

FCC SAR Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT2431-2, XT2431-3
FCC ID : IHDT56AM6
STANDARD : FCC 47 CFR Part 2 (2.1093)

We, Sporton International Inc. (Kunshan), 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. (Kunshan), the test report shall not be reproduced except in full.



Approved by: Si Zhang



Sporton International Inc. (Kunshan)

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China**



Table of Contents

1. Statement of Compliance	4
2. Administration Data	6
3. Data Reuse Approach	7
3.1 Introduction Section	7
3.2 Model Difference Information	7
3.3 Reference detail Section	7
4. Guidance Applied	8
5. Equipment Under Test (EUT) Information	9
5.1 General Information	9
5.2 General LTE SAR Test and Reporting Considerations	11
5.3 General 5G NR SAR Test and Reporting Considerations	14
6. Proximity Sensor Triggering Test	16
7. RF Exposure Limits	18
7.1 Uncontrolled Environment	18
7.2 Controlled Environment	18
8. Specific Absorption Rate (SAR)	19
8.1 Introduction	19
8.2 SAR Definition	19
9. System Description and Setup	20
9.1 E-Field Probe	21
9.2 Data Acquisition Electronics (DAE)	21
9.3 Phantom	22
9.4 Device Holder	23
10. Measurement Procedures	24
10.1 Spatial Peak SAR Evaluation	24
10.2 Power Reference Measurement	25
10.3 Area Scan	25
10.4 Zoom Scan	26
10.5 Volume Scan Procedures	26
10.6 Power Drift Monitoring	26
11. Test Equipment List	27
12. System Verification	28
12.1 Tissue Simulating Liquids	28
12.2 Tissue Verification	28
12.3 System Performance Check Results	30
13. RF Exposure Positions	32
13.1 Ear and handset reference point	32
13.2 Definition of the cheek position	33
13.3 Definition of the tilt position	34
13.4 Body Worn Accessory	35
13.5 Product Specific 10g SAR Exposure	36
13.6 Wireless Router	36
14. Conducted RF Output Power (Unit: dBm)	37
15. Antenna Location	51
16. Spot Check SAR Test Results	52
16.1 Head SAR	55
16.2 Hotspot SAR	59
16.3 Body Worn Accessory SAR	63
16.4 Product specific 10g SAR	67
16.5 Repeated SAR Measurement	71
17. Simultaneous Transmission Analysis	72
17.1 Head Exposure Conditions	73
17.2 Hotspot Exposure Conditions	74
17.3 Body-Worn Accessory Exposure Conditions	76
17.4 Product specific 10g SAR Exposure Conditions	78
17.5 SPLSR Evaluation and Analysis	79
18. Uncertainty Assessment	94
19. References	95
Appendix A. Plots of System Performance Check	
Appendix B. Plots of High SAR Measurement	
Appendix C. DASY Calibration Certificate	
Appendix D. Test Setup Photos	



Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA352916-13	Rev. 01	Initial issue of report.	Jan. 05, 2024



1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, XT2431-2, XT2431-3**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 5mm)	Body-worn (Separation 5mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.67	1.34	1.34	1.59
		GSM1900	0.10	1.12	1.29	
	WCDMA	WCDMA II	0.13	1.42	1.44	
		WCDMA IV	0.13	1.39	1.41	
		WCDMA V	0.34	1.37	1.37	
	LTE	LTE Band 2	0.13	1.38	1.31	
		LTE Band 4	0.11	1.14	1.07	
		LTE Band 12/17	0.22	0.77	0.69	
		LTE Band 26	0.29	1.33	1.33	
		LTE Band 41/38	1.11	1.38	1.38	
		LTE Band 42	0.90	0.65	0.86	
	5G NR	FR1 n41	1.00	0.58	1.02	
FR1 n77/n78		0.74	0.74	1.02		
DTS	WLAN	2.4GHz WLAN	0.93	0.65	1.39	1.57
NII		5GHz WLAN	1.19	0.71	1.13	1.59
DSS	Bluetooth	2.4GHz Bluetooth	0.47	0.49	0.44	1.58
Highest 10g SAR Summary						
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)			Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	GSM	GSM850	3.54			3.79
		GSM1900	3.41			
	WCDMA	WCDMA II	3.58			
		WCDMA IV	3.37			
		WCDMA V	1.57			
	LTE	LTE Band 2	3.52			
		LTE Band 4	3.34			
		LTE Band 26	2.04			
		LTE Band 41/38	2.85			
		LTE Band 42	2.09			
	5G NR	FR1 n41	2.68			
		FR1 n77/n78	2.68			
DTS	WLAN	2.4GHz WLAN	2.10			3.79
NII		5GHz WLAN	1.91			3.79
Date of Testing:			2023/12/1 ~ 2023/12/17			
Remark:						
1. This device supports LTE B17 / B38 and B12 / B41. Since the supported frequency span for LTE B17 / B38 falls completely within the supports frequency span for LTE B12 / B41, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B12 / B41.						
2. This device supports 5GNR n78 and n77. Since the supported frequency span for 5GNR n78 falls completely within the supports frequency span for n77, both 5GNR bands have the same target power, and both 5GNR bands share the same transmission path; therefore, SAR was only assessed for n77.						

Declaration of Conformity:



The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 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. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-KS	CN1257	314309

Applicant	
Company Name	Motorola Mobility LLC
Address	222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

Manufacturer	
Company Name	Motorola Mobility LLC
Address	222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

3. Data Reuse Approach

3.1 Introduction Section

This application re-uses data collected on a similar device, FCC ID: IHDT56AM4 (reference model) and FCC ID: IHDT56AM6 (variant model). Due to the same design are identical between parent model and variant model, SAR data reuse is requested and spot check data in this report is used to justify the SAR data reuse.

Per KDB 484596 D01 v02r02, the deviation of variant model 1g SAR and 10g SAR spot check result was no larger than 3 dB, the WWAN/WLAN/BT maximum SAR summary was always choose the higher SAR between parent model and variant model.

The applicant should take full responsibility that the test data as referenced in this report represent compliance for this FCC ID: IHDT56AM6

3.2 Model Difference Information

The **main** difference between FCC ID: IHDT56AM4 and FCC ID: IHDT56AM6 is as below:

- Removed LTE B5/7/13/25/40/66 and 5G NR n2/n5/n7/n26/n40/n66
- Added LTE B11/18/19 and 5G NR n41 /n77.

Other differences and all the details of similarity and difference can be found in the confidential documents (XT2431-2, XT2431-3_Operational Description of Product Equality Declaration).

3.3 Reference detail Section

Rule Part	Equipment Class	Wireless Technology	Frequency Band (MHz)	FCC ID (Reference)	Type Grant/ Permissive Change	Reference Title	FCC ID Filling (Variant)	Test on the variant
Part 2.1093	PCE	GSM	GSM850/1900				IHDT56AM6	Full Test
		WCDMA	B2/4/5				IHDT56AM6	Full Test
		LTE	B41 (Ant 1) / B42	IHDT56AM4	Original Grant	FA352916	IHDT56AM6	Spot check
		LTE	B2/4/12/17/26 B38/41 (Ant 4)				IHDT56AM6	Full Test
		5G NR	n41/n77/n78				IHDT56AM6	Full Test
	DTS	BLE/ Wi-Fi	2400~2483.5	IHDT56AM4	Original Grant	FA352916	IHDT56AM6	Spot check
	NII	Wi-Fi	5150 ~ 5250 5250 ~ 5350 5470 ~ 5725 5725 ~ 5850	IHDT56AM4	Original Grant	FA352916	IHDT56AM6	Spot check
	DSS	Bluetooth	2400~2483.5	IHDT56AM4	Original Grant	FA352916	IHDT56AM6	Spot check
	DXX	NFC	13.56				IHDT56AM6	Full Test

4. 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 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01
- FCC KDB 484596 D01 Referencing Test Data v02r02

5. Equipment Under Test (EUT) Information

5.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2431-2, XT2431-3
FCC ID	IHDT56AM6
IMEI Code	Sample 1: IMEI 1: 355221240002579 IMEI 2: 355221240002587 Sample 2: IMEI 1: 358738360011558 IMEI 2: 358738360011566
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 12: 699 MHz ~ 716 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 42: 3450 MHz ~ 3550 MHz 5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n77: 3700 MHz ~ 3980 MHz 5G NR n78: 3700 MHz ~ 3800 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 ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	GSM/GPRS/EGPRS AMR / RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM 5G NR : CP-OFDM / DFT-s-OFDM, PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM WLAN 2.4GHz : 802.11b/g/n HT20 WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK
HW Version	DVT
SW Version	U1TD34.37
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	Identical Prototype
Remark: 1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation. 2. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications. 3. This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports	

- WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only).
4. This device does not support DTM operation and supports GPRS/EGPRS mode up to multi-slot class 12.
 5. For dual SIM card mobile has single SIM slots + eSIM (electronic SIM) and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active).
 6. The device implements Proximity sensors/receiver detect mechanism/hotspot trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). The device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to appendix E. power table.
 7. For WLAN when transmit simultaneous with WWAN, power reduction will be activated to head exposure conditions. For WLAN when transmit simultaneous with WWAN and Proximity sensors trigger, power reduction will be activated to body-worn and Handheld exposure conditions.
 8. This device supports HPUE for LTE Band 41 with class 2 level, HPUE power has been measured separately.
 9. For some WWAN bands, sensor on power level is higher than hotspot power level, so front/back sensor on SAR can represent hotspot conservatively.
 10. For 5GNR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
 11. For 5GNR FDD/TDD supports SCS15KHz and SCS30KHz, after verification for 30KHz at FDD power level is less than 15KHz at FDD power level, also verification for 15KHz at TDD power level is less than 30KHz at TDD power level, so only show 15KHz at FDD power and 30KHz at TDD power, and chose higher power which is SCS15KHz for FDD bands and SCS30KHz for TDD bands to perform SAR testing.
 12. For 5GNR EN-DC mode, standalone SAR performed for 5GNR NSA band with the maximum power, EN-DC SAR summed EN-DC mode 5GNR standalone SAR and LTE standalone SAR, the result of EN-DC SAR is more conservatively.
 13. There are two samples, the different between them refer to the XT2431-2, XT2431-3_Operational Description of Product Equality Declaration which is exhibit separately. According to the differences, we choose sample 1 to perform full SAR testing and sample 2 to verify the worst case of sample 1.
 14. The two model names are only for different market purpose, and all the others are the same.
 15. This device has NFC function and the NFC SAR report will be separately submitted.
 16. This device supports 5GNR FR1 bands as following table, including NSA mode and SA mode. NSA and SA mode performed SAR separately.

<5G NR>

Mode	Band	Duplex	SCS(KHz)	Bandwidths(BW)
NSA	n77	TDD	15	10, 15, 20, 30, 40, 50
			30	10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100
	n78	TDD	15	10, 15, 20, 30, 40, 50
			30	10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100
SA	n41	TDD	15	10, 15, 20, 30, 40, 50
			30	10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100
	n77	TDD	15	10, 15, 20, 30, 40, 50
			30	10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100
	n78	TDD	15	10, 15, 20, 30, 40, 50
			30	10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100

5.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																																													
FCC ID	IHDT56AM6																																																																												
Equipment Name	Mobile Cellular 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 12: 699 MHz ~ 716 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 42: 3450 MHz ~ 3550MHz																																																																												
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 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 42: 5MHz, 10MHz, 15MHz, 20MHz																																																																												
uplink modulations used	QPSK / 16QAM / 64QAM																																																																												
LTE Voice / Data requirements	Voice and Data																																																																												
LTE Release Version	R15, Cat13																																																																												
CA Support	Supported, Uplink and Downlink																																																																												
LTE MPR permanently built-in by design	<table><tr><th colspan="8">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</th></tr><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr><tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr><tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr><tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr></table>							Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3								Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
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/hotspot detect mechanism, head/body-worn /hotspot/extremity will trigger reduced power for some bands applied to satisfy SAR compliance, the detail please referred to section 14.																																																																												
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power verification please referred to section 14.																																																																												
LTE Carrier Aggregation Additional Information	1. This device supports LTE Carrier Aggregation (CA) in the uplink for intra-band with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per FCC Guidance. 2. This device supports maximum of 3 carriers in the downlink and 2 carriers in the uplink.																																																																												

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 12												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704	23060	704	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711	23130	711	23130	711
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)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5	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

<3450 MHz ~ 3550 MHz>

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

<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 12	Yes	Yes	Yes	Yes		
LTE Band 17			Yes	Yes		
LTE Band 38			Yes	Yes	Yes	Yes
LTE Band 41			Yes	Yes	Yes	Yes

2) LTE Bands tune up:

Band	Antenna	Head ECI 2 Receiver on Tune-up Limit	Body Worn ECI 3 Sensor on Tune-up Limit	Hotspot ECI 7 Tune-up Limit	Extremity ECI 6 Handheld Tune-up Limit	Sensor Off ECI4 Tune-up Limit	Default Tune-up Limit
LTE Band 12	Ant 0	24	24	24	24	24	24
LTE Band 17		24	24	24	24	24	24
LTE Band 38	Ant 4	16	17.5	12	19	24	24
LTE Band 41		16	17.5	12	19	24	24

5.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information	
Operating Frequency Range of each 5G NR transmission band	5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n77: 3700 MHz ~ 3980 MHz 5G NR n78: 3700 MHz ~ 3800 MHz
Channel Bandwidth	The detail please refers to section 4.1 5G NR FR1 bands table.
SCS	FDD/TDD: SCS15KHz/SCS30KHz
uplink modulations used	DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM
A-MPR (Additional MPR) disabled for SAR Testing?	Yes
LTE Anchor Bands for n77	LTE B41
LTE Anchor Bands for n78	LTE B41

NR Band 41 SCS15KHz												
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	500202	2501.01	500700	2503.5	501204	2506.02	502200	2511	503202	2516.01	504204	2521.02
M	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99
H	537000	2685	536496	2682.48	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99

NR Band 41 SCS30KHz																						
Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz		
Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	500202	2501.01	500700	2503.5	501204	2506.02	502200	2511	503202	2516.01	504204	2521.02	505200	2526	500202	2501.01	507204	2536.02	508200	2541	509202	2546.01
M	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99
H	537000	2685	536496	2682.48	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	537000	2685	529998	2649.99	528996	2644.98	528000	2640

NR Band 77 SCS15KHz												
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	647000	3705	647168	3707.52	647334	3710.01	647668	3715.02	648000	3720	648334	3725.01
M	656000	3840	656000	3840	656000	3840	656000	3840.00	656000	3840	656000	3840
H	665000	3975	664832	3972.48	664666	3969.99	664332	3964.98	664000	3960	663666	3954.99

NR Band 77 SCS30KHz																						
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	647000	3705	647168	3707.52	647334	3710.01	647668	3715.02	648000	3720	648334	3725.01	648668	3730.02	649000	3735	649334	3740.01	649668	3745.02	650000	3750
M	656000	3840	656000	3840	656000	3840	656000	3840.00	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840
H	665000	3975	664832	3972.48	664666	3969.99	664332	3964.98	664000	3960	663666	3954.99	663332	3949.98	663000	3945	662666	3939.99	662332	3934.98	662000	3930

NR Band 78 SCS15KHz												
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	647000	3705	647168	3707.52	647334	3710.01	647668	3715.02	648000	3720	648334	3725.01
M	650000	3750	650000	3750	650000	3750	650000	3750.00	650000	3750	650000	3750
H	653000	3795	652832	3792.48	652666	3789.99	652332	3784.98	652000	3780	651666	3774.99

NR Band 78 SCS30KHz																						
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	647000	3705	647168	3707.52	647334	3710.01	647668	3715.02	648000	3720	648334	3725.01	648668	3730.02	649000	3735	649334	3740.01	649668	3745.02		
M	650000	3750	650000	3750	650000	3750	650000	3750.00	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750
H	653000	3795	652832	3792.48	652666	3789.99	652332	3784.98	652000	3780	651666	3774.99	651332	3769.98	651000	3765	650666	3759.99	650332	3754.98		

<For NR Overlap Bands Description>
1) NR Bands BW

Band	Duplex	SCS(KHz)	Bandwidths(BW)
n77	TDD	15	10, 15, 20, 30, 40, 50
		30	10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100
n78	TDD	15	10, 15, 20, 30, 40, 50
		30	10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100

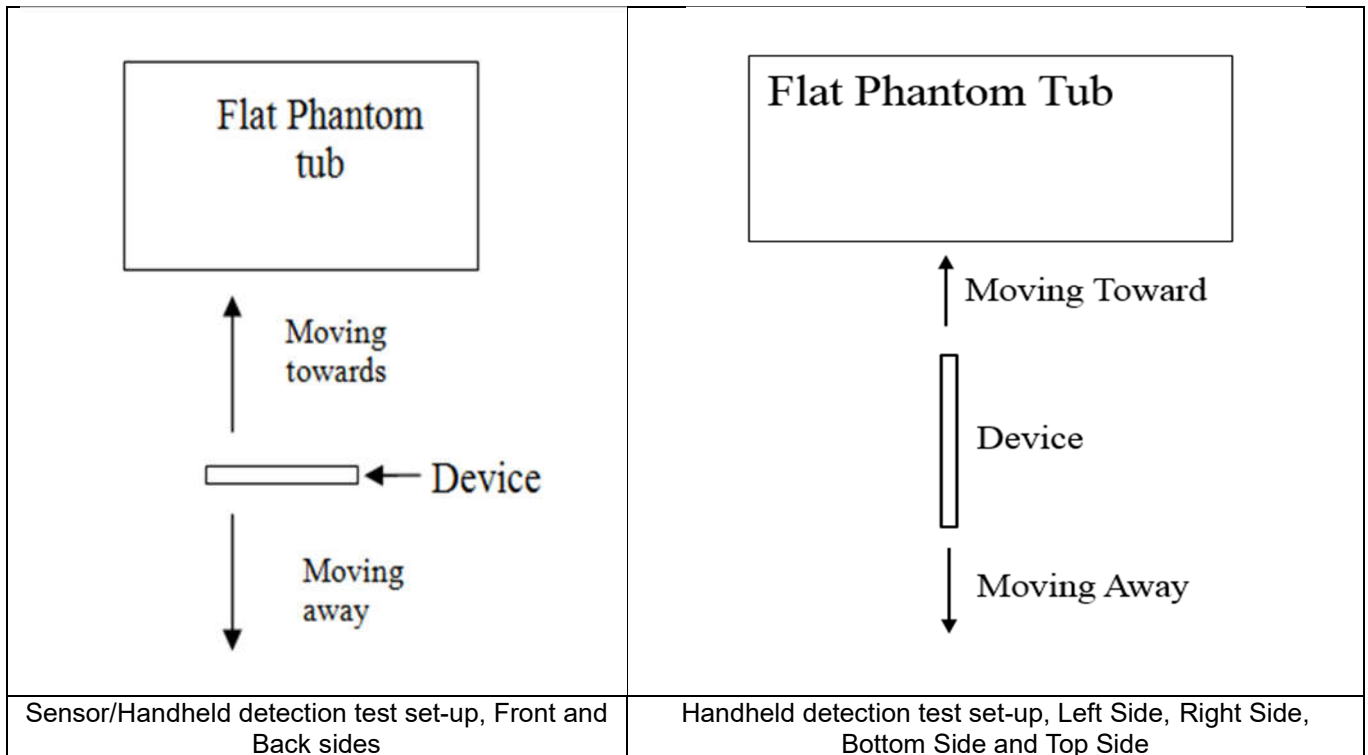
2) NR Bands Tune up:

Band	Antenna	Head ECI 2 Receiver on Tune-up Limit	Body Worn ECI 3 Sensor on Tune-up Limit	Hotspot ECI 7 Tune-up Limit	Extremity ECI 6 Handheld Tune-up Limit	Sensor Off ECI4 Tune-up Limit	Default Tune-up Limit
5G NR n77	Ant 5	17	17	15	20.5	24	24
5G NR n78		17	17	15	20.5	24	24
5G NR n77	Ant 1	20	20	20	20	20	20
5G NR n78		20	20	20	20	20	20
5G NR n77	Ant 2	21	18	16	21	21	21
5G NR n78		21	18	16	21	21	21
5G NR n77	Ant 7	19.5	18.5	16.5	20.5	20.5	20.5
5G NR n78		19.5	18.5	16.5	20.5	20.5	20.5

6. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance>:

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 (5850MHz) and lowest (835MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the top and bottom ends of the phone are utilized to determine when the device comes in proximity of the user's body at the front or back of the device.
3. The output power will reduce to body worn power level when top and bottom sensor pad be detected.
4. The sensors used to detect the proximity of the user's body at the front or back surface of the device use a detection threshold distance. The data shown in the sections below shows the distance(s). When front or back body worn condition is detected reduced power will be active.
5. The device employs proximity sensors also can detect the presence of the user's a finger or hand when handheld state at the front/back/top/bottom/left/right sides of the device. When front/back/top/bottom/left/right sides of handheld condition is detected reduced power will be active.
6. 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:



<P-Sensor>

Proximity Sensor Triggering Distance (mm)				
Position	Front		Back	
	Moving towards	Moving away	Moving towards	Moving away
Minimum	13	17	18	25

<Handheld for ANT 0>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Right Side		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	10	13	17	20	5	9	14	18

<Handheld for ANT1>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Left Side		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	5	9	10	14	8	11	10	13

<Handheld for ANT4>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Left Side		Top Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	8	14	12	17	6	12	15	18

<Handheld for ANT5>

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Top Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	7	8	14	16	16	19

<Handheld for ANT6>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Right Side		Top Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	5	12	11	15	5	9	12	17

7. RF Exposure Limits

7.1 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.

7.2 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.

8. Specific Absorption Rate (SAR)

8.1 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.

8.2 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:

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

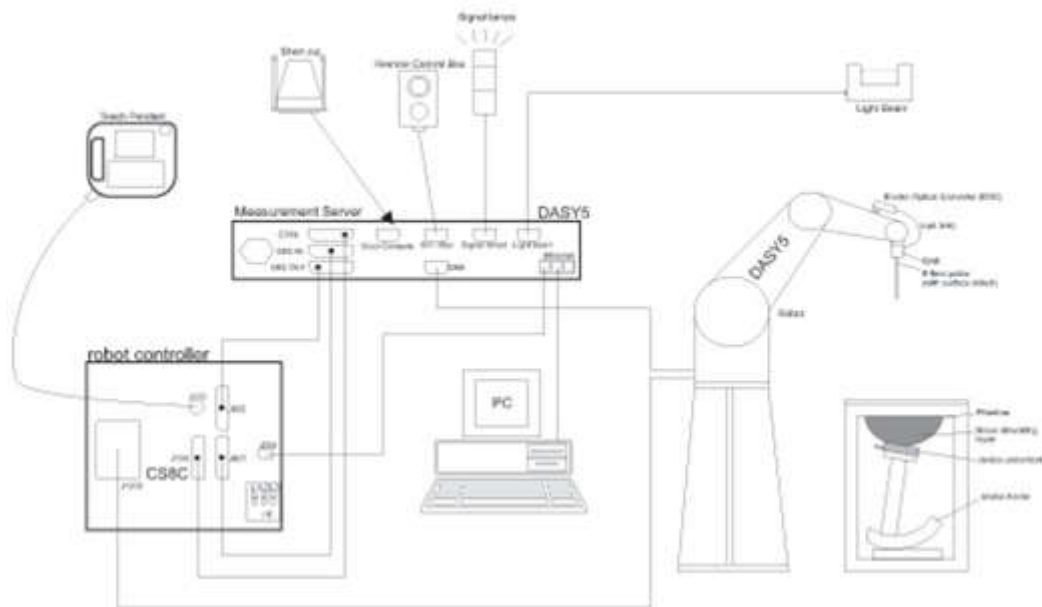
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

9. System Description and Setup

The DASY5 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 Win10 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.

9.1 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 μ W/g – >100 mW/g Linearity: ± 0.2 dB (noise: typically <1 μ W/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: ± 0.2 dB (30 MHz – 4 GHz)	
Directivity	± 0.2 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 μ W/g – >100 mW/g; Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

9.2 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

9.3 Phantom

<SAM Twin Phantom>

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

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

9.4 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

10. 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

10.1 Spatial Peak SAR Evaluation

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

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

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

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

10.2 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.

10.3 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 dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$	≤ 2 GHz: ≤ 15 mm $2 - 3$ GHz: ≤ 12 mm	$3 - 4$ GHz: ≤ 12 mm $4 - 6$ GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

10.4 Zoom Scan

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

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

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

10.5 Volume Scan Procedures

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

10.6 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.

11. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1087	2022/2/24	2025/2/23
SPEAG	835MHz System Validation Kit	D835V2	4d091	2022/8/19	2025/8/18
SPEAG	1750MHz System Validation Kit	D1750V2	1090	2022/2/24	2025/2/23
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2022/3/30	2025/3/29
SPEAG	2450MHz System Validation Kit	D2450V2	1040	2023/4/25	2024/4/24
SPEAG	2600MHz System Validation Kit	D2600V2	1070	2021/12/20	2024/12/19
SPEAG	3500MHz System Validation Kit	D3500V2	1076	2022/5/9	2025/5/8
SPEAG	3700MHz System Validation Kit	D3700V2	1037	2022/5/9	2025/5/8
SPEAG	3900MHz System Validation Kit	D3900V2	1048	2023/3/9	2024/3/8
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2022/9/23	2025/9/22
SPEAG	Data Acquisition Electronics	DAE4	1279	2023/6/7	2024/6/6
SPEAG	Dosimetric E-Field Probe	ES3DV3	3279	2023/8/18	2024/8/17
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	2022/12/14	2023/12/13
SPEAG	SAM Twin Phantom	SAM Twin	TP-1754	NCR	NCR
CHIGO	Thermo-Hygrometer	HTC-1	55011	2023/1/8	2024/1/7
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio Communication Analyzer	MT8821C	6262306175	2023/7/5	2024/7/4
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2023/7/5	2024/7/4
SPEAG	Dielectric Probe Kit	DAK-3.5	1071	2023/2/20	2024/2/19
Anritsu	Vector Signal Generator	MG3710A	6201682672	2023/1/5	2024/1/4
Rohde & Schwarz	Power Meter	NRVD	102081	2023/7/5	2024/7/4
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2023/7/5	2024/7/4
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2023/7/5	2024/7/4
R&S	BLUETOOTH TESTER	CBT	101246	2023/5/15	2024/5/14
Rohde & Schwarz	Spectrum Analyzer	FSV7	101631	2023/10/12	2024/10/11
TES	DIGITAC THERMOMETER	1310	220305411	2023/1/8	2024/1/7
ARRA	Power Divider	A3200-2	N/A	Note 1	
MCL	Attenuation1	BW-S10W5+	N/A	Note 1	
MCL	Attenuation2	BW-S10W5+	N/A	Note 1	
MCL	Attenuation3	BW-S10W5+	N/A	Note 1	
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note 1	

Note:

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

12. System Verification

12.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.2.

