FCC SAR Test Report

APPLICANT	: Motorola Mobility LLC
EQUIPMENT	: Mobile Cellular Phone
BRAND NAME	: Motorola
MODEL NAME	: XT2435-1
FCC ID	: IHDT56AM4
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.

Si Zhang

Approved by: Si Zhang

ACCREDITED
Cert #5145.02

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA352916-18	Rev. 01	Initial issue of report.	Jun. 17, 2024
FA352916-18	Rev. 02	Updated note 12 in section 16	Jun. 24, 2024

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, XT2435-1,** 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	0.64	1.20	1.20	1.59
		GSM1900	<0.10	1.28	1.13	
	WCDMA	WCDMA II	0.14	1.29	1.38	
		WCDMA IV	0.17	1.23	1.23	
		WCDMA V	0.44	1.33	1.33	
	LTE	LTE Band 2	**1.16**	1.23	1.36	
		LTE Band 5	0.52	0.54	0.54	
		LTE Band 7	0.93	1.34	1.34	
		LTE Band 12/17	0.21	0.60	0.60	
		LTE Band 13	0.26	1.06	1.06	
		LTE Band 25/2	0.15	1.35	1.37	
		LTE Band 26/5	0.52	1.16	1.16	
		LTE Band 66/4	0.98	1.10	1.17	
		LTE Band 41/38	0.47	1.38	1.38	
		LTE Band 42	0.90	0.65	0.86	
	5G NR	FR1 n2	0.92	1.26	1.23	
		FR1 n5	0.49	0.86	0.86	
		FR1 n7	1.10	**1.39**	**1.39**	
		FR1 n26	0.26	1.19	1.19	
		FR1 n66	1.02	1.34	1.35	
		FR1 n78	1.08	0.99	1.07	
DTS	WLAN	2.4GHz WLAN	0.93	0.65	**1.39**	1.59
NII		5GHz WLAN	1.13	0.71	1.20	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	3.35	3.95
		GSM1900	3.45	
	WCDMA	WCDMA II	**3.48**	
		WCDMA IV	3.45	
		WCDMA V	2.51	
	LTE	LTE Band 2	2.71	
		LTE Band 7	2.35	
		LTE Band 25/2	3.20	
		LTE Band 66/4	3.05	
		LTE Band 41/38	2.26	
		LTE Band 42	2.09	
	5G NR	FR1 n2	3.15	
		FR1 n7	3.06	
		FR1 n66	2.84	
		FR1 n78	2.78	
DTS	WLAN	2.4GHz WLAN	2.10	3.95
NII		5GHz WLAN	1.91	3.95

DXX	NFC	13.56MHz	<0.10	3.95
Date of Testing:			2024/5/24 ~ 2024/6/2	

Remark:

1. This device supports LTE B2 / B4 / B5 / B17 / B38 and B25 / B66 / B26 / B12 / B41. Since the supported frequency span for LTE B2 / B4 / B5 / B17 / B38 falls completely within the supports frequency span for LTE B25 / B66 / B26 / B12 / B41, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B25 / B66 / B26 / B12 / B41.
2. This is a variant report for XT2435-1, the difference is that please refer to the XT2343-1_Operational Description of Product Equality Declaration which is exhibit separately. According to the difference, only enabled WLAN2.4G 802.11n HT40 and reduced conducted power for WLAN 5.2GHz/5.3GHz at body worn exposure condition, WLAN 5.8GHz at head exposure conditions via software, re-measured WLAN 5.2GHz/5.3GHz at body worn exposure condition, WLAN 5.8GHz at head exposure conditions conducted power and performed full SAR testing, the worst cases from original test report (Sporton Report Number FA352916 and FA352916A) for all other Bands were verified.
3. The maximum SAR chose higher SAR between original applications and variant project.

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.
	SAR07-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. 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
- IEC/IEEE 62209-1528:2020
- 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

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2435-1
FCC ID	IHDT56AM4
IMEI Code	Sample 1: IMEI 1: 352433390002597 IMEI 2: 352433390002605 Sample 2: IMEI 1: 352433390015797 IMEI 2: 352433390015805 Sample 3: 353696960001608
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3450 MHz ~ 3550 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n78 : 3450 MHz ~ 3550 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/HT40 WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK
HW Version	DVT1

SW Version	U3UT34.4
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. There are two different types of EUT. They are single SIM card mobile and dual SIM card mobile. The others are the same including circuit design, PCB board, structure and all components. After pre-scan two types of EUT, we found test result of the sample that dual SIM was the worst, so we chose dual SIM card mobile to perform all tests.
6. For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 slot to perform all tests.
7. The device implements Proximity sensors/receiver detect mechanism/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.
8. For WLAN when transmit simultaneous with WWAN, power reduction will be activated to head. For WLAN when transmit simultaneous with WWAN and Proximity sensors trigger, power reduction will be activated to body-worn and Handheld.
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. There are three samples, the different between them refer to the XT2435-1_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 2/3 to verify the worst case of sample 1.
13. 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.
14. 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	n2	FDD	15	5, 10, 15, 20, 25, 30
			30	10, 15, 20, 25, 30
	n5	FDD	15	5, 10, 15, 20, 25
			30	10, 15, 20, 25
	n7	FDD	15	5, 10, 15, 20, 25, 30, 40, 50
			30	10, 15, 20, 25, 30, 40, 50
	n66	FDD	15	5, 10, 15, 20, 25, 30, 35, 40, 45
			30	10, 15, 20, 25, 30, 35, 40, 45
	n78	TDD	15	10, 15, 20, 30, 40, 50
			30	10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100
SA	n2	FDD	15	5, 10, 15, 20, 25, 30
			30	10, 15, 20, 25, 30
	n5	FDD	15	5, 10, 15, 20, 25
			30	10, 15, 20, 25
	n7	FDD	15	5, 10, 15, 20, 25, 30, 40, 50
			30	10, 15, 20, 25, 30, 40, 50
	n26	FDD	15	5, 10, 15, 20
			30	10, 15, 20
	n66	FDD	15	5, 10, 15, 20, 25, 30, 35, 40, 45
			30	10, 15, 20, 25, 30, 35, 40, 45
	n78	TDD	15	10, 15, 20, 30, 40, 50
			30	10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	IHDT56AM4
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 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 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 LTE Band 66: 1710 MHz ~ 1780 MHz
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 25:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz 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 LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM / 64QAM
LTE Voice / Data requirements	Voice and Data
LTE Release Version	R15, Cat13
CA Support	Supported, Uplink and Downlink
LTE MPR permanently built-in by design	**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3** Modulation: Channel bandwidth / Transmission bandwidth (N_{RB}): 1.4 MHz, 3.0 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz; MPR (dB) 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 13.
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power verification please referred to section 13.
LTE Carrier Aggregation Additional Information	1. This device supports LTE Carrier Aggregation (CA) in the uplink for intra-band and inter-band with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per FCC Guidance. 2. This device supports maximum of 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 5

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 7

	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 13

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		

LTE Band 17

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq. (MHz)
L	23755	706.5	23780	709
M	23790	710	23790	710
H	23825	713.5	23800	711

LTE Band 25

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905

LTE Band 26

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

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

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

LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

<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 4	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 66	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 12	Yes	Yes	Yes	Yes		
LTE Band 17			Yes	Yes		
LTE Band 2	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 25	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 5	Yes	Yes	Yes	Yes		
LTE Band 26	Yes	Yes	Yes	Yes	Yes	
LTE Band 38			Yes	Yes	Yes	Yes
LTE Band 41			Yes	Yes	Yes	Yes

2) LTE Bands tune up:

Band	Antenna	Head	Body Worn	Hotspot	Extremity	Sensor Off	Default
		ECI 2	ECI 3	ECI 7	ECI 6	ECI4	Tune-up Limit
		Receiver on	Sensor on	Tune-up Limit	Handheld	Tune-up Limit	
		Tune-up Limit	Tune-up Limit		Tune-up Limit		
LTE Band 12	Ant 0	24.00	24.00	24.00	24.00	24.00	24.00
LTE Band 17		24.00	24.00	24.00	24.00	24.00	24.00
LTE Band 2	Ant 0	24.00	16.50	15.00	17.00	24.00	24.00
LTE Band 25		24.00	17.00	16.50	19.50	24.00	24.00
LTE Band 5	Ant 0	24.00	24.00	24.00	24.00	24.00	24.00
LTE Band 26		24.00	24.00	24.00	24.00	24.00	24.00
LTE Band 4	Ant 0	24.00	18.50	17.50	21.50	24.00	24.00
LTE Band 66		24.00	18.50	17.50	21.50	24.00	24.00
LTE Band 4_Other PA	Ant 0	23.00	17.50	16.50	20.50	23.00	23.00
LTE Band 66_Other PA		23.00	17.50	16.50	20.50	23.00	23.00
LTE Band 38	Ant 1	24.00	22.00	22.00	22.50	24.00	24.00
LTE Band 41		24.00	22.00	22.00	22.50	24.00	24.00
LTE Band 4	Ant 4	20.50	21.00	19.50	21.50	21.50	21.50
LTE Band 66		20.50	21.00	19.50	21.50	21.50	21.50
LTE Band 4_Other PA	Ant 4	20.00	22.00	20.00	24.00	24.00	24.00
LTE Band 66_Other PA		20.00	22.00	20.00	24.00	24.00	24.00

4.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information	
Operating Frequency Range of each 5G NR transmission band	5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5: 824 MHz ~ 849 MHz 5G NR n7: 2500 MHz ~ 2570 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n78: 3450 MHz ~ 3550 MHz
Channel Bandwidth	The detail please refers to section 4.1 5GNR 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 n2	LTE B5/7/66
LTE Anchor Bands for n5	LTE B2
LTE Anchor Bands for n7	LTE B2/5/66
LTE Anchor Bands for n66	LTE B2/5/7
LTE Anchor Bands for n78	LTE B2/4/5/7/26/38/66/41

Transmission (H, M, L) channel numbers and frequencies in each 5G NR band

NR Band 2 SCS15KHz

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860	372500	1862.5	373000	1865
M	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880
H	381500	1907.5	381000	1905	380500	1902.5	380000	1900	379500	1897.5	379000	1895

NR Band 2 SCS30KHz

	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	371000	1855	371500	1857.5	372000	1860	372500	1862.5	373000	1865
M	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880
H	381000	1905	380500	1902.5	380000	1900	379500	1897.5	379000	1895

NR Band 5 SCS15KHz

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	165300	826.5	165800	829	166300	831.5	166800	834		
M	167300	836.5	167300	836.5	167300	836.5	167300	836.5	167300	836.5
H	169300	846.5	168800	844	168300	841.5	167800	839		

NR Band 5 SCS30KHz

	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	165800	829	166300	831.5	166800	834		
M	167300	836.5	167300	836.5	167300	836.5	167300	836.5
H	168800	844	168300	841.5	167800	839		

NR Band 7 SCS15KHz

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	500500	2502.5	501000	2505	501500	2507.5	502000	2510	502500	2512.5	503000	2515	504000	2520	505000	2525
M	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535
H	513500	2567.5	513000	2565	512500	2562.5	512000	2560	511500	2557.5	511000	2555	510000	2550	509000	2545

NR Band 7 SCS30KHz

	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	501000	2505	501500	2507.5	502000	2510	502500	2512.5	503000	2515	504000	2520	505000	2525
M	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535
H	513000	2565	512500	2562.5	512000	2560	511500	2557.5	511000	2555	510000	2550	509000	2545

NR Band 26 SCS15KHz								
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	163300	816.5	163800	819	164300	821.5	164800	824
M	166300	831.5	166300	831.5	166300	831.5	166300	831.5
H	169300	846.5	168800	844	168300	841.5	167800	839

NR Band 26 SCS30KHz						
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	163800	819	164300	821.5	164800	824
M	166300	831.5	166300	831.5	166300	831.5
H	168800	844	168300	841.5	167800	839

