	0	Left Tilted	Ant2	DSI3	55830	3609	22.36	23.30	1.242	62.9	1.006	0.01	0.015	0.019

<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Right Cheek	ANT 3	DSI3	376000	1880	19.48	20.00	1.127	0.03	0.802	0.904
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Right Cheek	ANT 3	DSI3	372000	1860	19.35	20.00	1.161	-0.04	0.728	0.846
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Right Cheek	ANT 3	DSI3	380000	1900	19.44	20.00	1.138	-0.09	0.702	0.799
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Right Cheek	ANT 3	DSI3	376000	1880	19.43	20.00	1.140	0.03	0.745	0.849
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Right Cheek	ANT 3	DSI3	372000	1860	19.33	20.00	1.167	0.12	0.658	0.768
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Right Cheek	ANT 3	DSI3	380000	1900	19.37	20.00	1.156	0.02	0.734	0.849
13	FR1 n2	20M	QPSK	100	0	DFT-15KHz	Right Cheek	ANT 3	DSI3	376000	1880	19.42	20.00	1.143	-0.01	0.824	**0.942**
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Right Tilted	ANT 3	DSI3	376000	1880	19.48	20.00	1.127	0.01	0.318	0.358
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Right Tilted	ANT 3	DSI3	376000	1880	19.43	20.00	1.140	0.05	0.197	0.225
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Left Cheek	ANT 3	DSI3	376000	1880	19.48	20.00	1.127	0.02	0.383	0.432
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Left Cheek	ANT 3	DSI3	376000	1880	19.43	20.00	1.140	0.03	0.241	0.275
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Left Tilted	ANT 3	DSI3	376000	1880	19.48	20.00	1.127	0.05	0.208	0.234
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Left Tilted	ANT 3	DSI3	376000	1880	19.43	20.00	1.140	0.01	0.163	0.186
	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Right Cheek	Ant1	DSI3	167300	836.5	21.70	22.80	1.288	0.05	0.553	0.712
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Right Cheek	Ant1	DSI3	167300	836.5	21.56	22.80	1.330	0.16	0.510	0.679
14	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Right Tilted	Ant1	DSI3	167300	836.5	21.70	22.80	1.288	0.03	0.748	**0.964**
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Right Tilted	Ant1	DSI3	167300	836.5	21.56	22.80	1.330	0.02	0.646	0.859
	FR1 n5	20M	QPSK	100	0	DFT-15KHz	Right Tilted	Ant1	DSI3	167300	836.5	21.45	22.80	1.365	0.02	0.648	0.884
	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Left Cheek	Ant1	DSI3	167300	836.5	21.70	22.80	1.288	0.04	0.449	0.578
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Left Cheek	Ant1	DSI3	167300	836.5	21.56	22.80	1.330	0.03	0.543	0.722
	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Left Tilted	Ant1	DSI3	167300	836.5	21.70	22.80	1.288	0.03	0.508	0.654
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Left Tilted	Ant1	DSI3	167300	836.5	21.56	22.80	1.330	-0.04	0.524	0.697
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Right Cheek	ANT 3	DSI3	349000	1745	21.45	22.00	1.135	-0.01	0.679	0.771
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Right Cheek	ANT 3	DSI3	344000	1720	21.39	22.00	1.151	0.07	0.632	0.727
15	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Right Cheek	ANT 3	DSI3	354000	1770	21.43	22.00	1.140	0.08	0.855	**0.975**
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Right Cheek	ANT 3	DSI3	349000	1745	21.42	22.00	1.143	0.02	0.794	0.907
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Right Cheek	ANT 3	DSI3	344000	1720	21.35	22.00	1.161	0.09	0.681	0.791
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Right Cheek	ANT 3	DSI3	354000	1770	21.40	22.00	1.148	0.03	0.770	0.884
	FR1 n66	20M	QPSK	100	0	DFT-15KHz	Right Cheek	ANT 3	DSI3	349000	1745	21.39	22.00	1.151	-0.04	0.663	0.763
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Right Tilted	ANT 3	DSI3	349000	1745	21.45	22.00	1.135	0.02	0.280	0.318
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Right Tilted	ANT 3	DSI3	349000	1745	21.42	22.00	1.143	0.03	0.263	0.301
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Left Cheek	ANT 3	DSI3	349000	1745	21.45	22.00	1.135	0.06	0.310	0.352
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Left Cheek	ANT 3	DSI3	349000	1745	21.42	22.00	1.143	0.01	0.278	0.318
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Left Tilted	ANT 3	DSI3	349000	1745	21.45	22.00	1.135	0.03	0.252	0.286
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Left Tilted	ANT 3	DSI3	349000	1745	21.42	22.00	1.143	0.05	0.224	0.256

<WLAN2.4G SAR>

Plot No.	Band	Mode	Test Position	Antenna	Power Reduction	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)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	0.01	0.029	0.030
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	0.07	0.046	0.048
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	-0.11	0.055	0.057
16	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	0.03	0.066	**0.069**

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Antenna	Power Reduction	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)
17	Bluetooth	1Mbps	Left Tilted	Ant4	Full	39	2441	12.84	13.00	1.038	76.72	1.086	-0.08	0.006	**0.007**

<WLAN5G SAR>

Plot No.	Band	Mode	Test Position	Antenna	Power Reduction	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)
	WLAN5.3GHz	802.11a 6Mbps	Right Cheek	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.09	0.159	0.197
	WLAN5.3GHz	802.11a 6Mbps	Right Tilted	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.07	0.162	0.201
	WLAN5.3GHz	802.11a 6Mbps	Left Cheek	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	-0.12	0.176	0.218
18	WLAN5.3GHz	802.11a 6Mbps	Left Tilted	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.03	0.265	**0.329**
	WLAN5.5GHz	802.11a 6Mbps	Right Cheek	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.03	0.210	0.261
	WLAN5.5GHz	802.11a 6Mbps	Right Tilted	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.06	0.241	0.300
	WLAN5.5GHz	802.11a 6Mbps	Left Cheek	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.07	0.254	0.316
19	WLAN5.5GHz	802.11a 6Mbps	Left Tilted	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.03	0.349	**0.434**
	WLAN5.8GHz	802.11a 6Mbps	Right Cheek	Ant 4+5	Full	165	5825	19.05	20.00	1.245	98.55	1.015	-0.11	0.207	0.261
	WLAN5.8GHz	802.11a 6Mbps	Right Tilted	Ant 4+5	Full	165	5825	19.05	20.00	1.245	98.55	1.015	0.09	0.216	0.273
	WLAN5.8GHz	802.11a 6Mbps	Left Cheek	Ant 4+5	Full	165	5825	19.05	20.00	1.245	98.55	1.015	0.03	0.262	0.331
20	WLAN5.8GHz	802.11a 6Mbps	Left Tilted	Ant 4+5	Full	165	5825	19.05	20.00	1.245	98.55	1.015	0.04	0.352	**0.445**

15.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS 1Tx slots	Front	10mm	Ant1	DSI2	189	836.4	32.47	33.50	1.268	0.06	0.370	0.469
21	GSM850	GPRS 1Tx slots	Back	10mm	Ant1	DSI2	189	836.4	32.47	33.50	1.268	0.02	0.583	**0.739**
	GSM850	GPRS 1Tx slots	Left Side	10mm	Ant1	DSI2	189	836.4	32.47	33.50	1.268	0.05	0.272	0.345
	GSM850	GPRS 1Tx slots	Right Side	10mm	Ant1	DSI2	189	836.4	32.47	33.50	1.268	-0.04	0.074	0.094
	GSM850	GPRS 1Tx slots	Top Side	10mm	Ant1	DSI2	189	836.4	32.47	33.50	1.268	0.08	0.569	0.721
	GSM1900	GPRS 2Tx slots	Front	10mm	Ant2	DSI2	661	1880	26.27	27.00	1.183	0.09	0.333	0.394
22	GSM1900	GPRS 2Tx slots	Back	10mm	Ant2	DSI2	661	1880	26.27	27.00	1.183	-0.11	0.670	**0.793**
	GSM1900	GPRS 2Tx slots	Left Side	10mm	Ant2	DSI2	661	1880	26.27	27.00	1.183	0.08	0.060	0.071
	GSM1900	GPRS 2Tx slots	Right Side	10mm	Ant2	DSI2	661	1880	26.27	27.00	1.183	0.02	0.580	0.686
	GSM1900	GPRS 2Tx slots	Bottom Side	10mm	Ant2	DSI2	661	1880	26.27	27.00	1.183	0.07	0.573	0.678

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	10mm	Ant2	DSI2	9400	1880	19.86	20.90	1.271	0.05	0.355	0.451
	WCDMA II	RMC 12.2Kbps	Back	10mm	Ant2	DSI2	9400	1880	19.86	20.90	1.271	-0.01	0.691	0.878
	WCDMA II	RMC 12.2Kbps	Back	10mm	Ant2	DSI2	9262	1852.4	19.82	20.90	1.282	-0.01	0.644	0.826
	WCDMA II	RMC 12.2Kbps	Back	10mm	Ant2	DSI2	9538	1907.6	19.84	20.90	1.276	-0.01	0.579	0.739
	WCDMA II	RMC 12.2Kbps	Left Side	10mm	Ant2	DSI2	9400	1880	19.86	20.90	1.271	0.05	0.072	0.091
	WCDMA II	RMC 12.2Kbps	Right Side	10mm	Ant2	DSI2	9400	1880	19.86	20.90	1.271	-0.01	0.048	0.061
23	WCDMA II	RMC 12.2Kbps	Bottom Side	10mm	Ant2	DSI2	9400	1880	19.86	20.90	1.271	0.03	0.719	**0.914**
	WCDMA II	RMC 12.2Kbps	Bottom Side	10mm	Ant2	DSI2	9262	1852.4	19.82	20.90	1.282	0.06	0.711	0.912
	WCDMA II	RMC 12.2Kbps	Bottom Side	10mm	Ant2	DSI2	9538	1907.6	19.84	20.90	1.276	0.04	0.614	0.784
	WCDMA IV	RMC 12.2Kbps	Front	10mm	Ant2	DSI2	1413	1732.6	20.98	21.60	1.153	0.01	0.535	0.617
	WCDMA IV	RMC 12.2Kbps	Back	10mm	Ant2	DSI2	1413	1732.6	20.98	21.60	1.153	0.02	0.745	0.859
	WCDMA IV	RMC 12.2Kbps	Back	10mm	Ant2	DSI2	1312	1712.4	20.94	21.60	1.164	-0.02	0.619	0.721
	WCDMA IV	RMC 12.2Kbps	Back	10mm	Ant2	DSI2	1513	1752.6	20.77	21.60	1.211	0.11	0.633	0.766
	WCDMA IV	RMC 12.2Kbps	Left Side	10mm	Ant2	DSI2	1413	1732.6	20.98	21.60	1.153	0.03	0.115	0.133
	WCDMA IV	RMC 12.2Kbps	Right Side	10mm	Ant2	DSI2	1413	1732.6	20.98	21.60	1.153	0.01	0.049	0.057
	WCDMA IV	RMC 12.2Kbps	Bottom Side	10mm	Ant2	DSI2	1413	1732.6	20.98	21.60	1.153	0.05	0.662	0.764
24	WCDMA IV	RMC 12.2Kbps	Bottom Side	10mm	Ant2	DSI2	1312	1712.4	20.94	21.60	1.164	0.09	0.857	**0.998**
	WCDMA IV	RMC 12.2Kbps	Bottom Side	10mm	Ant2	DSI2	1513	1752.6	20.77	21.60	1.211	0.01	0.529	0.640
	WCDMA V	RMC 12.2Kbps	Front	10mm	Ant1	DSI2	4182	836.4	24.08	25.00	1.236	0.02	0.576	0.712
25	WCDMA V	RMC 12.2Kbps	Back	10mm	Ant1	DSI2	4182	836.4	24.08	25.00	1.236	-0.03	0.763	**0.943**
	WCDMA V	RMC 12.2Kbps	Back	10mm	Ant1	DSI2	4132	826.4	24.05	25.00	1.245	0.09	0.609	0.758
	WCDMA V	RMC 12.2Kbps	Back	10mm	Ant1	DSI2	4233	846.6	24.02	25.00	1.253	0.01	0.711	0.891
	WCDMA V	RMC 12.2Kbps	Left Side	10mm	Ant1	DSI2	4182	836.4	24.08	25.00	1.236	0.04	0.128	0.158
	WCDMA V	RMC 12.2Kbps	Right Side	10mm	Ant1	DSI2	4182	836.4	24.08	25.00	1.236	0.04	0.079	0.098
	WCDMA V	RMC 12.2Kbps	Top Side	10mm	Ant1	DSI2	4182	836.4	24.08	25.00	1.236	-0.03	0.058	0.072