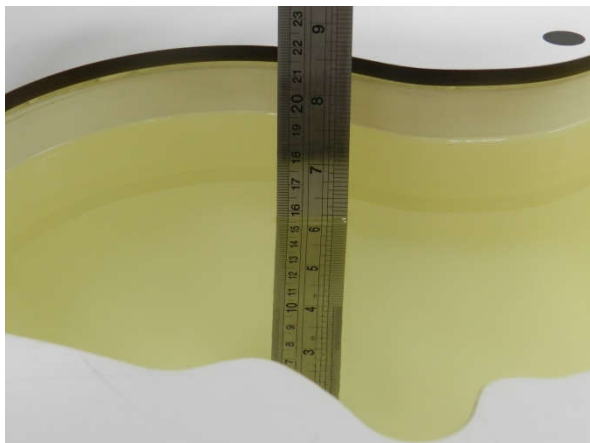


Fig 11.1 Photo of Liquid Height for Head SAR



Fig 11.2 Photo of Liquid Height for Body SAR

12.2 Tissue Verification

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ϵ_r)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
750	Head	22.7	0.889	42.282	0.89	41.90	-0.11	0.91	±5	2023/12/7
835	Head	22.8	0.912	41.952	0.90	41.50	1.33	1.09	±5	2023/12/8
1750	Head	22.8	1.317	40.226	1.37	40.10	-3.87	0.31	±5	2023/12/9
1900	Head	22.8	1.407	40.217	1.40	40.00	0.50	0.54	±5	2023/12/10
2600	Head	22.8	1.872	39.219	1.96	39.00	-4.49	0.56	±5	2023/12/11
3500	Head	22.8	2.810	38.714	2.91	37.90	-3.44	2.15	±5	2023/12/12
3700	Head	22.8	2.988	38.362	3.12	37.70	-4.23	1.76	±5	2023/12/12
3900	Head	22.7	3.171	38.039	3.32	37.50	-4.49	1.44	±5	2023/12/12
750	Head	22.7	0.888	42.264	0.89	41.90	-0.22	0.87	±5	2023/12/13
835	Head	22.7	0.911	41.930	0.90	41.50	1.22	1.04	±5	2023/12/14
1750	Head	22.8	1.316	40.209	1.37	40.10	-3.94	0.27	±5	2023/12/15
1900	Head	22.8	1.406	40.194	1.40	40.00	0.43	0.49	±5	2023/12/16
2600	Head	22.8	2.030	40.346	1.96	39.00	3.57	3.45	±5	2023/12/17
3500	Head	22.8	2.879	38.500	2.91	37.90	-1.07	1.58	±5	2023/12/5
3700	Head	22.8	3.076	38.038	3.12	37.70	-1.41	0.90	±5	2023/12/5
3900	Head	22.8	3.279	37.617	3.32	37.50	-1.23	0.31	±5	2023/12/6
2450	Head	22.8	1.824	39.239	1.80	39.20	1.33	0.10	±5	2023/12/1
5250	Head	22.7	4.579	35.733	4.71	35.90	-2.78	-0.47	±5	2023/12/2
5600	Head	22.7	4.954	35.113	5.07	35.50	-2.29	-1.09	±5	2023/12/3
5750	Head	22.7	5.113	34.880	5.22	35.40	-2.05	-1.47	±5	2023/12/4

12.3 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

<1g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2023/12/7	750	Head	50	1087	3279	1279	0.453	8.58	9.06	5.59
2023/12/8	835	Head	50	4d091	3279	1279	0.468	9.45	9.36	-0.95
2023/12/9	1750	Head	50	1090	3279	1279	1.810	37.00	36.2	-2.16
2023/12/10	1900	Head	50	5d118	3279	1279	2.040	39.30	40.8	3.82
2023/12/11	2600	Head	50	1070	3279	1279	2.640	56.20	52.8	-6.05
2023/12/12	3500	Head	50	1076	3857	1279	3.360	66.20	67.2	1.51
2023/12/12	3700	Head	50	1037	3857	1279	3.300	66.70	66	-1.05
2023/12/12	3900	Head	50	1048	3857	1279	3.330	69.10	66.6	-3.62
2023/12/13	750	Head	50	1087	3279	1279	0.397	8.58	7.94	-7.46
2023/12/14	835	Head	50	4d091	3279	1279	0.474	9.45	9.48	0.32
2023/12/15	1750	Head	50	1090	3279	1279	1.850	37.00	37	0.00
2023/12/16	1900	Head	50	5d118	3279	1279	2.120	39.30	42.4	7.89
2023/12/17	2600	Head	50	1070	3279	1279	2.620	56.20	52.4	-6.76
2023/12/5	3500	Head	50	1076	3857	1279	3.340	66.20	66.8	0.91
2023/12/5	3700	Head	50	1037	3857	1279	3.390	66.70	67.8	1.65
2023/12/6	3900	Head	50	1048	3857	1279	3.310	69.10	66.2	-4.20
2023/12/1	2450	Head	50	1040	3857	1279	2.650	52.70	53	0.57
2023/12/2	5250	Head	50	1113	3857	1279	4.340	81.50	86.8	6.50
2023/12/3	5600	Head	50	1113	3857	1279	4.390	82.60	87.8	6.30
2023/12/4	5750	Head	50	1113	3857	1279	4.140	80.80	82.8	2.48

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2023/12/7	750	Head	50	1087	3279	1279	0.279	5.65	5.58	-1.24
2023/12/8	835	Head	50	4d091	3279	1279	0.294	6.22	5.88	-5.47
2023/12/9	1750	Head	50	1090	3279	1279	0.961	19.50	19.22	-1.44
2023/12/10	1900	Head	50	5d118	3279	1279	1.050	20.40	21	2.94
2023/12/11	2600	Head	50	1070	3279	1279	1.180	24.60	23.6	-4.07
2023/12/12	3500	Head	50	1076	3857	1279	1.280	25.50	25.6	0.39
2023/12/12	3700	Head	50	1037	3857	1279	1.220	24.60	24.4	-0.81
2023/12/12	3900	Head	50	1048	3857	1279	1.210	24.10	24.2	0.41
2023/12/13	750	Head	50	1087	3279	1279	0.260	5.65	5.2	-7.96
2023/12/14	835	Head	50	4d091	3279	1279	0.315	6.22	6.3	1.29
2023/12/15	1750	Head	50	1090	3279	1279	1.020	19.50	20.4	4.62
2023/12/16	1900	Head	50	5d118	3279	1279	1.040	20.40	20.8	1.96
2023/12/17	2600	Head	50	1070	3279	1279	1.190	24.60	23.8	-3.25
2023/12/5	3500	Head	50	1076	3857	1279	1.270	25.50	25.4	-0.39
2023/12/5	3700	Head	50	1037	3857	1279	1.260	24.60	25.2	2.44
2023/12/6	3900	Head	50	1048	3857	1279	1.170	24.10	23.4	-2.90
2023/12/1	2450	Head	50	1040	3857	1279	1.250	24.60	25	1.63
2023/12/2	5250	Head	50	1113	3857	1279	1.240	23.30	24.8	6.44
2023/12/3	5600	Head	50	1113	3857	1279	1.220	23.70	24.4	2.95
2023/12/4	5750	Head	50	1113	3857	1279	1.210	23.00	24.2	5.22

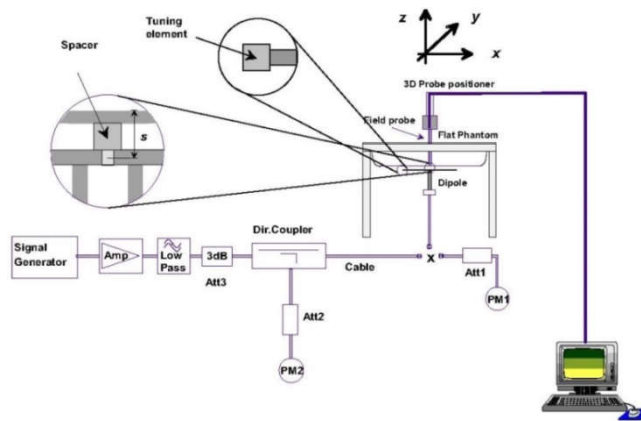


Fig 11.3.1 System Performance Check Setup



Fig 11.3.2 Setup Photo

13. RF Exposure Positions

13.1 Ear and handset reference point

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

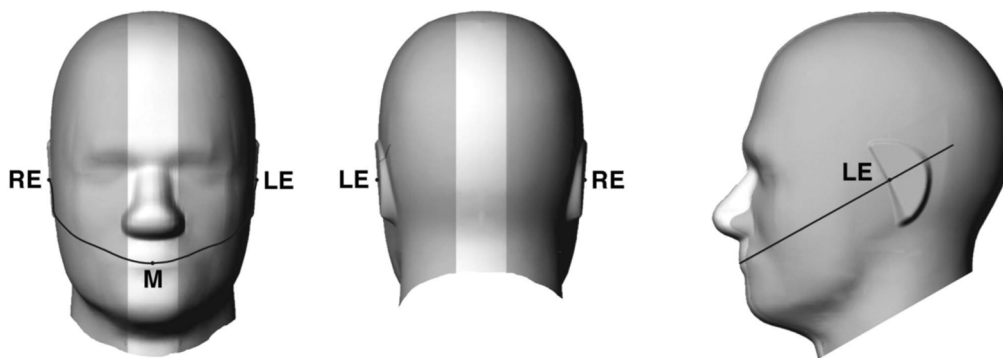


Fig 12.1.1 Front, back, and side views of SAM twin phantom

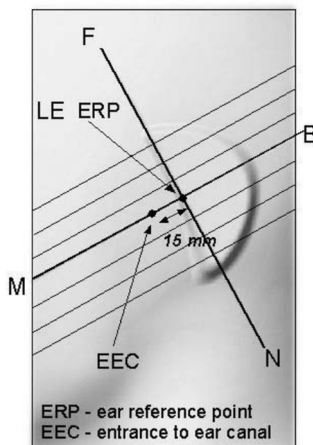


Fig 12.1.2 Close-up side view of phantom showing the ear region.

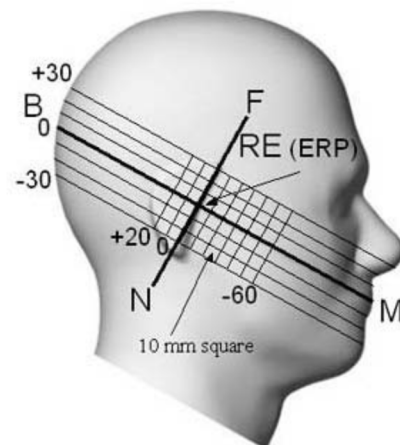


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

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

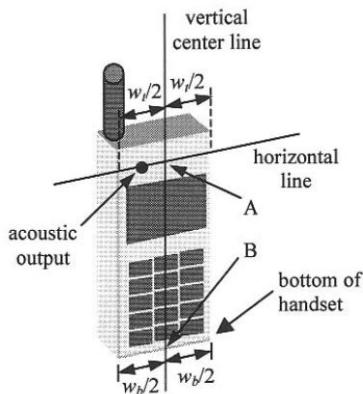


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case"

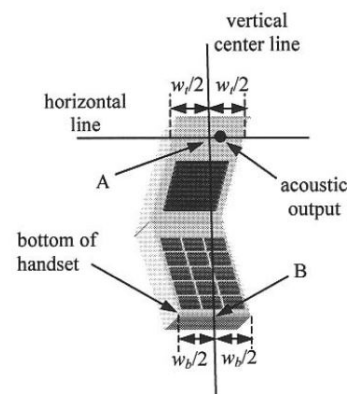


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

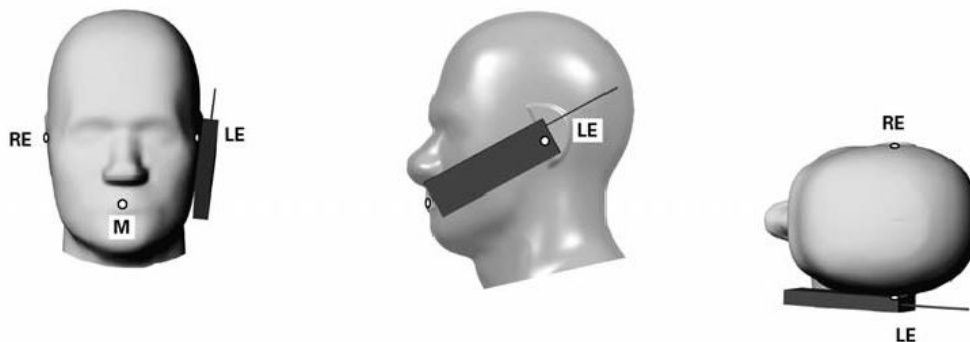


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

13.3 Definition of the tilt position

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

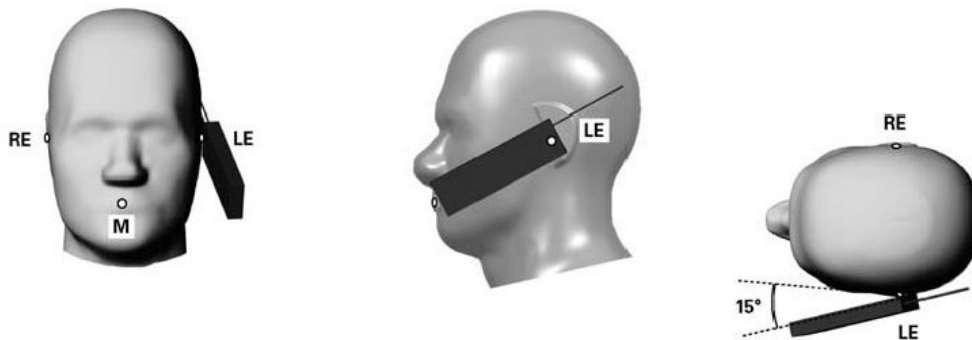


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

13.4 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 $> 1.2 \text{ W/kg}$, 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. 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-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

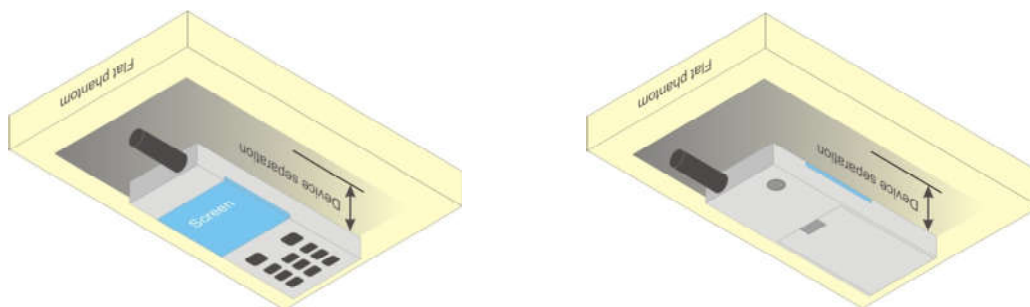


Fig 12.4 Body Worn Position

13.5 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 can provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets and 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.

13.6 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 ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) 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 from 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.

14. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<GSM Conducted Power>

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
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 $\leq 1/4$ 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 HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
4. 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_o/β_d	β_{HS} (Note 1, 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 $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$. Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$. Note 3: CM = 1 for $\beta_o/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. 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_o/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 $\beta_c = 11/15$ and $\beta_d = 15/15$.							

Setup Configuration

HSUPA Setup Configuration:

- The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- The RF path losses were compensated into the measurements.
- A call was established between EUT and Base Station with following setting * :
 - Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
 - 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
 - Set Cell Power = -86 dBm
 - Set Channel Type = 12.2k + HSPA
 - Set UE Target Power
 - Power Ctrl Mode= Alternating bits
 - Set and observe the E-TFCI
 - Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
- 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} (Note 1)	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	209/25	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	β_{ed1} : 47/15 β_{ed2} : 47/15	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 $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{hs} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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 $\beta_c = 10/15$ and $\beta_d = 15/15$.

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

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

- a. The EUT was connected to Base Station referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set RMC 12.2Kbps + HSDPA mode.
 - ii. Set Cell Power = -25 dBm
 - iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
 - iv. Select HSDPA Uplink Parameters
 - v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - a). Subtest 1: $\beta_c/\beta_d=2/15$
 - b). Subtest 2: $\beta_c/\beta_d=12/15$
 - c). Subtest 3: $\beta_c/\beta_d=15/8$
 - d). Subtest 4: $\beta_c/\beta_d=15/4$
 - 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	Processes	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.		

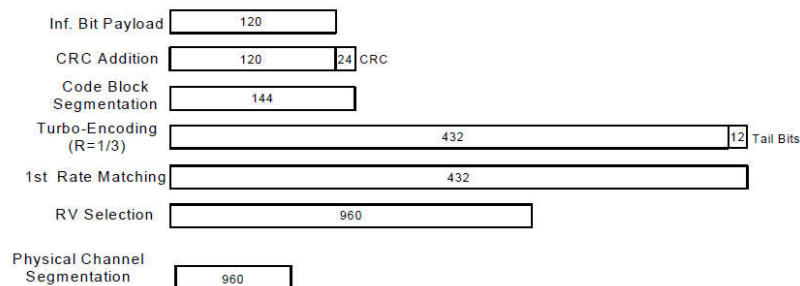


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)
Setup Configuration

HSPA+ 3GPP release 7 (uplink category 7) 16QAM, Setup Configuration:

1. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
2. The RF path losses were compensated into the measurements.
3. A call was established between EUT and Base Station with following setting * :
 - i. Call Configs = 5.2E:HSPA+:UL with 16QAM
 - 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, C11.1.4, quoted from the TS 34.121-1 s5.2E
 - iii. Set Channel Params
 - iv. Set Cell Power = -86 dBm
 - v. Set Channel Type = HSPA
 - vi. Set UE Target Power = 21 dBm
 - vii. Power Ctrl Mode= All Up Bits
 - viii. Set Manual Uplink DPCH Bc/Bd = Manual
 - ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
 - x. Set HSPA Conn DL Channel Levels
 - xi. Set HS-SCCH Configs
 - xii. Set RB Test Mode Setup
 - xiii. Set Common HSUPA Parameters
 - xiv. Set Serving Grant
 - xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
4. The transmitted maximum output power was recorded.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note 3)	β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105

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

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default.

Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

Setup Configuration

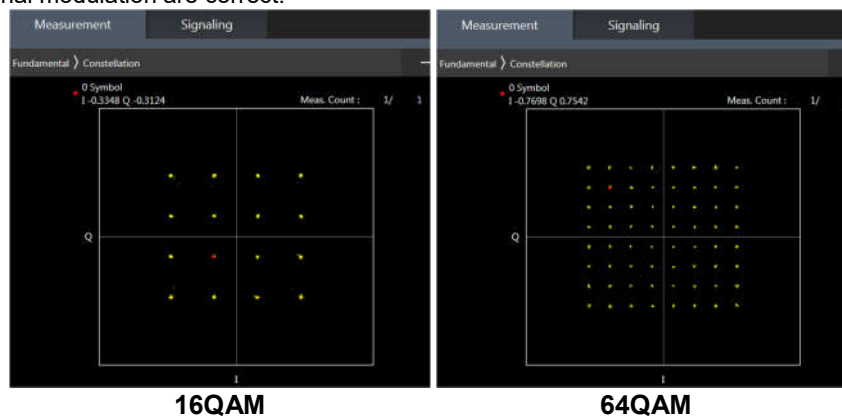
<WCDMA Conducted Power>**General Note:**

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 / HSPA+ is $\leq \frac{1}{4}$ 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 / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / 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 B17 / B38 SAR test was covered by B12 / B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to May 2017 TCB workshop, for 16QAM and 64QAM 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.



<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

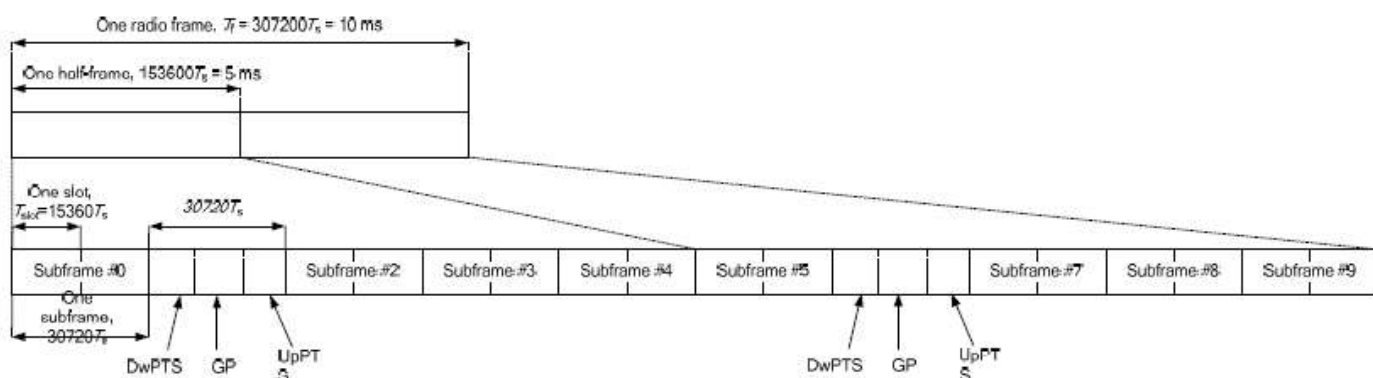


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

For LTE TDD Power class 2

- Uplink-downlink configuration: 1. In a half-frame consisted of 5 subframes, uplink operation is in 2 uplink subframes and 1 special subframe.
- special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(2+0.167)/5 = 43.3\%$
- for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(2+0.143)/5 = 42.9\%$
- For TDD LTE SAR measurement, the duty cycle 1:2.33 (42.9 %) was used perform testing and considering the theoretical duty cycle of 43.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 42.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $43.3\%/42.9\% = 1.009$ 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.

For LTE TDD Power class 3

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

<LTE Carrier Aggregation>
General Note:

10. 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.
11. 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.
12. The gray color table is covered by other combinations and no need to verify power

2CC Downlink Carrier Aggregation				3CC Downlink Carrier Aggregation			
Number	Combination	4X4 MIMO	Covered by Measurement Superset	Number	Combination	4X4 MIMO	Covered by Measurement Superset
1	CA_41A-42A	41A-42A, 42A, 41A		1	CA_41A-42C	41A	
2	CA_41C	41C, 41A	3CC-2	2	CA_41C-42A	42A	
3	CA_42C	42C, 42A	3CC-1	3	CA_42D		

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 three 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.

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

LTE 4x4 MIMO (Downlink)

This device supports downlink 4x4 MIMO operations for LTE Band 41/42 only. Uplink transmission is limited to a single output stream. Power measurements were performed with downlink 4x4 MIMO active for the configuration with highest measured maximum conducted power with 4x4 downlink MIMO inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.

Per FCC Guidance, SAR for downlink 4x4 MIMO was not needed since the maximum average output power in 4x4 downlink MIMO mode was not > 0.25 dB higher than the maximum output power with downlink 4x4 MIMO inactive. When carrier aggregation is applicable, power measurements were performed with the downlink carrier aggregation and 4x4 DL MIMO active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.

4X4 MIMO	Band
	LTE Band 41/42

LTE Carrier Aggregation Conducted Power (Uplink)

LTE Uplink CA	2CC Uplink Carrier Aggregation
Intra-band	Antenna Tx
CA_41C	Ant 4
CA_42C	Ant 5

<Intra-band>
General Note:

- i. The device supports intra-band uplink carrier aggregation for LTE B41/42 with a maximum of two uplink 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 uplink 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.

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

1. 5G NR n77 /n78 is NSA mode.
2. 5G NR n41/n77/ n78 is SA mode.
3. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
 - a. For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class2 and 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KDB 941225 D05 procedure for other modulation output power for each RB allocation configuration is > not ½ dB higher than the same configuration in DFT-s QPSK and the reported SAR for the DFT-s QPSK configuration is ≤ 1.45 W/kg; CP-OFDM testing is not required.
 - b. For DFT-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class2 and 3, for 16QAM/64QAM/256QAM and smaller bandwidth output power will spot check largest channel bandwidth worst RB configuration to ensure the 16QAM/64QAM/256QAM and smaller bandwidth output power will not ½ dB higher than the same configuration in the largest supported bandwidth.
 - c. SAR testing start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel
 - d. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
 - e. QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested
 - f. PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, PI/2 BPSK /16QAM/64QAM/256QAM SAR testing are not required.
 - g. Smaller bandwidth output power for each RB allocation configuration for this device will not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
4. Due to test setup limitations, SAR testing for NR was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.
5. NSA and SA mode should perform SAR separately. For the maximum power of NSA mode is the same as SA total power level, so SA SAR can represent NSA mode SAR.
6. 5G NR NSA mode, the power level is the same as 5G NR SA mode, so 5G NR NSA mode and SA mode power table only show one time.
7. 5G NR supports CP-OFDM and DFT-s-OFDM modulation, for DFT-s-OFDM power is higher than CP-OFDM, so only show DFT-s-OFDM power table and chose DFT-s-OFDM to perform SAR testing.
8. For DFT-s-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for the CP-OFDM mode will not higher than DFT-s-OFDM mode, therefore, CP-OFDM measurement is unnecessary.
9. For 5G NR EN-DC mode, standalone SAR performed for 5G NR NSA band with the maximum power, EN-DC SAR summed EN-DC mode 5G NR standalone SAR and LTE standalone SAR, the result of EN-DC SAR is more conservatively.

<3GPP 38.101 MPR for EN-DC>
Table 6.2.2-1 Maximum power reduction (MPR) for power class 3

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

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

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

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

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

<EN-DC combination>

ENDC	Antenna Tx	
	LTE TX	NR TX
DC 41A_n77A	Ant 1	Ant 5
DC 41A_n78A	Ant 1	Ant 5



15. Antenna Location

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

16. Spot Check SAR Test Results

Spot Check General Note:

- According to section 3.3, spot check conducted power test against the variant project based on the worst-case SAR condition from the original project was performed in this filing to demonstrate the test data from original project remains representative for the variant project. Detail Conducted power measurement referred to appendix E.
- SAR spot check verification on the worst cases from the original model was performed to demonstrate the test data from original model remains representative for the variant model.
- Per KDB 484596 D01 v02r02, the variant filings must demonstrate that the referenced test data remain valid for the variant device by including spot-check measurements that meet the following criteria:
 - Spot-check measurements shall be made in correspondence to the worst-case scenario reported in the reference device filing, i.e., for those conditions that are the closest to non-compliance
 - Spot-check measurements, while being always compliant with the applicable rule part(s) for the test under consideration, may show a deviation d_{dB} from the reference data no larger than 3 dB:
$$d_{dB} = |V_{dB} - R_{dB}| \leq 3 \text{ dB} \quad (1)$$
where between V_{dB} , the variant spot-check level in dB, and R_{dB} is the corresponding measurement level in dB for the reference model.
- The Spot check results showed that deviation of the SAR results did not exceed 3 dB, therefore referring to the guidance in the KDB inquiry, SAR data reuse is justified.
- 1st as parent model, 2nd as variant model.

General Note:

- Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - 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.
 - For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
 - For SAR testing of Bluetooth signal with 83.3% theoretical duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle) * 83.3%".
 - For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
 - For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
 - For TDD LTE SAR measurement of power class 3, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The reported TDD LTE SAR (W/kg) = Measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
- 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:
 - $\leq 0.8 \text{ W/kg}$ or 2.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\leq 100 \text{ MHz}$
 - $\leq 0.6 \text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - $\leq 0.4 \text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200 \text{ MHz}$
- Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is $\geq 0.8 \text{ W/kg}$. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
- The device implements Proximity sensors/receiver detect mechanism/hotspot trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). The device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to appendix E. power table.
- For WLAN when transmit simultaneous with WWAN, power reduction will be activated to head exposure conditions. For WLAN when transmit simultaneous with WWAN and Proximity sensors trigger, power reduction will be activated to body-worn and Handheld exposure conditions.
- For some WWAN bands, sensor on power level is higher than hotspot power level, so front/back sensor on SAR can represent hotspot conservatively.

7. This device supports HPUE for LTE Band 41 with class 2 level, HPUE power has been measured separately.
8. For 5GNR FDD/TDD supports SCS15KHz and SCS30KHz, after verification for 30KHz at FDD power level is less than 15KHz at FDD power level, also verification for 15KHz at TDD power level is less than 30KHz at TDD power level, so only show 15KHz at FDD power and 30KHz at TDD power, and chose higher power which is SCS15KHz for FDD bands and SCS30KHz for TDD bands to perform SAR testing.
9. For 5GNR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
10. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power (for handheld on state, the maximum full power means reduced power), including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
 - a. For this device SAR for WWAN/WLAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of GSM850/1900, WCDMA Band II/IV/V, LTE Band 2/4/26/38/41/42, 5GNR n41/ n77 / n78, WLAN2.4/5.2/5.8GHz, 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.
11. Although the headset SAR is greater than 0.8 W/kg, the headset SAR verified the worst of the non-headset SAR and less than non-headset SAR, so there is no need to be tested other channels.
12. According to Nov. 2017 TCB workshop, when the reported SAR for UL CA configuration 1g SAR is <1.2 W/kg, UL CA SAR is not required for all required test channels (PCC based).
13. LTE B2/4 at ant0 at ant4 support different PAs for some antennas and som LTE bands support Other PA only under ENDC & UL CA. Some LTE bands support different PAs for some antennas, whether it is the maximum power of Main PA is higher than and very close to the other PA, for RF exposure, after verification all PAs in a same position, so the worst-case PA was chosen to perform full SAR testing to ensure the RF exposure is compliance and another PA verify the worst case.

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 $\leq \frac{1}{4}$ 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 / HSPA+ is $\leq \frac{1}{4}$ 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 / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

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 $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / 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 B17/B38 SAR test was covered by B12 / B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

5G NR Note:

1. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
 - a. SAR testing start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
 - b. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
 - c. QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
 - d. $\pi/2$ BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not $\frac{1}{2}$ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, $\pi/2$ BPSK /16QAM/64QAM/256QAM SAR testing are not required.
 - e. Smaller bandwidth output power for each RB allocation configuration for this device will not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
 - f. For 5G FR1 n77/n78 the maximum bandwidth does not support three non-overlapping channels, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.



