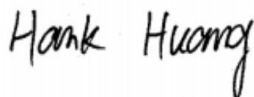


FCC SAR Test Report

APPLICANT : vivo Mobile Communication Co., Ltd.
EQUIPMENT : Mobile Phone
BRAND NAME : vivo
MODEL NAME : V2575
FCC ID : 2AUCY-V2553
STANDARD : FCC 47 CFR Part 2 (2.1093)

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

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



Approved by: Hank Huang

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



Table of Contents

1. Statement of Compliance	4
2. Administration Data	6
3. Guidance Applied	6
4. Equipment Under Test (EUT) Information	7
4.1 General Information.....	7
4.2 General LTE SAR Test and Reporting Considerations	9
4.3 General 5G NR SAR Test and Reporting Considerations	12
5. RF Exposure Limits.....	14
5.1 Uncontrolled Environment.....	14
5.2 Controlled Environment.....	14
6. Specific Absorption Rate (SAR)	15
6.1 Introduction	15
6.2 SAR Definition	15
7. System Description and Setup.....	16
7.1 E-Field Probe	17
7.2 Data Acquisition Electronics (DAE)	17
7.3 Phantom.....	18
7.4 Device Holder.....	19
8. Measurement Procedures.....	20
8.1 Spatial Peak SAR Evaluation	20
8.2 Power Reference Measurement.....	21
8.3 Area Scan.....	21
8.4 Zoom Scan.....	22
8.5 Volume Scan Procedures.....	22
8.6 Power Drift Monitoring.....	22
9. Test Equipment List	23
10. System Verification	24
10.1 Tissue Simulating Liquids.....	24
10.2 Tissue Verification	24
10.3 System Performance Check Results.....	26
11. RF Exposure Positions	27
11.1 Ear and handset reference point	27
11.2 Definition of the cheek position.....	28
11.3 Definition of the tilt position.....	29
11.4 Body Worn Accessory	30
11.5 Product Specific 10g SAR Exposure	31
11.6 Wireless Router	31
12. SAR Test Results	32
12.1 Head SAR	32
12.2 Hotspot SAR	33
12.3 Body Worn Accessory SAR.....	35
12.4 Product specific 10g SAR.....	37
12.5 Repeated SAR Measurement	38
13. Simultaneous Transmission Analysis	39
13.1 5G NR + LTE + WLAN + BT Sim-Tx analysis.....	40
13.2 Head Exposure Conditions.....	41
13.3 Hotspot Exposure Conditions.....	42
13.4 Body-Worn Accessory Exposure Conditions	43
13.5 Product specific 10g SAR Exposure Conditions.....	44
14. Uncertainty Assessment.....	45
15. References.....	46
Appendixes	47
Appendix A. Plots of System Performance Check.....	47
Appendix B. Plots of High SAR and PD Measurement	47
Appendix C. DASY Calibration Certificate.....	47
Appendix D. Test Setup Photos.....	47

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA5N1402-01	Rev. 01	Initial issue of report.	Feb. 02, 2026

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **vivo Mobile Communication Co., Ltd., Mobile Phone, V2575**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 10mm)	Body-worn (Separation 15mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			1g SAR (W/kg)
Licensed	GSM	GSM850	1.01	0.43	0.24	1.44
		GSM1900	0.68	0.54	0.36	
	WCDMA	WCDMA II	0.73	0.62	0.63	
		WCDMA IV	0.96	0.82	0.77	
		WCDMA V	0.72	0.42	0.24	
	LTE	LTE Band 2	0.82	0.58	0.54	
		LTE Band 7	0.93	0.58	0.92	
		LTE Band 12/17	0.42	0.22	0.22	
		LTE Band 13	0.85	0.26	0.23	
		LTE Band 26/5	0.59	0.29	0.21	
		LTE Band 66/4	0.94	0.66	0.82	
		LTE Band 41/38	0.79	0.73	0.89	
		5G NR	FR1 n2	0.64	0.72	
	FR1 n7		0.91	0.48	0.83	
	FR1 n26/n5		0.66	0.43	0.25	
	FR1 n66		0.76	0.67	0.71	
	FR1 n41/n38		0.94	0.57	0.99	
	FR1 n77		0.84	0.34	0.34	
	FR1 n78		1.03	0.49	0.47	
DTS	WLAN	2.4GHz WLAN	0.84	0.26	0.13	1.39
NII		5GHz WLAN	0.98	0.53	0.95	1.44
DSS	Bluetooth	2.4GHz Bluetooth	<0.10	<0.10	<0.10	1.44

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	GSM1900	2.36	3.79
	WCDMA	WCDMA II	2.38	
		WCDMA IV	2.31	
	LTE	LTE Band 2	2.32	
		LTE Band 7	2.38	
		LTE Band 66/4	2.27	
		LTE Band 41/38	2.36	
	5G NR	FR1 n2	2.40	
		FR1 n7	2.51	
		FR1 n66	1.98	
		FR1 n41/n38	2.04	
		FR1 n77	1.09	
		FR1 n78	1.19	
NII	WLAN	5GHz WLAN	1.55	3.79
Date of Testing:			2026/1/15 ~ 2026/1/28	

