FCC SAR Test Report

APPLICANT	: Motorola Mobility LLC
EQUIPMENT	: Mobile Cellular Phone
BRAND NAME	: Motorola
MODEL NAME	: XT2409-2
FCC ID	: IHDT56AS7
STANDARD	: FCC 47 CFR Part 2 (2.1093)

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

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

Approved by: Si Zhang

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

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA452307-01	Rev. 01	Initial issue of report.	Jul. 09, 2024
FA452307-01	Rev. 02	Updated Section 3.2 and Section 18.5	Jul. 10, 2024

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, XT2409-2,** 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	0.89	**1.29**	**1.29**	1.59
		GSM1900	0.24	1.27	1.28	
	WCDMA	WCDMA II	0.37	1.27	1.28	
		WCDMA IV	0.26	**1.29**	1.27	
		WCDMA V	0.88	1.24	1.24	
	LTE	LTE Band 7	0.89	1.27	**1.29**	
		LTE Band 12/17	0.88	1.22	1.22	
		LTE Band 13	0.89	1.25	1.25	
		LTE Band 25/2	0.89	1.27	1.27	
		LTE Band 26/5	0.83	1.26	1.26	
		LTE Band 66/4	0.89	1.27	1.28	
		LTE Band 41/38	0.89	**1.29**	**1.29**	
		LTE Band 42	0.89	0.61	0.89	
	5G NR	FR1 n2	0.88	1.28	1.28	
		FR1 n7	0.89	1.27	**1.29**	
		FR1 n26/n5	0.88	0.70	0.70	
		FR1 n66	0.89	1.28	1.28	
		FR1 n41/n38	0.89	**1.29**	1.28	
		FR1 n78	0.88	1.27	0.94	
DTS	WLAN	2.4GHz WLAN	**1.13**	0.57	1.11	1.59
NII		5GHz WLAN	1.12	0.64	1.18	1.59
6XD		6GHz WLAN	0.34		0.38	1.59
DSS	Bluetooth	2.4GHz Bluetooth	0.74	0.23	0.24	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	3.01	3.99
		GSM1900	2.97	
	WCDMA	WCDMA II	3.16	
		WCDMA IV	3.16	
		WCDMA V	2.12	
	LTE	LTE Band 7	3.16	
		LTE Band 12/17	2.63	
		LTE Band 13	2.00	
		LTE Band 25/2	3.17	
		LTE Band 26/5	2.25	
		LTE Band 66/4	3.17	
		LTE Band 41/38	3.17	
		LTE Band 42	2.48	

	5G NR	FR1 n2	3.16	
		FR1 n7	3.16	
		FR1 n66	3.10	
		FR1 n41/38	3.15	
		FR1 n78	3.02	
DTS	WLAN	2.4GHz WLAN	2.20	3.99
NII		5GHz WLAN	**3.18**	3.99
6XD		6GHz WLAN	0.46	3.70

Equipment Class	Frequency Band	Head	Body-worn	Product Specific
		Measured APD (W/m^2)	Measured APD (W/m^2)	Measured APD (W/m^2)
6XD	6GHz WLAN	1.32	1.64	6.16

Date of Testing:	2024/6/3 ~ 2024/6/25

Remark:

1. This device supports LTE B2 / B4 / B5 / B17 / B38 and B25 / B66 / B26 / B12 / B41. Since the supported frequency span for LTE 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 device supports 5GNR n38/n5 and n41/n26. Since the supported frequency span for 5GNR n38/n5 falls completely within the supports frequency span for n41/n26, both 5GNR bands have the same target power, and both 5GNR bands share the same transmission path; therefore, SAR was only assessed for n41/n26.

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.
	SAR03-KS, SAR04-KS	CN1257	314309

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

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

3. Data Reuse Approach

3.1 Introduction Section

This application re-uses data collected on a similar device, FCC ID: IHDT56AS6 (reference model) and FCC ID: IHDT56AS7 (variant model). Due to the same design are identical between parent model and variant model, SAR data reuse is requested and spot check data in this report is used to justify the SAR data reuse.

Per KDB 484596 D01 v02r03, the deviation of variant model 1g SAR and 10g SAR spot check result was no larger than 3 dB, the WWAN/WLAN/BT maximum SAR summary was always choosing the higher SAR between parent model and variant model.

The applicant should take full responsibility that the test data as referenced in this report represent compliance for this FCC ID: IHDT56AS7

3.2 Model Difference Information

The **main** difference between FCC ID: IHDT56AS6 and FCC ID: IHDT56AS7 is as below:

- Removed LTE B18/19/20/32/39/43 and 5G NR n20/n75/n77(Part 27O)/n78(Part 27O).
- Added 5G NR n78(Part 27Q).
- LTE Band 41/41C changed from Power class 2 to Power class 3.
- Different NFC chipset.

Other differences and all the details of similarity and difference can be found in the confidential documents (XT2409-2_Operational Description of Product Equality Declaration).

3.3 Reference detail Section

Rule Part	Equipment Class	Wireless Technology	Frequency Band (MHz)	FCC ID (Reference)	Type Grant/ Permissive Change	Reference Title	FCC ID Filling (Variant)	Test on the variant
Part 2.1093	PCE	GSM	GSM850/1900	IHDT56AS6	Original Grant	FA452307	IHDT56AS7	Spot check
		WCDMA	B2/4/5	IHDT56AS6	Original Grant	FA452307	IHDT56AS7	Spot check
		LTE	B2/4/5/7/12/13/17/25 /26/B38/41/66/42	IHDT56AS6	Original Grant	FA452307	IHDT56AS7	Spot check
		5G NR	n78				IHDT56AS7	Full Test
		5G NR	n2/n5/n7/n26/n66 /n38/n41	IHDT56AS6	Original Grant	FA452307	IHDT56AS7	Spot check
	DTS	BLE/ Wi-Fi	2400~2483.5	IHDT56AS6	Original Grant	FA452307	IHDT56AS7	Spot check
	NII	Wi-Fi	5150 ~ 5250 5250 ~ 5350 5470 ~ 5725 5725 ~ 5850	IHDT56AS6	Original Grant	FA452307	IHDT56AS7	Spot check
	DSS	Bluetooth	2400~2483.5	IHDT56AS6	Original Grant	FA452307	IHDT56AS7	Spot check
	6XD	Wi-Fi	5925 ~ 7125	IHDT56AS6	Original Grant	FA452307	IHDT56AS7	Spot check on SAR, full test on PD
	DXX	NFC	13.56				IHDT56AS7	Full Test

4. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- 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
- FCC KDB 484596 D01 Referencing Test Data v02r03

5. Equipment Under Test (EUT) Information

5.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2409-2
FCC ID	IHDT56AS7
IMEI Code	IMEI1: 355007474001447 8 IMEI2: 355007474001448 6
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 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3450 MHz ~3550 MHz LTE Band 66: 1710 MHz ~ 1780 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 n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 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 WLAN 6GHz U-NII-5: 5925 MHz ~ 6425 MHz WLAN 6GHz U-NII-6: 6425 MHz ~ 6525 MHz WLAN 6GHz U-NII-7: 6525 MHz ~ 6875 MHz WLAN 6GHz U-NII-8: 6875 MHz ~ 7125 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR : CP-OFDM / DFT-s-OFDM, PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11ax HE20/HE40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac/ax VHT20/VHT40/VHT80/HE20/HE40/HE80 WLAN 6GHz 802.11ax HE20/HE40/HE80

	Bluetooth BR/EDR/LE NFC: ASK
HW Version	DVT2
SW Version	UUI34.42
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, LTE and 5GNR (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). WLAN 6GHz has no hotspot function.
4. The 2.4GHz/5GHz/6GHz WLAN can transmit in MIMO/SISO antenna mode.
5. This device does not support DTM operation and supports GPRS/EGPRS mode up to multi-slot class 12.
6. This device supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active).
7. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the MediaTek TA-SAR will manage to ensure the power level not exceeding the associated power table. Details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
8. For WLAN/BT when transmit simultaneously with each other, or when transmit simultaneous with WWAN/BT, power reduction will be activated to head exposure conditions. For WLAN/BT when transmit simultaneous with WWAN and Proximity sensors trigger, power reduction will be activated to body-worn and extremity exposure conditions.
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 5G NR bands test, using FTM (Factory Test Mode) with default 100% duty cycle transmission to perform SAR testing.
11. The device support DBS (Dual Band Simultaneous) function, when the device 2.4GHz and 5GHz or 6GHz transmit at the same time for simultaneous transmission compliance.
12. Power density test report for WLAN 6GHz U-NII-5/6/7/8 will be separately submitted.
13. This device has NFC function and the NFC SAR report will be separately submitted.
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, 35, 40
	n5	FDD	15	5, 10, 15, 20
	n7	FDD	15	5, 10, 15, 20, 25, 30, 35, 40, 50
	n66	FDD	15	5, 10, 15, 20, 25, 30, 35, 40, 45
	n38	TDD	30	10, 15, 20, 25, 30, 40
	n41	TDD	30	10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
	n78	TDD	30	10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100
SA	n2	FDD	15	5, 10, 15, 20, 25, 30, 35, 40
	n5	FDD	15	5, 10, 15, 20
	n7	FDD	15	5, 10, 15, 20, 25, 30, 35, 40, 50
	n26	FDD	15	5, 10, 15, 20
	n66	FDD	15	5, 10, 15, 20, 25, 30, 35, 40, 45
	n38	TDD	30	10, 15, 20, 25, 30, 40
	n41	TDD	30	10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
	n78	TDD	30	10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100

5.2 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>IHDT56AS7</td></tr>
<tr><td>Equipment Name</td><td>Mobile Cellular Phone</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>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 ~3550 MHz
LTE Band 66: 1710 MHz ~ 1780 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 13: 5MHz, 10MHz
LTE Band 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</td></tr>
<tr><td>uplink modulations used</td><td>QPSK / 16QAM / 64QAM / 256QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Voice and Data</td></tr>
<tr><td>LTE Release Version</td><td>R15</td></tr>
<tr><td>CA Support</td><td>Supported, Uplink and Downlink</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table></td></tr>
<tr><td>LTE A-MPR</td><td>In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, 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 15.</td></tr>
<tr><td>LTE Carrier Aggregation Combinations</td><td>Inter-Band and Intra-Band possible combinations and the detail power verification please referred to section 15.</td></tr>
<tr><td>LTE Carrier Aggregation Additional Information</td><td>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.</td></tr>
</table>

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5

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

LTE Band 7

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

LTE Band 12

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

LTE Band 13

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

LTE Band 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

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 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
LTE Band 25	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 2	Yes	Yes	Yes	Yes	Yes	Yes

2) LTE Bands tune up:

Band	Antenna	Head ECI 2 Tune-up Limit	Body-worn ECI 3 Tune-up Limit	Hotspot ECI 7 Tune-up Limit	Extremity ECI 6 Tune-up Limit	Sensor off ECI 4 Tune-up Limit	Default Tune-up Limit
LTE Band 25(2)	Ant 1	24.00	21.80	19.50	22.60	24.00	24.00
LTE Band 2 other PA	Ant 1	24.00	21.80	19.50	22.60	24.00	24.00
LTE Band 25(2)	Ant 4	17.70	17.70	14.30	19.00	23.00	23.00
LTE Band 2 other PA	Ant 4	17.70	17.70	14.30	19.00	23.00	23.00
LTE Band 66(4)	Ant 1	24.00	22.20	19.70	22.70	24.00	24.00
LTE Band 66(4) other PA	Ant 1	24.00	22.20	19.70	22.70	24.00	24.00
LTE Band 66(4)	Ant 4	18.10	16.70	15.30	20.60	23.00	23.00
LTE Band 66(4) other PA	Ant 4	18.10	16.70	15.30	20.60	23.00	23.00
LTE Band 26(5)	Ant 0	24.00	24.00	24.00	24.00	24.00	24.00
LTE Band 26(5)	Ant 4	23.00	23.00	21.50	23.00	23.00	23.00
LTE Band 12(17)	Ant 0	24.00	24.00	24.00	24.00	24.00	24.00
LTE Band 12(17)	Ant 4	22.60	24.00	21.90	24.00	24.00	24.00
LTE Band 41(38)	Ant 1	24.00	22.80	21.70	22.30	24.00	24.00
LTE Band 41(38) other PA	Ant 1	24.00	22.80	21.70	22.30	24.00	24.00
LTE Band 41(38)	Ant 4	19.70	19.30	18.00	20.10	23.00	23.00
LTE Band 41(38) other PA	Ant 4	19.70	19.30	18.00	20.10	23.00	23.00

5.3 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 n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n78: 3450 MHz ~ 3550 MHz
Channel Bandwidth	The detail please refers to section 5.1 5GNR FR1 bands table.
SCS	FDD: SCS15KHz, TDD: SCS30KHz
uplink modulations used	DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM
A-MPR (Additional MPR) disabled for SAR Testing?	Yes
LTE Anchor Bands for n2	LTE B4/5/66
LTE Anchor Bands for n5	LTE B2/7/66
LTE Anchor Bands for n7	LTE B2/4/5/66
LTE Anchor Bands for n38	LTE B4/66
LTE Anchor Bands for n41	LTE B4/66
LTE Anchor Bands for n66	LTE B2/5/7
LTE Anchor Bands for n78	LTE B2/4/5/7/26/38/41/66

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

NR Band 2

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 35MHz		Bandwidth 40MHz	
	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	370500	1852.5	371000	1855	371500	1857.5	372000	1860	372500	1862.5	373000	1865	373500	1867.5	374000	1870
M	376000	1880	376000	1880	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	378500	1892.5	378000	1890

NR Band 5

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

NR Band 7

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 35MHz		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)	Ch. #	Freq. (MHz)
L	500500	2502.5	501000	2505	501500	2507.5	502000	2510	502500	2512.5	503000	2515	503500	2517.5	504000	2520	505000	2525
M	507000	2535	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	510500	2552.5	510000	2550	509000	2545

NR Band 26

	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 66

	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	346500	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 38												
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	515004	2575.02	515502	2577.51	516000	2580	516504	2582.52	517002	2585.01	518004	2590.02
M	519000	2595	519000	2595	519000	2595	519000	2595	519000	2595	519000	2595
H	522996	2614.98	522498	2612.49	522000	2610	521496	2607.48	520998	2604.99	519996	2599.98

NR Band 41																										
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 35MHz		Bandwidth 40MHz		Bandwidth 45MHz		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)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	500202	2501.01	500700	2503.5	501204	2506.02	501702	2508.51	502200	2511	502704	2513.52	503202	2516.01	503700	2518.5	504204	2521.02	505200	2526	500202	2501.01	507204	2536.02	508200	2541	509202	2546.01
M	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99
H	537000	2685	536496	2682.48	535998	2679.99	535500	2677.5	534996	2674.98	534498	2672.49	534000	2670	533496	2667.48	532998	2664.99	531996	2659.98	531000	2655	529998	2649.99	528996	2644.98	528000	2640

NR Band 78																										
	Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		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)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	630334	3455.01	630500	3457.5	630668	3460.02	630834	3462.51	631000	3465	631334	3470.01	631668	3475.02	632000	3480	632334	3485.01	632668	3490.02	633000	3495				
M	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98		
H	636332	3544.98	636166	3542.49	636000	3540	635832	3537.48	635666	3534.99	635332	3529.98	635000	3525	634666	3519.99	634332	3514.98	634000	3510	633666	3504.99				

<For NR Overlap Bands Description>

1) NR Bands BW

Band	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	35 MHz	40 MHz	45 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
FR1 n5	Yes	Yes	Yes	Yes											
FR1 n26	Yes	Yes	Yes	Yes											
FR1 n38		Yes	Yes	Yes	Yes	Yes		Yes							
FR1 n41		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

2) NR Bands Tune up:

Band	Antenna	Head ECI 2 Tune-up Limit	Body-worn ECI 3 Tune-up Limit	Hotspot ECI 7 Tune-up Limit	Extremity ECI 6 Tune-up Limit	Sensor off ECI 4 Tune-up Limit	Default Tune-up Limit
FR1 n26(5)	Ant 0	24.00	24.00	24.00	24.00	24.00	24.00
FR1 n26(5)	Ant 4	23.80	24.00	24.00	24.00	24.00	24.00
FR1 n41(38)	Ant 1	24.00	23.10	19.40	22.30	24.00	24.00
FR1 n41(38)	Ant 4	19.70	18.90	16.10	20.50	24.00	24.00
FR1 n41(38)	Ant 2	19.60	20.00	14.20	19.50	19.50	20.00
FR1 n41(38)	Ant 0	22.00	22.00	22.00	22.00	22.00	22.00

6. TA-SAR feature for RF Exposure compliance

WWAN bands and mmWave are all enabled with MediaTek TA-SAR feature. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. Note that WLAN operations are not enabled with TA-SAR feature.

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

The purpose of this report (Part 1 test) is to demonstrate that the EUT meets FCC SAR limits when transmitting in static transmission scenario at maximum allowable time-averaged power levels.

The Plimit values correspond to SAR_design_target. The power will be fixed at the static reduce power level at different exposure conditions for RF exposure compliance. For the GSM (TDD) Plimit power levels in the table correspond to the burst average power levels which don't account for TX duty cycle.

This report describes the procedures for the SAR char generation, and the parameters obtained from SAR characterization (referred to as SAR char, respectively) will be used as input for TA-SAR algorithm. SAR char will be entered via the MediaTek's NV suggestion to enable the TA-SAR Feature.

<Terminologies in this report>

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

<SAR Characterization>

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

<SAR design target and uncertainty>

Item	Uncertainty dB (k=2)
Total uncertainty	1.5

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

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

The TA-SAR algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of SAR_design_target, below the predefined time-averaged power limit, for each characterized technology and band.

TA-SAR allows the device to transmit at higher power instantaneously, as high as Pmax, when needed, but enforces power limiting to maintain time-averaged transmit power to Plimit.

