FCC SAR Test Report

APPLICANT	:	vivo Mobile Communication Co., Ltd.
EQUIPMENT	:	Mobile Phone
BRAND NAME	:	vivo
MODEL NAME	:	V2205
FCC ID	:	2AUCY-V2205
STANDARD	:	FCC 47 CFR PART 2 (2.1093)

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

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

Approved by: Si Zhang

Sporton International Inc. (Shenzhen)
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People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA270411	Rev. 01	Initial issue of report	Aug. 05, 2022

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **vivo Mobile Communication Co., Ltd. , Mobile Phone, V2205,** 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	0.77	0.27	0.20	1.39
		GSM1900	<0.10	0.53	0.32	
	WCDMA	WCDMA II	0.10	0.42	0.48	
		WCDMA IV	0.10	0.48	0.49	
		WCDMA V	0.71	0.23	0.20	
	LTE	Band 2	0.10	0.45	0.48	
		Band 7	0.34	0.44	**0.71**	
		Band 12	0.48	0.20	0.18	
		Band 13	**0.86**	0.28	0.19	
		Band 17	0.44	0.18	0.17	
		Band 26/5	0.66	0.33	0.20	
		Band 66/4	<0.10	0.57	0.49	
		Band 41/38	0.22	0.63	0.35	
DTS	WLAN	2.4GHz WLAN	0.75	0.48	0.23	1.25
NII		5GHz WLAN	0.82	**0.90**	0.47	1.39
DSS	Bluetooth	Bluetooth	0.21	<0.10	<0.10	0.76

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	WCDMA II	1.17	1.86
		WCDMA IV	1.59	
	LTE	LTE Band 2	1.11	
		LTE Band 4	**1.86**	
		LTE Band 7	1.45	
		LTE Band 66	1.46	
NII	WLAN	5GHz WLAN	1.55	1.86
Date of Testing:			2022/07/18~2022/07/29	

Remark:

1. This device supports LTE B5 / 38 and B26 / B41. Since the supported frequency span for LTE B5 / 38 falls completely within the supported frequency span for LTE B26 / 41, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B26 / B41 at all exposure conditions.
2. This device supports LTE B4 / and B66. Since the supported frequency span for LTE B4 falls completely within the supported frequency span for LTE B66 at Antenna 31 at head exposure condition, and at Antenna 13 at Body-worn exposure condition, 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 at Antenna 31 at head exposure condition and at Antenna 13 at Body-worn exposure condition.

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

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

Applicant	
Company Name	vivo Mobile Communication Co., Ltd.
Address	No.1, vivo Road, Chang'an, Dongguan,Guangdong,China

Manufacturer	
Company Name	vivo Mobile Communication Co., Ltd.
Address	No.1, vivo Road, Chang'an, Dongguan,Guangdong,China

3. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 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 D06 Hotspot Mode SAR v02r01
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Phone
Brand Name	vivo
Model Name	V2205
FCC ID	2AUCY-V2205
IMEI Code	SIM1: 863507069985992 SIM2: 863507069985984
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz 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 ~ 5720MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is not supported) LTE: QPSK/ 16QAM / 64QAM WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	MP_0.1
SW Version	PD2225IF_EX_A_12.0.5.5.W30.V000L1
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.
EUT Stage	Production Unit

Remark:

1. 802.11n-HT40 is not supported in 2.4GHz WLAN.
2. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
3. This device does not support DTM operation and support GRPS/EGRPS mode up to multi-slot class 33.
4. This device WLAN 2.4GHz supports hotspot operation and Bluetooth support tethering applications.
5. 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).
6. For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 slot to perform all tests.
7. The device implements Proximity sensors/receiver detect mechanism trigger reduced power for the power management for SAR compliance at different exposure conditions (head, hotspot, body, and extremity). It uses the receiver to indicate whether the user is making a call in head scenario or not. The selection between head and body

power levels is based on the receiver detection mechanism. It can determine proximity to head or body and set the relevant power level for 2G&3G&4G and Wi-Fi antennas accordingly. The device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to appendix E and the detail DSI descriptions of below table.

DSI	Trigger Conditions	Antenna No.	Exposure conditions	
DSI0	Default power	all Ant	Full power	-
DSI2	Receiver on	all Ant	Head Standalone	Head all Position
DSI3	Receiver on+ WLAN	all Ant	Head Simultaneous	Head all Position
DSI4	Receiver off/Sensor on	Ant 13	Body-worn/Extremity Standalone	See by section 5
	Receiver off	Ant 31	Body-worn/Extremity Standalone	Body all Position
DSI5	Receiver off/Sensor on + WLAN	Ant 13	Body-worn/Extremity Simultaneous	See by section 5
	Receiver off + WLAN	Ant 31	Body-worn/Extremity Simultaneous	Body all Position
DSI6	Receiver off/Sensor off + WLAN	Ant 13	Body-worn/Extremity Simultaneous	See by section 5
	Receiver off/hotspot on	all Ant	Hotspot Standalone/ Simultaneous	Body all Position
DSI7	Receiver off/Sensor off	Ant 13	Sensor Trigger Distance -1mm	See by section 5
			Body-worn/Extremity Standalone	No Sensor Position

8. For WLAN transmitter, while the device WWAN is transmitting simultaneously with the WLAN/Bluetooth antenna, the device power will be reduced power at body-worn and extremity conditions.
9. When the user is making a call in head scenario and the receiver detect mechanism trigger, GSM1900, WCDMA B2/B4, and LTE B2/B4/B7/B38/B41/B66 at Antenna 13 cannot be transmitted, so the SAR test for GSM1900, WCDMA B2/B4, and LTE B2/B4/B7/B38/B41/B66 at Antenna 13 were not required.

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	2AUCY-V2205
Equipment Name	Mobile Phone
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
Uplink Modulations used	QPSK / 16QAM / 64QAM
LTE Voice / Data requirements	Voice and Data
LTE Release Version	R10, category 4
CA Support	Yes, Uplink and Downlink
LTE MPR permanently built-in by design	**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3** Modulation | Channel bandwidth / Transmission bandwidth (N_{RB}) | MPR (dB) 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz QPSK: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 1 16 QAM: ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 16 QAM: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2 64 QAM: ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 2 64 QAM: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 3 256 QAM: ≥ 1 | ≤ 5
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, when operating in Proximity sensors/receiver detect mechanism trigger reduction power applied to satisfy SAR compliance the detail please referred to section 13.
LTE Carrier Aggregation Combinations	Intra-Band and Inter-Band possible combinations and the detail power verification please referred to section 13.
LTE Carrier Aggregation Additional Information	1.This device supports LTE Carrier Aggregation (CA) in the uplink for LTE 7C /41C with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per FCC Guidance. 2.This device supports maximum of 2 carriers in the downlink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844
LTE Band 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 17				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq. (MHz)
L	23755	706.5	23780	709
M	23790	710	23790	710
H	23825	713.5	23800	711

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

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

LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593
HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680

LTE Band 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

<For LTE Overlap Bands Description>

1) LTE Bands BW

Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
LTE Band 4	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 66	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 5	Yes	Yes	Yes	Yes		
LTE Band 26	Yes	Yes	Yes	Yes	Yes	
LTE Band 38			Yes	Yes	Yes	Yes
LTE Band 41			Yes	Yes	Yes	Yes

2) LTE Bands tune up:

TX. freq.	Ant	Full (Default)	DSI2	DSI3	DSI4	DSI5	DSI6	DSI7
		max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)
LTE Band 4	13	24.00			21.00	19.50	19.50	24.00
LTE Band 66	13	24.00			20.00	19.00	19.00	24.00
LTE Band 5	13	24.00	22.00	21.00	23.00	21.00	24.00	24.00
LTE Band 26	13	24.00	22.00	21.00	24.00	24.00	24.00	24.00
LTE Band 38	13	24.00			22.00	21.00	21.00	24.00
LTE Band 41	13	24.00			21.50	21.00	21.00	24.00

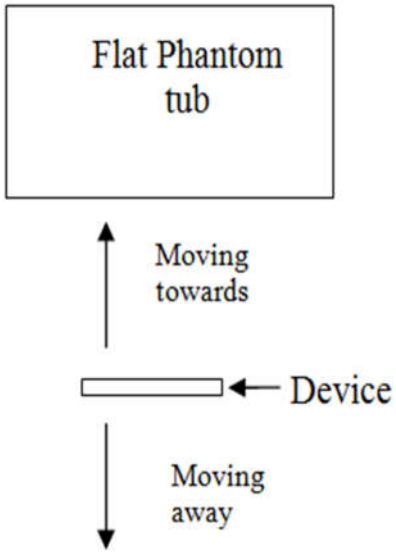
TX. freq.	Ant	Full (Default)	DSI2	DSI3	DSI4	DSI5	DSI6	DSI7
		max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)	max. tune up limit (dBm)
LTE Band 4	31	24.00	24.00	24.00	22.00	20.50	20.50	22.00
LTE Band 66	31	24.00	24.00	24.00	21.50	20.00	20.00	21.50
LTE Band 5	31	24.00	24.00	24.00	24.00	23.50	23.50	24.00
LTE Band 26	31	24.00	24.00	24.00	24.00	23.50	23.50	24.00
LTE Band 38	31	24.00	24.00	24.00	20.00	19.00	19.00	20.00
LTE Band 41	31	24.00	24.00	24.00	23.50	23.00	23.00	23.50

Note: LTE B5 / 38 were covered by B26 / B41 at all exposure conditions; LTE B4 was covered by B66 at Antenna 31 at head exposure condition and at Antenna 13 at Body-worn exposure condition.

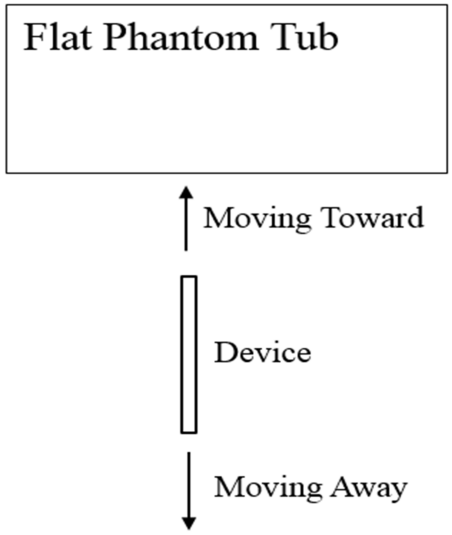
5. Proximity Sensor Triggering Test

5.1 Proximity sensor triggering distances(Per KDB616217§6.2)

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (2600MHz) and lowest (835MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensor placed coincident with antenna elements at the top end of the phone are utilized to determine when the device comes in proximity of the user's body at the front or back or top side of the device. There is no need to do sensor coverage testing for the proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna.
3. The device employs proximity sensors that detect the presence of the user's body at the front, back, top sides of the device. When front, back, top sides of body condition is detected, reduced power will be active. The data shown in the sections below shows the distance(s).
4. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed.



Sensor detection test set-up, front and back sides



Sensor detection test set-up, top sides

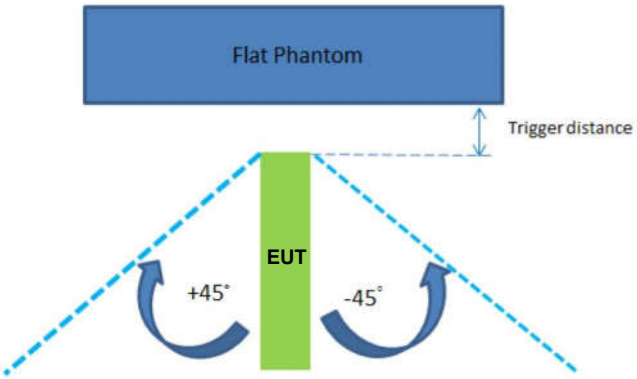
<P-Sensor>

Antenna 13:

Proximity Sensor Trigger Distance (mm)						
Position	Front		Back		Top Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	9	9	13	13	15	15

5.2 proximity sensor triggering (KDB 616217 D04 section 6.4):

The influence of Phone tilt angles to proximity sensor triggering was determined by positioning each Phone edge that contains a transmitting antenna, perpendicular to the flat phantom, at above separation distance.
Rotating the Phone around the edge next to the phantom in ≤ 10° increments until the Phone is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.



Antenna 13：

The Sensor Trigger Distance (mm)	
Position	Top Side
Minimum	15

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:

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

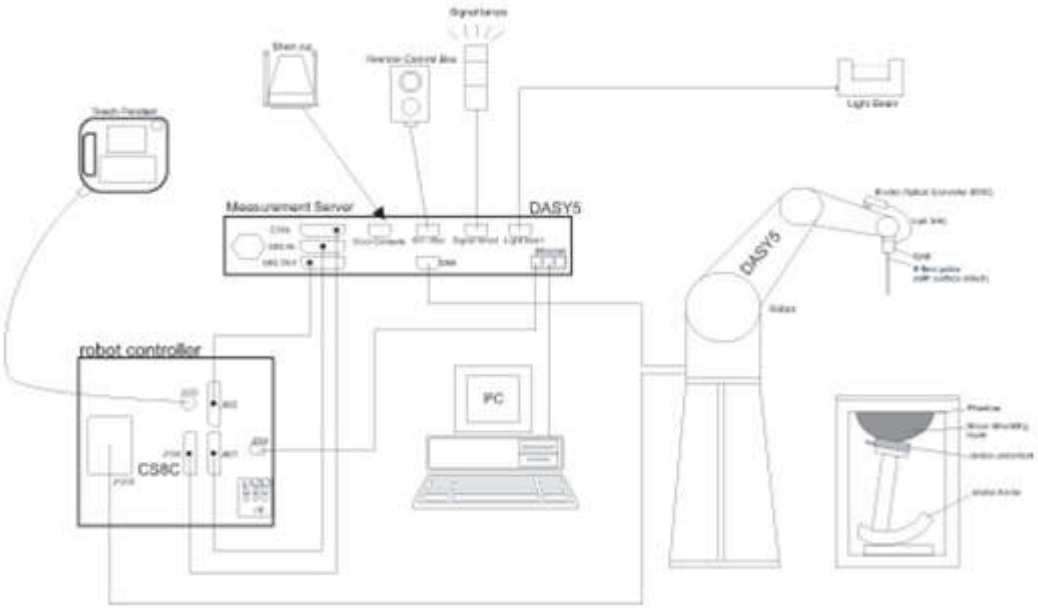
SAR is expressed in units of Watts per kilogram (W/kg)

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

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: 2.5 mm (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

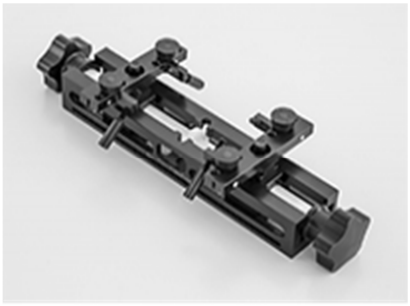
The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

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	1099	Dec. 15, 2021	Dec. 14, 2022
SPEAG	835MHz System Validation Kit	D835V2	4d162	Dec. 17, 2021	Dec. 16, 2022
SPEAG	1750MHz System Validation Kit	D1750V2	1137	Oct. 19, 2021	Oct. 18, 2022
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	Dec. 20, 2021	Dec. 19, 2022
SPEAG	2450MHz System Validation Kit	D2450V2	924	Sep. 02, 2020	Sep. 01, 2023
SPEAG	2600MHz System Validation Kit	D2600V2	1070	Dec. 20, 2021	Dec. 19, 2022
SPEAG	5000MHz System Validation Kit	D5GHzV2	1341	Dec. 13, 2021	Dec. 12, 2022
SPEAG	Data Acquisition Electronics	DAE4	1437	Oct. 26, 2021	Oct. 25, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	7641	Apr. 11, 2022	Apr. 10, 2023
SPEAG	SAM Twin Phantom	QD 000 P41 AA	2035	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300653	Jul. 07, 2022	Jul. 06, 2023
Anritsu	Radio communication analyzer	MT8821C	6262314715	Jun. 27, 2022	Jun. 26, 2023
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Jul. 07, 2022	Jul. 06, 2023
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 25, 2021	Oct. 24, 2022
Speag	Dielectric Assessment KIT	DAK-3.5	1071	Jan. 24, 2022	Jan. 23, 2023
Agilent	Signal Generator	N5181A	MY50145381	Dec. 28, 2021	Dec. 27, 2022
Anritsu	Power Senor	MA2411B	1306099	Sep. 29, 2021	Sep. 28, 2022
Anritsu	Power Meter	ML2495A	1349001	Sep. 29, 2021	Sep. 28, 2022
Anritsu	Power Sensor	MA2411B	1542004	Dec. 28, 2021	Dec. 27, 2022
Anritsu	Power Meter	ML2495A	1339473	Dec. 28, 2021	Dec. 27, 2022
R&S	CBT BLUETOOTH TESTER	CBT	100963	Dec. 28, 2021	Dec. 27, 2022
R&S	Spectrum Analyzer	FSP7	100818	Jul. 07, 2022	Jul. 06, 2023
TES	Hygrometer	1310	200505600	Jul. 12, 2022	Jul. 11, 2023
Anymetre	Thermo-Hygrometer	JR593	2020062101	Jul. 12, 2022	Jul. 11, 2023
SPEAG	Device Holder	N/A	N/A	N/A	N/A
AR	Amplifier	5S1G4	0333096	Note 1	
mini-circuits	Amplifier	ZVE-3W-83+	599201528	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
ET Industries	Dual Directional Coupler	C-058-10	N/A	Note 1	
Weinschel	Attenuator 1	3M-10	N/A	Note 1	
Weinschel	Attenuator 2	3M-20	N/A	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 source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

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. 10.1. 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. 10.2.