Remark:

1. This device supports LTE B4 / B5 / B17 / B38 and B66 / B26 / B12 / B41. Since the supported frequency span for LTE B4 / B5 / B17 / B38 falls completely within the support's frequency span for LTE 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 B66 / B26 / B12 / B41.
2. This device supports 5G NR n5 / n38 and n26 / n41. Since the supported frequency span for 5G NR n5 / n38 falls completely within the support's frequency span for n26 / n41, both 5G NR bands have the same target power, and both 5G NR bands share the same transmission path; therefore, SAR was only assessed for n26 / n41.
3. This is a variant report. The difference between them refers to the V2575_Operational Description of Product Equality Declaration which is exhibited separately. According to the difference, only the worst cases from the original test report (Sporton Report Number FA5N1402) were verified for the differences.
4. The Original report with the maximum SAR is 1.11 W/kg for head SAR, 0.84 W/kg for Hotspot SAR, 1.12 W/kg for Body worn SAR and 2.99 W/kg for Product Specific 10g SAR.

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

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093), and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

2. Administration Data

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

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR02-SZ, SAR05-SZ	CN1256	421272

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

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

3. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Phone
Brand Name	vivo
Model Name	V2575
FCC ID	2AUCY-V2553
IMEI Code	868644081998995/868644081998987, 868644081998912/868644081998904
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz 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 n38: 2570 MHz ~ 2620 MHz 5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n77: 3450 MHz ~ 3550 MHz, 3700 MHz ~ 3980 MHz 5G NR n78: 3450 MHz ~ 3550 MHz, 3700 MHz ~ 3800 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2472 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11VHT20/VHT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
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).
4. This device does not support DTM operation and supports GPRS/EGPRS mode up to multi-slot class 12.
5. This device supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active).
6. The device implements proximity 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 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 original report.
7. For WLAN when transmit simultaneous with WWAN/BT antenna, the device WLAN power reduction will be activated to head, hotspot, body-worn exposure conditions.
8. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
9. This device supports HPUE mode for 5G NR n41/n78 with higher power, so HPUE mode was chosen to perform full SAR testing and HPUE SAR can represent power class 3 level SAR.
10. This device supports 5G NR 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
	n5	FDD	15	5, 10, 15, 20
	n7	FDD	15	5, 10, 15, 20, 25, 30, 40, 50
	n26	FDD	15	5, 10, 15, 20
	n66	FDD	15	5, 10, 15, 20, 25, 30, 40
	n38	TDD	30	10, 15, 20, 25, 30, 40
	n41	TDD	30	10, 15, 20, 30, 40, 50, 60, 80, 90, 100
	n77	TDD	30	10, 15, 20, 25, 30, 40, 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
	n5	FDD	15	5, 10, 15, 20
	n7	FDD	15	5, 10, 15, 20, 25, 30, 40, 50
	n26	FDD	15	5, 10, 15, 20
	n66	FDD	15	5, 10, 15, 20, 25, 30, 40
	n38	TDD	30	10, 15, 20, 25, 30, 40
	n41	TDD	30	10, 15, 20, 30, 40, 50, 60, 80, 90, 100
	n77	TDD	30	10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100
	n78	TDD	30	10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																																													
FCC ID	2AUCY-V2553																																																																												
Equipment Name	Mobile Phone																																																																												
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz																																																																												
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz																																																																												
uplink modulations used	QPSK / 16QAM / 64QAM / 256QAM																																																																												
LTE Voice / Data requirements	Voice and Data																																																																												
LTE Release Version	R15																																																																												
CA Support	Supported, Uplink and Downlink																																																																												
LTE MPR permanently built-in by design	<table><tr><th colspan="8">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</th></tr><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr><tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr><tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr><tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr></table>							Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3								Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3																																																																													
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16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																																																						
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																																																						
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64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3																																																																						
256 QAM	≥ 1						≤ 5																																																																						
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)																																																																												
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																												
Power reduction applied to satisfy SAR compliance	Yes, when operating in Proximity sensors/receiver/hotspot detect mechanism, head/body-worn /hotspot/extremity will trigger reduced power for some bands applied to satisfy SAR compliance.																																																																												
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power verification please referred to original report.																																																																												
LTE Carrier Aggregation Additional Information	1. This device supports LTE Carrier Aggregation (CA) in the uplink for intra-band and inter-band with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per FCC Guidance. 2. This device supports maximum of 2 carriers in the uplink.																																																																												