<P_{limit} for supported technologies and bands>

Band	Antenna	Head ECI 2	Body-Worn ECI 3	Hotspot ECI 7	Extremity ECI 6	Sensor off ECI 4	Pmax*
GSM850	Ant 0	30.6	24.1	24.1	25.2	25.0	25.0
GSM850	Ant 4	22.5	25.6	24.1	24.0	24.0	24.0
GSM1900	Ant 1	29.8	22.5	20.7	22.8	22.5	22.5
WCDMA II	Ant 1	28.4	20.6	19.1	21.7	23.0	23.0
WCDMA IV	Ant 1	30	20.3	19.3	21.3	23.0	23.0
WCDMA V	Ant 0	29.2	23.1	23.1	23.0	23.0	23.0
WCDMA V	Ant 4	21.4	22.8	21.4	22.0	22.0	22.0
LTE Band 25(2)	Ant 1	28	20.8	18.5	21.6	23.0	23.0
LTE Band 2 other PA	Ant 1	28	20.8	18.5	21.6	23.0	23.0
LTE Band 25(2)	Ant 4	16.7	16.7	13.3	18.0	22.0	22.0
LTE Band 2 other PA	Ant 4	16.7	16.7	13.3	18.0	22.0	22.0
LTE Band 66(4)	Ant 1	30.3	21.2	18.7	21.7	23.0	23.0
LTE Band 66(4) other PA	Ant 1	30.3	21.2	18.7	21.7	23.0	23.0
LTE Band 66(4)	Ant 4	17.1	15.7	14.3	19.6	22.0	22.0
LTE Band 66(4) other PA	Ant 4	17.1	15.7	14.3	19.6	22.0	22.0
LTE Band 26(5)	Ant 0	28.5	23.1	23.1	23.0	23.0	23.0
LTE Band 26(5)	Ant 4	22.3	22.1	20.5	22.0	22.0	22.0
LTE Band 7	Ant 1	30.3	20.6	18.8	21.1	23.0	23.0
LTE Band 7 other PA	Ant 1	30.3	20.6	18.8	21.1	23.0	23.0
LTE Band 7	Ant 4	17.9	17.1	15.5	17.6	22.0	22.0
LTE Band 7 other PA	Ant 4	17.9	17.1	15.5	17.6	22.0	22.0
LTE Band 12(17)	Ant 0	29.7	23.2	23.2	23.0	23.0	23.0
LTE Band 12(17)	Ant 4	21.6	23.1	20.9	23.0	23.0	23.0
LTE Band 13	Ant 0	29.2	23.1	23.1	23.0	23.0	23.0
LTE Band 13	Ant 4	21.6	23.0	20.7	23.0	23.0	23.0
LTE Band 41(38)	Ant 1	30.5	19.8	18.7	19.3	22.4	21.0
LTE Band 41(38) other PA	Ant 1	30.5	19.8	18.7	19.3	22.4	21.0
LTE Band 41(38)	Ant 4	16.7	16.3	15.0	17.1	21.4	20.0
LTE Band 41(38) other PA	Ant 4	16.7	16.3	15.0	17.1	21.4	20.0
LTE Band 42	Ant 3	13	16.6	14.0	19.9	21.0	21.0
FR1 n2	Ant 1	30.7	22.3	20.4	23.0	23.0	23.0
FR1 n2 other PA	Ant 1	30.7	22.3	20.4	23.0	23.0	23.0
FR1 n2	Ant 4	18.3	18.1	15.2	19.6	23.0	23.0
FR1 n2 other PA	Ant 4	18.3	18.1	15.2	19.6	23.0	23.0
FR1 n26(5)	Ant 0	32.2	25.6	25.6	23.0	23.0	23.0
FR1 n26(5)	Ant 4	22.8	24.5	23.0	23.0	23.0	23.0
FR1 n7	Ant 1	31.1	21.6	18.3	21.9	23.0	23.0
FR1 n7	Ant 4	18.4	17.9	14.9	19.3	22.0	22.0
FR1 n66	Ant 1	31.3	21.9	20.9	23.1	23.0	23.0
FR1 n66 other PA	Ant 1	31.3	21.9	20.9	23.1	23.0	23.0
FR1 n66	Ant 4	18	18.0	16.0	20.8	23.0	23.0
FR1 n66 other PA	Ant 4	18	18.0	16.0	20.8	23.0	23.0
FR1 n41(38)	Ant 1	31.4	22.1	18.4	21.3	23.0	23.0
FR1 n41(38)	Ant 4	18.7	17.9	15.1	19.5	23.0	23.0
FR1 n41(38)	Ant 2	18.6	20.7	13.2	18.5	18.5	19.0

FR1 n41(38)	Ant 0	32.3	23.0	22.5	22.3	21.0	21.0
FR1 n78	Ant 3	14.7	17.4	13.1	20.4	23.0	23.0
FR1 n78	Ant 5	16.1	15.8	13.0	18.0	17.5	17.5
FR1 n78	Ant 9	32.1	24.3	20.8	22.6	22.6	23.0
FR1 n78	Ant 7	17.6	22.5	17.5	23.7	17.5	17.5

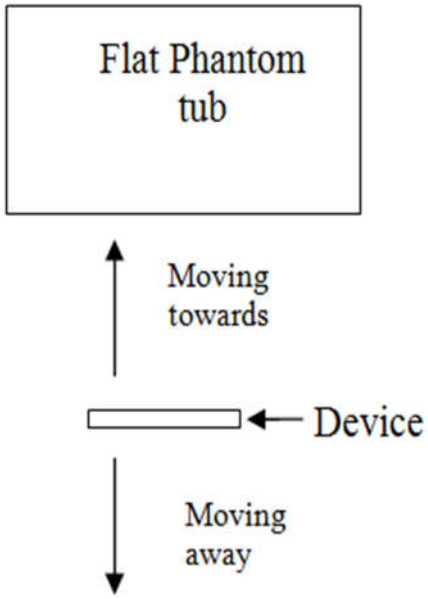
Note:

1) *P_{max} is used for RF tune up procedure. The maximum allowed output power is equal to Pmax + 1.0 dB device uncertainty.
2) All Plimit power levels entered in the Table correspond to average power levels after accounting for duty cycle in the case TDD modulation schemes (for e.g., GSM & LTE TDD & NR TDD).
3) The max allowed output power is the Plimit + 1.0 dB device uncertainty, and if Plimit is higher than Pmax, the device output power will be Pmax instead.

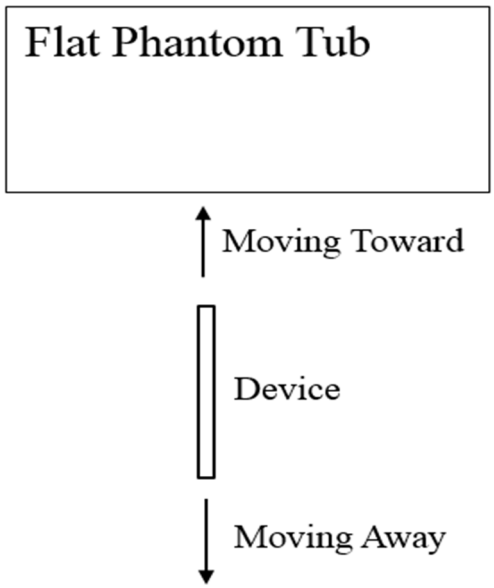
7. Proximity Sensor Triggering Test

<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 (7125MHz) 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	16	20	16	20

<Handheld for ANT1>

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	8	13	7	13	13	18

<Handheld for ANT3/4>

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	18	23	22	25	20	26	20	25

<Handheld for ANT 5/6/7/8>

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	8	13	11	16	12	17	8	14

8. RF Exposure Limits

8.1 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.

8.2 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.

9. Specific Absorption Rate (SAR)

9.1 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.

9.2 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:

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

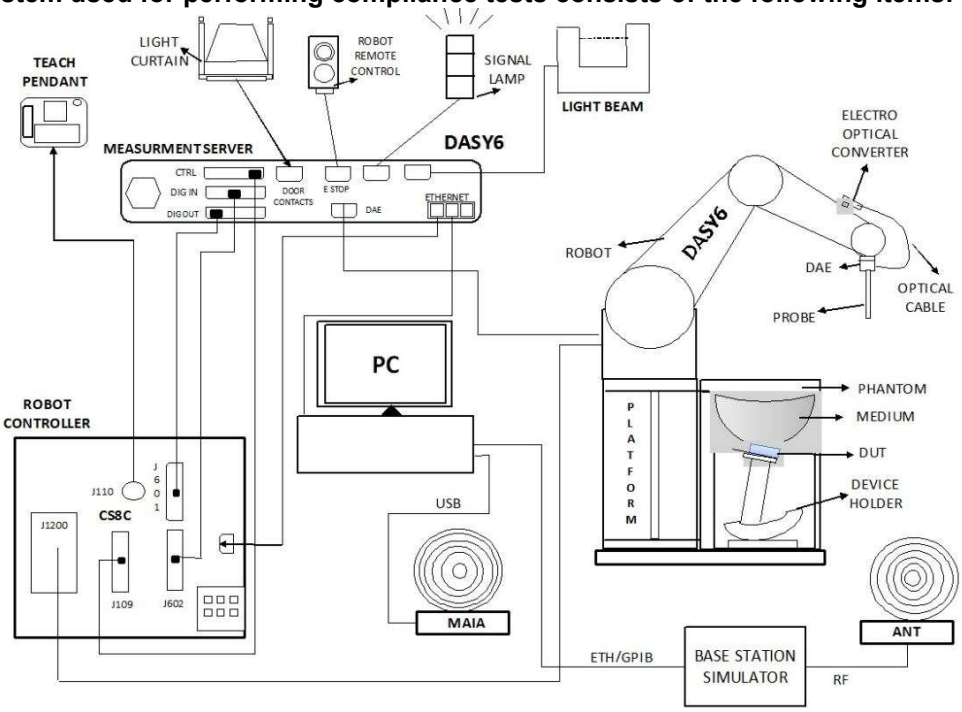
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

10. System Description and Setup

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



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

10.1 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

10.2 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

10.3 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

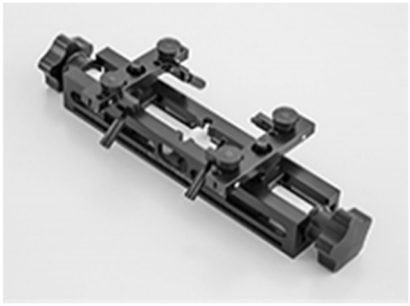
The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

10.4 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

11. 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

11.1 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

11.2 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.

11.3 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.	

11.4 Zoom Scan

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

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

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

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

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

11.5 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.

11.6 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.

12. 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	6500MHz System Validation Kit	D6.5GHzV2	1031	2023/2/22	2026/2/21
SPEAG	Data Acquisition Electronics	DAE4	1650	2023/9/13	2024/9/12
SPEAG	Data Acquisition Electronics	DAE4	1691	2024/4/19	2025/4/18
SPEAG	Data Acquisition Electronics	DAE4	1303	2023/11/20	2024/11/19
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	2024/1/22	2025/1/21
SPEAG	Dosimetric E-Field Probe	EX3DV4	7729	2024/1/22	2025/1/21
SPEAG	Dosimetric E-Field Probe	EX3DV4	7706	2024/1/24	2025/1/23
SPEAG	SAM Twin Phantom	SAM Twin	TP-1697	NCR	NCR
SPEAG	SAM Twin Phantom	SAM Twin	TP-2022	NCR	NCR
SPEAG	SAM Twin Phantom	SAM Twin	TP-2024	NCR	NCR
Testo	Thermo-Hygrometer	608-H1	1241332126	2023/7/10	2024/7/9
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
Anritsu	Vector Signal Generator	MG3710A	6201682672	2024/1/2	2025/1/1
Rohde & Schwarz	Signal Generator	SMB100A	100455	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
Keysight	Preamplifier	83017A	MY57280111	2023/7/5	2024/7/4
R&S	BLUETOOTH TESTER	CBT	101246	2024/5/15	2025/5/14
Rohde & Schwarz	Spectrum Analyzer	FSV7	101631	2023/10/11	2024/10/10
Rohde & Schwarz	Power Sensor	NRP50S	101385	2023/10/11	2024/10/10
TES	DIGITAC THERMOMETER	1310	220305411	2023/7/8	2024/7/7
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	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	

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.

13. System Verification

13.1 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.

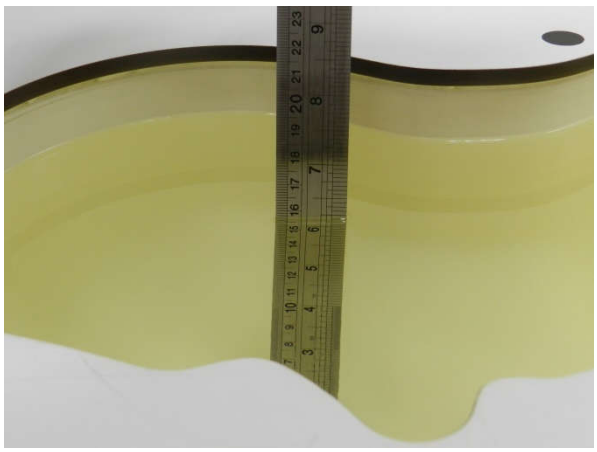


Fig 11.1 Photo of Liquid Height for Head SAR

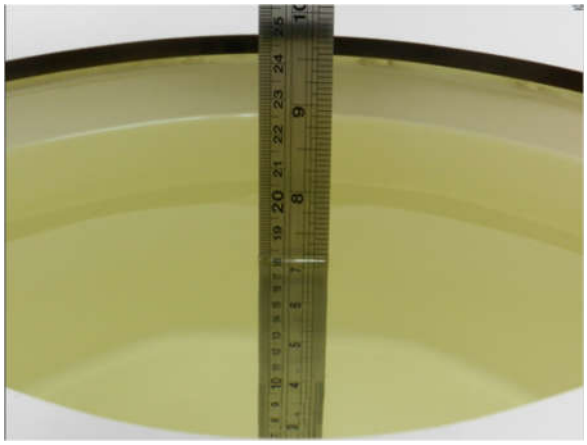


Fig 11.2 Photo of Liquid Height for Body SAR

13.2 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
900	40.3	57.9	0.2	1.4	0.2	0	0.97	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	0.900	41.192	0.89	41.90	1.12	-1.69	±5	2024/6/3
835	Head	22.9	0.902	41.240	0.90	41.50	0.22	-0.63	±5	2024/6/5
1750	Head	22.8	1.409	40.669	1.37	40.10	2.85	1.42	±5	2024/6/7
1900	Head	22.6	1.397	39.035	1.40	40.00	-0.21	-2.41	±5	2024/6/9
2450	Head	22.6	1.806	38.605	1.80	39.20	0.33	-1.52	±5	2024/6/11
2600	Head	22.7	1.926	38.230	1.96	39.00	-1.73	-1.97	±5	2024/6/13
3500	Head	22.9	2.784	38.912	2.91	37.90	-4.33	2.67	±5	2024/6/15
5250	Head	22.9	4.553	36.114	4.71	35.90	-3.33	0.60	±5	2024/6/17
5600	Head	22.7	4.924	35.585	5.07	35.50	-2.88	0.24	±5	2024/6/19
5750	Head	22.8	5.100	35.396	5.22	35.40	-2.30	-0.01	±5	2024/6/21
750	Head	22.8	0.900	41.200	0.89	41.90	1.12	-1.67	±5	2024/6/5
835	Head	22.6	0.902	41.200	0.90	41.50	0.22	-0.72	±5	2024/6/7
1750	Head	22.6	1.400	40.800	1.37	40.10	2.19	1.75	±5	2024/6/9
1900	Head	22.7	1.400	39.000	1.40	40.00	0.00	-2.50	±5	2024/6/11
2450	Head	22.7	1.830	37.500	1.80	39.20	1.67	-4.34	±5	2024/6/13
2600	Head	22.7	1.930	38.200	1.96	39.00	-1.53	-2.05	±5	2024/6/15
5250	Head	22.7	4.600	35.900	4.71	35.90	-2.34	0.00	±5	2024/6/19
5600	Head	22.8	5.000	35.300	5.07	35.50	-1.38	-0.56	±5	2024/6/21
5750	Head	22.8	5.170	35.100	5.22	35.40	-0.96	-0.85	±5	2024/6/23
3500	Head	22.6	2.790	39.600	2.91	37.90	-4.12	4.49	±5	2024/6/25
3500	Head	22.8	2.780	38.900	2.91	37.90	-4.47	2.64	±5	2024/6/17
6500	Head	22.8	6.16	34.6	6.07	34.50	1.48	0.29	±5	2024/6/20

13.3 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 (%)
2024/6/3	750	Head	50	1087	3857	1650	0.436	8.58	8.72	1.63
2024/6/5	835	Head	50	4d091	3857	1650	0.461	9.45	9.22	-2.43
2024/6/7	1750	Head	50	1090	3857	1650	1.910	37.00	38.2	3.24
2024/6/9	1900	Head	50	5d118	3857	1650	2.020	39.30	40.4	2.80
2024/6/11	2450	Head	50	1095	3857	1650	2.450	52.60	49	-6.84
2024/6/13	2600	Head	50	1112	3857	1650	2.630	55.10	52.6	-4.54
2024/6/15	3500	Head	50	1037	3857	1650	3.030	65.40	60.6	-7.34
2024/6/17	5250	Head	50	1113	3857	1650	3.890	81.50	77.8	-4.54
2024/6/19	5600	Head	50	1113	3857	1650	3.910	82.60	78.2	-5.33
2024/6/21	5750	Head	50	1113	3857	1650	3.880	80.80	77.6	-3.96
2024/6/5	750	Head	50	1087	7729	1691	0.425	8.58	8.5	-0.93
2024/6/7	835	Head	50	4d091	7729	1691	0.468	9.45	9.36	-0.95
2024/6/9	1750	Head	50	1090	7729	1691	1.890	37.00	37.8	2.16
2024/6/11	1900	Head	50	5d118	7729	1691	2.010	39.30	40.2	2.29
2024/6/13	2450	Head	50	1095	7729	1691	2.510	52.60	50.2	-4.56
2024/6/15	2600	Head	50	1112	7729	1691	2.620	55.10	52.4	-4.90
2024/6/19	5250	Head	50	1113	7729	1691	3.820	81.50	76.4	-6.26
2024/6/21	5600	Head	50	1113	7729	1691	3.910	82.60	78.2	-5.33
2024/6/23	5750	Head	50	1113	7729	1691	3.980	80.80	79.6	-1.49
2024/6/25	3500	Head	50	1037	7729	1691	3.180	65.40	63.6	-2.75
2024/6/17	3500	Head	50	1037	7729	1691	3.160	65.40	63.2	-3.36
2024/6/20	6500	Head	50	1031	7706	1303	13.8	297.00	276	-7.07

<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 (%)
2024/6/3	750	Head	50	1087	3857	1650	0.293	5.65	5.86	3.72
2024/6/5	835	Head	50	4d091	3857	1650	0.307	6.22	6.14	-1.29
2024/6/7	1750	Head	50	1090	3857	1650	0.998	19.50	19.96	2.36
2024/6/9	1900	Head	50	5d118	3857	1650	1.070	20.40	21.4	4.90
2024/6/11	2450	Head	50	1095	3857	1650	1.160	24.70	23.2	-6.07
2024/6/13	2600	Head	50	1112	3857	1650	1.200	24.80	24	-3.23
2024/6/15	3500	Head	50	1037	3857	1650	1.180	24.70	23.6	-4.45
2024/6/17	5250	Head	50	1113	3857	1650	1.130	23.30	22.6	-3.00
2024/6/19	5600	Head	50	1113	3857	1650	1.150	23.70	23	-2.95
2024/6/21	5750	Head	50	1113	3857	1650	1.110	23.00	22.2	-3.48
2024/6/5	750	Head	50	1087	7729	1691	0.281	5.65	5.62	-0.53
2024/6/7	835	Head	50	4d091	7729	1691	0.303	6.22	6.06	-2.57
2024/6/9	1750	Head	50	1090	7729	1691	0.993	19.50	19.86	1.85
2024/6/11	1900	Head	50	5d118	7729	1691	1.050	20.40	21	2.94
2024/6/13	2450	Head	50	1095	7729	1691	1.160	24.70	23.2	-6.07
2024/6/15	2600	Head	50	1112	7729	1691	1.170	24.80	23.4	-5.65
2024/6/19	5250	Head	50	1113	7729	1691	1.090	23.30	21.8	-6.44
2024/6/21	5600	Head	50	1113	7729	1691	1.110	23.70	22.2	-6.33
2024/6/23	5750	Head	50	1113	7729	1691	1.150	23.00	23	0.00
2024/6/25	3500	Head	50	1037	7729	1691	1.210	24.70	24.2	-2.02
2024/6/17	3500	Head	50	1037	7729	1691	1.180	24.70	23.6	-4.45
2024/6/20	6500	Head	50	1031	7706	1303	2.59	54.80	51.8	-5.47

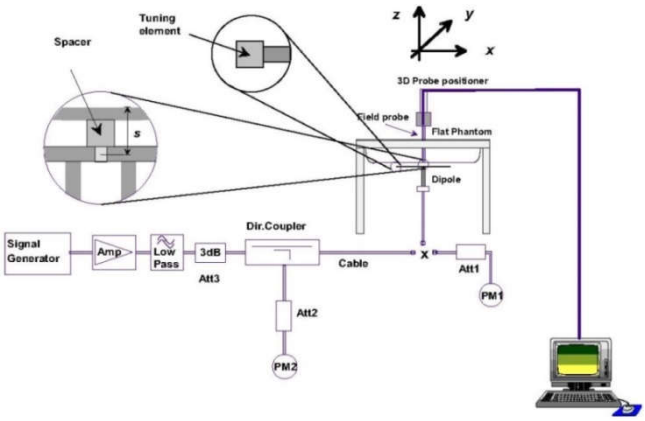


Fig 11.3.1 System Performance Check Setup

Fig 11.3.2 Setup Photo

14. RF Exposure Positions

14.1 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.