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	10mm	Ant2	DSI2	18900	1880	20.39	21.00	1.151	0.04	0.423	0.487
	LTE Band 2	20M	QPSK	50	0	Front	10mm	Ant2	DSI2	18900	1880	20.26	21.00	1.186	0.06	0.414	0.491
	LTE Band 2	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	18900	1880	20.39	21.00	1.151	0.08	0.725	0.834
	LTE Band 2	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	18700	1860	20.35	21.00	1.161	-0.18	0.670	0.778
	LTE Band 2	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	19100	1900	20.36	21.00	1.159	0.13	0.784	0.908
	LTE Band 2	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	18900	1880	20.26	21.00	1.186	0.11	0.734	0.870
	LTE Band 2	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	18700	1860	20.25	21.00	1.189	-0.13	0.661	0.786
	LTE Band 2	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	19100	1900	20.22	21.00	1.197	0.05	0.651	0.779
	LTE Band 2	20M	QPSK	100	0	Back	10mm	Ant2	DSI2	18900	1880	20.29	21.00	1.178	0.07	0.771	0.908
	LTE Band 2	20M	QPSK	1	0	Left Side	10mm	Ant2	DSI2	18900	1880	20.39	21.00	1.151	-0.06	0.087	0.100
	LTE Band 2	20M	QPSK	50	0	Left Side	10mm	Ant2	DSI2	18900	1880	20.26	21.00	1.186	-0.18	0.080	0.095
	LTE Band 2	20M	QPSK	1	0	Right Side	10mm	Ant2	DSI2	18900	1880	20.39	21.00	1.151	-0.01	0.072	0.083
	LTE Band 2	20M	QPSK	50	0	Right Side	10mm	Ant2	DSI2	18900	1880	20.26	21.00	1.186	0.05	0.073	0.087
	LTE Band 2	20M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	18900	1880	20.39	21.00	1.151	-0.11	0.830	0.955
26	LTE Band 2	20M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	18700	1860	20.35	21.00	1.161	0.02	0.829	**0.963**
	LTE Band 2	20M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	19100	1900	20.36	21.00	1.159	-0.06	0.820	0.950
	LTE Band 2	20M	QPSK	50	0	Bottom Side	10mm	Ant2	DSI2	18900	1880	20.26	21.00	1.186	0.06	0.760	0.901
	LTE Band 2	20M	QPSK	50	0	Bottom Side	10mm	Ant2	DSI2	18700	1860	20.25	21.00	1.189	0.07	0.799	0.950
	LTE Band 2	20M	QPSK	50	0	Bottom Side	10mm	Ant2	DSI2	19100	1900	20.22	21.00	1.197	0.12	0.760	0.910
	LTE Band 2	20M	QPSK	100	0	Bottom Side	10mm	Ant2	DSI2	18900	1880	20.29	21.00	1.178	0.01	0.761	0.896
	LTE Band 2	20M	QPSK	1	0	Front	10mm	Ant3	DSI2	18900	1880	20.24	21.00	1.191	0.09	0.313	0.373
	LTE Band 2	20M	QPSK	50	0	Front	10mm	Ant3	DSI2	18900	1880	20.17	21.00	1.211	0.04	0.324	0.392
	LTE Band 2	20M	QPSK	1	0	Back	10mm	Ant3	DSI2	18900	1880	20.24	21.00	1.191	0.06	0.710	0.846
	LTE Band 2	20M	QPSK	1	0	Back	10mm	Ant3	DSI2	18700	1860	20.21	21.00	1.199	0.08	0.668	0.801
	LTE Band 2	20M	QPSK	1	0	Back	10mm	Ant3	DSI2	19100	1900	20.22	21.00	1.197	-0.06	0.695	0.832
	LTE Band 2	20M	QPSK	50	0	Back	10mm	Ant3	DSI2	18900	1880	20.17	21.00	1.211	-0.11	0.677	0.820
	LTE Band 2	20M	QPSK	50	0	Back	10mm	Ant3	DSI2	18700	1860	20.03	21.00	1.250	0.06	0.711	0.889
	LTE Band 2	20M	QPSK	50	0	Back	10mm	Ant3	DSI2	19100	1900	19.89	21.00	1.291	0.07	0.683	0.882
71	LTE Band 2	20M	QPSK	100	0	Back	10mm	Ant3	DSI2	18900	1880	20.11	21.00	1.227	-0.02	0.780	**0.957**
	LTE Band 2	20M	QPSK	1	0	Left Side	10mm	Ant3	DSI2	18900	1880	20.24	21.00	1.191	0.04	0.728	0.867
	LTE Band 2	20M	QPSK	1	0	Left Side	10mm	Ant3	DSI2	18700	1860	20.21	21.00	1.199	-0.03	0.766	0.919
	LTE Band 2	20M	QPSK	1	0	Left Side	10mm	Ant3	DSI2	19100	1900	20.22	21.00	1.197	-0.08	0.695	0.832
	LTE Band 2	20M	QPSK	50	0	Left Side	10mm	Ant3	DSI2	18900	1880	20.17	21.00	1.211	0.04	0.761	0.921
	LTE Band 2	20M	QPSK	50	0	Left Side	10mm	Ant3	DSI2	18700	1860	20.03	21.00	1.250	-0.03	0.714	0.893
	LTE Band 2	20M	QPSK	50	0	Left Side	10mm	Ant3	DSI2	19100	1900	19.89	21.00	1.291	0.01	0.737	0.952
	LTE Band 2	20M	QPSK	100	0	Left Side	10mm	Ant3	DSI2	18900	1880	20.11	21.00	1.227	-0.06	0.757	0.929
	LTE Band 2	20M	QPSK	1	0	Top Side	10mm	Ant3	DSI2	18900	1880	20.24	21.00	1.191	0.02	0.116	0.138
	LTE Band 2	20M	QPSK	50	0	Top Side	10mm	Ant3	DSI2	18900	1880	20.17	21.00	1.211	-0.06	0.126	0.153

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 5	10M	QPSK	1	0	Front	10mm	Ant1	DSI2	20525	836.5	23.81	25.00	1.315	0.05	0.503	0.662
	LTE Band 5	10M	QPSK	25	0	Front	10mm	Ant1	DSI2	20525	836.5	22.80	24.00	1.318	-0.11	0.371	0.489
27	LTE Band 5	10M	QPSK	1	0	Back	10mm	Ant1	DSI2	20525	836.5	23.81	25.00	1.315	-0.07	0.759	**0.998**
	LTECA_5B	10M	QPSK	1	0	Back	10mm	Ant1	DSI2	20575+20476	841.5	23.71	25.00	1.346	0.04	0.663	0.892
	LTE Band 5	10M	QPSK	25	0	Back	10mm	Ant1	DSI2	20525	836.5	22.80	24.00	1.318	0.08	0.580	0.765
	LTE Band 5	10M	QPSK	50	0	Back	10mm	Ant1	DSI2	20525	836.5	22.79	24.00	1.321	0.06	0.650	0.859
	LTE Band 5	10M	QPSK	1	0	Left Side	10mm	Ant1	DSI2	20525	836.5	23.81	25.00	1.315	0.03	0.409	0.538
	LTE Band 5	10M	QPSK	25	0	Left Side	10mm	Ant1	DSI2	20525	836.5	22.80	24.00	1.318	0.05	0.298	0.393
	LTE Band 5	10M	QPSK	1	0	Right Side	10mm	Ant1	DSI2	20525	836.5	23.81	25.00	1.315	-0.11	0.093	0.122
	LTE Band 5	10M	QPSK	25	0	Right Side	10mm	Ant1	DSI2	20525	836.5	22.80	24.00	1.318	0.06	0.064	0.084
	LTE Band 5	10M	QPSK	1	0	Top Side	10mm	Ant1	DSI2	20525	836.5	23.81	25.00	1.315	0.07	0.720	0.947
	LTE Band 5	10M	QPSK	25	0	Top Side	10mm	Ant1	DSI2	20525	836.5	22.80	24.00	1.318	-0.11	0.556	0.733
	LTE Band 5	10M	QPSK	50	0	Top Side	10mm	Ant1	DSI2	20525	836.5	22.79	24.00	1.321	0.07	0.561	0.741
	LTE Band 7	20M	QPSK	1	0	Front	10mm	Ant2	DSI2	21100	2535	20.55	21.20	1.161	0.06	0.264	0.307
	LTE Band 7	20M	QPSK	50	0	Front	10mm	Ant2	DSI2	21100	2535	20.50	21.20	1.175	-0.06	0.271	0.318
	LTE Band 7	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	21100	2535	20.55	21.20	1.161	0.12	0.747	0.868
	LTE Band 7	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	20850	2510	20.35	21.20	1.216	-0.02	0.673	0.818
	LTE Band 7	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	21350	2560	20.51	21.20	1.172	-0.04	0.826	0.968
	LTE Band 7	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	21100	2535	20.50	21.20	1.175	0.01	0.795	0.934
	LTE Band 7	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	20850	2510	20.43	21.20	1.194	0.12	0.668	0.798
28	LTE Band 7	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	21350	2560	20.36	21.20	1.213	-0.07	0.811	**0.984**
	LTE Band 7	20M	QPSK	100	0	Back	10mm	Ant2	DSI2	21100	2535	20.48	21.20	1.180	0.03	0.796	0.940
	LTE Band 7	20M	QPSK	1	0	Left Side	10mm	Ant2	DSI2	21100	2535	20.55	21.20	1.161	0.02	0.124	0.144
	LTE Band 7	20M	QPSK	50	0	Left Side	10mm	Ant2	DSI2	21100	2535	20.50	21.20	1.175	-0.12	0.120	0.141
	LTE Band 7	20M	QPSK	1	0	Right Side	10mm	Ant2	DSI2	21100	2535	20.55	21.20	1.161	-0.04	0.054	0.063
	LTE Band 7	20M	QPSK	50	0	Right Side	10mm	Ant2	DSI2	21100	2535	20.50	21.20	1.175	-0.12	0.053	0.062
	LTE Band 7	20M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	21100	2535	20.55	21.20	1.161	0.09	0.569	0.661
	LTE Band 7	20M	QPSK	50	0	Bottom Side	10mm	Ant2	DSI2	21100	2535	20.50	21.20	1.175	0.04	0.562	0.660

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 12	10M	QPSK	1	0	Front	10mm	Ant1	DSI2	23095	707.5	23.90	25.00	1.288	0.01	0.544	0.701
	LTE Band 12	10M	QPSK	25	0	Front	10mm	Ant1	DSI2	23095	707.5	22.94	24.00	1.276	0.07	0.427	0.545
29	LTE Band 12	10M	QPSK	1	0	Back	10mm	Ant1	DSI2	23095	707.5	23.90	25.00	1.288	-0.03	0.740	**0.953**
	LTE Band 12	10M	QPSK	25	0	Back	10mm	Ant1	DSI2	23095	707.5	22.94	24.00	1.276	0.07	0.639	0.816
	LTE Band 12	10M	QPSK	50	0	Back	10mm	Ant1	DSI2	23095	707.5	22.99	24.00	1.262	0.03	0.685	0.864
	LTE Band 12	10M	QPSK	1	0	Left Side	10mm	Ant1	DSI2	23095	707.5	23.90	25.00	1.288	0.04	0.608	0.783
	LTE Band 12	10M	QPSK	25	0	Left Side	10mm	Ant1	DSI2	23095	707.5	22.94	24.00	1.276	-0.06	0.470	0.600
	LTE Band 12	10M	QPSK	1	0	Right Side	10mm	Ant1	DSI2	23095	707.5	23.90	25.00	1.288	0.01	0.203	0.262
	LTE Band 12	10M	QPSK	25	0	Right Side	10mm	Ant1	DSI2	23095	707.5	22.94	24.00	1.276	0.07	0.154	0.197
	LTE Band 12	10M	QPSK	1	0	Top Side	10mm	Ant1	DSI2	23095	707.5	23.90	25.00	1.288	-0.04	0.687	0.885
	LTE Band 12	10M	QPSK	25	0	Top Side	10mm	Ant1	DSI2	23095	707.5	22.94	24.00	1.276	-0.07	0.573	0.731
	LTE Band 12	10M	QPSK	50	0	Top Side	10mm	Ant1	DSI2	23095	707.5	22.99	24.00	1.262	0.11	0.560	0.707
	LTE Band 13	10M	QPSK	1	0	Front	10mm	Ant1	DSI2	23230	782	23.93	25.00	1.279	0.03	0.483	0.618
	LTE Band 13	10M	QPSK	25	0	Front	10mm	Ant1	DSI2	23230	782	23.07	24.00	1.239	0.02	0.378	0.468
30	LTE Band 13	10M	QPSK	1	0	Back	10mm	Ant1	DSI2	23230	782	23.93	25.00	1.279	-0.04	0.708	**0.906**
	LTE Band 13	10M	QPSK	25	0	Back	10mm	Ant1	DSI2	23230	782	23.07	24.00	1.239	0.01	0.568	0.704
	LTE Band 13	10M	QPSK	50	0	Back	10mm	Ant1	DSI2	23230	782	23.06	24.00	1.242	0.05	0.544	0.675
	LTE Band 13	10M	QPSK	1	0	Left Side	10mm	Ant1	DSI2	23230	782	23.93	25.00	1.279	0.09	0.330	0.422
	LTE Band 13	10M	QPSK	25	0	Left Side	10mm	Ant1	DSI2	23230	782	23.07	24.00	1.239	-0.11	0.397	0.492
	LTE Band 13	10M	QPSK	1	0	Right Side	10mm	Ant1	DSI2	23230	782	23.93	25.00	1.279	0.01	0.117	0.150
	LTE Band 13	10M	QPSK	25	0	Right Side	10mm	Ant1	DSI2	23230	782	23.07	24.00	1.239	-0.04	0.088	0.109
	LTE Band 13	10M	QPSK	1	0	Top Side	10mm	Ant1	DSI2	23230	782	23.93	25.00	1.279	-0.07	0.651	0.833
	LTE Band 13	10M	QPSK	25	0	Top Side	10mm	Ant1	DSI2	23230	782	23.07	24.00	1.239	0.03	0.523	0.648
	LTE Band 13	10M	QPSK	50	0	Top Side	10mm	Ant1	DSI2	23230	782	23.06	24.00	1.242	-0.07	0.513	0.637