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		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	20407	824.7	20415	825.5	20425	826.5	20450	829	20525	836.5	20525	836.5
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844	20600	844	20600	844
LTE Band 7												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		Bandwidth 25 MHz		Bandwidth 30 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510	20875	2512.5	20900	2515
M	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560	21325	2557.5	21300	2555
LTE Band 12												
	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	23017	699.7	23025	700.5	23035	701.5	23060	704	23085	707	23110	710
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711	23105	708	23080	705
LTE Band 13												
	Bandwidth 5 MHz				Bandwidth 10 MHz				Bandwidth 15 MHz			
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)		Channel #		Freq.(MHz)	
L	23205		779.5		23230		782		23255		784.5	
M	23230		782		23255		784.5		23280		787	
H	23255		784.5		23280		787		23305		790	
LTE Band 17												
	Bandwidth 5 MHz				Bandwidth 10 MHz				Bandwidth 15 MHz			
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)		Channel #		Freq.(MHz)	
L	23755		706.5		23780		709		23805		712	
M	23790		710		23790		710		23790		710	
H	23825		713.5		23800		711		23825		714	
LTE Band 26												
	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	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5	26790	824
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5	26940	838

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

4.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information								
Operating Frequency Range of each 5G NR transmission band	5G NR n2: 1850 MHz ~ 1910 MHz 5G NR n5: 824 MHz ~ 849 MHz 5G NR n7: 2500 MHz ~ 2570 MHz 5G NR n26: 814 MHz ~ 849 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n77: 3450 MHz ~ 3550 MHz, 3700 MHz ~ 3980 MHz 5G NR n78: 3450 MHz ~ 3550 MHz, 3700 MHz ~ 3800 MHz							
Channel Bandwidth	The detail please refers to section 4.1 5G NR 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 B4/7/66							
LTE Anchor Bands for n5	LTE B7							
LTE Anchor Bands for n7	LTE B2/4/5/66							
LTE Anchor Bands for n26	LTE B7							
LTE Anchor Bands for n66	LTE B2/5/7							
LTE Anchor Bands for n38	LTE B4/66							
LTE Anchor Bands for n41	LTE B4/5/26/66							
LTE Anchor Bands for n77	LTE B7							
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	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860
M	376000	1880	376000	1880	376000	1880	376000	1880
H	381500	1907.5	381000	1905	380500	1902.5	380000	1900

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

NR Band 7															
Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz	
Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L 500500	2502.5	501000	2505	501500	2507.5	502000	2510	502500	2512.5	503000	2515	504000	2520	505000	2525
M 507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535	507000	2535
H 513500	2567.5	513000	2565	512500	2562.5	512000	2560	511500	2557.5	511000	2555	510000	2550	509000	2545

NR Band 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 40MHz	
	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	346000	1730
M	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	352000	1760

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 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		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)
L	500202	2501.01	500700	2503.5	501204	2506.02	502200	2511	503202	2516.01	504204	2521.02	505200	2526	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
H	537000	2685	536496	2682.48	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	529998	2649.99	528996	2644.98	528000	2640

NR Band 77																								
	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)
L	647000	3705	647168	3707.52	647334	3710.01	647500	3712.5	647668	3715.02	648000	3720	648334	3725.01	648668	3730.02	649000	3735	649334	3740.01	649668	3745.02	650000	3750
M	656000	3840	656000	3840	656000	3840	656000	3840.00	656000	3840.00	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840
H	665000	3975	664834	3972.51	664668	3970.02	664500	3967.50	664334	3965.01	664000	3960	663668	3955.02	663334	3950.01	663000	3945	662668	3940.02	662334	3935.01	662000	3930

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)
L	647000	3705	647168	3707.52	647334	3710.01	647500	3712.5	647668	3715.02	648000	3720	648334	3725.01	648668	3730.02	649000	3735	649334	3740.01	649668	3745.02		
M	650000	3750	650000	3750	650000	3750	650000	3750.00	650000	3750.00	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750	650000	3750
H	653000	3795	652832	3792.48	652666	3789.99	652500	3787.5	652332	3784.98	652000	3780	651666	3774.99	651332	3769.98	651000	3765	650666	3759.99	650332	3754.98		

For <3450 MHz ~ 3550 MHz >

NR Band 77																								
	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)
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		

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)	
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		

5. RF Exposure Limits

5.1 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.

5.2 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.

6. Specific Absorption Rate (SAR)

6.1 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.