NR Band 66 SCS15KHz																		
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 35MHz		Bandwidth 40MHz		Bandwidth 45MHz	
	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	342500	1712.5	343000	1715	343500	1717.5	344000	1720	344500	1722.5	345000	1725	345500	1727.5	346000	1730	365000	1732.5
M	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745
H	355500	1777.5	355000	1775	354500	1772.5	354000	1770	353500	1767.5	353000	1765	352500	1762.5	352000	1760	351500	1757.5

NR Band 66 SCS30KHz																
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 35MHz		Bandwidth 40MHz		Bandwidth 45MHz	
	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	343000	1715	343500	1717.5	344000	1720	344500	1722.5	345000	1725	345500	1727.5	346000	1730	365000	1732.5
M	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745
H	355000	1775	354500	1772.5	354000	1770	353500	1767.5	353000	1765	352500	1762.5	352000	1760	351500	1757.5

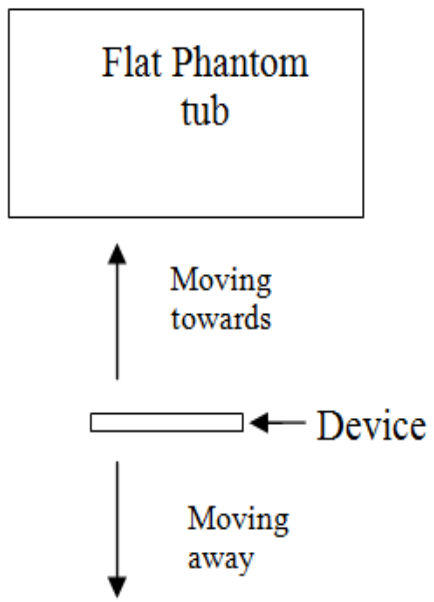
NR Band 78 SCS15KHz												
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	630334	3455.01	630500	3457.5	630668	3460.02	631000	3465	631334	3470.01	631668	3475.02
M	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01
H	636334	3545.01	636168	3542.52	636000	3540	635668	3535.02	635334	3530.01	635000	3525

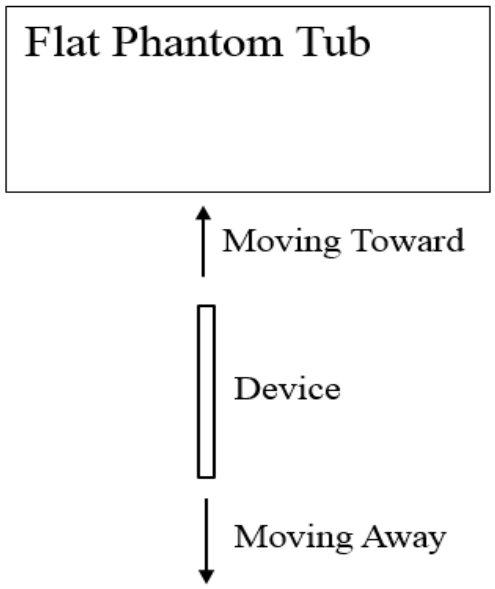
NR Band 78 SCS30KHz																						
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	630334	3455.01	630500	3457.5	630668	3460.02	631000	3465	631334	3470.01	631668	3475.02	632000	3480	632334	3485.01	632668	3490.02	633000	3495		
M	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01
H	636334	3545.01	636168	3542.52	636000	3540	635668	3535.02	635334	3530.01	635000	3525	634668	3520.02	634334	3515.01	634000	3510	633668	3505.02		

5. 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:





Sensor/Handheld detection test set-up, Front and Back sides	Handheld detection test set-up, Left Side, Right Side, Bottom Side and Top Side

<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

6. RF Exposure Limits

6.1 Uncontrolled Environment

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

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

7. Specific Absorption Rate (SAR)

7.1 Introduction

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

7.2 SAR Definition

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

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

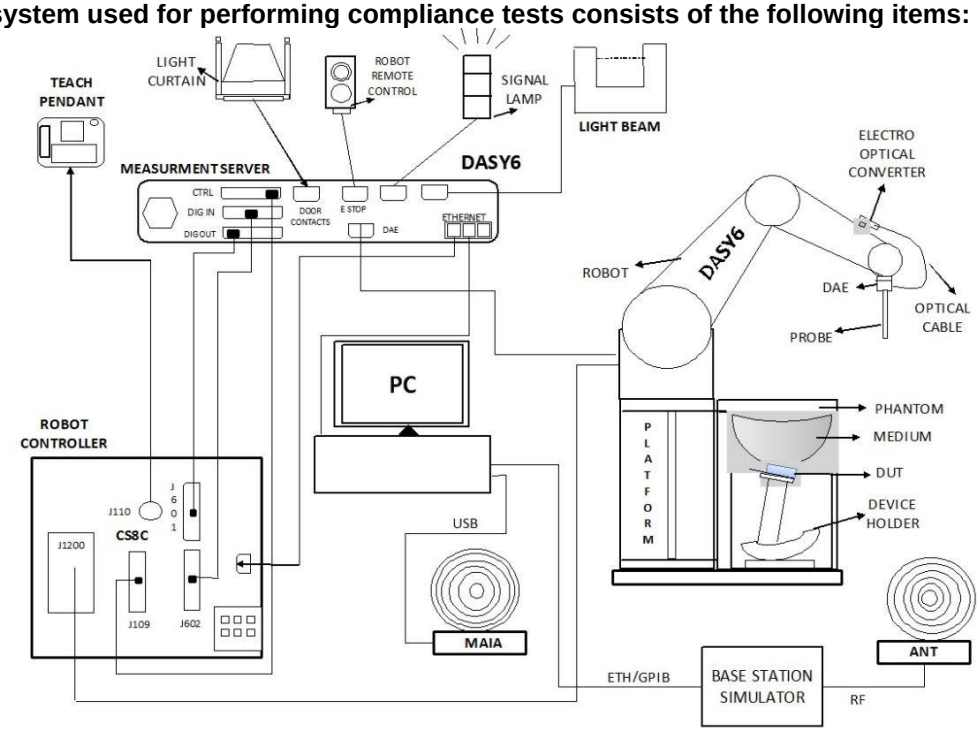
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 or Win10 and the DASY5 or DASY6 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

8.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	4 MHz – >10 GHz Linearity: ±0.2 dB (30 MHz – 10 GHz)
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

8.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

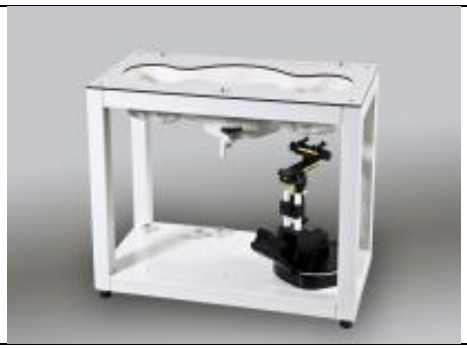
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

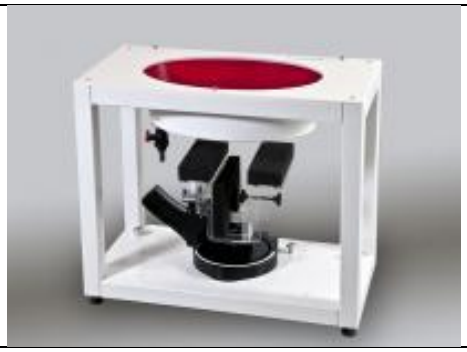
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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

<ELI Phantom>

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



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

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

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

Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 Power Reference Measurement

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

9.3 Area Scan

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

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

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

9.4 Zoom Scan

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

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

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

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

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

9.5 Volume Scan Procedures

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

9.6 Power Drift Monitoring

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

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1087	2022/2/24	2025/2/22
SPEAG	835MHz System Validation Kit	D835V2	4d091	2022/8/19	2025/8/18
SPEAG	1750MHz System Validation Kit	D1750V2	1090	2022/2/24	2025/2/22
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2022/3/30	2025/3/28
SPEAG	2450MHz System Validation Kit	D2450V2	1095	2024/2/8	2025/2/7
SPEAG	2600MHz System Validation Kit	D2600V2	1112	2023/12/18	2024/12/17
SPEAG	3500MHz System Validation Kit	D3500V2	1037	2023/11/20	2024/11/19
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2022/9/23	2025/9/22
SPEAG	13MHz System Validation Kit	CLA13	1023	2024/1/22	2025/1/21
SPEAG	Data Acquisition Electronics	DAE4	1303	2023/11/20	2024/11/19
SPEAG	Dosimetric E-Field Probe	EX3DV4	7706	2024/1/24	2025/1/23
SPEAG	SAM Twin Phantom	SAM Twin	TP-2024	NCR	NCR
SPEAG	ELI Phantom	ELI V8.0	TP-2135	NCR	NCR
Testo	Thermo-Hygrometer	608-H1	1241332126	2023/7/10	2024/7/9
Rohde & Schwarz	Vector Signal Generator	SMBV100A	258305	2024/1/2	2025/1/1
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	1144	2023/8/17	2024/8/16
SPEAG	Dielectric Probe Kit	DAK-12	1173	2023/9/20	2024/9/19
Anritsu	Vector Signal Generator	MG3710A	6201682672	2024/1/2	2025/1/1
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	2024/1/2	2025/1/1
Rohde & Schwarz	Spectrum Analyzer	FSV7	101631	2023/10/11	2024/10/10
TES	DIGITAC THERMOMETER	1310	220305411	2023/7/8	2024/7/7
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:

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

11. System Verification

11.1 Tissue Simulating Liquids

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

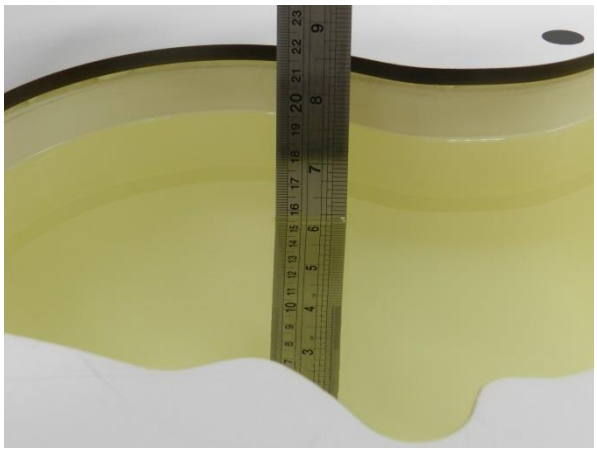


Fig 11.1 Photo of Liquid Height for Head SAR

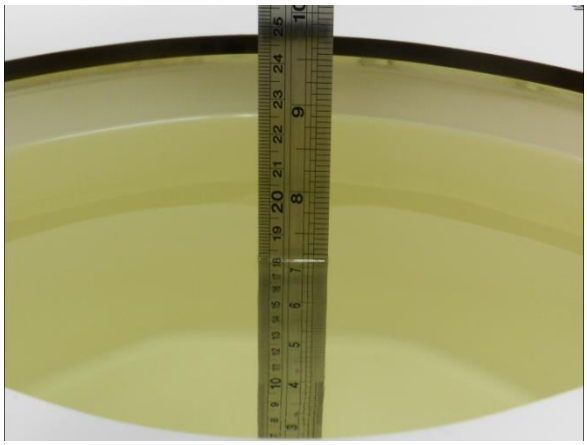


Fig 11.2 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

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

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

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Head	22.6	0.872	41.2	0.89	41.90	-2.02	-1.67	±5	2024/5/24
835	Head	22.8	0.911	42.7	0.90	41.50	1.22	2.89	±5	2024/5/25
1750	Head	22.9	1.34	38.5	1.37	40.10	-2.19	-3.99	±5	2024/5/26
1900	Head	22.7	1.40	41.4	1.40	40.00	0.00	3.50	±5	2024/5/27
2450	Head	22.6	1.83	37.5	1.80	39.20	1.67	-4.34	±5	2024/5/28
2600	Head	22.9	1.93	38.3	1.96	39.00	-1.53	-1.79	±5	2024/5/29
3500	Head	22.7	2.85	38.6	2.91	37.90	-2.06	1.85	±5	2024/5/30
5250	Head	22.8	4.58	35.7	4.71	35.90	-2.76	-0.56	±5	2024/5/31
5600	Head	22.6	4.95	35.1	5.07	35.50	-2.37	-1.13	±5	2024/6/1
5750	Head	22.9	5.11	34.9	5.22	35.40	-2.11	-1.41	±5	2024/6/2
13	Head	22.6	0.757	53.700	0.75	55.00	0.93	-2.36	±5	2024/5/29