16.1 Head SAR

Plot No.	No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)	Deviation (%)	Deviation d _{dB} (dB)
750MHz																								
01	2nd	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	23095	707.5	1	22.67	24.00	1.358	-	-	0.09	0.159	0.216		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 0	ECI2	23095	707.5	1	21.62	23.00	1.374	-	-	0.08	0.129	0.177		
	2nd	LTE Band 12	10M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI2	23095	707.5	1	22.67	24.00	1.358	-	-	0.01	0.084	0.114		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 0	ECI2	23095	707.5	1	21.62	23.00	1.374	-	-	0.03	0.070	0.096		
	2nd	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI2	23095	707.5	1	22.67	24.00	1.358	-	-	-0.08	0.139	0.189		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 0	ECI2	23095	707.5	1	21.62	23.00	1.374	-	-	-0.08	0.110	0.151		
	2nd	LTE Band 12	10M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI2	23095	707.5	1	22.67	24.00	1.358	-	-	0.1	0.084	0.114		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 0	ECI2	23095	707.5	1	21.62	23.00	1.374	-	-	-0.18	0.071	0.098		
835MHz																								
02	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Cheek	0mm	Ant 0	ECI2	189	836.4	1	28.35	29.50	1.303	-	-	-0.02	0.513	0.669		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Tilted	0mm	Ant 0	ECI2	189	836.4	1	28.35	29.50	1.303	-	-	0.08	0.288	0.375		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 0	ECI2	189	836.4	1	28.35	29.50	1.303	-	-	0.01	0.423	0.551		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Tilted	0mm	Ant 0	ECI2	189	836.4	1	28.35	29.50	1.303	-	-	0.03	0.261	0.340		
03	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI2	4182	836.4	1	22.90	24.00	1.288	-	-	0.04	0.267	0.344		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	ECI2	4182	836.4	1	22.90	24.00	1.288	-	-	-0.08	0.151	0.195		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI2	4182	836.4	1	22.90	24.00	1.288	-	-	0.1	0.211	0.272		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	ECI2	4182	836.4	1	22.90	24.00	1.288	-	-	-0.18	0.131	0.169		
04	2nd	LTE Band 26	15M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	26865	831.5	1	22.80	24.00	1.318	-	-	0.05	0.216	0.285		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Right Cheek	0mm	Ant 0	ECI2	26865	831.5	1	22.01	23.00	1.256	-	-	0.1	0.171	0.215		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI2	26865	831.5	1	22.80	24.00	1.318	-	-	0.12	0.122	0.161		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Right Tilted	0mm	Ant 0	ECI2	26865	831.5	1	22.01	23.00	1.256	-	-	0.08	0.100	0.126		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI2	26865	831.5	1	22.80	24.00	1.318	-	-	-0.17	0.180	0.237		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Left Cheek	0mm	Ant 0	ECI2	26865	831.5	1	22.01	23.00	1.256	-	-	-0.03	0.147	0.185		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI2	26865	831.5	1	22.80	24.00	1.318	-	-	0.14	0.108	0.142		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Left Tilted	0mm	Ant 0	ECI2	26865	831.5	1	22.01	23.00	1.256	-	-	0.11	0.095	0.119		
1750MHz																								
05	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI2	1413	1732.6	1	22.76	24.00	1.330	-	-	-0.05	0.096	0.128		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	ECI2	1413	1732.6	1	22.76	24.00	1.330	-	-	0.18	0.050	0.067		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI2	1413	1732.6	1	22.76	24.00	1.330	-	-	0.14	0.089	0.118		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	ECI2	1413	1732.6	1	22.76	24.00	1.330	-	-	-0.17	0.053	0.071		
06	2nd	LTE Band 4 Main PA	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	20175	1732.5	1	21.69	23.50	1.517	-	-	0.02	0.072	0.109		
	2nd	LTE Band 4 Main PA	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	ECI2	20175	1732.5	1	20.78	22.50	1.486	-	-	0.17	0.056	0.083		
	2nd	LTE Band 4 Main PA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI2	20175	1732.5	1	21.69	23.50	1.517	-	-	-0.05	0.032	0.049		
	2nd	LTE Band 4 Main PA	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	ECI2	20175	1732.5	1	20.78	22.50	1.486	-	-	0.01	0.000	0.000		
	2nd	LTE Band 4 Main PA	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI2	20175	1732.5	1	21.69	23.50	1.517	-	-	0.1	0.059	0.090		
	2nd	LTE Band 4 Main PA	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	ECI2	20175	1732.5	1	20.78	22.50	1.486	-	-	-0.17	0.052	0.077		
	2nd	LTE Band 4 Main PA	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI2	20175	1732.5	1	21.69	23.50	1.517	-	-	0.04	0.036	0.055		
	2nd	LTE Band 4 Main PA	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	ECI2	20175	1732.5	1	20.78	22.50	1.486	-	-	-0.01	0.000	0.000		
	2nd	LTE Band 4 Other PA_NSA	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	20175	1732.5	1	22.35	23.00	1.161	-	-	0.01	0.052	0.060		
1900MHz																								
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Right Cheek	0mm	Ant 0	ECI2	661	1880	1	25.59	26.50	1.233	-	-	0.05	0.001	0.001		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Right Tilted	0mm	Ant 0	ECI2	661	1880	1	25.59	26.50	1.233	-	-	0.06	0.001	0.001		
07	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 0	ECI2	661	1880	1	25.59	26.50	1.233	-	-	0.08	0.081	0.100		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Left Tilted	0mm	Ant 0	ECI2	661	1880	1	25.59	26.50	1.233	-	-	-0.09	0.000	0.000		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI2	9400	1880	1	22.61	24.00	1.377	-	-	-0.08	0.056	0.077		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	ECI2	9400	1880	1	22.61	24.00	1.377	-	-	0.13	0.001	0.001		



FCC SAR Test Report

Report No. : FA352916-13

08	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI2	9400	1880	1	22.61	24.00	1.377	-	-	0.12	0.092	0.127		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	ECI2	9400	1880	1	22.61	24.00	1.377	-	-	0.03	0.001	0.001		
	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	18900	1880	1	22.16	24.00	1.528	-	-	0.16	0.056	0.086		
	2nd	LTE Band 2 Main PA	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	ECI2	18900	1880	1	21.15	23.00	1.531	-	-	-0.1	0.001	0.002		
	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	ECI2	18900	1880	1	22.16	24.00	1.528	-	-	0.07	0.001	0.002		
	2nd	LTE Band 2 Main PA	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	ECI2	18900	1880	1	21.15	23.00	1.531	-	-	0.18	0.001	0.002		
09	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI2	18900	1880	1	22.16	24.00	1.528	-	-	0.05	0.088	0.134		
	2nd	LTE Band 2 Main PA	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	ECI2	18900	1880	1	21.15	23.00	1.531	-	-	-0.1	0.071	0.109		
	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	ECI2	18900	1880	1	22.16	24.00	1.528	-	-	0.01	0.001	0.002		
	2nd	LTE Band 2 Main PA	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	ECI2	18900	1880	1	21.15	23.00	1.531	-	-	-0.15	0.001	0.002		
	2nd	LTE Band 2 Other PA NSA	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI2	18900	1880	1	22.46	23.00	1.132	-	-	0.01	0.055	0.062		
2600MHz																								
	1st	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI2	40620	2593	1	22.97	24.00	1.268	62.9	1.006	0.03	0.370	0.472	-14.83%	0.70
	2nd	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI2	40620	2593	1	22.93	24.00	1.279	62.9	1.006	-0.01	0.312	0.402		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI2	40620	2593	1	14.79	16.00	1.321	62.9	1.006	0.19	0.427	0.568		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 4	ECI2	40620	2593	1	14.74	16.00	1.337	62.9	1.006	0.07	0.396	0.532		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	40620	2593	1	14.79	16.00	1.321	62.9	1.006	0.07	0.674	0.896		
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Right Tilted	0mm	Ant 4	ECI2	40620+2593+408182612.8	1	14.64	16.00	1.368	62.9	1.006	0.01	0.611	0.841			
	2nd	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	39750	2506	1	14.67	16.00	1.358	62.9	1.006	0.01	0.551	0.753		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	40185	2549.5	1	14.72	16.00	1.343	62.9	1.006	0.02	0.555	0.750		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	41055	2636.5	1	14.74	16.00	1.337	62.9	1.006	0.05	0.535	0.719		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	41490	2680	1	14.65	16.00	1.365	62.9	1.006	0.01	0.578	0.793		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	40620	2593	1	14.74	16.00	1.337	62.9	1.006	0.01	0.488	0.656		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	39750	2506	1	14.62	16.00	1.374	62.9	1.006	-0.15	0.471	0.651		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	40185	2549.5	1	14.66	16.00	1.361	62.9	1.006	-0.05	0.475	0.651		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	41055	2636.5	1	14.64	16.00	1.368	62.9	1.006	0.03	0.455	0.626		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	41490	2680	1	14.64	16.00	1.368	62.9	1.006	0.01	0.498	0.685		
	2nd	LTE Band 41	20M	QPSK	100	0	-	Right Tilted	0mm	Ant 4	ECI2	40620	2593	1	14.72	16.00	1.343	62.9	1.006	0.01	0.585	0.790		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 4	ECI2	40620	2593	1	14.79	16.00	1.321	62.9	1.006	-0.15	0.200	0.266		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 4	ECI2	40620	2593	1	14.74	16.00	1.337	62.9	1.006	-0.15	0.171	0.230		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 4	ECI2	40620	2593	1	14.79	16.00	1.321	62.9	1.006	0.11	0.266	0.354		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 4	ECI2	40620	2593	1	14.74	16.00	1.337	62.9	1.006	-0.08	0.228	0.307		
10	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	40620	2593	1	17.63	19.00	1.371	42.9	1.009	0.01	0.801	1.108		
	2nd	LTE Band 41C HPUE	20M	QPSK	1	99	-	Right Tilted	0mm	Ant 4	ECI2	40620+2593+408182612.8	1	17.43	19.00	1.435	42.9	1.009	0.02	0.751	1.088			
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	39750	2506	1	17.52	19.00	1.406	42.9	1.009	0.01	0.751	1.065		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	40185	2549.5	1	17.50	19.00	1.413	42.9	1.009	0.01	0.762	1.086		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	41055	2636.5	1	17.53	19.00	1.403	42.9	1.009	0.01	0.721	1.021		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	41490	2680	1	17.43	19.00	1.435	42.9	1.009	0.08	0.712	1.031		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	40620	2593	1	17.58	19.00	1.387	42.9	1.009	0.08	0.581	0.813		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	39750	2506	1	17.49	19.00	1.416	42.9	1.009	-0.08	0.652	0.931		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	40185	2549.5	1	17.50	19.00	1.413	42.9	1.009	-0.05	0.691	0.985		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	41055	2636.5	1	17.42	19.00	1.439	42.9	1.009	0.03	0.631	0.916		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 4	ECI2	41490	2680	1	17.43	19.00	1.435	42.9	1.009	0.01	0.712	1.031		
	2nd	LTE Band 41 HPUE	20M	QPSK	100	0	-	Right Tilted	0mm	Ant 4	ECI2	40620	2593	1	17.55	19.00	1.396	42.9	1.009	0.01	0.781	1.100		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 4	ECI2	518598	2592.99	1	13.89	15.00	1.291	-	-	0.08	0.410	0.529		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 4	ECI2	518598	2592.99	1	13.76	15.00	1.330	-	-	0.01	0.522	0.694		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 4	ECI2	518598	2592.99	1	13.89	15.00	1.291	-	-	0.01	0.705	0.910		
11	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 4	ECI2	518598	2592.99	1	13.76	15.00	1.330	-	-	0.08	0.750	0.998		
	2nd	FR1 n41	100M	QPSK	270	0	DFT-SCS-30KHz	Right Tilted	0mm	Ant 4	ECI2	518598	2592.99	1	13.73	15.00	1.340	-	-	0.08	0.689	0.923		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 4	ECI2	518598	2592.99	1	13.89	15.00	1.291	-	-	-0.08	0.171	0.221		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 4	ECI2	518598	2592.99	1	13.76	15.00	1.330	-	-	0.1	0.250	0.333		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 4	ECI2	518598	2592.99	1	13.89	15.00	1.291	-	-	-0.18	0.229	0.296		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 4	ECI2	518598	2592.99	1	13.76	15.00	1.330	-	-	0.1	0.339	0.451		



FCC SAR Test Report

Report No. : FA352916-13

3500MHz																								
	1st	LTE Band 42	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 5	ECI2	42190	3460	1	15.87	17.50	1.455	62.9	1.006	-0.02	0.613	0.898	-2.45%	0.11
12	2nd	LTE Band 42	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 5	ECI2	42190	3460	1	15.81	17.50	1.476	62.9	1.006	-0.08	0.590	0.876		
	2nd	LTE Band 42	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 5	ECI2	42190	3460	2	15.81	17.50	1.476	62.9	1.006	-0.02	0.567	0.842		
	2nd	LTE Band 42C	20M	QPSK	1	99	-	Left Tilted	0mm	Ant 5	ECI2	42190+42388	3460+3479.8	1	15.68	17.50	1.521	62.9	1.006	0.01	0.451	0.690		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 5	ECI2	656000	3840	1	15.51	17.00	1.409	-	-	0.08	0.279	0.393		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 5	ECI2	656000	3840	1	15.38	17.00	1.452	-	-	0.01	0.368	0.534		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 5	ECI2	656000	3840	1	15.51	17.00	1.409	-	-	-0.08	0.309	0.435		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 5	ECI2	656000	3840	1	15.38	17.00	1.452	-	-	-0.08	0.403	0.585		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 5	ECI2	656000	3840	1	15.51	17.00	1.409	-	-	-0.18	0.378	0.533		
13	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 5	ECI2	656000	3840	1	15.38	17.00	1.452	-	-	0.1	0.512	0.743		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 5	ECI2	656000	3840	1	15.51	17.00	1.409	-	-	0.08	0.388	0.547		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 5	ECI2	656000	3840	1	15.38	17.00	1.452	-	-	-0.17	0.510	0.741		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 1	ECI2	656000	3840	1	18.79	20.00	1.321	-	-	-0.01	0.042	0.055		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 1	ECI2	656000	3840	1	18.50	20.00	1.413	-	-	-0.08	0.048	0.068		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 1	ECI2	656000	3840	1	18.79	20.00	1.321	-	-	0.09	0.052	0.069		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 1	ECI2	656000	3840	1	18.50	20.00	1.413	-	-	0.08	0.059	0.083		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 1	ECI2	656000	3840	1	18.79	20.00	1.321	-	-	0.12	0.083	0.110		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 1	ECI2	656000	3840	1	18.50	20.00	1.413	-	-	0.03	0.108	0.153		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 1	ECI2	656000	3840	1	18.79	20.00	1.321	-	-	-0.12	0.000	0.000		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 1	ECI2	656000	3840	1	18.50	20.00	1.413	-	-	0.04	0.038	0.054		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 2	ECI2	656000	3840	1	19.49	21.00	1.416	-	-	0.04	0.094	0.133		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 2	ECI2	656000	3840	1	19.39	21.00	1.449	-	-	0.12	0.133	0.193		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 2	ECI2	656000	3840	1	19.49	21.00	1.416	-	-	-0.12	0.060	0.085		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 2	ECI2	656000	3840	1	19.39	21.00	1.449	-	-	-0.04	0.090	0.130		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 2	ECI2	656000	3840	1	19.49	21.00	1.416	-	-	-0.07	0.070	0.099		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 2	ECI2	656000	3840	1	19.39	21.00	1.449	-	-	0.02	0.081	0.117		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 2	ECI2	656000	3840	1	19.49	21.00	1.416	-	-	-0.09	0.000	0.000		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 2	ECI2	656000	3840	1	19.39	21.00	1.449	-	-	0.06	0.043	0.062		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 7	ECI2	656000	3840	1	18.70	19.50	1.202	-	-	0.17	0.139	0.167		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 7	ECI2	656000	3840	1	18.51	19.50	1.256	-	-	0.09	0.191	0.240		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 7	ECI2	656000	3840	1	18.70	19.50	1.202	-	-	0.13	0.122	0.147		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 7	ECI2	656000	3840	1	18.51	19.50	1.256	-	-	0.04	0.172	0.216		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 7	ECI2	656000	3840	1	18.70	19.50	1.202	-	-	0.19	0.438	0.527		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 7	ECI2	656000	3840	1	18.51	19.50	1.256	-	-	0.05	0.520	0.653		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 7	ECI2	656000	3840	2	18.51	19.50	1.256	-	-	0.01	0.512	0.643		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 7	ECI2	656000	3840	1	18.70	19.50	1.202	-	-	0.07	0.242	0.291		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 7	ECI2	656000	3840	1	18.51	19.50	1.256	-	-	0.11	0.340	0.427		



Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)	Deviation (%)	Deviation d _{dB} (dB)
2450MHz																				
	1st	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 6	standalone	6	2437	1	16.94	17.50	1.138	100	1.000	0.02	0.813	0.925	-13.19%	0.61
14	2nd	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 6	standalone	6	2437	1	16.83	17.50	1.167	100	1.000	-0.06	0.688	0.803		
	1st	Bluetooth	1Mbps	Left Tilted	0mm	Ant 6	Full Power	0	2402	1	14.67	15.50	1.211	76.73	1.086	-0.13	0.360	0.473	-19.66%	0.95
15	2nd	Bluetooth	1Mbps	Left Tilted	0mm	Ant 6	Full Power	0	2402	1	14.59	15.50	1.233	76.73	1.086	-0.01	0.284	0.380		
5000MHz																				
	1st	WLAN5.3GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 6	standalone	58	5290	1	14.27	16.00	1.489	100	1.000	0.01	0.689	1.026	-16.76%	0.80
	2nd	WLAN5.3GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 6	standalone	58	5290	1	14.45	16.00	1.429	100	1.000	0.02	0.598	0.854		
	1st	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 6	standalone	58	5290	1	14.27	16.00	1.489	100	1.000	-0.08	0.752	1.120	-4.73%	0.21
16	2nd	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 6	standalone	58	5290	1	14.45	16.00	1.429	100	1.000	0.01	0.747	1.067		
	2nd	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 6	standalone	58	5290	2	14.45	16.00	1.429	100	1.000	0.03	0.715	1.022		
	1st	WLAN5.5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 6	standalone	142	5710	1	15.43	17.00	1.435	100	1.000	-0.01	0.583	0.837	-3.82%	0.17
	2nd	WLAN5.5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 6	standalone	142	5710	1	15.57	17.00	1.390	100	1.000	0.02	0.579	0.805		
	1st	WLAN5.5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 6	standalone	142	5710	1	15.43	17.00	1.435	100	1.000	-0.07	0.699	1.003	-13.56%	0.63
17	2nd	WLAN5.5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 6	standalone	142	5710	1	15.57	17.00	1.390	100	1.000	-0.08	0.624	0.867		
	1st	WLAN5.8GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 6	standalone	149	5745	1	17.59	19.00	1.384	100	1.000	0.01	0.671	0.928	-0.86%	0.04
	2nd	WLAN5.8GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 6	standalone	149	5745	1	17.50	19.00	1.413	100	1.000	0.02	0.651	0.920		
	1st	WLAN5.8GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 6	standalone	157	5785	1	17.51	19.00	1.409	100	1.000	0.19	0.842	1.187	-6.49%	0.29
18	2nd	WLAN5.8GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 6	standalone	157	5785	1	17.48	19.00	1.419	100	1.000	-0.09	0.782	1.110		
	2nd	WLAN5.8GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 6	standalone	157	5785	2	17.48	19.00	1.419	100	1.000	0.02	0.732	1.039		



16.2 Hotspot SAR

Plot No.	No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)	Deviation (%)	Deviation d _{dB} (dB)
750MHz																								
	2nd	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	ECI7	23095	707.5	1	22.67	24.00	1.358	-	-	0.06	0.190	0.258		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Front	5mm	Ant 0	ECI7	23095	707.5	1	21.62	23.00	1.374	-	-	0.01	0.160	0.220		
	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	23095	707.5	1	22.67	24.00	1.358	-	-	0.08	0.440	0.598		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Back	5mm	Ant 0	ECI7	23095	707.5	1	21.62	23.00	1.374	-	-	0.03	0.369	0.507		
	2nd	LTE Band 12	10M	QPSK	1	0	-	Left Side	5mm	Ant 0	ECI7	23095	707.5	1	22.67	24.00	1.358	-	-	-0.05	0.189	0.257		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Left Side	5mm	Ant 0	ECI7	23095	707.5	1	21.62	23.00	1.374	-	-	0.18	0.149	0.205		
	2nd	LTE Band 12	10M	QPSK	1	0	-	Right Side	5mm	Ant 0	ECI7	23095	707.5	1	22.67	24.00	1.358	-	-	0.14	0.361	0.490		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Right Side	5mm	Ant 0	ECI7	23095	707.5	1	21.62	23.00	1.374	-	-	-0.17	0.290	0.398		
19	2nd	LTE Band 12	10M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	23095	707.5	1	22.67	24.00	1.358	-	-	0.19	0.567	0.770		
	2nd	LTE Band 12	10M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	23095	707.5	2	22.67	24.00	1.358	-	-	0.01	0.456	0.619		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Bottom Side	5mm	Ant 0	ECI7	23095	707.5	1	21.62	23.00	1.374	-	-	0.17	0.442	0.607		
835MHz																								
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Front	5mm	Ant 0	ECI7	189	836.4	1	25.43	26.50	1.279	-	-	0.02	0.418	0.535		
20	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI7	189	836.4	1	25.43	26.50	1.279	-	-	0.01	1.050	1.343		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI7	128	824.2	1	25.34	26.50	1.306	-	-	0.01	1.020	1.332		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI7	251	848.8	1	25.20	26.50	1.349	-	-	0.06	0.915	1.234		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Side	5mm	Ant 0	ECI7	189	836.4	1	25.43	26.50	1.279	-	-	0.08	0.251	0.321		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Side	5mm	Ant 0	ECI7	189	836.4	1	25.43	26.50	1.279	-	-	0.01	0.462	0.591		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 0	ECI7	189	836.4	1	25.43	26.50	1.279	-	-	-0.08	0.947	1.212		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 0	ECI7	128	824.2	1	25.34	26.50	1.306	-	-	-0.08	0.920	1.202		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 0	ECI7	251	848.8	1	25.20	26.50	1.349	-	-	-0.08	0.867	1.170		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	ECI7	4182	836.4	1	21.92	23.00	1.282	-	-	0.01	0.409	0.524		
21	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	4182	836.4	1	21.92	23.00	1.282	-	-	0.06	1.070	1.372		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	4182	836.4	2	21.92	23.00	1.282	-	-	0.01	0.889	1.140		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	4132	826.4	1	21.83	23.00	1.309	-	-	0.01	1.000	1.309		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	4233	846.6	1	21.76	23.00	1.330	-	-	0.02	0.998	1.328		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Ant 0	ECI7	4182	836.4	1	21.92	23.00	1.282	-	-	-0.05	0.229	0.294		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Ant 0	ECI7	4182	836.4	1	21.92	23.00	1.282	-	-	0.01	0.473	0.607		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	4182	836.4	1	21.92	23.00	1.282	-	-	0.1	0.917	1.176		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	4132	826.4	1	21.83	23.00	1.309	-	-	-0.17	0.831	1.088		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	4233	846.6	1	21.76	23.00	1.330	-	-	0.04	0.967	1.287		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Front	5mm	Ant 0	ECI7	26865	831.5	1	22.80	24.00	1.318	-	-	0.08	0.408	0.538		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Front	5mm	Ant 0	ECI7	26865	831.5	1	22.01	23.00	1.256	-	-	0.01	0.413	0.519		
22	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	26865	831.5	1	22.80	24.00	1.318	-	-	0.08	1.010	1.331		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Back	5mm	Ant 0	ECI7	26865	831.5	1	22.01	23.00	1.256	-	-	0.03	0.859	1.079		
	2nd	LTE Band 26	15M	QPSK	75	0	-	Back	5mm	Ant 0	ECI7	26865	831.5	1	21.95	23.00	1.274	-	-	-0.08	0.868	1.105		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Left Side	5mm	Ant 0	ECI7	26865	831.5	1	22.80	24.00	1.318	-	-	0.01	0.194	0.256		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Left Side	5mm	Ant 0	ECI7	26865	831.5	1	22.01	23.00	1.256	-	-	0.04	0.158	0.198		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Right Side	5mm	Ant 0	ECI7	26865	831.5	1	22.80	24.00	1.318	-	-	0.04	0.365	0.481		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Right Side	5mm	Ant 0	ECI7	26865	831.5	1	22.01	23.00	1.256	-	-	-0.08	0.311	0.391		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	26865	831.5	1	22.80	24.00	1.318	-	-	0.03	0.923	1.217		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Bottom Side	5mm	Ant 0	ECI7	26865	831.5	1	22.01	23.00	1.256	-	-	0.03	0.899	1.129		
	2nd	LTE Band 26	15M	QPSK	75	0	-	Bottom Side	5mm	Ant 0	ECI7	26865	831.5	1	21.95	23.00	1.274	-	-	0.02	0.653	0.832		
1750MHz																								
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	ECI7	1413	1732.6	1	17.29	18.50	1.321	-	-	0.04	0.502	0.663		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	1413	1732.6	1	17.29	18.50	1.321	-	-	-0.08	1.040	1.374		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	1312	1712.4	1	17.20	18.50	1.349	-	-	0.01	0.885	1.194		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	1513	1752.6	1	17.13	18.50	1.371	-	-	0.03	0.751	1.030		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Ant 0	ECI7	1413	1732.6	1	17.29	18.50	1.321	-	-	-0.08	0.075	0.099		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Ant 0	ECI7	1413	1732.6	1	17.29	18.50	1.321	-	-	-0.13	0.085	0.112		
23	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	1413	1732.6	1	17.29	18.50	1.321	-	-	0.01	1.050	1.387		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	1312	1712.4	1	17.20	18.50	1.349	-	-	0.03	0.911	1.229		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	1513	1752.6	1	17.13	18.50	1.371	-	-	0.06	0.940	1.289		