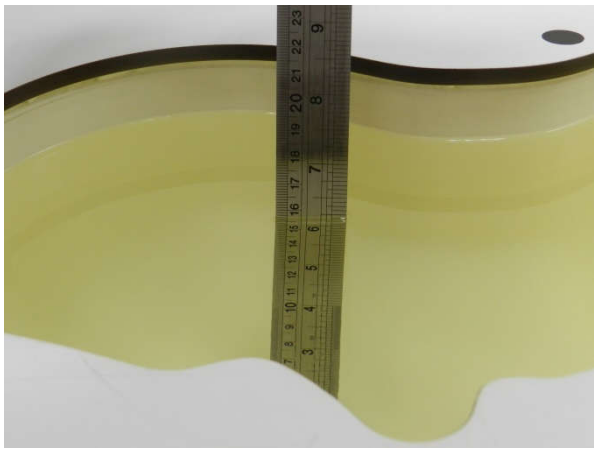


Fig 10.1Photo of Liquid Height for Head SAR

Fig 10.2 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	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	22.2	0.878	40.673	0.89	41.90	-1.35	-2.93	±5	2022/7/18
750	Head	22.4	0.881	40.783	0.89	41.90	-1.01	-2.67	±5	2022/7/29
835	Head	22.4	0.873	40.220	0.90	41.50	-3.00	-3.08	±5	2022/7/19
835	Head	22.3	0.902	40.749	0.90	41.50	0.22	-1.81	±5	2022/7/28
1750	Head	22.5	1.380	41.322	1.37	40.10	0.73	3.05	±5	2022/7/20
1750	Head	22.3	1.378	40.204	1.37	40.10	0.58	0.26	±5	2022/7/26
1900	Head	22.6	1.399	41.136	1.40	40.00	-0.07	2.84	±5	2022/7/21
1900	Head	22.3	1.449	39.097	1.40	40.00	3.50	-2.26	±5	2022/7/27
2450	Head	22.6	1.881	37.273	1.80	39.20	4.50	-4.92	±5	2022/7/23
2600	Head	22.5	2.052	37.587	1.96	39.00	4.69	-3.62	±5	2022/7/22
2600	Head	22.6	1.997	37.954	1.96	39.00	1.89	-2.68	±5	2022/7/19
5250	Head	22.4	4.578	37.433	4.71	35.95	-2.80	4.13	±5	2022/7/24
5600	Head	22.4	4.936	36.929	5.07	35.50	-2.64	4.03	±5	2022/7/25
5750	Head	22.3	5.103	36.744	5.22	35.35	-2.24	3.94	±5	2022/7/26

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>

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 (%)
2022/7/18	750	Head	250	1099	7641	1437	2.140	8.54	8.56	0.23
2022/7/29	750	Head	250	1099	7641	1437	2.180	8.54	8.72	2.11
2022/7/19	835	Head	250	4d162	7641	1437	2.290	9.64	9.16	-4.98
2022/7/28	835	Head	250	4d162	7641	1437	2.390	9.64	9.56	-0.83
2022/7/20	1750	Head	250	1137	7641	1437	8.980	36.50	35.92	-1.59
2022/7/26	1750	Head	250	1137	7641	1437	9.070	36.50	36.28	-0.60
2022/7/21	1900	Head	250	5d182	7641	1437	9.440	39.60	37.76	-4.65
2022/7/27	1900	Head	250	5d182	7641	1437	10.000	39.60	40	1.01
2022/7/23	2450	Head	250	924	7641	1437	12.400	51.40	49.6	-3.50
2022/7/22	2600	Head	250	1070	7641	1437	14.000	56.20	56	-0.36
2022/7/19	2600	Head	250	1070	7641	1437	13.500	56.20	54	-3.91
2022/7/24	5250	Head	100	1341	7641	1437	7.410	80.70	74.1	-8.18
2022/7/25	5600	Head	100	1341	7641	1437	7.840	84.50	78.4	-7.22
2022/7/26	5750	Head	100	1341	7641	1437	7.570	80.60	75.7	-6.08

<10g>

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 (%)
2022/7/18	750	Head	250	1099	7641	1437	1.440	5.65	5.76	1.95
2022/7/29	750	Head	250	1099	7641	1437	1.470	5.65	5.88	4.07
2022/7/19	835	Head	250	4d162	7641	1437	1.500	6.26	6	-4.15
2022/7/28	835	Head	250	4d162	7641	1437	1.570	6.26	6.28	0.32
2022/7/20	1750	Head	250	1137	7641	1437	4.800	19.20	19.2	0.00
2022/7/26	1750	Head	250	1137	7641	1437	4.820	19.20	19.28	0.42
2022/7/21	1900	Head	250	5d182	7641	1437	4.810	20.20	19.24	-4.75
2022/7/27	1900	Head	250	5d182	7641	1437	5.070	20.20	20.28	0.40
2022/7/23	2450	Head	250	924	7641	1437	5.580	24.00	22.32	-7.00
2022/7/22	2600	Head	250	1070	7641	1437	6.040	24.60	24.16	-1.79
2022/7/19	2600	Head	250	1070	7641	1437	5.970	24.60	23.88	-2.93
2022/7/24	5250	Head	100	1341	7641	1437	2.110	23.10	21.1	-8.66
2022/7/25	5600	Head	100	1341	7641	1437	2.210	24.00	22.1	-7.92
2022/7/26	5750	Head	100	1341	7641	1437	2.240	22.70	22.4	-1.32

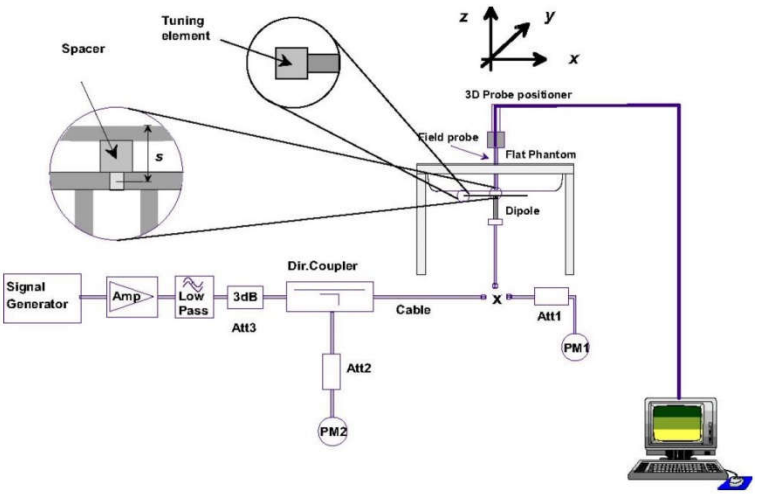


Fig 10.3.1 System Performance Check Setup

Fig 10.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

Figure 11.1.1 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 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 11.1.2 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 11.1.3). 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 11.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

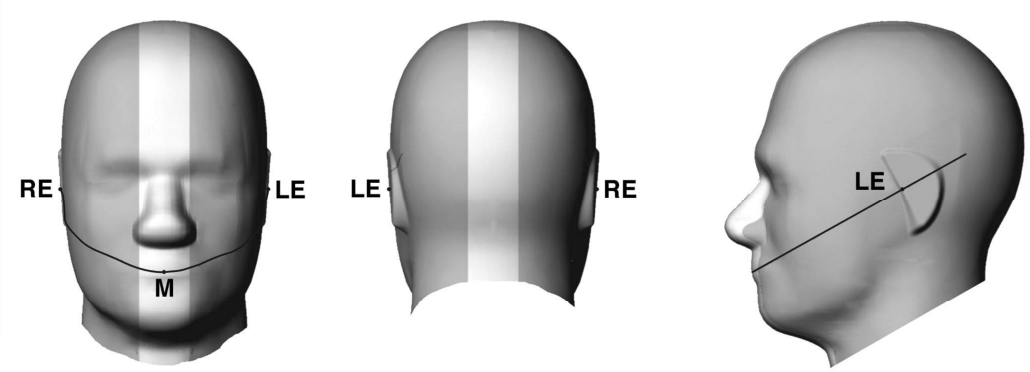


Fig 11.1.1 Front, back, and side views of SAM twin phantom

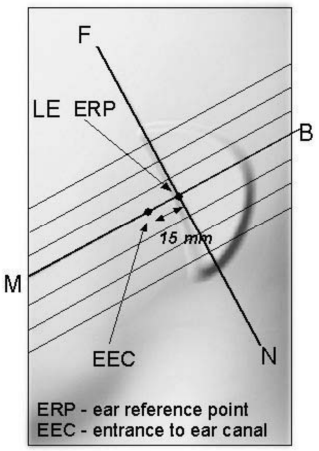


Fig 11.1.2 Close-up side view of phantom showing the ear region.

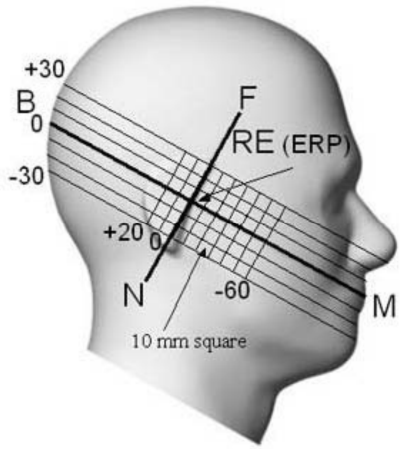


Fig 11.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

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 11.2.1 and Figure 11.2.2), 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 11.2.1). 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 11.2.2), 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 11.2.3), 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 11.2.3. The actual rotation angles should be documented in the test report.

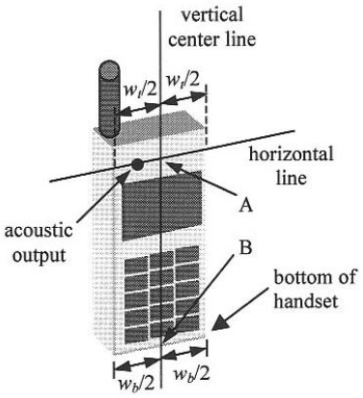


Fig 11.2.1 Handset vertical and horizontal reference lines—"fixed case

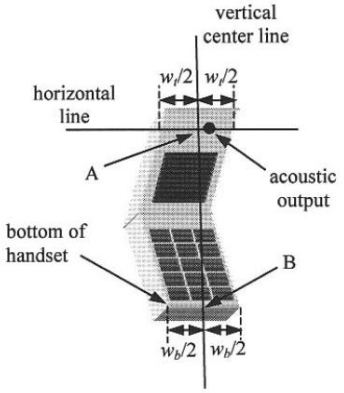


Fig 11.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

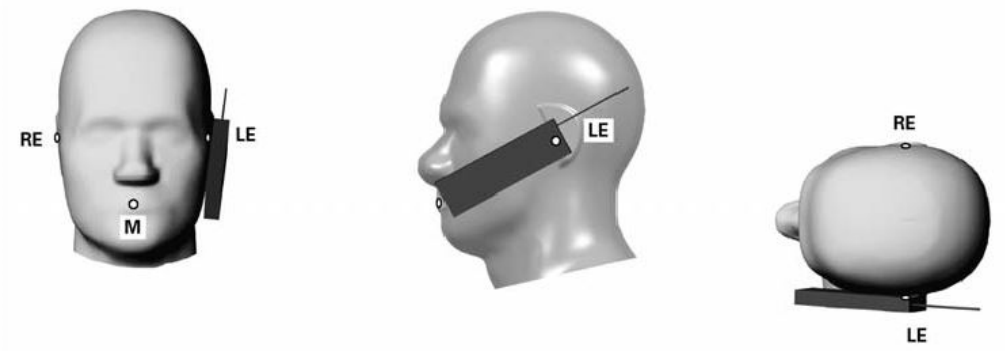


Fig 11.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

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 11.3.1. 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

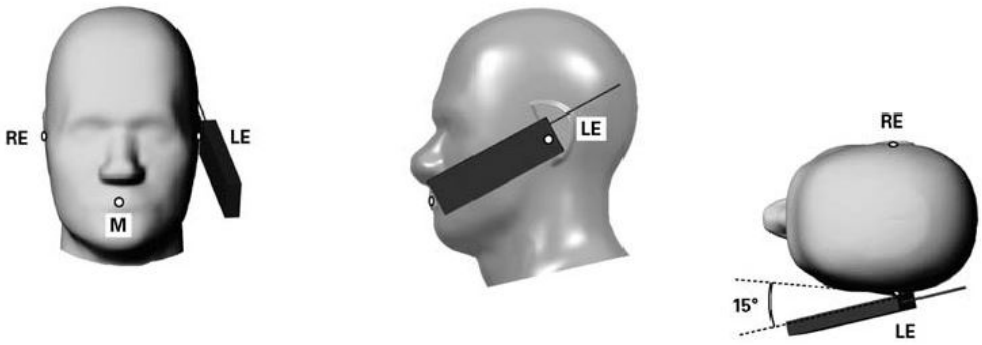


Fig 11.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

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 11.4). 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.

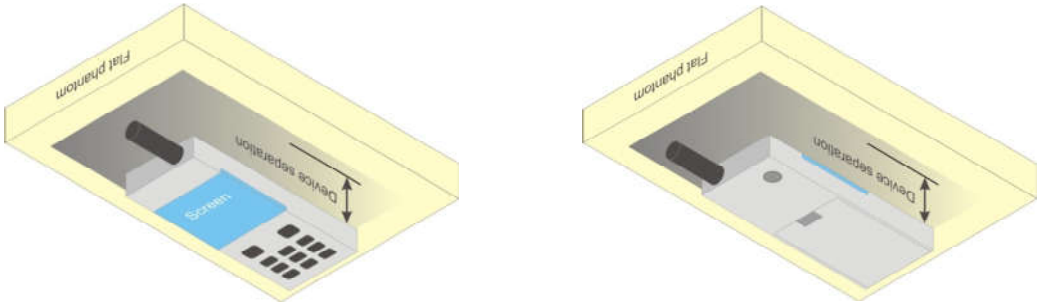


Fig 11.4 Body Worn Position

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 ≤ 25 mm 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 5 mm 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>

General Note:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

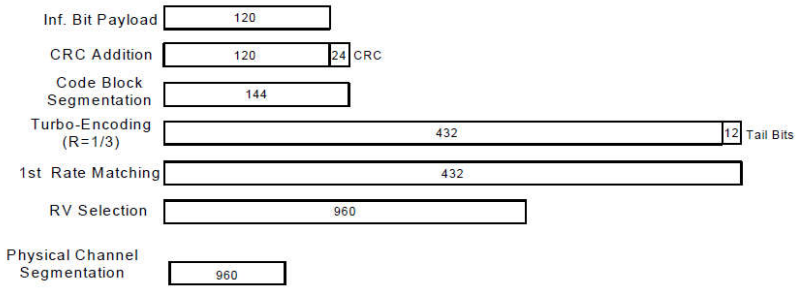


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

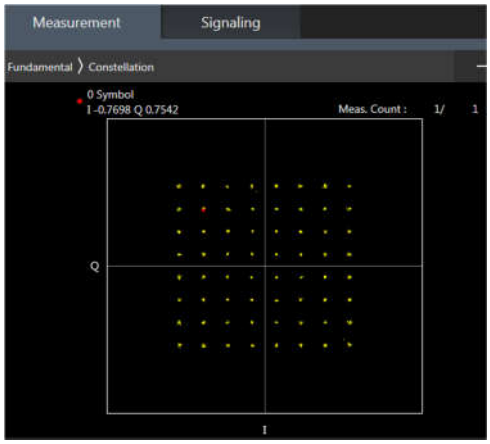
General Note:

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 output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B12 / B17 / B26 / B38 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 B5 / 38 were covered by B26 / B41 at all exposure conditions; LTE B4 was covered by B66 at Antenna 31 at head exposure condition and at Antenna 13 at Body-worn exposure condition; 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 May 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.

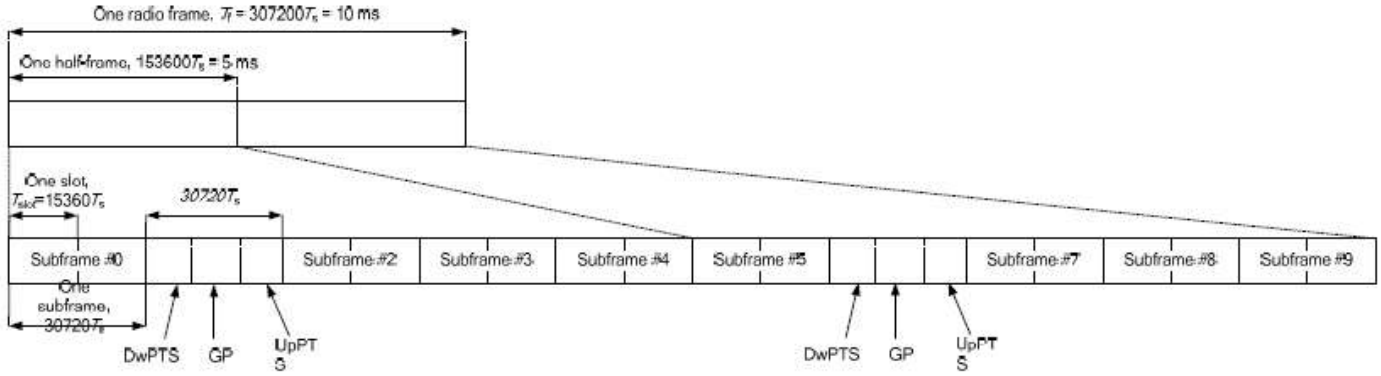


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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:

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. All permutations exist. No restrictions on Pcell & Scell combinations.