11.3 System Performance Check Results

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

<1g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2024/5/24	750	Head	50	1087	7706	1303	0.435	8.58	8.7	1.40
2024/5/25	835	Head	50	4d091	7706	1303	0.509	9.45	10.18	7.72
2024/5/26	1750	Head	50	1090	7706	1303	1.73	37.00	34.6	-6.49
2024/5/27	1900	Head	50	5d118	7706	1303	2.06	39.30	41.2	4.83
2024/5/28	2450	Head	50	1095	7706	1303	2.74	52.60	54.8	4.18
2024/5/29	2600	Head	50	1112	7706	1303	2.61	55.10	52.2	-5.26
2024/5/30	3500	Head	50	1037	7706	1303	3.31	65.40	66.2	1.22
2024/5/31	5250	Head	50	1113	7706	1303	3.75	81.50	75	-7.98
2024/6/1	5600	Head	50	1113	7706	1303	4.22	82.60	84.4	2.18
2024/6/2	5750	Head	50	1113	7706	1303	3.86	80.80	77.2	-4.46

<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 (%)
2024/5/24	750	Head	50	1087	7706	1303	0.291	5.65	5.82	3.01
2024/5/25	835	Head	50	4d091	7706	1303	0.335	6.22	6.7	7.72
2024/5/26	1750	Head	50	1090	7706	1303	0.909	19.50	18.18	-6.77
2024/5/27	1900	Head	50	5d118	7706	1303	1.08	20.40	21.6	5.88
2024/5/28	2450	Head	50	1095	7706	1303	1.31	24.70	26.2	6.07
2024/5/29	2600	Head	50	1112	7706	1303	1.19	24.80	23.8	-4.03
2024/5/30	3500	Head	50	1037	7706	1303	1.30	24.70	26	5.26
2024/5/31	5250	Head	50	1113	7706	1303	1.09	23.30	21.8	-6.44
2024/6/1	5600	Head	50	1113	7706	1303	1.21	23.70	24.2	2.11
2024/6/2	5750	Head	50	1113	7706	1303	1.12	23.00	22.4	-2.61
2024/5/29	13	Head	250	1023	7706	1303	0.090	0.335	0.36	5.88

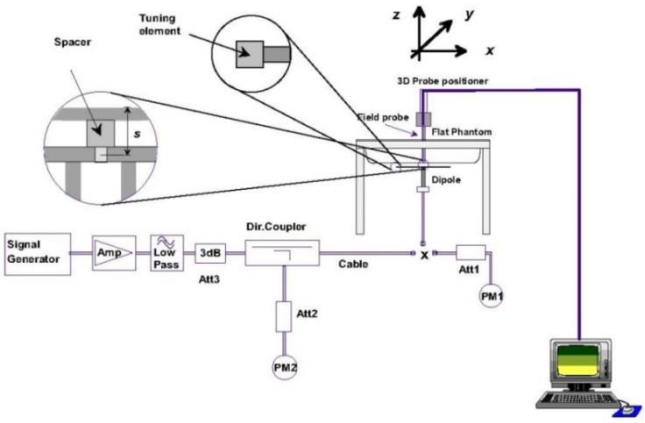


Fig 11.3.1 System Performance Check Setup

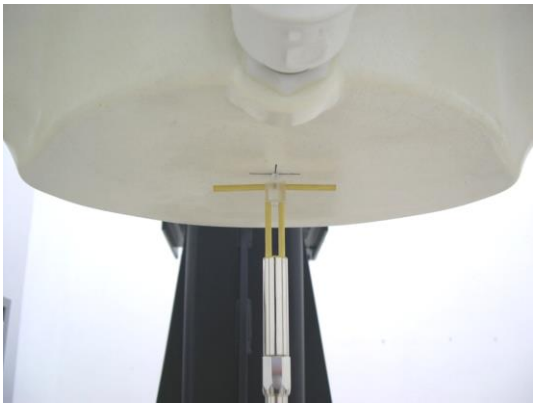


Fig 11.3.2 Setup Photo

Fig 11.3.3 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

Figure 12.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 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.

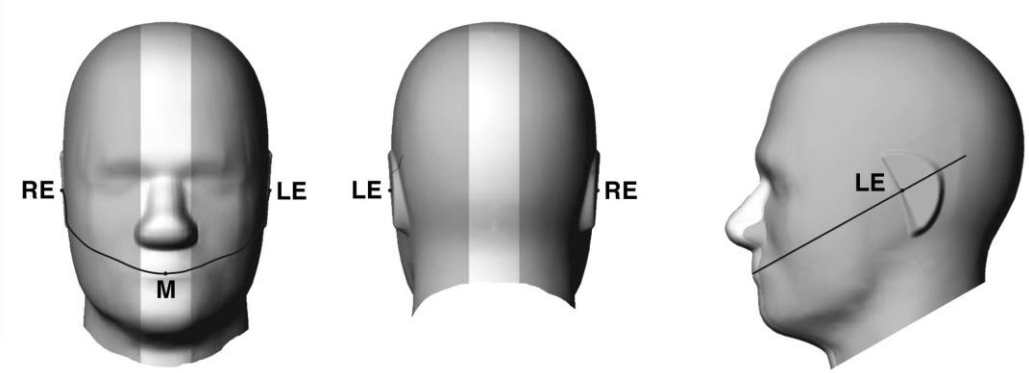


Fig 12.1.1 Front, back, and side views of SAM twin phantom

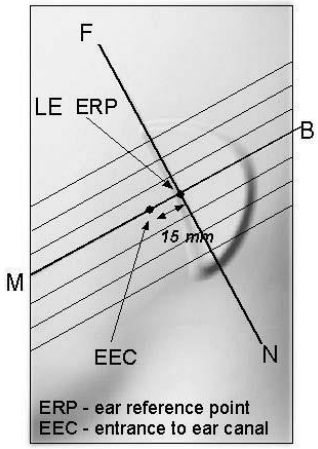


Fig 12.1.2 Close-up side view of phantom showing the ear region.

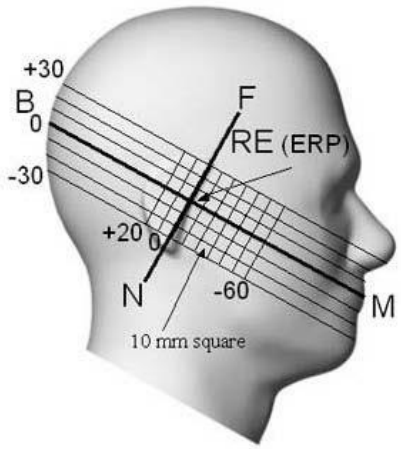


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

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

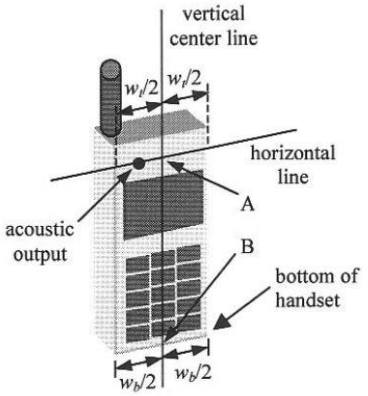


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case

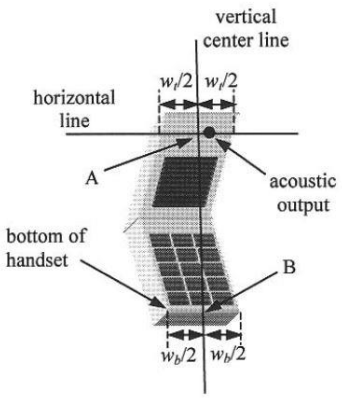


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

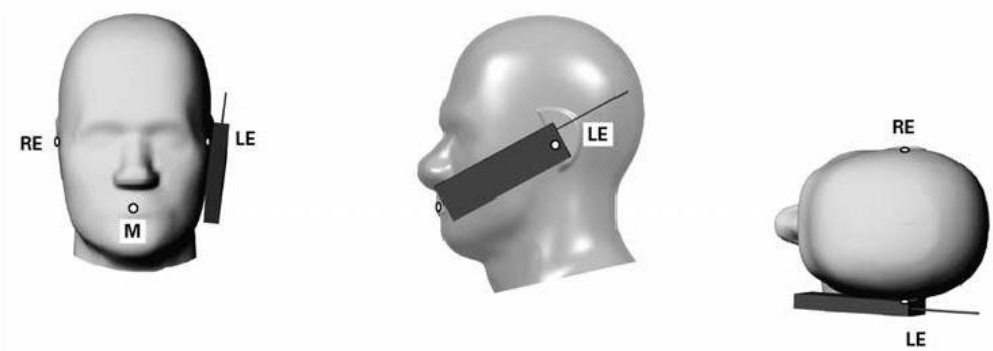


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

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

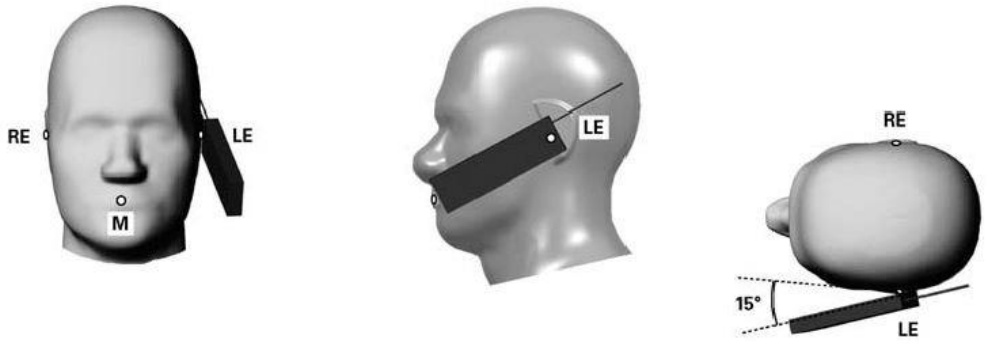


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 11.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

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

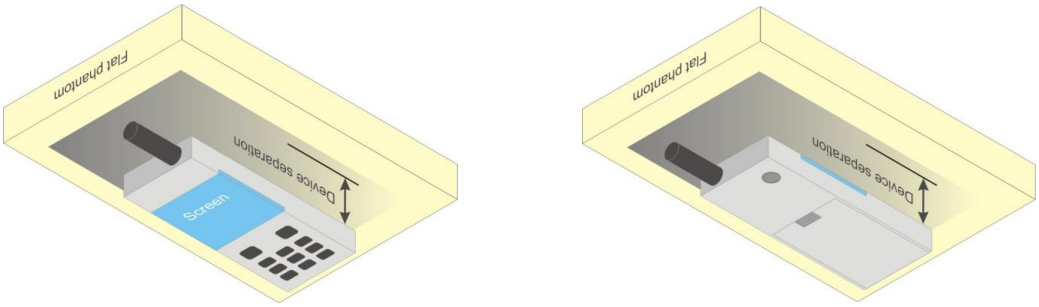


Fig 12.4 Body Worn Position

12.5 Product Specific 10g SAR Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, that 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.