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 66	20M	QPSK	1	0	Front	10mm	Ant2	DSI2	132322	1745	20.35	21.40	1.274	0.09	0.401	0.511
	LTE Band 66	20M	QPSK	50	0	Front	10mm	Ant2	DSI2	132322	1745	20.13	21.40	1.340	0.06	0.388	0.520
	LTE Band 66	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	132322	1745	20.35	21.40	1.274	0.01	0.573	0.730
	LTE Band 66	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	132322	1745	20.13	21.40	1.340	0.04	0.566	0.758
	LTE Band 66	20M	QPSK	1	0	Left Side	10mm	Ant2	DSI2	132322	1745	20.35	21.40	1.274	0.11	0.089	0.113
	LTE Band 66	20M	QPSK	50	0	Left Side	10mm	Ant2	DSI2	132322	1745	20.13	21.40	1.340	0.09	0.077	0.103
	LTE Band 66	20M	QPSK	1	0	Right Side	10mm	Ant2	DSI2	132322	1745	20.35	21.40	1.274	0.06	0.059	0.075
	LTE Band 66	20M	QPSK	50	0	Right Side	10mm	Ant2	DSI2	132322	1745	20.13	21.40	1.340	0.04	0.055	0.074
	LTE Band 66	20M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	132322	1745	20.35	21.40	1.274	0.03	0.705	0.898
	LTE Band 66	20M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	132072	1720	20.30	21.40	1.288	0.08	0.705	0.908
31	LTE Band 66	20M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	132572	1770	20.22	21.40	1.312	0.05	0.754	**0.989**
	LTE CA_66B	15M+5M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	132322+132229	1745	20.03	21.40	1.371	0.11	0.629	0.862
	LTE CA_66C	20M+20M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	132322+132124	1745	20.19	21.40	1.321	-0.07	0.661	0.873
	LTE Band 66	20M	QPSK	50	0	Bottom Side	10mm	Ant2	DSI2	132322	1745	20.13	21.40	1.340	0.01	0.648	0.868
	LTE Band 66	20M	QPSK	50	0	Bottom Side	10mm	Ant2	DSI2	132072	1720	19.95	21.40	1.396	-0.13	0.650	0.908
	LTE Band 66	20M	QPSK	50	0	Bottom Side	10mm	Ant2	DSI2	132572	1770	20.07	21.40	1.358	0.05	0.654	0.888
	LTE Band 66	20M	QPSK	100	0	Bottom Side	10mm	Ant2	DSI2	132322	1745	20.09	21.40	1.352	-0.09	0.687	0.929
	LTE Band 66	20M	QPSK	1	0	Front	10mm	Ant3	DSI2	132322	1745	21.86	22.50	1.159	0.01	0.257	0.298
	LTE Band 66	20M	QPSK	50	0	Front	10mm	Ant3	DSI2	132322	1745	21.84	22.50	1.164	0.02	0.236	0.275
	LTE Band 66	20M	QPSK	1	0	Back	10mm	Ant3	DSI2	132322	1745	21.86	22.50	1.159	0.01	0.717	0.831
	LTE Band 66	20M	QPSK	1	0	Back	10mm	Ant3	DSI2	132072	1720	21.81	22.50	1.172	0.06	0.511	0.599
	LTE Band 66	20M	QPSK	1	0	Back	10mm	Ant3	DSI2	132572	1770	21.71	22.50	1.199	-0.04	0.608	0.730
	LTE Band 66	20M	QPSK	50	0	Back	10mm	Ant3	DSI2	132322	1745	21.84	22.50	1.164	0.06	0.628	0.731
	LTE Band 66	20M	QPSK	50	0	Back	10mm	Ant3	DSI2	132072	1720	21.73	22.50	1.194	-0.1	0.558	0.666
	LTE Band 66	20M	QPSK	50	0	Back	10mm	Ant3	DSI2	132572	1770	21.71	22.50	1.199	-0.03	0.723	0.867
	LTE Band 66	20M	QPSK	100	0	Back	10mm	Ant3	DSI2	132322	1745	21.83	22.50	1.167	0.06	0.555	0.648
	LTE Band 66	20M	QPSK	1	0	Left Side	10mm	Ant3	DSI2	132322	1745	21.86	22.50	1.159	0.11	0.646	0.748
	LTE Band 66	20M	QPSK	1	0	Left Side	10mm	Ant3	DSI2	132072	1720	21.81	22.50	1.172	0.19	0.615	0.721
	LTE Band 66	20M	QPSK	1	0	Left Side	10mm	Ant3	DSI2	132572	1770	21.71	22.50	1.199	-0.01	0.626	0.751
	LTE Band 66	20M	QPSK	50	0	Left Side	10mm	Ant3	DSI2	132322	1745	21.84	22.50	1.164	-0.08	0.648	0.754
	LTE Band 66	20M	QPSK	50	0	Left Side	10mm	Ant3	DSI2	132072	1720	21.73	22.50	1.194	0.06	0.615	0.734
72	LTE Band 66	20M	QPSK	50	0	Left Side	10mm	Ant3	DSI2	132572	1770	21.71	22.50	1.199	0.06	0.754	**0.904**
	LTE Band 66	20M	QPSK	100	0	Left Side	10mm	Ant3	DSI2	132322	1745	21.83	22.50	1.167	-0.03	0.689	0.804
	LTE Band 66	20M	QPSK	1	0	Top Side	10mm	Ant3	DSI2	132322	1745	21.86	22.50	1.159	-0.17	0.167	0.194
	LTE Band 66	20M	QPSK	50	0	Top Side	10mm	Ant3	DSI2	132322	1745	21.84	22.50	1.164	0.09	0.155	0.181

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Output Power State	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)
	LTE Band 48	20M	QPSK	1	0	Front	10mm	Ant2	DSI2	55830	3609	22.62	23.60	1.253	62.9	1.006	0.05	0.220	0.277
	LTE Band 48	20M	QPSK	50	0	Front	10mm	Ant2	DSI2	55830	3609	22.31	23.30	1.256	62.9	1.006	-0.05	0.227	0.287
32	LTE Band 48	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	55830	3609	22.62	23.60	1.253	62.9	1.006	0.07	0.781	**0.985**
	LTE CA_48C	20M+20M	QPSK	100	0	Back	10mm	Ant2	DSI2	55830+55632	3609	19.69	20.00	1.074	62.9	1.006	-0.07	0.571	0.617
	LTE Band 48	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	55340	3560	22.42	23.60	1.312	62.9	1.006	0.03	0.533	0.704
	LTE Band 48	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	56150	3641	22.50	23.60	1.288	62.9	1.006	0.1	0.648	0.840
	LTE Band 48	20M	QPSK	1	0	Back	10mm	Ant2	DSI2	56640	3690	22.43	23.60	1.309	62.9	1.006	0.03	0.538	0.709
	LTE Band 48	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	55830	3609	22.31	23.30	1.256	62.9	1.006	0.04	0.718	0.907
	LTE Band 48	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	55340	3560	22.23	23.30	1.279	62.9	1.006	0.01	0.576	0.741
	LTE Band 48	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	56150	3641	22.24	23.30	1.276	62.9	1.006	0.15	0.663	0.851
	LTE Band 48	20M	QPSK	50	0	Back	10mm	Ant2	DSI2	56640	3690	22.19	23.30	1.291	62.9	1.006	0.01	0.555	0.721
	LTE Band 48	20M	QPSK	100	0	Back	10mm	Ant2	DSI2	55830	3609	22.28	23.30	1.265	62.9	1.006	-0.08	0.704	0.896
	LTE Band 48	20M	QPSK	1	0	Left Side	10mm	Ant2	DSI2	55830	3609	22.62	23.60	1.253	62.9	1.006	-0.04	0.089	0.112
	LTE Band 48	20M	QPSK	50	0	Left Side	10mm	Ant2	DSI2	55830	3609	22.31	23.30	1.256	62.9	1.006	0.01	0.081	0.102
	LTE Band 48	20M	QPSK	1	0	Right Side	10mm	Ant2	DSI2	55830	3609	22.62	23.60	1.253	62.9	1.006	0.05	0.071	0.090
	LTE Band 48	20M	QPSK	50	0	Right Side	10mm	Ant2	DSI2	55830	3609	22.31	23.30	1.256	62.9	1.006	0.09	0.074	0.094
	LTE Band 48	20M	QPSK	1	0	Bottom Side	10mm	Ant2	DSI2	55830	3609	22.62	23.60	1.253	62.9	1.006	0.18	0.658	0.830
	LTE Band 48	20M	QPSK	50	0	Bottom Side	10mm	Ant2	DSI2	55830	3609	22.31	23.30	1.256	62.9	1.006	0.17	0.612	0.773

<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Power Setting	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Front	10mm	Ant3	DSI2	376000	1880	200	20.75	21.50	1.189	0.06	0.260	0.309
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Front	10mm	Ant3	DSI2	376000	1880	200	20.68	21.50	1.208	0.08	0.241	0.291
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Back	10mm	Ant3	DSI2	376000	1880	200	20.75	21.50	1.189	0.04	0.671	0.797
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Back	10mm	Ant3	DSI2	376000	1880	200	20.68	21.50	1.208	0.02	0.641	0.774
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Left Side	10mm	Ant3	DSI2	376000	1880	200	20.75	21.50	1.189	-0.08	0.819	0.973
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Left Side	10mm	Ant3	DSI2	372000	1860	200	20.68	21.50	1.208	-0.03	0.657	0.794
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Left Side	10mm	Ant3	DSI2	380000	1900	200	20.60	21.50	1.230	-0.12	0.689	0.848
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Left Side	10mm	Ant3	DSI2	376000	1880	200	20.68	21.50	1.208	-0.07	0.796	0.961
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Left Side	10mm	Ant3	DSI2	372000	1860	200	20.61	21.50	1.227	-0.07	0.808	0.992
33	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Left Side	10mm	Ant3	DSI2	380000	1900	200	20.64	21.50	1.219	-0.09	0.814	**0.992**
	FR1 n2	20M	QPSK	100	0	DFT-15KHz	Left Side	10mm	Ant3	DSI2	376000	1880	200	20.67	21.50	1.211	-0.05	0.684	0.828
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Top Side	10mm	Ant3	DSI2	376000	1880	200	20.75	21.50	1.189	0.05	0.146	0.174
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Top Side	10mm	Ant3	DSI2	376000	1880	200	20.68	21.50	1.208	0.02	0.121	0.146
	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Front	10mm	Ant1	DSI2	167300	836.5	235	24.25	25.00	1.189	0.03	0.420	0.499
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Front	10mm	Ant1	DSI2	167300	836.5	235	24.04	25.00	1.247	0.01	0.458	0.571
34	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Back	10mm	Ant1	DSI2	167300	836.5	235	24.25	25.00	1.189	-0.17	0.674	**0.801**
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Back	10mm	Ant1	DSI2	167300	836.5	235	24.04	25.00	1.247	0.05	0.632	0.788
	FR1 n5	20M	QPSK	100	0	DFT-15KHz	Back	10mm	Ant1	DSI2	167300	836.5	235	23.58	24.00	1.102	-0.12	0.544	0.599
	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Left Side	10mm	Ant1	DSI2	167300	836.5	235	24.25	25.00	1.189	0.03	0.366	0.435
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Left Side	10mm	Ant1	DSI2	167300	836.5	235	24.04	25.00	1.247	0.02	0.378	0.472
	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Right Side	10mm	Ant1	DSI2	167300	836.5	235	24.25	25.00	1.189	0.04	0.011	0.013
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Right Side	10mm	Ant1	DSI2	167300	836.5	235	24.04	25.00	1.247	0.08	0.012	0.014
	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Top Side	10mm	Ant1	DSI2	167300	836.5	235	24.25	25.00	1.189	0.05	0.531	0.631
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Top Side	10mm	Ant1	DSI2	167300	836.5	235	24.04	25.00	1.247	0.02	0.510	0.636
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Front	10mm	Ant3	DSI2	349000	1745	220	22.73	23.50	1.194	0.01	0.254	0.303
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Front	10mm	Ant3	DSI2	349000	1745	220	22.68	23.50	1.208	0.03	0.271	0.327
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Back	10mm	Ant3	DSI2	349000	1745	220	22.73	23.50	1.194	0.03	0.621	0.741
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Back	10mm	Ant3	DSI2	349000	1745	220	22.68	23.50	1.208	0.05	0.616	0.744
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Left Side	10mm	Ant3	DSI2	349000	1745	220	22.73	23.50	1.194	-0.19	0.705	0.842
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Left Side	10mm	Ant3	DSI2	344000	1720	220	22.67	23.50	1.211	-0.04	0.545	0.660
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Left Side	10mm	Ant3	DSI2	354000	1770	220	22.65	23.50	1.216	-0.03	0.783	0.952
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Left Side	10mm	Ant3	DSI2	349000	1745	220	22.68	23.50	1.208	-0.13	0.723	0.873
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Left Side	10mm	Ant3	DSI2	344000	1720	220	22.65	23.50	1.216	0.07	0.594	0.722
35	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Left Side	10mm	Ant3	DSI2	354000	1770	220	22.62	23.50	1.225	-0.01	0.813	**0.996**
	FR1 n66	20M	QPSK	100	0	DFT-15KHz	Left Side	10mm	Ant3	DSI2	349000	1745	220	22.63	23.50	1.222	-0.12	0.723	0.883
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Top Side	10mm	Ant3	DSI2	349000	1745	220	22.73	23.50	1.194	0.05	0.149	0.178
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Top Side	10mm	Ant3	DSI2	349000	1745	220	22.68	23.50	1.208	0.06	0.152	0.184

<WLAN2.4G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	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)
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	0.05	0.018	0.019
36	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	0.04	0.275	**0.287**
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	0.02	0.079	0.083
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	0.03	0.057	0.060

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	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)
37	Bluetooth	1Mbps	Back	10mm	Ant4	Full	39	2441	12.84	13.00	1.038	76.72	1.086	-0.02	0.123	**0.139**

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	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)
	WLAN5.2GHz	802.11a 6Mbps	Front	10mm	Ant 4+5	Simultaneous	44	5220	15.72	16.00	1.067	98.55	1.015	-0.02	0.014	0.015
38	WLAN5.2GHz	802.11a 6Mbps	Back	10mm	Ant 4+5	Simultaneous	44	5220	15.72	16.00	1.067	98.55	1.015	0.01	0.286	**0.310**
	WLAN5.2GHz	802.11a 6Mbps	Right Side	10mm	Ant 4+5	Simultaneous	44	5220	15.72	16.00	1.067	98.55	1.015	0.02	0.044	0.048
	WLAN5.2GHz	802.11a 6Mbps	Top Side	10mm	Ant 4+5	Simultaneous	44	5220	15.72	16.00	1.067	98.55	1.015	0.01	0.073	0.079
	WLAN5.8GHz	802.11a 6Mbps	Front	10mm	Ant 4+5	Simultaneous	165	5825	14.61	15.50	1.227	98.55	1.015	0.05	0.010	0.012
39	WLAN5.8GHz	802.11a 6Mbps	Back	10mm	Ant 4+5	Simultaneous	165	5825	14.61	15.50	1.227	98.55	1.015	-0.06	0.263	**0.328**
	WLAN5.8GHz	802.11a 6Mbps	Right Side	10mm	Ant 4+5	Simultaneous	165	5825	14.61	15.50	1.227	98.55	1.015	0.03	0.036	0.045
	WLAN5.8GHz	802.11a 6Mbps	Top Side	10mm	Ant 4+5	Simultaneous	165	5825	14.61	15.50	1.227	98.55	1.015	0.01	0.050	0.062

15.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS 1Tx slots	Front	15mm	Ant1	DSI1	189	836.4	32.47	33.50	1.268	0.05	0.200	0.254
40	GSM850	GPRS 1Tx slots	Back	15mm	Ant1	DSI1	189	836.4	32.47	33.50	1.268	-0.02	0.288	**0.365**
	GSM1900	GPRS 2Tx slots	Front	15mm	Ant2	DSI1	661	1880	26.27	27.00	1.183	0.02	0.246	0.291
41	GSM1900	GPRS 2Tx slots	Back	15mm	Ant2	DSI1	661	1880	26.27	27.00	1.183	0.01	0.398	**0.471**