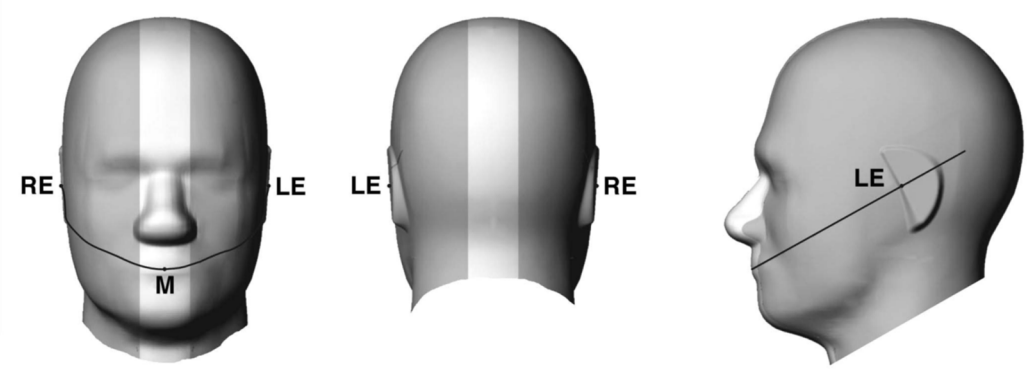


Fig 12.1.1 Front, back, and side views of SAM twin phantom

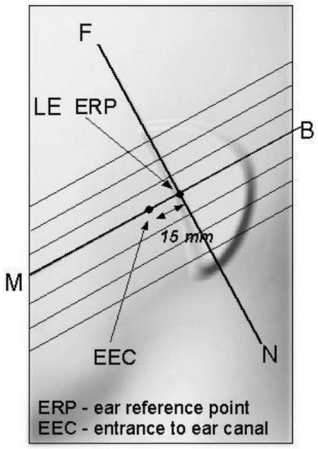


Fig 12.1.2 Close-up side view of phantom showing the ear region.

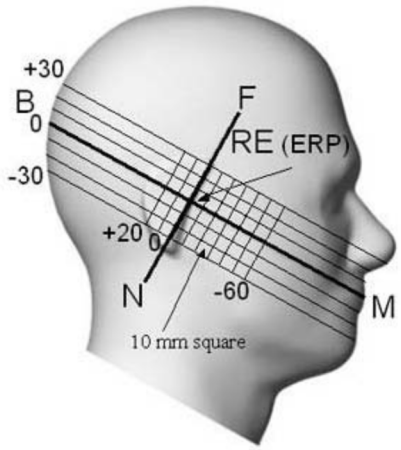


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

14.2 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.

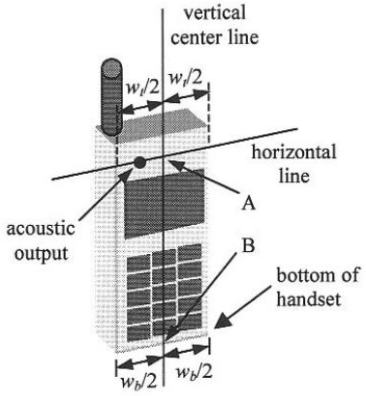


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case

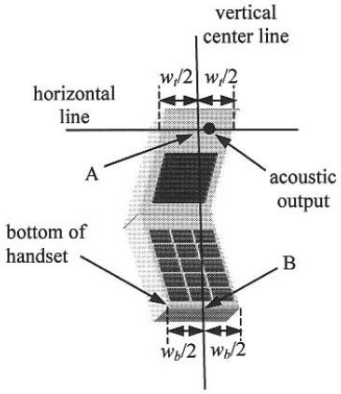


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

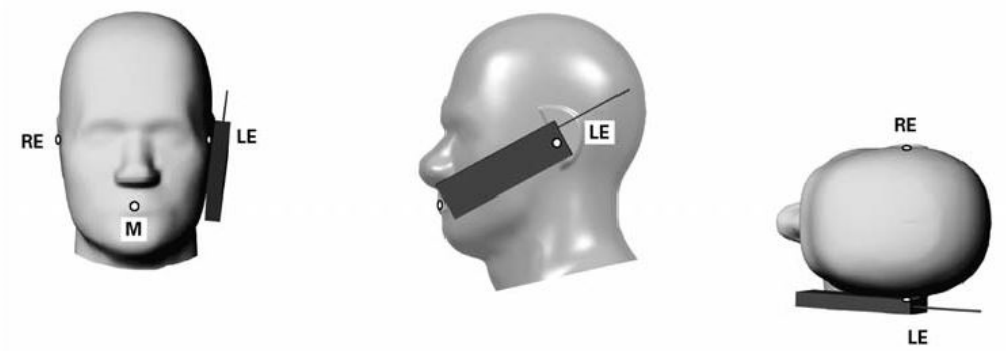


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

14.3 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

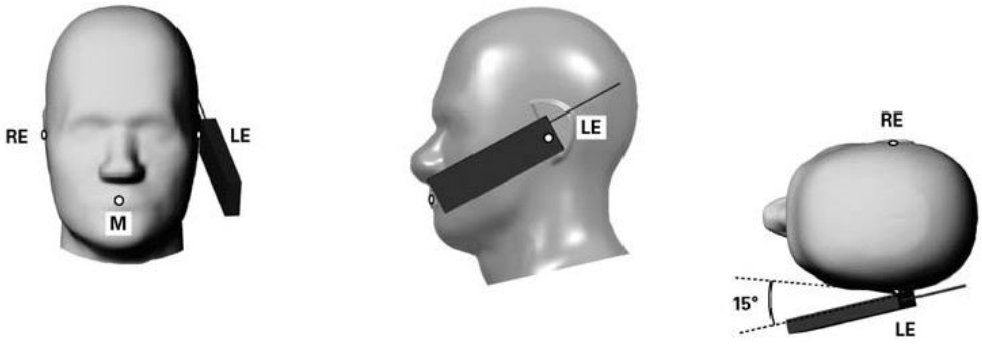


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

14.4 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.

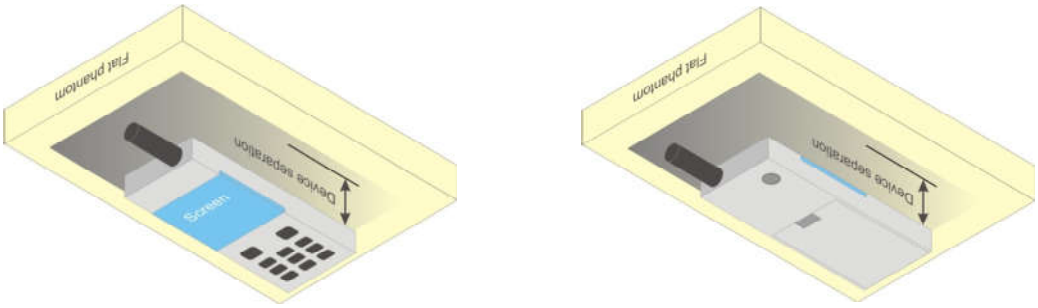


Fig 12.4 Body Worn Position

14.5 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.

14.6 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.

15. 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	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset
1	CA_26A-66A	3CC-24	1	CA_26A-41C	
2	CA_2A-2A	3CC-2	2	CA_2A-2A-4A	
3	CA_2A-38A		3	CA_2A-2A-5A	
4	CA_2A-4A	3CC-6	4	CA_2A-2A-66A	
5	CA_2A-5A	3CC-3	5	CA_2A-2A-7A	
6	CA_2A-66A	3CC-4	6	CA_2A-4A-4A	
7	CA_2A-7A	3CC-8	7	CA_2A-4A-5A	
8	CA_2C	3CC-15	8	CA_2A-4A-7A	
9	CA_38A-66A	3CC-25	9	CA_2A-5A-66A	
10	CA_38C		10	CA_2A-5A-7A	
11	CA_41A-41A		11	CA_2A-66A-66A	
12	CA_41A-42A		12	CA_2A-7A-66A	
13	CA_41C	3CC-1	13	CA_2A-7A-7A	
14	CA_42A-42A		14	CA_2A-7C	
15	CA_42C		15	CA_2C-66A	
16	CA_4A-4A	3CC-16	16	CA_4A-4A-5A	
17	CA_4A-5A	3CC-16	17	CA_4A-4A-7A	
18	CA_4A-7A	3CC-17	18	CA_4A-5A-7A	
19	CA_5A-5A	3CC-20	19	CA_4A-7C	
20	CA_5A-66A	3CC-20	20	CA_5A-5A-66A	
21	CA_5A-7A	3CC-22	21	CA_5A-66A-66A	
22	CA_66A-66A	3CC-21	22	CA_5A-7A-66A	
23	CA_66B		23	CA_5A-7C	
24	CA_66C		24	CA_7A-26A-66A	
25	CA_7A-26A	3CC-24	25	CA_7A-38A-66A	
26	CA_7A-42A		26	CA_7A-66A-66A	
27	CA_7A-66A	3CC-24	27	CA_7C-66A	
28	CA_7A-7A	3CC-13			
29	CA_7C	3CC-27			

LTE Carrier Aggregation Conducted Power (Downlink)

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

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

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

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

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

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

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

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

LTE 4x4 MIMO (Downlink)

This device supports downlink 4x4 MIMO operations for LTE Band 2/4/7/38/41/42/66 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 2/4/7/38/41/42/66

LTE Carrier Aggregation Conducted Power (Uplink)

LTE Uplink CA	2CC Uplink Carrier Aggregation	
Intra-band	Antenna Tx	ASDiv-1 Tx
CA_38C	ANT1	ANT4
CA_41C	ANT1	ANT4
CA_7C	ANT1	ANT4

<Intra-band>

General Note:

i. The device supports intra-band uplink carrier aggregation for LTE B7/41/38 with a maximum of two uplink component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre 3GPP requirement.

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

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

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

<Inter-band uplink carrier aggregation consideration>

LTE Uplink CA	2CC Uplink Carrier Aggregation	
Inter-band	Main Antenna Tx	ASDiv-1 Tx
CA_2A-4A	ANT1+ANT4	ANT4+ANT1
CA_2A-66A	ANT1+ANT4	ANT4+ANT1
CA_2A-7A	ANT1+ANT4	ANT4+ANT1
CA_4A-5A	ANT1+ANT4	ANT4+ANT0
CA_4A-7A	ANT1+ANT4	ANT4+ANT1
CA_5A-66A	ANT4+ANT1	ANT0+ANT4
CA_5A-7A	ANT4+ANT1	ANT0+ANT4

General Note:

1. The single carrier of inte-band CA uplink power level is the same as Non-CA standalone LTE power level.
2. The product implements MediaTek TA-SAR feature which controls the instantaneous transmitting power for WWAN transmitter to ensure the product in compliance with FCC RF exposure limit over a defined time window, for SAR (transmit frequency ≤ 6GHz). To control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is compliant to the regulation requirement.
3. MediaTek's TA-SAR algorithm controls the total RF exposure base on LTE inter CA bands to not exceed FCC limit. In Part 1 Report, simultaneous transmission compliance was evaluated with other Radios (WLAN or BT) using standalone LTE SAR mode.

5G NR Output Power (Unit: dBm)

General Note:

1. 5G NR n2/n5/n7/n26/n66 /n38/n41/n78 is SA mode, and 5G NR n2/n5/n7/n66/n38/n41/n78 is NSA mode.
2. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
   a. For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class2 and 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KDB 941225 D05 procedure for other modulation output power for each RB allocation configuration is > not ½ dB higher than the same configuration in DFT-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
3. For 5G NR bands test, using FTM (Factory Test Mode) with default 100% duty cycle transmission to perform SAR testing.
4. 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.
5. 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.
6. 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.
7. 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.

<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	Main Antenna Tx		ASDiv-1 Tx	
	LTE TX	NR TX	LTE TX	NR TX
DC_26A_n78A	ANT0	ANT3	ANT4	ANT5
DC_2A_n5A	ANT1	ANT4	ANT4	ANT0
DC_2A_n66A	ANT1	ANT4	ANT4	ANT1
DC_2A_n78A	ANT1	ANT3	ANT4	ANT5
DC_2A_n7A	ANT1	ANT4	ANT4	ANT1
DC_38A_n78A	ANT1	ANT3	ANT4	ANT5
DC_41A_n78A	ANT1	ANT3	ANT4	ANT5
DC_4A_n2A	ANT1	ANT4	ANT4	ANT1
DC_4A_n38A	ANT4	ANT1	ANT1	ANT4
DC_4A_n41A	ANT4	ANT1	ANT1	ANT4
DC_4A_n78A	ANT1	ANT3	ANT4	ANT5
DC_4A_n7A	ANT1	ANT4	ANT4	ANT1
DC_5A_n2A	ANT4	ANT1	ANT0	ANT4
DC_5A_n66A	ANT4	ANT1	ANT0	ANT4
DC_5A_n78A	ANT0	ANT3	ANT4	ANT5
DC_5A_n7A	ANT4	ANT1	ANT0	ANT4
DC_66A_n2A	ANT1	ANT4	ANT4	ANT1
DC_66A_n38A	ANT4	ANT1	ANT1	ANT4
DC_66A_n41A	ANT4	ANT1	ANT1	ANT4
DC_66A_n5A	ANT1	ANT4	ANT4	ANT0
DC_66A_n78A	ANT1	ANT3	ANT4	ANT5
DC_66A_n7A	ANT1	ANT4	ANT4	ANT1
DC_7A_n5A	ANT1	ANT4	ANT4	ANT0
DC_7A_n66A	ANT1	ANT4	ANT4	ANT1
DC_7A_n78A	ANT1	ANT3	ANT4	ANT5

16. Antenna Location

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

17. SAR Test Results

Spot Check General Note:

1. According to section 3.3, spot check conducted power test against the variant project based on the worst-case SAR condition from the original project was performed in this filing to demonstrate the test data from original project remains representative for the variant project. Detail Conducted power measurement referred to appendix E.
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. Per KDB 484596 D01 v02r03, the variant filings must demonstrate that the referenced test data remain valid for the variant device by including spot-check measurements that meet the following criteria:
   a. Spot-check measurements shall be made in correspondence to the worst-case scenario reported in the reference device filing, i.e., for those conditions that are the closest to non-compliance
   b. Spot-check measurements, while being always compliant with the applicable rule part(s) for the test under consideration, may show a deviation ddB from the reference data no larger than 3 dB:
   $$d_{dB} = | VdB – RdB | \leq 3\ dB \quad (1)$$
   where between VdB, the variant spot-check level in dB, and RdB is the corresponding measurement level in dB for the reference model.
4. The Spot check results showed that deviation of the SAR results did not exceed 3 dB, therefore referring to the guidance in the KDB inquiry, SAR data reuse is justified.
5. 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 the power management, proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the MediaTek TA-SAR will manage to ensure the power level not exceeding the associated power table. Details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
5. For WLAN/BT when transmit simultaneously with each other, or when transmit simultaneous with WWAN/BT, power reduction will be activated to head exposure conditions. For WLAN/BT when transmit simultaneous with WWAN and Proximity sensors trigger, power reduction will be activated to body-worn and extremity exposure conditions.
6. For 5G NR bands test, using FTM (Factory Test Mode) with default 100% duty cycle transmission to perform SAR testing.

7. Per KDB648474 D04v01r03, when the EUT is in flip open configuration with 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, 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 2/4/5/7/12/13/17/25/26/66/38/41/42, 5GNR n2/n7/n66/n38/n41/n78, WLAN2.4 /5.2GHz/5.8GHz, therefore product specific 10g SAR is necessary.
   b. WLAN 5.3/5.5GHz/6GHz 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.
8. 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.
9. Although the distance 1gSAR is greater than 0.8 W/kg at body-worn exposure conditions, the distance SAR verified the worst of the non-distance SAR and less than non-distance SAR, so there is no need to be tested other channels.
10. According to Nov. 2017 TCB workshop, when the reported 1gSAR for UL CA configuration is <1.2 W/kg, UL CA 1gSAR is not required for all required test channels (PCC based).
11. LTE Band 2/4/7/66/38/41 at ant1/4 and 5GNR n2/66 at ant1/4 support different PAs for some antennas, and 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 other PAs verified the worst case.

5G NR Note:

1. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
   a. SAR testing start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
   b. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
   c. QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
   d. PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not 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.
   e. 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
   f. For 5G FR1 n5 /n7/n26/n66/n38/n41 the maximum bandwidth does not support three non-overlapping channels, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

ECI status description：

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

This WWAN bands enabled with MediaTek TA-SAR feature which located at chapter 6. The default power is Pmax power, When Plimit power higher than Pmax power, the output power will be limited at Pmax, and so the SAR will use Pmax power to do the testing.

Exposure Condition	ECI	Trigger conditions
Head SAR	ECI2	Earpiece On
Body worn Mode SAR	ECI3	Sensor On
Hotspot Mode SAR	ECI7	Hotspot On
Extremity(Handheld) SAR	ECI6	Sensor On
Sensor off SAR	ECI4	Sensor Off