2CC Downlink Carrier Aggregation	
Number	Combination
1	CA_2A-5A
2	CA_4A-5A
3	CA_4A-7A
4	CA_5A-7A
5	CA_5A-66A
6	CA_4A-4A
7	CA_7A-7A
8	CA_66A-66A
9	CA_41A-41A
10	CA_7C
11	CA_66C
12	CA_38C
13	CA_41C

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)

2CC Uplink Carrier Aggregation		
Number	Combination	Ant No.
1	CA_7C	ANT13/31
2	CA_41C	ANT13/31

<Intra-band>

General Note:

i. The device supports intra-band uplink carrier aggregation for LTE B7/B41 with a maximum of two component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre 3GPP requirement.

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

iii. According Nov. 2017 TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

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

<WLAN Conducted Power>

General Note:

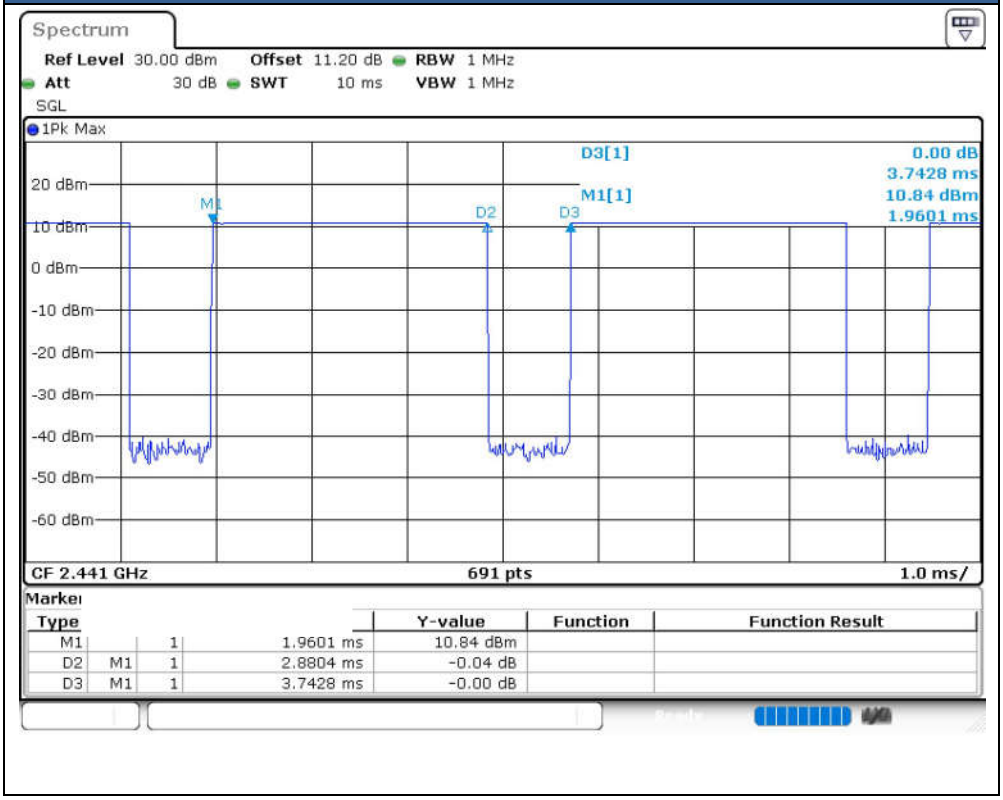
1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default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

<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 76.96% see as following figure, according to Oct. 2016 TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to100% for Bluetooth reported SAR calculation.

Bluetooth time-domain plot



14. Antenna Location

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

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 BT/WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN/Bluetooth: 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 (W/kg) = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   · ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   · ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   · ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
5. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15cm or an overall diagonal dimension > 16cm, when hotspot mode applies, 10-g product specific SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, in this report all the hotspot mode results are < 1.2W/kg.
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 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 5.8GHz WIFI, 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.
7. For distance SAR and non-distance SAR, always chose higher SAR to do co-located analysis.
8. When the user is making a call in head scenario and the receiver detect mechanism trigger, GSM1900, WCDMA B2/B4, and LTE B2/B4/B7/B38/B41/B66 at Antenna 13 cannot be transmitted, so the SAR test for GSM1900, WCDMA B2/B4, and LTE B2/B4/B7/B38/B41/B66 at Antenna 13 were not required.

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.
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. For LTE B4 / B5 / B12 / B17 / B26 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE B5 / 38 were covered by B26 / B41 at all exposure conditions; LTE B4 was covered by B66 at Antenna 31 at head exposure condition and at Antenna 13 at Body-worn exposure condition.

WLAN/Bluetooth 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.

15.1 Head SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	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)
750MHz																		
	LTE Band 13	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 13	DSI 2	23230	782	22.24	23.00	1.191	0.08	0.643	0.766
	LTE Band 13	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 13	DSI 2	23230	782	22.24	23.00	1.191	0.05	0.480	0.572
	LTE Band 13	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 13	DSI 2	23230	782	22.24	23.00	1.191	0.03	0.459	0.547
	LTE Band 13	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 13	DSI 2	23230	782	22.24	23.00	1.191	0.03	0.429	0.511
01	LTE Band 13	10M	QPSK	25	12	-	Right Cheek	0mm	Ant 13	DSI 2	23230	782	21.95	23.00	1.274	-0.01	0.671	**0.855**
	LTE Band 13	10M	QPSK	25	12	-	Right Tilted	0mm	Ant 13	DSI 2	23230	782	21.95	23.00	1.274	0.11	0.488	0.621
	LTE Band 13	10M	QPSK	25	12	-	Left Cheek	0mm	Ant 13	DSI 2	23230	782	21.95	23.00	1.274	-0.03	0.463	0.590
	LTE Band 13	10M	QPSK	25	12	-	Left Tilted	0mm	Ant 13	DSI 2	23230	782	21.95	23.00	1.274	-0.05	0.450	0.573
	LTE Band 13	10M	QPSK	50	0	-	Right Cheek	0mm	Ant 13	DSI 2	23230	782	21.85	23.00	1.303	0.09	0.629	0.820
	LTE Band 13	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 13	DSI 3	23230	782	21.15	22.00	1.216	0.05	0.511	0.621
	LTE Band 13	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 13	DSI 3	23230	782	21.15	22.00	1.216	-0.12	0.381	0.463
	LTE Band 13	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 13	DSI 3	23230	782	21.15	22.00	1.216	-0.02	0.365	0.444
	LTE Band 13	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 13	DSI 3	23230	782	21.15	22.00	1.216	-0.05	0.341	0.415
	LTE Band 13	10M	QPSK	25	12	-	Right Cheek	0mm	Ant 13	DSI 3	23230	782	20.93	22.00	1.279	-0.08	0.533	0.682
	LTE Band 13	10M	QPSK	25	12	-	Right Tilted	0mm	Ant 13	DSI 3	23230	782	20.93	22.00	1.279	0.03	0.388	0.496
	LTE Band 13	10M	QPSK	25	12	-	Left Cheek	0mm	Ant 13	DSI 3	23230	782	20.93	22.00	1.279	0.04	0.368	0.471
	LTE Band 13	10M	QPSK	25	12	-	Left Tilted	0mm	Ant 13	DSI 3	23230	782	20.93	22.00	1.279	0.1	0.357	0.457
	LTE Band 13	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 31	DSI 2/3	23230	782	23.25	24.00	1.189	0.08	0.068	0.081
	LTE Band 13	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 31	DSI 2/3	23230	782	23.25	24.00	1.189	-0.16	0.045	0.053
	LTE Band 13	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 31	DSI 2/3	23230	782	23.25	24.00	1.189	0.16	0.087	0.103
	LTE Band 13	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 31	DSI 2/3	23230	782	23.25	24.00	1.189	-0.16	0.065	0.077
	LTE Band 13	10M	QPSK	25	12	-	Right Cheek	0mm	Ant 31	DSI 2/3	23230	782	22.09	23.00	1.233	0.01	0.055	0.068
	LTE Band 13	10M	QPSK	25	12	-	Right Tilted	0mm	Ant 31	DSI 2/3	23230	782	22.09	23.00	1.233	-0.07	0.042	0.052
	LTE Band 13	10M	QPSK	25	12	-	Left Cheek	0mm	Ant 31	DSI 2/3	23230	782	22.09	23.00	1.233	-0.02	0.075	0.092
	LTE Band 13	10M	QPSK	25	12	-	Left Tilted	0mm	Ant 31	DSI 2/3	23230	782	22.09	23.00	1.233	-0.05	0.049	0.060
02	LTE Band 12	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 13	DSI 2/3	23095	707.5	23.31	24.00	1.172	-0.1	0.406	**0.476**
	LTE Band 12	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 13	DSI 2/3	23095	707.5	23.31	24.00	1.172	0.13	0.334	0.392
	LTE Band 12	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 13	DSI 2/3	23095	707.5	23.31	24.00	1.172	-0.08	0.268	0.314
	LTE Band 12	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 13	DSI 2/3	23095	707.5	23.31	24.00	1.172	0.05	0.276	0.324
	LTE Band 12	10M	QPSK	25	12	-	Right Cheek	0mm	Ant 13	DSI 2/3	23095	707.5	22.15	23.00	1.216	-0.11	0.349	0.424
	LTE Band 12	10M	QPSK	25	12	-	Right Tilted	0mm	Ant 13	DSI 2/3	23095	707.5	22.15	23.00	1.216	0.05	0.272	0.331
	LTE Band 12	10M	QPSK	25	12	-	Left Cheek	0mm	Ant 13	DSI 2/3	23095	707.5	22.15	23.00	1.216	-0.11	0.218	0.265
	LTE Band 12	10M	QPSK	25	12	-	Left Tilted	0mm	Ant 13	DSI 2/3	23095	707.5	22.15	23.00	1.216	0.04	0.223	0.271
	LTE Band 12	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 31	DSI 2/3	23095	707.5	23.99	24.80	1.205	-0.01	0.080	0.096
	LTE Band 12	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 31	DSI 2/3	23095	707.5	23.99	24.80	1.205	-0.15	0.044	0.053
	LTE Band 12	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 31	DSI 2/3	23095	707.5	23.99	24.80	1.205	0.04	0.093	0.111
	LTE Band 12	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 31	DSI 2/3	23095	707.5	23.99	24.80	1.205	-0.05	0.051	0.061
	LTE Band 12	10M	QPSK	25	12	-	Right Cheek	0mm	Ant 31	DSI 2/3	23095	707.5	22.91	23.80	1.227	-0.06	0.066	0.081
	LTE Band 12	10M	QPSK	25	12	-	Right Tilted	0mm	Ant 31	DSI 2/3	23095	707.5	22.91	23.80	1.227	0.07	0.030	0.037
	LTE Band 12	10M	QPSK	25	12	-	Left Cheek	0mm	Ant 31	DSI 2/3	23095	707.5	22.91	23.80	1.227	0.09	0.070	0.086
	LTE Band 12	10M	QPSK	25	12	-	Left Tilted	0mm	Ant 31	DSI 2/3	23095	707.5	22.91	23.80	1.227	0.08	0.035	0.043
03	LTE Band 17	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 13	DSI 2/3	23790	710	23.89	24.50	1.151	-0.03	0.384	**0.442**
	LTE Band 17	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 13	DSI 2/3	23790	710	23.89	24.50	1.151	0.14	0.356	0.410
	LTE Band 17	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 13	DSI 2/3	23790	710	23.89	24.50	1.151	0.13	0.295	0.339
	LTE Band 17	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 13	DSI 2/3	23790	710	23.89	24.50	1.151	-0.11	0.297	0.342
	LTE Band 17	10M	QPSK	25	12	-	Right Cheek	0mm	Ant 13	DSI 2/3	23790	710	22.73	23.50	1.194	-0.16	0.297	0.355
	LTE Band 17	10M	QPSK	25	12	-	Right Tilted	0mm	Ant 13	DSI 2/3	23790	710	22.73	23.50	1.194	0.07	0.285	0.340
	LTE Band 17	10M	QPSK	25	12	-	Left Cheek	0mm	Ant 13	DSI 2/3	23790	710	22.73	23.50	1.194	0.14	0.229	0.273
	LTE Band 17	10M	QPSK	25	12	-	Left Tilted	0mm	Ant 13	DSI 2/3	23790	710	22.73	23.50	1.194	-0.15	0.233	0.278
	LTE Band 17	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 31	DSI 2/3	23790	710	24.42	24.80	1.091	0.04	0.085	0.093
	LTE Band 17	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 31	DSI 2/3	23790	710	24.42	24.80	1.091	0.14	0.050	0.055