FCC SAR Test Report

Report No. : FA352916-13

	2nd	LTE Band 4	20M	QPSK	1	0	-	Front	5mm	Ant 0	ECI7	20175	1732.5	1	16.66	18.00	1.361	-	-	0.01	0.415	0.565		
	2nd	LTE Band 4	20M	QPSK	50	0	-	Front	5mm	Ant 0	ECI7	20175	1732.5	1	16.61	18.00	1.377	-	-	0.02	0.359	0.494		
	2nd	LTE Band 4	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	20175	1732.5	1	16.66	18.00	1.361	-	-	0.07	0.549	0.747		
	2nd	LTE Band 4	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI7	20175	1732.5	1	16.61	18.00	1.377	-	-	0.01	0.500	0.689		
	2nd	LTE Band 4	20M	QPSK	1	0	-	Left Side	5mm	Ant 0	ECI7	20175	1732.5	1	16.66	18.00	1.361	-	-	0.08	0.051	0.069		
	2nd	LTE Band 4	20M	QPSK	50	0	-	Left Side	5mm	Ant 0	ECI7	20175	1732.5	1	16.61	18.00	1.377	-	-	0.01	0.048	0.066		
	2nd	LTE Band 4	20M	QPSK	1	0	-	Right Side	5mm	Ant 0	ECI7	20175	1732.5	1	16.66	18.00	1.361	-	-	0.03	0.070	0.095		
	2nd	LTE Band 4	20M	QPSK	50	0	-	Right Side	5mm	Ant 0	ECI7	20175	1732.5	1	16.61	18.00	1.377	-	-	-0.08	0.055	0.076		
24	2nd	LTE Band 4	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	20175	1732.5	1	16.66	18.00	1.361	-	-	0.04	0.836	1.138		
	2nd	LTE Band 4	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI7	20175	1732.5	1	16.61	18.00	1.377	-	-	-0.08	0.706	0.972		
	2nd	LTE Band 4	20M	QPSK	100	0	-	Bottom Side	5mm	Ant 0	ECI7	20175	1732.5	1	16.60	18.00	1.380	-	-	0.1	0.685	0.946		
	2nd	LTE Band 4 Other PA NSA	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	20175	1732.5	1	16.99	17.50	1.125	-	-	0.05	0.713	0.802		
1900MHz																								
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Front	5mm	Ant 0	ECI7	661	1880	1	17.97	19.00	1.268	-	-	-0.08	0.185	0.235		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI7	661	1880	1	17.97	19.00	1.268	-	-	-0.17	0.664	0.842		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI7	512	1850.2	1	17.81	19.00	1.315	-	-	-0.08	0.566	0.744		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI7	810	1909.8	1	17.60	19.00	1.380	-	-	-0.04	0.433	0.598		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Left Side	5mm	Ant 0	ECI7	661	1880	1	17.97	19.00	1.268	-	-	-0.08	0.023	0.029		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Right Side	5mm	Ant 0	ECI7	661	1880	1	17.97	19.00	1.268	-	-	0.17	0.023	0.029		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 0	ECI7	661	1880	1	17.97	19.00	1.268	-	-	0.18	0.678	0.859		
25	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 0	ECI7	512	1850.2	1	17.81	19.00	1.315	-	-	0.06	0.849	1.117		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 0	ECI7	810	1909.8	1	17.60	19.00	1.380	-	-	-0.04	0.620	0.856		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	ECI7	9400	1880	1	15.13	16.50	1.371	-	-	0.03	0.213	0.292		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	9400	1880	1	15.13	16.50	1.371	-	-	0.01	0.816	1.119		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	9262	1852.4	1	15.02	16.50	1.406	-	-	-0.04	0.807	1.135		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	9538	1907.6	1	15.10	16.50	1.380	-	-	0.03	0.918	1.267		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Ant 0	ECI7	9400	1880	1	15.13	16.50	1.371	-	-	0.1	0.030	0.041		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Ant 0	ECI7	9400	1880	1	15.13	16.50	1.371	-	-	-0.1	0.030	0.041		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	9400	1880	1	15.13	16.50	1.371	-	-	0.02	1.020	1.398		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	9262	1852.4	1	15.02	16.50	1.406	-	-	0.01	0.940	1.322		
26	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	9538	1907.6	1	15.10	16.50	1.380	1	1	0.03	1.030	1.422		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	9538	1907.6	2	15.10	16.50	1.380	-	-	0.01	0.895	1.235		
	2nd	LTE Band 2	20M	QPSK	1	0	-	Front	5mm	Ant 0	ECI7	18900	1880	1	15.19	16.50	1.352	-	-	0.08	0.210	0.284		
	2nd	LTE Band 2	20M	QPSK	50	0	-	Front	5mm	Ant 0	ECI7	18900	1880	1	15.17	16.50	1.358	-	-	0.01	0.165	0.224		
	2nd	LTE Band 2	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	18900	1880	1	15.19	16.50	1.352	-	-	-0.08	0.793	1.072		
	2nd	LTE Band 2	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	18700	1860	1	15.10	16.50	1.380	-	-	-0.08	0.750	1.035		
	2nd	LTE Band 2	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	19100	1900	1	15.09	16.50	1.384	-	-	0.02	0.771	1.067		
	2nd	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI7	18900	1880	1	15.17	16.50	1.358	-	-	0.1	0.578	0.785		
	2nd	LTE Band 2	20M	QPSK	100	0	-	Back	5mm	Ant 0	ECI7	18900	1880	1	15.16	16.50	1.361	-	-	-0.18	0.615	0.837		
	2nd	LTE Band 2	20M	QPSK	1	0	-	Left Side	5mm	Ant 0	ECI7	18900	1880	1	15.19	16.50	1.352	-	-	0.1	0.032	0.043		
	2nd	LTE Band 2	20M	QPSK	50	0	-	Left Side	5mm	Ant 0	ECI7	18900	1880	1	15.17	16.50	1.358	-	-	0.12	0.025	0.034		
	2nd	LTE Band 2	20M	QPSK	1	0	-	Right Side	5mm	Ant 0	ECI7	18900	1880	1	15.19	16.50	1.352	-	-	0.08	0.031	0.042		
	2nd	LTE Band 2	20M	QPSK	50	0	-	Right Side	5mm	Ant 0	ECI7	18900	1880	1	15.17	16.50	1.358	-	-	-0.17	0.026	0.035		
27	2nd	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	18900	1880	1	15.19	16.50	1.352	-	-	0.07	1.020	1.379		
	2nd	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	18700	1860	1	15.10	16.50	1.380	-	-	-0.03	0.895	1.235		
	2nd	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	19100	1900	1	15.09	16.50	1.384	-	-	0.14	0.993	1.374		
	2nd	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI7	18900	1880	1	15.17	16.50	1.358	-	-	0.11	0.827	1.123		
	2nd	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI7	18700	1860	1	15.11	16.50	1.377	-	-	-0.05	0.727	1.001		
	2nd	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI7	19100	1900	1	15.13	16.50	1.371	-	-	0.18	0.802	1.099		
	2nd	LTE Band 2	20M	QPSK	100	0	-	Bottom Side	5mm	Ant 0	ECI7	18900	1880	1	15.16	16.50	1.361	-	-	0.01	0.827	1.126		
	2nd	LTE Band 2 Other PA NSA	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	18900	1880	1	15.35	15.50	1.035	-	-	0.08	0.891	0.922		
2600MHz																								
	1st	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI7	41055	2636.5	1	20.81	22.00	1.315	62.9	1.006	0.06	1.04	1.376		
28	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI7	41055	2636.5	1	20.93	22.00	1.279	62.9	1.006	0.01	1.01	1.300	-5.52%	0.25
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI7	41055	2636.5	2	20.93	22.00	1.279	62.9	1.006	0.02	0.80	1.027		
	1st	LTE Band 41	20M	QPSK	1	0	-	Left Side	5mm	Ant 1	ECI7	41490	2680	1	20.76	22.00	1.330	62.9	1.006	0.06	0.710	0.950	-4.11%	0.18
	2nd	LTE Band 41	20M	QPSK	1	0	-	Left Side	5mm	Ant 1	ECI7	41490	2680	1	20.56	22.00	1.393	62.9	1.006	0.06	0.65	0.911		



FCC SAR Test Report

Report No. : FA352916-13

	2nd	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 4	ECI7	40620	2593	1	11.39	12.00	1.151	62.9	1.006	0.01	0.134	0.155		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 4	ECI7	40620	2593	1	11.38	12.00	1.153	62.9	1.006	0.1	0.129	0.150		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI7	40620	2593	1	11.39	12.00	1.151	62.9	1.006	-0.17	0.246	0.285		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 4	ECI7	40620	2593	1	11.38	12.00	1.153	62.9	1.006	0.04	0.251	0.291		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Left Side	5mm	Ant 4	ECI7	40620	2593	1	11.39	12.00	1.151	62.9	1.006	-0.01	0.053	0.061		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Left Side	5mm	Ant 4	ECI7	40620	2593	1	11.38	12.00	1.153	62.9	1.006	-0.08	0.053	0.061		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	40620	2593	1	11.39	12.00	1.151	62.9	1.006	0.05	0.445	0.515		
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Top Side	5mm	Ant 4	ECI7	40620+40818	2593+2612.8	1	11.29	12.00	1.178	62.9	1.006	0.01	0.413	0.489		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Top Side	5mm	Ant 4	ECI7	40620	2593	1	11.38	12.00	1.153	62.9	1.006	0.06	0.414	0.480		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	40620	2593	1	13.98	15.00	1.265	42.9	1.009	0.03	0.512	0.653		
	2nd	LTE Band 41C HPUE	20M	QPSK	1	99	-	Top Side	5mm	Ant 4	ECI7	40620+40818	2593+2612.8	1	13.88	15.00	1.294	42.9	1.009	0.01	0.485	0.633		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	39750	2506	1	13.68	15.00	1.355	42.9	1.009	0.04	0.431	0.589		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	40185	2549.5	1	13.84	15.00	1.306	42.9	1.009	0.13	0.426	0.561		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	41055	2636.5	1	13.73	15.00	1.340	42.9	1.009	0.02	0.401	0.542		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	41490	2680	1	13.71	15.00	1.346	42.9	1.009	0.03	0.392	0.532		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Top Side	5mm	Ant 4	ECI7	40620	2593	1	13.82	15.00	1.312	42.9	1.009	0.04	0.457	0.605		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Top Side	5mm	Ant 4	ECI7	39750	2506	1	13.73	15.00	1.340	42.9	1.009	-0.01	0.467	0.631		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Top Side	5mm	Ant 4	ECI7	40185	2549.5	1	13.82	15.00	1.312	42.9	1.009	0.04	0.467	0.618		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Top Side	5mm	Ant 4	ECI7	41055	2636.5	1	13.73	15.00	1.340	42.9	1.009	0.02	0.464	0.627		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Top Side	5mm	Ant 4	ECI7	41490	2680	1	13.70	15.00	1.349	42.9	1.009	0.03	0.431	0.587		
	2nd	LTE Band 41 HPUE	20M	QPSK	100	0	-	Top Side	5mm	Ant 4	ECI7	40620	2593	1	13.90	15.00	1.288	42.9	1.009	0.04	0.447	0.581		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 4	ECI7	518598	2592.99	1	10.39	11.00	1.151	-	-	-0.01	0.182	0.209		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 4	ECI7	518598	2592.99	1	10.16	11.00	1.213	-	-	-0.08	0.105	0.127		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 4	ECI7	518598	2592.99	1	10.39	11.00	1.151	-	-	0.05	0.189	0.218		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 4	ECI7	518598	2592.99	1	10.16	11.00	1.213	-	-	0.06	0.340	0.413		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	5mm	Ant 4	ECI7	518598	2592.99	1	10.39	11.00	1.151	-	-	-0.08	0.037	0.043		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Left Side	5mm	Ant 4	ECI7	518598	2592.99	1	10.16	11.00	1.213	-	-	0.13	0.077	0.093		
29	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	5mm	Ant 4	ECI7	518598	2592.99	1	10.39	11.00	1.151	-	-	0.12	0.507	0.583		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	5mm	Ant 4	ECI7	518598	2592.99	1	10.16	11.00	1.213	-	-	0.11	0.444	0.539		
3500MHz																								
	1st	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	ECI7	42990	3540	1	14.39	16.00	1.449	62.9	1.006	-0.05	0.446	0.650		
30	2nd	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	ECI7	42990	3540	1	14.41	16.00	1.442	62.9	1.006	0.04	0.437	0.634	-2.46%	0.11
	2nd	LTE Band 42C	20M	QPSK	1	99	-	Back	5mm	Ant 5	ECI7	42990+42792	3540+3520	1	14.20	16.00	1.514	62.9	1.006	0.1	0.412	0.627		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 5	ECI7	656000	3840	1	13.62	15.00	1.374	-	-	0.03	0.228	0.313		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 5	ECI7	656000	3840	1	13.50	14.00	1.122	-	-	0.03	0.210	0.236		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI7	656000	3840	1	13.62	15.00	1.374	-	-	0.16	0.490	0.673		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI7	656000	3840	1	13.50	14.00	1.122	-	-	0.01	0.411	0.461		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	5mm	Ant 5	ECI7	656000	3840	1	13.62	15.00	1.374	-	-	0.01	0.036	0.049		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Side	5mm	Ant 5	ECI7	656000	3840	1	13.50	14.00	1.122	-	-	0.03	0.046	0.052		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	5mm	Ant 5	ECI7	656000	3840	1	13.62	15.00	1.374	-	-	-0.08	0.105	0.144		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Side	5mm	Ant 5	ECI7	656000	3840	1	13.50	14.00	1.122	-	-	-0.08	0.165	0.185		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	5mm	Ant 5	ECI7	656000	3840	1	13.62	15.00	1.374	-	-	0.1	0.307	0.422		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	5mm	Ant 5	ECI7	656000	3840	1	13.50	14.00	1.122	-	-	-0.18	0.419	0.470		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 1	ECI7	656000	3840	1	18.79	20.00	1.321	-	-	-0.17	0.277	0.366		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 1	ECI7	656000	3840	1	18.50	20.00	1.413	-	-	-0.03	0.415	0.586		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI7	656000	3840	1	18.79	20.00	1.321	-	-	0.14	0.324	0.428		
31	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI7	656000	3840	1	18.50	20.00	1.413	-	-	0.11	0.521	0.736		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI7	656000	3840	2	18.50	20.00	1.413	-	-	0.01	0.508	0.718		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	5mm	Ant 1	ECI7	656000	3840	1	18.79	20.00	1.321	-	-	-0.05	0.327	0.432		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Side	5mm	Ant 1	ECI7	656000	3840	1	18.50	20.00	1.413	-	-	0.18	0.517	0.730		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Bottom Side	5mm	Ant 1	ECI7	656000	3840	1	18.79	20.00	1.321	-	-	0.14	0.088	0.116		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Bottom Side	5mm	Ant 1	ECI7	656000	3840	1	18.50	20.00	1.413	-	-	-0.17	0.176	0.249		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 2	ECI7	656000	3840	1	15.06	16.00	1.242	-	-	0.03	0.009	0.011		



FCC SAR Test Report

Report No. : FA352916-13

2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 2	ECI7	656000	3840	1	15.00	16.00	1.259	-	-	0.18	0.004	0.005		
2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI7	656000	3840	1	15.06	16.00	1.242	-	-	0.16	0.388	0.482		
2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI7	656000	3840	1	15.00	16.00	1.259	-	-	0.02	0.372	0.468		
2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	5mm	Ant 2	ECI7	656000	3840	1	15.06	16.00	1.242	-	-	0.07	0.130	0.161		
2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Left Side	5mm	Ant 2	ECI7	656000	3840	1	15.00	16.00	1.259	-	-	0.18	0.154	0.194		
2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	5mm	Ant 2	ECI7	656000	3840	1	15.06	16.00	1.242	-	-	-0.1	0.000	0.000		
2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	5mm	Ant 2	ECI7	656000	3840	1	15.00	16.00	1.259	-	-	0.01	0.023	0.029		
2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 7	ECI7	656000	3840	1	15.96	16.50	1.132	-	-	-0.13	0.094	0.106		
2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 7	ECI7	656000	3840	1	15.86	16.50	1.159	-	-	-0.13	0.079	0.092		
2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI7	656000	3840	1	15.96	16.50	1.132	-	-	0.06	0.300	0.340		
2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI7	656000	3840	1	15.86	16.50	1.159	-	-	-0.07	0.220	0.255		
2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	5mm	Ant 7	ECI7	656000	3840	1	15.96	16.50	1.132	-	-	0.08	0.161	0.182		
2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Right Side	5mm	Ant 7	ECI7	656000	3840	1	15.86	16.50	1.159	-	-	-0.07	0.192	0.222		
2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	5mm	Ant 7	ECI7	656000	3840	1	15.96	16.50	1.132	-	-	-0.11	0.049	0.055		
2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	5mm	Ant 7	ECI7	656000	3840	1	15.86	16.50	1.159	-	-	-0.12	0.080	0.093		

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)	Deviation (%)	Deviation d _{avg} (dB)
2450MHz																				
	1st	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	Ant 6	standalone	11	2462	1	14.14	15.50	1.368	100	1.000	-0.03	0.477	0.652	-10.28%	0.47
32	2nd	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	Ant 6	standalone	11	2462	1	14.21	15.50	1.346	100	1.000	0.06	0.435	0.585		
	1st	Bluetooth	1Mbps	Top Side	5mm	Ant 6	Full Power	0	2402	1	14.67	15.50	1.211	76.73	1.086	-0.03	0.373	0.490	-5.92%	0.26
33	2nd	Bluetooth	1Mbps	Top Side	5mm	Ant 6	Full Power	0	2402	1	14.59	15.50	1.233	76.73	1.086	0.07	0.344	0.461		
5000MHz																				
	1st	WLAN5.2GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 6	standalone	42	5210	1	13.41	15.00	1.442	100	1.000	0.02	0.429	0.619	-5.98%	0.27
34	2nd	WLAN5.2GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 6	standalone	42	5210	1	13.49	15.00	1.416	100	1.000	0.06	0.411	0.582		
	1st	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 6	standalone	155	5775	1	9.77	11.00	1.327	100	1.000	-0.01	0.531	0.705	-2.98%	0.13
35	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 6	standalone	155	5775	1	9.65	11.00	1.365	100	1.000	0.05	0.501	0.684		



16.3 Body Worn Accessory SAR

Plot No.	No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Headset	Power State	Ch.	Freq. (MHz)	Sample	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)	Deviation (%)	Deviation d ₉₅ (dB)
750MHz																									
	2nd	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	-	ECI3	23095	707.5	1	22.67	24.00	1.358	-	-	0.06	0.262	0.356		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Front	5mm	Ant 0	-	ECI3	23095	707.5	1	21.62	23.00	1.374	-	-	0.01	0.220	0.302		
36	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	-	ECI3	23095	707.5	1	22.67	24.00	1.358	-	-	0.08	0.505	0.686		
	2nd	LTE Band 12	10M	QPSK	25	0	-	Back	5mm	Ant 0	-	ECI3	23095	707.5	1	21.62	23.00	1.374	-	-	0.03	0.485	0.666		
835MHz																									
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Front	5mm	Ant 0	-	ECI3	189	836.4	1	25.43	26.50	1.279	-	-	0.02	0.418	0.535		
37	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	-	ECI3	189	836.4	1	25.43	26.50	1.279	-	-	0.01	1.050	1.343		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	Headset	ECI3	189	836.4	1	25.43	26.50	1.279	-	-	0.08	1.000	1.279		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	-	ECI3	128	824.2	1	25.34	26.50	1.306	-	-	0.01	1.020	1.332		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	-	ECI3	251	848.8	1	25.20	26.50	1.349	-	-	0.06	0.915	1.234		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Front	12mm	Ant 0	-	ECI4	189	836.4	1	28.35	29.50	1.303	-	-	0.01	0.311	0.405		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	17mm	Ant 0	-	ECI4	189	836.4	1	28.35	29.50	1.303	-	-	0.02	0.358	0.467		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	ECI3	4182	836.4	1	21.92	23.00	1.282	-	-	0.01	0.409	0.524		
38	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	4182	836.4	1	21.92	23.00	1.282	-	-	0.06	1.070	1.372		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Headset	ECI3	4182	836.4	1	21.92	23.00	1.282	-	-	0.03	0.998	1.280		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	4132	826.4	1	21.83	23.00	1.309	-	-	0.01	1.000	1.309		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	4233	846.6	1	21.76	23.00	1.330	-	-	0.02	0.998	1.328		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	12mm	Ant 0	-	ECI4	4182	836.4	1	22.90	24.00	1.288	-	-	0.03	0.241	0.310		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	17mm	Ant 0	-	ECI4	4182	836.4	1	22.90	24.00	1.288	-	-	0.04	0.279	0.359		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Front	5mm	Ant 0	-	ECI3	26865	831.5	1	22.80	24.00	1.318	-	-	0.08	0.408	0.538		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Front	5mm	Ant 0	-	ECI3	26865	831.5	1	22.01	23.00	1.256	-	-	0.01	0.413	0.519		
39	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	-	ECI3	26865	831.5	1	22.80	24.00	1.318	-	-	0.08	1.010	1.331		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	Headset	ECI3	26865	831.5	1	22.80	24.00	1.318	-	-	0.01	0.971	1.280		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Back	5mm	Ant 0	-	ECI3	26865	831.5	1	22.01	23.00	1.256	-	-	0.03	0.859	1.079		
	2nd	LTE Band 26	15M	QPSK	75	0	-	Back	5mm	Ant 0	-	ECI3	26865	831.5	1	21.95	23.00	1.274	-	-	-0.08	0.868	1.105		
1750MHz																									
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	ECI3	1413	1732.6	1	18.31	19.50	1.315	-	-	0.03	0.612	0.805		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	ECI3	1312	1712.4	1	18.25	19.50	1.334	-	-	0.02	0.596	0.795		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	ECI3	1513	1752.6	1	18.19	19.50	1.352	-	-	0.08	0.600	0.811		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	1413	1732.6	1	18.31	19.50	1.315	-	-	0.01	0.871	1.146		
40	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	1312	1712.4	1	18.25	19.50	1.334	-	-	0.04	1.060	1.414		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	1312	1712.4	2	18.25	19.50	1.334	-	-	0.03	0.915	1.220		
	2nd	WCDMA IV					RMC 12.2Kbps	Back	5mm	Ant 0	Headset	ECI3	1312	1712.4	1	18.25	19.50	1.334			0.04	0.990	1.320		
	2nd	WCDMA IV					RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	1513	1752.6	1	18.19	19.50	1.352			0.04	0.763	1.032		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	12mm	Ant 0	-	ECI4	1513	1752.6	1	22.69	24.00	1.352	-	-	0.01	0.588	0.795		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	17mm	Ant 0	-	ECI4	1312	1712.4	1	22.69	24.00	1.352	-	-	0.02	0.579	0.783		
	2nd	LTE Band 4 Main PA	20M	QPSK	1	0	-	Front	5mm	Ant 0	-	ECI3	20175	1732.5	1	17.55	19.00	1.396	-	-	0.01	0.540	0.754		
	2nd	LTE Band 4 Main PA	20M	QPSK	50	0	-	Front	5mm	Ant 0	-	ECI3	20175	1732.5	1	17.53	19.00	1.403	-	-	0.04	0.477	0.669		
	2nd	LTE Band 4 Main PA	20M	QPSK	100	0	-	Front	5mm	Ant 0	-	ECI3	20175	1732.5	1	17.50	19.00	1.413	-	-	0.01	0.504	0.712		
41	2nd	LTE Band 4 Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 0	-	ECI3	20175	1732.5	1	17.55	19.00	1.396	-	-	0.07	0.767	1.071		
	2nd	LTE Band 4 Main PA	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI3	20175	1732.5	1	17.53	19.00	1.403	-	-	0.01	0.651	0.913		
	2nd	LTE Band 4 Main PA	20M	QPSK	100	0	-	Back	5mm	Ant 0	-	ECI3	20175	1732.5	1	17.50	19.00	1.413	-	-	0.03	0.705	0.996		
	2nd	LTE Band 4 Other PA NSA	20M	QPSK	1	0	-	Back	5mm	Ant 0	-	ECI3	20175	1732.5	1	17.95	18.50	1.135	-	-	0.01	0.559	0.634		
	2nd	LTE Band 4 Main PA	20M	QPSK	1	0	-	Front	12mm	Ant 0	-	ECI4	20175	1732.5	1	21.69	23.50	1.517	-	-	0.03	0.512	0.777		
	2nd	LTE Band 4 Main PA	20M	QPSK	1	0	-	Back	17mm	Ant 0	-	ECI4	20175	1732.5	1	21.69	23.50	1.517	-	-	0.05	0.504	0.765		
1900MHz																									
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Front	5mm	Ant 0	-	ECI3	661	1880	1	18.45	19.50	1.274	-	-	0.01	0.273	0.348		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	-	ECI3	661	1880	1	18.45	19.50	1.274	-	-	0.02	0.837	1.066		
42	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	-	ECI3	512	1850.2	1	18.30	19.50	1.318	-	-	0.08	0.981	1.293		



FCC SAR Test Report

Report No. : FA352916-13

	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	-	ECI3	810	1909.8	1	18.13	19.50	1.371	-	-	0.01	0.639	0.876		
	2nd	GSM1900					GPRS (4 Tx slots)	Back	5mm	Ant 0	Headset	ECI3	512	1850.2		18.30	19.50	1.318	-	-	0.08	0.854	1.126		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Front	12mm	Ant 0	-	ECI4	661	1880	1	25.59	26.50	1.233	-	-	0.03	0.455	0.561		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	17mm	Ant 0	-	ECI4	512	1850.2	1	25.58	26.50	1.236	-	-	0.01	0.654	0.808		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	ECI3	9400	1880	1	16.63	18.00	1.371	-	-	0.03	0.244	0.334		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	9400	1880	1	16.63	18.00	1.371	-	-	0.03	0.933	1.279		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Headset	ECI3	9538	1907.6	1	16.60	18.00	1.380	-	-	0.17	0.917	1.266		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	9262	1852.4	1	16.57	18.00	1.390	-	-	0.01	0.923	1.283		
43	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	9538	1907.6	1	16.60	18.00	1.380	-	-	-0.05	1.040	1.436		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI3	9538	1907.6	2	16.60	18.00	1.380	-	-	0.01	0.811	1.119		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	12mm	Ant 0	-	ECI4	9400	1880	1	22.61	24.00	1.377	-	-	0.01	0.471	0.649		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	17mm	Ant 0	-	ECI4	9538	1907.6	1	22.59	24.00	1.384	-	-	0.03	0.812	1.123		
	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Front	5mm	Ant 0	-	ECI3	18900	1880	1	16.49	18.00	1.416	-	-	0.08	0.232	0.328		
	2nd	LTE Band 2 Main PA	20M	QPSK	50	0	-	Front	5mm	Ant 0	-	ECI3	18900	1880	1	16.45	18.00	1.429	-	-	0.01	0.183	0.261		
	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 0	-	ECI3	18900	1880	1	16.49	18.00	1.416	-	-	0.03	0.853	1.208		
	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 0	-	ECI3	18700	1860	1	16.27	18.00	1.489	-	-	-0.08	0.830	1.236		
44	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 0	-	ECI3	19100	1900	1	16.20	18.00	1.514	-	-	-0.04	0.866	1.311		
	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 0	Headset	ECI3	19100	1900	1	16.20	18.00	1.514	-	-	0.01	0.820	1.241		
	2nd	LTE Band 2 Main PA	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI3	18900	1880	1	16.45	18.00	1.429	-	-	-0.08	0.640	0.914		
	2nd	LTE Band 2 Main PA	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI3	18700	1860	1	16.35	18.00	1.462	-	-	0.03	0.613	0.896		
	2nd	LTE Band 2 Main PA	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI3	19100	1900	1	16.41	18.00	1.442	-	-	0.08	0.596	0.860		
	2nd	LTE Band 2 Main PA	20M	QPSK	100	0	-	Back	5mm	Ant 0	-	ECI3	18900	1880	1	16.29	18.00	1.483	-	-	0.1	0.680	1.008		
	2nd	LTE Band 2 Other PA NSA	20M	QPSK	1	0	-	Back	5mm	Ant 0	-	ECI3	19100	1900	1	16.59	17.00	1.099	-	-	0.01	0.711	0.781		
	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Front	12mm	Ant 0	-	ECI4	18900	1880	1	22.16	24.00	1.528	-	-	0.01	0.451	0.689		
	2nd	LTE Band 2 Main PA	20M	QPSK	1	0	-	Back	17mm	Ant 0	-	ECI4	19100	1900	1	22.11	24.00	1.545	-	-	0.03	0.735	1.136		
2600MHz																									
	1st	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	-	ECI3	41055	2636.5	1	20.81	22.00	1.315	62.9	1.006	0.09	0.667	0.883	-6.57%	0.30
	2nd	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	-	ECI3	41055	2636.5	1	20.93	22.00	1.279	62.9	1.006	0.03	0.641	0.825		
	1st	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	-	ECI3	41055	2636.5	1	20.81	22.00	1.315	62.9	1.006	0.06	1.040	1.376	-5.52%	0.25
45	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	-	ECI3	41055	2636.5	1	20.93	22.00	1.279	62.9	1.006	0.01	1.01	1.300		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 4	-	ECI3	40620	2593	1	16.39	17.50	1.291	62.9	1.006	-0.08	0.433	0.562		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 4	-	ECI3	40620	2593	1	16.34	17.50	1.306	62.9	1.006	-0.04	0.403	0.530		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	40620	2593	1	16.39	17.50	1.291	62.9	1.006	0.02	0.705	0.916		
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Back	5mm	Ant 4	-	ECI3	40620+40818	2593+2612.8	1	16.28	17.50	1.324	62.9	1.006	0.01	0.651	0.867		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	39750	2506	1	16.06	17.50	1.393	62.9	1.006	0.12	0.605	0.848		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	40185	2549.5	1	16.13	17.50	1.371	62.9	1.006	0.03	0.606	0.836		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	41055	2636.5	1	16.08	17.50	1.387	62.9	1.006	0.01	0.593	0.827		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	41490	2680	1	16.30	17.50	1.318	62.9	1.006	0.03	0.631	0.837		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	40620	2593	1	16.34	17.50	1.306	62.9	1.006	0.02	0.618	0.812		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	39750	2506	1	16.05	17.50	1.396	62.9	1.006	0.04	0.539	0.757		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	40185	2549.5	1	16.10	17.50	1.380	62.9	1.006	-0.01	0.548	0.761		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	41055	2636.5	1	16.07	17.50	1.390	62.9	1.006	0.02	0.601	0.840		
	2nd	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	41490	2680	1	16.29	17.50	1.321	62.9	1.006	0.03	0.548	0.728		
	2nd	LTE Band 41	20M	QPSK	100	0	-	Back	5mm	Ant 4	-	ECI3	40620	2593	1	16.38	17.50	1.294	62.9	1.006	0.04	0.565	0.736		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	40620	2593	1	19.19	20.50	1.352	42.9	1.009	0.01	0.829	1.131		
	2nd	LTE Band 41C HPUE	20M	QPSK	1	99	-	Back	5mm	Ant 4	-	ECI3	40620+40818	2593+2612.8	1	19.03	20.50	1.403	42.9	1.009	0.02	0.715	1.012		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	40620	2593	2	19.19	20.50	1.352	42.9	1.009	0.12	0.781	1.065		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	39750	2506	1	19.00	20.50	1.413	42.9	1.009	0.12	0.715	1.019		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	40185	2549.5	1	19.12	20.50	1.374	42.9	1.009	0.03	0.716	0.993		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	41055	2636.5	1	19.00	20.50	1.413	42.9	1.009	0.01	0.703	1.002		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	5mm	Ant 4	-	ECI3	41490	2680	1	19.01	20.50	1.409	42.9	1.009	0.03	0.741	1.054		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	40620	2593	1	19.18	20.50	1.355	42.9	1.009	0.02	0.668	0.913		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	39750	2506	1	19.01	20.50	1.409	42.9	1.009	0.04	0.649	0.923		