12.6 Wireless Router

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

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

13. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<LTE Carrier Aggregation>

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

General Note:

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

2CC Downlink Carrier Aggregation				3CC Downlink Carrier Aggregation			
Number	Combination	4X4 MIMO	Covered by Measurement Superset	Number	Combination	4X4 MIMO	Covered by Measurement Superset
1	CA_26A-66A	66A		1	CA_2A-4A-5A	4A, 2A	
2	CA_2A-2A	2A-2A, 2A		2	CA_2A-4A-7A	7A, 4A, 2A	
3	CA_2A-4A	4A, 2A	3CC-1	3	CA_2A-5A-7A	7A, 2A	
4	CA_2A-5A	2A	3CC-1	4	CA_2A-66A-66A	66A, 2A	
5	CA_2A-66A	66A, 2A	3CC-4	5	CA_2A-7A-66A	7A, 66A, 2A	
6	CA_2A-7A	2A-7A, 7A, 2A	3CC-5	6	CA_2A-7A-7A	7A, 2A	
7	CA_2C	2C, 2A		7	CA_2A-7C	2A	
8	CA_38A-66A	66A	3CC-11	8	CA_4A-7A-7A	7A, 4A	
9	CA_38C			9	CA_4A-7C	4A	
10	CA_41A-42A	42A		10	CA_5A-7C		
11	CA_41C			11	CA_7A-38A-66A	66A	
12	CA_42C	42C, 42A		12	CA_7A-66A-66A	7A, 66A	
13	CA_4A-4A	4A-4A, 4A		13	CA_7A-7A-66A		
14	CA_4A-5A	4A	3CC-1	14	CA_7C-66A		
15	CA_4A-7A	4A-7A, 7A, 4A	3CC-2	15	CA_2C-66A		
16	CA_5A-38A						
17	CA_5A-66A	66A					
18	CA_5A-7A	7A	3CC-3				
19	CA_66A-66A	66A-66A, 66A	3CC-12				
20	CA_7A-26A	7A					
21	CA_7A-42A	7A-42A, 7A, 42A					
22	CA_7A-66A	7A-66A, 7A, 66A	3CC-12				
23	CA_7A-7A	7A-7A, 7A	3CC-6				
24	CA_7B	7B, 7A					
25	CA_7C	7C, 7A	3CC-7				
26	CA_66B	66B, 66A					
27	CA_66C	66C, 66A					

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

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

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

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

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

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

LTE 4x4 MIMO (Downlink)

This device supports downlink 4x4 MIMO operations for LTE Band 2/4/7/66 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 2/4/7/66

5G NR Output Power (Unit: dBm)

General Note:

1. 5G NR n2/n5/n7/n66/n78 is NSA mode.
2. 5G NR n2/n5/n7/n26/n66/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. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
5. NSA and SA mode should perform SAR separately. For the maximum power of NSA mode is the same as SA total power level, so SA SAR can represent NSA mode SAR.
6. 5GNR NSA mode, the power level is the same as 5GNR SA mode, so 5GNR 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 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.

<3GPP 38.101 MPR for EN-DC>

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

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

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

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

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

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

<EN-DC combination>

ENDC	Antenna Tx	
	LTE TX	NR TX
DC_26A_n78A	Ant 0	Ant 5
DC_2A_n5A	Ant 0	Ant 4
DC_2A_n66A	Ant 0	Ant 4
DC_2A_n78A	Ant 0	Ant 5
DC_2A_n7A	Ant 0	Ant 4
DC_38A_n78A	Ant 1	Ant 5
DC_4A_n78A	Ant 0	Ant 5
DC_5A_n2A	Ant 4	Ant 0
DC_5A_n66A	Ant 4	Ant 0
DC_5A_n78A	Ant 0	Ant 5
DC_5A_n7A	Ant 0	Ant 4
DC_66A_n2A	Ant 0	Ant 4
DC_66A_n78A	Ant 0	Ant 5
DC_66A_n7A	Ant 0	Ant 4
DC_7A_n78A	Ant 1	Ant 5
DC_7A_n2A	Ant 1	Ant 4
DC_7A_n66A	Ant 1	Ant 4
DC_41A_n78A	Ant 1	Ant 5

<WLAN Conducted Power>

General Note:

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

14. Antenna Location

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

15. SAR Test Results

Spot Check General Note:

1. 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.
2. 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.
3. 1st as parent model, 2nd as variant model.

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For 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%".
   d. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   e. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   f. For TDD LTE SAR measurement of power class 3, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The reported TDD LTE SAR (W/kg) = Measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. 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.
5. For WLAN when transmit simultaneous with WWAN, power reduction will be activated to head. For WLAN when transmit simultaneous with WWAN and Proximity sensors trigger, power reduction will be activated to body-worn and Handheld.
6. 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. 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.
8. For 5GNR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
9. 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 2/4/7/25/66/38/41/42, 5GNR n2/ n7/ n66/ 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.

10. 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.
11. 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).
12. LTE B2/4/66 at ant0/4 and LTE B7 at ant4, 5GNR n2/66 at ant0/4 and 5GNR n7 at ant4 support different PAs for some antennas and som LTE/NR bands support Other PA only under ENDC & UL CA. Some LTE/NR 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.

WLAN Note:

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

ECI status description:

The device has the following ECI state which used at different exposure condition.

Exposure Condition	ECI	Trigger Conditions
Head SAR	ECI 2	Receiver on
Body worn Mode SAR	ECI 3	Receiver off/Sensor On
Hotspot Mode SAR	ECI 7	Hotspot On
Extremity (Handheld) SAR	ECI 6	Receiver off/Sensor On
Sensor Off SAR	ECI 4	Sensor Off

15.1 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 d_{dB}(dB)
750MHz																							
	1st	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	23095	707.5	1	22.68	24.00	1.355	-	-	-0.05	0.158	0.214	0.54
01	2nd	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	23095	707.5	1	22.83	24.00	1.309	-	-	-0.05	0.144	**0.189**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	23230	782	1	22.73	24.00	1.340	-	-	0.03	0.193	0.259	0.48
02	2nd	LTE Band 13	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	23230	782	1	23.15	24.00	1.216	-	-	0.18	0.191	**0.232**	
835MHz																							
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Cheek	0mm	Ant 0	ECI2	189	836.4	1	29.32	30.50	1.312	-	-	-0.07	0.491	0.644	0.16
03	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Cheek	0mm	Ant 0	ECI2	189	836.4	1	29.18	30.50	1.355	-	-	0.01	0.458	**0.621**	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI2	4182	836.4	1	22.93	24.00	1.279	-	-	-0.03	0.344	0.440	1.21
04	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI2	4182	836.4	1	23.33	24.00	1.167	-	-	-0.09	0.285	**0.333**	
	1st	LTE Band 26	15M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	26865	831.5	1	23.03	24.00	1.250	-	-	0.05	0.272	0.340	0.68
05	2nd	LTE Band 26	15M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	26865	831.5	1	23.13	24.00	1.222	-	-	-0.17	0.238	**0.291**	
	1st	LTE Band 5 _UL_CA	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI2	20525	836.5	1	21.96	22.50	1.132	-	-	-0.05	0.458	0.519	0.56
06	2nd	LTE Band 5 _UL_CA	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI2	20525	836.5	1	21.85	22.50	1.161	-	-	0.02	0.393	**0.456**	
	1st	FR1 n26	20M	QPSK	50	28	DFT-SCS-15KHz	Right Cheek	0mm	Ant 0	ECI2	166300	831.5	1	22.89	24.00	1.291	-	-	-0.04	0.201	0.260	1.39
07	2nd	FR1 n26	20M	QPSK	50	28	DFT-SCS-15KHz	Right Cheek	0mm	Ant 0	ECI2	166300	831.5	1	22.76	24.00	1.330	-	-	-0.06	0.142	**0.189**	
	1st	FR1 n5	25M	QPSK	1	1	DFT-SCS-15KHz	Right Cheek	0mm	Ant 0	ECI2	167300	836.5	1	22.92	24.00	1.282	-	-	0.02	0.179	0.230	1.39
	2nd	FR1 n5	25M	QPSK	1	1	DFT-SCS-15KHz	Right Cheek	0mm	Ant 0	ECI2	167300	836.5	1	22.82	24.00	1.312	-	-	-0.06	0.127	0.167	
	1st	FR1 n5_ENDC	25M	QPSK	64	33	DFT-SCS-15KHz	Right Cheek	0mm	Ant 4	ECI2	167300	836.5	1	23.08	24.00	1.236	-	-	-0.14	0.398	0.492	0.04
08	2nd	FR1 n5_ENDC	25M	QPSK	64	33	DFT-SCS-15KHz	Right Cheek	0mm	Ant 4	ECI2	167300	836.5	1	22.95	24.00	1.274	-	-	-0.04	0.383	**0.488**	
	2nd	FR1 n5_ENDC	25M	QPSK	64	33	DFT-SCS-15KHz	Right Cheek	0mm	Ant 4	ECI2	167300	836.5	2	22.95	24.00	1.274	-	-	0.09	0.372	0.474	
	2nd	FR1 n5_ENDC	25M	QPSK	64	33	DFT-SCS-15KHz	Right Cheek	0mm	Ant 4	ECI2	167300	836.5	3	22.95	24.00	1.274	-	-	0.06	0.356	0.453	
1750MHz																							
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI2	1413	1732.6	1	22.77	24.00	1.327	-	-	0.04	0.128	0.170	0.69
09	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI2	1413	1732.6	1	23.35	24.00	1.161	-	-	-0.03	0.125	**0.145**	
	1st	LTE Band 66 _Main PA	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	132322	1745	1	22.99	24.00	1.262	-	-	0.02	0.142	0.179	0.07
	2nd	LTE Band 66 _Main PA	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI2	132322	1745	1	22.87	24.00	1.297	-	-	0.02	0.136	0.176	
	1st	LTE Band 66 _Other PA_NSA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	132572	1770	1	18.81	20.00	1.315	-	-	0.05	0.745	0.980	0.80
10	2nd	LTE Band 66 _Other PA_NSA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	132572	1770	1	18.74	20.00	1.337	-	-	-0.01	0.610	**0.815**	
	2nd	LTE Band 66 _Other PA_NSA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	132572	1770	2	18.74	20.00	1.337	-	-	0.09	0.604	0.807	
	2nd	LTE Band 66 _Other PA_NSA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	132572	1770	3	18.74	20.00	1.337	-	-	0.02	0.545	0.728	
	1st	FR1 n66_Main PA	45M	QPSK	1	120	DFT-SCS-15KHz	Right Cheek	0mm	Ant 0	ECI2	349000	1745	1	22.77	24.00	1.327	-	-	0.03	0.098	0.130	0.69
	2nd	FR1 n66_Main PA	45M	QPSK	1	120	DFT-SCS-15KHz	Right Cheek	0mm	Ant 0	ECI2	349000	1745	1	22.28	24.00	1.486	-	-	-0.04	0.075	0.111	
	1st	FR1 n66_ Other PA_NSA	45M	QPSK	120	60	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI2	349000	1745	1	20.63	22.00	1.371	-	-	0.01	0.745	1.021	2.42
11	2nd	FR1 n66_ Other PA_NSA	45M	QPSK	120	60	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI2	349000	1745	1	20.75	22.00	1.334	-	-	0.05	0.439	**0.585**	
1900MHz																							
	1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 0	ECI2	661	1880	1	25.33	26.50	1.309	-	-	-0.01	0.059	0.077	0.41
12	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 0	ECI2	661	1880	1	25.19	26.50	1.352	-	-	0.01	0.052	**0.070**	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI2	9400	1880	1	22.65	24.00	1.365	-	-	-0.07	0.100	0.136	2.47
13	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI2	9400	1880	1	23.56	24.00	1.107	-	-	-0.03	0.070	**0.077**	
	1st	LTE Band 2 _Main PA	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI2	18900	1880	1	22.66	24.00	1.361	-	-	0.06	0.095	0.129	0.77
	2nd	LTE Band 2 _Main PA	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI2	18900	1880	1	22.97	24.00	1.268	-	-	0.02	0.085	0.108	
	1st	LTE Band 2 _Main PA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	19100	1900	1	16.58	18.00	1.387	-	-	0.05	0.838	1.162	1.18
14	2nd	LTE Band 2 _Main PA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	19100	1900	1	16.62	18.00	1.374	-	-	-0.03	0.645	**0.886**	
	2nd	LTE Band 2 _Main PA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	19100	1900	2	16.62	18.00	1.374	-	-	0.01	0.592	0.813	
	2nd	LTE Band 2 _Main PA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	19100	1900	3	16.62	18.00	1.374	-	-	0.06	0.546	0.750	
	1st	LTE Band 25	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI2	26340	1880	1	22.81	24.00	1.315	-	-	0.03	0.111	0.146	2.45