6.2 SAR Definition

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

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

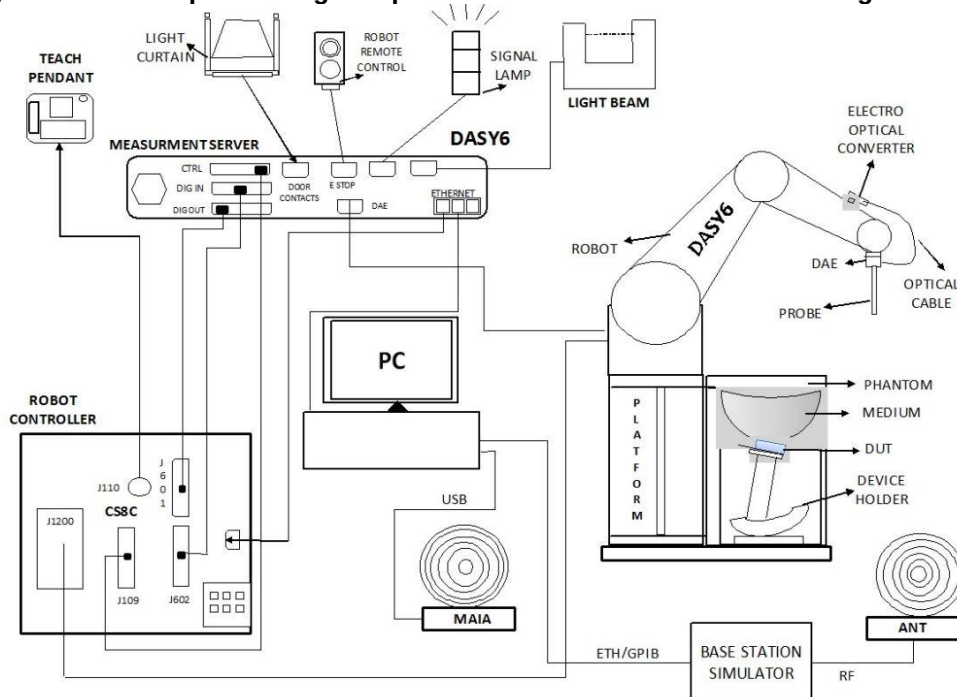
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



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

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

7.2 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

7.3 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.

7.4 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

8. 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

8.1 Spatial Peak SAR Evaluation

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

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

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

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

8.2 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.

8.3 Area Scan

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

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

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

8.4 Zoom Scan

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

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

			$\leq 3 \text{ GHz}$	$> 3 \text{ GHz}$
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			$\leq 2 \text{ GHz}: \leq 8 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz}: \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz}: \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 4 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 3 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 3 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz}: \geq 28 \text{ mm}$ $4 - 5 \text{ GHz}: \geq 25 \text{ mm}$ $5 - 6 \text{ GHz}: \geq 22 \text{ mm}$
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.				
* When zoom scan is required and the <u>reported</u> SAR from the <u>area scan based 1-g SAR estimation</u> procedures of KDB 447498 is $\leq 1.4 \text{ W/kg}$, $\leq 8 \text{ mm}$, $\leq 7 \text{ mm}$ and $\leq 5 \text{ mm}$ zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

8.5 Volume Scan Procedures

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

8.6 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.

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1087	Mar. 12, 2025	Mar. 11, 2026
SPEAG	835MHz System Validation Kit	D835V2	4d298	Jan. 26, 2024	Jan. 24, 2026
SPEAG	1750MHz System Validation Kit	D1750V2	1090	Mar. 12, 2025	Mar. 11, 2026
SPEAG	1900MHz System Validation Kit	D1900V2	5d170	Jun. 30, 2025	Jun. 29, 2026
SPEAG	2450MHz System Validation Kit	D2450V2	1095	Feb. 08, 2024	Feb. 06, 2026
SPEAG	2600MHz System Validation Kit	D2600V2	1112	Dec. 18, 2023	Dec. 15, 2026
SPEAG	3500MHz System Validation Kit	D3500V2	1076	Apr. 16, 2025	Apr. 15, 2026
SPEAG	3700MHz System Validation Kit	D3700V2	1037	Apr. 16, 2025	Apr. 15, 2026
SPEAG	3900MHz System Validation Kit	D3900V2	1022	Aug. 13, 2025	Aug. 12, 2026
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	Sep. 17, 2025	Sep. 16, 2026
SPEAG	Data Acquisition Electronics	DAE4	715	Nov. 28, 2025	Nov. 27, 2026
SPEAG	Dosimetric E-Field Probe	EX3DV4	7930	Jul. 21, 2025	Jul. 20, 2026
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1670	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300653	Jul. 03, 2025	Jul. 02, 2026
Anritsu	Radio communication analyzer	MT8821C	6262314715	Jul. 03, 2025	Jul. 02, 2026
Anritsu	Radio communication analyzer	MT8821C	6272278319	Jul. 03, 2025	Jul. 02, 2026
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 14, 2025	Oct. 13, 2026
Speag	Dielectric Assessment KIT	DAK-3.5	1071	Feb. 24, 2025	Feb. 23, 2026
Agilent	Signal Generator	N5181A	MY50145381	Dec. 25, 2025	Dec. 24, 2026
R&S	Power Sensor	NRPZ51	103113	Apr. 01, 2025	Mar. 31, 2026
R&S	Power Sensor	NRP8S	109228	Apr. 01, 2025	Mar. 31, 2026
R&S	CBT BLUETOOTH TESTER	CBT	100963	Dec. 24, 2025	Dec. 23, 2026
R&S	Spectrum Analyzer	FSP7	100818	Jul. 03, 2025	Jul. 02, 2026
TES	Hygrometer	1310	200505600	Jul. 05, 2025	Jul. 04, 2026
Anymetre	Thermo-Hygrometer	JR593	2020062101	Jul. 05, 2025	Jul. 04, 2026
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Mini-Circuits	Amplifier	ZVA-183W-S+	726202215	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
ET Industries	Dual Directional Coupler	C-058-10	N/A	Note 1	
Jinkexinhua	Attenuator	10db-8G	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.