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	15mm	Ant2	DSI1	9400	1880	21.62	22.50	1.225	0.01	0.290	0.355
42	WCDMA II	RMC 12.2Kbps	Back	15mm	Ant2	DSI1	9400	1880	21.62	22.50	1.225	0.09	0.511	**0.626**
	WCDMA IV	RMC 12.2Kbps	Front	15mm	Ant2	DSI1	1413	1732.6	21.64	22.40	1.191	0.07	0.281	0.335
43	WCDMA IV	RMC 12.2Kbps	Back	15mm	Ant2	DSI1	1413	1732.6	21.64	22.40	1.191	-0.01	0.411	**0.490**
	WCDMA V	RMC 12.2Kbps	Front	15mm	Ant1	DSI1	4182	836.4	24.08	25.00	1.236	0.05	0.150	0.185
44	WCDMA V	RMC 12.2Kbps	Back	15mm	Ant1	DSI1	4182	836.4	24.08	25.00	1.236	0.03	0.231	**0.286**

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	15mm	Ant2	DSI1	18900	1880	21.41	22.50	1.285	0.02	0.213	0.274
	LTE Band 2	20M	QPSK	50	0	Front	15mm	Ant2	DSI1	18900	1880	21.38	22.50	1.294	0.05	0.251	0.325
45	LTE Band 2	20M	QPSK	1	0	Back	15mm	Ant2	DSI1	18900	1880	21.41	22.50	1.285	-0.08	0.432	**0.555**
	LTE Band 2	20M	QPSK	50	0	Back	15mm	Ant2	DSI1	18900	1880	21.38	22.50	1.294	-0.03	0.421	0.545
	LTE Band 2	20M	QPSK	1	0	Front	15mm	Ant3	DSI1	18900	1880	20.86	21.50	1.159	0.02	0.106	0.123
	LTE Band 2	20M	QPSK	50	0	Front	15mm	Ant3	DSI1	18900	1880	20.65	21.50	1.216	-0.01	0.120	0.146
	LTE Band 2	20M	QPSK	1	0	Back	15mm	Ant3	DSI1	18900	1880	20.86	21.50	1.159	0.01	0.271	0.314
73	LTE Band 2	20M	QPSK	50	0	Back	15mm	Ant3	DSI1	18900	1880	20.65	21.50	1.216	-0.07	0.336	**0.409**
	LTE Band 5	10M	QPSK	1	0	Front	15mm	Ant1	DSI1	20525	836.5	23.81	25.00	1.315	0.04	0.165	0.217
	LTE Band 5	10M	QPSK	25	0	Front	15mm	Ant1	DSI1	20525	836.5	22.80	24.00	1.318	0.05	0.124	0.163
46	LTE Band 5	10M	QPSK	1	0	Back	15mm	Ant1	DSI1	20525	836.5	23.81	25.00	1.315	-0.03	0.251	**0.330**
	LTE CA_5B	10M	QPSK	1	0	Back	15mm	Ant1	DSI1	20575+20476	841.5	23.71	25.00	1.346	-0.04	0.241	0.324
	LTE Band 5	10M	QPSK	25	0	Back	15mm	Ant1	DSI1	20525	836.5	22.80	24.00	1.318	0.01	0.190	0.250
	LTE Band 7	20M	QPSK	1	0	Front	15mm	Ant2	DSI1	21100	2535	22.55	23.20	1.161	0.06	0.212	0.246
	LTE Band 7	20M	QPSK	50	0	Front	15mm	Ant2	DSI1	21100	2535	22.25	23.20	1.245	0.08	0.224	0.279
47	LTE Band 7	20M	QPSK	1	0	Back	15mm	Ant2	DSI1	21100	2535	22.55	23.20	1.161	-0.07	0.576	**0.669**
	LTE Band 7	20M	QPSK	50	0	Back	15mm	Ant2	DSI1	21100	2535	22.25	23.20	1.245	0.04	0.582	0.724
	LTE Band 12	10M	QPSK	1	0	Front	15mm	Ant1	DSI1	23095	707.5	23.90	25.00	1.288	0.02	0.241	0.310
	LTE Band 12	10M	QPSK	25	0	Front	15mm	Ant1	DSI1	23095	707.5	22.94	24.00	1.276	0.06	0.238	0.304
48	LTE Band 12	10M	QPSK	1	0	Back	15mm	Ant1	DSI1	23095	707.5	23.90	25.00	1.288	-0.04	0.402	**0.518**
	LTE Band 12	10M	QPSK	25	0	Back	15mm	Ant1	DSI1	23095	707.5	22.94	24.00	1.276	0.07	0.311	0.397
	LTE Band 13	10M	QPSK	1	0	Front	15mm	Ant1	DSI1	23230	782	23.93	25.00	1.279	0.14	0.247	0.316
	LTE Band 13	10M	QPSK	25	0	Front	15mm	Ant1	DSI1	23230	782	23.07	24.00	1.239	0.09	0.202	0.250
49	LTE Band 13	10M	QPSK	1	0	Back	15mm	Ant1	DSI1	23230	782	23.93	25.00	1.279	-0.04	0.342	**0.438**
	LTE Band 13	10M	QPSK	25	0	Back	15mm	Ant1	DSI1	23230	782	23.07	24.00	1.239	0.01	0.279	0.346
	LTE Band 66	20M	QPSK	1	0	Front	15mm	Ant2	DSI1	132322	1745	21.64	22.40	1.191	-0.01	0.260	0.310
	LTE Band 66	20M	QPSK	50	0	Front	15mm	Ant2	DSI1	132322	1745	21.61	22.40	1.199	0.04	0.266	0.319
50	LTE Band 66	20M	QPSK	1	0	Back	15mm	Ant2	DSI1	132322	1745	21.64	22.40	1.191	-0.08	0.395	**0.471**
	LTE CA_66B	15M+5M	QPSK	1	0	Back	15mm	Ant2	DSI1	132322	1745	21.32	22.40	1.282	-0.12	0.375	0.481
	LTE CA_66C	20M+20M	QPSK	1	0	Back	15mm	Ant2	DSI1	132322	1745	21.46	22.40	1.242	-0.04	0.372	0.462
	LTE Band 66	20M	QPSK	50	0	Back	15mm	Ant2	DSI1	132322	1745	21.61	22.40	1.199	0.06	0.392	0.470
	LTE Band 66	20M	QPSK	1	0	Front	15mm	Ant3	DSI1	132322	1745	21.33	22.00	1.167	0.11	0.129	0.151
	LTE Band 66	20M	QPSK	50	0	Front	15mm	Ant3	DSI1	132322	1745	21.33	22.00	1.167	0.06	0.122	0.142
74	LTE Band 66	20M	QPSK	1	0	Back	15mm	Ant3	DSI1	132322	1745	21.33	22.00	1.167	0.01	0.324	**0.378**
	LTE Band 66	20M	QPSK	50	0	Back	15mm	Ant3	DSI1	132322	1745	21.33	22.00	1.167	-0.01	0.313	0.365

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Output Power State	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)
	LTE Band 48	20M	QPSK	1	0	Front	15mm	Ant2	DSI1	55830	3609	22.62	23.60	1.253	62.9	1.006	0.01	0.157	0.198
	LTE Band 48	20M	QPSK	50	0	Front	15mm	Ant2	DSI1	55830	3609	22.31	23.30	1.256	62.9	1.006	0.02	0.125	0.158
	LTE Band 48	20M	QPSK	1	0	Back	15mm	Ant2	DSI1	55830	3609	22.62	23.60	1.253	62.9	1.006	0.03	0.489	0.616
51	LTE Band 48	20M	QPSK	1	0	Back	15mm	Ant2	DSI1	55340	3560	22.42	23.60	1.312	62.9	1.006	-0.13	0.492	**0.649**
	LTE CA_48C	20M+20M	QPSK	100	0	Back	15mm	Ant2	DSI1	55340+55538	3560	19.42	20.00	1.143	62.9	1.006	0.08	0.323	0.371
	LTE Band 48	20M	QPSK	1	0	Back	15mm	Ant2	DSI1	56150	3641	22.50	23.60	1.288	62.9	1.006	0.11	0.490	0.635
	LTE Band 48	20M	QPSK	1	0	Back	15mm	Ant2	DSI1	56640	3690	22.43	23.60	1.309	62.9	1.006	-0.07	0.419	0.552
	LTE Band 48	20M	QPSK	50	0	Back	15mm	Ant2	DSI1	55830	3609	22.31	23.30	1.256	62.9	1.006	0.05	0.466	0.589
	LTE Band 48	20M	QPSK	50	0	Back	15mm	Ant2	DSI1	55340	3560	22.23	23.30	1.279	62.9	1.006	0.12	0.384	0.494
	LTE Band 48	20M	QPSK	50	0	Back	15mm	Ant2	DSI1	56150	3641	22.24	23.30	1.276	62.9	1.006	-0.01	0.462	0.593
	LTE Band 48	20M	QPSK	50	0	Back	15mm	Ant2	DSI1	56640	3690	22.19	23.30	1.291	62.9	1.006	0.11	0.425	0.552

<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Front	15mm	Ant3	DSI1	376000	1880	22.32	23.00	1.169	0.01	0.161	0.188
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Front	15mm	Ant3	DSI1	376000	1880	22.31	23.00	1.172	0.03	0.125	0.147
52	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Back	15mm	Ant3	DSI1	376000	1880	22.32	23.00	1.169	-0.11	0.434	**0.508**
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Back	15mm	Ant3	DSI1	376000	1880	22.31	23.00	1.172	0.03	0.339	0.397
	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Front	15mm	Ant1	DSI1	167300	836.5	24.25	25.00	1.189	0.03	0.215	0.256
	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Front	15mm	Ant1	DSI1	167300	836.5	24.04	25.00	1.247	0.05	0.207	0.258
	FR1 n5	20M	QPSK	1	1	DFT-15KHz	Back	15mm	Ant1	DSI1	167300	836.5	24.25	25.00	1.189	0.02	0.253	0.301
53	FR1 n5	20M	QPSK	50	28	DFT-15KHz	Back	15mm	Ant1	DSI1	167300	836.5	24.04	25.00	1.247	-0.12	0.302	**0.377**
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Front	15mm	Ant3	DSI1	349000	1745	23.72	24.50	1.197	0.01	0.132	0.158
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Front	15mm	Ant3	DSI1	349000	1745	23.68	24.50	1.208	0.02	0.150	0.181
54	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Back	15mm	Ant3	DSI1	349000	1745	23.72	24.50	1.197	-0.02	0.404	**0.483**
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Back	15mm	Ant3	DSI1	349000	1745	23.68	24.50	1.208	-0.17	0.376	0.454

<WLAN2.4G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	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)
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	0.03	0.011	0.011
55	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 4+5	Full	1	2412	20.82	21.00	1.042	100	1.000	0.06	0.115	**0.120**

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	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)
56	Bluetooth	1Mbps	Back	15mm	Ant4	Full	39	2441	12.84	13.00	1.038	76.72	1.086	0.05	0.048	**0.054**

<WLAN5G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	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)
	WLAN5.3GHz	802.11a 6Mbps	Front	15mm	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.01	0.030	0.037
57	WLAN5.3GHz	802.11a 6Mbps	Back	15mm	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.02	0.626	**0.776**
	WLAN5.3GHz	802.11a 6Mbps	Front	15mm	Ant 4+5	Simultaneous	56	5280	14.34	16.00	1.466	98.55	1.015	0.05	0.013	0.019
	WLAN5.3GHz	802.11a 6Mbps	Back	15mm	Ant 4+5	Simultaneous	56	5280	14.34	16.00	1.466	98.55	1.015	-0.09	0.162	0.241
	WLAN5.5GHz	802.11a 6Mbps	Front	15mm	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.01	0.035	0.043
58	WLAN5.5GHz	802.11a 6Mbps	Back	15mm	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.01	0.535	**0.665**
	WLAN5.5GHz	802.11a 6Mbps	Front	15mm	Ant 4+5	Simultaneous	132	5660	13.53	15.00	1.403	98.55	1.015	0.03	0.023	0.032
	WLAN5.5GHz	802.11a 6Mbps	Back	15mm	Ant 4+5	Simultaneous	132	5660	13.53	15.00	1.403	98.55	1.015	-0.02	0.125	0.178
	WLAN5.8GHz	802.11a 6Mbps	Front	15mm	Ant 4+5	Full	165	5825	19.05	20.00	1.245	98.55	1.015	0.02	0.041	0.052
59	WLAN5.8GHz	802.11a 6Mbps	Back	15mm	Ant 4+5	Full	165	5825	19.05	20.00	1.245	98.55	1.015	0.05	0.564	**0.712**
	WLAN5.8GHz	802.11a 6Mbps	Front	15mm	Ant 4+5	Simultaneous	165	5825	14.61	15.50	1.227	98.55	1.015	0.07	0.026	0.032
	WLAN5.8GHz	802.11a 6Mbps	Back	15mm	Ant 4+5	Simultaneous	165	5825	14.61	15.50	1.227	98.55	1.015	-0.06	0.192	0.239

15.4 Product Specific SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Back	0mm	Ant2	DSI1	9400	1880	21.62	22.50	1.225	0.08	2.480	3.037
60	WCDMA II	RMC 12.2Kbps	Back	0mm	Ant2	DSI1	9262	1852.4	21.53	22.50	1.250	0.11	2.430	**3.038**
	WCDMA II	RMC 12.2Kbps	Back	0mm	Ant2	DSI1	9538	1907.6	21.47	22.50	1.268	-0.12	2.030	2.573
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	Ant2	DSI1	9400	1880	21.62	22.50	1.225	0.09	2.240	2.743
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	Ant2	DSI1	9262	1852.4	21.53	22.50	1.250	0.04	2.150	2.688
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	Ant2	DSI1	9538	1907.6	21.47	22.50	1.268	0.07	1.840	2.332
	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	Ant2	DSI1	1413	1732.6	21.64	22.40	1.191	0.11	2.560	3.050
	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	Ant2	DSI1	1312	1712.4	21.60	22.40	1.202	-0.03	2.530	3.042
61	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	Ant2	DSI1	1513	1752.6	21.58	22.40	1.208	0.06	2.580	**3.116**