	LTE Band 17	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 31	DSI 2/3	23790	710	24.42	24.80	1.091	0.15	0.089	0.097
	LTE Band 17	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 31	DSI 2/3	23790	710	24.42	24.80	1.091	-0.05	0.055	0.060
	LTE Band 17	10M	QPSK	25	12	-	Right Cheek	0mm	Ant 31	DSI 2/3	23790	710	23.46	23.80	1.081	0.04	0.068	0.074
	LTE Band 17	10M	QPSK	25	12	-	Right Tilted	0mm	Ant 31	DSI 2/3	23790	710	23.46	23.80	1.081	-0.1	0.040	0.043
	LTE Band 17	10M	QPSK	25	12	-	Left Cheek	0mm	Ant 31	DSI 2/3	23790	710	23.46	23.80	1.081	-0.11	0.073	0.079
	LTE Band 17	10M	QPSK	25	12	-	Left Tilted	0mm	Ant 31	DSI 2/3	23790	710	23.46	23.80	1.081	0.04	0.046	0.050
835MHz																		
04	GSM850	-	-	-	-	GPRS 4 Tx slots	Right Cheek	0mm	Ant 13	DSI 2	128	824.2	24.56	26.50	1.563	0.03	0.493	**0.771**
	GSM850	-	-	-	-	GPRS 4 Tx slots	Right Tilted	0mm	Ant 13	DSI 2	128	824.2	24.56	26.50	1.563	-0.11	0.398	0.622
	GSM850	-	-	-	-	GPRS 4 Tx slots	Left Cheek	0mm	Ant 13	DSI 2	128	824.2	24.56	26.50	1.563	0.07	0.355	0.555
	GSM850	-	-	-	-	GPRS 4 Tx slots	Left Tilted	0mm	Ant 13	DSI 2	128	824.2	24.56	26.50	1.563	-0.16	0.352	0.550
	GSM850	-	-	-	-	GPRS 4 Tx slots	Right Cheek	0mm	Ant 13	DSI 3	128	824.2	23.58	25.50	1.556	0.09	0.438	0.682
	GSM850	-	-	-	-	GPRS 4 Tx slots	Right Tilted	0mm	Ant 13	DSI 3	128	824.2	23.58	25.50	1.556	-0.13	0.316	0.492
	GSM850	-	-	-	-	GPRS 4 Tx slots	Left Cheek	0mm	Ant 13	DSI 3	128	824.2	23.58	25.50	1.556	-0.1	0.282	0.439
	GSM850	-	-	-	-	GPRS 4 Tx slots	Left Tilted	0mm	Ant 13	DSI 3	128	824.2	23.58	25.50	1.556	0.14	0.279	0.434
	GSM850	-	-	-	-	GPRS 2 Tx slots	Right Cheek	0mm	Ant 31	DSI 2/3	128	824.2	30.50	31.50	1.259	0.12	0.128	0.161
	GSM850	-	-	-	-	GPRS 2 Tx slots	Right Tilted	0mm	Ant 31	DSI 2/3	128	824.2	30.50	31.50	1.259	0.1	0.070	0.088
	GSM850	-	-	-	-	GPRS 2 Tx slots	Left Cheek	0mm	Ant 31	DSI 2/3	128	824.2	30.50	31.50	1.259	-0.11	0.153	0.193
	GSM850	-	-	-	-	GPRS 2 Tx slots	Left Tilted	0mm	Ant 31	DSI 2/3	128	824.2	30.50	31.50	1.259	-0.09	0.087	0.110
05	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 2	4233	846.6	21.01	22.00	1.256	-0.03	0.563	**0.707**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 2	4233	846.6	21.01	22.00	1.256	-0.12	0.486	0.610
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 13	DSI 2	4233	846.6	21.01	22.00	1.256	0.09	0.451	0.566
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 13	DSI 2	4233	846.6	21.01	22.00	1.256	-0.07	0.448	0.563
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 3	4233	846.6	20.53	21.50	1.250	-0.14	0.502	0.628
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 3	4233	846.6	20.53	21.50	1.250	-0.14	0.433	0.541
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 13	DSI 3	4233	846.6	20.53	21.50	1.250	0.03	0.402	0.503
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 13	DSI 3	4233	846.6	20.53	21.50	1.250	0	0.399	0.499
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 31	DSI 2/3	4233	846.6	23.28	24.50	1.324	-0.13	0.106	0.140
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 31	DSI 2/3	4233	846.6	23.28	24.50	1.324	-0.02	0.055	0.073
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	DSI 2/3	4233	846.6	23.28	24.50	1.324	-0.15	0.123	0.163
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 31	DSI 2/3	4233	846.6	23.28	24.50	1.324	-0.03	0.069	0.091
	LTE Band 26	15M	QPSK	1	37	-	Right Cheek	0mm	Ant 13	DSI 2	26865	831.5	21.28	22.00	1.180	0.04	0.530	0.626
	LTE Band 26	15M	QPSK	1	37	-	Right Tilted	0mm	Ant 13	DSI 2	26865	831.5	21.28	22.00	1.180	-0.02	0.489	0.577
	LTE Band 26	15M	QPSK	1	37	-	Left Cheek	0mm	Ant 13	DSI 2	26865	831.5	21.28	22.00	1.180	-0.11	0.450	0.531
	LTE Band 26	15M	QPSK	1	37	-	Left Tilted	0mm	Ant 13	DSI 2	26865	831.5	21.28	22.00	1.180	-0.07	0.447	0.528
06	LTE Band 26	15M	QPSK	36	20	-	Right Cheek	0mm	Ant 13	DSI 2	26865	831.5	21.25	22.00	1.189	0.1	0.554	**0.658**
	LTE Band 26	15M	QPSK	36	20	-	Right Tilted	0mm	Ant 13	DSI 2	26865	831.5	21.25	22.00	1.189	0.09	0.492	0.585
	LTE Band 26	15M	QPSK	36	20	-	Left Cheek	0mm	Ant 13	DSI 2	26865	831.5	21.25	22.00	1.189	-0.11	0.476	0.566
	LTE Band 26	15M	QPSK	36	20	-	Left Tilted	0mm	Ant 13	DSI 2	26865	831.5	21.25	22.00	1.189	0.16	0.468	0.556
	LTE Band 26	15M	QPSK	1	37	-	Right Cheek	0mm	Ant 13	DSI 3	26865	831.5	20.27	21.00	1.183	-0.14	0.421	0.498
	LTE Band 26	15M	QPSK	1	37	-	Right Tilted	0mm	Ant 13	DSI 3	26865	831.5	20.27	21.00	1.183	-0.06	0.388	0.459
	LTE Band 26	15M	QPSK	1	37	-	Left Cheek	0mm	Ant 13	DSI 3	26865	831.5	20.27	21.00	1.183	0.14	0.357	0.422
	LTE Band 26	15M	QPSK	1	37	-	Left Tilted	0mm	Ant 13	DSI 3	26865	831.5	20.27	21.00	1.183	0.08	0.355	0.420
	LTE Band 26	15M	QPSK	36	20	-	Right Cheek	0mm	Ant 13	DSI 3	26865	831.5	20.25	21.00	1.189	-0.03	0.440	0.523
	LTE Band 26	15M	QPSK	36	20	-	Right Tilted	0mm	Ant 13	DSI 3	26865	831.5	20.25	21.00	1.189	0.05	0.391	0.465
	LTE Band 26	15M	QPSK	36	20	-	Left Cheek	0mm	Ant 13	DSI 3	26865	831.5	20.25	21.00	1.189	0.08	0.378	0.449
	LTE Band 26	15M	QPSK	36	20	-	Left Tilted	0mm	Ant 13	DSI 3	26865	831.5	20.25	21.00	1.189	-0.09	0.372	0.442
	LTE Band 26	15M	QPSK	1	37	-	Right Cheek	0mm	Ant 31	DSI 2/3	26865	831.5	23.42	24.00	1.143	-0.06	0.062	0.071
	LTE Band 26	15M	QPSK	1	37	-	Right Tilted	0mm	Ant 31	DSI 2/3	26865	831.5	23.42	24.00	1.143	0.06	0.051	0.058
	LTE Band 26	15M	QPSK	1	37	-	Left Cheek	0mm	Ant 31	DSI 2/3	26865	831.5	23.42	24.00	1.143	-0.04	0.066	0.075
	LTE Band 26	15M	QPSK	1	37	-	Left Tilted	0mm	Ant 31	DSI 2/3	26865	831.5	23.42	24.00	1.143	0.1	0.055	0.063
	LTE Band 26	15M	QPSK	36	20	-	Right Cheek	0mm	Ant 31	DSI 2/3	26865	831.5	22.31	23.00	1.172	0.12	0.048	0.056
	LTE Band 26	15M	QPSK	36	20	-	Right Tilted	0mm	Ant 31	DSI 2/3	26865	831.5	22.31	23.00	1.172	-0.16	0.038	0.045
	LTE Band 26	15M	QPSK	36	20	-	Left Cheek	0mm	Ant 31	DSI 2/3	26865	831.5	22.31	23.00	1.172	-0.09	0.052	0.061
	LTE Band 26	15M	QPSK	36	20	-	Left Tilted	0mm	Ant 31	DSI 2/3	26865	831.5	22.31	23.00	1.172	0.08	0.041	0.048
1750MHz																		

	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 31	DSI 2/3	1413	1732.6	23.47	24.50	1.268	-0.08	0.064	0.081
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 31	DSI 2/3	1413	1732.6	23.47	24.50	1.268	0.14	0.048	0.061
07	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	DSI 2/3	1413	1732.6	23.47	24.50	1.268	0.07	0.079	**0.101**
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 31	DSI 2/3	1413	1732.6	23.47	24.50	1.268	-0.07	0.056	0.071
	LTE Band 66	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 31	DSI 2/3	132322	1745	23.16	24.00	1.213	0.16	0.052	0.063
	LTE Band 66	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 31	DSI 2/3	132322	1745	23.16	24.00	1.213	-0.12	0.038	0.046
08	LTE Band 66	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 31	DSI 2/3	132322	1745	23.16	24.00	1.213	0.07	0.071	**0.086**
	LTE Band 66	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 31	DSI 2/3	132322	1745	23.16	24.00	1.213	-0.16	0.049	0.059
	LTE Band 66	20M	QPSK	50	24	-	Right Cheek	0mm	Ant 31	DSI 2/3	132322	1745	22.15	23.00	1.216	-0.09	0.049	0.060
	LTE Band 66	20M	QPSK	50	24	-	Right Tilted	0mm	Ant 31	DSI 2/3	132322	1745	22.15	23.00	1.216	0.16	0.035	0.043
	LTE Band 66	20M	QPSK	50	24	-	Left Cheek	0mm	Ant 31	DSI 2/3	132322	1745	22.15	23.00	1.216	0.07	0.057	0.069
	LTE Band 66	20M	QPSK	50	24	-	Left Tilted	0mm	Ant 31	DSI 2/3	132322	1745	22.15	23.00	1.216	-0.1	0.046	0.056
1900MHz																		
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Right Cheek	0mm	Ant 31	DSI 2/3	661	1880	24.85	25.40	1.135	0.1	0.050	0.057
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Right Tilted	0mm	Ant 31	DSI 2/3	661	1880	24.85	25.40	1.135	0.02	0.055	0.062
09	GSM1900	-	-	-	-	GPRS 4 Tx slots	Left Cheek	0mm	Ant 31	DSI 2/3	661	1880	24.85	25.40	1.135	0.11	0.076	**0.086**
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Left Tilted	0mm	Ant 31	DSI 2/3	661	1880	24.85	25.40	1.135	0.1	0.048	0.054
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 31	DSI 2/3	9400	1880	23.57	24.00	1.104	-0.03	0.062	0.068
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 31	DSI 2/3	9400	1880	23.57	24.00	1.104	0.02	0.074	0.082
10	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	DSI 2/3	9400	1880	23.57	24.00	1.104	0.14	0.094	**0.104**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 31	DSI 2/3	9400	1880	23.57	24.00	1.104	-0.1	0.064	0.071
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 31	DSI 2/3	18900	1880	23.31	24.00	1.172	-0.04	0.056	0.066
	LTE Band 2	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 31	DSI 2/3	18900	1880	23.31	24.00	1.172	0.15	0.068	0.080
11	LTE Band 2	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 31	DSI 2/3	18900	1880	23.31	24.00	1.172	-0.14	0.083	**0.097**
	LTE Band 2	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 31	DSI 2/3	18900	1880	23.31	24.00	1.172	0.03	0.060	0.070
	LTE Band 2	20M	QPSK	50	24	-	Right Cheek	0mm	Ant 31	DSI 2/3	18900	1880	22.43	23.00	1.140	-0.01	0.048	0.055
	LTE Band 2	20M	QPSK	50	24	-	Right Tilted	0mm	Ant 31	DSI 2/3	18900	1880	22.43	23.00	1.140	0.04	0.056	0.064
	LTE Band 2	20M	QPSK	50	24	-	Left Cheek	0mm	Ant 31	DSI 2/3	18900	1880	22.43	23.00	1.140	0.1	0.074	0.084
	LTE Band 2	20M	QPSK	50	24	-	Left Tilted	0mm	Ant 31	DSI 2/3	18900	1880	22.43	23.00	1.140	0.01	0.053	0.060

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	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)
2600MHz																			
12	LTE Band 7	20M	QPSK	1	49	Right Cheek	0mm	Ant 31	DSI 2/3	21100	2535	23.19	24.00	1.205	-	-	0.14	0.285	**0.343**
	LTE Band 7C	20M	QPSK	1	49	Right Cheek	0mm	Ant 31	DSI 2/3	21100 +20902	2535 +2515.2	23.06	24.00	1.242	-	-	-0.03	0.271	0.336
	LTE Band 7	20M	QPSK	1	49	Right Tilted	0mm	Ant 31	DSI 2/3	21100	2535	23.19	24.00	1.205	-	-	-0.05	0.102	0.123
	LTE Band 7	20M	QPSK	1	49	Left Cheek	0mm	Ant 31	DSI 2/3	21100	2535	23.19	24.00	1.205	-	-	-0.09	0.153	0.184
	LTE Band 7	20M	QPSK	1	49	Left Tilted	0mm	Ant 31	DSI 2/3	21100	2535	23.19	24.00	1.205	-	-	0.03	0.095	0.114
	LTE Band 7	20M	QPSK	50	24	Right Cheek	0mm	Ant 31	DSI 2/3	21100	2535	22.16	23.00	1.213	-	-	-0.11	0.258	0.313
	LTE Band 7	20M	QPSK	50	24	Right Tilted	0mm	Ant 31	DSI 2/3	21100	2535	22.16	23.00	1.213	-	-	0.05	0.080	0.097
	LTE Band 7	20M	QPSK	50	24	Left Cheek	0mm	Ant 31	DSI 2/3	21100	2535	22.16	23.00	1.213	-	-	0.16	0.126	0.153
	LTE Band 7	20M	QPSK	50	24	Left Tilted	0mm	Ant 31	DSI 2/3	21100	2535	22.16	23.00	1.213	-	-	0.02	0.076	0.092
13	LTE Band 41	20M	QPSK	1	49	Right Cheek	0mm	Ant 31	DSI 2/3	41055	2636.5	23.19	24.00	1.205	62.9	1.006	0.12	0.181	**0.219**
	LTE Band 41C	20M	QPSK	1	49	Right Cheek	0mm	Ant 31	DSI 2/3	41055 +40857	2636.5 +2616.7	22.66	24.00	1.361	62.9	1.006	-0.06	0.156	0.214
	LTE Band 41	20M	QPSK	1	49	Right Tilted	0mm	Ant 31	DSI 2/3	41055	2636.5	23.19	24.00	1.205	62.9	1.006	-0.09	0.064	0.078
	LTE Band 41	20M	QPSK	1	49	Left Cheek	0mm	Ant 31	DSI 2/3	41055	2636.5	23.19	24.00	1.205	62.9	1.006	0.07	0.093	0.113
	LTE Band 41	20M	QPSK	1	49	Left Tilted	0mm	Ant 31	DSI 2/3	41055	2636.5	23.19	24.00	1.205	62.9	1.006	0.05	0.084	0.102
	LTE Band 41	20M	QPSK	50	24	Right Cheek	0mm	Ant 31	DSI 2/3	41055	2636.5	22.09	23.00	1.233	62.9	1.006	-0.11	0.165	0.205
	LTE Band 41	20M	QPSK	50	24	Right Tilted	0mm	Ant 31	DSI 2/3	41055	2636.5	22.09	23.00	1.233	62.9	1.006	0.08	0.051	0.063
	LTE Band 41	20M	QPSK	50	24	Left Cheek	0mm	Ant 31	DSI 2/3	41055	2636.5	22.09	23.00	1.233	62.9	1.006	-0.03	0.076	0.094
	LTE Band 41	20M	QPSK	50	24	Left Tilted	0mm	Ant 31	DSI 2/3	41055	2636.5	22.09	23.00	1.233	62.9	1.006	-0.08	0.070	0.087

Plot No.	Band	Mode	Test Position	Gap (mm)	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)
2450MHz															
	Bluetooth	DH5 1Mbps	Right Cheek	0mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	-0.09	0.048	0.075
	Bluetooth	DH5 1Mbps	Right Tilted	0mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	0.1	0.066	0.103
14	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	0.12	0.131	**0.205**
	Bluetooth	DH5 1Mbps	Left Tilted	0mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	0.15	0.079	0.123
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Reduced	11	2462	17.20	18.00	1.202	98.6	1.014	-0.09	0.254	0.310
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Reduced	11	2462	17.20	18.00	1.202	98.6	1.014	-0.12	0.331	0.404
15	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Reduced	11	2462	17.20	18.00	1.202	98.6	1.014	0.16	0.612	**0.746**
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Reduced	11	2462	17.20	18.00	1.202	98.6	1.014	-0.02	0.454	0.553
5000MHz															
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Reduced	58	5290	14.25	15.50	1.334	92.63	1.080	0.03	0.104	0.150
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Reduced	58	5290	14.25	15.50	1.334	92.63	1.080	-0.06	0.121	0.174
16	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Reduced	58	5290	14.25	15.50	1.334	92.63	1.080	0.11	0.306	**0.441**
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Reduced	58	5290	14.25	15.50	1.334	92.63	1.080	-0.06	0.200	0.288
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Reduced	138	5690	14.44	15.50	1.276	92.63	1.080	-0.15	0.073	0.101
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Reduced	138	5690	14.44	15.50	1.276	92.63	1.080	-0.08	0.088	0.121
17	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Reduced	138	5690	14.44	15.50	1.276	92.63	1.080	-0.11	0.344	**0.474**
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Reduced	138	5690	14.44	15.50	1.276	92.63	1.080	-0.1	0.219	0.302
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Reduced	155	5775	14.35	15.50	1.303	92.63	1.080	-0.13	0.079	0.111
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Reduced	155	5775	14.35	15.50	1.303	92.63	1.080	-0.06	0.080	0.113
18	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Reduced	155	5775	14.35	15.50	1.303	92.63	1.080	0.04	0.584	**0.822**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Reduced	155	5775	14.35	15.50	1.303	92.63	1.000	-0.1	0.205	0.267