FCC SAR Test Report

Report No. : FA352916-13

	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	40185	2549.5	1	19.16	20.50	1.361	42.9	1.009	-0.01	0.658	0.904		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	41055	2636.5	1	19.04	20.50	1.400	42.9	1.009	0.02	0.711	1.004		
	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	5mm	Ant 4	-	ECI3	41490	2680	1	19.00	20.50	1.413	42.9	1.009	0.03	0.658	0.938		
	2nd	LTE Band 41 HPUE	20M	QPSK	100	0	-	Back	5mm	Ant 4	-	ECI3	40620	2593	1	19.17	20.50	1.358	42.9	1.009	0.04	0.675	0.925		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Front	12mm	Ant 4	-	ECI4	40620	2593	1	22.65	24.00	1.365	62.9	1.006	0.03	0.431	0.592		
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	17mm	Ant 4	-	ECI4	40620	2593	1	22.65	24.00	1.365	62.9	1.006	0.01	0.408	0.560		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Front	12mm	Ant 4	-	ECI4	40620	2593	1	25.46	27.00	1.426	42.9	1.009	0.02	0.551	0.793		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	17mm	Ant 4	-	ECI4	40620	2593	1	25.46	27.00	1.426	42.9	1.009	0.04	0.533	0.767		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 4	-	ECI3	518598	2592.99	1	14.40	15.50	1.288	-	-	0.01	0.424	0.546		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 4	-	ECI3	518598	2592.99	1	14.29	15.50	1.321	-	-	0.02	0.244	0.322		
46	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 4	-	ECI3	518598	2592.99	1	14.40	15.50	1.288	-	-	-0.16	0.794	1.023		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 4	-	ECI3	518598	2592.99	1	14.29	15.50	1.321	-	-	0.01	0.742	0.980		
	2nd	FR1 n41	100M	QPSK	270	0	DFT-SCS-30KHz	Back	5mm	Ant 4	-	ECI3	518598	2592.99	1	14.19	15.50	1.352	-	-	0.02	0.690	0.933		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Front	12mm	Ant 4	-	ECI4	518598	2592.99	1	21.78	23.00	1.324	-	-	0.01	0.513	0.679		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	17mm	Ant 4	-	ECI4	518598	2592.99	1	21.78	23.00	1.324	-	-	0.03	0.458	0.607		
3500MHz																									
	1st	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	-	ECI3	42990	3540	1	15.81	17.50	1.476	62.9	1.006	-0.04	0.576	0.855		
47	2nd	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	-	ECI3	42990	3540	1	15.69	17.50	1.517	62.9	1.006	0.04	0.532	0.812	-5.03%	0.22
	2nd	LTE Band 42C	20M	QPSK	1	99	-	Back	5mm	Ant 5	-	ECI3	42990 +42792	3540 +3520	1	15.61	17.50	1.545	62.9	1.006	0.01	0.503	0.782		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 5	-	ECI3	656000	3840	1	15.60	17.00	1.380	-	-	0.03	0.422	0.583		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 5	-	ECI3	656000	3840	1	15.49	17.00	1.416	-	-	0.03	0.560	0.793		
48	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 5	-	ECI3	656000	3840	1	15.60	17.00	1.380	-	-	0.16	0.741	1.023		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 5	-	ECI3	656000	3840	1	15.60	17.00	1.380	-	-	0.01	0.721	0.995		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	-	ECI3	656000	3840	2	15.49	17.00	1.416	-	-	0.01	0.703	0.995		
	2nd	FR1 n77 Part 270	100M	QPSK	270	0	DFT-SCS-30KHz	Back	5mm	Ant 5	-	ECI3	656000	3840	1	15.40	17.00	1.445	-	-	0.05	0.691	0.999		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	12mm	Ant 5	-	ECI4	656000	3840	1	22.51	24.00	1.409	-	-	0.03	0.489	0.689		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	17mm	Ant 5	-	ECI4	656000	3840	1	22.51	24.00	1.409	-	-	0.01	0.331	0.466		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 1	-	ECI3	656000	3840	1	18.79	20.00	1.321	-	-	-0.17	0.277	0.366		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 1	-	ECI3	656000	3840	1	18.50	20.00	1.413	-	-	-0.03	0.415	0.586		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 1	-	ECI3	656000	3840	1	18.79	20.00	1.321	-	-	0.14	0.324	0.428		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 1	-	ECI3	656000	3840	1	18.50	20.00	1.413	-	-	0.11	0.521	0.736		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 2	-	ECI3	656000	3840	1	16.89	18.00	1.291	-	-	0.03	0.015	0.019		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 2	-	ECI3	656000	3840	1	16.79	18.00	1.321	-	-	0.18	0.006	0.008		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 2	-	ECI3	656000	3840	1	16.89	18.00	1.291	-	-	0.16	0.615	0.794		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 2	-	ECI3	656000	3840	2	16.89	18.00	1.291	-	-	0.01	0.605	0.781		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	-	ECI3	656000	3840	1	16.79	18.00	1.321	-	-	0.02	0.589	0.778		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	12mm	Ant 2	-	ECI4	656000	3840	1	19.49	21.00	1.416	-	-	0.01	0.105	0.149		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	17mm	Ant 2	-	ECI4	656000	3840	1	19.49	21.00	1.416	-	-	0.03	0.134	0.190		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 7	-	ECI3	656000	3840	1	17.74	18.50	1.191	-	-	-0.13	0.149	0.177		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 7	-	ECI3	656000	3840	1	17.64	18.50	1.219	-	-	-0.13	0.125	0.152		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 7	-	ECI3	656000	3840	1	17.74	18.50	1.191	-	-	0.06	0.476	0.567		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	-	ECI3	656000	3840	1	17.64	18.50	1.219	-	-	-0.07	0.348	0.424		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Front	12mm	Ant 7	-	ECI4	656000	3840	1	19.69	20.50	1.205	-	-	0.01	0.561	0.676		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	17mm	Ant 7	-	ECI4	656000	3840	1	19.69	20.50	1.205	-	-	0.03	0.351	0.423		



FCC SAR Test Report

Report No. : FA352916-13

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power State	Ch.	Freq. (MHz)	Sample	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)	Deviation (%)	Deviation d _{dB} (dB)
2450MHz																					
	1st	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 6	-	Standalone	6	2437	1	18.89	20.50	1.449	100	1.000	-0.01	0.741	1.074	-0.37%	0.02
	2nd	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 6	-	Standalone	6	2437	1	18.87	20.50	1.455	100	1.000	0.02	0.735	1.070		
	1st	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6	-	Standalone	11	2462	1	19.16	20.50	1.361	100	1.000	0.18	1.020	1.389	-4.61%	0.20
49	2nd	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6	-	Standalone	11	2462	1	19.11	20.50	1.377	100	1.000	0.17	0.962	1.325		
	2nd	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6	-	Standalone	11	2462	2	19.11	20.50	1.377	100	1.000	0.02	0.815	1.122	0.00%	0.00
	1st	Bluetooth	1Mbps	Back	5mm	Ant 6	-	Full Power	0	2402	1	14.67	15.50	1.211	76.73	1.086	-0.05	0.337	0.443		
50	2nd	Bluetooth	1Mbps	Back	5mm	Ant 6	-	Full Power	0	2402	1	14.59	15.50	1.233	76.73	1.086	0.03	0.331	0.443		
5000MHz																					
	1st	WLAN5.3GHz	802.11a 6Mbps	Front	5mm	Ant 6	-	Standalone	60	5300	1	17.38	19.00	1.452	100	1.000	0.01	0.738	1.072	-0.28%	0.01
	2nd	WLAN5.3GHz	802.11a 6Mbps	Front	5mm	Ant 6	-	Standalone	60	5300	1	17.35	19.00	1.462	100	1.000	0.02	0.731	1.069		
	1st	WLAN5.3GHz	802.11a 6Mbps	Back	5mm	Ant 6	-	Standalone	60	5300	1	17.38	19.00	1.452	100	1.000	0.01	0.776	1.127	-0.71%	0.03
51	2nd	WLAN5.3GHz	802.11a 6Mbps	Back	5mm	Ant 6	-	Standalone	60	5300	1	17.35	19.00	1.462	100	1.000	-0.03	0.765	1.119		
	1st	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 6	-	Standalone	122	5610	1	12.72	14.00	1.343	100	1.000	0.04	0.277	0.372	-25.54%	1.28
	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 6	-	Standalone	122	5610	1	12.71	14.00	1.346	100	1.000	0.01	0.206	0.277		
	1st	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	-	Standalone	138	5690	1	12.68	14.00	1.355	100	1.000	-0.06	0.783	1.061	-16.87%	0.80
52	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	-	Standalone	138	5690	1	12.74	14.00	1.337	100	1.000	-0.09	0.660	0.882		
	1st	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 6	-	Standalone	155	5775	1	12.87	14.00	1.297	100	1.000	0.04	0.140	0.182	-22.53%	1.11
	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 6	-	Standalone	155	5775	1	12.95	14.00	1.274	100	1.000	0.01	0.111	0.141		
	1st	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	-	Standalone	155	5775	1	12.87	14.00	1.297	100	1.000	-0.07	0.813	1.055	-2.46%	0.11
53	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	-	Standalone	155	5775	1	12.95	14.00	1.274	100	1.000	-0.09	0.808	1.029		



16.4 Product specific 10g SAR

Plot No.	No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)	Deviation (%)	Deviation d _{dB} (dB)
835MHz																								
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI6	189	836.4	1	28.35	29.50	1.303	-	-	0.1	1.87	2.437		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI6	128	824.2	1	28.23	29.50	1.340	-	-	-0.18	2.07	2.773		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI6	251	848.8	1	28.13	29.50	1.371	-	-	0.1	1.68	2.303		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	189	836.4	1	28.35	29.50	1.303	-	-	0.12	2.40	3.128		
54	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	128	824.2	1	28.23	29.50	1.340	-	-	0.04	2.64	3.537		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	128	824.2	2	28.23	29.50	1.340	-	-	0.05	2.05	2.746		
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	251	848.8	1	28.13	29.50	1.371	-	-	0.08	2.50	3.427		
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI6	4182	836.4	1	22.90	24.00	1.288	-	-	0.08	1.15	1.481		
55	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	4182	836.4	1	22.90	24.00	1.288	-	-	0.08	1.22	1.572		
	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	0mm	Ant 0	ECI6	26865	831.5	1	22.80	24.00	1.318	1	1	0.08	0.779	1.027		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Back	0mm	Ant 0	ECI6	26865	831.5	1	22.01	23.00	1.256	1	1	0.03	0.651	0.818		
56	2nd	LTE Band 26	15M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	26865	831.5	1	22.80	24.00	1.318	1	1	0.01	1.55	2.043		
	2nd	LTE Band 26	15M	QPSK	36	0	-	Bottom Side	0mm	Ant 0	ECI6	26865	831.5	1	22.01	23.00	1.256	1	1	0.14	1.25	1.570		
	2nd	LTE Band 26	15M	QPSK	75	0	-	Bottom Side	0mm	Ant 0	ECI6	26865	831.5	1	21.95	23.00	1.274	1	1	0.11	1.34	1.706		
1750MHz																								
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	0mm	Ant 0	ECI6	1413	1732.6	1	20.75	22.00	1.334	-	-	-0.08	0.899	1.199		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI6	1413	1732.6	1	20.75	22.00	1.334	-	-	-0.08	1.21	1.614		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	1413	1732.6	1	20.75	22.00	1.334	-	-	0.08	2.44	3.254		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	1312	1712.4	1	20.74	22.00	1.337	-	-	0.01	2.25	3.007		
57	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	1513	1752.6	1	20.71	22.00	1.346	-	-	0.09	2.50	3.365		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	1513	1752.6	2	20.71	22.00	1.346	-	-	0.01	2.29	3.082		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	9mm	Ant 0	ECI4	1413	1732.6	1	22.76	24.00	1.330	-	-	-0.08	0.581	0.773		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	16mm	Ant 0	ECI4	1413	1732.6	1	22.76	24.00	1.330	-	-	-0.08	0.405	0.539		
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	13mm	Ant 0	ECI4	1513	1752.6	1	22.69	24.00	1.352	-	-	0.08	0.759	1.026		
	2nd	LTE Band 4	20M	QPSK	1	0	-	Front	0mm	Ant 0	ECI6	20175	1732.5	1	19.92	21.50	1.439	-	-	0.01	1.15	1.655		
	2nd	LTE Band 4	20M	QPSK	50	0	-	Front	0mm	Ant 0	ECI6	20175	1732.5	1	19.92	21.50	1.439	-	-	0.02	1.04	1.496		
	2nd	LTE Band 4	20M	QPSK	1	0	-	Back	0mm	Ant 0	ECI6	20175	1732.5	1	19.92	21.50	1.439	-	-	0.01	1.35	1.942		
	2nd	LTE Band 4	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECI6	20175	1732.5	1	19.92	21.50	1.439	-	-	0.02	1.31	1.885		
58	2nd	LTE Band 4	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	20175	1732.5	1	19.92	21.50	1.439	-	-	0.17	2.32	3.338		
	2nd	LTE Band 4	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 0	ECI6	20175	1732.5	1	19.92	21.50	1.439	-	-	0.03	1.86	2.676		
	2nd	LTE Band 4	20M	QPSK	100	0	-	Bottom Side	0mm	Ant 0	ECI6	20175	1732.5	1	19.88	21.50	1.452	-	-	-0.08	1.90	2.759		
	2nd	LTE Band 4 Other PA NSA	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	20175	1732.5	1	20.52	21.00	1.117	-	-	0.1	2.07	2.312		
	2nd	LTE Band 4	20M	QPSK	1	0	-	Front	9mm	Ant 0	ECI4	20175	1732.5	1	21.69	23.50	1.517	-	-	0.02	0.569	0.863		
	2nd	LTE Band 4	20M	QPSK	1	0	-	Back	16mm	Ant 0	ECI4	20175	1732.5	1	21.69	23.50	1.517	-	-	0.17	0.395	0.599		
	2nd	LTE Band 4	20M	QPSK	1	0	-	Bottom Side	13mm	Ant 0	ECI4	20175	1732.5	1	21.69	23.50	1.517	-	-	-0.17	0.589	0.894		
1900MHz																								
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI6	661	1880	1	22.65	23.50	1.216	-	-	0.01	2.05	2.493		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI6	512	1850.2	1	22.61	23.50	1.227	-	-	0.01	2.01	2.467		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI6	810	1909.8	1	22.63	23.50	1.222	-	-	0.13	1.98	2.419		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	661	1880	1	22.65	23.50	1.216	-	-	0.01	2.67	3.247		
59	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	512	1850.2	1	22.61	23.50	1.227	-	-	0.13	2.78	3.412		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	810	1909.8	1	22.63	23.50	1.222	-	-	0.02	2.38	2.908		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	16mm	Ant 0	ECI4	661	1880	1	25.59	26.50	1.233	-	-	0.01	0.511	0.630		
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	13mm	Ant 0	ECI4	512	1850.2	1	25.58	26.50	1.236	-	-	0.03	0.578	0.714		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI6	9400	1880	1	18.63	20.00	1.371	-	-	0.08	2.03	2.783		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI6	9262	1852.4	1	18.54	20.00	1.400	-	-	0.01	1.74	2.435		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI6	9538	1907.6	1	18.58	20.00	1.387	-	-	0.03	1.89	2.621		
60	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	9400	1880	1	18.63	20.00	1.371	-	-	0.03	2.61	3.578		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	9400	1880	2	18.63	20.00	1.371	-	-	0.02	2.35	3.222		
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	9262	1852.4	1	18.54	20.00	1.400	-	-	-0.08	2.31	3.233		



FCC SAR Test Report

Report No. : FA352916-13

2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	9538	1907.6	1	18.58	20.00	1.387	-	-	-0.08	2.38	3.300			
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	16mm	Ant 0	ECI4	9538	1907.6	1	22.59	24.00	1.384	-	-	0.03	0.501	0.693			
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	13mm	Ant 0	ECI4	9538	1907.6	1	22.59	24.00	1.384	-	-	0.01	0.731	1.011			
2nd	LTE Band 2	20M	QPSK	1	0	-	Back	0mm	Ant 0	ECI6	18900	1880	1	17.89	19.50	1.449	-	-	0.18	1.85	2.680			
2nd	LTE Band 2	20M	QPSK	1	0	-	Back	0mm	Ant 0	ECI6	18700	1860	1	17.81	19.50	1.476	-	-	0.14	1.75	2.582			
2nd	LTE Band 2	20M	QPSK	1	0	-	Back	0mm	Ant 0	ECI6	19100	1900	1	17.83	19.50	1.469	-	-	0.02	1.69	2.482			
61	2nd	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	18900	1880	1	17.89	19.50	1.449	-	-	-0.05	2.43	3.521		
2nd	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	18700	1860	1	17.81	19.50	1.476	-	-	0.17	2.13	3.143			
2nd	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	19100	1900	1	17.83	19.50	1.469	-	-	-0.05	2.28	3.349			
2nd	LTE Band 2 Other PA NSA	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	18900	1880	1	18.02	18.50	1.117	-	-	0.03	2.20	2.457			
2nd	LTE Band 2	20M	QPSK	1	0	-	Back	16mm	Ant 0	ECI4	18900	1880	1	22.16	24.00	1.528	-	-	0.01	0.501	0.765			
2nd	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	13mm	Ant 0	ECI4	18900	1880	1	22.16	24.00	1.528	-	-	0.03	0.754	1.152			
2600MHz																								
1st	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 1	ECI6	39750	2506	1	21.34	22.50	1.306	62.9	1.006	-0.05	1.72	2.260	-16.64%	0.79	
2nd	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 1	ECI6	39750	2506	1	21.11	22.50	1.377	62.9	1.006	0.01	1.360	1.884			
2nd	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 1	ECI6	39750	2506	2	21.11	22.50	1.377	62.9	1.006	0.02	1.310	1.815			
2nd	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 4	ECI6	40620	2593	1	17.79	19.00	1.321	62.9	1.006	-0.01	1.61	2.140			
2nd	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 4	ECI6	39750	2506	1	17.43	19.00	1.435	62.9	1.006	0.04	1.46	2.108			
2nd	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 4	ECI6	40185	2549.5	1	17.53	19.00	1.403	62.9	1.006	-0.01	1.43	2.018			
2nd	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 4	ECI6	41055	2636.5	1	17.50	19.00	1.413	62.9	1.006	0.01	1.35	1.918			
2nd	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 4	ECI6	41490	2680	1	17.69	19.00	1.352	62.9	1.006	0.02	1.36	1.850			
2nd	LTE Band 41	20M	QPSK	50	0	-	Front	0mm	Ant 4	ECI6	40620	2593	1	17.78	19.00	1.324	62.9	1.006	0.03	1.59	2.118			
2nd	LTE Band 41	20M	QPSK	50	0	-	Front	0mm	Ant 4	ECI6	39750	2506	1	17.45	19.00	1.429	62.9	1.006	0.04	1.44	2.070			
2nd	LTE Band 41	20M	QPSK	50	0	-	Front	0mm	Ant 4	ECI6	40185	2549.5	1	17.53	19.00	1.403	62.9	1.006	-0.01	1.43	2.018			
2nd	LTE Band 41	20M	QPSK	50	0	-	Front	0mm	Ant 4	ECI6	41055	2636.5	1	17.46	19.00	1.426	62.9	1.006	0.01	1.34	1.922			
2nd	LTE Band 41	20M	QPSK	50	0	-	Front	0mm	Ant 4	ECI6	41490	2680	1	17.73	19.00	1.340	62.9	1.006	0.02	1.38	1.860			
2nd	LTE Band 41	20M	QPSK	50	0	-	Front	0mm	Ant 4	ECI6	40620	2593	1	17.78	19.00	1.324	62.9	1.006	0.13	1.33	1.772			
2nd	LTE Band 41	20M	QPSK	100	0	-	Front	0mm	Ant 4	ECI6	39750	2506	1	17.47	19.00	1.422	62.9	1.006	0.04	1.36	1.946			
2nd	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	40620	2593	1	17.79	19.00	1.321	62.9	1.006	-0.09	1.81	2.406			
2nd	LTE Band 41C	20M	QPSK	1	99	-	Back	0mm	Ant 4	ECI6	40620+ 40818	2593+ 2612.8	1	17.66	19.00	1.361	62.9	1.006	0.02	1.56	2.137			
2nd	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	39750	2506	1	17.43	19.00	1.435	62.9	1.006	0.04	1.61	2.324			
2nd	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	40185	2549.5	1	17.53	19.00	1.403	62.9	1.006	-0.01	1.61	2.272			
2nd	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	41055	2636.5	1	17.50	19.00	1.413	62.9	1.006	0.01	1.59	2.259			
2nd	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	41490	2680	1	17.69	19.00	1.352	62.9	1.006	0.02	1.54	2.095			
2nd	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	40620	2593	1	17.78	19.00	1.324	62.9	1.006	-0.08	1.59	2.118			
2nd	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	39750	2506	1	17.45	19.00	1.429	62.9	1.006	0.04	1.42	2.041			
2nd	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	40185	2549.5	1	17.53	19.00	1.403	62.9	1.006	-0.01	1.44	2.032			
2nd	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	41055	2636.5	1	17.46	19.00	1.426	62.9	1.006	0.01	1.47	2.108			
2nd	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	41490	2680	1	17.73	19.00	1.340	62.9	1.006	0.02	1.51	2.035			
2nd	LTE Band 41	20M	QPSK	100	0	-	Back	0mm	Ant 4	ECI6	39750	2506	1	17.47	19.00	1.422	62.9	1.006	0.04	1.61	2.304			
2nd	LTE Band 41	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI6	40620	2593	1	17.79	19.00	1.321	62.9	1.006	0.12	1.12	1.489			
2nd	LTE Band 41	20M	QPSK	50	0	-	Top Side	0mm	Ant 4	ECI6	40620	2593	1	17.78	19.00	1.324	62.9	1.006	0.12	1.10	1.466			
2nd	LTE Band 41	20M	QPSK	100	0	-	Back	0mm	Ant 4	ECI6	39750	2506	1	17.47	19.00	1.422	62.9	1.006	0.04	1.61	2.304			
62	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	40620	2593	1	20.61	22.00	1.377	42.9	1.009	0.03	2.05	2.849		
2nd	LTE Band 41C HPUE	20M	QPSK	1	99	-	Back	0mm	Ant 4	ECI6	40620+ 40818	2593+ 2612.8	1	20.48	22.00	1.419	42.9	1.009	0.01	1.95	2.792			
2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	40620	2593	2	20.61	22.00	1.377	42.9	1.009	0.01	1.89	2.626			
2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	39750	2506	1	20.41	22.00	1.442	42.9	1.009	0.02	1.85	2.692			
2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	40185	2549.5	1	20.55	22.00	1.396	42.9	1.009	-0.08	1.86	2.621			
2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	41055	2636.5	1	20.40	22.00	1.445	42.9	1.009	0.04	1.84	2.684			
2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	41490	2680	1	20.44	22.00	1.432	42.9	1.009	-0.01	1.79	2.587			
2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	40620	2593	1	20.58	22.00	1.387	42.9	1.009	-0.08	1.74	2.435			
2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	39750	2506	1	20.41	22.00	1.442	42.9	1.009	0.13	1.67	2.430			
2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	40185	2549.5	1	20.54	22.00	1.400	42.9	1.009	0.12	1.69	2.387			
2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	41055	2636.5	1	20.45	22.00	1.429	42.9	1.009	0.01	1.72	2.480			



FCC SAR Test Report

Report No. : FA352916-13

	2nd	LTE Band 41 HPUE	20M	QPSK	50	0	-	Back	0mm	Ant 4	ECI6	41490	2680	1	20.38	22.00	1.452	42.9	1.009	0.02	1.76	2.579		
	2nd	LTE Band 41 HPUE	20M	QPSK	100	0	-	Back	0mm	Ant 4	ECI6	39750	2506	1	20.55	22.00	1.396	42.9	1.009	0.04	1.84	2.592		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Front	7mm	Ant 4	ECI4	40620	2593	1	22.65	24.00	1.365	62.9	1.006	0.02	0.635	0.872		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	11mm	Ant 4	ECI4	40620	2593	1	22.65	24.00	1.365	62.9	1.006	-0.09	0.731	1.003		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Top Side	14mm	Ant 4	ECI4	40620	2593	1	22.65	24.00	1.365	62.9	1.006	0.06	0.689	0.946		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Front	7mm	Ant 4	ECI4	40620	2593	1	25.46	27.00	1.426	42.9	1.009	-0.08	0.859	1.236		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	11mm	Ant 4	ECI4	40620	2593	1	25.46	27.00	1.426	42.9	1.009	0.13	0.958	1.378		
	2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Top Side	14mm	Ant 4	ECI4	40620	2593	1	25.46	27.00	1.426	42.9	1.009	0.13	0.831	1.195		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Front	0mm	Ant 4	ECI6	518598	2592.99	1	18.29	19.50	1.321	-	-	-0.01	1.75	2.312		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Front	0mm	Ant 4	ECI6	518598	2592.99	1	18.24	19.50	1.337	-	-	-0.08	1.65	2.205		
	2nd	FR1 n41	100M	QPSK	270	0	DFT-SCS-30KHz	Front	0mm	Ant 4	ECI6	518598	2592.99	1	18.11	19.50	1.377	-	-	-0.08	1.58	2.176		
63	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 4	ECI6	518598	2592.99	1	18.29	19.50	1.321	-	-	0.08	2.03	2.682		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 4	ECI6	518598	2592.99	1	18.24	19.50	1.337	-	-	0.08	1.82	2.433		
	2nd	FR1 n41	100M	QPSK	270	0	DFT-SCS-30KHz	Back	0mm	Ant 4	ECI6	518598	2592.99	1	18.11	19.50	1.377	-	-	0.16	1.70	2.341		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	0mm	Ant 4	ECI6	518598	2592.99	1	18.29	19.50	1.321	-	-	-0.1	1.82	2.405		
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	0mm	Ant 4	ECI6	518598	2592.99	1	18.24	19.50	1.337	-	-	0.07	1.61	2.152		
	2nd	FR1 n41	100M	QPSK	270	0	DFT-SCS-30KHz	Top Side	0mm	Ant 4	ECI6	518598	2592.99	1	18.11	19.50	1.377	-	-	0.18	1.68	2.314		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Front	7mm	Ant 4	ECI4	518598	2592.99	1	21.78	23.00	1.324	-	-	0.01	0.851	1.127		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	11mm	Ant 4	ECI4	518598	2592.99	1	21.78	23.00	1.324	-	-	0.03	0.935	1.238		
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	14mm	Ant 4	ECI4	518598	2592.99	1	21.78	23.00	1.324	-	-	0.01	0.771	1.021		
3500MHz																								
	1st	LTE Band 42	20M	QPSK	1	0	-	Back	0mm	Ant 5	ECI6	42990	3540	1	19.72	21.50	1.507	62.9	1.006	0.04	1.38	2.092	-14.24%	0.67
64	2nd	LTE Band 42	20M	QPSK	1	0	-	Back	0mm	Ant 5	ECI6	42990	3540	1	20.06	21.50	1.393	62.9	1.006	0.05	1.28	1.794		
	2nd	LTE Band 42	20M	QPSK	1	0	-	Back	0mm	Ant 5	ECI6	42990	3540	2	20.06	21.50	1.393	62.9	1.006	0.05	1.19	1.668		
	2nd	LTE Band 42C	20M	QPSK	1	99	-	Back	0mm	Ant 5	ECI6	42990+42792	3540+3520	1	19.56	21.50	1.563	62.9	1.006	0.03	1.01	1.588		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	656000	3840	1	19.08	20.50	1.387	-	-	-0.12	1.85	2.565		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	656000	3840	2	19.08	20.50	1.387	-	-	0.02	1.59	2.205		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	650000	3750	1	18.96	20.50	1.426	-	-	-0.12	1.65	2.352		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	662000	3930	1	18.99	20.50	1.416	-	-	-0.12	1.58	2.237		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	656000	3840	1	19.00	20.50	1.413	-	-	-0.02	1.40	1.978		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	650000	3750	1	18.73	20.50	1.503	-	-	-0.12	1.25	1.879		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	662000	3930	1	18.83	20.50	1.469	-	-	-0.12	1.29	1.895		
	2nd	FR1 n77 Part 270	100M	QPSK	270	0	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	656000	3840	1	18.87	20.50	1.455	-	-	0.02	1.33	1.936		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI6	656000	3840	1	19.08	20.50	1.387	-	-	-0.03	1.79	2.482		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI6	650000	3750	1	18.96	20.50	1.426	-	-	-0.12	1.61	2.295		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI6	662000	3930	1	18.99	20.50	1.416	-	-	-0.12	1.66	2.350		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI6	656000	3840	1	19.00	20.50	1.413	-	-	0.02	1.59	2.246		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI6	650000	3750	1	18.73	20.50	1.503	-	-	-0.12	1.46	2.195		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI6	662000	3930	1	18.83	20.50	1.469	-	-	-0.12	1.58	2.321		
	2nd	FR1 n77 Part 270	100M	QPSK	270	0	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI6	656000	3840	1	18.87	20.50	1.455	-	-	0.02	1.31	1.907		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	13mm	Ant 5	Ant 4	656000	3840	1	22.51	24.00	1.409	-	-	0.05	0.121	0.171		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	15mm	Ant 5	Ant 4	656000	3840	1	22.51	24.00	1.409	-	-	0.01	0.061	0.086		
65	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 2	ECI6	656000	3840	1	19.49	21.00	1.416	-	-	-0.15	1.89	2.676		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 2	ECI6	656000	3840	2	19.49	21.00	1.416	-	-	0.01	1.61	2.279		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 2	ECI6	656000	3840	1	19.39	21.00	1.449	-	-	0.01	1.59	2.304		
	2nd	FR1 n77 Part 270	100M	QPSK	270	0	DFT-SCS-30KHz	Back	0mm	Ant 2	ECI6	656000	3840	1	18.46	20.00	1.426	-	-	0.07	1.55	2.210		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 7	ECI6	656000	3840	1	19.69	20.50	1.205	-	-	0.03	0.867	1.045		
	2nd	FR1 n77 Part 270	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 7	ECI6	656000	3840	2	19.69	20.50	1.205	-	-	0.01	0.857	1.033		
	2nd	FR1 n77 Part 270	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 7	ECI6	656000	3840	1	19.40	20.50	1.288	-	-	-0.16	0.801	1.032		



Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	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)	Deviation (%)	Deviation d ₀₅ (dB)
2450MHz																				
	1st	WLAN2.4GHz	802.11b 1Mbps	Top Side	0mm	Ant 6	Full Power	11	2462	1	19.16	20.50	1.361	100	1.000	-0.01	1.540	2.097	-6.10%	0.27
66	2nd	WLAN2.4GHz	802.11b 1Mbps	Top Side	0mm	Ant 6	Full Power	11	2462	1	19.11	20.50	1.377	100	1.000	0.03	1.430	1.969		
	2nd	WLAN2.4GHz	802.11b 1Mbps	Top Side	0mm	Ant 6	Full Power	11	2462	2	19.11	20.50	1.377	100	1.000	0.03	1.310	1.804		
5000MHz																				
	1st	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	44	5220	1	17.96	19.50	1.426	100	1.000	-0.07	1.080	1.540	-4.09%	0.18
67	2nd	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	44	5220	1	17.85	19.50	1.462	100	1.000	-0.06	1.010	1.477		
	1st	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	56	5280	1	18.51	20.00	1.409	100	1.000	-0.04	1.270	1.790	-1.62%	0.07
68	2nd	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	56	5280	1	18.37	20.00	1.455	100	1.000	0.02	1.210	1.761		
	2nd	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	56	5280	2	18.37	20.00	1.455	100	1.000	0.02	1.120	1.630		
	1st	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	100	5500	1	17.63	19.00	1.371	100	1.000	0.09	1.130	1.549	-0.45%	0.02
69	2nd	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	100	5500	1	17.61	19.00	1.377	100	1.000	0.06	1.120	1.542		
	2nd	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	100	5500	2	17.61	19.00	1.377	100	1.000	0.02	1.110	1.529		
	1st	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	149	5745	1	17.59	19.00	1.384	100	1.000	0.07	1.380	1.909	-1.57%	0.07
70	2nd	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	149	5745	1	17.50	19.00	1.413	100	1.000	0.09	1.330	1.879		
	2nd	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	149	5745	2	17.50	19.00	1.413	100	1.000	0.01	1.250	1.766		

16.5 Repeated SAR Measurement

<1g>

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	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	4182	836.4	21.92	23.00	1.282	-	-	0.06	1.070	1	1.372
2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	4182	836.4	21.92	23.00	1.282	-	-	0.06	1.000	1.070	1.282
1st	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI7	41055	2636.5	20.93	22.00	1.279	62.9	1.006	0.01	1.01	1	1.300
2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI7	41055	2636.5	20.93	22.00	1.279	62.9	1.006	0.05	0.98	1.031	1.261
1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	1312	1712.4	18.25	19.50	1.334	-	-	0.04	1.060	1	1.414
2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	1312	1712.4	18.25	19.50	1.334	-	-	0.01	0.895	1.158	1.194
1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	9538	1907.6	16.60	18.00	1.380	-	-	-0.05	1.040	1	1.436
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	9538	1907.6	16.60	18.00	1.380	-	-	0.1	0.980	1.061	1.353
1st	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Back	5mm	Ant 6	Standalone	11	2462	19.11	20.50	1.377	100	1.000	0.17	0.962	1	1.325
2nd	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Back	5mm	Ant 6	Standalone	11	2462	19.11	20.50	1.377	100	1.000	0.01	0.941	1.022	1.296
1st	WLAN5.8GHz	-	-	-	-	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	Standalone	155	5775	12.95	14.00	1.274	100	1.000	-0.09	0.808	1	1.029
2nd	WLAN5.8GHz	-	-	-	-	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	Standalone	155	5775	12.95	14.00	1.274	100	1.000	0.12	0.785	1.022	1.000

<10g>

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	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	128	824.2	28.23	29.50	1.340	-	-	0.04	2.64	1	3.537
2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	128	824.2	28.23	29.50	1.340	-	-	0.07	2.43	1.086	3.255
1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	1513	1752.6	20.71	22.00	1.346	-	-	0.09	2.50	1	3.365
2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	1513	1752.6	20.71	22.00	1.346	-	-	0.02	2.32	1.078	3.122
1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	512	1850.2	22.61	23.50	1.227	-	-	0.13	2.78	1	3.412
2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	512	1850.2	22.61	23.50	1.227	-	-	0.02	2.56	1.086	3.142
1st	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	40620	2593	20.61	22.00	1.377	42.9	1.009	0.03	2.05	1	2.849
2nd	LTE Band 41 HPUE	20M	QPSK	1	0	-	Back	0mm	Ant 4	ECI6	40620	2593	20.61	22.00	1.377	42.9	1.009	0.03	1.86	1.102	2.585

General Note:

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

17. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product specific 10g SAR
1.	WWAN + WLAN2.4GHz	Yes	Yes	Yes	Yes
2.	WWAN + WLAN5GHz	Yes	Yes	Yes	Yes
3.	WWAN + Bluetooth	Yes	Yes	Yes	Yes
4.	WWAN + WLAN2.4GHz + NFC				Yes
5.	WWAN + WLAN5GHz + NFC				Yes
6.	WWAN + Bluetooth + NFC				Yes

General Note:

- This device supports VoIP in GPRS, EGPRS, WCDMA, LTE and 5GNR (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
- WWAN above includes 5G NR bands and EN-DC combination.
- EUT will choose each GSM, WCDMA, LTE and 5GNR according to the network signal condition; therefore, they will not operate simultaneously at any moment.
- This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
- This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WLAN Direct (GC/GO), and 5.3GHz / 5.5GHz supports WLAN Direct (GC only).
- According to the EUT characteristic, WLAN 5GHz and Bluetooth can not transmit simultaneously.
- According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz can not transmit simultaneously.
- WLAN 2.4GHz and Bluetooth share the same antenna and they cannot transmit simultaneously.
- NFC can transmit simultaneously with other Radios in extremity exposure condition.
- The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
- For Headset SAR and non-Headset SAR always chose higher SAR to do co-located analysis.
- For 5GNR EN-DC mode, standalone SAR performed for 5GNR NSA band with the maximum power, EN-DC SAR summed EN-DC mode 5GNR standalone SAR and LTE standalone SAR, the result of EN-DC SAR is more conservatively.
- When stand-alone SAR is not required for a transmitter or antenna, its SAR is considered zero in the SAR summing process to assess Multi-band transmission SAR compliance.
- For standalone WWAN, always choose the highest SAR among all WWAN bands within the selected antenna for each exposure position (except Head/Extremity exposure Conditions) to perform simultaneous transmission analysis with WLAN/BT. This is the worst co-located analysis and can represent each band. If the co-located analysis within standalone SAR is higher SAR limit (1.6W/kg for 1g SAR), always choose the highest SAR among the selected WWAN bands within the selected antenna for each exposure position to perform simultaneous transmission analysis with WLAN/BT.
- For inter-band UL CA SAR co-located with WLAN/Bluetooth, chose the worst SAR among the selected LTE bands within the selected antenna per each test position to do co-located with WLAN/Bluetooth. This is the worst co-located analysis and can represent each LTE bands.
- For EN-DC SAR co-located with WLAN/Bluetooth, chose the worst SAR among the selected LTE bands within the selected antenna per each test position and also the worst SAR of the selected 5GNR Bands within the selected antenna to do co-located with WLAN/Bluetooth. This is the worst co-located analysis and can represent each LTE bands and each 5GNR bands.
- For Headset SAR and non-Headset SAR always chose higher SAR to do co-located analysis
- The maximum SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
 - $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 - If $SPLSR \leq 0.04$ for 1g SAR and $SPLSR \leq 0.10$ for 10g SAR, simultaneously transmission SAR measurement is not necessary.
 - Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.
 - The SPLSR calculated results please refer to section 17.5.

Conclusion:

1. The Spot check results showed that Deviation of the SAR results did not exceed 3dB, SAR data reuse is justified.
2. Simultaneous transmission analysis for all bands and all position are based on maximum SAR results chosen between the original filing and Spot check Verification Data

17.1 Head Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
		WWAN	WLAN2.4GHz Ant 6	WLAN5GHz Ant 6	Bluetooth Ant 6			
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
All Bands Ant0	Right Cheek	0.669	0.095	0.339	0.124	0.76	1.01	0.79
	Right Tilted	0.375	0.119	0.371	0.158	0.49	0.75	0.53
	Left Cheek	0.551	0.299	0.404	0.393	0.85	0.96	0.94
	Left Tilted	0.340	0.372	0.366	0.473	0.71	0.71	0.81
All Bands Ant1	Right Cheek	0.291	0.095	0.339	0.124	0.39	0.63	0.42
	Right Tilted	0.217	0.119	0.371	0.158	0.34	0.59	0.38
	Left Cheek	0.472	0.299	0.404	0.393	0.77	0.88	0.87
	Left Tilted	0.147	0.372	0.366	0.473	0.52	0.51	0.62
All Bands Ant2	Right Cheek	0.193	0.095	0.339	0.124	0.29	0.53	0.32
	Right Tilted	0.130	0.119	0.371	0.158	0.25	0.50	0.29
	Left Cheek	0.117	0.299	0.404	0.393	0.42	0.52	0.51
	Left Tilted	0.062	0.372	0.366	0.473	0.43	0.43	0.54
All Bands Ant4	Right Cheek	0.694	0.095	0.339	0.124	0.79	1.03	0.82
	Right Tilted	1.108	0.119	0.371	0.158	1.23	1.48	1.27
	Left Cheek	0.333	0.299	0.404	0.393	0.63	0.74	0.73
	Left Tilted	0.451	0.372	0.366	0.473	0.82	0.82	0.92
All Bands Ant5	Right Cheek	0.534	0.095	0.339	0.124	0.63	0.87	0.66
	Right Tilted	0.585	0.119	0.371	0.158	0.70	0.96	0.74
	Left Cheek	0.743	0.299	0.404	0.393	1.04	1.15	1.14
	Left Tilted	0.741	0.372	0.366	0.473	1.11	1.11	1.21
All Bands Ant7	Right Cheek	0.240	0.095	0.339	0.124	0.34	0.58	0.36
	Right Tilted	0.216	0.119	0.371	0.158	0.34	0.59	0.37
	Left Cheek	0.653	0.299	0.404	0.393	0.95	1.06	1.05
	Left Tilted	0.427	0.372	0.366	0.473	0.80	0.79	0.90

EN-DC

WWAN Band	Exposure Position	1	2	3	4	5	1+2+3 Summed 1g SAR (W/kg)	1+2+4 Summed 1g SAR (W/kg)	1+2+5 Summed 1g SAR (W/kg)	Case No
		WWAN	FR1	WLAN2.4GHz Ant 6	WLAN5GHz Ant 6	Bluetooth Ant 6				
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
LTE Band 41 Ant1	FR1 n77 Ant 5	Right Cheek	0.291	0.534	0.095	0.339	0.124	0.92	1.16	0.95
		Right Tilted	0.217	0.585	0.119	0.371	0.158	0.92	1.17	0.96
		Left Cheek	0.472	0.743	0.299	0.404	0.393	1.51	1.62	1.61
		Left Tilted	0.147	0.741	0.372	0.366	0.473	1.26	1.25	1.36



17.2 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2	1+3	1+4	Case No
		WWAN	WLAN2.4GHz Ant 6	WLAN5GHz Ant 6	Bluetooth Ant 6	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 Band Ant2&4&5&7	Front	0.313	0.245	0.395	0.183	0.56	0.71	0.50	
	Back	0.673	0.408	0.487	0.310	1.08	1.16	0.98	
	Left side	0.194				0.19	0.19	0.19	
	Right side	0.222	0.220	0.415	0.151	0.44	0.64	0.37	
	Top side	0.653	0.652	0.705	0.490	1.31	1.36	1.14	
	Bottom side					0.00	0.00	0.00	
GSM850 Ant0	Front	0.535	0.245	0.395	0.183	0.78	0.93	0.72	
	Back	1.343	0.408	0.487	0.310	1.75	1.83	1.65	21&22&23
	Left side	0.321				0.32	0.32	0.32	
	Right side	0.591	0.220	0.415	0.151	0.81	1.01	0.74	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	1.212				1.21	1.21	1.21	
GSM1900 Ant0	Front	0.235	0.245	0.395	0.183	0.48	0.63	0.42	
	Back	0.842	0.408	0.487	0.310	1.25	1.33	1.15	
	Left side	0.029				0.03	0.03	0.03	
	Right side	0.029	0.220	0.415	0.151	0.25	0.44	0.18	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	1.117				1.12	1.12	1.12	
WCDMA II Ant0	Front	0.292	0.245	0.395	0.183	0.54	0.69	0.48	
	Back	1.267	0.408	0.487	0.310	1.68	1.75	1.58	24&25
	Left side	0.041				0.04	0.04	0.04	
	Right side	0.041	0.220	0.415	0.151	0.26	0.46	0.19	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	1.422				1.42	1.42	1.42	
WCDMA IV Ant0	Front	0.663	0.245	0.395	0.183	0.91	1.06	0.85	
	Back	1.374	0.408	0.487	0.310	1.78	1.86	1.68	26&27&28
	Left side	0.099				0.10	0.10	0.10	
	Right side	0.112	0.220	0.415	0.151	0.33	0.53	0.26	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	1.387				1.39	1.39	1.39	
WCDMA V Ant0	Front	0.524	0.245	0.395	0.183	0.77	0.92	0.71	
	Back	1.372	0.408	0.487	0.310	1.78	1.86	1.68	29&30&31
	Left side	0.294				0.29	0.29	0.29	
	Right side	0.607	0.220	0.415	0.151	0.83	1.02	0.76	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	1.287				1.29	1.29	1.29	
LTE Band 2 Ant0	Front	0.284	0.245	0.395	0.183	0.53	0.68	0.47	
	Back	1.072	0.408	0.487	0.310	1.48	1.56	1.38	
	Left side	0.043				0.04	0.04	0.04	
	Right side	0.042	0.220	0.415	0.151	0.26	0.46	0.19	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	1.379				1.38	1.38	1.38	
LTE Band 4 Ant0	Front	0.565	0.245	0.395	0.183	0.81	0.96	0.75	
	Back	0.747	0.408	0.487	0.310	1.16	1.23	1.06	
	Left side	0.069				0.07	0.07	0.07	
	Right side	0.095	0.220	0.415	0.151	0.32	0.51	0.25	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	1.138				1.14	1.14	1.14	
LTE Band 12 Ant0	Front	0.258	0.245	0.395	0.183	0.50	0.65	0.44	
	Back	0.598	0.408	0.487	0.310	1.01	1.09	0.91	



FCC SAR Test Report

Report No. : FA352916-13

	Left side	0.257				0.26	0.26	0.26	
	Right side	0.490	0.220	0.415	0.151	0.71	0.91	0.64	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	0.770				0.77	0.77	0.77	
LTE Band 26 Ant0	Front	0.538	0.245	0.395	0.183	0.78	0.93	0.72	
	Back	1.331	0.408	0.487	0.310	1.74	1.82	1.64	32&33&34
	Left side	0.256				0.26	0.26	0.26	
	Right side	0.481	0.220	0.415	0.151	0.70	0.90	0.63	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	1.217				1.22	1.22	1.22	
LTE Band 41 Ant1	Front	0.883	0.245	0.395	0.183	1.13	1.28	1.07	
	Back	1.376	0.408	0.487	0.310	1.78	1.86	1.69	35&36&37
	Left side	0.950				0.95	0.95	0.95	
	Right side		0.220	0.415	0.151	0.22	0.42	0.15	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	0.309				0.31	0.31	0.31	
FR1 n77 Ant 1	Front	0.586	0.245	0.395	0.183	0.83	0.98	0.77	
	Back	0.736	0.408	0.487	0.310	1.14	1.22	1.05	
	Left side	0.730				0.73	0.73	0.73	
	Right side		0.220	0.415	0.151	0.22	0.42	0.15	
	Top side		0.652	0.705	0.490	0.65	0.71	0.49	
	Bottom side	0.249				0.25	0.25	0.25	

EN-DC

WWAN Band		Exposure Position	1	2	3	4	5	1+2+3	1+2+4	1+2+5	Case No
			WWAN	FR1	WLAN2.4GHz Ant 6	WLAN5GHz Ant 6	Bluetooth Ant 6	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)	1g SAR (W/kg)	
LTE Band 41 Ant1	FR1 n77 Ant 5	Front	0.883	0.313	0.245	0.395	0.183	1.44	1.59	1.38	
		Back	1.376	0.673	0.408	0.487	0.310	2.46	2.54	2.36	38&39&40
		Left side	0.950	0.052				1.00	1.00	1.00	
		Right side	0.062	0.185	0.220	0.415	0.151	0.47	0.66	0.40	
		Top side		0.470	0.652	0.705	0.490	1.12	1.18	0.96	
		Bottom side	1.229					1.23	1.23	1.23	

17.3 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2	1+3	1+4	Case No
		WWAN	WLAN2.4GHz Ant 6	WLAN5GHz Ant 6	Bluetooth Ant 6	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)	
GSM850 Ant 0	Front	0.535	0.318	0.383	0.260	0.85	0.92	0.80	
	Back	1.343	0.440	0.431	0.443	1.78	1.77	1.79	50&51&52
GSM1900 Ant 0	Front	0.348	0.318	0.383	0.260	0.67	0.73	0.61	
	Back	1.293	0.440	0.431	0.443	1.73	1.72	1.74	53&54&55
WCDMA II Ant 0	Front	0.334	0.318	0.383	0.260	0.65	0.72	0.59	
	Back	1.436	0.440	0.431	0.443	1.88	1.87	1.88	7&8&9
WCDMA IV Ant 0	Front	0.811	0.318	0.383	0.260	1.13	1.19	1.07	
	Back	1.414	0.440	0.431	0.443	1.85	1.85	1.86	56&57&58
WCDMA V Ant 0	Front	0.524	0.318	0.383	0.260	0.84	0.91	0.78	
	Back	1.372	0.440	0.431	0.443	1.81	1.80	1.82	59&60&61
LTE Band 2 Ant 0	Front	0.328	0.318	0.383	0.260	0.65	0.71	0.59	
	Back	1.311	0.440	0.431	0.443	1.75	1.74	1.75	62&63&64
LTE Band 4 Ant 0	Front	0.754	0.318	0.383	0.260	1.07	1.14	1.01	
	Back	1.071	0.440	0.431	0.443	1.51	1.50	1.51	
LTE Band 12 Ant 0	Front	0.356	0.318	0.383	0.260	0.67	0.74	0.62	
	Back	0.686	0.440	0.431	0.443	1.13	1.12	1.13	
LTE Band 26 Ant 0	Front	0.538	0.318	0.383	0.260	0.86	0.92	0.80	
	Back	1.331	0.440	0.431	0.443	1.77	1.76	1.77	65&66&67
LTE Band 41 Ant 1	Front	0.883	0.318	0.383	0.260	1.20	1.27	1.14	
	Back	1.376	0.440	0.431	0.443	1.82	1.81	1.82	10&11&12
FR1 n77 Part 270 Ant 1	Front	0.586	0.318	0.383	0.260	0.90	0.97	0.85	
	Back	0.736	0.440	0.431	0.443	1.18	1.17	1.18	
All Bands Ant2	Front	0.149	0.318	0.383	0.260	0.47	0.53	0.41	
	Back	0.794	0.440	0.431	0.443	1.23	1.23	1.24	
All Bands Ant4	Front	0.793	0.318	0.383	0.260	1.11	1.18	1.05	
	Back	1.131	0.440	0.431	0.443	1.57	1.56	1.57	
All Bands Ant5	Front	0.793	0.318	0.383	0.260	1.11	1.18	1.05	
	Back	1.023	0.440	0.431	0.443	1.46	1.45	1.47	
All Bands Ant7	Front	0.676	0.318	0.383	0.260	0.99	1.06	0.94	
	Back	0.567	0.440	0.431	0.443	1.01	1.00	1.01	

EN-DC

WWAN Band		Exposure Position	1	2	3	4	5	1+2+3	1+2+4	1+2+5	Case No
			WWAN	FR1 Band	WLAN2.4GHz Ant 6	WLAN5GHz Ant 6	Bluetooth Ant 6	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)	1g SAR (W/kg)	
LTE Band 41 Ant1	FR1 n77 Ant 5	Front	0.883	0.793	0.318	0.383	0.260	1.99	2.06	1.94	13&14&15
		Back	1.376	1.023	0.440	0.431	0.443	2.84	2.83	2.84	16&17&18



Sensor-Off

WWAN Band	Exposure Position	1	2	3	4	1+2	1+3	1+4	Case No
		WWAN 1g SAR (W/kg)	WLAN2.4GHz Ant 6 1g SAR (W/kg)	WLAN5GHz Ant 6 1g SAR (W/kg)	Bluetooth Ant 6 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	
All Band Ant1&2&4&5&7	Front at 12mm	0.793	0.244	0.389	0.260	1.04	1.18	1.05	
	Back at 17mm	0.767	0.125	0.654	0.443	0.89	1.42	1.21	
GSM850 Ant 0	Front at 12mm	0.405	0.244	0.389	0.260	0.65	0.79	0.67	
	Back at 17mm	0.467	0.125	0.654	0.443	0.59	1.12	0.91	
GSM1900 Ant 0	Front at 12mm	0.561	0.244	0.389	0.260	0.81	0.95	0.82	
	Back at 17mm	0.808	0.125	0.654	0.443	0.93	1.46	1.25	
WCDMA II Ant 0	Front at 12mm	0.649	0.244	0.389	0.260	0.89	1.04	0.91	
	Back at 17mm	1.123	0.125	0.654	0.443	1.25	1.78	1.57	19
WCDMA IV Ant 0	Front at 12mm	0.795	0.244	0.389	0.260	1.04	1.18	1.06	
	Back at 17mm	0.783	0.125	0.654	0.443	0.91	1.44	1.23	
WCDMA V Ant 0	Front at 12mm	0.310	0.244	0.389	0.260	0.55	0.70	0.57	
	Back at 17mm	0.359	0.125	0.654	0.443	0.48	1.01	0.80	
LTE Band 2 Ant 0	Front at 12mm	0.689	0.244	0.389	0.260	0.93	1.08	0.95	
	Back at 17mm	1.136	0.125	0.654	0.443	1.26	1.79	1.58	20
LTE Band 4 Ant 0	Front at 12mm	0.777	0.244	0.389	0.260	1.02	1.17	1.04	
	Back at 17mm	0.765	0.125	0.654	0.443	0.89	1.42	1.21	

EN-DC

WWAN Band	FR1 Band	Exposure Position	1	2	3	4	5	1+2+3	1+2+4	1+2+5	Case No
			WWAN 1g SAR (W/kg)	FR1 Band 1g SAR (W/kg)	WLAN2.4GHz Ant 6 1g SAR (W/kg)	WLAN5GHz Ant 6 1g SAR (W/kg)	Bluetooth Ant 6 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	
LTE Band 41 Ant1	FR1 n77 Ant 5	Front at 12mm	0.513	0.689	0.244	0.389	0.260	1.45	1.59	1.46	
		Back at 17mm	0.334	0.466	0.125	0.654	0.443	0.93	1.45	1.24	

17.4 Product specific 10g SAR Exposure Conditions

Remark:

- 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.

WWAN Band	Exposure Position	1	2	3	4	1+2+4	1+3+4
		WWAN	WLAN2.4GHz Ant 6	WLAN5GHz Ant 6	NFC	Summed	Summed
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
WWAN All Bands	Front	2.312		0.809	0.031	2.34	3.15
	Back	2.849	0.868	0.863	0.077	3.79	3.79
	Left side					0.00	0.00
	Right side			0.843		0.00	0.84
	Top side	2.482	1.179	1.025		3.66	3.51
	Bottom side	3.578				3.58	3.58

EN-DC

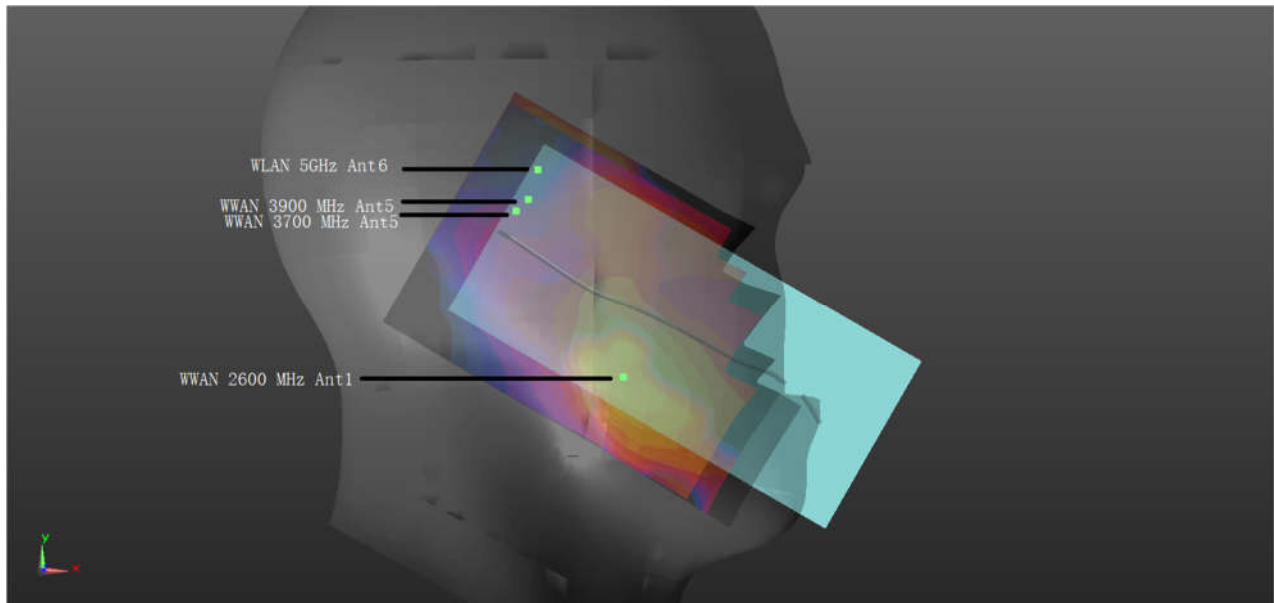
WWAN Band		Exposure Position	1	2	3	4	5	1+2+3+5	1+2+4+5	Case No
			WWAN	FR1	WLAN2.4GHz Ant 6	WLAN5GHz Ant 6	NFC	Summed	Summed	
			10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	
LTE Band 41 Ant1	FR1 n77 Ant 5	Front				0.809	0.031	0.03	0.84	
		Back	2.260	2.565	0.868	0.863	0.077	5.77	5.77	41&42
		Left side						0.00	0.00	
		Right side				0.843		0.00	0.84	
		Top side		2.482	1.179	1.025		3.66	3.51	
		Bottom side						0.00	0.00	

17.5 SPLSR Evaluation and Analysis

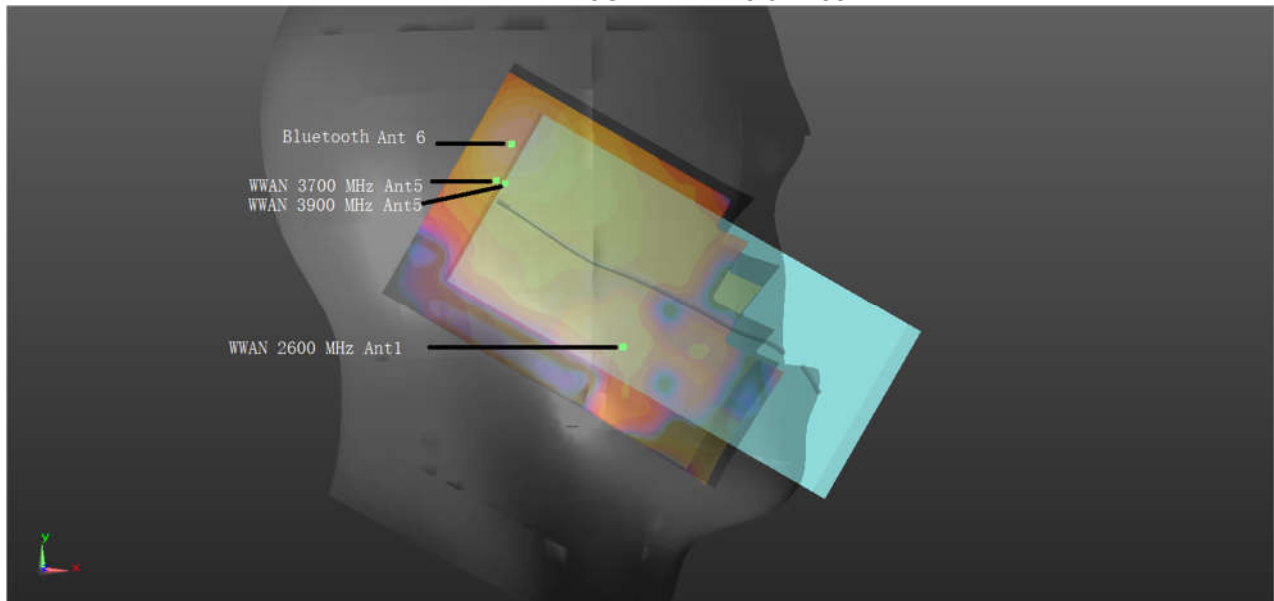
General Note:

1. When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where $(x1, y1, z1)$ and $(x2, y2, z2)$ are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
2. $SPLSR = (SAR1 + SAR2)1.5 / (\text{min. separation distance, mm})$. If $SPLSR \leq 0.04$ for 1g SAR and $SPLSR \leq 0.10$ for 10g SAR, simultaneously transmission SAR measurement is not necessary.
3. Per April 2022 TCB Workshop Notes, WWAN band antenna 5 was summed algebraically with the NFC and BT/WIFI Antenna 6 separately for the purposes of hybrid SPLSR combination and they are located at the top of the device.
4. Per April 2022 TCB Workshop, instead of doing a small volume scan over a co-located antenna pair, used summing the SAR values of the co-located pair and using that value in SPLSR calculation. In the calculation used the minimum distance between the spatially separated antenna and the closest antenna of the co-located antenna pair to be conservative.