10. System Verification

10.1 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.

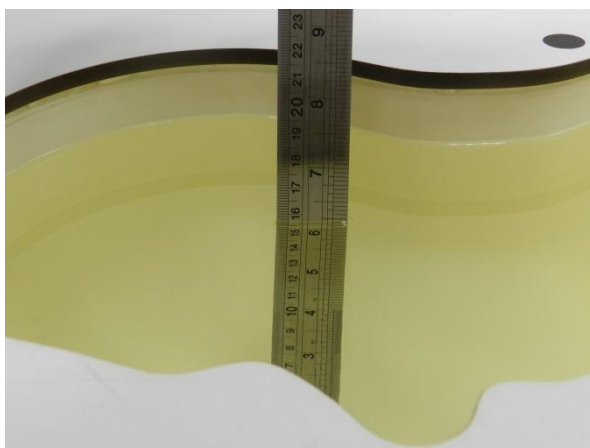


Fig 11.1 Photo of Liquid Height for Head SAR



Fig 11.2 Photo of Liquid Height for Body SAR

10.2 Tissue Verification

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

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

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ε _r)	Conductivity Target (σ)	Permittivity Target (ε _r)	Delta (σ) (%)	Delta (ε _r) (%)	Limit (%)	Date
750	Head	22.1	0.885	43.900	0.89	41.90	-0.56	4.77	±5	2026/1/18
835	Head	22.4	0.914	43.300	0.90	41.50	1.56	4.34	±5	2026/1/17
1750	Head	22.6	1.340	41.900	1.37	40.10	-2.19	4.49	±5	2026/1/15
1900	Head	22.5	1.440	41.700	1.40	40.00	2.86	4.25	±5	2026/1/19
2450	Head	22.3	1.820	41.000	1.80	39.20	1.11	4.59	±5	2026/1/23
2600	Head	22.2	1.940	40.700	1.96	39.00	-1.02	4.36	±5	2026/1/21
3500	Head	22.8	2.770	39.200	2.91	37.90	-4.81	3.43	±5	2026/1/22
3700	Head	22.7	3.100	38.900	3.12	37.70	-0.64	3.18	±5	2026/1/20
3900	Head	22.1	3.200	38.600	3.33	37.51	-3.90	2.91	±5	2026/1/24
5250	Head	22.6	4.590	36.200	4.71	35.95	-2.55	0.70	±5	2026/1/25
5600	Head	22.5	5.000	35.600	5.07	35.50	-1.38	0.28	±5	2026/1/28
5800	Head	22.3	5.230	35.300	5.27	35.30	-0.76	0.00	±5	2026/1/26

10.3 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.

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 (%)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2026/1/18	750	Head	250	D750V3-1087	EX3DV4 - SN7930	DAE4 Sn715	2.250	8.680	9	3.69	1.450	5.610	5.8	3.39
2026/1/17	835	Head	250	D835V2-4d298	EX3DV4 - SN7930	DAE4 Sn715	2.590	9.890	10.36	4.75	1.670	6.450	6.68	3.57
2026/1/15	1750	Head	250	D1750V2-1090	EX3DV4 - SN7930	DAE4 Sn715	8.910	36.600	35.64	-2.62	4.690	19.500	18.76	-3.79
2026/1/19	1900	Head	250	D1900V2-5d170	EX3DV4 - SN7930	DAE4 Sn715	9.730	39.600	38.92	-1.72	5.010	20.900	20.04	-4.11
2026/1/23	2450	Head	250	D2450V2-1095	EX3DV4 - SN7930	DAE4 Sn715	13.000	52.600	52	-1.14	6.020	24.700	24.08	-2.51
2026/1/21	2600	Head	250	D2600V2-1112	EX3DV4 - SN7930	DAE4 Sn715	13.600	55.100	54.4	-1.27	6.130	24.800	24.52	-1.13
2026/1/22	3500	Head	100	D3500V2-1076	EX3DV4 - SN7930	DAE4 Sn715	6.610	65.800	66.1	0.46	2.490	25.000	24.9	-0.40
2026/1/20	3700	Head	100	D3700V2-1037	EX3DV4 - SN7930	DAE4 Sn715	7.020	67.000	70.2	4.78	2.530	24.400	25.3	3.69
2026/1/24	3900	Head	100	D3900V2-1022	EX3DV4 - SN7930	DAE4 Sn715	6.850	70.100	68.5	-2.28	2.420	24.600	24.2	-1.63
2026/1/25	5250	Head	100	D5GHzV2-1113	EX3DV4 - SN7930	DAE4 Sn715	7.750	78.100	77.5	-0.77	2.200	22.400	22	-1.79
2026/1/28	5600	Head	100	D5GHzV2-1113	EX3DV4 - SN7930	DAE4 Sn715	8.260	80.000	82.6	3.25	2.290	23.000	22.9	-0.43
2026/1/26	5800	Head	100	D5GHzV2-1113	EX3DV4 - SN7930	DAE4 Sn715	8.050	77.900	80.5	3.34	2.220	22.300	22.2	-0.45