17.1 Head SAR

Plot No.	No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	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	-	Left Cheek	0mm	Ant 0	ECI 2	23095	707.5	22.35	24.00	1.462	-	-	0.1	0.188	0.275	0.87
	2nd	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	23095	707.5	22.32	24.00	1.472	-	-	-0.14	0.153	0.225	
	1st	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	23095	707.5	21.70	22.60	1.230	-	-	-0.09	0.713	0.877	0.07
01	2nd	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	23095	707.5	21.74	22.60	1.219	-	-	-0.01	0.708	**0.863**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	23230	782	22.52	24.00	1.406	-	-	0.01	0.221	0.311	1.24
	2nd	LTE Band 13	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	23230	782	22.57	24.00	1.390	-	-	0.01	0.168	0.234	
	1st	LTE Band 13	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	23230	782	21.45	22.60	1.303	-	-	-0.17	0.685	0.893	0.26
02	2nd	LTE Band 13	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	23230	782	21.44	22.60	1.306	-	-	0.14	0.644	**0.841**	
835MHz																						
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 0	ECI 2	189	836.4	27.87	29.00	1.297	-	-	0.02	0.272	0.353	0.37
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 0	ECI 2	189	836.4	27.88	29.00	1.294	-	-	0.01	0.250	0.324	
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Cheek	0mm	Ant 4	ECI 2	128	824.2	25.49	26.50	1.262	-	-	-0.03	0.704	0.888	0.05
03	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Cheek	0mm	Ant 4	ECI 2	128	824.2	25.53	26.50	1.250	-	-	-0.08	0.702	**0.878**	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 2	4182	836.4	22.53	24.00	1.403	-	-	0.07	0.218	0.306	0.22
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 2	4182	836.4	22.58	24.00	1.387	-	-	-0.06	0.210	0.291	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 4	ECI 2	4132	826.4	21.47	22.40	1.239	-	-	-0.06	0.707	0.876	0.03
04	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 4	ECI 2	4132	826.4	21.48	22.40	1.236	-	-	-0.06	0.704	**0.870**	
	1st	LTE Band 26	15M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	26865	831.5	22.53	24.00	1.403	-	-	0.01	0.256	0.359	1.40
	2nd	LTE Band 26	15M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	26865	831.5	22.57	24.00	1.390	-	-	0.06	0.187	0.260	
	1st	LTE Band 26	15M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	26865	831.5	22.30	23.00	1.175	-	-	0.03	0.704	0.827	0.11
05	2nd	LTE Band 26	15M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	26865	831.5	22.33	23.00	1.167	-	-	0.11	0.691	**0.806**	
	1st	FR1 n26	20M	QPSK	1	1	DFT-SCS-15KHz	Left Cheek	0mm	Ant 0	ECI 2	166300	831.5	22.96	24.00	1.271	-	-	0.02	0.122	0.155	0.06
	2nd	FR1 n26	20M	QPSK	1	1	DFT-SCS-15KHz	Left Cheek	0mm	Ant 0	ECI 2	166300	831.5	22.95	24.00	1.274	-	-	-0.06	0.120	0.153	
	1st	FR1 n26	20M	QPSK	1	1	DFT-SCS-15KHz	Right Cheek	0mm	Ant 4	ECI 2	166300	831.5	22.85	23.80	1.245	-	-	-0.01	0.709	0.882	0.16
06	2nd	FR1 n26	20M	QPSK	1	1	DFT-SCS-15KHz	Right Cheek	0mm	Ant 4	ECI 2	166300	831.5	22.85	23.80	1.245	-	-	-0.06	0.684	**0.851**	
1750MHz																						
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 1	ECI 2	1413	1732.6	22.55	24.00	1.396	-	-	0.04	0.185	0.258	0.12
07	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 1	ECI 2	1413	1732.6	22.54	24.00	1.400	-	-	-0.02	0.179	**0.251**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	132322	1745	22.39	24.00	1.449	-	-	-0.08	0.166	0.240	0.05
	2nd	LTE Band 66	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	132322	1745	22.42	24.00	1.439	-	-	-0.16	0.165	0.237	
	1st	LTE Band 66	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	132072	1720	17.06	18.10	1.271	-	-	0.01	0.702	0.892	0.08
08	2nd	LTE Band 66	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	132072	1720	17.13	18.10	1.250	-	-	0.1	0.701	**0.876**	
	1st	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Left Cheek	0mm	Ant 1	ECI 2	349000	1745	22.80	24.00	1.318	-	-	-0.06	0.143	0.189	0.07
	2nd	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Left Cheek	0mm	Ant 1	ECI 2	349000	1745	22.79	24.00	1.321	-	-	-0.14	0.141	0.186	
	1st	FR1 n66	45M	QPSK	1	1	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI 2	349000	1745	18.06	19.00	1.242	-	-	0.01	0.715	0.888	0.02
09	2nd	FR1 n66	45M	QPSK	1	1	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI 2	349000	1745	18.02	19.00	1.253	-	-	0.03	0.705	**0.883**	
1900MHz																						
	1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Right Cheek	0mm	Ant 1	ECI 2	661	1880	25.22	26.50	1.343	-	-	-0.02	0.176	0.236	0.32
10	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Right Cheek	0mm	Ant 1	ECI 2	661	1880	25.29	26.50	1.321	-	-	0.09	0.166	**0.219**	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	ECI 2	9400	1880	22.63	24.00	1.371	-	-	-0.01	0.268	0.367	0.76
11	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	ECI 2	9400	1880	22.68	24.00	1.355	-	-	-0.02	0.227	**0.308**	
	1st	LTE Band 25	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	26340	1880	22.33	24.00	1.469	-	-	-0.09	0.273	0.401	0.98
	2nd	LTE Band 25	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	26340	1880	22.37	24.00	1.455	-	-	-0.07	0.220	0.320	
	1st	LTE Band 25	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	26340	1880	16.78	17.70	1.236	-	-	0.05	0.720	0.890	0.55
12	2nd	LTE Band 25	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	26340	1880	16.78	17.70	1.236	-	-	0.01	0.634	**0.784**	
	1st	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Right Cheek	0mm	Ant 1	ECI 2	376000	1880	22.77	24.00	1.327	-	-	0.02	0.163	0.216	0.12
	2nd	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Right Cheek	0mm	Ant 1	ECI 2	376000	1880	22.71	24.00	1.346	-	-	-0.03	0.156	0.210	
	1st	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Right Cheek	0mm	Ant 4	ECI 2	376000	1880	18.20	19.30	1.288	-	-	0.06	0.684	0.881	0.57
13	2nd	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Right Cheek	0mm	Ant 4	ECI 2	376000	1880	18.19	19.30	1.291	-	-	-0.03	0.599	**0.773**	
2600MHz																						

	1st	LTE Band 7	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	21100	2535	22.27	24.00	1.489	-	-	0.01	0.159	0.237	
	2nd	LTE Band 7	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	21100	2535	22.31	24.00	1.476	-	-	-0.06	0.133	0.196	0.82
	2nd	LTE Band 7C	20M	QPSK	1	99	-	Left Cheek	0mm	Ant 1	ECI 2	21100+ 21298	2535+ 2554.8	22.11	24.00	1.545	-	-	0.02	0.125	0.193	
	1st	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI 2	21350	2560	18.00	18.90	1.230	-	-	0.02	0.720	0.886	
14	2nd	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI 2	21350	2560	18.02	18.90	1.225	-	-	-0.06	0.713	**0.873**	0.06
	2nd	LTE Band 7C	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI 2	21350+ 21152	2560+ 2540.2	17.80	18.90	1.288	-	-	0.05	0.672	0.866	
	1st	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	40620	2593	22.52	24.00	1.406	62.9	1.006	-0.05	0.103	0.146	
	2nd	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	ECI 2	40620	2593	22.49	24.00	1.416	62.9	1.006	-0.05	0.102	0.145	0.03
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Left Cheek	0mm	Ant 1	ECI 2	40620+ 40818	2593+ 2612.8	22.45	24.00	1.429	62.9	1.006	0.01	0.098	0.141	
	1st	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI 2	40620	2593	18.62	19.70	1.282	62.9	1.006	-0.13	0.691	0.891	
15	2nd	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	ECI 2	40620	2593	18.63	19.70	1.279	62.9	1.006	0.02	0.684	**0.880**	0.05
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Right Tilted	0mm	Ant 4	ECI 2	40620+ 40818	2593+ 2612.8	18.53	19.70	1.309	62.9	1.006	-0.06	0.664	0.875	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Left Cheek	0mm	Ant 1	ECI 2	507000	2535	22.55	24.00	1.396	-	-	-0.03	0.141	0.197	0.07
	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Left Cheek	0mm	Ant 1	ECI 2	507000	2535	22.51	24.00	1.409	-	-	0.05	0.138	0.194	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI 2	507000	2535	18.44	19.40	1.247	-	-	-0.03	0.713	0.889	0.01
16	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Right Tilted	0mm	Ant 4	ECI 2	507000	2535	18.45	19.40	1.245	-	-	0.04	0.712	**0.886**	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 1	ECI 2	518598	2592.99	22.85	24.00	1.303	-	-	-0.06	0.141	0.184	0.10
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 1	ECI 2	518598	2592.99	22.81	24.00	1.315	-	-	-0.09	0.137	0.180	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 4	ECI 2	518598	2592.99	18.88	19.70	1.208	-	-	-0.05	0.738	0.891	0.02
17	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 4	ECI 2	518598	2592.99	18.87	19.70	1.211	-	-	-0.04	0.733	**0.887**	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 2	ECI 2	518598	2592.99	18.58	19.60	1.265	-	-	0.09	0.698	0.883	0.01
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 2	ECI 2	518598	2592.99	18.55	19.60	1.274	-	-	0.03	0.691	0.880	
	1st	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 0	ECI 2	518598	2592.99	21.25	22.00	1.189	-	-	0.01	0.080	0.095	0.59
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 0	ECI 2	518598	2592.99	21.22	22.00	1.197	-	-	0.06	0.069	0.083	
3500MHz																						
	1st	LTE Band 42 Part 27Q	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 3	ECI 2	42990	3540	14.92	16.00	1.282	62.9	1.006	0.06	0.689	0.889	0.70
18	2nd	LTE Band 42 Part 27Q	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 3	ECI 2	42990	3540	14.98	16.00	1.265	62.9	1.006	0.17	0.594	**0.756**	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 3	ECI 2	633332	3499.98	14.61	15.70	1.285	-	-	0.08	0.613	0.788	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 3	ECI 2	633332	3499.98	14.59	15.70	1.291	-	-	0.06	0.677	0.874	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Right Cheek	0mm	Ant 3	ECI 2	633332	3499.98	14.56	15.70	1.300	-	-	0.01	0.557	0.724	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 3	ECI 2	633332	3499.98	14.61	15.70	1.285	-	-	0.03	0.238	0.306	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 3	ECI 2	633332	3499.98	14.59	15.70	1.291	-	-	-0.08	0.262	0.338	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 3	ECI 2	633332	3499.98	14.61	15.70	1.285	-	-	-0.08	0.135	0.174	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 3	ECI 2	633332	3499.98	14.59	15.70	1.291	-	-	0.1	0.155	0.200	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 3	ECI 2	633332	3499.98	14.61	15.70	1.285	-	-	-0.18	0.082	0.105	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 3	ECI 2	633332	3499.98	14.59	15.70	1.291	-	-	0.1	0.093	0.120	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 5	ECI 2	633332	3499.98	16.12	17.10	1.253	-	-	0.08	0.403	0.505	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 5	ECI 2	633332	3499.98	16.09	17.10	1.262	-	-	-0.17	0.492	0.621	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 5	ECI 2	633332	3499.98	16.12	17.10	1.253	-	-	-0.03	0.498	0.624	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 5	ECI 2	633332	3499.98	16.09	17.10	1.262	-	-	0.14	0.594	0.750	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 5	ECI 2	633332	3499.98	16.12	17.10	1.253	-	-	0.11	0.472	0.591	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 5	ECI 2	633332	3499.98	16.09	17.10	1.262	-	-	-0.05	0.569	0.718	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 5	ECI 2	633332	3499.98	16.12	17.10	1.253	-	-	0.18	0.656	0.822	
19	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 5	ECI 2	633332	3499.98	16.09	17.10	1.262	-	-	-0.01	0.694	**0.876**	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Left Tilted	0mm	Ant 5	ECI 2	633332	3499.98	16.08	17.10	1.265	-	-	0.14	0.560	0.708	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 9	ECI 2	633332	3499.98	22.87	24.00	1.297	-	-	-0.03	0.122	0.158	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 9	ECI 2	633332	3499.98	22.72	24.00	1.343	-	-	0.17	0.110	0.148	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 9	ECI 2	633332	3499.98	22.87	24.00	1.297	-	-	-0.05	0.042	0.054	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 9	ECI 2	633332	3499.98	22.72	24.00	1.343	-	-	0.01	0.043	0.058	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 9	ECI 2	633332	3499.98	22.87	24.00	1.297	-	-	0.1	0.083	0.108	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 9	ECI 2	633332	3499.98	22.72	24.00	1.343	-	-	-0.17	0.084	0.113	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 9	ECI 2	633332	3499.98	22.87	24.00	1.297	-	-	0.04	0.064	0.083	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 9	ECI 2	633332	3499.98	22.72	24.00	1.343	-	-	-0.01	0.063	0.085	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 7	ECI 2	633332	3499.98	17.67	18.50	1.211	-	-	0.05	0.185	0.224	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 7	ECI 2	633332	3499.98	17.59	18.50	1.233	-	-	0.06	0.194	0.239	

	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 7	ECI 2	633332	3499.98	17.67	18.50	1.211	-	-	-0.09	0.129	0.156	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 7	ECI 2	633332	3499.98	17.59	18.50	1.233	-	-	-0.08	0.149	0.184	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 7	ECI 2	633332	3499.98	17.67	18.50	1.211	-	-	0.13	0.595	0.720	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 7	ECI 2	633332	3499.98	17.59	18.50	1.233	-	-	-0.05	0.700	0.863	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Left Cheek	0mm	Ant 7	ECI 2	633332	3499.98	16.49	17.50	1.262	-	-	0.12	0.578	0.729	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 7	ECI 2	633332	3499.98	17.67	18.50	1.211	-	-	0.03	0.355	0.430	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 7	ECI 2	633332	3499.98	17.59	18.50	1.233	-	-	0.18	0.415	0.512	

Plot No.	No.	Band	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)	Reported 1g SAR (W/kg)	Deviation d_{dB}(dB)
WLAN/BT																		
	1st	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 6+8(6)	Standalone	1	2412	16.38	18.00	1.452	100	1.000	-0.03	0.778	1.130	0.84
20	2nd	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 6+8(6)	Standalone	1	2412	16.40	18.00	1.445	100	1.000	-0.08	0.644	**0.931**	
	1st	Bluetooth	1Mbps	Left Cheek	0mm	Ant 6	Standalone	39	2441	16.90	18.00	1.288	76.79	1.085	0.07	0.530	0.741	0.38
21	2nd	Bluetooth	1Mbps	Left Cheek	0mm	Ant 6	Standalone	39	2441	16.93	18.00	1.279	76.79	1.085	-0.02	0.489	**0.679**	
	1st	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5+7(5)	Standalone	54	5270	14.35	16.00	1.462	93.75	1.067	-0.02	0.720	1.123	0.65
22	2nd	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5+7(5)	Standalone	54	5270	14.78	16.00	1.324	93.75	1.067	-0.11	0.684	**0.967**	
	1st	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5+7(5)	Standalone	138	5690	13.44	15.00	1.432	87.32	1.145	0.17	0.640	1.050	0.05
23	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5+7(5)	Standalone	138	5690	13.45	15.00	1.429	87.32	1.145	-0.01	0.634	**1.037**	
	1st	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5+7(5)	Standalone	155	5775	13.28	15.00	1.486	87.32	1.145	0.01	0.594	1.011	0.51
24	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5+7(5)	Standalone	155	5775	13.30	15.00	1.479	87.32	1.145	-0.11	0.530	**0.898**	

Plot No.	No.	Band	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)	Reported 1g SAR (W/kg)	Measured APD (W/m^2)	Deviation d_{dB}(dB)
	1st	WLAN6GHz	802.11ax-HE80 MCS0	Left Tilted	0mm	Ant 5+7(7)	WWAN+non DBS	167	6785	12.19	14.00	1.517	86.77	1.152	-0.02	0.195	0.341	1.32	0.22
25	2nd	WLAN6GHz	802.11ax-HE80 MCS0	Left Tilted	0mm	Ant 5+7(7)	WWAN+non DBS	167	6785	12.19	14.00	1.517	86.77	1.152	-0.05	0.187	**0.324**	1.23	

17.2 Hotspot SAR

Plot No.	No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	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	ECI 7	23095	707.5	22.35	24.00	1.462	-	-	-0.02	0.835	1.221	0.25
26	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 7	23095	707.5	22.32	24.00	1.472	-	-	-0.04	0.783	**1.153**	
	1st	LTE Band 12	10M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI 7	23095	707.5	20.75	21.90	1.303	-	-	0.09	0.482	0.628	0.56
	2nd	LTE Band 12	10M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI 7	23095	707.5	20.73	21.90	1.309	-	-	-0.11	0.422	0.552	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 7	23230	782	22.52	24.00	1.406	-	-	-0.05	0.887	1.247	0.19
27	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 7	23230	782	22.57	24.00	1.390	-	-	0.01	0.858	**1.193**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI 7	23230	782	20.44	21.70	1.337	-	-	0.03	0.473	0.632	0.54
	2nd	LTE Band 13	10M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI 7	23230	782	20.48	21.70	1.324	-	-	-0.06	0.421	0.558	
835MHz																						
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI 7	189	836.4	26.83	28.10	1.340	-	-	-0.04	0.962	1.289	0.48
28	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI 7	189	836.4	26.85	28.10	1.334	-	-	-0.03	0.866	**1.155**	
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 4	ECI 7	189	836.4	27.18	28.00	1.208	-	-	-0.08	0.500	0.604	0.08
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 4	ECI 7	189	836.4	27.15	28.00	1.216	-	-	-0.18	0.488	0.593	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 7	4182	836.4	22.53	24.00	1.403	-	-	-0.02	0.884	1.240	0.20
29	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 7	4182	836.4	22.58	24.00	1.387	-	-	-0.05	0.853	**1.183**	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 4	ECI 7	4182	836.4	21.44	22.40	1.247	-	-	-0.12	0.499	0.622	0.06
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 4	ECI 7	4182	836.4	21.52	22.40	1.225	-	-	-0.03	0.501	0.614	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 7	26865	831.5	22.53	24.00	1.403	-	-	-0.04	0.896	1.257	0.62
30	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 7	26865	831.5	22.57	24.00	1.390	-	-	-0.01	0.784	**1.090**	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 7	26865	831.5	20.53	21.50	1.250	-	-	-0.13	0.499	0.624	0.18
	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 7	26865	831.5	20.60	21.50	1.230	-	-	-0.03	0.487	0.599	
	1st	FR1 n26	20M	QPSK	50	25	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI 7	166300	831.5	22.89	24.00	1.291	-	-	-0.04	0.544	0.702	0.08
31	2nd	FR1 n26	20M	QPSK	50	25	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI 7	166300	831.5	22.83	24.00	1.309	-	-	-0.07	0.526	**0.689**	
	1st	FR1 n26	20M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 7	166300	831.5	22.85	24.00	1.303	-	-	-0.13	0.475	0.619	0.02
	2nd	FR1 n26	20M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 7	166300	831.5	22.85	24.00	1.303	-	-	0.12	0.473	0.616	
1750MHz																						
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 1	ECI 7	1413	1732.6	18.94	20.30	1.368	-	-	-0.02	0.944	1.291	0.02
32	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 1	ECI 7	1413	1732.6	18.95	20.30	1.365	-	-	0.04	0.941	**1.284**	
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 1	ECI 7	1413	1732.6	18.94	20.30	1.368	-	-	-0.15	0.770	1.053	0.05
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 1	ECI 7	1413	1732.6	18.95	20.30	1.365	-	-	0.03	0.762	1.040	
	1st	LTE Band 66	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	ECI 7	132572	1770	18.45	19.70	1.334	-	-	0.08	0.952	1.270	0.03
33	2nd	LTE Band 66	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	ECI 7	132572	1770	18.46	19.70	1.330	-	-	0.06	0.948	**1.261**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 7	132572	1770	18.45	19.70	1.334	-	-	-0.02	0.921	1.228	0.13
	2nd	LTE Band 66	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 7	132572	1770	18.46	19.70	1.330	-	-	0.05	0.896	1.192	
	1st	LTE Band 66	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI 7	132322	1745	14.29	15.30	1.262	-	-	0.02	0.488	0.616	0.06
	2nd	LTE Band 66	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI 7	132322	1745	14.30	15.30	1.259	-	-	-0.07	0.482	0.607	
	1st	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Bottom Side	5mm	Ant 1	ECI 7	349000	1745	20.78	21.90	1.294	-	-	-0.15	0.991	1.283	0.02
34	2nd	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Bottom Side	5mm	Ant 1	ECI 7	349000	1745	20.79	21.90	1.291	-	-	-0.07	0.990	**1.278**	
	1st	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 7	349000	1745	20.78	21.90	1.294	-	-	-0.01	0.671	0.868	0.04
	2nd	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 7	349000	1745	20.79	21.90	1.291	-	-	-0.06	0.667	0.861	
	1st	FR1 n66	45M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 7	349000	1745	15.98	17.00	1.265	-	-	-0.05	0.494	0.625	0.08
	2nd	FR1 n66	45M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 7	349000	1745	16.03	17.00	1.250	-	-	0.17	0.491	0.614	
1900MHz																						
	1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 1	ECI 7	512	1850.2	23.60	24.70	1.288	-	-	-0.02	0.982	1.265	0.28
35	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Bottom Side	5mm	Ant 1	ECI 7	512	1850.2	23.63	24.70	1.279	-	-	-0.02	0.927	**1.186**	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 1	ECI 7	9400	1880	19.00	20.10	1.288	-	-	-0.01	0.987	1.272	1.16
36	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 1	ECI 7	9400	1880	19.04	20.10	1.276	-	-	0.07	0.763	**0.974**	
	1st	LTE Band 25	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	ECI 7	26340	1880	18.36	19.50	1.300	-	-	0.02	0.975	1.268	0.37
37	2nd	LTE Band 25	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	ECI 7	26340	1880	18.40	19.50	1.288	-	-	0.03	0.904	**1.165**	
	1st	LTE Band 25	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI 7	26340	1880	13.28	14.30	1.265	-	-	-0.02	0.494	0.625	0.61