15	2nd	LTE Band 25	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI2	26340	1880	1	23.06	24.00	1.242	-	-	-0.06	0.067	**0.083**	
	1st	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Left Cheek	0mm	Ant 0	ECI2	376000	1880	1	22.29	24.00	1.483	-	-	-0.02	0.063	0.093	2.70
	2nd	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Left Cheek	0mm	Ant 0	ECI2	376000	1880	1	22.41	24.00	1.442	-	-	0.07	0.035	0.050	
	1st	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI2	376000	1880	1	17.32	19.00	1.472	-	-	-0.02	0.622	0.916	0.48
16	2nd	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI2	376000	1880	1	17.52	19.00	1.406	-	-	0.06	0.584	**0.821**	
2600MHz																							
	1st	LTE Band 7	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI2	21100	2535	1	23.04	24.00	1.247	-	-	0.06	0.412	0.514	0.92
	2nd	LTE Band 7	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI2	21100	2535	1	22.94	24.00	1.276	-	-	0.02	0.326	0.416	
	1st	LTE Band 7 Other PA_ UL_CA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	21350	2560	1	13.43	14.50	1.279	-	-	0.11	0.730	0.934	2.69
17	2nd	LTE Band 7 Other PA_ UL_CA	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI2	21350	2560	1	13.55	14.50	1.245	-	-	0.07	0.404	**0.503**	
	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	1.26
18	2nd	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI2	40620	2593	1	23.41	24.00	1.146	62.9	1.006	-0.04	0.306	**0.353**	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Left Cheek	0mm	Ant 1	ECI2	507000	2535	1	22.93	24.00	1.279	-	-	0.01	0.401	0.513	1.50
	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Left Cheek	0mm	Ant 1	ECI2	507000	2535	1	22.81	24.00	1.315	-	-	-0.07	0.276	0.363	
	1st	FR1 n7_ Other PA_ ENDC	50M	QPSK	135	68	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI2	507000	2535	1	13.72	14.50	1.197	-	-	0.04	0.919	1.100	2.06
19	2nd	FR1 n7_ Other PA_ ENDC	50M	QPSK	135	68	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI2	507000	2535	1	13.86	14.50	1.159	-	-	0.09	0.590	**0.684**	
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	0.91
20	2nd	LTE Band 42	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 5	ECI2	42190	3460	1	15.79	17.50	1.483	62.9	1.006	0.01	0.489	**0.729**	
	2nd	LTE Band 42	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 5	ECI2	42190	3460	2	15.79	17.50	1.483	62.9	1.006	0.06	0.413	0.616	
	2nd	LTE Band 42	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 5	ECI2	42190	3460	3	15.79	17.50	1.483	62.9	1.006	0.02	0.388	0.579	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 1	ECI2	633334	3500.01	1	20.70	22.00	1.349	-	-	0.01	0.151	0.204	0.02
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 1	ECI2	633334	3500.01	1	20.44	22.00	1.432	-	-	0.01	0.142	0.203	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 2	ECI2	633334	3500.01	1	21.54	23.00	1.400	-	-	0.09	0.209	0.293	0.78
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 2	ECI2	633334	3500.01	1	21.96	23.00	1.271	-	-	0.09	0.193	0.245	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 5	ECI2	633334	3500.01	1	15.31	17.00	1.476	-	-	-0.01	0.732	1.080	1.74
21	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 5	ECI2	633334	3500.01	1	15.34	17.00	1.466	-	-	-0.05	0.493	**0.723**	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 7	ECI2	633334	3500.01	1	18.33	19.00	1.167	-	-	-0.01	0.886	1.034	2.45
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 7	ECI2	633334	3500.01	1	18.26	19.00	1.186	-	-	-0.06	0.496	0.588	

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 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	1.39
22	2nd	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 6	standalone	6	2437	1	16.57	17.50	1.239	100	1.000	-0.07	0.542	**0.671**	
	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	0.34
23	2nd	Bluetooth	1Mbps	Left Tilted	0mm	Ant 6	Full Power	0	2402	1	14.55	15.50	1.245	76.73	1.086	-0.06	0.323	**0.437**	
5000MHz																			
	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	1.87
24	2nd	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 6	standalone	58	5290	1	14.06	16.00	1.563	100	1.000	-0.01	0.466	**0.728**	
	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	1.94
25	2nd	WLAN5.5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 6	standalone	142	5710	1	15.10	17.00	1.549	100	1.000	0.01	0.414	**0.641**	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Right Cheek	0mm	Ant 6	standalone	157	5785	1	16.42	18.00	1.439	100	1.000	-0.02	0.448	0.645	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Right Tilted	0mm	Ant 6	standalone	157	5785	1	16.42	18.00	1.439	100	1.000	-0.02	0.592	0.852	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Right Tilted	0mm	Ant 6	standalone	149	5745	1	16.35	18.00	1.462	100	1.000	0.08	0.566	0.828	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 6	standalone	157	5785	1	16.42	18.00	1.439	100	1.000	-0.02	0.652	0.938	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 6	standalone	149	5745	1	16.35	18.00	1.462	100	1.000	0.01	0.613	0.896	
26	2nd	WLAN5.8GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 6	standalone	157	5785	1	16.42	18.00	1.439	100	1.000	0.05	0.783	**1.127**	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 6	standalone	149	5745	1	16.35	18.00	1.462	100	1.000	0.03	0.762	1.114	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 6	standalone	157	5785	2	16.42	18.00	1.439	100	1.000	0.01	0.713	1.026	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 6	standalone	157	5785	3	16.42	18.00	1.439	100	1.000	0.06	0.675	0.971	
	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 6	Simultaneous	155	5775	1	11.32	12.50	1.312	100	1.000	0.08	0.159	0.209	
	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 6	Simultaneous	155	5775	1	11.32	12.50	1.312	100	1.000	0.01	0.183	0.240	
	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 6	Simultaneous	155	5775	1	11.32	12.50	1.312	100	1.000	0.03	0.214	0.281	

	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 6	Simultaneous	155	5775	1	11.32	12.50	1.312	100	1.000	-0.08	0.268	0.352	

15.2 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 d_{dB}(dB)
750MHz																							
	1st	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	23095	707.5	1	22.68	24.00	1.355	-	-	-0.07	0.442	0.599	0.16
27	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	23095	707.5	1	22.83	24.00	1.309	-	-	0.01	0.441	**0.577**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	23230	782	1	22.73	24.00	1.340	-	-	0.02	0.790	1.058	0.73
28	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	23230	782	1	23.15	24.00	1.216	-	-	-0.01	0.736	**0.895**	
835MHz																							
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI7	189	836.4	1	26.22	27.50	1.343	-	-	0.09	0.893	1.199	0.79
29	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI7	189	836.4	1	26.20	27.50	1.349	-	-	-0.06	0.741	**1.000**	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	4233	846.6	1	21.89	23.00	1.291	-	-	0.06	1.030	1.330	0.75
30	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI7	4233	846.6	1	22.00	23.00	1.259	-	-	-0.02	0.890	**1.120**	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	26865	831.5	1	23.03	24.00	1.250	-	-	0.05	0.927	1.159	0.53
31	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	ECI7	26865	831.5	1	23.13	24.00	1.222	-	-	-0.06	0.840	**1.026**	
	1st	LTE Band 5_UL_CA	10M	QPSK	1	0	-	Back	5mm	Ant 4	ECI7	20525	836.5	1	21.96	22.50	1.132	-	-	0.07	0.474	0.537	1.09
32	2nd	LTE Band 5_UL_CA	10M	QPSK	1	0	-	Back	5mm	Ant 4	ECI7	20525	836.5	1	21.85	22.50	1.161	-	-	-0.1	0.360	**0.418**	
	1st	FR1 n26	20M	QPSK	50	28	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI7	166300	831.5	1	22.89	24.00	1.291	-	-	0.03	0.922	1.191	1.16
33	2nd	FR1 n26	20M	QPSK	50	28	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI7	166300	831.5	1	22.76	24.00	1.330	-	-	0.02	0.685	**0.911**	
	1st	FR1 n5	25M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI7	167300	836.5	1	22.92	24.00	1.282	-	-	0.09	0.669	0.858	0.20
34	2nd	FR1 n5	25M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI7	167300	836.5	1	22.82	24.00	1.312	-	-	-0.07	0.624	**0.819**	
	1st	FR1 n5_ENDC	25M	QPSK	64	33	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI7	167300	836.5	1	23.08	24.00	1.236	-	-	0.01	0.488	0.603	1.76
	2nd	FR1 n5_ENDC	25M	QPSK	64	33	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI7	167300	836.5	1	22.95	24.00	1.274	-	-	-0.06	0.316	0.402	
1750MHz																							
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	1513	1752.6	1	15.73	17.00	1.340	-	-	0.01	0.917	1.228	1.57
35	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	1513	1752.6	1	15.96	17.00	1.271	-	-	-0.05	0.673	**0.855**	
	1st	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	132572	1770	1	16.48	17.50	1.265	-	-	-0.14	0.866	1.095	1.25
36	2nd	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	132572	1770	1	16.44	17.50	1.276	-	-	-0.05	0.644	**0.822**	
	1st	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	132322	1745	1	18.85	19.50	1.161	-	-	0.01	0.563	0.654	2.22
	2nd	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	132322	1745	1	18.77	19.50	1.183	-	-	-0.05	0.331	0.392	
	1st	FR1 n66_Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Bottom Side	5mm	Ant 0	ECI7	349000	1745	1	18.78	20.00	1.324	-	-	0.04	1.010	1.338	0.01
37	2nd	FR1 n66_Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Bottom Side	5mm	Ant 0	ECI7	349000	1745	1	18.75	20.00	1.334	-	-	-0.06	1.000	**1.334**	
	1st	FR1 n66_Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI7	349000	1745	1	18.78	20.00	1.324	-	-	0.01	0.873	1.156	0.33
	2nd	FR1 n66_Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI7	349000	1745	1	18.75	20.00	1.334	-	-	-0.09	0.803	1.071	
	1st	FR1 n66_ Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Top Side	5mm	Ant 4	ECI7	349000	1745	1	20.69	21.50	1.205	-	-	-0.01	0.597	0.719	0.24
	2nd	FR1 n66_ Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Top Side	5mm	Ant 4	ECI7	349000	1745	1	20.41	21.50	1.285	-	-	-0.09	0.529	0.680	
1900MHz																							
	1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 0	ECI7	512	1850.2	1	18.46	19.50	1.271	-	-	-0.07	1.010	1.283	1.56
38	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 0	ECI7	512	1850.2	1	18.35	19.50	1.303	-	-	-0.06	0.687	**0.895**	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	9400	1880	1	14.18	15.50	1.355	-	-	0.07	0.953	1.291	2.12
39	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI7	9400	1880	1	14.82	15.50	1.169	-	-	-0.06	0.677	**0.792**	
	1st	LTE Band 2_Main PA	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	19100	1900	1	13.48	15.00	1.419	-	-	0.03	0.863	1.225	2.14
40	2nd	LTE Band 2_Main PA	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	19100	1900	1	13.82	15.00	1.312	-	-	-0.09	0.570	**0.748**	
	1st	LTE Band 2_Main PA	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	18900	1880	1	15.76	17.00	1.330	-	-	0.1	0.511	0.680	1.33
	2nd	LTE Band 2_Main PA	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	18900	1880	1	15.68	17.00	1.355	-	-	-0.03	0.370	0.501	
	1st	LTE Band 25	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	26340	1880	1	15.34	16.50	1.306	-	-	0.04	1.030	1.345	1.74
41	2nd	LTE Band 25	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	ECI7	26340	1880	1	15.38	16.50	1.294	-	-	-0.05	0.697	**0.902**	
	1st	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Bottom Side	5mm	Ant 0	ECI7	379000	1895	1	14.30	16.00	1.479	-	-	-0.04	0.854	1.263	1.62
42	2nd	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Bottom Side	5mm	Ant 0	ECI7	379000	1895	1	14.26	16.00	1.493	-	-	-0.06	0.583	**0.870**	
	1st	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Top Side	5mm	Ant 4	ECI7	376000	1880	1	15.37	17.00	1.455	-	-	0.01	0.425	0.619	1.37
	2nd	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Top Side	5mm	Ant 4	ECI7	376000	1880	1	15.50	17.00	1.413	-	-	-0.01	0.320	0.452	