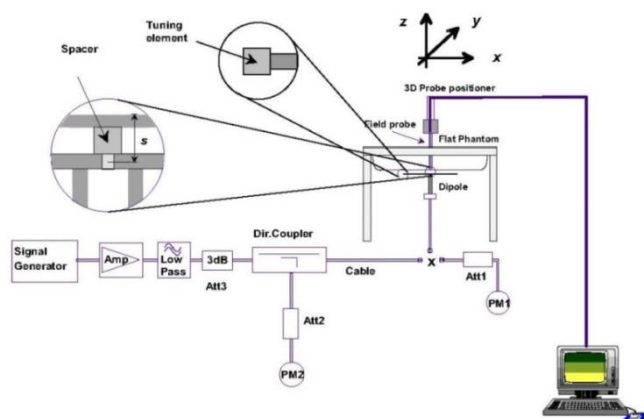


Fig 11.3.1 System Performance Check Setup



Fig 11.3.2 Setup Photo

11. RF Exposure Positions

11.1 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.

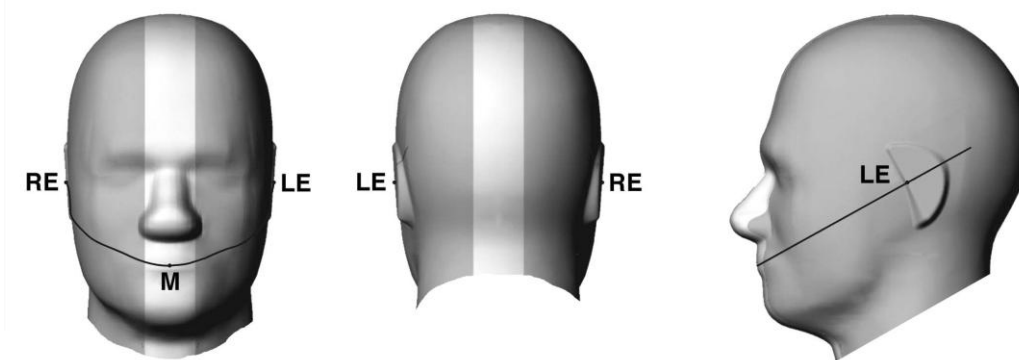


Fig 12.1.1 Front, back, and side views of SAM twin phantom

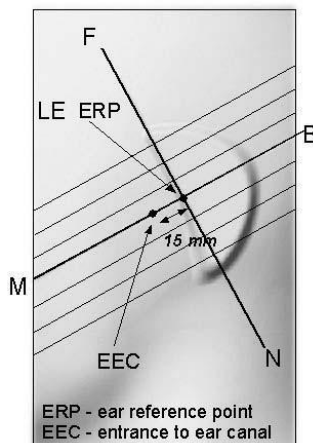


Fig 12.1.2 Close-up side view of phantom showing the ear region.

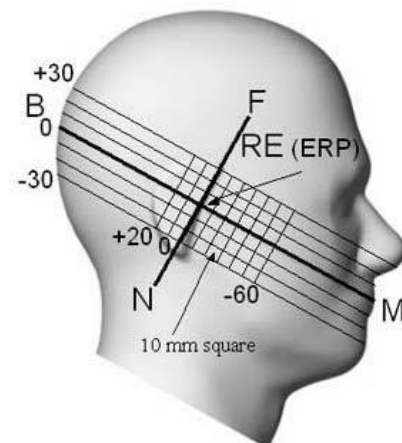


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width w_t of the handset at the level of the acoustic output (point A in Figure 12.2.1 and Figure 12.2.2), and the midpoint of the width w_b of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 12.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the 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.