	2nd	LTE Band 25	20M	QPSK	1	0	-	Top Side	5mm	Ant 4	ECI 7	26340	1880	13.26	14.30	1.271	-	-	0.04	0.427	0.543	
	1st	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Bottom Side	5mm	Ant 1	ECI 7	376000	1880	20.30	21.40	1.288	-	-	-0.18	0.996	1.283	0.07
38	2nd	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Bottom Side	5mm	Ant 1	ECI 7	376000	1880	20.25	21.40	1.303	-	-	0.03	0.969	**1.263**	
	1st	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 7	376000	1880	20.30	21.40	1.288	-	-	0.15	0.701	0.903	0.07
	2nd	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 7	376000	1880	20.25	21.40	1.303	-	-	0.03	0.682	0.889	
	1st	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Top Side	5mm	Ant 4	ECI 7	376000	1880	15.15	16.20	1.274	-	-	0.12	0.486	0.619	0.55
	2nd	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Top Side	5mm	Ant 4	ECI 7	376000	1880	15.13	16.20	1.279	-	-	0.02	0.426	0.545	
2600MHz																						
	1st	LTE Band 7	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	ECI 7	21350	2560	18.61	19.80	1.315	-	-	0.01	0.964	1.268	
39	2nd	LTE Band 7	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	ECI 7	21350	2560	18.65	19.80	1.303	-	-	0.05	0.880	**1.147**	0.44
	2nd	LTE Band 7C	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	ECI 7	21350+ 21152	2560+ 2540.2	18.49	19.80	1.352	-	-	0.05	0.843	1.140	
	1st	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 7	21100	2535	15.64	16.50	1.219	-	-	-0.06	0.498	0.607	
	2nd	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 7	21100	2535	15.64	16.50	1.219	-	-	0.08	0.486	0.592	0.11
	2nd	LTE Band 7C	20M	QPSK	1	99	-	Back	5mm	Ant 4	ECI 7	21100+ 21298	2535+ 2554.8	15.51	16.50	1.256	-	-	0.03	0.462	0.580	
	1st	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	ECI 7	40620	2593	20.65	21.70	1.274	62.9	1.006	-0.02	1.010	1.294	
40	2nd	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	ECI 7	40620	2593	20.67	21.70	1.268	62.9	1.006	0.08	0.992	**1.265**	0.10
	1st	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 7	40620	2593	20.65	21.70	1.274	62.9	1.006	-0.02	0.850	1.089	
	2nd	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 7	40620	2593	20.67	21.70	1.268	62.9	1.006	0.09	0.816	1.041	0.20
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Bottom Side	5mm	Ant 1	ECI 7	40620+ 40818	2593+ 2612.8	20.49	21.70	1.321	62.9	1.006	0.02	0.897	1.192	
	1st	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 7	40620	2593	16.96	18.00	1.271	62.9	1.006	-0.06	0.493	0.630	
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 7	40620	2593	16.97	18.00	1.268	62.9	1.006	0.01	0.488	0.622	0.06
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Back	5mm	Ant 4	ECI 7	40620+ 40818	2593+ 2612.8	16.88	18.00	1.294	62.9	1.006	0.09	0.471	0.613	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Bottom Side	5mm	Ant 1	ECI 7	507000	2535	18.08	19.30	1.324	-	-	-0.08	0.960	1.271	0.09
41	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Bottom Side	5mm	Ant 1	ECI 7	507000	2535	18.06	19.30	1.330	-	-	0.04	0.936	**1.245**	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 7	507000	2535	18.08	19.30	1.324	-	-	-0.05	0.703	0.931	0.05
	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 7	507000	2535	18.06	19.30	1.330	-	-	-0.11	0.692	0.921	
	1st	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 7	507000	2535	15.00	15.90	1.230	-	-	-0.08	0.509	0.626	0.08
	2nd	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 7	507000	2535	15.05	15.90	1.216	-	-	-0.09	0.505	0.614	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Bottom Side	5mm	Ant 1	ECI 7	518598	2592.99	18.33	19.40	1.279	-	-	0.08	1.010	1.292	1.06
42	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Bottom Side	5mm	Ant 1	ECI 7	518598	2592.99	18.26	19.40	1.300	-	-	0.02	0.778	**1.012**	
	1st	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 4	ECI 7	518598	2592.99	15.28	16.10	1.208	-	-	0.02	0.516	0.623	0.03
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 4	ECI 7	518598	2592.99	15.24	16.10	1.219	-	-	0.12	0.507	0.618	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	5mm	Ant 2	ECI 7	518598	2592.99	13.20	14.20	1.259	-	-	0.06	0.489	0.616	1.22
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	5mm	Ant 2	ECI 7	518598	2592.99	13.18	14.20	1.265	-	-	-0.02	0.368	0.465	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 0	ECI 7	518598	2592.99	21.29	22.00	1.178	-	-	-0.05	0.771	0.908	0.16
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 0	ECI 7	518598	2592.99	21.25	22.00	1.189	-	-	-0.03	0.736	0.875	
3500MHz																						
	1st	LTE Band 42 Part 27Q	20M	QPSK	1	0	-	Left Side	5mm	Ant 3	ECI 7	42590	3500	16.05	17.00	1.245	62.9	1.006	0.11	0.489	0.612	
43	2nd	LTE Band 42 Part 27Q	20M	QPSK	1	0	-	Left Side	5mm	Ant 3	ECI 7	42590	3500	16.09	17.00	1.233	62.9	1.006	0.06	0.485	**0.602**	0.07
	2nd	LTE Band 42C Part 27Q	20M	QPSK	1	99	-	Left Side	5mm	Ant 3	ECI 7	42590+ 42788	3500+ 3519.8	15.98	17.00	1.265	62.9	1.006	0.03	0.469	0.597	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 3	ECI 7	633332	3499.98	13.08	14.10	1.265	-	-	0.08	0.273	0.345	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 3	ECI 7	633332	3499.98	13.05	14.10	1.274	-	-	0.01	0.288	0.367	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 3	ECI 7	633332	3499.98	13.08	14.10	1.265	-	-	-0.08	0.235	0.297	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 3	ECI 7	633332	3499.98	13.05	14.10	1.274	-	-	-0.08	0.221	0.281	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	5mm	Ant 3	ECI 7	633332	3499.98	13.08	14.10	1.265	-	-	-0.18	0.471	0.596	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Side	5mm	Ant 3	ECI 7	633332	3499.98	13.05	14.10	1.274	-	-	0.14	0.487	0.620	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	5mm	Ant 3	ECI 7	633332	3499.98	13.08	14.10	1.265	-	-	0.12	0.050	0.063	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	5mm	Ant 3	ECI 7	633332	3499.98	13.05	14.10	1.274	-	-	0.08	0.048	0.061	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 5	ECI 7	633332	3499.98	12.61	14.00	1.377	-	-	-0.05	0.122	0.168	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 5	ECI 7	633332	3499.98	12.59	14.00	1.384	-	-	0.01	0.128	0.177	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI 7	633332	3499.98	12.61	14.00	1.377	-	-	0.1	0.261	0.359	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI 7	633332	3499.98	12.59	14.00	1.384	-	-	-0.17	0.314	0.434	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	5mm	Ant 5	ECI 7	633332	3499.98	12.61	14.00	1.377	-	-	-0.01	0.031	0.043	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Side	5mm	Ant 5	ECI 7	633332	3499.98	12.59	14.00	1.384	-	-	-0.08	0.039	0.054	

	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	5mm	Ant 5	ECI 7	633332	3499.98	12.61	14.00	1.377	-	-	0.05	0.040	0.055	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Side	5mm	Ant 5	ECI 7	633332	3499.98	12.59	14.00	1.384	-	-	0.06	0.039	0.054	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	5mm	Ant 5	ECI 7	633332	3499.98	12.61	14.00	1.377	-	-	-0.09	0.413	0.569	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	5mm	Ant 5	ECI 7	633332	3499.98	12.59	14.00	1.384	-	-	0.01	0.445	0.616	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 9	ECI 7	633332	3499.98	20.92	21.80	1.225	-	-	-0.1	0.361	0.442	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 9	ECI 7	633332	3499.98	20.89	21.80	1.233	-	-	0.07	0.365	0.450	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 9	ECI 7	633332	3499.98	20.92	21.80	1.225	-	-	0.18	0.501	0.614	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 9	ECI 7	633332	3499.98	20.89	21.80	1.233	-	-	-0.1	0.487	0.601	
44	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	5mm	Ant 9	ECI 7	633332	3499.98	20.92	21.80	1.225	-	-	0.02	1.040	**1.274**	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Side	5mm	Ant 9	ECI 7	633332	3499.98	20.89	21.80	1.233	-	-	0.01	0.998	1.231	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Right Side	5mm	Ant 9	ECI 7	633332	3499.98	20.83	21.80	1.250	-	-	-0.15	0.944	1.180	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Bottom Side	5mm	Ant 9	ECI 7	633332	3499.98	20.92	21.80	1.225	-	-	0.19	0.479	0.587	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Bottom Side	5mm	Ant 9	ECI 7	633332	3499.98	20.89	21.80	1.233	-	-	0.07	0.467	0.576	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 7	ECI 7	633332	3499.98	17.67	18.50	1.211	-	-	-0.15	0.290	0.351	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 7	ECI 7	633332	3499.98	17.59	18.50	1.233	-	-	0.11	0.325	0.401	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI 7	633332	3499.98	17.67	18.50	1.211	-	-	-0.08	0.297	0.360	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI 7	633332	3499.98	17.59	18.50	1.233	-	-	-0.17	0.329	0.406	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	5mm	Ant 7	ECI 7	633332	3499.98	17.67	18.50	1.211	-	-	-0.08	0.507	0.614	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Side	5mm	Ant 7	ECI 7	633332	3499.98	17.59	18.50	1.233	-	-	-0.01	0.508	0.626	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	5mm	Ant 7	ECI 7	633332	3499.98	17.67	18.50	1.211	-	-	-0.04	0.184	0.223	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	5mm	Ant 7	ECI 7	633332	3499.98	17.59	18.50	1.233	-	-	-0.08	0.130	0.160	

Plot No.	No.	Band	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)	Reported 1g SAR (W/kg)	Deviation d_{dB}(dB)
WLAN/BT																		
	1st	WLAN2.4GHz	802.11b 1Mbps	Right Side	5mm	Ant 6+8(6)	Hotspot	1	2412	14.56	16.00	1.393	100	1.000	-0.12	0.407	0.567	0.61
45	2nd	WLAN2.4GHz	802.11b 1Mbps	Right Side	5mm	Ant 6+8(6)	Hotspot	1	2412	14.56	16.00	1.393	100	1.000	-0.17	0.354	**0.493**	
	1st	Bluetooth	1Mbps	Top Side	5mm	Ant 6	Hotspot	39	2441	15.93	17.00	1.279	76.79	1.085	0.15	0.164	0.228	0.17
46	2nd	Bluetooth	1Mbps	Top Side	5mm	Ant 6	Hotspot	39	2441	15.96	17.00	1.271	76.79	1.085	0.03	0.159	**0.219**	
	1st	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	5mm	Ant 5+7(7)	Hotspot	46	5230	11.99	13.50	1.416	93.75	1.067	-0.03	0.421	0.636	0.04
47	2nd	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	5mm	Ant 5+7(7)	Hotspot	46	5230	12.33	13.50	1.309	93.75	1.067	0.11	0.451	**0.630**	
	1st	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 5+7(5)	Hotspot	155	5775	7.52	9.00	1.406	87.32	1.145	-0.06	0.374	0.602	0.08
48	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 5+7(5)	Hotspot	155	5775	7.47	9.00	1.422	87.32	1.145	0.15	0.363	**0.591**	

17.3 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)	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	ECI 3	23095	707.5	22.35	24.00	1.462	-	-	-0.02	0.835	1.221	0.25
49	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 3	23095	707.5	22.32	24.00	1.472	-	-	-0.04	0.783	**1.153**	
	1st	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	23095	707.5	22.49	24.00	1.416	-	-	-0.12	0.606	0.858	0.01
	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	23095	707.5	22.48	24.00	1.419	-	-	-0.02	0.603	0.856	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 3	23230	782	22.52	24.00	1.406	-	-	-0.05	0.887	1.247	0.19
50	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 3	23230	782	22.57	24.00	1.390	-	-	0.01	0.858	**1.193**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	23230	782	22.42	24.00	1.439	-	-	-0.16	0.615	0.885	0.03
	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	23230	782	22.43	24.00	1.435	-	-	0.05	0.612	0.879	
835MHz																						
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI 3	189	836.4	26.83	28.10	1.340	-	-	-0.04	0.962	1.289	0.48
51	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI 3	189	836.4	26.85	28.10	1.334	-	-	-0.03	0.866	**1.155**	
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 4	ECI 3	189	836.4	27.18	28.00	1.208	-	-	-0.08	0.500	0.604	0.01
	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 4	ECI 3	189	836.4	27.17	28.00	1.211	-	-	0.08	0.498	0.603	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 3	4182	836.4	22.53	24.00	1.403	-	-	-0.02	0.884	1.240	0.20
52	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 3	4182	836.4	22.58	24.00	1.387	-	-	-0.05	0.853	**1.183**	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 4	ECI 3	4182	836.4	22.26	23.00	1.186	-	-	-0.1	0.624	0.740	0.28
	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 4	ECI 3	4182	836.4	22.31	23.00	1.172	-	-	-0.02	0.592	0.694	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 3	26865	831.5	22.53	24.00	1.403	-	-	-0.04	0.896	1.257	0.62
53	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 3	26865	831.5	22.57	24.00	1.390	-	-	-0.01	0.784	**1.090**	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	26865	831.5	22.30	23.00	1.175	-	-	0.02	0.742	0.872	0.04
	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	26865	831.5	22.33	23.00	1.167	-	-	-0.05	0.741	0.865	
	1st	FR1 n26	20M	QPSK	50	25	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI 3	166300	831.5	22.89	24.00	1.291	-	-	-0.04	0.544	0.702	0.08
54	2nd	FR1 n26	20M	QPSK	50	25	DFT-SCS-15KHz	Back	5mm	Ant 0	ECI 3	166300	831.5	22.83	24.00	1.309	-	-	-0.07	0.526	**0.689**	
	1st	FR1 n26	20M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 3	166300	831.5	22.85	24.00	1.303	-	-	-0.13	0.475	0.619	0.02
	2nd	FR1 n26	20M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 3	166300	831.5	22.85	24.00	1.303	-	-	0.12	0.473	0.616	
1750MHz																						
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 1	ECI 3	1413	1732.6	20.44	21.30	1.219	-	-	0.07	1.040	1.268	0.45
55	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 1	ECI 3	1413	1732.6	20.46	21.30	1.213	-	-	-0.09	0.943	**1.144**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	132572	1770	21.48	22.20	1.180	-	-	-0.17	1.080	1.275	0.11
56	2nd	LTE Band 66	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	132572	1770	21.47	22.20	1.183	-	-	-0.15	1.050	**1.242**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI 3	132572	1770	21.48	22.20	1.180	-	-	-0.15	0.728	0.859	0.09
	2nd	LTE Band 66	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI 3	132572	1770	21.47	22.20	1.183	-	-	0.09	0.711	0.841	
	1st	LTE Band 66	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	132322	1745	15.66	16.70	1.271	-	-	0.02	0.702	0.892	0.74
	2nd	LTE Band 66	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	132322	1745	15.70	16.70	1.259	-	-	0.01	0.597	0.752	
	1st	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 3	349000	1745	21.86	22.90	1.271	-	-	-0.09	1.010	1.283	0.02
57	2nd	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 3	349000	1745	21.83	22.90	1.279	-	-	-0.06	0.999	**1.278**	
	1st	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI 3	349000	1745	21.86	22.90	1.271	-	-	0.17	0.919	1.168	0.00
	2nd	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI 3	349000	1745	21.83	22.90	1.279	-	-	0.03	0.912	1.167	
	1st	FR1 n66	45M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 3	349000	1745	18.06	19.00	1.242	-	-	-0.01	0.718	0.892	0.08
	2nd	FR1 n66	45M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 3	349000	1745	18.01	19.00	1.256	-	-	-0.07	0.697	0.875	
1900MHz																						
	1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Front	5mm	Ant 1	ECI 3	512	1850.2	25.16	26.50	1.361	-	-	0.01	0.941	1.281	0.13
58	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Front	5mm	Ant 1	ECI 3	512	1850.2	25.23	26.50	1.340	-	-	-0.02	0.927	**1.242**	
	1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 1	ECI 3	661	1880	25.22	26.50	1.343	-	-	0.1	0.924	1.241	0.17
	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 1	ECI 3	661	1880	25.29	26.50	1.321	-	-	0.05	0.903	1.193	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 1	ECI 3	9400	1880	20.52	21.60	1.282	-	-	-0.02	0.998	1.280	0.22
59	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 1	ECI 3	9400	1880	20.53	21.60	1.279	-	-	-0.08	0.952	**1.218**	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 1	ECI 3	9262	1852.4	20.41	21.60	1.315	-	-	0.11	0.892	1.173	0.09
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 1	ECI 3	9262	1852.4	20.42	21.60	1.312	-	-	0.11	0.876	1.149	
	1st	LTE Band 25	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	26340	1880	20.84	21.80	1.247	-	-	-0.06	1.020	1.272	0.03