15.2 Hotspot SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	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)
750MHz																		
	LTE Band 13	10M	QPSK	1	25	-	Front	10mm	Ant 13	DSI 6	23230	782	23.21	24.00	1.199	0.16	0.135	0.162
19	LTE Band 13	10M	QPSK	1	25	-	Back	10mm	Ant 13	DSI 6	23230	782	23.21	24.00	1.199	-0.13	0.229	**0.275**
	LTE Band 13	10M	QPSK	1	25	-	Left Side	10mm	Ant 13	DSI 6	23230	782	23.21	24.00	1.199	-0.07	0.142	0.170
	LTE Band 13	10M	QPSK	1	25	-	Top Side	10mm	Ant 13	DSI 6	23230	782	23.21	24.00	1.199	0.15	0.130	0.156
	LTE Band 13	10M	QPSK	25	12	-	Front	10mm	Ant 13	DSI 6	23230	782	21.94	23.00	1.276	-0.04	0.105	0.134
	LTE Band 13	10M	QPSK	25	12	-	Back	10mm	Ant 13	DSI 6	23230	782	21.94	23.00	1.276	-0.13	0.148	0.189
	LTE Band 13	10M	QPSK	25	12	-	Left Side	10mm	Ant 13	DSI 6	23230	782	21.94	23.00	1.276	-0.03	0.118	0.151
	LTE Band 13	10M	QPSK	25	12	-	Top Side	10mm	Ant 13	DSI 6	23230	782	21.94	23.00	1.276	0.01	0.101	0.129
	LTE Band 13	10M	QPSK	1	25	-	Front	10mm	Ant 31	DSI 6	23230	782	23.25	24.00	1.189	0.15	0.074	0.088
	LTE Band 13	10M	QPSK	1	25	-	Back	10mm	Ant 31	DSI 6	23230	782	23.25	24.00	1.189	0.15	0.094	0.111
	LTE Band 13	10M	QPSK	1	25	-	Left Side	10mm	Ant 31	DSI 6	23230	782	23.25	24.00	1.189	0.03	0.076	0.090
	LTE Band 13	10M	QPSK	1	25	-	Right Side	10mm	Ant 31	DSI 6	23230	782	23.25	24.00	1.189	-0.05	0.052	0.062
	LTE Band 13	10M	QPSK	1	25	-	Bottom Side	10mm	Ant 31	DSI 6	23230	782	23.25	24.00	1.189	-0.16	0.044	0.052
	LTE Band 13	10M	QPSK	25	12	-	Front	10mm	Ant 31	DSI 6	23230	782	22.09	23.00	1.233	0.09	0.059	0.073
	LTE Band 13	10M	QPSK	25	12	-	Back	10mm	Ant 31	DSI 6	23230	782	22.09	23.00	1.233	0.15	0.077	0.095
	LTE Band 13	10M	QPSK	25	12	-	Left Side	10mm	Ant 31	DSI 6	23230	782	22.09	23.00	1.233	-0.11	0.062	0.076
	LTE Band 13	10M	QPSK	25	12	-	Right Side	10mm	Ant 31	DSI 6	23230	782	22.09	23.00	1.233	-0.13	0.044	0.054
	LTE Band 13	10M	QPSK	25	12	-	Bottom Side	10mm	Ant 31	DSI 6	23230	782	22.09	23.00	1.233	-0.02	0.035	0.043
	LTE Band 12	10M	QPSK	1	25	-	Front	10mm	Ant 13	DSI 6	23095	707.5	23.31	24.00	1.172	-0.1	0.074	0.087
	LTE Band 12	10M	QPSK	1	25	-	Back	10mm	Ant 13	DSI 6	23095	707.5	23.31	24.00	1.172	0.14	0.111	0.130
	LTE Band 12	10M	QPSK	1	25	-	Left Side	10mm	Ant 13	DSI 6	23095	707.5	23.31	24.00	1.172	-0.16	0.081	0.095
	LTE Band 12	10M	QPSK	1	25	-	Top Side	10mm	Ant 13	DSI 6	23095	707.5	23.31	24.00	1.172	-0.12	0.057	0.067
	LTE Band 12	10M	QPSK	25	12	-	Front	10mm	Ant 13	DSI 6	23095	707.5	22.15	23.00	1.216	-0.16	0.062	0.075
	LTE Band 12	10M	QPSK	25	12	-	Back	10mm	Ant 13	DSI 6	23095	707.5	22.15	23.00	1.216	-0.01	0.087	0.106
	LTE Band 12	10M	QPSK	25	12	-	Left Side	10mm	Ant 13	DSI 6	23095	707.5	22.15	23.00	1.216	0.09	0.069	0.084
	LTE Band 12	10M	QPSK	25	12	-	Top Side	10mm	Ant 13	DSI 6	23095	707.5	22.15	23.00	1.216	0.04	0.047	0.057
	LTE Band 12	10M	QPSK	1	25	-	Front	10mm	Ant 31	DSI 6	23095	707.5	23.99	24.80	1.205	0.03	0.130	0.157
20	LTE Band 12	10M	QPSK	1	25	-	Back	10mm	Ant 31	DSI 6	23095	707.5	23.99	24.80	1.205	-0.01	0.167	**0.201**
	LTE Band 12	10M	QPSK	1	25	-	Left Side	10mm	Ant 31	DSI 6	23095	707.5	23.99	24.80	1.205	0.09	0.160	0.193
	LTE Band 12	10M	QPSK	1	25	-	Right Side	10mm	Ant 31	DSI 6	23095	707.5	23.99	24.80	1.205	-0.07	0.110	0.133
	LTE Band 12	10M	QPSK	1	25	-	Bottom Side	10mm	Ant 31	DSI 6	23095	707.5	23.99	24.80	1.205	0.16	0.041	0.049
	LTE Band 12	10M	QPSK	25	12	-	Front	10mm	Ant 31	DSI 6	23095	707.5	22.91	23.80	1.227	0.04	0.110	0.135
	LTE Band 12	10M	QPSK	25	12	-	Back	10mm	Ant 31	DSI 6	23095	707.5	22.91	23.80	1.227	0	0.140	0.172
	LTE Band 12	10M	QPSK	25	12	-	Left Side	10mm	Ant 31	DSI 6	23095	707.5	22.91	23.80	1.227	0.15	0.134	0.164
	LTE Band 12	10M	QPSK	25	12	-	Right Side	10mm	Ant 31	DSI 6	23095	707.5	22.91	23.80	1.227	-0.13	0.093	0.114
	LTE Band 12	10M	QPSK	25	12	-	Bottom Side	10mm	Ant 31	DSI 6	23095	707.5	22.91	23.80	1.227	0.15	0.032	0.039
	LTE Band 17	10M	QPSK	1	25	-	Front	10mm	Ant 13	DSI 6	23790	710	23.89	24.50	1.151	-0.11	0.082	0.094
	LTE Band 17	10M	QPSK	1	25	-	Back	10mm	Ant 13	DSI 6	23790	710	23.89	24.50	1.151	0.03	0.113	0.130
	LTE Band 17	10M	QPSK	1	25	-	Left Side	10mm	Ant 13	DSI 6	23790	710	23.89	24.50	1.151	0.01	0.085	0.098
	LTE Band 17	10M	QPSK	1	25	-	Top Side	10mm	Ant 13	DSI 6	23790	710	23.89	24.50	1.151	0.07	0.058	0.067
	LTE Band 17	10M	QPSK	25	12	-	Front	10mm	Ant 13	DSI 6	23790	710	22.73	23.50	1.194	-0.01	0.069	0.082
	LTE Band 17	10M	QPSK	25	12	-	Back	10mm	Ant 13	DSI 6	23790	710	22.73	23.50	1.194	0.07	0.090	0.107
	LTE Band 17	10M	QPSK	25	12	-	Left Side	10mm	Ant 13	DSI 6	23790	710	22.73	23.50	1.194	-0.15	0.071	0.085
	LTE Band 17	10M	QPSK	25	12	-	Top Side	10mm	Ant 13	DSI 6	23790	710	22.73	23.50	1.194	-0.08	0.047	0.056
	LTE Band 17	10M	QPSK	1	25	-	Front	10mm	Ant 31	DSI 6	23790	710	24.42	24.80	1.091	-0.1	0.126	0.138
21	LTE Band 17	10M	QPSK	1	25	-	Back	10mm	Ant 31	DSI 6	23790	710	24.42	24.80	1.091	-0.09	0.169	**0.184**
	LTE Band 17	10M	QPSK	1	25	-	Left Side	10mm	Ant 31	DSI 6	23790	710	24.42	24.80	1.091	-0.04	0.148	0.162
	LTE Band 17	10M	QPSK	1	25	-	Right Side	10mm	Ant 31	DSI 6	23790	710	24.42	24.80	1.091	-0.11	0.115	0.126
	LTE Band 17	10M	QPSK	1	25	-	Bottom Side	10mm	Ant 31	DSI 6	23790	710	24.42	24.80	1.091	0.11	0.031	0.034
	LTE Band 17	10M	QPSK	25	12	-	Front	10mm	Ant 31	DSI 6	23790	710	23.46	23.80	1.081	-0.12	0.111	0.120
	LTE Band 17	10M	QPSK	25	12	-	Back	10mm	Ant 31	DSI 6	23790	710	23.46	23.80	1.081	0.11	0.148	0.160

	LTE Band 17	10M	QPSK	25	12	-	Left Side	10mm	Ant 31	DSI 6	23790	710	23.46	23.80	1.081	0.1	0.145	0.157
	LTE Band 17	10M	QPSK	25	12	-	Right Side	10mm	Ant 31	DSI 6	23790	710	23.46	23.80	1.081	0	0.094	0.102
	LTE Band 17	10M	QPSK	25	12	-	Bottom Side	10mm	Ant 31	DSI 6	23790	710	23.46	23.80	1.081	0.12	0.026	0.028
835MHz																		
	GSM850	-	-	-	-	GPRS 4 Tx slots	Front	10mm	Ant 13	DSI 6	128	824.2	26.16	28.00	1.528	0.02	0.114	0.174
22	GSM850	-	-	-	-	GPRS 4 Tx slots	Back	10mm	Ant 13	DSI 6	128	824.2	26.16	28.00	1.528	-0.12	0.179	**0.273**
	GSM850	-	-	-	-	GPRS 4 Tx slots	Left Side	10mm	Ant 13	DSI 6	128	824.2	26.16	28.00	1.528	0.15	0.079	0.121
	GSM850	-	-	-	-	GPRS 4 Tx slots	Top Side	10mm	Ant 13	DSI 6	128	824.2	26.16	28.00	1.528	0.1	0.138	0.211
	GSM850	-	-	-	-	GPRS 3 Tx slots	Front	10mm	Ant 31	DSI 6	128	824.2	27.76	29.50	1.493	-0.15	0.104	0.155
	GSM850	-	-	-	-	GPRS 3 Tx slots	Back	10mm	Ant 31	DSI 6	128	824.2	27.76	29.50	1.493	-0.12	0.156	0.233
	GSM850	-	-	-	-	GPRS 3 Tx slots	Left Side	10mm	Ant 31	DSI 6	128	824.2	27.76	29.50	1.493	0.03	0.118	0.176
	GSM850	-	-	-	-	GPRS 3 Tx slots	Right Side	10mm	Ant 31	DSI 6	128	824.2	27.76	29.50	1.493	-0.05	0.077	0.115
	GSM850	-	-	-	-	GPRS 3 Tx slots	Bottom Side	10mm	Ant 31	DSI 6	128	824.2	27.76	29.50	1.493	0.13	0.084	0.125
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 13	DSI 6	4233	846.6	19.03	20.00	1.250	-0.07	0.073	0.091
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 13	DSI 6	4233	846.6	19.03	20.00	1.250	0.13	0.118	0.148
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 13	DSI 6	4233	846.6	19.03	20.00	1.250	0.12	0.031	0.039
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 13	DSI 6	4233	846.6	19.03	20.00	1.250	-0.09	0.077	0.096
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 31	DSI 6	4233	846.6	22.78	24.00	1.324	-0.06	0.102	0.135
23	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 31	DSI 6	4233	846.6	22.78	24.00	1.324	0.07	0.174	**0.230**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 31	DSI 6	4233	846.6	22.78	24.00	1.324	0.11	0.125	0.166
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 31	DSI 6	4233	846.6	22.78	24.00	1.324	0.12	0.074	0.098
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 31	DSI 6	4233	846.6	22.78	24.00	1.324	-0.12	0.092	0.122
	LTE Band 26	15M	QPSK	1	37	-	Front	10mm	Ant 13	DSI 6	26865	831.5	23.31	24.00	1.172	-0.1	0.198	0.232
24	LTE Band 26	15M	QPSK	1	37	-	Back	10mm	Ant 13	DSI 6	26865	831.5	23.31	24.00	1.172	-0.1	0.283	**0.332**
	LTE Band 26	15M	QPSK	1	37	-	Left Side	10mm	Ant 13	DSI 6	26865	831.5	23.31	24.00	1.172	-0.12	0.104	0.122
	LTE Band 26	15M	QPSK	1	37	-	Top Side	10mm	Ant 13	DSI 6	26865	831.5	23.31	24.00	1.172	-0.16	0.197	0.231
	LTE Band 26	15M	QPSK	36	20	-	Front	10mm	Ant 13	DSI 6	26865	831.5	22.33	23.00	1.167	-0.11	0.165	0.193
	LTE Band 26	15M	QPSK	36	20	-	Back	10mm	Ant 13	DSI 6	26865	831.5	22.33	23.00	1.167	0.13	0.248	0.289
	LTE Band 26	15M	QPSK	36	20	-	Left Side	10mm	Ant 13	DSI 6	26865	831.5	22.33	23.00	1.167	-0.06	0.086	0.100
	LTE Band 26	15M	QPSK	36	20	-	Top Side	10mm	Ant 13	DSI 6	26865	831.5	22.33	23.00	1.167	-0.15	0.161	0.188
	LTE Band 26	15M	QPSK	1	37	-	Front	10mm	Ant 31	DSI 6	26865	831.5	22.90	23.50	1.148	0.16	0.048	0.055
	LTE Band 26	15M	QPSK	1	37	-	Back	10mm	Ant 31	DSI 6	26865	831.5	22.90	23.50	1.148	-0.11	0.083	0.095
	LTE Band 26	15M	QPSK	1	37	-	Left Side	10mm	Ant 31	DSI 6	26865	831.5	22.90	23.50	1.148	0	0.046	0.053
	LTE Band 26	15M	QPSK	1	37	-	Right Side	10mm	Ant 31	DSI 6	26865	831.5	22.90	23.50	1.148	-0.16	0.023	0.026
	LTE Band 26	15M	QPSK	1	37	-	Bottom Side	10mm	Ant 31	DSI 6	26865	831.5	22.90	23.50	1.148	0.04	0.028	0.032
	LTE Band 26	15M	QPSK	36	20	-	Front	10mm	Ant 31	DSI 6	26865	831.5	22.31	23.00	1.172	-0.03	0.045	0.053
	LTE Band 26	15M	QPSK	36	20	-	Back	10mm	Ant 31	DSI 6	26865	831.5	22.31	23.00	1.172	-0.14	0.076	0.089
	LTE Band 26	15M	QPSK	36	20	-	Left Side	10mm	Ant 31	DSI 6	26865	831.5	22.31	23.00	1.172	0.08	0.043	0.050
	LTE Band 26	15M	QPSK	36	20	-	Right Side	10mm	Ant 31	DSI 6	26865	831.5	22.31	23.00	1.172	0.07	0.021	0.025
	LTE Band 26	15M	QPSK	36	20	-	Bottom Side	10mm	Ant 31	DSI 6	26865	831.5	22.31	23.00	1.172	-0.06	0.024	0.028
1750MHz																		
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 13	DSI 6	1413	1732.6	17.12	17.50	1.091	0.09	0.132	0.144
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 13	DSI 6	1413	1732.6	17.12	17.50	1.091	-0.05	0.191	0.208
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 13	DSI 6	1413	1732.6	17.12	17.50	1.091	-0.12	0.030	0.033
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 13	DSI 6	1413	1732.6	17.12	17.50	1.091	0.05	0.286	0.312
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 31	DSI 6	1413	1732.6	18.78	19.50	1.180	0.02	0.167	0.197
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 31	DSI 6	1413	1732.6	18.78	19.50	1.180	0.09	0.267	0.315
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 31	DSI 6	1413	1732.6	18.78	19.50	1.180	-0.09	0.018	0.021
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 31	DSI 6	1413	1732.6	18.78	19.50	1.180	-0.14	0.062	0.073
25	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 31	DSI 6	1413	1732.6	18.78	19.50	1.180	-0.02	0.403	**0.476**
	LTE Band 4	20M	QPSK	1	49	-	Front	10mm	Ant 13	DSI 6	20175	1732.5	18.47	19.50	1.268	0.11	0.230	0.292
	LTE Band 4	20M	QPSK	1	49	-	Back	10mm	Ant 13	DSI 6	20175	1732.5	18.47	19.50	1.268	-0.04	0.250	0.317
	LTE Band 4	20M	QPSK	1	49	-	Left Side	10mm	Ant 13	DSI 6	20175	1732.5	18.47	19.50	1.268	0.14	0.042	0.053
	LTE Band 4	20M	QPSK	1	49	-	Top Side	10mm	Ant 13	DSI 6	20175	1732.5	18.47	19.50	1.268	0.1	0.363	0.460
	LTE Band 4	20M	QPSK	50	24	-	Front	10mm	Ant 13	DSI 6	20175	1732.5	18.45	19.50	1.274	0.02	0.234	0.298
	LTE Band 4	20M	QPSK	50	24	-	Back	10mm	Ant 13	DSI 6	20175	1732.5	18.45	19.50	1.274	0.15	0.251	0.320