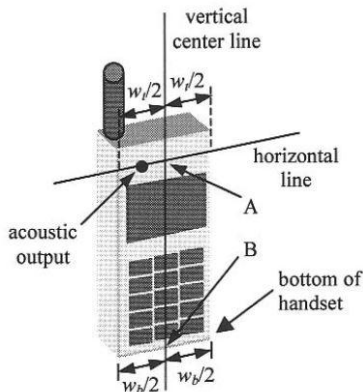


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case"

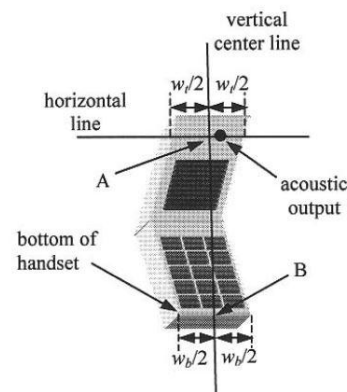


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

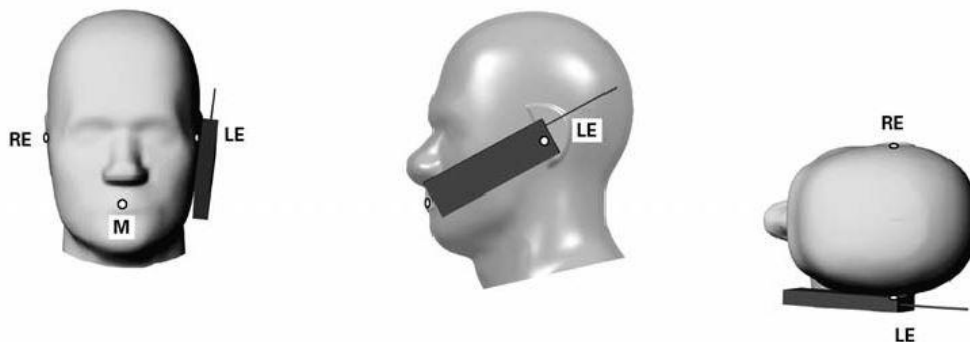


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 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

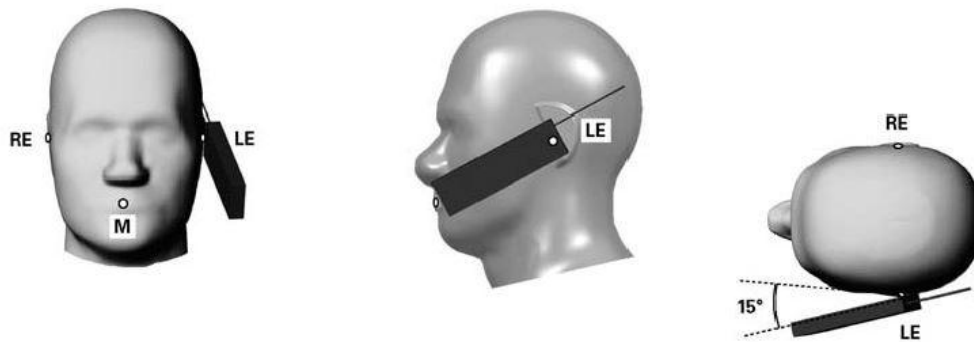


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 Body Worn Accessory

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

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

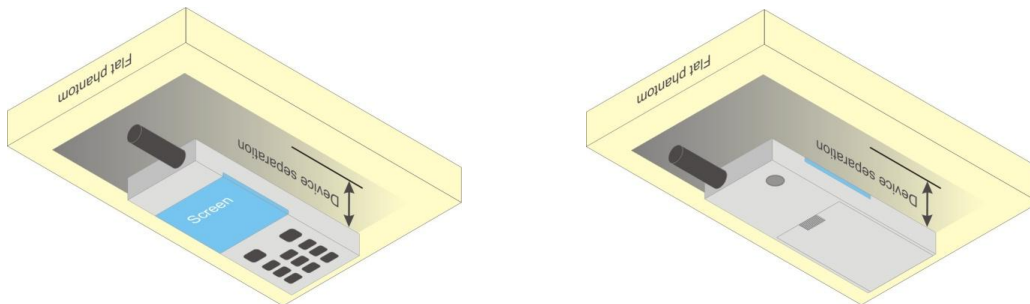


Fig 12.4 Body Worn Position

11.5 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.