60	2nd	LTE Band 25	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	26340	1880	20.83	21.80	1.250	-	-	-0.06	1.010	**1.263**	
	1st	LTE Band 25	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI 3	26140	1860	20.73	21.80	1.279	-	-	-0.17	0.884	1.131	0.09
	2nd	LTE Band 25	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI 3	26140	1860	20.79	21.80	1.262	-	-	0.01	0.879	1.109	
	1st	LTE Band 25	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	26140	1860	16.67	17.70	1.268	-	-	-0.1	0.692	0.877	0.08
	2nd	LTE Band 25	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	26140	1860	16.73	17.70	1.250	-	-	0.09	0.689	0.861	
	1st	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 3	376000	1880	22.30	23.30	1.259	-	-	-0.09	1.020	1.284	0.01
61	2nd	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 3	376000	1880	22.27	23.30	1.268	-	-	-0.02	1.010	**1.280**	
	1st	FR1 n2	40M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI 3	376000	1880	22.31	23.30	1.256	-	-	-0.18	0.953	1.197	0.01
	2nd	FR1 n2	40M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI 3	376000	1880	22.30	23.30	1.259	-	-	0.05	0.948	1.193	
	1st	FR1 n2	40M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 3	376000	1880	18.22	19.10	1.225	-	-	-0.07	0.717	0.878	0.33
	2nd	FR1 n2	40M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 3	376000	1880	18.17	19.10	1.239	-	-	-0.15	0.657	0.814	
2600MHz																						
	1st	LTE Band 7	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	21350	2560	20.62	21.60	1.253	-	-	-0.07	1.030	1.291	0.10
62	2nd	LTE Band 7	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	21350	2560	20.68	21.60	1.236	-	-	0.03	1.020	**1.261**	
	1st	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI 3	21350	2560	20.62	21.60	1.253	-	-	0.06	0.743	0.931	0.07
	2nd	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI 3	21350	2560	20.68	21.60	1.236	-	-	0.02	0.741	0.916	
	2nd	LTE Band 7C	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	21350+ 21152	2560+ 2540.2	20.52	21.60	1.282	-	-	0.08	0.926	1.187	
	1st	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	21350	2560	17.07	18.10	1.268	-	-	-0.11	0.704	0.892	0.01
	2nd	LTE Band 7	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	21350	2560	17.08	18.10	1.265	-	-	-0.08	0.703	0.889	
	2nd	LTE Band 7C	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	21350+ 21152	2560+ 2540.2	16.97	18.10	1.297	-	-	0.03	0.681	0.883	
	1st	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	40620	2593	21.55	22.80	1.334	62.9	1.006	-0.09	0.959	1.287	0.13
63	2nd	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	40620	2593	21.58	22.80	1.324	62.9	1.006	-0.03	0.938	**1.250**	
	1st	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI 3	41055	2636.5	21.48	22.80	1.355	62.9	1.006	-0.08	0.614	0.837	0.07
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	ECI 3	41055	2636.5	21.52	22.80	1.343	62.9	1.006	0.02	0.609	0.823	
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Front	5mm	Ant 1	ECI 3	40620+ 40818	2593+ 2612.8	21.44	22.80	1.368	62.9	1.006	0.02	0.866	1.192	
	1st	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	40620	2593	18.22	19.30	1.282	62.9	1.006	-0.01	0.696	0.898	0.43
	2nd	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 4	ECI 3	40620	2593	18.24	19.30	1.276	62.9	1.006	0.06	0.634	0.814	
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Back	5mm	Ant 4	ECI 3	40620+ 40818	2593+ 2612.8	18.12	19.30	1.312	62.9	1.006	0.04	0.613	0.809	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 3	507000	2535	21.62	22.60	1.253	-	-	-0.03	1.030	1.291	0.38
64	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Front	5mm	Ant 1	ECI 3	507000	2535	21.61	22.60	1.256	-	-	-0.06	0.941	**1.182**	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI 3	507000	2535	21.62	22.60	1.253	-	-	0.02	0.747	0.936	0.08
	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Back	5mm	Ant 1	ECI 3	507000	2535	21.61	22.60	1.256	-	-	0.03	0.732	0.919	
	1st	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 3	507000	2535	18.00	18.90	1.230	-	-	-0.06	0.711	0.875	0.00
	2nd	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Back	5mm	Ant 4	ECI 3	507000	2535	17.98	18.90	1.236	-	-	-0.06	0.707	0.874	
	1st	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 1	ECI 3	518598	2592.99	21.88	23.10	1.324	-	-	-0.01	0.965	1.278	0.08
65	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 1	ECI 3	518598	2592.99	21.95	23.10	1.303	-	-	0.02	0.963	**1.255**	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI 3	518598	2592.99	21.91	23.10	1.315	-	-	0.06	0.756	0.994	0.07
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 1	ECI 3	518598	2592.99	21.96	23.10	1.300	-	-	0.01	0.752	0.978	
	1st	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 4	ECI 3	518598	2592.99	17.89	18.90	1.262	-	-	0.04	0.706	0.891	0.01
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 4	ECI 3	518598	2592.99	17.88	18.90	1.265	-	-	-0.05	0.703	0.889	
	1st	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI 3	518598	2592.99	18.96	20.00	1.271	-	-	-0.09	0.471	0.598	1.15
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 2	ECI 3	518598	2592.99	18.99	20.00	1.262	-	-	0.01	0.364	0.459	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 0	ECI 3	518598	2592.99	21.29	22.00	1.178	-	-	-0.01	0.679	0.800	0.05
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 0	ECI 3	518598	2592.99	21.25	22.00	1.189	-	-	-0.03	0.665	0.790	
3500MHz																						
	1st	LTE Band 42 Part 27Q	20M	QPSK	1	0	-	Back	5mm	Ant 3	ECI 3	42990	3540	18.35	19.60	1.334	62.9	1.006	0.03	0.662	0.888	
66	2nd	LTE Band 42 Part 27Q	20M	QPSK	1	0	-	Back	5mm	Ant 3	ECI 3	42990	3540	18.31	19.60	1.346	62.9	1.006	-0.01	0.615	**0.833**	0.28
	2nd	LTE Band 42C Part 27Q	20M	QPSK	1	0	-	Back	5mm	Ant 3	ECI 3	42990+ 42792	3540+ 3520.2	18.17	19.60	1.390	62.9	1.006	0.02	0.592	0.828	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 3	ECI 3	633332	3499.98	17.56	18.40	1.213	-	-	0.08	0.679	0.824	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 3	ECI 3	633332	3499.98	17.54	18.40	1.219	-	-	-0.02	0.718	0.875	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Front	5mm	Ant 3	ECI 3	633332	3499.98	17.49	18.40	1.233	-	-	0.01	0.542	0.668	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 3	ECI 3	633332	3499.98	17.56	18.40	1.213	-	-	0.03	0.586	0.711	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 3	ECI 3	633332	3499.98	17.54	18.40	1.219	-	-	-0.08	0.550	0.670	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	15mm	Ant 3	ECI 4	633332	3499.98	23.05	24.00	1.245	-	-	0.08	0.513	0.638	

	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	15mm	Ant 3	ECI 4	633332	3499.98	23.03	24.00	1.250	-	-	0.01	0.492	0.615
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	15mm	Ant 3	ECI 4	633332	3499.98	23.05	24.00	1.245	-	-	0.03	0.477	0.594
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 5	ECI 3	633332	3499.98	15.58	16.80	1.324	-	-	-0.18	0.261	0.346
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 5	ECI 3	633332	3499.98	15.56	16.80	1.330	-	-	0.1	0.273	0.363
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI 3	633332	3499.98	15.58	16.80	1.324	-	-	0.12	0.557	0.738
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI 3	633332	3499.98	15.56	16.80	1.330	-	-	0.07	0.671	0.893
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Back	5mm	Ant 5	ECI 3	633332	3499.98	15.47	16.80	1.358	-	-	0.08	0.628	0.853
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	15mm	Ant 5	ECI 4	633332	3499.98	17.56	18.50	1.242	-	-	-0.08	0.058	0.072
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	15mm	Ant 5	ECI 4	633332	3499.98	17.56	18.50	1.242	-	-	-0.08	0.104	0.129
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	15mm	Ant 5	ECI 4	633332	3499.98	17.54	18.50	1.247	-	-	0.1	0.092	0.115
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 9	ECI 3	633332	3499.98	22.87	24.00	1.297	-	-	-0.03	0.522	0.677
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 9	ECI 3	633332	3499.98	22.72	24.00	1.343	-	-	0.14	0.528	0.709
67	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 9	ECI 3	633332	3499.98	22.87	24.00	1.297	-	-	-0.09	0.725	**0.940**
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 9	ECI 3	633332	3499.98	22.72	24.00	1.343	-	-	0.11	0.695	0.933
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Back	5mm	Ant 9	ECI 3	633332	3499.98	21.71	23.00	1.346	-	-	-0.05	0.687	0.925
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 7	ECI 3	633332	3499.98	17.67	18.50	1.211	-	-	0.14	0.197	0.238
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 7	ECI 3	633332	3499.98	17.59	18.50	1.233	-	-	-0.17	0.221	0.273
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI 3	633332	3499.98	17.67	18.50	1.211	-	-	0.03	0.232	0.281
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 7	ECI 3	633332	3499.98	17.59	18.50	1.233	-	-	0.17	0.222	0.274

Plot No.	No.	Band	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)	Reported 1g SAR (W/kg)	Deviation d_{dB}(dB)
WLAN/BT																		
	1st	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6+8(6)	Standalone	1	2412	18.75	20.50	1.496	100	1.000	0.09	0.740	1.107	0.09
68	2nd	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6+8(6)	Standalone	1	2412	18.78	20.50	1.486	100	1.000	0.04	0.730	**1.085**	
	1st	Bluetooth	1Mbps	Front	5mm	Ant 6	Full power	39	2441	16.90	18.00	1.288	76.79	1.085	-0.03	0.171	0.239	0.75
69	2nd	Bluetooth	1Mbps	Front	5mm	Ant 6	Full power	39	2441	16.93	18.00	1.279	76.79	1.085	0.04	0.145	**0.201**	
	1st	WLAN5.3GHz	802.11n-HT40 MCS0	Back	5mm	Ant 5+7(5)	Standalone	54	5270	14.35	16.00	1.462	93.75	1.067	0.01	0.705	1.100	0.34
70	2nd	WLAN5.3GHz	802.11n-HT40 MCS0	Back	5mm	Ant 5+7(5)	Standalone	54	5270	14.78	16.00	1.324	93.75	1.067	-0.06	0.719	**1.016**	
	1st	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5+7(5)	Standalone	138	5690	13.44	15.00	1.432	87.32	1.145	0.07	0.703	1.153	0.02
71	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5+7(5)	Standalone	138	5690	13.45	15.00	1.429	87.32	1.145	0.06	0.701	**1.147**	
	1st	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5+7(5)	Standalone	155	5775	13.28	15.00	1.486	87.32	1.145	0.01	0.691	1.176	0.19
72	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5+7(5)	Standalone	155	5775	13.30	15.00	1.479	87.32	1.145	0.07	0.664	**1.125**	

Plot No.	No.	Band	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)	Reported 1g SAR (W/kg)	Measured APD (W/m^2)	Deviation d_{dB}(dB)
	1st	WLAN6GHz	802.11ax-HE80 MCS0	Back	5mm	Ant 5+7(5)	Standalone & WWAN+non DBS	7	5985	11.43	13.00	1.435	86.77	1.152	-0.01	0.231	0.382	1.64	0.13
73	2nd	WLAN6GHz	802.11ax-HE80 MCS0	Back	5mm	Ant 5+7(5)	Standalone & WWAN+non DBS	7	5985	11.43	13.00	1.435	86.77	1.152	0.04	0.226	**0.371**	1.56	

17.4 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)	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)
750MHz																						
	1st	LTE Band 12	10M	QPSK	1	0	-	Back	0mm	Ant 0	ECI 6	23095	707.5	22.35	24.00	1.462	-	-	0.08	1.800	2.632	0.27
74	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	0mm	Ant 0	ECI 6	23095	707.5	22.32	24.00	1.472	-	-	-0.03	1.680	**2.473**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	0mm	Ant 0	ECI 6	23230	782	22.52	24.00	1.406	-	-	-0.04	1.420	1.997	0.24
75	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	0mm	Ant 0	ECI 6	23230	782	22.57	24.00	1.390	-	-	-0.04	1.360	**1.890**	
835MHz																						
	1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI 6	128	824.2	27.79	29.00	1.321	-	-	0.01	2.280	3.013	0.57
76	2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI 6	128	824.2	27.88	29.00	1.294	-	-	-0.08	2.040	**2.640**	
	1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI 6	4182	836.4	22.53	24.00	1.403	-	-	-0.09	1.510	2.118	0.98
77	2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI 6	4182	836.4	22.58	24.00	1.387	-	-	-0.02	1.220	**1.692**	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	0mm	Ant 0	ECI 6	26865	831.5	22.53	24.00	1.403	-	-	-0.12	1.600	2.245	0.56
78	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	0mm	Ant 0	ECI 6	26865	831.5	22.57	24.00	1.390	-	-	-0.08	1.420	**1.974**	
1750MHz																						
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	0mm	Ant 1	ECI 6	1413	1732.6	21.46	22.30	1.213	-	-	0.03	2.600	3.155	1.08
79	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	0mm	Ant 1	ECI 6	1413	1732.6	21.44	22.30	1.219	-	-	0.08	2.020	**2.462**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Front	0mm	Ant 1	ECI 6	132322	1745	21.45	22.70	1.334	-	-	0.02	2.380	3.174	0.29
80	2nd	LTE Band 66	20M	QPSK	1	0	-	Front	0mm	Ant 1	ECI 6	132322	1745	21.52	22.70	1.312	-	-	-0.09	2.260	**2.966**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI 6	132322	1745	19.60	20.60	1.259	-	-	-0.04	1.980	2.493	0.04
	2nd	LTE Band 66	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI 6	132322	1745	19.62	20.60	1.253	-	-	0.07	1.970	2.469	
	1st	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	349000	1745	22.80	24.00	1.318	-	-	0.01	2.350	3.098	0.06
81	2nd	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	349000	1745	22.79	24.00	1.321	-	-	-0.03	2.310	**3.052**	
	1st	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Back	0mm	Ant 1	ECI 6	349000	1745	22.80	24.00	1.318	-	-	-0.01	1.940	2.557	0.10
	2nd	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Back	0mm	Ant 1	ECI 6	349000	1745	22.79	24.00	1.321	-	-	-0.16	1.890	2.497	
	1st	FR1 n66	45M	QPSK	1	1	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI 6	349000	1745	20.98	21.80	1.208	-	-	-0.08	2.020	2.440	0.79
	2nd	FR1 n66	45M	QPSK	1	1	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI 6	349000	1745	20.97	21.80	1.211	-	-	-0.07	1.680	2.034	
1900MHz																						
	1st	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Front	0mm	Ant 1	ECI 6	512	1850.2	25.16	26.50	1.361	-	-	0.01	2.180	2.968	0.60
82	2nd	GSM1900	-	-	-	-	GPRS (4 Tx slots)	Front	0mm	Ant 1	ECI 6	512	1850.2	25.23	26.50	1.340	-	-	0.08	1.930	**2.586**	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	0mm	Ant 1	ECI 6	9400	1880	21.54	22.70	1.306	-	-	0.01	2.420	3.161	0.73
83	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	0mm	Ant 1	ECI 6	9400	1880	21.53	22.70	1.309	-	-	-0.08	2.040	**2.671**	
	1st	LTE Band 25	20M	QPSK	1	0	-	Front	0mm	Ant 1	ECI 6	26340	1880	21.38	22.60	1.324	-	-	-0.15	2.390	3.165	0.35
84	2nd	LTE Band 25	20M	QPSK	1	0	-	Front	0mm	Ant 1	ECI 6	26340	1880	21.37	22.60	1.327	-	-	0.03	2.200	**2.920**	
	1st	LTE Band 25	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI 6	26140	1860	17.84	19.00	1.306	-	-	-0.16	1.900	2.482	0.53
	2nd	LTE Band 25	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI 6	26140	1860	17.83	19.00	1.309	-	-	0.05	1.680	2.199	
	1st	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	376000	1880	22.77	24.00	1.327	-	-	0.1	2.380	3.159	0.05
85	2nd	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	376000	1880	22.71	24.00	1.346	-	-	-0.06	2.320	**3.122**	
	1st	FR1 n2	40M	QPSK	1	1	DFT-SCS-15KHz	Back	0mm	Ant 1	ECI 6	376000	1880	22.78	24.00	1.324	-	-	-0.07	1.910	2.529	0.05
	2nd	FR1 n2	40M	QPSK	1	1	DFT-SCS-15KHz	Back	0mm	Ant 1	ECI 6	376000	1880	22.74	24.00	1.337	-	-	0.02	1.870	2.499	
	1st	FR1 n2	40M	QPSK	1	1	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI 6	376000	1880	19.62	20.60	1.253	-	-	0.08	1.950	2.444	0.37
	2nd	FR1 n2	40M	QPSK	1	1	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI 6	376000	1880	19.59	20.60	1.262	-	-	-0.08	1.780	2.246	
2600MHz																						
	1st	LTE Band 7	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	ECI 6	21350	2560	21.08	22.10	1.265	-	-	0.09	2.500	3.162	0.15
86	2nd	LTE Band 7	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	ECI 6	21350	2560	21.09	22.10	1.262	-	-	0.01	2.420	**3.054**	
	1st	LTE Band 7	20M	QPSK	1	0	-	Front	0mm	Ant 1	ECI 6	21350	2560	21.08	22.10	1.265	-	-	-0.11	2.140	2.707	0.24
	2nd	LTE Band 7	20M	QPSK	1	0	-	Front	0mm	Ant 1	ECI 6	21350	2560	21.09	22.10	1.262	-	-	0.13	2.030	2.562	
	2nd	LTE Band 7C	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	ECI 6	21350+ 21152	2560+ 2540.2	20.96	22.10	1.300	-	-	0.05	2.330	3.029	
	1st	LTE Band 7	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI 6	20850	2510	17.76	18.60	1.213	-	-	-0.09	2.010	2.439	0.15
	2nd	LTE Band 7	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI 6	20850	2510	17.87	18.60	1.183	-	-	-0.04	1.990	2.354	
	2nd	LTE Band 7C	20M	QPSK	1	99	-	Top Side	0mm	Ant 4	ECI 6	20850+ 21048	2510+ 2529.8	17.62	18.60	1.253	-	-	0.06	1.850	2.318	

	1st	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	ECI 6	40620	2593	21.06	22.30	1.330	62.9	1.006	-0.03	2.370	3.172	
87	2nd	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	ECI 6	40620	2593	21.07	22.30	1.327	62.9	1.006	0.01	2.050	**2.737**	0.64
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Bottom Side	0mm	Ant 1	ECI 6	40620+ 40818	2593+ 2612.8	20.92	22.30	1.374	62.9	1.006	0.05	1.950	2.695	
	1st	LTE Band 41	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI 6	39750	2506	18.96	20.10	1.300	62.9	1.006	0.12	1.910	2.498	
	2nd	LTE Band 41	20M	QPSK	1	0	-	Top Side	0mm	Ant 4	ECI 6	39750	2506	19.04	20.10	1.276	62.9	1.006	0.07	1.710	2.196	0.56
	2nd	LTE Band 41C	20M	QPSK	1	99	-	Top Side	0mm	Ant 4	ECI 6	39750+ 39948	2506+ 2525.8	18.86	20.10	1.330	62.9	1.006	0.02	1.630	2.182	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Bottom Side	0mm	Ant 1	ECI 6	507000	2535	22.01	22.90	1.227	-	-	0.1	2.570	3.155	0.09
88	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Bottom Side	0mm	Ant 1	ECI 6	507000	2535	22.01	22.90	1.227	-	-	-0.02	2.520	**3.093**	
	1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	507000	2535	22.01	22.90	1.227	-	-	0.18	2.040	2.504	0.11
	2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	507000	2535	22.01	22.90	1.227	-	-	0.03	1.990	2.443	
	1st	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI 6	507000	2535	19.50	20.30	1.202	-	-	0.03	2.040	2.453	0.03
	2nd	FR1 n7	50M	QPSK	1	1	DFT-SCS-15KHz	Top Side	0mm	Ant 4	ECI 6	507000	2535	19.53	20.30	1.194	-	-	0.05	2.040	2.436	
	1st	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Bottom Side	0mm	Ant 1	ECI 6	518598	2592.99	21.38	22.30	1.236	-	-	0.01	2.550	3.152	0.22
89	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Bottom Side	0mm	Ant 1	ECI 6	518598	2592.99	21.30	22.30	1.259	-	-	0.07	2.380	**2.996**	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	0mm	Ant 4	ECI 6	518598	2592.99	19.35	20.50	1.303	-	-	0.03	1.910	2.489	0.02
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	0mm	Ant 4	ECI 6	518598	2592.99	19.32	20.50	1.312	-	-	-0.07	1.890	2.480	
	1st	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	0mm	Ant 2	ECI 4	518598	2592.99	18.58	19.50	1.236	-	-	-0.09	2.010	2.484	0.41
	2nd	FR1 n41	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	0mm	Ant 2	ECI 4	518598	2592.99	18.56	19.50	1.242	-	-	-0.03	1.820	2.260	
	1st	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 0	ECI 6	518598	2592.99	21.25	22.00	1.189	-	-	-0.01	1.970	2.341	0.04
	2nd	FR1 n41	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 0	ECI 6	518598	2592.99	21.22	22.00	1.197	-	-	-0.02	1.940	2.322	
3500MHz																						
	1st	LTE Band 42 Part 27Q	20M	QPSK	1	0	-	Left Side	0mm	Ant 3	ECI 6	42990	3540	22.02	22.90	1.225	62.9	1.006	0.05	2.010	2.476	
90	2nd	LTE Band 42 Part 27Q	20M	QPSK	1	0	-	Left Side	0mm	Ant 3	ECI 6	42990	3540	22.01	22.90	1.227	62.9	1.006	-0.09	1.990	**2.457**	0.03
	2nd	LTE Band 42C Part 27Q	20M	QPSK	1	0	-	Left Side	0mm	Ant 3	ECI 6	42990+ 42792	3540+ 3520.2	21.88	22.90	1.265	62.9	1.006	0.02	1.920	2.443	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	0mm	Ant 3	ECI 6	633332	3499.98	20.11	21.40	1.346		1.000	-0.17	1.530	2.059	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	0mm	Ant 3	ECI 6	633332	3499.98	20.06	21.40	1.361		1.000	-0.03	1.470	2.001	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Front	0mm	Ant 3	ECI 6	633332	3499.98	20.04	21.40	1.368		1.000	0.14	1.140	1.559	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 3	ECI 6	633332	3499.98	20.11	21.40	1.346		1.000	0.06	1.850	2.490	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 3	ECI 6	633332	3499.98	20.06	21.40	1.361		1.000	0.11	1.780	2.423	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Back	0mm	Ant 3	ECI 6	633332	3499.98	20.04	21.40	1.368		1.000	-0.05	1.330	1.819	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	0mm	Ant 3	ECI 6	633332	3499.98	20.11	21.40	1.346		1.000	0.18	1.580	2.126	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Side	0mm	Ant 3	ECI 6	633332	3499.98	20.06	21.40	1.361		1.000	0.14	1.490	2.029	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Left Side	0mm	Ant 3	ECI 6	633332	3499.98	20.04	21.40	1.368		1.000	-0.17	1.440	1.970	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	17mm	Ant 3	ECI 4	633332	3499.98	23.05	24.00	1.245		1.000	0.17	0.174	0.217	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	21mm	Ant 3	ECI 4	633332	3499.98	23.05	24.00	1.245		1.000	0.18	0.151	0.188	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	19mm	Ant 3	ECI 4	633332	3499.98	23.05	24.00	1.245		1.000	-0.04	0.252	0.314	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI 6	633332	3499.98	17.56	18.50	1.242		1.000	0.13	0.628	0.780	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 5	ECI 6	633332	3499.98	17.54	18.50	1.247		1.000	0.12	0.656	0.818	
	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI 6	633332	3499.98	17.56	18.50	1.242		1.000	0.02	1.750	2.173	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI 6	633332	3499.98	17.54	18.50	1.247		1.000	0.03	1.700	2.121	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Top Side	0mm	Ant 5	ECI 6	633332	3499.98	16.46	17.50	1.271		1.000	0.18	1.610	2.046	
91	2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	0mm	Ant 9	ECI 4	633332	3499.98	22.42	23.60	1.312		1.000	0.01	2.300	**3.018**	
	2nd	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Side	0mm	Ant 9	ECI 4	633332	3499.98	22.37	23.60	1.327		1.000	-0.18	1.750	2.323	
	2nd	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Right Side	0mm	Ant 9	ECI 4	633332	3499.98	21.71	23.00	1.346		1.000	0.03	1.520	2.046	