2600MHz																								
	1st	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI7	20850	2510	1	19.10	20.00	1.230	-	-	-0.05	1.090	1.341	2.08
43	2nd	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI7	20850	2510	1	18.96	20.00	1.271	-	-	-0.03	0.654	**0.831**	
	1st	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	21100	2535	1	12.96	14.00	1.271	-	-	0.01	0.531	0.675	1.40
	2nd	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI7	21100	2535	1	13.02	14.00	1.253	-	-	-0.04	0.390	0.489	
	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	1.040	1.376	0.82
44	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI7	41055	2636.5	1	21.07	22.00	1.239	62.9	1.006	-0.07	0.913	**1.138**	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI7	507000	2535	1	20.02	21.00	1.253	-	-	-0.09	1.110	1.391	0.54
45	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI7	507000	2535	1	19.91	21.00	1.285	-	-	-0.03	0.956	**1.229**	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Left Side	5mm	Ant 1	ECI7	507000	2535	1	20.02	21.00	1.253	-	-	0.06	0.718	0.900	0.33
	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Left Side	5mm	Ant 1	ECI7	507000	2535	1	19.91	21.00	1.285	-	-	-0.02	0.649	0.834	
	1st	FR1 n7_ENDC	50M	QPSK	135	68	DFT-SCS-15KHz	Top Side	5mm	Ant 4	ECI7	507000	2535	1	10.44	11.00	1.138	-	-	0.01	0.610	0.694	1.52
	2nd	FR1 n7_ENDC	50M	QPSK	135	68	DFT-SCS-15KHz	Top Side	5mm	Ant 4	ECI7	507000	2535	1	10.41	11.00	1.146	-	-	-0.07	0.427	0.489	
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	0.93
46	2nd	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	ECI7	42990	3540	1	14.28	16.00	1.486	62.9	1.006	0.01	0.351	**0.525**	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI7	633334	3500.01	1	20.70	22.00	1.349	-	-	-0.07	0.734	0.990	0.83
47	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI7	633334	3500.01	1	20.44	22.00	1.432	-	-	-0.02	0.571	**0.818**	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI7	633334	3500.01	1	15.11	16.50	1.377	-	-	0.09	0.490	0.675	2.05
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI7	633334	3500.01	1	15.42	16.50	1.282	-	-	-0.03	0.328	0.421	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI7	633334	3500.01	1	12.51	14.00	1.409	-	-	-0.04	0.431	0.607	1.31
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI7	633334	3500.01	1	12.46	14.00	1.426	-	-	0.01	0.315	0.449	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI7	633334	3500.01	1	15.55	16.50	1.245	-	-	0.09	0.529	0.658	2.08
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI7	633334	3500.01	1	15.87	16.50	1.156	-	-	0.01	0.353	0.408	

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 d_{dB}(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	1.01
48	2nd	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	Ant 6	standalone	11	2462	1	14.31	15.50	1.315	100	1.000	-0.03	0.393	**0.517**	
	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	0.16
49	2nd	Bluetooth	1Mbps	Top Side	5mm	Ant 6	Full Power	0	2402	1	14.55	15.50	1.245	76.73	1.086	0.07	0.349	**0.472**	
	2nd	Bluetooth	1Mbps	Top Side	5mm	Ant 6	Full Power	0	2402	2	14.55	15.50	1.245	76.73	1.086	0.02	0.318	0.430	
	2nd	Bluetooth	1Mbps	Top Side	5mm	Ant 6	Full Power	0	2402	3	14.55	15.50	1.245	76.73	1.086	0.06	0.305	0.412	
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	1.22
50	2nd	WLAN5.2GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 6	standalone	42	5210	1	13.30	15.00	1.479	100	1.000	-0.08	0.316	**0.467**	
	2nd	WLAN5.2GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 6	standalone	42	5210	2	13.30	15.00	1.479	100	1.000	0.02	0.294	0.435	
	2nd	WLAN5.2GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 6	standalone	42	5210	3	13.30	15.00	1.479	100	1.000	0.09	0.266	0.393	
	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	1.45
51	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 6	standalone	155	5775	1	9.73	11.00	1.340	100	1.000	0.03	0.377	**0.505**	

15.3 Body Worn Accessory 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 d_{dB}(dB)
												750MHz											
	1st	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	23095	707.5	1	22.68	24.00	1.355	-	-	-0.07	0.442	0.599	0.16
52	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	23095	707.5	1	22.83	24.00	1.309	-	-	0.01	0.441	**0.577**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	23230	782	1	22.73	24.00	1.340	-	-	0.02	0.790	1.058	0.73
53	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	23230	782	1	23.15	24.00	1.216	-	-	-0.01	0.736	**0.895**	
	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	23230	782	2	23.15	24.00	1.216	-	-	0.06	0.617	0.750	
	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	23230	782	3	23.15	24.00	1.216	-	-	0.02	0.666	0.810	
												835MHz											
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI3	189	836.4	1	26.22	27.50	1.343	-	-	0.09	0.893	1.199	0.79
54	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI3	189	836.4	1	26.20	27.50	1.349	-	-	-0.06	0.741	**1.000**	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	4233	846.6	1	21.89	23.00	1.291	-	-	0.06	1.030	1.330	0.75
55	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	4233	846.6	1	22.00	23.00	1.259	-	-	-0.02	0.890	**1.120**	
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	4233	846.6	2	22.00	23.00	1.259	-	-	0.01	0.734	0.924	
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	4233	846.6	3	22.00	23.00	1.259	-	-	0.06	0.756	0.952	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	26865	831.5	1	23.03	24.00	1.250	-	-	0.05	0.927	1.159	0.53
56	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	26865	831.5	1	23.13	24.00	1.222	-	-	-0.06	0.840	**1.026**	
	1st	LTE Band 5_UL_CA	10M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	20525	836.5	1	21.96	22.50	1.132	-	-	0.07	0.474	0.537	1.09
57	2nd	LTE Band 5_UL_CA	10M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	20525	836.5	1	21.85	22.50	1.161	-	-	-0.1	0.360	**0.418**	
	1st	FR1 n26	20M	QPSK	50	28	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	166300	831.5	1	22.89	24.00	1.291	-	-	0.03	0.922	1.191	1.16
58	2nd	FR1 n26	20M	QPSK	50	28	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	166300	831.5	1	22.76	24.00	1.330	-	-	0.02	0.685	**0.911**	
	1st	FR1 n5	25M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	167300	836.5	1	22.92	24.00	1.282	-	-	0.09	0.669	0.858	0.20
59	2nd	FR1 n5	25M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	167300	836.5	1	22.82	24.00	1.312	-	-	-0.07	0.624	**0.819**	
	1st	FR1 n5_ENDC	25M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI3	167300	836.5	1	23.14	24.00	1.219	-	-	0.04	0.488	0.595	1.95
	2nd	FR1 n5_ENDC	25M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI3	167300	836.5	1	23.02	24.00	1.253	-	-	-0.17	0.303	0.380	
												1750MHz											
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	1513	1752.6	1	16.71	18.00	1.346	-	-	-0.05	0.915	1.231	0.42
60	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	1513	1752.6	1	17.01	18.00	1.256	-	-	-0.03	0.889	**1.117**	
	1st	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	132572	1770	1	17.48	18.50	1.265	-	-	-0.03	0.926	1.171	0.25
61	2nd	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	132572	1770	1	17.35	18.50	1.303	-	-	-0.07	0.849	**1.106**	
	1st	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	132572	1770	1	20.25	21.00	1.189	-	-	0.09	0.826	0.982	1.29
	2nd	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	132572	1770	1	20.14	21.00	1.219	-	-	-0.16	0.599	0.730	
	1st	FR1 n66_ Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	349000	1745	1	19.77	21.00	1.327	-	-	0.01	1.020	1.354	0.06
62	2nd	FR1 n66_ Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	349000	1745	1	19.75	21.00	1.334	-	-	-0.04	1.000	**1.334**	
	2nd	FR1 n66_ Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	349000	1745	2	19.75	21.00	1.334	-	-	0.01	0.970	1.294	
	2nd	FR1 n66_ Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	349000	1745	3	19.75	21.00	1.334	-	-	0.06	0.915	1.220	
	1st	FR1 n66_ Main PA	45M	QPSK	1	120	DFT-SCS-15KHz	Front	5mm	Ant 0	ECI3	349000	1745	1	19.84	21.00	1.306	-	-	0.03	0.620	0.810	0.37
	2nd	FR1 n66_ Main PA	45M	QPSK	1	120	DFT-SCS-15KHz	Front	5mm	Ant 0	ECI3	349000	1745	1	19.79	21.00	1.321	-	-	-0.04	0.563	0.744	
	1st	FR1 n66_Other PA_NSA	45M	QPSK	1	120	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI3	349000	1745	1	19.57	21.00	1.390	-	-	-0.05	0.865	1.202	2.18
	2nd	FR1 n66_Other PA_NSA	45M	QPSK	1	120	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI3	349000	1745	1	19.51	21.00	1.409	-	-	-0.06	0.516	0.727	
												1900MHz											
	1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI3	512	1850.2	1	18.46	19.50	1.271	-	-	-0.04	0.891	1.132	1.28
63	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI3	512	1850.2	1	18.35	19.50	1.303	-	-	-0.04	0.648	**0.844**	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	9400	1880	1	15.76	17.00	1.330	-	-	0.15	1.040	1.384	1.06
64	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	9400	1880	1	16.04	17.00	1.247	-	-	-0.03	0.870	**1.085**	
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	9400	1880	2	16.04	17.00	1.247	-	-	0.03	0.828	1.033	
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	9400	1880	3	16.04	17.00	1.247	-	-	0.02	0.759	0.947	
	1st	LTE Band 2_ Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	19100	1900	1	15.26	16.50	1.330	-	-	0.09	1.020	1.357	1.59
65	2nd	LTE Band 2_ Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	19100	1900	1	15.18	16.50	1.355	-	-	-0.03	0.694	**0.941**	
	1st	LTE Band 2_ Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	19100	1900	1	16.19	17.50	1.352	-	-	-0.06	0.682	0.922	0.88
	2nd	LTE Band 2_ Main PA	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	19100	1900	1	16.11	17.50	1.377	-	-	-0.06	0.547	0.753	
	1st	LTE Band 25	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	26590	1905	1	15.75	17.00	1.334	-	-	0.01	1.030	1.374	1.14