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Ant2	DSI1	18900	1880	21.41	22.50	1.285	0.01	2.010	2.583
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Ant2	DSI1	18700	1860	21.34	22.50	1.306	0.06	2.050	2.678
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Ant2	DSI1	19100	1900	21.33	22.50	1.309	0.04	1.900	2.487
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Ant2	DSI1	18900	1880	21.38	22.50	1.294	0.04	2.050	2.653
62	LTE Band 2	20M	QPSK	50	0	Back	0mm	Ant2	DSI1	18700	1860	21.30	22.50	1.318	0.09	2.290	**3.019**
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Ant2	DSI1	19100	1900	21.33	22.50	1.309	0.01	1.890	2.474
	LTE Band 2	20M	QPSK	100	0	Back	0mm	Ant2	DSI1	18900	1880	21.19	22.50	1.352	0.01	2.030	2.745
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	Ant2	DSI1	18900	1880	21.41	22.50	1.285	0.01	1.900	2.442
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	Ant2	DSI1	18700	1860	21.34	22.50	1.306	0.06	1.940	2.534
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	Ant2	DSI1	19100	1900	21.33	22.50	1.309	0.04	1.750	2.291
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	Ant2	DSI1	18900	1880	21.38	22.50	1.294	0.04	1.930	2.498
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	Ant2	DSI1	18700	1860	21.30	22.50	1.318	0.09	2.010	2.650
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	Ant2	DSI1	19100	1900	21.33	22.50	1.309	0.01	1.660	2.173
	LTE Band 2	20M	QPSK	100	0	Bottom Side	0mm	Ant2	DSI1	18900	1880	21.19	22.50	1.352	0.01	1.900	2.569
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Ant3	DSI1	18900	1880	20.86	21.50	1.159	0.07	2.120	2.457
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Ant3	DSI1	18700	1860	20.85	21.50	1.161	0.06	2.100	2.439
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Ant3	DSI1	19100	1900	20.75	21.50	1.189	0.01	2.020	2.401
75	LTE Band 2	20M	QPSK	50	0	Back	0mm	Ant3	DSI1	18900	1880	20.65	21.50	1.216	-0.01	2.410	**2.931**
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Ant3	DSI1	18700	1860	20.62	21.50	1.225	0.01	2.210	2.706
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Ant3	DSI1	19100	1900	20.49	21.50	1.262	0.02	1.930	2.435
	LTE Band 2	20M	QPSK	100	0	Back	0mm	Ant3	DSI1	18900	1880	20.62	21.50	1.225	-0.09	2.370	2.902
	LTE Band 2	20M	QPSK	1	0	Left Side	0mm	Ant3	DSI1	18900	1880	20.86	21.50	1.159	0.08	1.780	2.063
	LTE Band 2	20M	QPSK	1	0	Left Side	0mm	Ant3	DSI1	18700	1860	20.85	21.50	1.161	0.11	2.160	2.509
	LTE Band 2	20M	QPSK	1	0	Left Side	0mm	Ant3	DSI1	19100	1900	20.75	21.50	1.189	0.06	1.840	2.187
	LTE Band 2	20M	QPSK	50	0	Left Side	0mm	Ant3	DSI1	18900	1880	20.65	21.50	1.216	-0.08	1.980	2.408
	LTE Band 2	20M	QPSK	50	0	Left Side	0mm	Ant3	DSI1	18700	1860	20.62	21.50	1.225	0.04	2.060	2.523
	LTE Band 2	20M	QPSK	50	0	Left Side	0mm	Ant3	DSI1	19100	1900	20.49	21.50	1.262	0.06	1.600	2.019
	LTE Band 2	20M	QPSK	100	0	Left Side	0mm	Ant3	DSI1	18900	1880	20.62	21.50	1.225	0.03	1.940	2.376

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 7	20M	QPSK	1	0	Back	0mm	Ant2	DSI1	21100	2535	22.55	23.20	1.161	0.07	2.410	2.799
	LTE Band 7	20M	QPSK	1	0	Back	0mm	Ant2	DSI1	20850	2510	22.49	23.20	1.178	0.06	2.330	2.744
63	LTE Band 7	20M	QPSK	1	0	Back	0mm	Ant2	DSI1	21350	2560	22.46	23.20	1.186	0.08	2.560	**3.036**
	LTE Band 7	20M	QPSK	50	0	Back	0mm	Ant2	DSI1	21100	2535	22.25	23.20	1.245	-0.11	2.220	2.763
	LTE Band 7	20M	QPSK	50	0	Back	0mm	Ant2	DSI1	20850	2510	22.06	23.20	1.300	0.07	2.020	2.626
	LTE Band 7	20M	QPSK	50	0	Back	0mm	Ant2	DSI1	21350	2560	22.22	23.20	1.253	-0.12	2.040	2.556
	LTE Band 7	20M	QPSK	100	0	Back	0mm	Ant2	DSI1	21100	2535	21.97	23.20	1.327	0.09	2.130	2.827
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Ant2	DSI1	132072	1720	21.49	22.40	1.233	0.11	2.220	2.737
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Ant2	DSI1	132322	1745	21.64	22.40	1.191	-0.12	2.250	2.680
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Ant2	DSI1	132572	1770	21.54	22.40	1.219	-0.11	2.150	2.621
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Ant2	DSI1	132072	1720	21.52	22.40	1.225	0.09	2.240	2.743
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Ant2	DSI1	132322	1745	21.61	22.40	1.199	0.08	2.260	2.711
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Ant2	DSI1	132572	1770	21.54	22.40	1.219	0.02	2.180	2.657
	LTE Band 66	20M	QPSK	100	0	Back	0mm	Ant2	DSI1	132322	1745	21.59	22.40	1.205	0.01	2.300	2.772
	LTE Band 66	20M	QPSK	1	0	Bottom Side	0mm	Ant2	DSI1	132072	1720	21.49	22.40	1.233	0.03	2.350	2.898
	LTE Band 66	20M	QPSK	1	0	Bottom Side	0mm	Ant2	DSI1	132322	1745	21.64	22.40	1.191	-0.09	2.290	2.728
	LTE CA_66B	15M+5M	QPSK	1	0	Bottom Side	0mm	Ant2	DSI1	132322+132229	1745	21.32	22.40	1.282	0.17	2.110	2.706
	LTE CA_66C	20M+20M	QPSK	1	0	Bottom Side	0mm	Ant2	DSI1	132322+132124	1745	21.46	22.40	1.242	0.09	2.210	2.744
	LTE Band 66	20M	QPSK	1	0	Bottom Side	0mm	Ant2	DSI1	132572	1770	21.54	22.40	1.219	-0.03	2.450	2.987
	LTE Band 66	20M	QPSK	50	0	Bottom Side	0mm	Ant2	DSI1	132072	1720	21.52	22.40	1.225	0.03	2.360	2.890
	LTE Band 66	20M	QPSK	50	0	Bottom Side	0mm	Ant2	DSI1	132322	1745	21.61	22.40	1.199	0.02	2.300	2.759
64	LTE Band 66	20M	QPSK	50	0	Bottom Side	0mm	Ant2	DSI1	132572	1770	21.54	22.40	1.219	0.05	2.510	**3.060**
	LTE Band 66	20M	QPSK	100	0	Bottom Side	0mm	Ant2	DSI1	132322	1745	21.59	22.40	1.205	0.07	2.380	2.868
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Ant3	DSI1	132072	1720	21.31	22.00	1.172	0.06	2.020	2.368
76	LTE Band 66	20M	QPSK	1	0	Back	0mm	Ant3	DSI1	132322	1745	21.33	22.00	1.167	0.1	2.450	**2.859**
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Ant3	DSI1	132572	1770	21.21	22.00	1.199	0.07	2.160	2.591
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Ant3	DSI1	132072	1720	21.32	22.00	1.169	0.06	2.300	2.690
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Ant3	DSI1	132322	1745	21.33	22.00	1.167	0.07	2.310	2.695
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Ant3	DSI1	132572	1770	21.21	22.00	1.199	0.04	2.250	2.699
	LTE Band 66	20M	QPSK	100	0	Back	0mm	Ant3	DSI1	132322	1745	21.23	22.00	1.194	-0.06	2.230	2.663
	LTE Band 66	20M	QPSK	1	0	Left Side	0mm	Ant3	DSI1	132072	1720	21.31	22.00	1.172	0.08	2.100	2.462
	LTE Band 66	20M	QPSK	1	0	Left Side	0mm	Ant3	DSI1	132322	1745	21.33	22.00	1.167	-0.09	1.580	1.844
	LTE Band 66	20M	QPSK	1	0	Left Side	0mm	Ant3	DSI1	132572	1770	21.21	22.00	1.199	-0.07	1.630	1.955
	LTE Band 66	20M	QPSK	50	0	Left Side	0mm	Ant3	DSI1	132072	1720	21.32	22.00	1.169	0.09	1.950	2.281
	LTE Band 66	20M	QPSK	50	0	Left Side	0mm	Ant3	DSI1	132322	1745	21.33	22.00	1.167	0.14	1.810	2.112
	LTE Band 66	20M	QPSK	50	0	Left Side	0mm	Ant3	DSI1	132572	1770	21.21	22.00	1.199	0.16	1.570	1.883
	LTE Band 66	20M	QPSK	100	0	Left Side	0mm	Ant3	DSI1	132322	1745	21.23	22.00	1.194	0.08	1.800	2.149

<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Back	0mm	Ant3	DSI1	376000	1880	22.32	23.00	1.169	0.02	2.600	3.041
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Back	0mm	Ant3	DSI1	372000	1860	22.31	23.00	1.172	0.05	2.210	2.591
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Back	0mm	Ant3	DSI1	380000	1900	22.30	23.00	1.175	0.03	2.460	2.890
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Back	0mm	Ant3	DSI1	376000	1880	22.31	23.00	1.172	0.01	2.550	2.989
65	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Back	0mm	Ant3	DSI1	372000	1860	22.25	23.00	1.189	-0.13	2.560	**3.043**
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Back	0mm	Ant3	DSI1	380000	1900	22.23	23.00	1.194	0.03	2.440	2.913
	FR1 n2	20M	QPSK	100	0	DFT-15KHz	Back	0mm	Ant3	DSI1	376000	1880	22.27	23.00	1.183	-0.08	2.520	2.981
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Left Side	0mm	Ant3	DSI1	376000	1880	22.32	23.00	1.169	0.16	2.030	2.374
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Left Side	0mm	Ant3	DSI1	372000	1860	22.31	23.00	1.172	0.05	1.930	2.262
	FR1 n2	20M	QPSK	1	1	DFT-15KHz	Left Side	0mm	Ant3	DSI1	380000	1900	22.30	23.00	1.175	0.04	2.020	2.373
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Left Side	0mm	Ant3	DSI1	376000	1880	22.31	23.00	1.172	0.02	2.220	2.602
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Left Side	0mm	Ant3	DSI1	372000	1860	22.25	23.00	1.189	0.01	2.180	2.591
	FR1 n2	20M	QPSK	50	28	DFT-15KHz	Left Side	0mm	Ant3	DSI1	380000	1900	22.23	23.00	1.194	0.02	2.150	2.567
	FR1 n2	20M	QPSK	100	0	DFT-15KHz	Left Side	0mm	Ant3	DSI1	376000	1880	22.27	23.00	1.183	0.03	2.130	2.520
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Left Side	0mm	Ant3	DSI1	349000	1745	23.72	24.50	1.197	0.15	2.250	2.693
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Left Side	0mm	Ant3	DSI1	344000	1720	23.65	24.50	1.216	0.14	2.400	2.919
	FR1 n66	20M	QPSK	1	1	DFT-15KHz	Left Side	0mm	Ant3	DSI1	354000	1770	23.67	24.50	1.211	-0.01	2.120	2.566
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Left Side	0mm	Ant3	DSI1	349000	1745	23.68	24.50	1.208	0.02	2.390	2.887
66	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Left Side	0mm	Ant3	DSI1	344000	1720	23.67	24.50	1.211	0.05	2.580	**3.123**
	FR1 n66	20M	QPSK	50	28	DFT-15KHz	Left Side	0mm	Ant3	DSI1	354000	1770	23.61	24.50	1.227	-0.05	2.420	2.970
	FR1 n66	20M	QPSK	100	0	DFT-15KHz	Left Side	0mm	Ant3	DSI1	349000	1745	23.25	24.00	1.189	-0.04	2.280	2.710

<WLAN5G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.03	0.141	0.175
67	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.01	2.260	**2.803**
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Ant 4+5	Full	60	5300	19.50	20.50	1.259	98.55	1.015	0.05	1.590	2.032
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.02	0.194	0.241
	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.02	0.312	0.387
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	Ant 4+5	Simultaneous	56	5280	14.34	16.00	1.466	98.55	1.015	-0.03	0.035	0.051
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Ant 4+5	Simultaneous	56	5280	14.34	16.00	1.466	98.55	1.015	0.01	0.515	0.766
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Ant 4+5	Simultaneous	56	5280	14.34	16.00	1.466	98.55	1.015	0.03	0.052	0.077
	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 4+5	Simultaneous	56	5280	14.34	16.00	1.466	98.55	1.015	0.02	0.090	0.134
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.05	0.085	0.105
68	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.03	2.000	**2.486**
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Ant 4+5	Full	140	5700	18.87	20.00	1.297	98.55	1.015	0.02	1.790	2.357
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.02	0.140	0.174
	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 4+5	Full	132	5660	19.12	20.00	1.225	98.55	1.015	0.01	0.314	0.390
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	Ant 4+5	Simultaneous	132	5660	13.53	15.00	1.403	98.55	1.015	0.03	0.012	0.017
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Ant 4+5	Simultaneous	132	5660	13.53	15.00	1.403	98.55	1.015	0.02	0.518	0.738
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Ant 4+5	Simultaneous	132	5660	13.53	15.00	1.403	98.55	1.015	-0.08	0.039	0.056
	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 4+5	Simultaneous	132	5660	13.53	15.00	1.403	98.55	1.015	0.05	0.084	0.119