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)	Deviation d_{dB}(dB)
WLAN/BT																		
	1st	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 6+8(6)	Standalone	11	2462	19.16	21.00	1.528	100	1.000	-0.14	1.440	2.200	0.01
92	2nd	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 6+8(6)	Standalone	11	2462	19.20	21.00	1.514	100	1.000	-0.14	1.450	**2.195**	
	1st	WLAN5.2GHz	802.11n-HT20 MCS0	Top Side	0mm	Ant 5+7(7)	Standalone	48	5240	16.85	18.50	1.462	97.01	1.031	0.1	2.030	3.060	0.02
93	2nd	WLAN5.2GHz	802.11n-HT20 MCS0	Top Side	0mm	Ant 5+7(7)	Standalone	48	5240	17.20	18.50	1.349	97.01	1.031	0.03	2.190	**3.046**	
	1st	WLAN5.2GHz	802.11n-HT20 MCS0	Right Side	0mm	Ant 5+7(7)	Standalone	48	5240	16.85	18.50	1.462	97.01	1.031	0.01	1.090	1.643	0.19
	2nd	WLAN5.2GHz	802.11n-HT20 MCS0	Right Side	0mm	Ant 5+7(7)	Standalone	48	5240	17.20	18.50	1.349	97.01	1.031	0.08	1.130	1.572	
	1st	WLAN5.3GHz	802.11n-HT20 MCS0	Top Side	0mm	Ant 5+7(5)	Standalone	52	5260	17.21	19.00	1.510	97.01	1.031	0.1	2.020	3.145	0.01
94	2nd	WLAN5.3GHz	802.11n-HT20 MCS0	Top Side	0mm	Ant 5+7(5)	Standalone	52	5260	17.59	19.00	1.384	96.86	1.032	-0.05	2.200	**3.141**	
	1st	WLAN5.3GHz	802.11n-HT20 MCS0	Right Side	0mm	Ant 5+7(5)	Standalone	60	5300	17.85	19.50	1.462	97.01	1.031	0.18	1.950	2.940	0.05
	2nd	WLAN5.3GHz	802.11n-HT20 MCS0	Right Side	0mm	Ant 5+7(5)	Standalone	60	5300	17.81	19.50	1.476	97.01	1.031	0.01	1.910	2.906	
	1st	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Ant 5+7(5)	Standalone	116	5580	16.82	18.50	1.472	96.86	1.032	-0.15	2.090	3.176	0.05
95	2nd	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Ant 5+7(5)	Standalone	116	5580	17.17	18.50	1.358	96.86	1.032	0.01	2.240	**3.140**	
	1st	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 5+7(7)	Standalone	124	5620	17.11	19.00	1.545	96.86	1.032	0.13	1.790	2.855	0.28
	2nd	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 5+7(7)	Standalone	124	5620	17.34	19.00	1.466	96.86	1.032	0.03	1.770	2.677	
	1st	WLAN5.8GHz	802.11a 6Mbps	Right Side	0mm	Ant 5+7(5)	Standalone	149	5745	16.82	18.50	1.472	96.86	1.032	-0.05	1.950	2.963	0.03
96	2nd	WLAN5.8GHz	802.11a 6Mbps	Right Side	0mm	Ant 5+7(5)	Standalone	149	5745	17.05	18.50	1.396	96.86	1.032	0.08	2.040	**2.940**	

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)	Measured APD (W/m^2)	Deviation d_{dB}(dB)
	1st	WLAN6GHz	802.11ax-HE80 MCS0	Top Side	0mm	Ant 5+7(7)	Standalone & WWAN+non DBS	167	6785	12.19	14.00	1.517	86.77	1.152	-0.12	0.262	0.458	6.16	0.74
97	2nd	WLAN6GHz	802.11ax-HE80 MCS0	Top Side	0mm	Ant 5+7(7)	Standalone & WWAN+non DBS	167	6785	12.19	14.00	1.517	86.77	1.152	-0.02	0.223	**0.386**	5.59	

17.5 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	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 7	23230	782	22.57	24.00	1.390	-	-	0.01	0.858	1	1.193
2nd	LTE Band 13	10M	QPSK	1	0	-	Back	5mm	Ant 0	ECI 7	23230	782	22.57	24.00	1.390	-	-	0.05	0.851	1.008	1.183
1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI 7	189	836.4	26.85	28.10	1.334	-	-	-0.03	0.866	1	1.155
2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 0	ECI 7	189	836.4	26.85	28.10	1.334	-	-	0.09	0.857	1.011	1.143
1st	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	5mm	Ant 9	ECI 7	633332	3499.98	20.92	21.80	1.225	-	-	0.02	1.040	1	1.274
2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	5mm	Ant 9	ECI 7	633332	3499.98	20.92	21.80	1.225	-	-	0.06	0.996	1.044	1.220
1st	LTE Band 66	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	132572	1770	21.47	22.20	1.183	-	-	-0.15	1.050	1	1.242
2nd	LTE Band 66	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	132572	1770	21.47	22.20	1.183	-	-	0.09	1.010	1.040	1.195
1st	LTE Band 25	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	26340	1880	20.83	21.80	1.250	-	-	-0.06	1.010	1	1.263
2nd	LTE Band 25	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	26340	1880	20.83	21.80	1.250	-	-	0.03	0.995	1.015	1.244
1st	LTE Band 7	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	21350	2560	20.68	21.60	1.236	-	-	0.03	1.020	1	1.261
2nd	LTE Band 7	20M	QPSK	1	0	-	Front	5mm	Ant 1	ECI 3	21350	2560	20.68	21.60	1.236	-	-	0.06	0.996	1.024	1.231

<10g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI 6	128	824.2	27.88	29.00	1.294	-	-	-0.08	2.040	1	2.640
2nd	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 0	ECI 6	128	824.2	27.88	29.00	1.294	-	-	0.03	1.990	1.025	2.575
1st	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	349000	1745	22.79	24.00	1.321	-	-	-0.03	2.310	1	3.052
2nd	FR1 n66	45M	QPSK	120	60	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	349000	1745	22.79	24.00	1.321	-	-	0.02	2.240	1.031	2.960
1st	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	376000	1880	22.71	24.00	1.346	-	-	-0.06	2.320	1	3.122
2nd	FR1 n2	40M	QPSK	108	54	DFT-SCS-15KHz	Front	0mm	Ant 1	ECI 6	376000	1880	22.71	24.00	1.346	-	-	-0.04	2.270	1.022	3.055
1st	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Bottom Side	0mm	Ant 1	ECI 6	507000	2535	22.01	22.90	1.227	-	-	-0.02	2.520	1	3.093
2nd	FR1 n7	50M	QPSK	135	68	DFT-SCS-15KHz	Bottom Side	0mm	Ant 1	ECI 6	507000	2535	22.01	22.90	1.227	-	-	0.08	2.490	1.012	3.056
1st	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	0mm	Ant 9	ECI 4	633332	3499.98	22.42	23.60	1.312	-	-	0.01	2.300	1	3.018
2nd	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	0mm	Ant 9	ECI 4	633332	3499.98	22.42	23.60	1.312	-	-	0.03	2.280	1.009	2.992
1st	WLAN5.3GHz	-	-	-	-	802.11n-HT20 MCS0	Top Side	0mm	Ant 5+7(5)	Standalone	52	5260	17.59	19.00	1.384	96.86	1.032	-0.05	2.200	1	3.141
2nd	WLAN5.3GHz	-	-	-	-	802.11n-HT20 MCS0	Top Side	0mm	Ant 5+7(5)	Standalone	52	5260	17.59	19.00	1.384	96.86	1.032	0.09	2.110	1.043	3.013
1st	WLAN5.5GHz	-	-	-	-	802.11a 6Mbps	Right Side	0mm	Ant 5+7(5)	Standalone	116	5580	17.17	18.50	1.358	96.86	1.032	0.01	2.240	1	3.140
2nd	WLAN5.5GHz	-	-	-	-	802.11a 6Mbps	Right Side	0mm	Ant 5+7(5)	Standalone	116	5580	17.17	18.50	1.358	96.86	1.032	0.09	2.180	1.028	3.056
1st	WLAN5.8GHz	-	-	-	-	802.11a 6Mbps	Right Side	0mm	Ant 5+7(5)	Standalone	149	5745	17.05	18.50	1.396	96.86	1.032	0.08	2.040	1	2.940
2nd	WLAN5.8GHz	-	-	-	-	802.11a 6Mbps	Right Side	0mm	Ant 5+7(5)	Standalone	149	5745	17.05	18.50	1.396	96.86	1.032	0.02	1.970	1.036	2.839

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.

18. 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 + WLAN6GHz	Yes	Yes		Yes
4.	WWAN + Bluetooth	Yes	Yes	Yes	Yes
5.	WLAN2.4GHz + WLAN5GHz	Yes	Yes	Yes	Yes
6.	WLAN2.4GHz + WLAN6GHz	Yes	Yes		Yes
7.	WLAN2.4GHz+ Bluetooth	Yes	Yes	Yes	Yes
8.	WLAN5GHz+ Bluetooth	Yes	Yes	Yes	Yes
9.	WLAN6GHz+ Bluetooth	Yes	Yes		Yes
10.	WWAN + WLAN2.4GHz + WLAN5GHz	Yes	Yes	Yes	Yes
11.	WWAN + WLAN2.4GHz + WLAN6GHz	Yes	Yes		Yes
12.	WWAN + WLAN2.4GHz+ Bluetooth	Yes	Yes	Yes	Yes
13.	WWAN + WLAN5GHz+ Bluetooth	Yes	Yes	Yes	Yes
14.	WWAN + WLAN6GHz+ Bluetooth	Yes	Yes		Yes
15.	WWAN + WLAN2.4GHz+NFC				Yes
16.	WWAN + WLAN5GHz+NFC				Yes
17.	WWAN + WLAN6GHz+NFC				Yes
18.	WWAN + Bluetooth+NFC				Yes
19.	WLAN2.4GHz + WLAN5GHz+NFC				Yes
20.	WLAN2.4GHz + WLAN6GHz+NFC				Yes
21.	WLAN2.4GHz+ Bluetooth+NFC				Yes
22.	WLAN5GHz+ Bluetooth+NFC				Yes
23.	WLAN6GHz+ Bluetooth+NFC				Yes
24.	WWAN + WLAN2.4GHz + WLAN5GHz+NFC				Yes
25.	WWAN + WLAN2.4GHz + WLAN6GHz+NFC				Yes
26.	WWAN + WLAN2.4GHz+ Bluetooth+NFC				Yes
27.	WWAN + WLAN5GHz+ Bluetooth+NFC				Yes
28.	WWAN + WLAN6GHz+ Bluetooth+NFC				Yes

General Note:

1. This device supports VoIP in GPRS, EGPRS, WCDMA, LTE and 5GNR (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. WWAN above includes 5G NR bands and EN-DC combination.
3. The 2.4GHz/5GHz/6GHz WLAN can transmit in SISO/MIMO antenna mode.
4. EUT will choose each GSM, WCDMA, LTE and 5GNR according to the network signal condition; therefore, they will not operate simultaneously at any moment.
5. For EN-DC mode, MediaTek TA-SAR algorithm in WWAN adds directly the time-averaged RF exposure from 4G(LTE) and time-averaged RF exposure from 5G NR. TA-SAR algorithm controls the total RF exposure from both 4G and 5G NR to not exceed SAR exposure limit. Therefore, simultaneous transmission compliance between 4G+5G NR operation is demonstrated in the Part 2 Report during algorithm validation. In this Report, simultaneous transmission compliance was evaluated individually with other Radios (WLAN or BT) using one of 4G or 5G NR.
6. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
7. 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). WLAN 6GHz has no hotspot function.
8. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
9. WLAN 2.4GHz and Bluetooth share the same antenna path and cannot transmit simultaneously. WLAN2.4GHz and Bluetooth are located on different antennas, they can transmit simultaneously.
10. According to the EUT characteristic, WLAN 5GHz/6GHz and Bluetooth can transmit simultaneously.
11. According to the EUT characteristic, WLAN 5GHz/6GHz (Ant 7) and WLAN 2.4GHz (Ant 6) can transmit simultaneously.
12. According to the EUT characteristic, WLAN 5GHz and WLAN 6GHz can't transmit simultaneously.
13. NFC can transmit simultaneously with other Radios in extremity exposure condition.

14. For Headset SAR and non-Headset SAR always chose higher SAR to do co-located analysis.
15. For standalone WWAN, always choose the highest SAR among the selected WWAN bands within the selected antenna for each exposure position to perform simultaneous transmission analysis with WLAN/BT. This is the worst co-located analysis and can represent each band.
16. The maximum SAR summation is calculated based on the same configuration and test position.
17. For simultaneously analysis, since the SAR summation of 3 transmitters can cover others combination of 2 transmitters, therefore in this section did not additional to evaluate 2TX combination of simultaneously transmission.
18. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
    i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
    ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
    iii) If SPLSR ≤ 0.04 for 1g SAR and SPLSR≤ 0.10 for 10g SAR, simultaneously transmission SAR measurement is not necessary.
    iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.
    v) The SPLSR calculated results please refer to section 18.6.
19. The WLAN6GHz Sim-Tx analysis guidance with other transmitters was based on SAR test results. The simultaneous transmission and test exemption analysis was compliance with KDB 447498 D01, and the device does not support FR2 or another MPE field measurement, therefore SAR report in section 18 has no include TER analysis requirement according to KDB 987594.

18.1 5G NR + LTE + WLAN + BT Sim-Tx analysis

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

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

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

$$x*A + y*B + m \le 1$$
$$x + y = g \le 1$$
$$g + m \le 1$$

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

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

$$x * A + y * B + m \le 1.0 \quad (1)$$

$$x * A + y * B \le x * \max(A, B) + (g-x) * \max(A, B) \le \max(A, B)$$

$$x * A + (g-x) * B + m \le \max(A, B) + m \le 1.0 \quad (2)$$

If A + m ≤ 1.0 and B + m ≤ 1.0 can be proven, then “x * A + y * B + m ≤ 1.0”. Therefore simultaneous transmission analysis for 5G NR + LTE + WLAN + BT can be performed in two steps

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

Else, if A + m > 1.0 and/or B + m > 1.0, then the followings need to hold true for compliance:
i. A and m are decoupled based on the SPLSR criteria, and
ii. y * B + m ≤ 1.0, and
iii. x% * A + y * B ≤ 1.0
Note iii. is covered in Part 2 report; i. and ii. should be addressed in Part 2 report.

Above analysis is also apply to LTE(NR) inter-band uplink, LTE1 + LTE2 + WLAN + BT simultaneous transmission, so inter-band uplink CA no need to do additional simultaneously analysis again. Only required comply with total exposure ratio (TER) of LTE + WLAN + BT < 1.

Conclusion:

1. The Spot check results from chapter 17.1 to 17.4, showed that Deviation of the SAR results did not exceed 3dB, SAR data reuse is justified.
2. For the verified maximum SAR from chapter 17.1 to 17.4, when the SAR test results were less than reference model SAR results (Sporton SAR report no.: FA452307), there is no need to consider co-located SAR for reference model report had been performed conservatively. For the SAR results were higher than reference model SAR results and full tested bands, they were evaluated to do simultaneous transmission analysis with WLAN/BT. WLAN/BT SAR Chose higher SAR between reference model SAR results and variant model SAR results for each exposure position to perform co-located SAR analysis.