	LTE Band 4	20M	QPSK	50	24	-	Left Side	10mm	Ant 13	DSI 6	20175	1732.5	18.45	19.50	1.274	0.06	0.045	0.057
	LTE Band 4	20M	QPSK	50	24	-	Top Side	10mm	Ant 13	DSI 6	20175	1732.5	18.45	19.50	1.274	-0.06	0.400	0.509
	LTE Band 4	20M	QPSK	1	49	-	Front	10mm	Ant 31	DSI 6	20175	1732.5	19.32	20.50	1.312	0.09	0.188	0.247
	LTE Band 4	20M	QPSK	1	49	-	Back	10mm	Ant 31	DSI 6	20175	1732.5	19.32	20.50	1.312	-0.13	0.276	0.362
	LTE Band 4	20M	QPSK	1	49	-	Left Side	10mm	Ant 31	DSI 6	20175	1732.5	19.32	20.50	1.312	0.11	0.015	0.020
	LTE Band 4	20M	QPSK	1	49	-	Right Side	10mm	Ant 31	DSI 6	20175	1732.5	19.32	20.50	1.312	-0.11	0.065	0.085
	LTE Band 4	20M	QPSK	1	49	-	Bottom Side	10mm	Ant 31	DSI 6	20175	1732.5	19.32	20.50	1.312	-0.15	0.403	0.529
	LTE Band 4	20M	QPSK	50	24	-	Front	10mm	Ant 31	DSI 6	20175	1732.5	19.27	20.50	1.327	0.07	0.191	0.254
	LTE Band 4	20M	QPSK	50	24	-	Back	10mm	Ant 31	DSI 6	20175	1732.5	19.27	20.50	1.327	-0.06	0.280	0.372
	LTE Band 4	20M	QPSK	50	24	-	Left Side	10mm	Ant 31	DSI 6	20175	1732.5	19.27	20.50	1.327	-0.12	0.020	0.027
	LTE Band 4	20M	QPSK	50	24	-	Right Side	10mm	Ant 31	DSI 6	20175	1732.5	19.27	20.50	1.327	-0.08	0.066	0.088
26	LTE Band 4	20M	QPSK	50	24	-	Bottom Side	10mm	Ant 31	DSI 6	20175	1732.5	19.27	20.50	1.327	0.12	0.431	**0.572**
	LTE Band 66	20M	QPSK	1	49	-	Front	10mm	Ant 13	DSI 6	132322	1745	18.28	19.00	1.180	0.11	0.225	0.266
	LTE Band 66	20M	QPSK	1	49	-	Back	10mm	Ant 13	DSI 6	132322	1745	18.28	19.00	1.180	-0.11	0.255	0.301
	LTE Band 66	20M	QPSK	1	49	-	Left Side	10mm	Ant 13	DSI 6	132322	1745	18.28	19.00	1.180	0.01	0.025	0.030
	LTE Band 66	20M	QPSK	1	49	-	Top Side	10mm	Ant 13	DSI 6	132322	1745	18.28	19.00	1.180	0.02	0.389	0.459
	LTE Band 66	20M	QPSK	50	24	-	Front	10mm	Ant 13	DSI 6	132322	1745	18.25	19.00	1.189	-0.05	0.229	0.272
	LTE Band 66	20M	QPSK	50	24	-	Back	10mm	Ant 13	DSI 6	132322	1745	18.25	19.00	1.189	0.07	0.259	0.308
	LTE Band 66	20M	QPSK	50	24	-	Left Side	10mm	Ant 13	DSI 6	132322	1745	18.25	19.00	1.189	-0.1	0.030	0.036
	LTE Band 66	20M	QPSK	50	24	-	Top Side	10mm	Ant 13	DSI 6	132322	1745	18.25	19.00	1.189	0.01	0.409	0.486
	LTE Band 66	20M	QPSK	1	49	-	Front	10mm	Ant 31	DSI 6	132322	1745	19.16	20.00	1.213	0.01	0.180	0.218
	LTE Band 66	20M	QPSK	1	49	-	Back	10mm	Ant 31	DSI 6	132322	1745	19.16	20.00	1.213	-0.12	0.276	0.335
	LTE Band 66	20M	QPSK	1	49	-	Left Side	10mm	Ant 31	DSI 6	132322	1745	19.16	20.00	1.213	0.13	0.021	0.025
	LTE Band 66	20M	QPSK	1	49	-	Right Side	10mm	Ant 31	DSI 6	132322	1745	19.16	20.00	1.213	-0.06	0.066	0.080
27	LTE Band 66	20M	QPSK	1	49	-	Bottom Side	10mm	Ant 31	DSI 6	132322	1745	19.16	20.00	1.213	-0.02	0.425	**0.516**
	LTE Band 66	20M	QPSK	50	24	-	Front	10mm	Ant 31	DSI 6	132322	1745	19.09	20.00	1.233	-0.03	0.172	0.212
	LTE Band 66	20M	QPSK	50	24	-	Back	10mm	Ant 31	DSI 6	132322	1745	19.09	20.00	1.233	-0.16	0.270	0.333
	LTE Band 66	20M	QPSK	50	24	-	Left Side	10mm	Ant 31	DSI 6	132322	1745	19.09	20.00	1.233	-0.03	0.017	0.021
	LTE Band 66	20M	QPSK	50	24	-	Right Side	10mm	Ant 31	DSI 6	132322	1745	19.09	20.00	1.233	-0.08	0.061	0.075
	LTE Band 66	20M	QPSK	50	24	-	Bottom Side	10mm	Ant 31	DSI 6	132322	1745	19.09	20.00	1.233	0.04	0.403	0.497
1900MHz																		
	GSM1900	-	-	-	-	EDGE 4 Tx slots	Front	10mm	Ant 13	DSI 6	661	1880	20.45	22.00	1.429	-0.02	0.170	0.243
	GSM1900	-	-	-	-	EDGE 4 Tx slots	Back	10mm	Ant 13	DSI 6	661	1880	20.45	22.00	1.429	0.02	0.202	0.289
	GSM1900	-	-	-	-	EDGE 4 Tx slots	Left Side	10mm	Ant 13	DSI 6	661	1880	20.45	22.00	1.429	-0.11	0.016	0.023
	GSM1900	-	-	-	-	EDGE 4 Tx slots	Top Side	10mm	Ant 13	DSI 6	661	1880	20.45	22.00	1.429	-0.16	0.323	0.462
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Front	10mm	Ant 31	DSI 6	661	1880	22.65	23.40	1.189	-0.01	0.145	0.172
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Back	10mm	Ant 31	DSI 6	661	1880	22.65	23.40	1.189	0.12	0.254	0.302
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Left Side	10mm	Ant 31	DSI 6	661	1880	22.65	23.40	1.189	-0.08	0.014	0.017
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Right Side	10mm	Ant 31	DSI 6	661	1880	22.65	23.40	1.189	0.08	0.076	0.090
28	GSM1900	-	-	-	-	GPRS 4 Tx slots	Bottom Side	10mm	Ant 31	DSI 6	661	1880	22.65	23.40	1.189	0.12	0.446	**0.530**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 13	DSI 6	9400	1880	16.24	17.00	1.191	0.06	0.141	0.168
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 13	DSI 6	9400	1880	16.24	17.00	1.191	0.12	0.226	0.269
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 13	DSI 6	9400	1880	16.24	17.00	1.191	-0.06	0.017	0.020
29	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 13	DSI 6	9400	1880	16.24	17.00	1.191	-0.11	0.352	**0.419**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 31	DSI 6	9400	1880	18.71	19.00	1.069	-0.14	0.123	0.131
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 31	DSI 6	9400	1880	18.71	19.00	1.069	-0.12	0.210	0.225
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 31	DSI 6	9400	1880	18.71	19.00	1.069	-0.12	0.011	0.012
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 31	DSI 6	9400	1880	18.71	19.00	1.069	-0.05	0.065	0.069
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 31	DSI 6	9400	1880	18.71	19.00	1.069	0.05	0.298	0.319
	LTE Band 2	20M	QPSK	1	49	-	Front	10mm	Ant 13	DSI 6	18900	1880	16.35	17.00	1.161	-0.12	0.157	0.182
	LTE Band 2	20M	QPSK	1	49	-	Back	10mm	Ant 13	DSI 6	18900	1880	16.35	17.00	1.161	-0.01	0.229	0.266
	LTE Band 2	20M	QPSK	1	49	-	Left Side	10mm	Ant 13	DSI 6	18900	1880	16.35	17.00	1.161	0.11	0.025	0.029
30	LTE Band 2	20M	QPSK	1	49	-	Top Side	10mm	Ant 13	DSI 6	18900	1880	16.35	17.00	1.161	-0.11	0.391	**0.454**
	LTE Band 2	20M	QPSK	50	24	-	Front	10mm	Ant 13	DSI 6	18900	1880	16.31	17.00	1.172	-0.02	0.154	0.181
	LTE Band 2	20M	QPSK	50	24	-	Back	10mm	Ant 13	DSI 6	18900	1880	16.31	17.00	1.172	0.08	0.221	0.259
	LTE Band 2	20M	QPSK	50	24	-	Left Side	10mm	Ant 13	DSI 6	18900	1880	16.31	17.00	1.172	0	0.020	0.023

	LTE Band 2	20M	QPSK	50	24	-	Top Side	10mm	Ant 13	DSI 6	18900	1880	16.31	17.00	1.172	-0.16	0.375	0.440
	LTE Band 2	20M	QPSK	1	49	-	Front	10mm	Ant 31	DSI 6	18900	1880	19.84	20.50	1.164	0.11	0.156	0.182
	LTE Band 2	20M	QPSK	1	49	-	Back	10mm	Ant 31	DSI 6	18900	1880	19.84	20.50	1.164	-0.1	0.260	0.303
	LTE Band 2	20M	QPSK	1	49	-	Left Side	10mm	Ant 31	DSI 6	18900	1880	19.84	20.50	1.164	0.05	0.010	0.012
	LTE Band 2	20M	QPSK	1	49	-	Right Side	10mm	Ant 31	DSI 6	18900	1880	19.84	20.50	1.164	0.06	0.077	0.090
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	10mm	Ant 31	DSI 6	18900	1880	19.84	20.50	1.164	-0.08	0.353	0.411
	LTE Band 2	20M	QPSK	50	24	-	Front	10mm	Ant 31	DSI 6	18900	1880	19.81	20.50	1.172	0.06	0.157	0.184
	LTE Band 2	20M	QPSK	50	24	-	Back	10mm	Ant 31	DSI 6	18900	1880	19.81	20.50	1.172	-0.08	0.266	0.312
	LTE Band 2	20M	QPSK	50	24	-	Left Side	10mm	Ant 31	DSI 6	18900	1880	19.81	20.50	1.172	0.15	0.014	0.016
	LTE Band 2	20M	QPSK	50	24	-	Right Side	10mm	Ant 31	DSI 6	18900	1880	19.81	20.50	1.172	0.07	0.081	0.095
	LTE Band 2	20M	QPSK	50	24	-	Bottom Side	10mm	Ant 31	DSI 6	18900	1880	19.81	20.50	1.172	-0.03	0.381	0.447

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	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)
2600MHz																			
	LTE Band 7	20M	QPSK	1	49	Front	10mm	Ant 13	DSI 6	21100	2535	17.49	18.00	1.125	-	-	-0.02	0.111	0.125
	LTE Band 7	20M	QPSK	1	49	Back	10mm	Ant 13	DSI 6	21100	2535	17.49	18.00	1.125	-	-	-0.09	0.365	0.410
	LTE Band 7	20M	QPSK	1	49	Left Side	10mm	Ant 13	DSI 6	21100	2535	17.49	18.00	1.125	-	-	0	0.162	0.182
	LTE Band 7	20M	QPSK	1	49	Top Side	10mm	Ant 13	DSI 6	21100	2535	17.49	18.00	1.125	-	-	0.03	0.295	0.332
	LTE Band 7	20M	QPSK	50	24	Front	10mm	Ant 13	DSI 6	21100	2535	17.44	18.00	1.138	-	-	0.15	0.112	0.127
31	LTE Band 7	20M	QPSK	50	24	Back	10mm	Ant 13	DSI 6	21100	2535	17.44	18.00	1.138	-	-	-0.02	0.382	**0.435**
	LTE Band 7C	20M	QPSK	50	24	Back	10mm	Ant 13	DSI 6	21100 +20902	2535 +2515.2	17.29	18.00	1.178	-	-	0.03	0.306	0.360
	LTE Band 7	20M	QPSK	50	24	Left Side	10mm	Ant 13	DSI 6	21100	2535	17.44	18.00	1.138	-	-	-0.1	0.166	0.189
	LTE Band 7	20M	QPSK	50	24	Top Side	10mm	Ant 13	DSI 6	21100	2535	17.44	18.00	1.138	-	-	0.09	0.305	0.347
	LTE Band 7	20M	QPSK	1	49	Front	10mm	Ant 31	DSI 6	21100	2535	16.20	17.00	1.202	-	-	-0.15	0.088	0.106
	LTE Band 7	20M	QPSK	1	49	Back	10mm	Ant 31	DSI 6	21100	2535	16.20	17.00	1.202	-	-	-0.02	0.199	0.239
	LTE Band 7C	20M	QPSK	1	49	Back	10mm	Ant 31	DSI 6	21100 +20902	2535 +2515.2	16.04	17.00	1.247	-	-	0.06	0.184	0.230
	LTE Band 7	20M	QPSK	1	49	Left Side	10mm	Ant 31	DSI 6	21100	2535	16.20	17.00	1.202	-	-	0.16	0.012	0.014
	LTE Band 7	20M	QPSK	1	49	Right Side	10mm	Ant 31	DSI 6	21100	2535	16.20	17.00	1.202	-	-	0.05	0.059	0.071
	LTE Band 7	20M	QPSK	1	49	Bottom Side	10mm	Ant 31	DSI 6	21100	2535	16.20	17.00	1.202	-	-	-0.06	0.067	0.081
	LTE Band 7	20M	QPSK	50	24	Front	10mm	Ant 31	DSI 6	21100	2535	16.15	17.00	1.216	-	-	-0.16	0.085	0.103
	LTE Band 7	20M	QPSK	50	24	Back	10mm	Ant 31	DSI 6	21100	2535	16.15	17.00	1.216	-	-	0.01	0.186	0.226
	LTE Band 7	20M	QPSK	50	24	Left Side	10mm	Ant 31	DSI 6	21100	2535	16.15	17.00	1.216	-	-	0.13	0.008	0.010
	LTE Band 7	20M	QPSK	50	24	Right Side	10mm	Ant 31	DSI 6	21100	2535	16.15	17.00	1.216	-	-	-0.01	0.055	0.067
	LTE Band 7	20M	QPSK	50	24	Bottom Side	10mm	Ant 31	DSI 6	21100	2535	16.15	17.00	1.216	-	-	0.03	0.062	0.075
	LTE Band 41	20M	QPSK	1	49	Front	10mm	Ant 13	DSI 6	41055	2636.5	20.44	21.00	1.138	62.9	1.006	0.02	0.153	0.175
	LTE Band 41	20M	QPSK	1	49	Back	10mm	Ant 13	DSI 6	41055	2636.5	20.44	21.00	1.138	62.9	1.006	0.1	0.354	0.405
	LTE Band 41C	20M	QPSK	1	49	Back	10mm	Ant 13	DSI 6	41055 +40857	2636.5 +2616.7	19.85	21.00	1.303	62.9	1.006	0.09	0.306	0.401
	LTE Band 41	20M	QPSK	1	49	Left Side	10mm	Ant 13	DSI 6	41055	2636.5	20.44	21.00	1.138	62.9	1.006	-0.07	0.200	0.229
	LTE Band 41	20M	QPSK	1	49	Top Side	10mm	Ant 13	DSI 6	41055	2636.5	20.44	21.00	1.138	62.9	1.006	0	0.204	0.233
	LTE Band 41	20M	QPSK	50	24	Front	10mm	Ant 13	DSI 6	41055	2636.5	20.37	21.00	1.156	62.9	1.006	-0.13	0.149	0.173
	LTE Band 41	20M	QPSK	50	24	Back	10mm	Ant 13	DSI 6	41055	2636.5	20.37	21.00	1.156	62.9	1.006	0.14	0.331	0.385
	LTE Band 41	20M	QPSK	50	24	Left Side	10mm	Ant 13	DSI 6	41055	2636.5	20.37	21.00	1.156	62.9	1.006	-0.11	0.192	0.223
	LTE Band 41	20M	QPSK	50	24	Top Side	10mm	Ant 13	DSI 6	41055	2636.5	20.37	21.00	1.156	62.9	1.006	-0.03	0.196	0.228
	LTE Band 41	20M	QPSK	1	49	Front	10mm	Ant 31	DSI 6	41055	2636.5	22.23	23.00	1.194	62.9	1.006	-0.06	0.202	0.243
	LTE Band 41	20M	QPSK	1	49	Back	10mm	Ant 31	DSI 6	41055	2636.5	22.23	23.00	1.194	62.9	1.006	0.1	0.502	0.603
	LTE Band 41	20M	QPSK	1	49	Left Side	10mm	Ant 31	DSI 6	41055	2636.5	22.23	23.00	1.194	62.9	1.006	-0.03	0.018	0.022
	LTE Band 41	20M	QPSK	1	49	Right Side	10mm	Ant 31	DSI 6	41055	2636.5	22.23	23.00	1.194	62.9	1.006	0.04	0.162	0.195
	LTE Band 41	20M	QPSK	1	49	Bottom Side	10mm	Ant 31	DSI 6	41055	2636.5	22.23	23.00	1.194	62.9	1.006	0.14	0.190	0.228
	LTE Band 41	20M	QPSK	1	49	Back	10mm	Ant 31	DSI 6	39750	2506	21.94	23.00	1.276	62.9	1.006	0.09	0.376	0.483
	LTE Band 41	20M	QPSK	1	49	Back	10mm	Ant 31	DSI 6	40185	2549.5	22.06	23.00	1.242	62.9	1.006	-0.04	0.452	0.565
	LTE Band 41	20M	QPSK	1	49	Back	10mm	Ant 31	DSI 6	40620	2593	22.09	23.00	1.233	62.9	1.006	0.01	0.501	0.621
	LTE Band 41	20M	QPSK	1	49	Back	10mm	Ant 31	DSI 6	41490	2680	22.05	23.00	1.245	62.9	1.006	0.08	0.459	0.575
	LTE Band 41	20M	QPSK	50	24	Front	10mm	Ant 31	DSI 6	41055	2636.5	22.11	23.00	1.227	62.9	1.006	-0.06	0.205	0.253