For Head

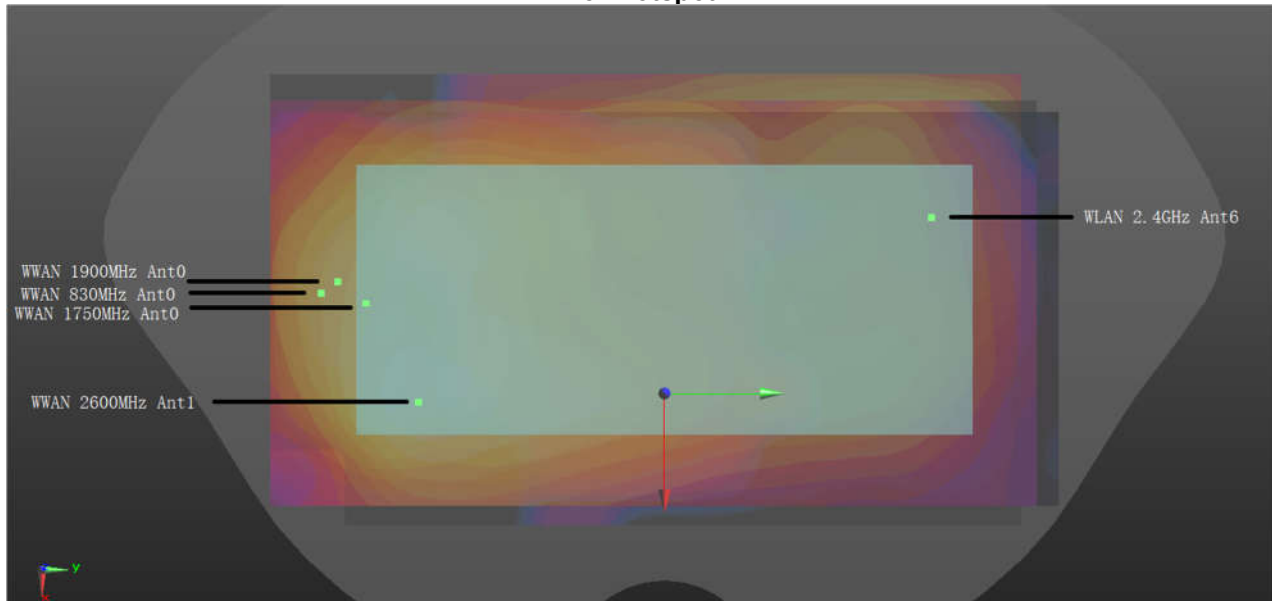


WWAN+FR1+5GHz WIFI Left Cheek

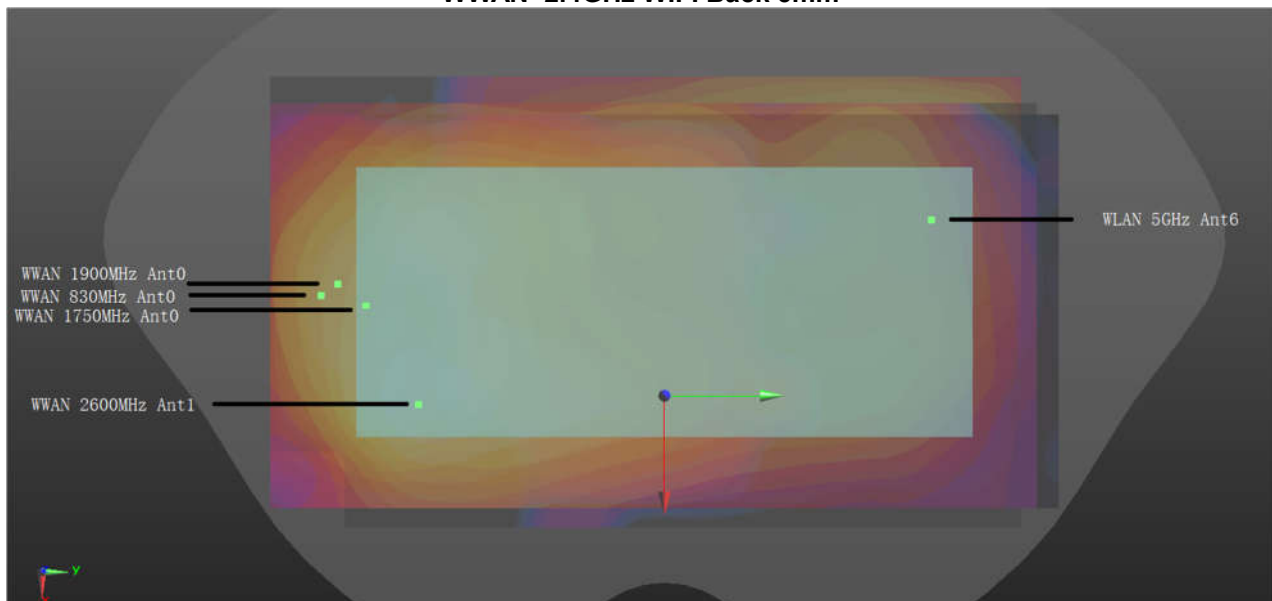


WWAN+FR1+BT Left Cheek

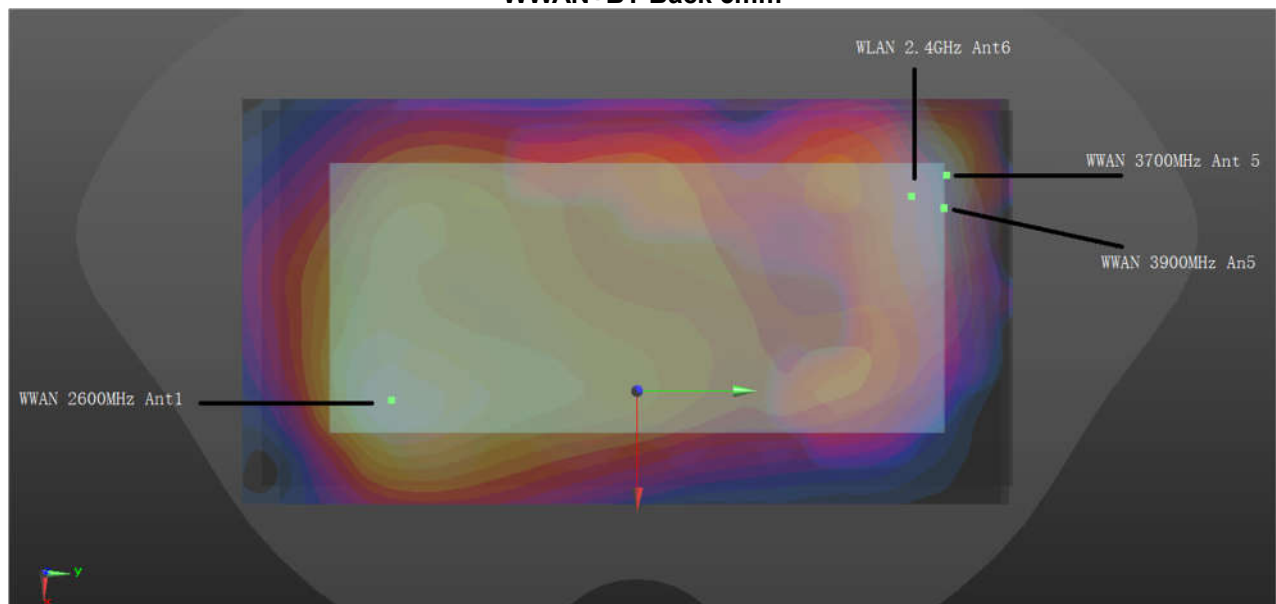
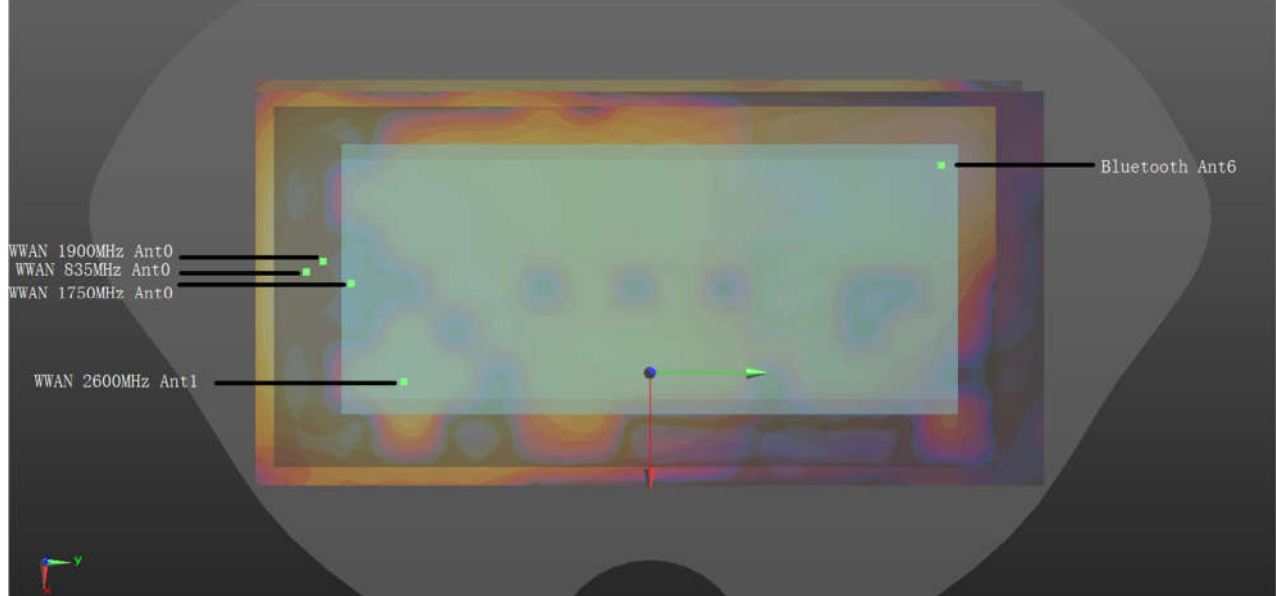
For Hotspot