66	2nd	LTE Band 25	20M	QPSK	1	0	-	Back	5mm	Ant 0	ECI3	26590	1905	1	15.81	17.00	1.315	-	-	-0.02	0.804	**1.057**	
	1st	FR1 n2_ Main PA	30M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	379000	1895	1	16.02	17.50	1.406	-	-	-0.01	0.875	1.230	1.50
67	2nd	FR1 n2_ Main PA	30M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	379000	1895	1	16.10	17.50	1.380	-	-	-0.06	0.631	**0.871**	
	1st	FR1 n2_Other PA_NSA	30M	QPSK	80	40	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI3	379000	1895	1	20.78	21.50	1.180	-	-	0.05	0.780	0.921	0.63
	2nd	FR1 n2_Other PA_NSA	30M	QPSK	80	40	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI3	379000	1895	1	20.64	21.50	1.219	-	-	0.07	0.653	0.796	
2600MHz																							
	1st	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI3	20850	2510	1	19.10	20.00	1.230	-	-	-0.05	1.090	1.341	2.08
	2nd	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI3	20850	2510	1	18.96	20.00	1.271	-	-	-0.03	0.654	0.831	
	1st	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	21350	2560	1	16.38	17.50	1.294	-	-	0.03	0.785	1.016	0.30
68	2nd	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	21350	2560	1	16.61	17.50	1.227	-	-	-0.01	0.773	**0.949**	
	2nd	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	21350	2560	2	16.61	17.50	1.227	-	-	0.06	0.656	0.805	
	2nd	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI3	21350	2560	3	16.61	17.50	1.227	-	-	0.02	0.695	0.853	
	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	0.82
69	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI3	41055	2636.5	1	21.07	22.00	1.239	62.9	1.006	-0.07	0.913	**1.138**	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI3	507000	2535	1	20.02	21.00	1.253	-	-	-0.09	1.110	1.391	0.54
70	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI3	507000	2535	1	19.91	21.00	1.285	-	-	-0.03	0.956	**1.229**	
	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI3	507000	2535	2	19.91	21.00	1.285	-	-	0.01	0.916	1.177	
	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI3	507000	2535	3	19.91	21.00	1.285	-	-	0.06	0.886	1.139	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI3	507000	2535	1	20.02	21.00	1.253	-	-	-0.04	0.640	0.802	0.98
	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI3	507000	2535	1	19.91	21.00	1.285	-	-	-0.02	0.498	0.640	
	1st	FR1 n7_ENDC	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI3	507000	2535	1	12.83	14.00	1.309	-	-	-0.08	0.876	1.147	1.42
	2nd	FR1 n7_ENDC	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI3	507000	2535	1	13.00	14.00	1.259	-	-	-0.01	0.658	0.828	
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	0.76
71	2nd	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	ECI3	42990	3540	1	15.79	17.50	1.483	62.9	1.006	0.03	0.481	**0.717**	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI3	633334	3500.01	1	20.70	22.00	1.349	-	-	-0.07	0.734	0.990	0.83
72	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI3	633334	3500.01	1	20.44	22.00	1.432	-	-	-0.02	0.571	**0.818**	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI3	633334	3500.01	2	20.44	22.00	1.432	-	-	0.03	0.562	0.805	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI3	633334	3500.01	3	20.44	22.00	1.432	-	-	0.02	0.526	0.753	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI3	633334	3500.01	1	16.54	18.00	1.400	-	-	0.03	0.764	1.069	2.76
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI3	633334	3500.01	1	16.66	18.00	1.361	-	-	0.07	0.416	0.566	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI3	633334	3500.01	2	16.66	18.00	1.361	-	-	0.01	0.344	0.468	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI3	633334	3500.01	3	16.66	18.00	1.361	-	-	0.05	0.389	0.530	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI3	633334	3500.01	1	14.38	16.00	1.452	-	-	-0.09	0.676	0.982	2.04
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI3	633334	3500.01	1	14.40	16.00	1.445	-	-	0.02	0.425	0.614	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI3	633334	3500.01	1	16.91	18.00	1.285	-	-	-0.09	0.764	0.982	2.01
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI3	633334	3500.01	1	17.03	18.00	1.250	-	-	0.09	0.494	0.618	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI3	633334	3500.01	2	17.03	18.00	1.250	-	-	0.02	0.410	0.513	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI3	633334	3500.01	3	17.03	18.00	1.250	-	-	0.06	0.446	0.558	

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 d_{de}(dB)
2450MHz																			
	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	1.84
73	2nd	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6	Standalone	11	2462	1	19.14	20.50	1.368	100	1.000	-0.07	0.665	**0.910**	
	2nd	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6	Standalone	11	2462	2	19.14	20.50	1.368	100	1.000	0.02	0.588	0.804	
	2nd	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6	Standalone	11	2462	3	19.14	20.50	1.368	100	1.000	0.02	0.563	0.770	
	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	0.27
74	2nd	Bluetooth	1Mbps	Back	5mm	Ant 6	Full Power	0	2402	1	14.55	15.50	1.245	76.73	1.086	-0.03	0.308	**0.416**	
5000MHz																			
	2nd	WLAN5.3GHz	802.11a 6Mbps	Front	5mm	Ant 6	Standalone	60	5300	1	16.91	18.50	1.442	100	1.000	0.02	0.482	0.695	
75	2nd	WLAN5.3GHz	802.11a 6Mbps	Back	5mm	Ant 6	Standalone	60	5300	1	16.91	18.50	1.442	100	1.000	-0.06	0.830	**1.197**	
	2nd	WLAN5.3GHz	802.11a 6Mbps	Back	5mm	Ant 6	Standalone	56	5280	1	16.88	18.50	1.452	100	1.000	0.01	0.802	1.165	
	2nd	WLAN5.3GHz	802.11a 6Mbps	Back	5mm	Ant 6	Standalone	60	5300	2	16.91	18.50	1.442	100	1.000	0.02	0.810	1.168	
	2nd	WLAN5.3GHz	802.11a 6Mbps	Back	5mm	Ant 6	Standalone	60	5300	3	16.91	18.50	1.442	100	1.000	0.06	0.758	1.093	

	2nd	WLAN5.3GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 6	Simultaneous	58	5290	1	12.79	14.50	1.483	100	1.000	-0.08	0.166	0.246	
	2nd	WLAN5.3GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	Simultaneous	58	5290	1	12.79	14.50	1.483	100	1.000	0.1	0.285	0.423	
	2nd	WLAN5.3GHz	802.11a 6Mbps	Front	12mm	Ant 6	Full Power	60	5300	1	18.66	20.00	1.361	100	1.000	-0.18	0.183	0.249	
	2nd	WLAN5.3GHz	802.11a 6Mbps	Back	17mm	Ant 6	Full Power	60	5300	1	18.66	20.00	1.361	100	1.000	0.02	0.315	0.429	
	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	0.05
76	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	Standalone	138	5690	1	12.50	14.00	1.413	100	1.000	0.04	0.742	**1.048**	
	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	Standalone	138	5690	2	12.50	14.00	1.413	100	1.000	0.03	0.736	1.040	
	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	Standalone	138	5690	3	12.50	14.00	1.413	100	1.000	0.02	0.722	1.020	
	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	0.01
77	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 6	Standalone	155	5775	1	12.75	14.00	1.334	100	1.000	0.08	0.789	**1.052**	

15.4 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 d_{dB}(dB)
835MHz																							
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	128	824.2	1	28.83	30.00	1.309	-	-	-0.01	2.560	3.352	0.56
78	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	128	824.2	1	28.77	30.00	1.327	-	-	-0.04	2.220	**2.947**	
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	128	824.2	2	28.77	30.00	1.327	-	-	0.02	1.980	2.628	
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	128	824.2	3	28.77	30.00	1.327	-	-	0.06	1.920	2.549	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	4233	846.6	1	22.88	24.00	1.294	-	-	0.06	1.940	2.511	0.52
79	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	4233	846.6	1	23.26	24.00	1.186	-	-	-0.01	1.880	**2.229**	
1750MHz																							
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	1513	1752.6	1	19.76	21.00	1.330	-	-	0.08	2.590	3.446	1.57
80	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	1513	1752.6	1	20.01	21.00	1.256	-	-	-0.11	1.910	**2.399**	
	1st	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	132572	1770	1	20.43	21.50	1.279	-	-	0.04	2.380	3.045	0.71
81	2nd	LTE Band 66_ Main PA	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	132572	1770	1	20.36	21.50	1.300	-	-	-0.17	1.990	**2.587**	
	1st	FR1 n66_Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Bottom Side	0mm	Ant 0	ECI6	349000	1745	1	21.85	23.00	1.303	-	-	0.05	2.180	2.841	0.24
82	2nd	FR1 n66_Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Bottom Side	0mm	Ant 0	ECI6	349000	1745	1	21.69	23.00	1.352	-	-	-0.1	1.990	**2.691**	
	2nd	FR1 n66_Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Bottom Side	0mm	Ant 0	ECI6	349000	1745	2	21.69	23.00	1.352	-	-	0.03	1.910	2.582	
	2nd	FR1 n66_Main PA	45M	QPSK	120	60	DFT-SCS-15KHz	Bottom Side	0mm	Ant 0	ECI6	349000	1745	3	21.69	23.00	1.352	-	-	0.05	1.840	2.488	
1900MHz																							
	1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	512	1850.2	1	22.65	24.00	1.365	-	-	0.03	2.530	3.452	0.80
83	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	512	1850.2	1	22.62	24.00	1.374	-	-	-0.02	2.090	**2.872**	
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	512	1850.2	2	22.62	24.00	1.374	-	-	0.06	1.880	2.583	
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	512	1850.2	3	22.62	24.00	1.374	-	-	0.01	1.910	2.624	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	9262	1852.4	1	18.08	19.50	1.387	-	-	0.01	2.510	3.481	1.95
84	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI6	9262	1852.4	1	18.68	19.50	1.208	-	-	-0.1	1.840	**2.222**	
	1st	LTE Band 2_Main PA	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	19100	1900	1	15.48	17.00	1.419	-	-	0.03	1.910	2.710	1.13
85	2nd	LTE Band 2_Main PA	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	19100	1900	1	15.62	17.00	1.374	-	-	-0.16	1.520	**2.089**	
	1st	LTE Band 2_Main PA	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI6	19100	1900	1	18.21	19.50	1.346	-	-	0.06	1.750	2.355	0.70
	2nd	LTE Band 2_Main PA	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI6	19100	1900	1	18.18	19.50	1.355	-	-	-0.08	1.480	2.006	
	1st	LTE Band 25	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	26140	1860	1	18.30	19.50	1.318	-	-	0.07	2.430	3.203	1.44
86	2nd	LTE Band 25	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 0	ECI6	26140	1860	1	18.41	19.50	1.285	-	-	-0.13	1.790	**2.301**	
	1st	FR1 n2_Main PA	30M	QPSK	1	1	DFT-SCS-15KHz	Bottom Side	0mm	Ant 0	ECI6	379000	1895	1	16.96	18.50	1.426	-	-	0.06	2.210	3.151	2.47
	2nd	FR1 n2_Main PA	30M	QPSK	1	1	DFT-SCS-15KHz	Bottom Side	0mm	Ant 0	ECI6	379000	1895	1	16.92	18.50	1.439	-	-	-0.14	1.240	1.784	
	1st	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI6	379000	1895	1	19.16	21.00	1.528	-	-	0.07	1.760	2.689	0.57
87	2nd	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI6	379000	1895	1	19.42	21.00	1.439	-	-	-0.1	1.640	**2.360**	
	2nd	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI6	379000	1895	2	19.42	21.00	1.439	-	-	0.04	1.380	1.986	
	2nd	FR1 n2_Main PA	30M	QPSK	80	40	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI6	379000	1895	3	19.42	21.00	1.439	-	-	0.06	1.450	2.086	
2600MHz																							
	1st	LTE Band 7	20M	QPSK	1	0	-	Back	0mm	Ant 1	ECI6	20850	2510	1	19.10	20.00	1.230	-	-	-0.05	1.910	2.350	1.81
88	2nd	LTE Band 7	20M	QPSK	1	0	-	Back	0mm	Ant 1	ECI6	20850	2510	1	18.96	20.00	1.271	-	-	-0.06	1.220	**1.550**	
	1st	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI6	21100	2535	1	18.92	20.00	1.282	-	-	0.04	1.300	1.667	0.59
	2nd	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI6	21100	2535	1	19.27	20.00	1.183	-	-	-0.09	1.230	1.455	
	2nd	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI6	21100	2535	2	19.27	20.00	1.183	-	-	0.06	1.190	1.408	
	2nd	LTE Band 7_UL_CA	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI6	21100	2535	3	19.27	20.00	1.183	-	-	0.02	1.110	1.313	
	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	1.720	2.260	1.25
89	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 1	ECI6	39750	2506	1	21.44	22.50	1.276	62.9	1.006	-0.03	1.320	**1.695**	
	1st	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Back	0mm	Ant 1	ECI6	507000	2535	1	20.81	22.00	1.315	-	-	0.05	2.330	3.064	1.75
90	2nd	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Back	0mm	Ant 1	ECI6	507000	2535	1	20.76	22.00	1.330	-	-	-0.07	1.540	**2.049**	
	2nd	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Back	0mm	Ant 1	ECI6	507000	2535	2	20.76	22.00	1.330	-	-	0.01	1.520	2.022	
	2nd	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Back	0mm	Ant 1	ECI6	507000	2535	3	20.76	22.00	1.330	-	-	0.05	1.420	1.889	
	1st	FR1 n7_ENDC	50M	QPSK	1	135	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI6	507000	2535	1	17.21	18.00	1.199	-	-	0.02	1.380	1.655	1.12
	2nd	FR1 n7_ENDC	50M	QPSK	1	135	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI6	507000	2535	1	17.18	18.00	1.208	-	-	-0.06	1.060	1.280	
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	1.380	2.092	2.67
91	2nd	LTE Band 42	20M	QPSK	1	0	-	Back	0mm	Ant 5	ECI6	42990	3540	1	19.69	21.50	1.517	62.9	1.006	0.01	0.742	**1.132**	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 2	ECI4	633334	3500.01	1	18.50	20.00	1.413	-	-	-0.02	1.970	2.783	2.89
92	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 2	ECI4	633334	3500.01	1	18.66	20.00	1.361	-	-	-0.06	1.050	**1.430**	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 2	ECI4	633334	3500.01	2	18.66	20.00	1.361	-	-	0.1	0.876	1.193	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 2	ECI4	633334	3500.01	3	18.66	20.00	1.361	-	-	0.06	0.922	1.255	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	633334	3500.01	1	18.51	20.00	1.409	-	-	-0.05	1.490	2.100	2.13
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	633334	3500.01	1	18.43	20.00	1.435	-	-	0.07	0.895	1.285	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	633334	3500.01	2	18.43	20.00	1.435	-	-	0.03	0.750	1.077	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI6	633334	3500.01	3	18.43	20.00	1.435	-	-	0.09	0.799	1.147	
	1st	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 7	ECI4	633334	3500.01	1	20.28	21.00	1.180	-	-	-0.09	1.070	1.263	1.74
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 7	ECI4	633334	3500.01	1	20.42	21.00	1.143	-	-	0.05	0.740	0.846	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 7	ECI4	633334	3500.01	2	20.42	21.00	1.143	-	-	0.06	0.615	0.703	
	2nd	FR1 n78	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 7	ECI4	633334	3500.01	3	20.42	21.00	1.143	-	-	0.01	0.662	0.757	