15.5 Repeated SAR Measurement

<1g>

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 13	10M	QPSK	1	0	-	Right Tilted	0mm	Ant1	DSI3	23230	782	21.34	22.00	1.164	-0.05	0.856	1	0.996
2nd	LTE Band 13	10M	QPSK	1	0	-	Right Tilted	0mm	Ant1	DSI3	23230	782	21.34	22.00	1.164	0.11	0.798	1.073	0.929
1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant2	DSI2	1312	1712.4	20.94	21.60	1.164	0.09	0.857	1	0.998
2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant2	DSI2	1312	1712.4	20.94	21.60	1.164	0.11	0.841	1.019	0.979
1st	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	10mm	Ant2	DSI2	18900	1880	20.39	21.00	1.151	-0.11	0.830	1	0.955
2nd	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	10mm	Ant2	DSI2	18900	1880	20.39	21.00	1.151	0.07	0.811	1.023	0.933
1st	LTE Band 7	20M	QPSK	1	0	-	Back	10mm	Ant2	DSI2	21350	2560	20.51	21.20	1.172	-0.04	0.826	1	0.968
2nd	LTE Band 7	20M	QPSK	1	0	-	Back	10mm	Ant2	DSI2	21350	2560	20.51	21.20	1.172	0.11	0.807	1.024	0.946

<10g>

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Output Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	LTE Band 7	20M	QPSK	1	0	-	Back	0mm	Ant2	DSI1	21350	2560	22.46	23.20	1.186	-	-	0.08	2.560	1	3.036
2nd	LTE Band 7	20M	QPSK	1	0	-	Back	0mm	Ant2	DSI1	21350	2560	22.46	23.20	1.186	-	-	0.09	2.510	1.020	2.976
1st	FR1 n2	20M	QPSK	1	1	DFT- 15KHz	Back	0mm	Ant3	DSI1	376000	1880	22.32	23.00	1.169	-	-	0.02	2.600	1	3.041
2nd	FR1 n2	20M	QPSK	1	1	DFT- 15KHz	Back	0mm	Ant3	DSI1	376000	1880	22.32	23.00	1.169	-	-	0.08	2.520	1.032	2.947
1st	FR1 n66	20M	QPSK	50	28	DFT- 15KHz	Left Side	0mm	Ant3	DSI1	344000	1720	23.67	24.50	1.211	-	-	0.05	2.580	1	3.123
2nd	FR1 n66	20M	QPSK	50	28	DFT- 15KHz	Left Side	0mm	Ant3	DSI1	344000	1720	23.67	24.50	1.211	-	-	0.09	2.530	1.020	3.063
1st	WLAN5GHz	-	-	-	-	802.11a 6Mbps	Back	0mm	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.01	2.260	1	2.803
2nd	WLAN5GHz	-	-	-	-	802.11a 6Mbps	Back	0mm	Ant 4+5	Full	56	5280	19.63	20.50	1.222	98.55	1.015	0.04	2.210	1.023	2.741

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The ratio is the difference in percentage between original and repeated *measured SAR*.
5. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product specific 10g SAR
1.	GSM Voice + WLAN2.4GHz MIMO	Yes	Yes		Yes
2.	GPRS/EDGE + WLAN2.4GHz MIMO	Yes	Yes	Yes	Yes
3.	WCDMA + WLAN2.4GHz MIMO	Yes	Yes	Yes	Yes
4.	LTE + WLAN2.4GHz MIMO	Yes	Yes	Yes	Yes
5.	5GNR FR1 + WLAN2.4GHz MIMO	Yes	Yes	Yes	Yes
6.	GSM Voice + WLAN5.3/5.5GHz MIMO	Yes	Yes		Yes
7.	GPRS/EDGE + WLAN5.3/5.5GHz MIMO	Yes	Yes		Yes
8.	WCDMA + WLAN5.3/5.5GHz MIMO	Yes	Yes		Yes
9.	LTE + WLAN5.3/5.5GHz MIMO	Yes	Yes		Yes
10.	5GNR FR1 + WLAN5.3/5.5GHz MIMO	Yes	Yes		Yes
11.	GSM Voice + WLAN5.2/5.8GHz MIMO	Yes	Yes		Yes
12.	GPRS/EDGE + WLAN5.2/5.8GHz MIMO	Yes	Yes	Yes	Yes
13.	WCDMA + WLAN5.2/5.8GHz MIMO	Yes	Yes	Yes	Yes
14.	LTE + WLAN5.2/5.8GHz MIMO	Yes	Yes	Yes	Yes
15.	5GNR FR1 + WLAN5.2/5.8GHz MIMO	Yes	Yes	Yes	Yes
16.	GSM Voice + WLAN5.3/5.5GHz MIMO +Bluetooth	Yes	Yes		Yes
17.	GPRS/EDGE + WLAN5.3/5.5GHz MIMO +Bluetooth	Yes	Yes		Yes
18.	WCDMA + WLAN5.3/5.5GHz MIMO +Bluetooth	Yes	Yes		Yes
19.	LTE + WLAN5.3/5.5GHz MIMO +Bluetooth	Yes	Yes		Yes
20.	5GNR FR1 + WLAN5.3/5.5GHz MIMO +Bluetooth	Yes	Yes		Yes
21.	GSM Voice + WLAN5.2/5.8GHz MIMO +Bluetooth	Yes	Yes		Yes
22.	GPRS/EDGE + WLAN5.2/5.8GHz MIMO +Bluetooth	Yes	Yes	Yes	Yes
23.	WCDMA + WLAN5.2/5.8GHz MIMO +Bluetooth	Yes	Yes	Yes	Yes
24.	LTE + WLAN5.2/5.8GHz MIMO +Bluetooth	Yes	Yes	Yes	Yes
25.	5GNR FR1 + WLAN5.2/5.8GHz MIMO +Bluetooth	Yes	Yes	Yes	Yes
26.	WLAN5.2/5.8GHz MIMO + Bluetooth	Yes	Yes	Yes	Yes
27.	WLAN5.3/5.5GHz MIMO + Bluetooth	Yes	Yes	Yes	Yes
28.	GSM Voice + Bluetooth	Yes	Yes		Yes
29.	GPRS/EDGE + Bluetooth	Yes	Yes	Yes	Yes
30.	WCDMA + Bluetooth	Yes	Yes	Yes	Yes
31.	LTE + Bluetooth	Yes	Yes	Yes	Yes
32.	5GNR FR1+ Bluetooth	Yes	Yes	Yes	Yes

General Note:

1. This device supports VoIP in GPRS, EGPRS, WCDMA, CDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. The 2.4GHz/5GHz WLAN can transmit in MIMO antenna mode only and it has no SISO antenna mode.
4. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
5. This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WLAN Direct (GC/GO), and 5.3GHz / 5.5GHz supports WLAN Direct (GC only).
6. 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.
7. According to the EUT character, WLAN 5GHz and Bluetooth can transmit simultaneously.
8. According to the EUT character, WLAN 2.4GHz and Bluetooth cannot transmit simultaneously.
9. For simultaneously analysis, since the SAR summation of 3 transmitters can cover others combination of 2 transmitters, therefore in this section did not additional to evaluate 2TX combination of simultaneously transmission.
10. For Bluetooth SAR testing only perform the worst positon of WLAN, so other positon use this SAR value to do co-located with WWAN analysis.
11. Chose the worst zoom scan SAR of WLAN correspondingly for co-located with WWAN analysis.
12. The reported SAR summation is calculated based on the same configuration and test position.
13. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
    i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
    ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
    iii) If SPLSR ≤ 0.04 for 1g SAR and SPLSR≤ 0.10 for 10g SAR , simultaneously transmission SAR measurement is not necessary.
    iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.

16.1 5G NR + LTE + WLAN + BT Sim-Tx analysis

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

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

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

*x% * A + (100-x)% * B ≤ 1.0,*

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

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

*x% * A + (100-x)% * B + C ≤ 1.0* (1)

x% * A + (100-x)% * B ≤ x% * max(A, B) + (100-x)% * max(A, B) ≤ max(A, B)

*x% * A + (100-x)% * B + C ≤ max(A, B) + C ≤ 1.0* (2)

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

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

16.2 Head Exposure Conditions

WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN MIMO 1g SAR (W/kg)	3 5GHz WLAN MIMO 1g SAR (W/kg)	4 Bluetooth Ant 4 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
GSM850	Right Cheek	0.498	0.030	0.261	0.007	0.53	0.77
	Right Tilted	0.630	0.048	0.300	0.007	0.68	0.94
	Left Cheek	0.505	0.057	0.331	0.007	0.56	0.84
	Left Tilted	0.450	0.069	0.445	0.007	0.52	0.90
GSM1900	Right Cheek	0.072	0.030	0.261	0.007	0.10	0.34
	Right Tilted	0.095	0.048	0.300	0.007	0.14	0.40
	Left Cheek	0.143	0.057	0.331	0.007	0.20	0.48
	Left Tilted	0.079	0.069	0.445	0.007	0.15	0.53
WCDMA II	Right Cheek	0.226	0.030	0.261	0.007	0.26	0.49
	Right Tilted	0.233	0.048	0.300	0.007	0.28	0.54
	Left Cheek	0.251	0.057	0.331	0.007	0.31	0.59
	Left Tilted	0.084	0.069	0.445	0.007	0.15	0.54
WCDMA IV	Right Cheek	0.202	0.030	0.261	0.007	0.23	0.47
	Right Tilted	0.131	0.048	0.300	0.007	0.18	0.44
	Left Cheek	0.077	0.057	0.331	0.007	0.13	0.42
	Left Tilted	0.115	0.069	0.445	0.007	0.18	0.57
WCDMA V	Right Cheek	0.797	0.030	0.261	0.007	0.83	1.07
	Right Tilted	0.984	0.048	0.300	0.007	1.03	1.29
	Left Cheek	0.712	0.057	0.331	0.007	0.77	1.05
	Left Tilted	0.672	0.069	0.445	0.007	0.74	1.12
LTE Band 2	Right Cheek	0.154	0.030	0.261	0.007	0.18	0.42
	Right Tilted	0.149	0.048	0.300	0.007	0.20	0.46
	Left Cheek	0.219	0.057	0.331	0.007	0.28	0.56
	Left Tilted	0.139	0.069	0.445	0.007	0.21	0.59
LTE Band 5	Right Cheek	0.724	0.030	0.261	0.007	0.75	0.99
	Right Tilted	0.902	0.048	0.300	0.007	0.95	1.21
	Left Cheek	0.632	0.057	0.331	0.007	0.69	0.97
	Left Tilted	0.669	0.069	0.445	0.007	0.74	1.12
LTE Band 7	Right Cheek	0.077	0.030	0.261	0.007	0.11	0.35
	Right Tilted	0.059	0.048	0.300	0.007	0.11	0.37
	Left Cheek	0.193	0.057	0.331	0.007	0.25	0.53
	Left Tilted	0.099	0.069	0.445	0.007	0.17	0.55
LTE Band 12	Right Cheek	0.744	0.030	0.261	0.007	0.77	1.01
	Right Tilted	0.949	0.048	0.300	0.007	1.00	1.26
	Left Cheek	0.636	0.057	0.331	0.007	0.69	0.97
	Left Tilted	0.643	0.069	0.445	0.007	0.71	1.10
LTE Band 13	Right Cheek	0.623	0.030	0.261	0.007	0.65	0.89
	Right Tilted	0.996	0.048	0.300	0.007	1.04	1.30
	Left Cheek	0.520	0.057	0.331	0.007	0.58	0.86
	Left Tilted	0.550	0.069	0.445	0.007	0.62	1.00
LTE Band 66	Right Cheek	0.123	0.030	0.261	0.007	0.15	0.39
	Right Tilted	0.100	0.048	0.300	0.007	0.15	0.41
	Left Cheek	0.188	0.057	0.331	0.007	0.25	0.53
	Left Tilted	0.115	0.069	0.445	0.007	0.18	0.57
LTE Band 48	Right Cheek	0.041	0.030	0.261	0.007	0.07	0.31
	Right Tilted	0.029	0.048	0.300	0.007	0.08	0.34
	Left Cheek	0.042	0.057	0.331	0.007	0.10	0.38
	Left Tilted	0.031	0.069	0.445	0.007	0.10	0.48

WWAN Band	Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN MIMO	5GHz WLAN MIMO	Bluetooth Ant 4		
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
LTE Band 2_Ant3	Right Cheek	0.988	0.030	0.261	0.007	1.02	1.26
	Right Tilted	0.401	0.048	0.300	0.007	0.45	0.71
	Left Cheek	0.403	0.057	0.331	0.007	0.46	0.74
	Left Tilted	0.255	0.069	0.445	0.007	0.32	0.71
LTE Band 66_Ant3	Right Cheek	0.993	0.030	0.261	0.007	1.02	1.26
	Right Tilted	0.437	0.048	0.300	0.007	0.49	0.74
	Left Cheek	0.402	0.057	0.331	0.007	0.46	0.74
	Left Tilted	0.344	0.069	0.445	0.007	0.41	0.80

<5G NR>

WWAN Band	Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN MIMO	5GHz WLAN MIMO	Bluetooth Ant 4		
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
FR1 N2	Right Cheek	0.942	0.030	0.261	0.007	0.97	1.21
	Right Tilted	0.358	0.048	0.300	0.007	0.41	0.67
	Left Cheek	0.432	0.057	0.331	0.007	0.49	0.77
	Left Tilted	0.234	0.069	0.445	0.007	0.30	0.69
FR1 N5	Right Cheek	0.712	0.030	0.261	0.007	0.74	0.98
	Right Tilted	0.964	0.048	0.300	0.007	1.01	1.27
	Left Cheek	0.722	0.057	0.331	0.007	0.78	1.06
	Left Tilted	0.697	0.069	0.445	0.007	0.77	1.15
FR1 N66	Right Cheek	0.975	0.030	0.261	0.007	1.01	1.24
	Right Tilted	0.318	0.048	0.300	0.007	0.37	0.63
	Left Cheek	0.352	0.057	0.331	0.007	0.41	0.69
	Left Tilted	0.286	0.069	0.445	0.007	0.36	0.74