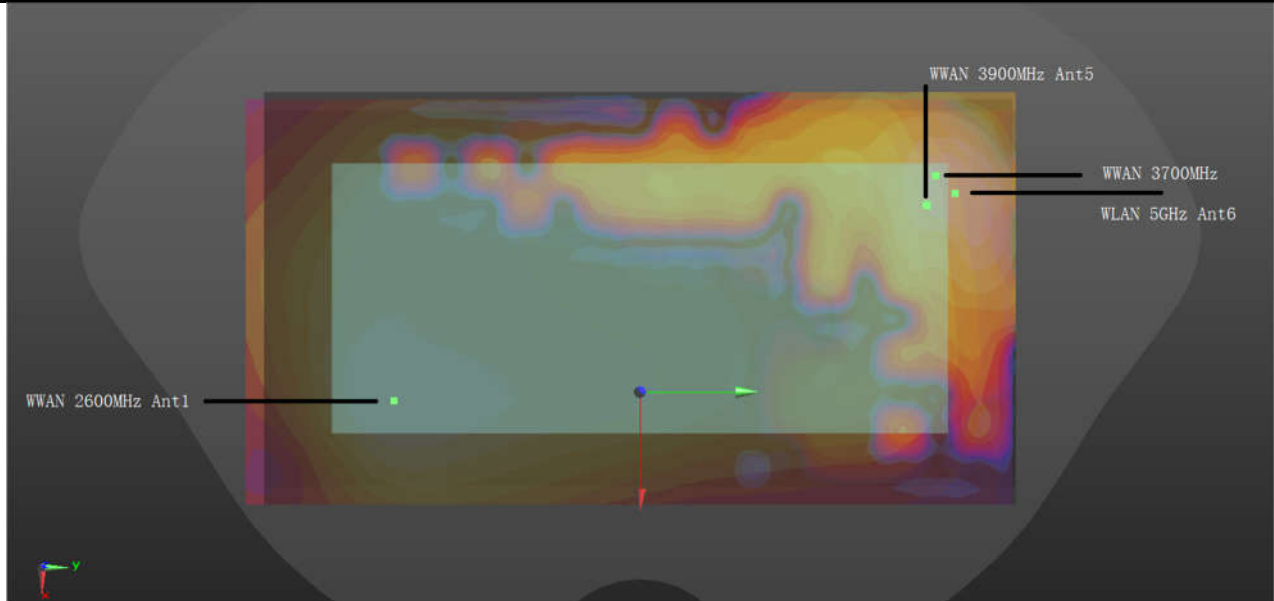


WWAN+2.4GHz WIFI Back 5mm

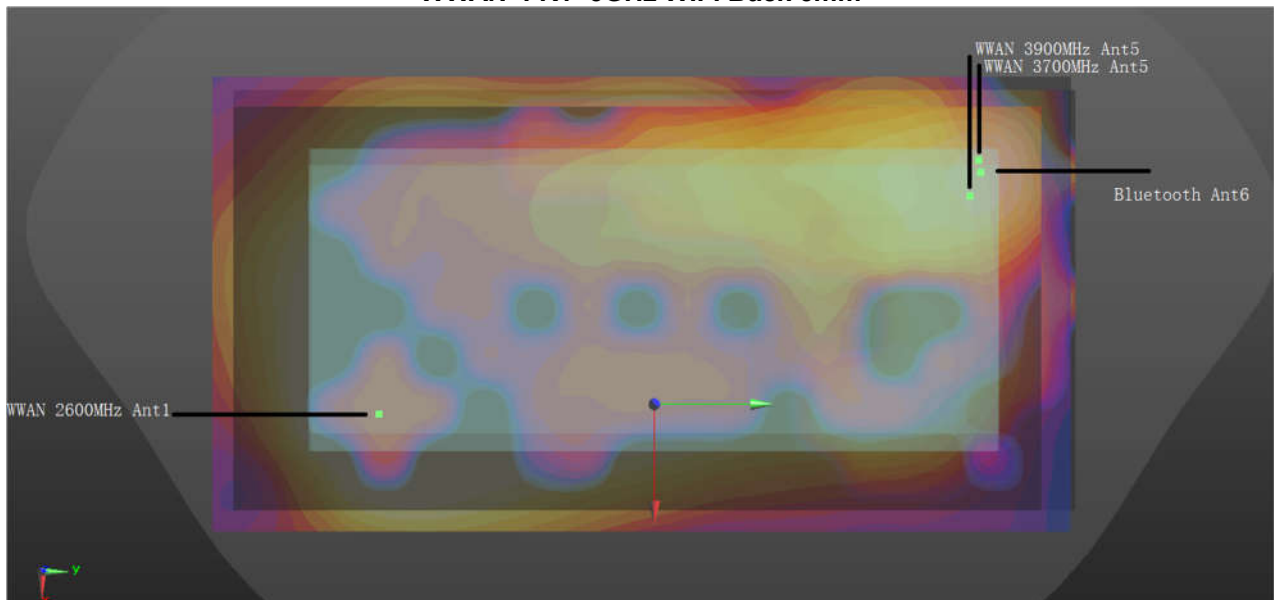


WWAN+5GHz WIFI Back 5mm



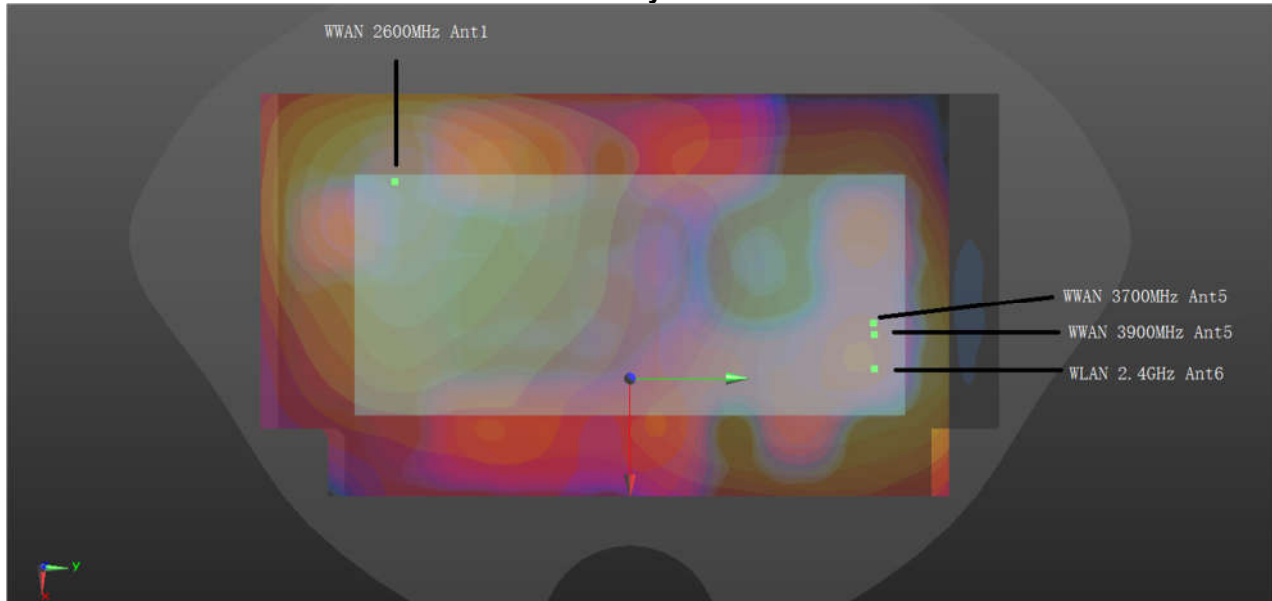


WWAN+FR1+5GHz WIFI Back 5mm

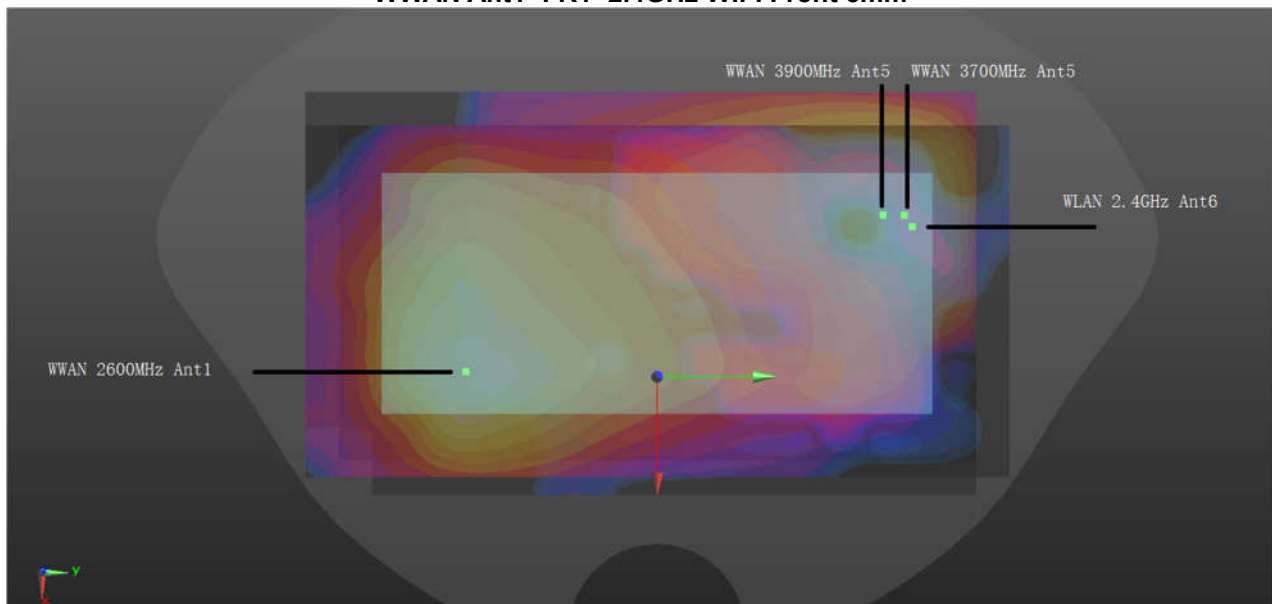


WWAN+FR1+BT Back 5mm

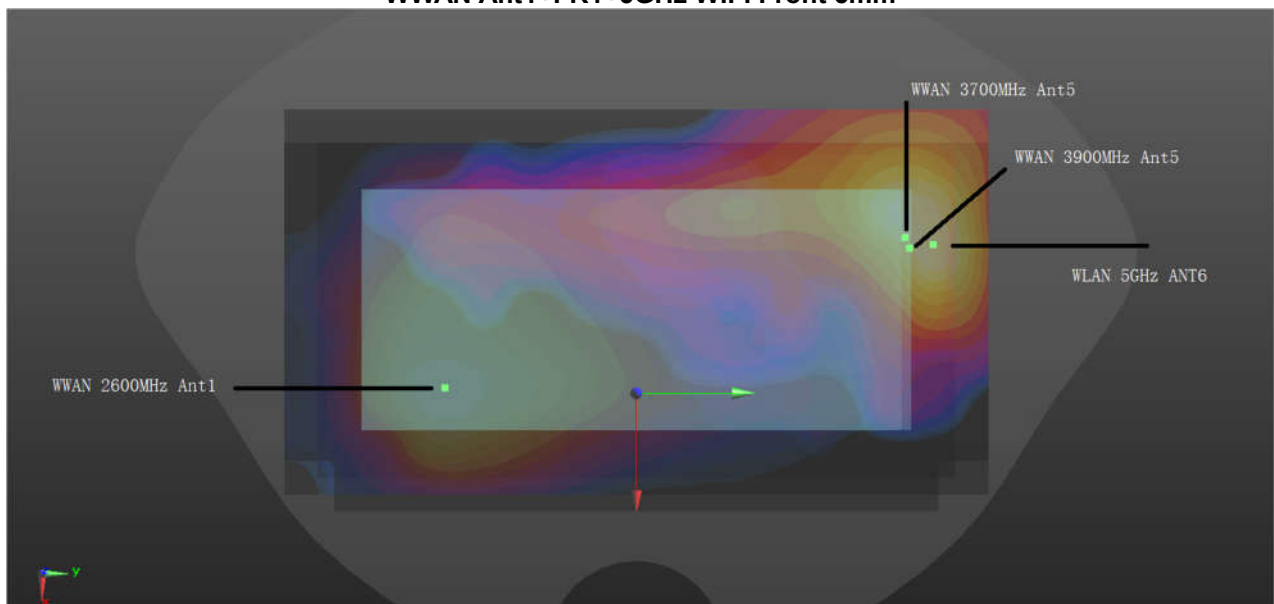
For Body-worn

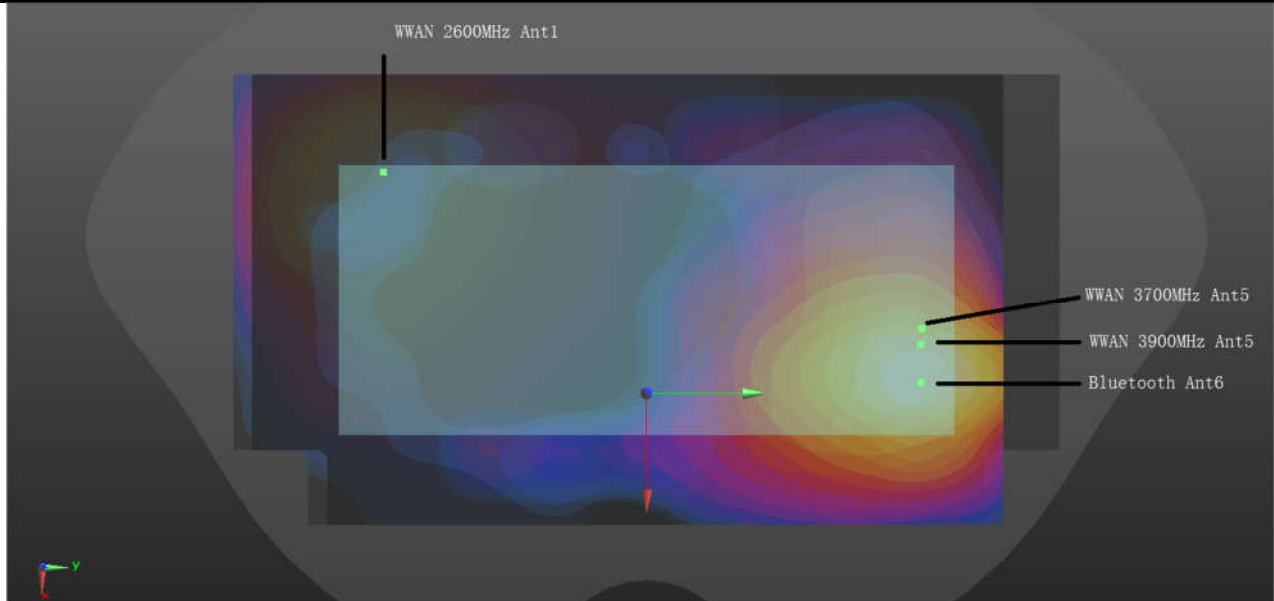


WWAN Ant1+FR1+2.4GHz WIFI Front 5mm

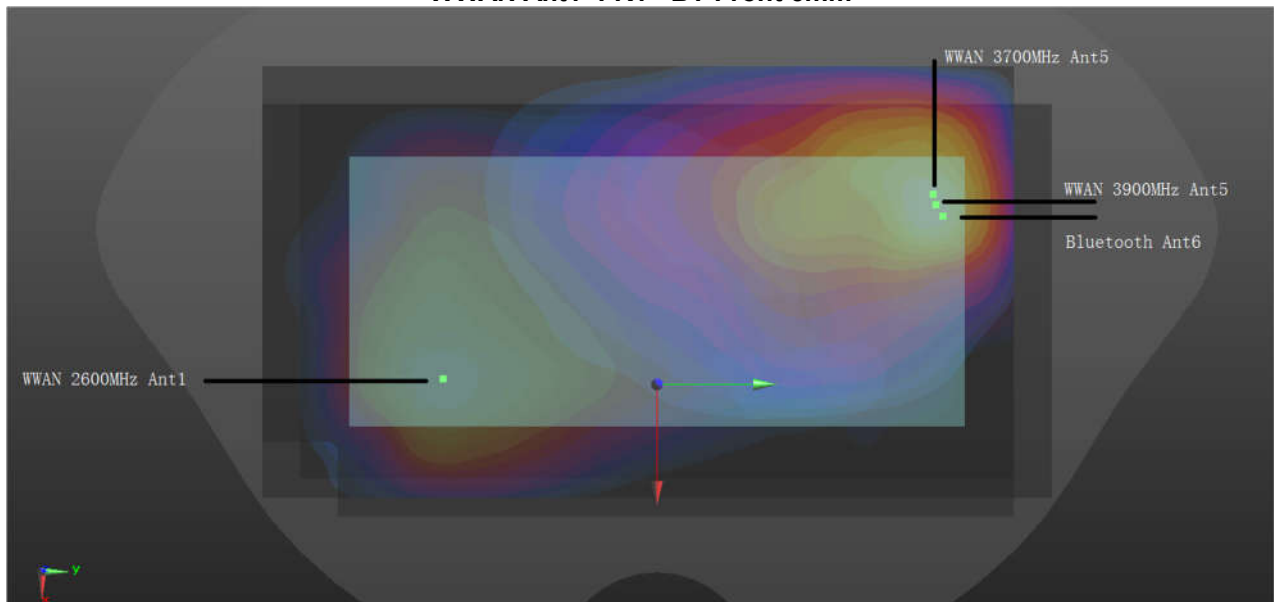


WWAN Ant1+FR1+2.4GHz WIFI Back 5mm

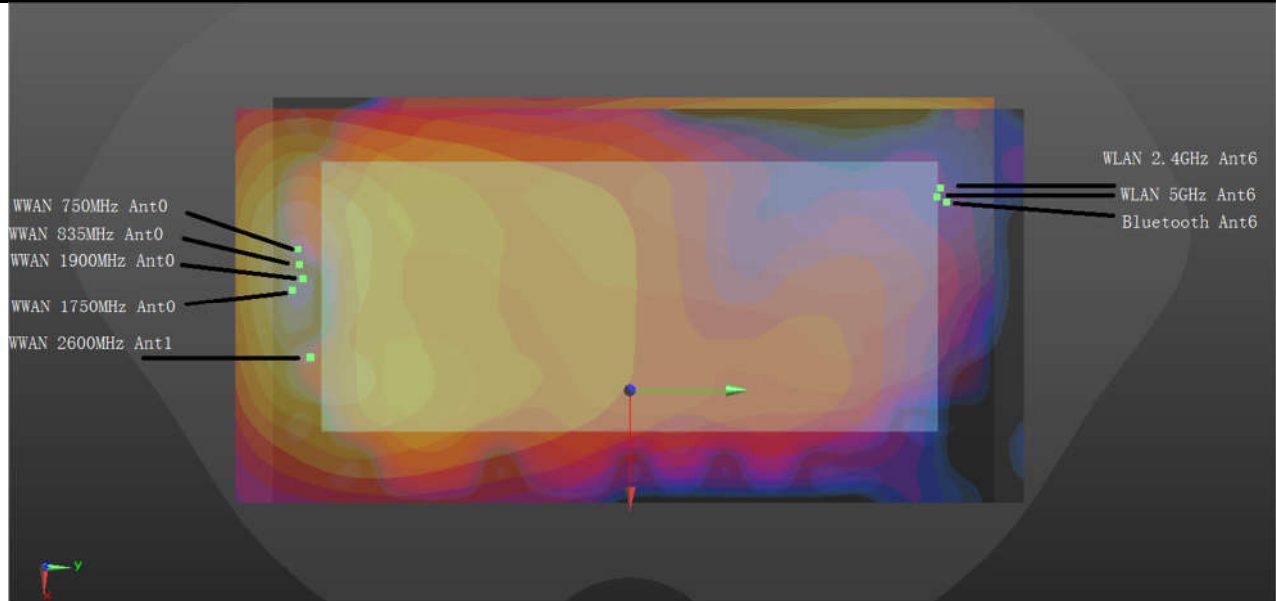




WWAN Ant1+FR1+ BT Front 5mm

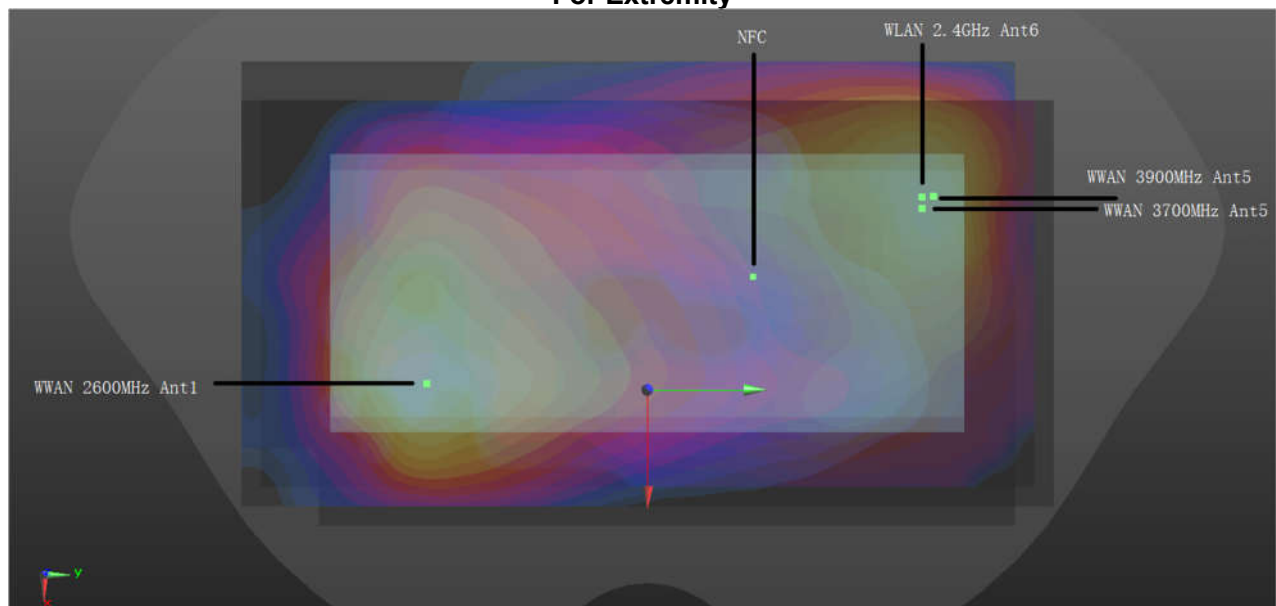


WWAN Ant1+FR1+BT Back 5mm

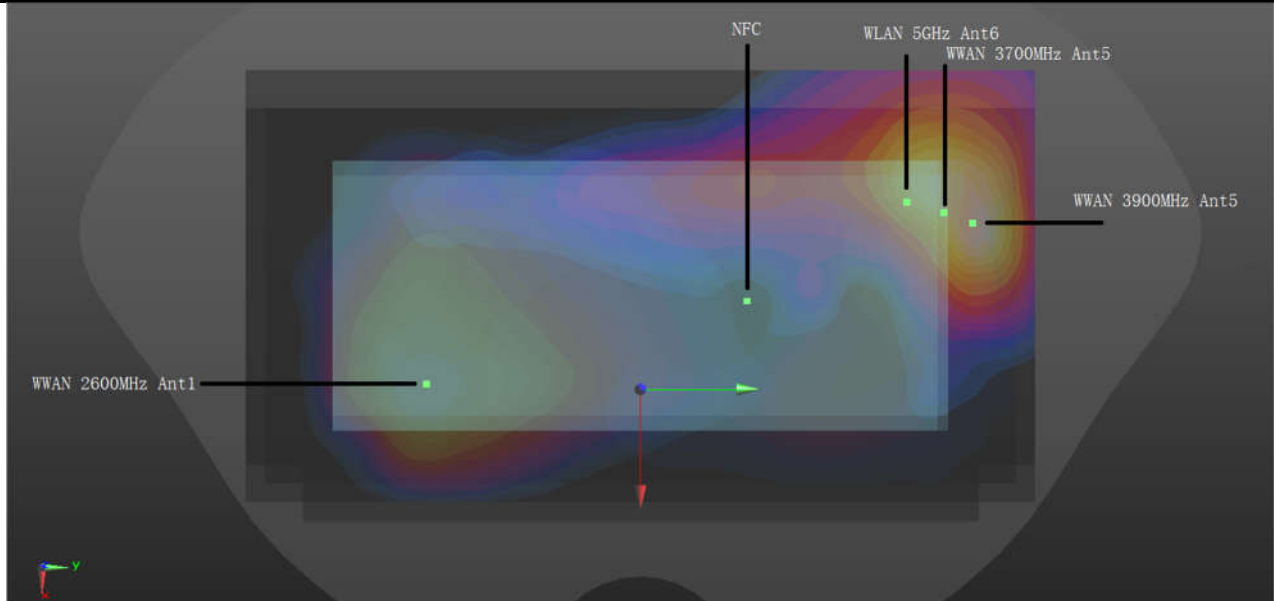


WWAN+2.4G+5G+BT Back 5mm

For Extremity



WWAN+FR1+2.4G+NFC Back 0mm



WWAN+FR1+5G+NFC Back 0mm

For Head

Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 1	LTE Band 41 Ant 1	Left Cheek	0.472	0.472	0mm	49.97	-57.61	-1.67	106.5	1.62	0.02	Not required
	FR1 n77 Ant 5		0.743	1.15	0mm							
	WLAN5GHz Ant 6		0.404		0mm	10.01	41.05	0.89				
	LTE Band 41 Ant 1	Left Cheek	0.472	0.472	0mm	49.97	-57.61	-1.67	84.4	1.62	0.02	Not required
	FR1 n77 Ant 5		0.743	1.15	0mm	4.15	13.28	-0.57				
	WLAN5GHz Ant 6		0.404		0mm							
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 2	LTE Band 41 Ant 1	Left Cheek	0.472	0.472	0mm	49.97	-57.61	-1.67	91.2	1.61	0.02	Not required
	FR1 n77 Ant 5		0.743	1.14	0mm							
	Bluetooth Ant 6		0.393		0mm	9.53	24.09	0.29				
	LTE Band 41 Ant 1	Left Cheek	0.472	0.472	0mm	49.97	-57.61	-1.67	84.4	1.61	0.02	Not required
	FR1 n77 Ant 5		0.743	1.14	0mm	4.15	13.28	-0.57				
	Bluetooth Ant 6		0.393		0mm							

For Hotspot

Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 21	GSM850 Ant 0	Back	1.343	1.75	5mm	-6.9	-78.5	-1.57	153.9	1.75	0.02	Not required
	WLAN2.4GHz Ant 6		0.408		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 22	GSM850 Ant 0	Back	1.343	1.83	5mm	-6.9	-78.5	-1.57	153.8	1.83	0.02	Not required
	WLAN5GHz Ant 6		0.487		5mm	-21.5	74.6	-1.23				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 23	GSM850 Ant 0	Back	1.343	1.65	5mm	-6.9	-78.5	-1.57	156.5	1.65	0.01	Not required
	Bluetooth Ant 6		0.31		5mm	-27.1	76.7	-1.21				
Case	Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D	Summed	SPLSR	Simultaneous
						X	Y	Z			Results	SAR



FCC SAR Test Report

Report No. : FA352916-13

No				1g SAR (W/kg)	(mm)	X	Y	Z	distance (mm)	SAR (W/kg)	Results	SAR
Case 24	WCDMA II Ant 0	Back	1.267	1.68	5mm	-5	-87	-1.3	162.6	1.68	0.01	Not required
	WLAN2.4GHz Ant 6		0.408		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 25	WCDMA II Ant 0	Back	1.267	1.75	5mm	-5	-87	-1.3	162.4	1.75	0.01	Not required
	WLAN5GHz Ant 6		0.487		5mm	-21.5	74.6	-1.23				
Case 26	WCDMA IV Ant 0	Back	1.374	1.78	5mm	8.5	-76.5	-1.25	155.2	1.78	0.02	Not required
	WLAN2.4GHz Ant 6		0.408		5mm	-31.2	73.5	-1.05				
Case 27	WCDMA IV Ant 0	Back	1.374	1.86	5mm	8.5	-76.5	-1.25	154.0	1.86	0.02	Not required
	WLAN5GHz Ant 6		0.487		5mm	-21.5	74.6	-1.23				
Case 28	WCDMA IV Ant 0	Back	1.374	1.68	5mm	8.5	-76.5	-1.25	157.3	1.68	0.01	Not required
	Bluetooth Ant 6		0.31		5mm	-27.1	76.7	-1.21				
Case 29	WCDMA V Ant 0	Back	1.372	1.78	5mm	2.6	-76.3	-1.3	153.6	1.78	0.02	Not required
	WLAN2.4GHz Ant 6		0.408		5mm	-31.2	73.5	-1.05				
Case 30	WCDMA V Ant 0	Back	1.372	1.86	5mm	2.6	-76.3	-1.3	152.8	1.86	0.02	Not required
	WLAN5GHz Ant 6		0.487		5mm	-21.5	74.6	-1.23				
Case 31	WCDMA V Ant 0	Back	1.372	1.68	5mm	2.6	-76.3	-1.3	155.9	1.68	0.01	Not required
	Bluetooth Ant 6		0.31		5mm	-27.1	76.7	-1.21				
Case 32	LTE Band 26 Ant 0	Back	1.331	1.74	5mm	4.5	-75.6	-0.98	153.3	1.74	0.02	Not required
	WLAN2.4GHz Ant 6		0.408		5mm	-31.2	73.5	-1.05				
Case 33	LTE Band 26 Ant 0	Back	1.331	1.82	5mm	4.5	-75.6	-0.98	152.4	1.82	0.02	Not required
	WLAN5GHz Ant 6		0.487		5mm	-21.5	74.6	-1.23				
Case 34	LTE Band 26 Ant 0	Back	1.331	1.64	5mm	4.5	-75.6	-0.98	155.5	1.64	0.01	Not required
	Bluetooth Ant 6		0.31		5mm	-27.1	76.7	-1.21				
Case 35	LTE Band 41 Ant 1	Back	1.376	1.78	5mm	27.4	-67.4	-1.24	152.6	1.78	0.02	Not required
	WLAN2.4GHz Ant 6		0.408		5mm	-31.2	73.5	-1.05				
Case 36	LTE Band 41 Ant 1	Back	1.376	1.86	5mm	27.4	-67.4	-1.24	150.2	1.86	0.02	Not required
	WLAN5GHz Ant 6		0.487		5mm	-21.5	74.6	-1.23				



FCC SAR Test Report

Report No. : FA352916-13

Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 37	LTE Band 41 Ant 1	Back	1.376	1.69	5mm	27.4	-67.4	-1.24	154.1	1.69	0.01	Not required
	Bluetooth Ant 6		0.31		5mm	-27.1	76.7	-1.21				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 38	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	152.6	2.46	0.03	Not required
	FR1 n77 Ant 5		0.673	1.08	5mm							
	WLAN2.4GHz Ant 6		0.408		5mm	-31.2	73.5	-1.05				
	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	143.2	2.46	0.03	Not required
	FR1 n77 Ant 5		0.673	1.08	5mm	-10.8	70.6	-1.35				
	WLAN2.4GHz Ant 6		0.408		5mm							
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 39	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	150.2	2.54	0.03	Not required
	FR1 n77 Ant 5		0.673	1.16	5mm							
	WLAN5GHz Ant 6		0.487		5mm	-21.5	74.6	-1.23				
	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	143.2	2.54	0.03	Not required
	FR1 n77 Ant 5		0.673	1.16	5mm	-10.8	70.6	-1.35				
	WLAN5GHz Ant 6		0.487		5mm							
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 40	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	154.1	2.36	0.02	Not required
	FR1 n77 Ant 5		0.673	0.98	5mm							
	Bluetooth Ant 6		0.31		5mm	-27.1	76.7	-1.21				
	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	143.2	2.36	0.03	Not required
	FR1 n77 Ant 5		0.673	0.98	5mm	-10.8	70.6	-1.35				
	Bluetooth Ant 6		0.31		5mm							

For Body worn

Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 7	WCDMA II Ant 0	Back	1.436	1.88	5mm	-5	-87	-1.3	162.6	1.88	0.02	Not required
	WLAN2.4GHz Ant 6		0.44		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 8	WCDMA II Ant 0	Back	1.436	1.87	5mm	-5	-87	-1.3	162.4	1.87	0.02	Not required
	WLAN5GHz Ant 6		0.431		5mm	-21.5	74.6	-1.23				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 9	WCDMA II Ant 0	Back	1.436	1.88	5mm	-5	-87	-1.3	165.2	1.88	0.02	Not required
	Bluetooth Ant 6		0.443		5mm	-27.1	76.7	-1.21				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 10	LTE Band 41 Ant 1	Back	1.376	1.82	5mm	27.4	-67.4	-1.24	152.6	1.82	0.02	Not required
	WLAN2.4GHz Ant 6		0.44		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 11	LTE Band 41 Ant 1	Back	1.376	1.81	5mm	27.4	-67.4	-1.24	150.2	1.81	0.02	Not required
	WLAN5GHz Ant 6		0.431		5mm	-21.5	74.6	-1.23				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 12	LTE Band 41 Ant 1	Back	1.376	1.82	5mm	27.4	-67.4	-1.24	154.1	1.82	0.02	Not required
	Bluetooth Ant 6		0.443		5mm	-27.1	76.7	-1.21				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 13	LTE Band 41 Ant 1	Front	0.883	1.11	5mm	-31.6	-74.2	-0.95	161.4	1.99	0.02	Not required
	FR1 n77 Ant 5		0.793		5mm							
	WLAN2.4GHz Ant 6		0.318		5mm	21.3	78.3	-0.91				
	LTE Band 41 Ant 1	Front	0.883	1.11	5mm	-31.6	-74.2	-0.95	153.3	1.99	0.02	Not required
	FR1 n77 Ant 5		0.793		5mm	10.5	73.2	-1.35				
	WLAN2.4GHz Ant 6		0.318		5mm							
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 14	LTE Band 41 Ant 1	Front	0.883	1.18	5mm	-31.6	-74.2	-0.95	151.7	2.06	0.02	Not required
	FR1 n77 Ant 5		0.793		5mm							
	WLAN5GHz Ant 6		0.383		5mm	28.1	65.3	-0.86				
	LTE Band 41 Ant 1	Front	0.883	1.18	5mm	-31.6	-74.2	-0.95	153.3	2.06	0.02	Not required
	FR1 n77 Ant 5		0.793		5mm	10.5	73.2	-1.35				
	WLAN5GHz Ant 6		0.383		5mm							
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 15	LTE Band 41 Ant 1	Front	0.883	1.05	5mm	-31.6	-74.2	-0.95	160.6	1.94	0.02	Not required
	FR1 n77 Ant 5		0.793		5mm							
	Bluetooth Ant 6		0.26		5mm	22.8	76.9	-0.95				
	LTE Band 41 Ant 1	Front	0.883	1.05	5mm	-31.6	-74.2	-0.95	153.3	1.94	0.02	Not required
	FR1 n77 Ant 5		0.793		5mm	10.5	73.2	-1.35				
	Bluetooth Ant 6		0.26		5mm							
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR



FCC SAR Test Report

Report No. : FA352916-13

Case 16	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	152.6	2.84	0.03	Not required
	FR1 n77 Ant 5		1.023	1.46	5mm							
	WLAN2.4GHz Ant 6		0.44		5mm	-31.2	73.5	-1.05				
	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	143.2	2.84	0.03	Not required
	FR1 n77 Ant 5		1.023	1.46	5mm	-10.8	70.6	-1.35				
	WLAN2.4GHz Ant 6		0.44		5mm							
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 17	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	150.2	2.83	0.03	Not required
	FR1 n77 Ant 5		1.023	1.45	5mm							
	WLAN5GHz Ant 6		0.431		5mm	-21.5	74.6	-1.23				
	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	143.2	2.83	0.03	Not required
	FR1 n77 Ant 5		1.023	1.45	5mm	-10.8	70.6	-1.35				
	WLAN5GHz Ant 6		0.431		5mm							
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 18	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	154.1	2.84	0.03	Not required
	FR1 n77 Ant 5		1.023	1.47	5mm							
	Bluetooth Ant 6		0.443		5mm	-27.1	76.7	-1.21				
	LTE Band 41 Ant 1	Back	1.376	1.376	5mm	27.4	-67.4	-1.24	143.2	2.84	0.03	Not required
	FR1 n77 Ant 5		1.023	1.47	5mm	-10.8	70.6	-1.35				
	Bluetooth Ant 6		0.443		5mm							
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 50	GSM850 Ant 0	Back	1.343	1.78	5mm	-6.9	-78.5	-1.57	153.9	1.78	0.02	Not required
	WLAN2.4GHz Ant 6		0.44		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 51	GSM850 Ant 0	Back	1.343	1.77	5mm	-6.9	-78.5	-1.57	153.8	1.77	0.02	Not required
	WLAN5GHz Ant 6		0.431		5mm	-21.5	74.6	-1.23				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 52	GSM850 Ant 0	Back	1.343	1.79	5mm	-6.9	-78.5	-1.57	156.5	1.79	0.02	Not required
	Bluetooth Ant 6		0.443		5mm	-27.1	76.7	-1.21				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 53	GSM1900 Ant 0	Back	1.293	1.73	5mm	-8.1	-90.3	-1.13	165.4	1.73	0.01	Not required
	WLAN2.4GHz Ant 6		0.44		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 54	GSM1900 Ant 0	Back	1.293	1.72	5mm	-8.1	-90.3	-1.13	165.4	1.72	0.01	Not required
	WLAN5GHz Ant 6		0.431		5mm	-21.5	74.6	-1.23				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 55	GSM1900 Ant 0	Back	1.293	1.74	5mm	-8.1	-90.3	-1.13	168.1	1.74	0.01	Not required
	Bluetooth Ant 6		0.443		5mm	-27.1	76.7	-1.21				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 56	WCDMA IV Ant 0	Back	1.414	1.85	5mm	8.5	-76.5	-1.25	155.2	1.85	0.02	Not required
	WLAN2.4GHz Ant 6		0.44		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR



FCC SAR Test Report

Report No. : FA352916-13

Case 57	WCDMA IV Ant 0	Back	1.414	1.85	5mm	8.5	-76.5	-1.25	154.0	1.85	0.02	Not required
	WLAN5GHz Ant 6		0.431		5mm	-21.5	74.6	-1.23				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 58	WCDMA IV Ant 0	Back	1.414	1.86	5mm	8.5	-76.5	-1.25	157.3	1.86	0.02	Not required
	Bluetooth Ant 6		0.443		5mm	-27.1	76.7	-1.21				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 59	WCDMA V Ant 0	Back	1.372	1.81	5mm	2.6	-76.3	-1.3	153.6	1.81	0.02	Not required
	WLAN2.4GHz Ant 6		0.44		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 60	WCDMA V Ant 0	Back	1.372	1.80	5mm	2.6	-76.3	-1.3	152.8	1.80	0.02	Not required
	WLAN5GHz Ant 6		0.431		5mm	-21.5	74.6	-1.23				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 61	WCDMA V Ant 0	Back	1.372	1.82	5mm	2.6	-76.3	-1.3	155.9	1.82	0.02	Not required
	Bluetooth Ant 6		0.443		5mm	-27.1	76.7	-1.21				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 62	LTE Band 2 Ant 0	Back	1.311	1.75	5mm	-7.1	-89.6	-1.01	164.9	1.75	0.01	Not required
	WLAN2.4GHz Ant 6		0.44		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 63	LTE Band 2 Ant 0	Back	1.311	1.74	5mm	-7.1	-89.6	-1.01	164.8	1.74	0.01	Not required
	WLAN5GHz Ant 6		0.431		5mm	-21.5	74.6	-1.23				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 64	LTE Band 2 Ant 0	Back	1.311	1.75	5mm	-7.1	-89.6	-1.01	167.5	1.75	0.01	Not required
	Bluetooth Ant 6		0.443		5mm	-27.1	76.7	-1.21				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 65	LTE Band 26 Ant 0	Back	1.331	1.77	5mm	4.5	-75.6	-0.98	153.3	1.77	0.02	Not required
	WLAN2.4GHz Ant 6		0.44		5mm	-31.2	73.5	-1.05				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 66	LTE Band 26 Ant 0	Back	1.331	1.76	5mm	4.5	-75.6	-0.98	152.4	1.76	0.02	Not required
	WLAN5GHz Ant 6		0.431		5mm	-21.5	74.6	-1.23				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed 1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 67	LTE Band 26 Ant 0	Back	1.331	1.77	5mm	4.5	-75.6	-0.98	155.5	1.77	0.02	Not required
	Bluetooth Ant 6		0.443		5mm	-27.1	76.7	-1.21				



For Body worn Sensor-off

Case No	Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				1g SAR (W/kg)	(mm)	X	Y	Z				
Case 19	WCDMA II Ant 0	Back	1.123	1.78	17mm	-6	-89.5	-1.25	163.3	1.78	0.01	Not required
	WLAN5GHz Ant 6		0.654		17mm	-20.7	73.1	-1.02				
Case No	Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				1g SAR (W/kg)	(mm)	X	Y	Z				
Case 20	LTE Band 2 Ant 0	Back	1.136	1.79	17mm	-7.8	-81.5	-1.35	155.1	1.79	0.02	Not required
	WLAN5GHz Ant 6		0.654		17mm	-20.7	73.1	-1.02				

For Extremity

Case No	Band	Position	SAR 10g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				10g SAR (W/kg)	(mm)	X	Y	Z				
Case 41	LTE Band 41 Ant 1	Back	2.26	3.51	0mm	32.9	-79.7	-1.05	139.8	5.77	0.10	Not required
	FR1 n78 Ant 5		2.565		0mm							
	WLAN2.4GHz Ant 6		0.868		0mm							
	NFC		0.077		0mm	-9.5	53.5	-1.45				
Case 41	LTE Band 41 Ant 1	Back	2.26	3.51	0mm	32.9	-79.7	-1.05	164.8	5.77	0.08	Not required
	FR1 n78 Ant 5		2.565		0mm							
	WLAN2.4GHz Ant 6		0.868		0mm	-33.1	71.3	-1.06				
	NFC		0.077		0mm							
Case 41	LTE Band 41 Ant 1	Back	2.26	3.51	0mm	32.9	-79.7	-1.05	156.7	5.77	0.09	Not required
	FR1 n78 Ant 5		2.565		0mm	-12.6	70.2	-1.05				
	WLAN2.4GHz Ant 6		0.868		0mm							
	NFC		0.077		0mm							
Case No	Band	Position	SAR 10g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				10g SAR (W/kg)	(mm)	X	Y	Z				
Case 42	LTE Band 41 Ant 1	Back	2.26	3.51	0mm	32.9	-79.7	-1.05	139.8	5.77	0.10	Not required
	FR1 n78 Ant 5		2.565		0mm							
	WLAN5GHz Ant 6		0.868		0mm							
	NFC		0.077		0mm	-9.5	53.5	-1.45				
Case 42	LTE Band 41 Ant 1	Back	1.714	3.51	0mm	32.9	-79.7	-1.05	161.9	5.77	0.09	Not required
	FR1 n78 Ant 5		2.565		0mm							
	WLAN5GHz Ant 6		0.868		0mm	-29.3	69.8	-0.85				
	NFC		0.077		0mm							
Case 42	LTE Band 41 Ant 1	Back	1.714	3.51	0mm	32.9	-79.7	-1.05	156.7	5.77	0.09	Not required
	FR1 n78 Ant 5		2.565		0mm	-12.6	70.2	-1.05				
	WLAN5GHz Ant 6		0.868		0mm							
	NFC		0.077		0mm							

Test Engineer : Martin Li, Varus Wang, Ricky Gu, Light Wang

18. Uncertainty Assessment

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

19. References

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992
- [3] IEEE Std. 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [6] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.
- [7] FCC KDB 648474 D04 v01r03, "SAR Evaluation Considerations for Wireless Handsets", Oct 2015.
- [8] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [9] FCC KDB 616217 D04 v01r02, "SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers", Oct 2015
- [10] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [11] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [12] FCC KDB 941225 D05A v01r02, "Rel. 10 LTE SAR Test Guidance and KDB Inquiries", Oct 2015
- [13] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.
- [14] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [15] FCC KDB 484596 D01 v02r02, "Test Reductions Via Data Referencing", Dec. 2023

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