	LTE Band 41	20M	QPSK	50	24	Back	10mm	Ant 31	DSI 6	41055	2636.5	22.11	23.00	1.227	62.9	1.006	0.09	0.509	0.629
	LTE Band 41	20M	QPSK	50	24	Left Side	10mm	Ant 31	DSI 6	41055	2636.5	22.11	23.00	1.227	62.9	1.006	0.03	0.024	0.030
	LTE Band 41	20M	QPSK	50	24	Right Side	10mm	Ant 31	DSI 6	41055	2636.5	22.11	23.00	1.227	62.9	1.006	0.11	0.165	0.204
	LTE Band 41	20M	QPSK	50	24	Bottom Side	10mm	Ant 31	DSI 6	41055	2636.5	22.11	23.00	1.227	62.9	1.006	0.05	0.194	0.240
	LTE Band 41	20M	QPSK	50	24	Back	10mm	Ant 31	DSI 6	39750	2506	21.82	23.00	1.312	62.9	1.006	-0.08	0.385	0.508
	LTE Band 41	20M	QPSK	50	24	Back	10mm	Ant 31	DSI 6	40185	2549.5	21.76	23.00	1.330	62.9	1.006	-0.09	0.453	0.606
32	LTE Band 41	20M	QPSK	50	24	Back	10mm	Ant 31	DSI 6	40620	2593	22.08	23.00	1.236	62.9	1.006	-0.13	0.509	**0.633**
	LTE Band 41C	20M	QPSK	50	24	Back	10mm	Ant 31	DSI 6	40620 +40422	2593 +2573.2	21.83	23.00	1.309	62.9	1.006	0.02	0.431	0.568
	LTE Band 41	20M	QPSK	50	24	Back	10mm	Ant 31	DSI 6	41490	2680	21.86	23.00	1.300	62.9	1.006	-0.09	0.470	0.615
	LTE Band 41	20M	QPSK	100	0	Back	10mm	Ant 31	DSI 6	41055	2636.5	21.92	23.00	1.282	62.9	1.006	0.08	0.455	0.587

Plot No.	Band	Mode	Test Position	Gap (mm)	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)
2450MHz															
	Bluetooth	DH5 1Mbps	Front	10mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	0.04	0.027	0.042
33	Bluetooth	DH5 1Mbps	Back	10mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	0.13	0.041	**0.064**
	Bluetooth	DH5 1Mbps	Left Side	10mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	-0.16	0.012	0.019
	Bluetooth	DH5 1Mbps	Right Side	10mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	-0.15	0.026	0.041
	Bluetooth	DH5 1Mbps	Top Side	10mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	-0.08	0.040	0.062
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Full	11	2462	19.10	20.00	1.230	98.6	1.014	0.14	0.178	0.222
34	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Full	11	2462	19.10	20.00	1.230	98.6	1.014	0.09	0.387	**0.483**
	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Full	11	2462	19.10	20.00	1.230	98.6	1.014	0	0.043	0.054
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Full	11	2462	19.10	20.00	1.230	98.6	1.014	-0.12	0.164	0.205
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Full	11	2462	19.10	20.00	1.230	98.6	1.014	-0.11	0.131	0.163
5000MHz															
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Front	10mm	Reduced	42	5210	14.39	15.50	1.291	92.63	1.080	0.1	0.041	0.057
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Back	10mm	Reduced	42	5210	14.39	15.50	1.291	92.63	1.080	-0.15	0.128	0.178
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Left Side	10mm	Reduced	42	5210	14.39	15.50	1.291	92.63	1.080	0.15	0.008	0.011
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Right Side	10mm	Reduced	42	5210	14.39	15.50	1.291	92.63	1.080	-0.13	0.133	0.185
35	WLAN5.2GHz	802.11ac-VHT80 MCS0	Top Side	10mm	Reduced	42	5210	14.39	15.50	1.291	92.63	1.080	-0.11	0.179	**0.250**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	10mm	Reduced	155	5775	14.35	15.50	1.303	92.63	1.080	-0.11	0.092	0.129
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	10mm	Reduced	155	5775	14.35	15.50	1.303	92.63	1.080	-0.09	0.540	0.760
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Side	10mm	Reduced	155	5775	14.35	15.50	1.303	92.63	1.080	0.03	0.012	0.017
36	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	10mm	Reduced	155	5775	14.35	15.50	1.303	92.63	1.080	-0.08	0.640	**0.901**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	10mm	Reduced	155	5775	14.35	15.50	1.303	92.63	1.080	0.01	0.064	0.090

15.3 Body Worn Accessory SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	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)
750MHz																		
	LTE Band 13	10M	QPSK	1	25	-	Front	15mm	Ant 13	DSI 7	23230	782	23.21	24.00	1.199	0.11	0.156	0.187
37	LTE Band 13	10M	QPSK	1	25	-	Back	15mm	Ant 13	DSI 7	23230	782	23.21	24.00	1.199	-0.02	0.158	**0.190**
	LTE Band 13	10M	QPSK	25	12	-	Front	15mm	Ant 13	DSI 7	23230	782	21.94	23.00	1.276	0.15	0.122	0.156
	LTE Band 13	10M	QPSK	25	12	-	Back	15mm	Ant 13	DSI 7	23230	782	21.94	23.00	1.276	-0.02	0.124	0.158
	LTE Band 13	10M	QPSK	1	25	-	Front	15mm	Ant 31	DSI 7	23230	782	23.25	24.00	1.189	-0.13	0.074	0.088
	LTE Band 13	10M	QPSK	1	25	-	Back	15mm	Ant 31	DSI 7	23230	782	23.25	24.00	1.189	-0.05	0.083	0.099
	LTE Band 13	10M	QPSK	25	12	-	Front	15mm	Ant 31	DSI 7	23230	782	22.09	23.00	1.233	0.1	0.058	0.072
	LTE Band 13	10M	QPSK	25	12	-	Back	15mm	Ant 31	DSI 7	23230	782	22.09	23.00	1.233	0.03	0.059	0.073
	LTE Band 12	10M	QPSK	1	25	-	Front	15mm	Ant 13	DSI 7	23095	707.5	23.31	24.00	1.172	0.09	0.092	0.108
	LTE Band 12	10M	QPSK	1	25	-	Back	15mm	Ant 13	DSI 7	23095	707.5	23.31	24.00	1.172	-0.09	0.099	0.116
	LTE Band 12	10M	QPSK	25	12	-	Front	15mm	Ant 13	DSI 7	23095	707.5	22.15	23.00	1.216	-0.1	0.076	0.092
	LTE Band 12	10M	QPSK	25	12	-	Back	15mm	Ant 13	DSI 7	23095	707.5	22.15	23.00	1.216	0.11	0.078	0.095
	LTE Band 12	10M	QPSK	1	25	-	Front	15mm	Ant 31	DSI 7	23095	707.5	23.99	24.80	1.205	0.04	0.147	0.177
38	LTE Band 12	10M	QPSK	1	25	-	Back	15mm	Ant 31	DSI 7	23095	707.5	23.99	24.80	1.205	0.01	0.149	**0.180**
	LTE Band 12	10M	QPSK	25	12	-	Front	15mm	Ant 31	DSI 7	23095	707.5	22.91	23.80	1.227	-0.02	0.135	0.166
	LTE Band 12	10M	QPSK	25	12	-	Back	15mm	Ant 31	DSI 7	23095	707.5	22.91	23.80	1.227	0.02	0.141	0.173
	LTE Band 17	10M	QPSK	1	25	-	Front	15mm	Ant 13	DSI 7	23790	710	23.89	24.50	1.151	-0.08	0.082	0.094
	LTE Band 17	10M	QPSK	1	25	-	Back	15mm	Ant 13	DSI 7	23790	710	23.89	24.50	1.151	0.1	0.115	0.132
	LTE Band 17	10M	QPSK	25	12	-	Front	15mm	Ant 13	DSI 7	23790	710	22.73	23.50	1.194	0.04	0.063	0.075
	LTE Band 17	10M	QPSK	25	12	-	Back	15mm	Ant 13	DSI 7	23790	710	22.73	23.50	1.194	0.02	0.085	0.101
	LTE Band 17	10M	QPSK	1	25	-	Front	15mm	Ant 31	DSI 7	23790	710	24.42	24.80	1.091	-0.1	0.138	0.151
39	LTE Band 17	10M	QPSK	1	25	-	Back	15mm	Ant 31	DSI 7	23790	710	24.42	24.80	1.091	-0.06	0.151	**0.165**
	LTE Band 17	10M	QPSK	25	12	-	Front	15mm	Ant 31	DSI 7	23790	710	23.46	23.80	1.081	-0.03	0.126	0.136
	LTE Band 17	10M	QPSK	25	12	-	Back	15mm	Ant 31	DSI 7	23790	710	23.46	23.80	1.081	0.12	0.145	0.157
835MHz																		
	GSM850	-	-	-	-	GPRS 2 Tx slots	Front	15mm	Ant 13	DSI 7	128	824.2	30.71	31.50	1.199	-0.02	0.125	0.150
	GSM850	-	-	-	-	GPRS 2 Tx slots	Back	15mm	Ant 13	DSI 7	128	824.2	30.71	31.50	1.199	0.01	0.131	0.157
	GSM850	-	-	-	-	GPRS 3 Tx slots	Front	15mm	Ant 31	DSI 7	128	824.2	27.76	29.50	1.493	-0.05	0.120	0.179
40	GSM850	-	-	-	-	GPRS 3 Tx slots	Back	15mm	Ant 31	DSI 7	128	824.2	27.76	29.50	1.493	-0.09	0.132	**0.197**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 13	DSI 7	4233	846.6	23.39	24.50	1.291	-0.01	0.111	0.143
41	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 13	DSI 7	4233	846.6	23.39	24.50	1.291	-0.06	0.155	**0.200**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 31	DSI 7	4233	846.6	23.28	24.50	1.324	0.01	0.098	0.130
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 31	DSI 7	4233	846.6	23.28	24.50	1.324	-0.11	0.116	0.154
	LTE Band 26	15M	QPSK	1	37	-	Front	15mm	Ant 13	DSI 7	26865	831.5	23.31	24.00	1.172	-0.09	0.130	0.152
42	LTE Band 26	15M	QPSK	1	37	-	Back	15mm	Ant 13	DSI 7	26865	831.5	23.31	24.00	1.172	0.04	0.166	**0.195**
	LTE Band 26	15M	QPSK	36	20	-	Front	15mm	Ant 13	DSI 7	26865	831.5	22.33	23.00	1.167	-0.14	0.110	0.128
	LTE Band 26	15M	QPSK	36	20	-	Back	15mm	Ant 13	DSI 7	26865	831.5	22.33	23.00	1.167	-0.07	0.132	0.154
	LTE Band 26	15M	QPSK	1	37	-	Front	15mm	Ant 31	DSI 7	26865	831.5	23.42	24.00	1.143	0.06	0.050	0.057
	LTE Band 26	15M	QPSK	1	37	-	Back	15mm	Ant 31	DSI 7	26865	831.5	23.42	24.00	1.143	0.12	0.058	0.066
	LTE Band 26	15M	QPSK	36	20	-	Front	15mm	Ant 31	DSI 7	26865	831.5	22.31	23.00	1.172	-0.02	0.041	0.048
	LTE Band 26	15M	QPSK	36	20	-	Back	15mm	Ant 31	DSI 7	26865	831.5	22.31	23.00	1.172	-0.15	0.047	0.055
1750MHz																		
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 13	DSI 7	1413	1732.6	23.65	24.50	1.216	-0.02	0.319	0.388
43	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 13	DSI 7	1413	1732.6	23.65	24.50	1.216	0.05	0.405	**0.493**
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 31	DSI 7	1413	1732.6	20.00	21.00	1.259	0.08	0.127	0.160
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 31	DSI 7	1413	1732.6	20.00	21.00	1.259	-0.15	0.212	0.267
	LTE Band 4	20M	QPSK	1	49	-	Front	15mm	Ant 31	DSI 7	20175	1732.5	20.79	22.00	1.321	-0.09	0.154	0.203
44	LTE Band 4	20M	QPSK	1	49	-	Back	15mm	Ant 31	DSI 7	20175	1732.5	20.79	22.00	1.321	-0.17	0.222	**0.293**
	LTE Band 4	20M	QPSK	50	24	-	Front	15mm	Ant 31	DSI 7	20175	1732.5	20.75	22.00	1.334	-0.07	0.146	0.195
	LTE Band 4	20M	QPSK	50	24	-	Back	15mm	Ant 31	DSI 7	20175	1732.5	20.75	22.00	1.334	0.05	0.211	0.281
	LTE Band 66	20M	QPSK	1	49	-	Front	15mm	Ant 13	DSI 7	132322	1745	23.25	24.00	1.189	-0.01	0.335	0.398

45	LTE Band 66	20M	QPSK	1	49	-	Back	15mm	Ant 13	DSI 7	132322	1745	23.25	24.00	1.189	0.13	0.408	**0.485**
	LTE Band 66	20M	QPSK	50	24	-	Front	15mm	Ant 13	DSI 7	132322	1745	22.13	23.00	1.222	0.09	0.299	0.365
	LTE Band 66	20M	QPSK	50	24	-	Back	15mm	Ant 13	DSI 7	132322	1745	22.13	23.00	1.222	0.11	0.351	0.429
	LTE Band 66	20M	QPSK	1	49	-	Front	15mm	Ant 31	DSI 7	132322	1745	20.64	21.50	1.219	0.14	0.133	0.162
	LTE Band 66	20M	QPSK	1	49	-	Back	15mm	Ant 31	DSI 7	132322	1745	20.64	21.50	1.219	-0.16	0.221	0.269
	LTE Band 66	20M	QPSK	50	24	-	Front	15mm	Ant 31	DSI 7	132322	1745	20.62	21.50	1.225	-0.04	0.121	0.148
	LTE Band 66	20M	QPSK	50	24	-	Back	15mm	Ant 31	DSI 7	132322	1745	20.62	21.50	1.225	0.16	0.199	0.244
1900MHz																		
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Front	15mm	Ant 13	DSI 7	661	1880	23.96	25.40	1.393	0.13	0.143	0.199
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Back	15mm	Ant 13	DSI 7	661	1880	23.96	25.40	1.393	0.05	0.207	0.288
	GSM1900	-	-	-	-	GPRS 4 Tx slots	Front	15mm	Ant 31	DSI 7	661	1880	24.01	24.90	1.227	0.09	0.144	0.177
46	GSM1900	-	-	-	-	GPRS 4 Tx slots	Back	15mm	Ant 31	DSI 7	661	1880	24.01	24.90	1.227	-0.07	0.261	**0.320**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 13	DSI 7	9400	1880	22.19	23.00	1.205	0.04	0.243	0.293
47	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 13	DSI 7	9400	1880	22.19	23.00	1.205	0.01	0.398	**0.480**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 31	DSI 7	9400	1880	20.61	21.00	1.094	0.06	0.102	0.112
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 31	DSI 7	9400	1880	20.61	21.00	1.094	-0.16	0.200	0.219
	LTE Band 2	20M	QPSK	1	49	-	Front	15mm	Ant 13	DSI 7	18900	1880	22.35	23.00	1.161	0.07	0.257	0.298
48	LTE Band 2	20M	QPSK	1	49	-	Back	15mm	Ant 13	DSI 7	18900	1880	22.35	23.00	1.161	-0.15	0.409	**0.475**
	LTE Band 2	20M	QPSK	50	24	-	Front	15mm	Ant 13	DSI 7	18900	1880	22.30	23.00	1.175	-0.08	0.244	0.287
	LTE Band 2	20M	QPSK	50	24	-	Back	15mm	Ant 13	DSI 7	18900	1880	22.30	23.00	1.175	-0.15	0.387	0.455
	LTE Band 2	20M	QPSK	1	49	-	Front	15mm	Ant 31	DSI 7	18900	1880	21.34	22.00	1.164	-0.05	0.131	0.153
	LTE Band 2	20M	QPSK	1	49	-	Back	15mm	Ant 31	DSI 7	18900	1880	21.34	22.00	1.164	-0.13	0.223	0.260
	LTE Band 2	20M	QPSK	50	24	-	Front	15mm	Ant 31	DSI 7	18900	1880	21.33	22.00	1.167	0.1	0.119	0.139
	LTE Band 2	20M	QPSK	50	24	-	Back	15mm	Ant 31	DSI 7	18900	1880	21.33	22.00	1.167	-0.05	0.189	0.221