16.3 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN MIMO 1g SAR (W/kg)	3 5GHz WLAN MIMO 1g SAR (W/kg)	4 Bluetooth Ant 4 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
GSM850	Front	0.469	0.019	0.015	0.139	0.49	0.62
	Back	0.739	0.287	0.328	0.139	1.03	1.21
	Left side	0.345				0.35	0.35
	Right side	0.094	0.083	0.048	0.139	0.18	0.28
	Top side	0.721	0.060	0.079	0.139	0.78	0.94
	Bottom side					0.00	0.00
GSM1900	Front	0.394	0.019	0.015	0.139	0.41	0.55
	Back	0.793	0.287	0.328	0.139	1.08	1.26
	Left side	0.071				0.07	0.07
	Right side	0.686	0.083	0.048	0.139	0.77	0.87
	Top side		0.060	0.079	0.139	0.06	0.22
	Bottom side	0.678				0.68	0.68
WCDMA II	Front	0.451	0.019	0.015	0.139	0.47	0.61
	Back	0.878	0.287	0.328	0.139	1.17	1.35
	Left side	0.091				0.09	0.09
	Right side	0.061	0.083	0.048	0.139	0.14	0.25
	Top side		0.060	0.079	0.139	0.06	0.22
	Bottom side	0.914				0.91	0.91
WCDMA IV	Front	0.617	0.019	0.015	0.139	0.64	0.77
	Back	0.859	0.287	0.328	0.139	1.15	1.33
	Left side	0.133				0.13	0.13
	Right side	0.057	0.083	0.048	0.139	0.14	0.24
	Top side		0.060	0.079	0.139	0.06	0.22
	Bottom side	0.998				1.00	1.00
WCDMA V	Front	0.712	0.019	0.015	0.139	0.73	0.87
	Back	0.943	0.287	0.328	0.139	1.23	1.41
	Left side	0.158				0.16	0.16
	Right side	0.098	0.083	0.048	0.139	0.18	0.29
	Top side	0.072	0.060	0.079	0.139	0.13	0.29
	Bottom side					0.00	0.00
LTE Band 2	Front	0.491	0.019	0.015	0.139	0.51	0.65
	Back	0.908	0.287	0.328	0.139	1.20	1.38
	Left side	0.100				0.10	0.10
	Right side	0.087	0.083	0.048	0.139	0.17	0.27
	Top side		0.060	0.079	0.139	0.06	0.22
	Bottom side	0.963				0.96	0.96
LTE Band 5	Front	0.662	0.019	0.015	0.139	0.68	0.82
	Back	0.998	0.287	0.328	0.139	**1.29**	**1.47**
	Left side	0.538				0.54	0.54
	Right side	0.122	0.083	0.048	0.139	0.21	0.31
	Top side	0.947	0.060	0.079	0.139	1.01	1.17
	Bottom side					0.00	0.00
LTE Band 7	Front	0.318	0.019	0.015	0.139	0.34	0.47
	Back	0.984	0.287	0.328	0.139	1.27	1.45
	Left side	0.144				0.14	0.14
	Right side	0.063	0.083	0.048	0.139	0.15	0.25
	Top side		0.060	0.079	0.139	0.06	0.22
	Bottom side	0.661				0.66	0.66

WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN MIMO 1g SAR (W/kg)	3 5GHz WLAN MIMO 1g SAR (W/kg)	4 Bluetooth Ant 4 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
LTE Band 12	Front	0.701	0.019	0.015	0.139	0.72	0.86
	Back	0.953	0.287	0.328	0.139	1.24	1.42
	Left side	0.783				0.78	0.78
	Right side	0.262	0.083	0.048	0.139	0.35	0.45
	Top side	0.885	0.060	0.079	0.139	0.95	1.10
	Bottom side					0.00	0.00
LTE Band 13	Front	0.618	0.019	0.015	0.139	0.64	0.77
	Back	0.906	0.287	0.328	0.139	1.19	1.37
	Left side	0.492				0.49	0.49
	Right side	0.150	0.083	0.048	0.139	0.23	0.34
	Top side	0.833	0.060	0.079	0.139	0.89	1.05
	Bottom side					0.00	0.00
LTE Band 66	Front	0.520	0.019	0.015	0.139	0.54	0.67
	Back	0.758	0.287	0.328	0.139	1.05	1.23
	Left side	0.113				0.11	0.11
	Right side	0.075	0.083	0.048	0.139	0.16	0.26
	Top side		0.060	0.079	0.139	0.06	0.22
	Bottom side	0.989				0.99	0.99
LTE Band 48	Front	0.287	0.019	0.015	0.139	0.31	0.44
	Back	0.985	0.287	0.328	0.139	1.27	1.45
	Left side	0.112				0.11	0.11
	Right side	0.094	0.083	0.048	0.139	0.18	0.28
	Top side		0.060	0.079	0.139	0.06	0.22
	Bottom side	0.830				0.83	0.83

WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN MIMO 1g SAR (W/kg)	3 5GHz WLAN MIMO 1g SAR (W/kg)	4 Bluetooth Ant 4 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
LTE Band 2_Ant 3	Front	0.392	0.019	0.015	0.139	0.41	0.55
	Back	0.957	0.287	0.328	0.139	1.24	1.42
	Left side	0.952				0.95	0.95
	Right side		0.083	0.048	0.139	0.08	0.19
	Top side	0.153	0.060	0.079	0.139	0.21	0.37
	Bottom side					0.00	0.00
LTE Band 66_Ant 3	Front	0.298	0.019	0.015	0.139	0.32	0.45
	Back	0.867	0.287	0.328	0.139	1.15	1.33
	Left side	0.904				0.90	0.90
	Right side		0.083	0.048	0.139	0.08	0.19
	Top side	0.194	0.060	0.079	0.139	0.25	0.41
	Bottom side					0.00	0.00

<5G NR>

WWAN Band	Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN MIMO	5GHz WLAN MIMO	Bluetooth Ant 4		
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
FR1 N2	Front	0.309	0.019	0.015	0.139	0.33	0.46
	Back	0.797	0.287	0.328	0.139	1.08	1.26
	Left side	0.992				0.99	0.99
	Right side		0.083	0.048	0.139	0.08	0.19
	Top side	0.174	0.060	0.079	0.139	0.23	0.39
	Bottom side					0.00	0.00
FR1 N5	Front	0.571	0.019	0.015	0.139	0.59	0.73
	Back	0.801	0.287	0.328	0.139	1.09	1.27
	Left side	0.472				0.47	0.47
	Right side	0.014	0.083	0.048	0.139	0.10	0.20
	Top side	0.636	0.060	0.079	0.139	0.70	0.85
	Bottom side					0.00	0.00
FR1 N66	Front	0.327	0.019	0.015	0.139	0.35	0.48
	Back	0.744	0.287	0.328	0.139	1.03	1.21
	Left side	0.996				1.00	1.00
	Right side		0.083	0.048	0.139	0.08	0.19
	Top side	0.184	0.060	0.079	0.139	0.24	0.40
	Bottom side					0.00	0.00

16.4 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN MIMO 1g SAR (W/kg)	3 5GHz WLAN MIMO 1g SAR (W/kg)	4 Bluetooth Ant 4 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
GSM850	Front	0.254	0.011	0.032	0.054	0.27	0.34
	Back	0.365	0.120	0.241	0.054	0.49	0.66
GSM1900	Front	0.291	0.011	0.032	0.054	0.30	0.38
	Back	0.471	0.120	0.241	0.054	0.59	0.77
WCDMA II	Front	0.355	0.011	0.032	0.054	0.37	0.44
	Back	0.626	0.120	0.241	0.054	0.75	0.92
WCDMA IV	Front	0.335	0.011	0.032	0.054	0.35	0.42
	Back	0.490	0.120	0.241	0.054	0.61	0.79
WCDMA V	Front	0.185	0.011	0.032	0.054	0.20	0.27
	Back	0.286	0.120	0.241	0.054	0.41	0.58
LTE Band 2	Front	0.325	0.011	0.032	0.054	0.34	0.41
	Back	0.555	0.120	0.241	0.054	0.68	0.85
LTE Band 5	Front	0.217	0.011	0.032	0.054	0.23	0.30
	Back	0.330	0.120	0.241	0.054	0.45	0.63
LTE Band 7	Front	0.279	0.011	0.032	0.054	0.29	0.37
	Back	0.669	0.120	0.241	0.054	0.79	0.96
LTE Band 12	Front	0.310	0.011	0.032	0.054	0.32	0.40
	Back	0.518	0.120	0.241	0.054	0.64	0.81
LTE Band 13	Front	0.316	0.011	0.032	0.054	0.33	0.40
	Back	0.438	0.120	0.241	0.054	0.56	0.73
LTE Band 66	Front	0.319	0.011	0.032	0.054	0.33	0.41
	Back	0.471	0.120	0.241	0.054	0.59	0.77
LTE Band 48	Front	0.198	0.011	0.032	0.054	0.21	0.28
	Back	0.649	0.120	0.241	0.054	0.77	0.94

WWAN Band	Exposure Position	1 WWAN Ant3 1g SAR (W/kg)	2 2.4GHz WLAN MIMO 1g SAR (W/kg)	3 5GHz WLAN MIMO 1g SAR (W/kg)	4 Bluetooth Ant 4 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
LTE Band 2_Ant 3	Front	0.146	0.011	0.032	0.054	0.16	0.23
	Back	0.409	0.120	0.241	0.054	0.53	0.70
LTE Band 66_Ant 3	Front	0.151	0.011	0.032	0.054	0.16	0.24
	Back	0.378	0.120	0.241	0.054	0.50	0.67

<5G NR>

WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN MIMO 1g SAR (W/kg)	3 5GHz WLAN MIMO 1g SAR (W/kg)	4 Bluetooth Ant 4 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
FR1 N2	Front	0.188	0.011	0.032	0.054	0.20	0.27
	Back	0.508	0.120	0.241	0.054	0.63	0.80
FR1 N5	Front	0.258	0.011	0.032	0.054	0.27	0.34
	Back	0.377	0.120	0.241	0.054	0.50	0.67
FR1 N66	Front	0.181	0.011	0.032	0.054	0.19	0.27
	Back	0.483	0.120	0.241	0.054	0.60	0.78

16.5 Product specific 10g SAR Exposure Conditions

WWAN Band	Exposure Position	1 WWAN 10g SAR (W/kg)	2 5GHz WLAN MIMO 10g SAR (W/kg)	1+2 Summed 10g SAR (W/kg)
WCDMA II	Front		0.051	0.05
	Back	3.038	0.766	3.80
	Left side			0.00
	Right side		0.077	0.08
	Top side		0.134	0.13
	Bottom side	2.743		2.74
WCDMA IV	Front		0.051	0.05
	Back		0.766	0.77
	Left side			0.00
	Right side		0.077	0.08
	Top side		0.134	0.13
	Bottom side	3.116		3.12
LTE Band 2	Front		0.051	0.05
	Back	3.019	0.766	3.79
	Left side			0.00
	Right side		0.077	0.08
	Top side		0.134	0.13
	Bottom side	2.650		2.65
LTE Band 7	Front		0.051	0.05
	Back	3.036	0.766	3.80
	Left side			0.00
	Right side		0.077	0.08
	Top side		0.134	0.13
	Bottom side			0.00
LTE Band 66	Front		0.051	0.05
	Back	2.772	0.766	3.54
	Left side			0.00
	Right side		0.077	0.08
	Top side		0.134	0.13
	Bottom side	3.060		3.06

WWAN Band	Exposure Position	1 WWAN 10g SAR (W/kg)	2 5GHz WLAN 10g SAR (W/kg)	1+2 Summed 10g SAR (W/kg)
LTE Band 2_Ant 3	Front		0.051	0.05
	Back	2.931	0.766	3.70
	Left side	2.523		2.52
	Right side		0.077	0.08
	Top side		0.134	0.13
	Bottom side			0.00
LTE Band 66_Ant 3	Front		0.051	0.05
	Back	2.859	0.766	3.63
	Left side	2.462		2.46
	Right side		0.077	0.08
	Top side		0.134	0.13
	Bottom side			0.00

<5G NR>

WWAN Band	Exposure Position	1 WWAN 10g SAR (W/kg)	2 5GHz WLAN 10g SAR (W/kg)	1+2 Summed 10g SAR (W/kg)
FR1 N2	Front		0.051	0.05
	Back	3.043	0.766	**3.81**
	Left side	2.602		2.60
	Right side		0.077	0.08
	Top side		0.134	0.13
	Bottom side			0.00
FR1 N66	Front		0.051	0.05
	Back		0.766	0.77
	Left side	3.123		3.12
	Right side		0.077	0.08
	Top side		0.134	0.13
	Bottom side			0.00

Test Engineer： Nick Hu, Yuan Zhao, Jiaxing Chang, Yuankai Kong

17. Uncertainty Assessment

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

18. 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 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

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

[7] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[8] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

[9] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[10] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

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

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

[13] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

------THE END------

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2020.7.6

System Check_Head_750MHz

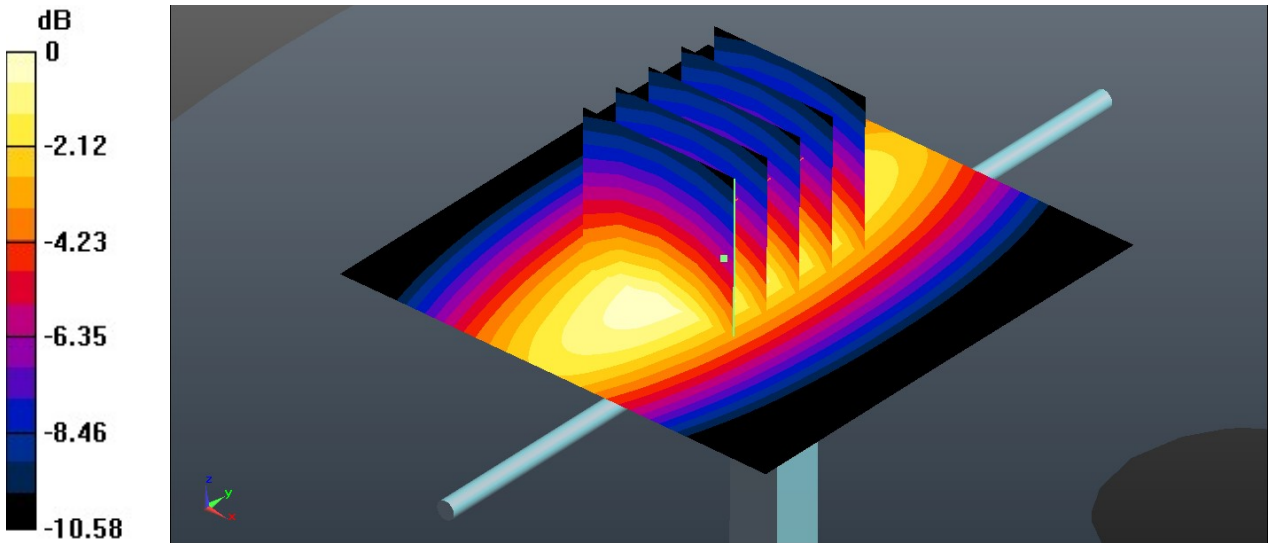
DUT: D750V3 - SN:1087

Communication System: UID 0, CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: HSL_750 Medium parameters used: f = 750 MHz; σ = 0.895 S/m; ε_r = 41.703; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10.23, 10.23, 10.23); Calibrated: 2020.1.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2019.11.20
- Phantom: SAM1; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.52 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.02 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.94 W/kg
SAR(1 g) = 2 W/kg; SAR(10 g) = 1.32 W/kg
Maximum value of SAR (measured) = 2.52 W/kg