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 d_{dB}(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	2.18
93	2nd	WLAN2.4GHz	802.11b 1Mbps	Top Side	0mm	Ant 6	Full Power	11	2462	1	19.14	20.50	1.368	100	1.000	-0.02	0.927	**1.268**	
	2nd	WLAN2.4GHz	802.11b 1Mbps	Top Side	0mm	Ant 6	Full Power	11	2462	2	19.14	20.50	1.368	100	1.000	-0.06	0.914	1.250	
	2nd	WLAN2.4GHz	802.11b 1Mbps	Top Side	0mm	Ant 6	Full Power	11	2462	3	19.14	20.50	1.368	100	1.000	0.01	0.885	1.210	
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	0.77
94	2nd	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	44	5220	1	18.14	19.50	1.368	100	1.000	-0.06	0.943	**1.290**	
	2nd	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	44	5220	2	18.14	19.50	1.368	100	1.000	0.03	0.925	1.265	
	2nd	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	44	5220	3	18.14	19.50	1.368	100	1.000	0.06	0.845	1.156	
	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	0.98
95	2nd	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	56	5280	1	18.75	20.00	1.334	100	1.000	-0.07	1.070	**1.427**	
	2nd	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	56	5280	2	18.75	20.00	1.334	100	1.000	0.06	1.040	1.387	
	2nd	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	56	5280	3	18.75	20.00	1.334	100	1.000	0.02	0.985	1.314	
	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	0.22
96	2nd	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	100	5500	1	17.81	19.00	1.315	100	1.000	-0.05	1.120	**1.473**	
	2nd	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	100	5500	2	17.81	19.00	1.315	100	1.000	0.01	1.020	1.342	
	2nd	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	100	5500	3	17.81	19.00	1.315	100	1.000	0.03	0.962	1.265	
	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	0.02
97	2nd	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	149	5745	1	17.48	19.00	1.419	100	1.000	-0.08	1.340	**1.902**	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	149	5745	2	17.48	19.00	1.419	100	1.000	0.02	1.220	1.731	
	2nd	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Ant 6	Full Power	149	5745	3	17.48	19.00	1.419	100	1.000	0.01	1.230	1.745	

<NFC>

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)	Deviation d_{dB}(dB)
	1st	NFC	ASK	Back	0mm	13.56	0.01	0.022	1.38
98	2nd	NFC	ASK	Back	0mm	13.56	-0.07	**0.016**	

15.5 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	ECI3	4233	846.6	22.00	23.00	1.259	-	-	-0.02	0.890	1.0	1.120
2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	4233	846.6	22.00	23.00	1.259	-	-	0.03	0.868	1.025	1.093
1st	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	349000	1745	19.75	21.00	1.334	-	-	-0.04	1.000	1.0	1.334
2nd	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI3	349000	1745	19.75	21.00	1.334	-	-	0.06	0.985	1.015	1.314
1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	9400	1880	16.04	17.00	1.247	-	-	-0.03	0.870	1.0	1.085
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI3	9400	1880	16.04	17.00	1.247	-	-	0.01	0.855	1.018	1.067
1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI3	507000	2535	19.91	21.00	1.285	-	-	-0.03	0.956	1.0	1.229
2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI3	507000	2535	19.91	21.00	1.285	-	-	0.02	0.944	1.013	1.213
1st	WLAN5.3GHz	-	-	-	-	802.11a 6Mbps	Back	5mm	Ant 6	Standalone	60	5300	16.91	18.50	1.442	100	1.000	-0.06	0.830	1.0	1.197
2nd	WLAN5.3GHz	-	-	-	-	802.11a 6Mbps	Back	5mm	Ant 6	Standalone	60	5300	16.91	18.50	1.442	100	1.000	0.02	0.812	1.022	1.171

<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	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	28.77	30.00	1.327	-0.04	2.220	1	2.947
2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	128	824.2	28.77	30.00	1.327	0.06	2.180	1.018	2.894
1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	512	1850.2	22.62	24.00	1.374	-0.02	2.090	1	2.872
2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	0mm	Ant 0	ECI6	512	1850.2	22.62	24.00	1.374	0.03	2.050	1.020	2.817

General Note:

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

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product specific 10g SAR
1.	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:

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. WWAN above includes 5G NR bands and EN-DC combination.
3. EUT will choose each GSM, WCDMA, LTE and 5GNR according to the network signal condition; therefore, they will not operate simultaneously at any moment.
4. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
5. This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WLAN Direct (GC/GO), and 5.3GHz / 5.5GHz supports WLAN Direct (GC only).
6. According to the EUT characteristic, WLAN 5GHz and Bluetooth can not transmit simultaneously.
7. According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz can not transmit simultaneously.
8. WLAN 2.4GHz and Bluetooth share the same antenna and they cannot transmit simultaneously.
9. NFC can transmit simultaneously with other Radios in extremity exposure condition.
10. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
11. 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.
12. The verified maximum SAR from chapter 15.1 to 15.4 are most less than original report, so the standalone reported SAR in the original filing was used to determine simultaneous transmission compliance as it is more conservative. Please see the original filing for complete evaluation of simultaneous transmission analysis.
    1) This variant report adds DC_41A_n78A combination for XT2435-1, and the Original application supports DC_38A_n78A combination, and their EN-DC Configuration as following table.

ENDC	Antenna Tx	
	LTE TX	NR TX
DC_38A_n78A	Ant 1	Ant 5
DC_41A_n78A	Ant 1	Ant 5

    2) Since the supported frequency span for LTE B38 falls completely within the support's frequency span for LTE B41, both LTE bands have the same target power, and both LTE bands share the same transmission path, so the original filing was used to determine simultaneous transmission compliance as it is more conservative.

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17. Uncertainty Assessment

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

Declaration of Conformity:
The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

The judgment of conformity in the report is based on the measurement results excluding the measurement uncertainty.

Uncertainty Budget According to IEC/IEEE 62209-1528 (Frequency band: 4 MHz - 10 GHz range)							
Error Description	**Uncert. Value (±%)**	**Prob. Dist.**	**Div.**	**(Ci) 1g**	**(Ci) 10g**	**Standard Uncertainty (1g) (±%)**	**Standard Uncertainty (10g) (±%)**
Measurement System errors							
Probe calibration	18.6	N	2	1	1	9.3	9.3
Probe calibration drift	1.7	R	1.732	1	1	1.0	1.0
Probe linearity and detection Limit	4.7	R	1.732	1	1	2.7	2.7
Broadband signal	2.8	R	1.732	1	1	1.6	1.6
Probe isotropy	7.6	R	1.732	1	1	4.4	4.4
Other probe and data acquisition errors	2.4	N	1	1	1	2.4	2.4
RF ambient and noise	1.8	N	1	1	1	1.8	1.8
Probe positioning errors	0.006	N	1	0.5	0.5	0.0	0.0
Data processing errors	4.0	N	1	1	1	4.0	4.0
Phantom and Device Errors							
Measurement of phantom conductivity (σ)	2.5	N	1	0.78	0.71	2.0	1.8
Temperature effects (medium)	5.4	R	1.732	0.78	0.71	2.4	2.2
Shell permittivity	14.0	R	1.732	0.5	0.5	4.0	4.0
Distance between the radiating element of the DUT and the phantom medium	2.0	N	1	2	2	4.0	4.0
Repeatability of positioning the DUT or source against the phantom	1.0	N	1	1	1	1.0	1.0
Device holder effects	3.6	N	1	1	1	3.6	3.6
Effect of operating mode on probe sensitivity	2.4	R	1.732	1	1	1.4	1.4
Time-average SAR	1.7	R	1.732	1	1	1.0	1.0
Variation in SAR due to drift in output of DUT	2.5	N	1	1	1	2.5	2.5
Validation antenna uncertainty (validation measurement only)	0.0	N	1	1	1	0.0	0.0
Uncertainty in accepted power (validation measurement only)	0.0	N	1	1	1	0.0	0.0
Correction to the SAR results							
Phantom deviation from target (ε′,σ)	1.9	N	1	1	0.84	1.9	1.6
SAR scaling	0.0	R	1.732	1	1	0.0	0.0
Combined Std. Uncertainty						**14.5%**	**14.4%**
Coverage Factor for 95 %						**K=2**	**K=2**
Expanded STD Uncertainty						**29.0%**	**28.8%**

18. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] IEC/IEEE 62209-1528:2020, “Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz)”, Oct. 2020

[5] SPEAG DASY System Handbook

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

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

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

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

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

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

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

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

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

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

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