18.2 Head Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	5	6	7	8	9	10	11	12
		WWAN	WLAN2.4GHz Ant 6+8 Standalone	WLAN2.4GHz Ant 6+8 WWAN+non DBS	WLAN2.4GHz Ant 6 DBS only	WLAN2.4GHz Ant 6 WWAN+DBS	WLAN5GHz Ant 5+7 Standalone	WLAN5GHz Ant 5+7 WWAN+non DBS	WLAN5GHz Ant 7 DBS only	WLAN5GHz Ant 7 WWAN+DBS	Bluetooth Ant 6	WLAN6GHz Ant 5+7	WLAN6GHz Ant 7
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
FR1 n78 Part 27Q Ant 3	Right Cheek	0.874	0.470	0.143	0.312	0.077	0.600	0.224	0.176	0.043	0.056	0.149	0.055
	Right Tilted	0.338	0.347	0.105	0.306	0.075	0.629	0.222	0.192	0.046	0.053	0.149	0.019
	Left Cheek	0.200	1.130	0.344	0.764	0.188	1.123	0.391	0.777	0.193	0.284	0.190	0.169
	Left Tilted	0.120	0.694	0.211	0.507	0.124	0.877	0.327	0.345	0.083	0.093	0.341	0.016
FR1 n78 Part 27Q Ant 5	Right Cheek	0.621	0.470	0.143	0.312	0.077	0.600	0.224	0.176	0.043	0.056	0.149	0.055
	Right Tilted	0.750	0.347	0.105	0.306	0.075	0.629	0.222	0.192	0.046	0.053	0.149	0.019
	Left Cheek	0.718	1.130	0.344	0.764	0.188	1.123	0.391	0.777	0.193	0.284	0.190	0.169
	Left Tilted	0.876	0.694	0.211	0.507	0.124	0.877	0.327	0.345	0.083	0.093	0.341	0.016
FR1 n78 Part 27Q Ant 9	Right Cheek	0.158	0.470	0.143	0.312	0.077	0.600	0.224	0.176	0.043	0.056	0.149	0.055
	Right Tilted	0.058	0.347	0.105	0.306	0.075	0.629	0.222	0.192	0.046	0.053	0.149	0.019
	Left Cheek	0.113	1.130	0.344	0.764	0.188	1.123	0.391	0.777	0.193	0.284	0.190	0.169
	Left Tilted	0.085	0.694	0.211	0.507	0.124	0.877	0.327	0.345	0.083	0.093	0.341	0.016
FR1 n78 Part 27Q Ant 7	Right Cheek	0.239	0.470	0.143	0.312	0.077	0.600	0.224	0.176	0.043	0.056	0.149	0.055
	Right Tilted	0.184	0.347	0.105	0.306	0.075	0.629	0.222	0.192	0.046	0.053	0.149	0.019
	Left Cheek	0.863	1.130	0.344	0.764	0.188	1.123	0.391	0.777	0.193	0.284	0.190	0.169
	Left Tilted	0.512	0.694	0.211	0.507	0.124	0.877	0.327	0.345	0.083	0.093	0.341	0.016

WWAN Band	Exposure Position	2+10 Summed 1g SAR (W/kg)	6+10 Summed 1g SAR (W/kg)	4+8 Summed 1g SAR (W/kg)	4+12 Summed 1g SAR (W/kg)	1+3+10 Summed 1g SAR (W/kg)	1+7+10 Summed 1g SAR (W/kg)	1+10+11 Summed 1g SAR (W/kg)	1+5+9 Summed 1g SAR (W/kg)	1+5+12 Summed 1g SAR (W/kg)
FR1 n78 Part 27Q Ant 3	Right Cheek	0.53	0.66	0.49	0.37	1.07	1.15	1.08	0.99	1.01
	Right Tilted	0.40	0.68	0.50	0.33	0.50	0.61	0.54	0.46	0.43
	Left Cheek	1.41	1.41	1.54	0.93	0.83	0.88	0.67	0.58	0.56
	Left Tilted	0.79	0.97	0.85	0.52	0.42	0.54	0.55	0.33	0.26
FR1 n78 Part 27Q Ant 5	Right Cheek	0.53	0.66	0.49	0.37	0.82	0.90	0.83	0.74	0.75
	Right Tilted	0.40	0.68	0.50	0.33	0.91	1.03	0.95	0.87	0.84
	Left Cheek	1.41	1.41	1.54	0.93	1.35	1.39	1.19	1.10	1.08
	Left Tilted	0.79	0.97	0.85	0.52	1.18	1.30	1.31	1.08	1.02
FR1 n78 Part 27Q Ant 9	Right Cheek	0.53	0.66	0.49	0.37	0.36	0.44	0.36	0.28	0.29
	Right Tilted	0.40	0.68	0.50	0.33	0.22	0.33	0.26	0.18	0.15
	Left Cheek	1.41	1.41	1.54	0.93	0.74	0.79	0.59	0.49	0.47
	Left Tilted	0.79	0.97	0.85	0.52	0.39	0.51	0.52	0.29	0.23
FR1 n78 Part 27Q Ant 7	Right Cheek	0.53	0.66	0.49	0.37	0.44	0.52	0.44	0.36	0.37
	Right Tilted	0.40	0.68	0.50	0.33	0.34	0.46	0.39	0.31	0.28
	Left Cheek	1.41	1.41	1.54	0.93	1.49	**1.54**	1.34	1.24	1.22
	Left Tilted	0.79	0.97	0.85	0.52	0.82	0.93	0.95	0.72	0.65

18.3 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	5	6	1+2+6	1+4+6	1+3+5	SPLSR
		WWAN	WLAN2.4GHz Ant 6+8 Simultaneous	WLAN2.4GHz Ant 6 WWAN+DBS	WLAN5GHz Ant 5+7 Simultaneous	WLAN5GHz Ant 7 WWAN+DBS	Bluetooth Ant 6	Summed	Summed	Summed	
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
FR1 n78 Part 27Q Ant 3	Front	0.367	0.233	0.192	0.316	0.113	0.119	0.72	0.80	0.67	
	Back	0.297	0.309	0.298	0.455	0.168	0.075	0.68	0.83	0.76	
	Left side	0.620	0.015	0.022	0.089	0.010	0.001	0.64	0.71	0.65	
	Right side		0.567	0.117	0.636	0.297	0.053	0.62	0.69	0.41	
	Top side	0.063	0.177	0.306	0.619	0.042	0.228	0.47	0.91	0.41	
	Bottom side							0.00	0.00	0.00	
FR1 n78 Part 27Q Ant 5	Front	0.177	0.233	0.192	0.316	0.113	0.119	0.53	0.61	0.48	
	Back	0.434	0.309	0.298	0.455	0.168	0.075	0.82	0.96	0.90	
	Left side	0.054	0.015	0.022	0.089	0.010	0.001	0.07	0.14	0.09	
	Right side	0.055	0.567	0.117	0.636	0.297	0.053	0.68	0.74	0.47	
	Top side	0.616	0.177	0.306	0.619	0.042	0.228	1.02	1.46	0.96	
	Bottom side							0.00	0.00	0.00	
FR1 n78 Part 27Q Ant 9	Front	0.450	0.233	0.192	0.316	0.113	0.119	0.80	0.89	0.76	
	Back	0.614	0.309	0.298	0.455	0.168	0.075	1.00	1.14	1.08	
	Left side		0.015	0.022	0.089	0.010	0.001	0.02	0.09	0.03	
	Right side	1.274	0.567	0.117	0.636	0.297	0.053	**1.89**	**1.96**	**1.69**	**1,2,3**
	Top side		0.177	0.306	0.619	0.042	0.228	0.41	0.85	0.35	
	Bottom side	0.587						0.59	0.59	0.59	
FR1 n78 Part 27Q Ant 7	Front	0.401	0.233	0.192	0.316	0.113	0.119	0.75	0.84	0.71	
	Back	0.406	0.309	0.298	0.455	0.168	0.075	0.79	0.94	0.87	
	Left side		0.015	0.022	0.089	0.010	0.001	0.02	0.09	0.03	
	Right side	0.626	0.567	0.117	0.636	0.297	0.053	1.25	1.32	1.04	
	Top side	0.223	0.177	0.306	0.619	0.042	0.228	0.63	1.07	0.57	
	Bottom side							0.00	0.00	0.00	

18.4 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	5	6	7	8	9	10	11	12
		WWAN	WLAN2.4GHz Ant 6+8 Standalone	WLAN2.4GHz Ant 6+8 WWAN+non DBS	WLAN2.4GHz Ant 6 DBS only	WLAN2.4GHz Ant 6 WWAN+DBS	WLAN5GHz Ant 5+7 Standalone	WLAN5GHz Ant 5+7 WWAN+non DBS	WLAN5GHz Ant 7 DBS only	WLAN5GHz Ant 7 WWAN+DBS	Bluetooth Ant 6	WLAN6GHz Ant 5+7	WLAN6GHz Ant 7
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
FR1 n78 Part 27Q Ant 3	Front	0.875	0.833	0.267	0.472	0.116	0.689	0.239	0.458	0.114	0.239	0.049	0.023
	Back	0.711	1.107	0.357	0.732	0.180	1.176	0.389	0.785	0.195	0.151	0.382	0.184
FR1 n78 Part 27Q Ant 5	Front	0.363	0.833	0.267	0.472	0.116	0.689	0.239	0.458	0.114	0.239	0.049	0.023
	Back	0.893	1.107	0.357	0.732	0.180	1.176	0.389	0.785	0.195	0.151	0.382	0.184
FR1 n78 Part 27Q Ant 9	Front	0.709	0.833	0.267	0.472	0.116	0.689	0.239	0.458	0.114	0.239	0.049	0.023
	Back	0.940	1.107	0.357	0.732	0.180	1.176	0.389	0.785	0.195	0.151	0.382	0.184
FR1 n78 Part 27Q Ant 7	Front	0.273	0.833	0.267	0.472	0.116	0.689	0.239	0.458	0.114	0.239	0.049	0.023
	Back	0.281	1.107	0.357	0.732	0.180	1.176	0.389	0.785	0.195	0.151	0.382	0.184

WWAN Band	Exposure Position	2+10	6+10	4+8	4+12	1+3+10	1+7+10	1+10+11	1+5+9	1+5+12
		Summed	Summed	Summed	Summed	Summed	Summed	Summed	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
FR1 n78 Part 27Q Ant 3	Front	1.07	0.93	0.93	0.50	1.38	1.35	1.16	1.11	1.01
	Back	1.26	1.33	1.52	0.92	1.22	1.25	1.24	1.09	1.08
FR1 n78 Part 27Q Ant 5	Front	1.07	0.93	0.93	0.50	0.87	0.84	0.65	0.59	0.50
	Back	1.26	1.33	**1.52**	0.92	1.40	1.43	1.43	1.27	1.26
FR1 n78 Part 27Q Ant 9	Front	1.07	0.93	0.93	0.50	1.22	1.19	1.00	0.94	0.85
	Back	1.26	1.33	1.52	0.92	1.45	1.48	**1.47**	1.32	1.30
FR1 n78 Part 27Q Ant 7	Front	1.07	0.93	0.93	0.50	0.78	0.75	0.56	0.50	0.41
	Back	1.26	1.33	1.52	0.92	0.79	0.82	0.81	0.66	0.65

<Sensor on>

WWAN Band	Exposure Position	1	2	3	4	1+2+3	1+2+4
		WWAN	WLAN2.4GHz Ant 6+8	WLAN5GHz Ant 5+7	WLAN6GHz Ant 5+7	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
FR1 n78 Part 27Q Ant 3	Front	0.638	0.193	0.443	0.031	1.27	0.86
	Back	0.594	0.255	0.639	0.269	1.49	1.12
FR1 n78 Part 27Q Ant 5	Front	0.072	0.193	0.443	0.031	0.71	0.30
	Back	0.129	0.255	0.639	0.269	1.02	0.65

18.5 Product specific 10g SAR Exposure Conditions

WWAN Band	Exposure Position	1	2	3	6	7	8	9	10	11	12
		WWAN	WLAN2.4GHz Ant 6+8 Standalone	WLAN2.4GHz Ant 6+8 WWAN+non DBS	WLAN5GHz Ant 5+7 Standalone	WLAN5GHz Ant 5+7 WWAN+non DBS	WLAN5GHz Ant 7 DBS only	WLAN5GHz Ant 7 WWAN+DBS	NFC	WLAN6GHz Ant 5+7	WLAN6GHz Ant 7
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
FR1 n78 Part 27Q Ant 3	Front	2.059			1.643	0.509	1.219	0.300	0.001	0.094	0.021
	Back	2.490	0.666	0.302	1.085	0.335	0.703	0.142	0.020	0.073	0.018
	Left side	2.126			0.267	0.083	0.013	0.003	0.001	0.013	0.002
	Right side		2.140	0.967	3.176	0.973	1.975	0.490	0.001	0.055	0.347
	Top side				3.145	0.974	0.301	0.074	0.001	0.458	0.008
	Bottom side								0.001		
FR1 n78 Part 27Q Ant 5	Front				1.643	0.509	1.219	0.300	0.001	0.094	0.021
	Back	0.818	0.666	0.302	1.085	0.335	0.703	0.142	0.020	0.073	0.018
	Left side				0.267	0.083	0.013	0.003	0.001	0.013	0.002
	Right side		2.140	0.967	3.176	0.973	1.975	0.490	0.001	0.055	0.347
	Top side	2.173			3.145	0.974	0.301	0.074	0.001	0.458	0.008
	Bottom side								0.001		
FR1 n78 Part 27Q Ant 9	Front				1.643	0.509	1.219	0.300	0.001	0.094	0.021
	Back		0.666	0.302	1.085	0.335	0.703	0.142	0.020	0.073	0.018
	Left side				0.267	0.083	0.013	0.003	0.001	0.013	0.002
	Right side	3.018	2.140	0.967	3.176	0.973	1.975	0.490	0.001	0.055	0.347
	Top side				3.145	0.974	0.301	0.074	0.001	0.458	0.008
	Bottom side								0.001		

WWAN Band	Exposure Position	2+10 Summed 10g SAR (W/kg)	6+10 Summed 10g SAR (W/kg)	10+8 Summed 10g SAR (W/kg)	1+3+10 Summed 10g SAR (W/kg)	1+7+10 Summed 10g SAR (W/kg)	1+11+10 Summed 10g SAR (W/kg)	1+9+10 Summed 10g SAR (W/kg)	1+12+10 Summed 10g SAR (W/kg)
FR1 n78 Part 27Q Ant 3	Front	0.00	1.64	1.22	2.06	2.57	2.15	2.36	2.08
	Back	0.69	1.11	0.72	2.81	2.85	2.58	2.65	2.53
	Left side	0.00	0.27	0.01	2.13	2.21	2.14	2.13	2.13
	Right side	2.14	3.18	1.98	0.97	0.97	0.06	0.49	0.35
	Top side	0.00	3.15	0.30	0.00	0.98	0.46	0.08	0.01
	Bottom side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FR1 n78 Part 27Q Ant 5	Front	0.00	1.64	1.22	0.00	0.51	0.10	0.30	0.02
	Back	0.69	1.11	0.72	1.14	1.17	0.91	0.98	0.86
	Left side	0.00	0.27	0.01	0.00	0.08	0.01	0.00	0.00
	Right side	2.14	3.18	1.98	0.97	0.97	0.06	0.49	0.35
	Top side	0.00	3.15	0.30	2.17	3.15	2.63	2.25	2.18
	Bottom side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FR1 n78 Part 27Q Ant 9	Front	0.00	1.64	1.22	0.00	0.51	0.10	0.30	0.02
	Back	0.69	1.11	0.72	0.32	0.36	0.09	0.16	0.04
	Left side	0.00	0.27	0.01	0.00	0.08	0.01	0.00	0.00
	Right side	2.14	3.18	1.98	3.99	3.99	3.07	3.51	3.37
	Top side	0.00	3.15	0.30	0.00	0.98	0.46	0.08	0.01
	Bottom side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

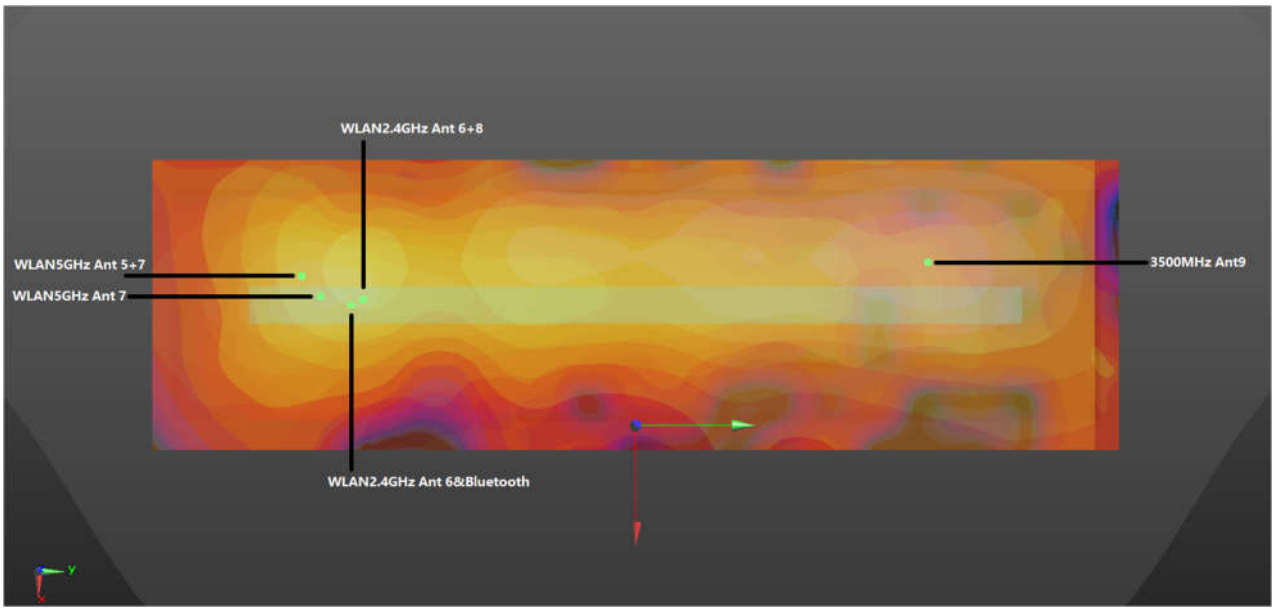
1	2	1+2
Max Summed SAR *	NFC Max SAR	Summed
10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
3.68	0.020	3.70

Note: *The Max Summed SAR are leveraged from original report (Sporton Report Number FA452307) and transmitted simultaneously with NFC more conservatively.

18.6 SPLSR Evaluation and Analysis

General Note:

1. When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of [(x1−x2)2 + (y1−y2)2 + (z1−z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
2. SPLSR = (SAR1 + SAR2)1.5 / (min. separation distance, mm). If SPLSR ≤ 0.04 for 1g SAR, simultaneously transmission SAR measurement is not necessary.
3. Per April 2022 TCB Workshop Notes, WLAN antenna 5/7/8 was summed algebraically with the BT Antenna 6 separately for the purposes of hybrid SPLSR combination and they are located at the top of the device.
4. Per April 2022 TCB Workshop, instead of doing a small volume scan over a co-located antenna pair, used summing the SAR values of the co-located pair and using that value in SPLSR calculation. In the calculation used the minimum distance between the spatially separated antenna and the closest antenna of the co-located antenna pair to be conservative.



Right Side (5mm) for Hotspot

<For Hotspot>

	Band	Position	SAR (W/kg)	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					(mm)	X	Y	Z				
Case 1	FR1 n78 Part 27Q Ant 9	Right side	1.274	1.841	5mm	-9	60.5	-1.15	103.2	1.89	0.03	Not required
	WLAN2.4GHz Ant 6+8		0.567		5mm	-1.2	-42.4	-1.5				
	Bluetooth Ant 6		0.053	0.053	5mm							
	FR1 n78 Part 27Q Ant 9	Right side	1.274	1.327	5mm	-9	60.5	-1.15	124.7	1.89	0.02	Not required
	Bluetooth Ant 6		0.053		5mm	-2.5	-64	-1.37				
	WLAN2.4GHz Ant 6+8		0.567	0.053	5mm							
	Band	Position	SAR (W/kg)	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					(mm)	X	Y	Z				
Case 2	FR1 n78 Part 27Q Ant 9	Right side	1.274	1.910	5mm	-9	60.5	-1.15	127.2	1.96	0.02	Not required
	WLAN5GHz Ant 5+7		0.636		5mm	-5.2	-66.6	-1.32				
	Bluetooth Ant 6		0.053	0.053	5mm							
	FR1 n78 Part 27Q Ant 9	Right side	1.274	1.327	5mm	-9	60.5	-1.15	124.7	1.96	0.02	Not required
	Bluetooth Ant 6		0.053		5mm	-2.5	-64	-1.37				
	WLAN5GHz Ant 5+7		0.636	0.053	5mm							
	Band	Position	SAR (W/kg)	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					(mm)	X	Y	Z				
Case 3	FR1 n78 Part 27Q Ant 9	Right side	1.274	1.391	5mm	-9	60.5	-1.15	125.6	1.69	0.02	Not required
	WLAN2.4GHz Ant 6		0.117		5mm	0	-64.8	-1.4				
	WLAN5GHz Ant 7		0.297	0.297	5mm							
	FR1 n78 Part 27Q Ant 9	Right side	1.274	1.571	5mm	-9	60.5	-1.15	123.3	1.69	0.02	Not required
	WLAN5GHz Ant 7		0.297		5mm	-2	-62.6	-1.14				
	WLAN2.4GHz Ant 6		0.117	0.297	5mm							

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

19. 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%**

20. 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.

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[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

[16] FCC KDB 484596 D01 v02r03, “Test Reductions Via Data Referencing”, Mar. 2024

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