0 dB = 2.52 W/kg = 4.01 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2020.7.23

System Check_Head_850MHz

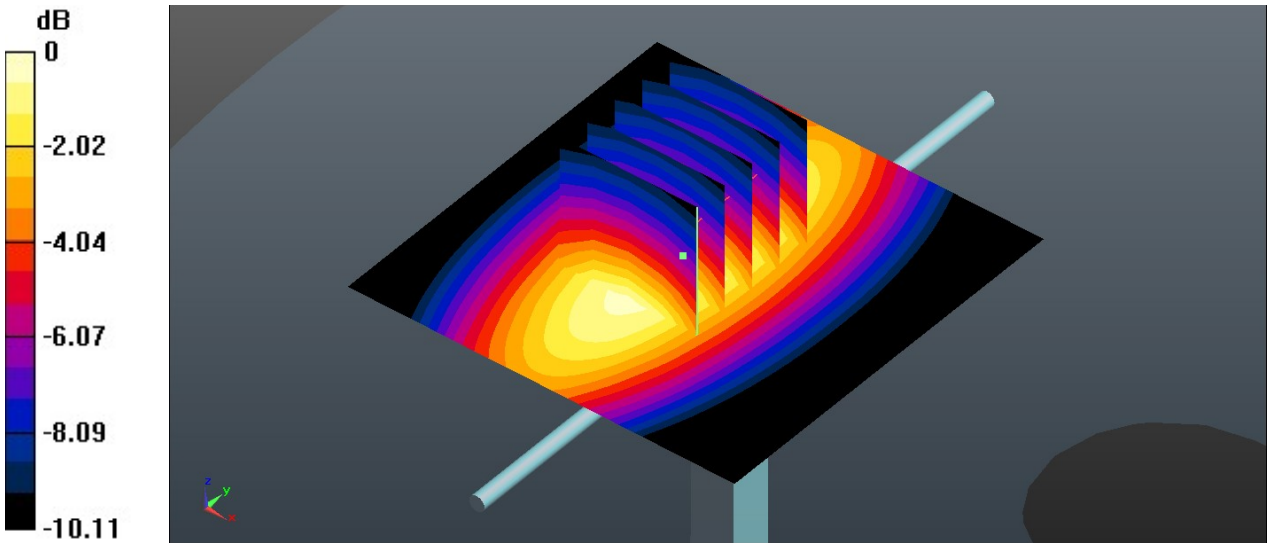
DUT: D835V2 - SN:4d151

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_835 Medium parameters used: f = 835 MHz; σ = 0.902 S/m; ε_r = 41.24; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10.16, 10.16, 10.16); Calibrated: 2020.1.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2019.11.20
- Phantom: SAM1; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.07 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 53.30 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 3.62 W/kg
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.62 W/kg
Maximum value of SAR (measured) = 3.08 W/kg



0 dB = 3.08 W/kg = 4.89 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2020.8.5

System Check_Head_835MHz

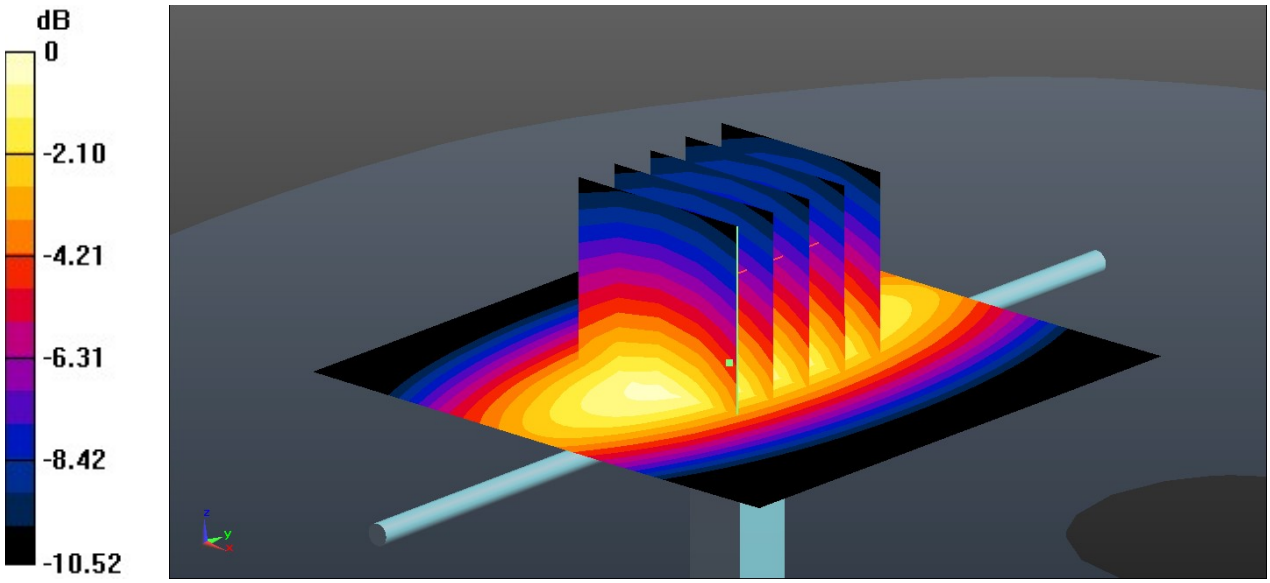
DUT: D835V2 - SN:4d151

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_835 Medium parameters used: f = 835 MHz; σ = 0.913 S/m; ε_r = 41.937; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10.16, 10.16, 10.16); Calibrated: 2020.1.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2019.11.20
- Phantom: SAM1; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.09 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.73 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.61 W/kg
Maximum value of SAR (measured) = 3.07 W/kg



0 dB = 3.07 W/kg = 4.87 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2020.7.9

System Check_Head_1750MHz

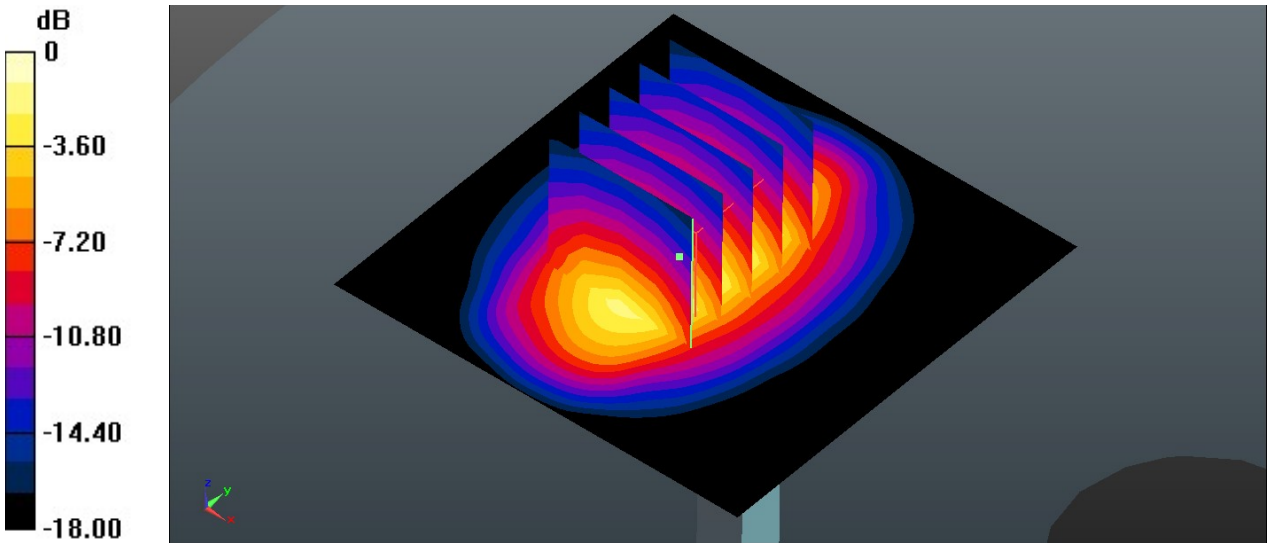
DUT: D1750V2 - SN:1090

Communication System: UID 0, CW (0); Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: HSL_1750 Medium parameters used: f = 1750 MHz; σ = 1.356 S/m; ε_r = 39.061; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(8.63, 8.63, 8.63); Calibrated: 2020.1.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2019.11.20
- Phantom: SAM1; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.2 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 80.86 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 15.6 W/kg
SAR(1 g) = 8.63 W/kg; SAR(10 g) = 4.58 W/kg
Maximum value of SAR (measured) = 12.3 W/kg



0 dB = 12.3 W/kg = 10.90 dBW/kg

System Check_Head_1900MHz

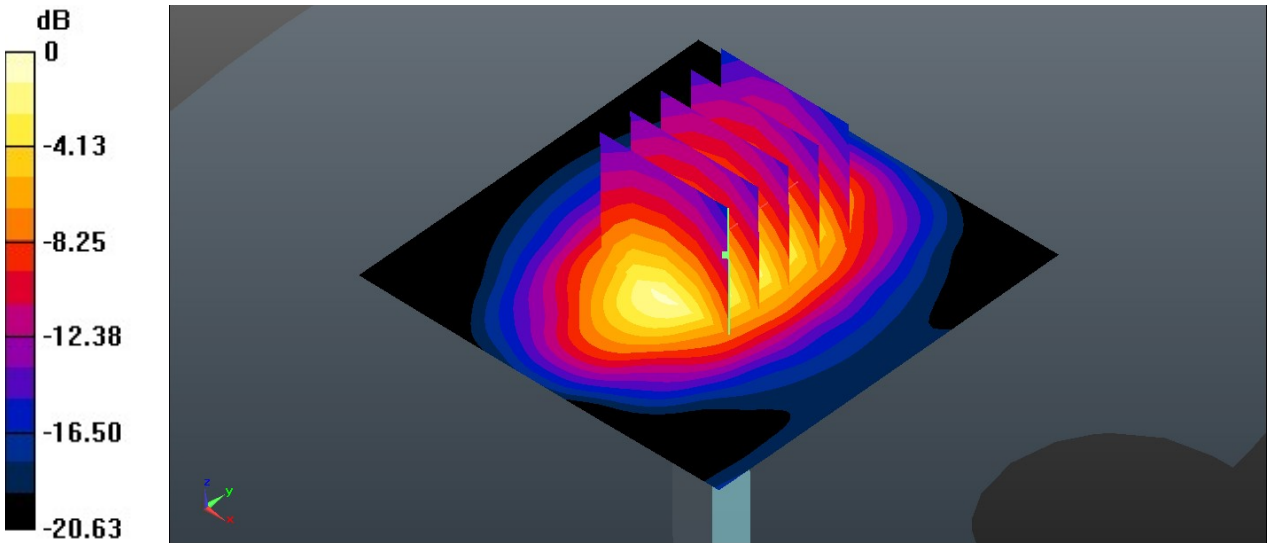
DUT: D1900V2 - SN:5d170

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1900 MHz; σ = 1.397 S/m; ε_r = 39.035; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(8.33, 8.33, 8.33); Calibrated: 2020.1.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2019.11.20
- Phantom: SAM1; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.0 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 94.69 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 9.29 W/kg; SAR(10 g) = 4.96 W/kg
Maximum value of SAR (measured) = 11.6 W/kg



0 dB = 11.6 W/kg = 10.64 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2020.7.14

System Check_Head_2450MHz

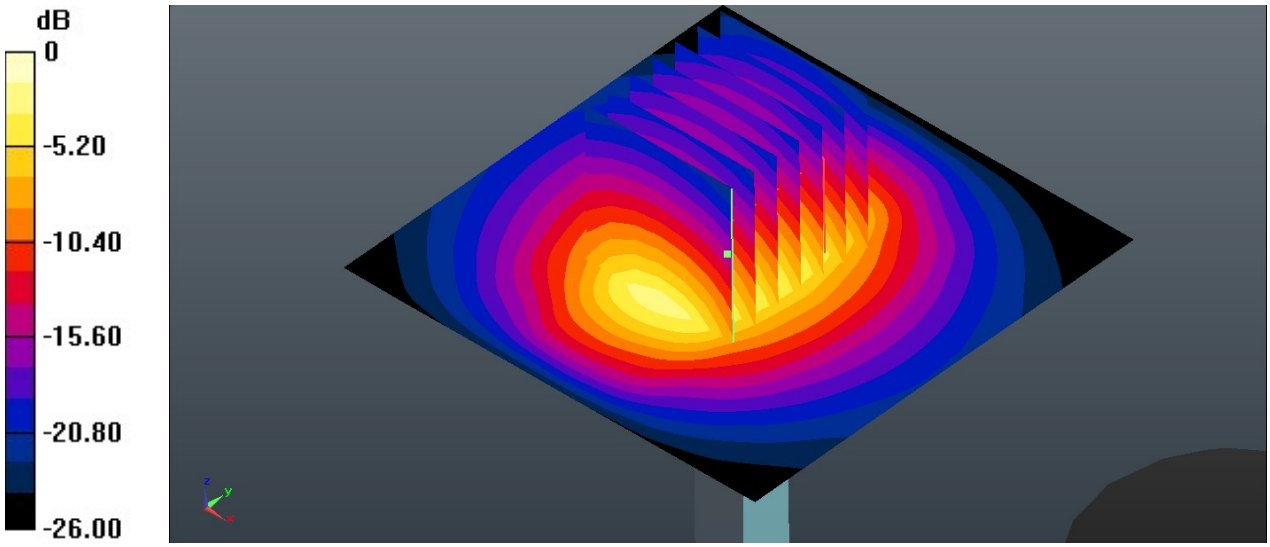
DUT: D2450V2 - SN:908

Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL_2450 Medium parameters used: f = 2450 MHz; σ = 1.854 S/m; ε_r = 39.1; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(7.74, 7.74, 7.74); Calibrated: 2020.1.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2019.11.20
- Phantom: SAM1; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 19.1 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.8 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 30.3 W/kg
SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.27 W/kg
Maximum value of SAR (measured) = 18.4 W/kg



0 dB = 18.4 W/kg = 12.65 dBW/kg