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	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)
2600MHz																			
	LTE Band 7	20M	QPSK	1	49	Front	15mm	Ant 13	DSI 7	21100	2535	23.47	24.00	1.130	-	-	0.03	0.255	0.288
49	LTE Band 7	20M	QPSK	1	49	Back	15mm	Ant 13	DSI 7	21100	2535	23.47	24.00	1.130	-	-	-0.15	0.632	**0.714**
	LTE Band 7C	20M	QPSK	1	49	Back	15mm	Ant 13	DSI 7	21100 +20902	2535 +2515.2	23.31	24.00	1.172	-	-	0.05	0.551	0.646
	LTE Band 7	20M	QPSK	50	24	Front	15mm	Ant 13	DSI 7	21100	2535	22.44	23.00	1.138	-	-	0.14	0.211	0.240
	LTE Band 7	20M	QPSK	50	24	Back	15mm	Ant 13	DSI 7	21100	2535	22.44	23.00	1.138	-	-	-0.01	0.558	0.635
	LTE Band 7	20M	QPSK	1	49	Front	15mm	Ant 31	DSI 7	21100	2535	17.16	18.00	1.213	-	-	0.04	0.060	0.073
	LTE Band 7	20M	QPSK	1	49	Back	15mm	Ant 31	DSI 7	21100	2535	17.16	18.00	1.213	-	-	-0.01	0.121	0.147
	LTE Band 7C	20M	QPSK	1	49	Back	15mm	Ant 31	DSI 7	21100 +20902	2535 +2515.2	16.94	18.00	1.276	-	-	-0.08	0.102	0.130
	LTE Band 7	20M	QPSK	50	24	Front	15mm	Ant 31	DSI 7	21100	2535	17.14	18.00	1.219	-	-	-0.06	0.054	0.066
	LTE Band 7	20M	QPSK	50	24	Back	15mm	Ant 31	DSI 7	21100	2535	17.14	18.00	1.219	-	-	0.1	0.096	0.117
	LTE Band 41	20M	QPSK	1	49	Front	15mm	Ant 13	DSI 7	41055	2636.5	23.51	24.00	1.119	62.9	1.006	0.13	0.172	0.194
50	LTE Band 41	20M	QPSK	1	49	Back	15mm	Ant 13	DSI 7	41055	2636.5	23.51	24.00	1.119	62.9	1.006	-0.09	0.308	**0.347**
	LTE Band 41C	20M	QPSK	1	49	Back	15mm	Ant 13	DSI 7	41055 +40857	2636.5 +2616.7	22.82	24.00	1.312	62.9	1.006	0.03	0.202	0.267
	LTE Band 41	20M	QPSK	50	24	Front	15mm	Ant 13	DSI 7	41055	2636.5	22.38	23.00	1.153	62.9	1.006	-0.04	0.140	0.162
	LTE Band 41	20M	QPSK	50	24	Back	15mm	Ant 13	DSI 7	41055	2636.5	22.38	23.00	1.153	62.9	1.006	0.02	0.267	0.310
	LTE Band 41	20M	QPSK	1	49	Front	15mm	Ant 31	DSI 7	41055	2636.5	22.65	23.50	1.216	62.9	1.006	0.12	0.118	0.144
	LTE Band 41	20M	QPSK	1	49	Back	15mm	Ant 31	DSI 7	41055	2636.5	22.65	23.50	1.216	62.9	1.006	0.08	0.269	0.329
	LTE Band 41C	20M	QPSK	1	49	Back	15mm	Ant 31	DSI 7	41055 +40857	2636.5 +2616.7	22.31	23.50	1.315	62.9	1.006	-0.05	0.217	0.287
	LTE Band 41	20M	QPSK	50	24	Front	15mm	Ant 31	DSI 7	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.16	0.094	0.117
	LTE Band 41	20M	QPSK	50	24	Back	15mm	Ant 31	DSI 7	41055	2636.5	22.06	23.00	1.242	62.9	1.006	0.1	0.237	0.296

Plot No.	Band	Mode	Test Position	Gap (mm)	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)
2450MHz															
	Bluetooth	DH5 1Mbps	Front	15mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	-0.11	0.012	0.019
51	Bluetooth	DH5 1Mbps	Back	15mm	Full	39	2441	11.20	12.00	1.202	76.96	1.299	-0.08	0.020	**0.031**
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Full	11	2462	19.10	20.00	1.230	98.6	1.014	-0.1	0.094	0.117
52	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Full	11	2462	19.10	20.00	1.230	98.6	1.014	0.01	0.184	**0.230**
5000MHz															
	WLAN5.3GHz	802.11a 6Mbps	Front	15mm	Standalone	64	5320	18.31	19.00	1.172	98.11	1.019	0.07	0.108	0.129
53	WLAN5.3GHz	802.11a 6Mbps	Back	15mm	Standalone	64	5320	18.31	19.00	1.172	98.11	1.019	-0.11	0.374	**0.447**
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Front	15mm	Simultaneous	58	5290	14.25	15.50	1.334	92.63	1.080	-0.13	0.042	0.060
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Back	15mm	Simultaneous	58	5290	14.25	15.50	1.334	92.63	1.080	0.1	0.117	0.169
	WLAN5.5GHz	802.11a 6Mbps	Front	15mm	Standalone	100	5500	18.23	19.00	1.194	98.11	1.019	0.16	0.162	0.197
54	WLAN5.5GHz	802.11a 6Mbps	Back	15mm	Standalone	100	5500	18.23	19.00	1.194	98.11	1.019	-0.05	0.302	**0.367**
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	15mm	Simultaneous	138	5690	14.44	15.50	1.276	92.63	1.080	-0.13	0.073	0.101
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	15mm	Simultaneous	138	5690	14.44	15.50	1.276	92.63	1.080	-0.05	0.194	0.267
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	15mm	Standalone	155	5775	14.88	16.00	1.294	92.63	1.080	0.01	0.021	0.029
55	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	15mm	Standalone	155	5775	14.88	16.00	1.294	92.63	1.080	-0.16	0.334	**0.467**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	15mm	Simultaneous	155	5775	14.35	15.50	1.303	92.63	1.080	0.14	0.017	0.024
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	15mm	Simultaneous	155	5775	14.35	15.50	1.303	92.63	1.080	-0.08	0.295	0.415

15.4 Product specific 10g SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	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)
1750MHz																		
56	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	0mm	Ant 13	DSI 4	1413	1732.6	20.03	20.50	1.114	-0.09	1.430	**1.593**
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	14mm	Ant 13	DSI 7	1413	1732.6	23.65	24.50	1.216	-0.07	0.360	0.438
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	0mm	Ant 13	DSI 5	1413	1732.6	17.12	17.50	1.091	0.04	0.737	0.804
	LTE Band 4	20M	QPSK	1	49	-	Top Side	0mm	Ant 13	DSI 4	20175	1732.5	20.05	21.00	1.245	0.13	1.380	1.717
	LTE Band 4	20M	QPSK	1	49	-	Top Side	14mm	Ant 13	DSI 7	20175	1732.5	22.97	24.00	1.268	-0.09	0.304	0.385
57	LTE Band 4	20M	QPSK	50	24	-	Top Side	0mm	Ant 13	DSI 4	20175	1732.5	20.02	21.00	1.253	-0.08	1.480	**1.855**
	LTE Band 4	20M	QPSK	50	24	-	Top Side	14mm	Ant 13	DSI 7	20175	1732.5	21.97	23.00	1.268	0.1	0.246	0.312
	LTE Band 4	20M	QPSK	1	49	-	Top Side	0mm	Ant 13	DSI 5	20175	1732.5	18.47	19.50	1.268	0.16	1.000	1.268
	LTE Band 4	20M	QPSK	50	24	-	Top Side	0mm	Ant 13	DSI 5	20175	1732.5	18.45	19.50	1.274	0.16	1.050	1.337
	LTE Band 66	20M	QPSK	1	49	-	Top Side	0mm	Ant 13	DSI 4	132322	1745	19.23	20.00	1.194	0.12	1.120	1.337
	LTE Band 66	20M	QPSK	1	49	-	Top Side	14mm	Ant 13	DSI 7	132322	1745	23.25	24.00	1.189	0.05	0.318	0.378
58	LTE Band 66	20M	QPSK	50	24	-	Top Side	0mm	Ant 13	DSI 4	132322	1745	19.20	20.00	1.202	0.15	1.210	**1.455**
	LTE Band 66	20M	QPSK	50	24	-	Top Side	14mm	Ant 13	DSI 7	132322	1745	22.13	23.00	1.222	0.09	0.349	0.426
	LTE Band 66	20M	QPSK	1	49	-	Top Side	0mm	Ant 13	DSI 5	132322	1745	18.28	19.00	1.180	-0.12	0.908	1.072
	LTE Band 66	20M	QPSK	50	24	-	Top Side	0mm	Ant 13	DSI 5	132322	1745	18.25	19.00	1.189	-0.01	0.945	1.123
1900MHz																		
59	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	0mm	Ant 13	DSI 4	9400	1880	17.71	18.50	1.199	0.01	0.976	**1.171**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	14mm	Ant 13	DSI 7	9400	1880	22.19	23.00	1.205	0.06	0.431	0.519
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	0mm	Ant 13	DSI 5	9400	1880	16.24	17.00	1.191	0.09	0.912	1.086
60.	LTE Band 2	20M	QPSK	1	49	-	Top Side	0mm	Ant 13	DSI 4	18900	1880	17.83	18.50	1.167	-0.14	0.950	**1.108**
	LTE Band 2	20M	QPSK	1	49	-	Top Side	14mm	Ant 13	DSI 7	18900	1880	22.35	23.00	1.161	0.01	0.433	0.503
	LTE Band 2	20M	QPSK	50	24	-	Top Side	0mm	Ant 13	DSI 4	18900	1880	17.81	18.50	1.172	0.15	0.931	1.091
	LTE Band 2	20M	QPSK	1	49	-	Top Side	0mm	Ant 13	DSI 5	18900	1880	16.35	17.00	1.161	-0.11	0.667	0.775
	LTE Band 2	20M	QPSK	50	24	-	Top Side	0mm	Ant 13	DSI 5	18900	1880	16.31	17.00	1.172	-0.08	0.627	0.735
2600MHz																		
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 13	DSI 4	21100	2535	18.44	19.00	1.138	-0.1	1.220	1.388
	LTE Band 7	20M	QPSK	1	49	-	Top Side	0mm	Ant 13	DSI 4	21100	2535	18.44	19.00	1.138	-0.13	0.724	0.824
	LTE Band 7	20M	QPSK	1	49	-	Back	12mm	Ant 13	DSI 7	21100	2535	23.47	24.00	1.130	0.09	0.428	0.484
	LTE Band 7	20M	QPSK	1	49	-	Top Side	14mm	Ant 13	DSI 7	21100	2535	23.47	24.00	1.130	0.02	0.318	0.359
61	LTE Band 7	20M	QPSK	50	24	-	Back	0mm	Ant 13	DSI 4	21100	2535	18.40	19.00	1.148	0.12	1.260	**1.447**
	LTE Band 7C	20M	QPSK	50	24	-	Back	0mm	Ant 13	DSI 4	21100 +20902	2535 +2515.2	18.32	19.00	1.169	0.08	1.200	1.403
	LTE Band 7	20M	QPSK	50	24	-	Top Side	0mm	Ant 13	DSI 4	21100	2535	18.40	19.00	1.148	-0.01	0.728	0.836
	LTE Band 7	20M	QPSK	50	24	-	Back	12mm	Ant 13	DSI 7	21100	2535	22.44	23.00	1.138	-0.04	0.446	0.507
	LTE Band 7	20M	QPSK	50	24	-	Top Side	14mm	Ant 13	DSI 7	21100	2535	22.44	23.00	1.138	-0.01	0.331	0.377
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 13	DSI 5	21100	2535	17.49	18.00	1.125	0.16	0.991	1.114
	LTE Band 7	20M	QPSK	1	49	-	Top Side	0mm	Ant 13	DSI 5	21100	2535	17.49	18.00	1.125	0.1	0.570	0.641
	LTE Band 7	20M	QPSK	50	24	-	Back	0mm	Ant 13	DSI 5	21100	2535	17.44	18.00	1.138	-0.07	1.010	1.149
	LTE Band 7C	20M	QPSK	50	24	-	Back	0mm	Ant 13	DSI 5	21100 +20902	2535 +2515.2	17.29	18.00	1.178	-0.04	0.970	1.142
	LTE Band 7	20M	QPSK	50	24	-	Top Side	0mm	Ant 13	DSI 5	21100	2535	17.44	18.00	1.138	0.05	0.574	0.653

Plot No.	Band	Mode	Test Position	Gap (mm)	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)	Reported 10g SAR (W/kg)
5000MHz															
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	Standalone	64	5320	18.31	19.00	1.172	98.11	1.019	0	0.531	0.634
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Standalone	64	5320	18.31	19.00	1.172	98.11	1.019	0.04	0.763	0.911
	WLAN5.3GHz	802.11a 6Mbps	Left Side	0mm	Standalone	64	5320	18.31	19.00	1.172	98.11	1.019	0.08	0.048	0.057
62	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Standalone	64	5320	18.31	19.00	1.172	98.11	1.019	0.08	1.300	**1.553**
	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Standalone	64	5320	18.31	19.00	1.172	98.11	1.019	-0.16	0.911	1.088
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Front	0mm	Simultaneous	58	5290	14.25	15.50	1.334	92.63	1.080	-0.01	0.205	0.295
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Back	0mm	Simultaneous	58	5290	14.25	15.50	1.334	92.63	1.080	-0.06	0.256	0.369
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Simultaneous	58	5290	14.25	15.50	1.334	92.63	1.080	0.13	0.018	0.026
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Simultaneous	58	5290	14.25	15.50	1.334	92.63	1.080	0	0.402	0.579
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Simultaneous	58	5290	14.25	15.50	1.334	92.63	1.080	0.13	0.279	0.402
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	Standalone	100	5500	18.23	19.00	1.194	98.11	1.019	0	0.596	0.725
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Standalone	100	5500	18.23	19.00	1.194	98.11	1.019	0.02	0.793	0.965
	WLAN5.5GHz	802.11a 6Mbps	Left Side	0mm	Standalone	100	5500	18.23	19.00	1.194	98.11	1.019	-0.06	0.044	0.054
63	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Standalone	100	5500	18.23	19.00	1.194	98.11	1.019	-0.04	1.180	**1.436**
	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Standalone	100	5500	18.23	19.00	1.194	98.11	1.019	-0.06	0.850	1.034
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	0mm	Simultaneous	138	5690	14.44	15.50	1.276	92.63	1.080	-0.01	0.261	0.360
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	0mm	Simultaneous	138	5690	14.44	15.50	1.276	92.63	1.080	0.09	0.312	0.430
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Simultaneous	138	5690	14.44	15.50	1.276	92.63	1.080	-0.12	0.017	0.023
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Simultaneous	138	5690	14.44	15.50	1.276	92.63	1.080	0.1	0.515	0.710
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Simultaneous	138	5690	14.44	15.50	1.276	92.63	1.080	0.13	0.321	0.443
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	0mm	Standalone	155	5775	14.88	16.00	1.294	92.63	1.080	0.17	0.566	0.791
64	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Standalone	155	5775	14.88	16.00	1.294	92.63	1.080	0.03	0.956	**1.336**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	0mm	Simultaneous	155	5775	14.35	15.50	1.303	92.63	1.080	-0.08	0.489	0.688
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Simultaneous	155	5775	14.35	15.50	1.303	92.63	1.080	-0.02	0.866	1.219

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product specific 10g SAR
1.	WWAN + 2.4GHz WLAN	Yes	Yes	Yes	Yes
2.	WWAN + 5GHz WLAN	Yes	Yes	Yes	Yes
3.	WWAN + Bluetooth	Yes	Yes	Yes	Yes

General Note:

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), and LTE supports VoLTE function.
2. EUT will choose each GSM, WCDM, and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. This device WLAN 2.4GHz supports hotspot operation and Bluetooth support tethering applications.
4. This device 2.4GHz WLAN/ 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).
5. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
6. WLAN 2.4GHz and Bluetooth share the same antenna, and cannot transmit simultaneously.
7. According to the EUT characteristic, 5GHz and Bluetooth cannot transmit simultaneously.
8. According to the EUT characteristic, WLAN 2.4GHz and WLAN 5GHz cannot transmit simultaneously.
9. For distance SAR and non-distance SAR, always chose higher SAR to do co-located analysis.
10. The reported SAR summation is calculated based on the same configuration and test position
11. 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 Head Exposure Conditions

Exposure Position	1	3	6	9	1+3	1+6	1+9
	WWAN	WLAN2.4GHz	WLAN5GHz	Bluetooth	Summed	Summed	Summed
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Right Cheek	0.682	0.310	0.150	0.075	0.99	0.83	**0.76**
Right Tilted	0.541	0.404	0.174	0.103	0.95	0.72	0.64
Left Cheek	0.503	0.746	0.822	0.205	**1.25**	1.33	0.71
Left Tilted	0.499	0.553	0.302	0.123	1.05	0.80	0.62

16.2 Hotspot Exposure Conditions

Exposure Position	1	3	6	9	1+3	1+6	1+9
	WWAN	WLAN2.4GHz	WLAN5GHz	Bluetooth	Summed	Summed	Summed
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Front	0.298	0.222	0.129	0.042	0.52	0.43	0.34
Back	0.633	0.483	0.760	0.064	1.12	**1.39**	0.70
Left side	0.229	0.054	0.017	0.019	0.28	0.25	0.25
Right side	0.204	0.205	0.901	0.041	0.41	1.11	0.25
Top side	0.509	0.163	0.250	0.062	0.67	0.76	0.57
Bottom side	0.572				0.57	0.57	0.57

16.3 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	3	6	9	1+3	1+6	1+9
		WWAN	WLAN2.4GHz	WLAN5GHz	Bluetooth	Summed	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
ALL Bands	Front	0.398	0.117	0.101	0.019	0.52	0.50	0.42
	Back	0.714	0.230	0.415	0.031	0.94	1.13	0.75

16.4 Product specific 10g SAR Exposure Conditions

WWAN Band	Exposure Position	1	6	1+6
		WWAN	WLAN5GHz	Summed
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
ALL Bands	Front		0.360	0.36
	Back	1.149	0.688	**1.84**
	Left side		0.026	0.03
	Right side		1.219	1.22
	Top side	1.337	0.443	1.78

Note: For Bluetooth Product specific 10g stand-alone SAR is not required for a transmitter or antenna, due to 1g hotspot SAR is <1.2W/kg.

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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 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

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

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

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

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

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

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

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

[13] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

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