11.6 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets ($L \times W \geq 9$ 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 from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

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



12. SAR Test Results

12.1 Head SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
750MHz																				
01	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 13	ECI 2	23095	707.5	24.00	25.00	1.259	-	-	0.04	0.337	0.424
	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 31	ECI 2	23095	707.5	24.35	25.00	1.161	-	-	0.08	0.093	0.108
02	LTE Band 13	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 13	ECI 2	23230	782	23.70	25.00	1.349	-	-	-0.05	0.633	0.854
	LTE Band 13	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 31	ECI 2	23230	782	24.10	25.00	1.230	-	-	0.17	0.123	0.151
835MHz																				
03	GSM850	-	-	-	-	GPRS 1 TX Slot	Right Cheek	0mm	Ant 13	ECI 2	189	836.4	30.90	32.60	1.479	-	-	0.16	0.682	1.009
	GSM850	-	-	-	-	GPRS 1 TX Slot	Right Cheek	0mm	Ant 13	ECI 3	189	836.4	29.80	31.60	1.514	-	-	0.01	0.601	0.910
04	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	ECI 2	4182	836.4	20.68	22.00	1.355	-	-	-0.1	0.530	0.718
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	ECI 2	4182	836.4	23.90	25.00	1.288	-	-	0.05	0.237	0.305
05	LTE Band 26	15M	QPSK	36	0	-	Right Cheek	0mm	Ant 13	ECI 2	26865	831.5	20.65	22.00	1.365	-	-	0.1	0.434	0.592
	LTE Band 26	15M	QPSK	1	0	-	Left Cheek	0mm	Ant 31	ECI 2	26865	831.5	24.40	25.00	1.148	-	-	0.02	0.184	0.211
06	FR1 n26	20M	QPSK	50	28	DFT-15	Right Cheek	0mm	Ant 13	ECI 2	166300	831.5	20.73	22.00	1.340	-	-	-0.1	0.491	0.658
	FR1 n26	20M	QPSK	50	28	DFT-15	Left Cheek	0mm	Ant 31	ECI 2	166300	831.5	24.05	25.50	1.396	-	-	-0.1	0.188	0.263
1750MHz																				
07	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	ECI 2	1413	1732.6	17.25	18.20	1.245	-	-	0.07	0.773	0.962
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	ECI 2	1413	1732.6	24.12	24.70	1.143	-	-	0.18	0.089	0.102
08	LTE Band 66	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 13	ECI 2	132322	1745	17.47	18.30	1.211	-	-	0.08	0.775	0.938
	LTE Band 66	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 31	ECI 2	132322	1745	24.40	25.00	1.148	-	-	-0.11	0.090	0.103
	LTE Band 66	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 11	ECI 2	132322	1745	21.07	21.50	1.104	-	-	-0.12	0.535	0.591
09	FR1 n66	40M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 13	ECI 2	349000	1745	15.95	17.30	1.365	-	-	-0.11	0.556	0.759
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Cheek	0mm	Ant 31	ECI 2	349000	1745	24.13	25.30	1.309	-	-	0.05	0.091	0.119
	FR1 n66	40M	QPSK	108	54	DFT-15	Right Cheek	0mm	Ant 11	ECI 2	349000	1745	20.13	21.30	1.309	-	-	-0.11	0.462	0.605
1900MHz																				
10	GSM1900	-	-	-	-	GPRS 1 TX Slot	Right Tilted	0mm	Ant 13	ECI 2	661	1880	25.13	26.30	1.309	-	-	0.12	0.520	0.681
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Right Cheek	0mm	Ant 31	ECI 2	661	1880	27.80	28.00	1.047	-	-	0.03	0.090	0.094
11	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	ECI 2	9400	1880	16.65	17.70	1.274	-	-	-0.02	0.573	0.730
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	ECI 2	9400	1880	24.10	24.70	1.148	-	-	-0.06	0.113	0.130
12	LTE Band 2	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 13	ECI 2	18900	1880	16.67	17.80	1.297	-	-	0.18	0.629	0.816
	LTE Band 2	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 31	ECI 2	18900	1880	24.15	24.80	1.161	-	-	-0.07	0.128	0.149
13	FR1 n2	20M	QPSK	1	1	DFT-15	Right Tilted	0mm	Ant 13	ECI 2	376000	1880	15.18	16.80	1.452	-	-	0.04	0.440	0.639
	FR1 n2	20M	QPSK	50	28	DFT-15	Left Cheek	0mm	Ant 31	ECI 2	376000	1880	23.83	25.30	1.403	-	-	0.18	0.115	0.161
	FR1 n2	20M	QPSK	50	28	DFT-15	Right Cheek	0mm	Ant 11	ECI 2	376000	1880	21.66	23.00	1.361	-	-	-0.18	0.288	0.392
2600MHz																				
14	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 13	ECI 2	21100	2535	17.68	18.50	1.208	-	-	0.06	0.773	0.934
	LTE Band 7	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 31	ECI 2	21100	2535	24.15	25.00	1.216	-	-	0.18	0.417	0.507
	LTE Band 7	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 11	ECI 2	21100	2535	19.68	20.50	1.208	-	-	0.17	0.634	0.766
15	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 13	ECI 2	40185	2549.5	19.38	20.00	1.153	62.9	1.006	0.05	0.677	0.786
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 31	ECI 2	40620	2593	24.80	25.00	1.047	62.9	1.006	-0.08	0.301	0.317
	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 11	ECI 2	40620	2593	21.78	22.00	1.052	62.9	1.006	0.13	0.645	0.683
16	FR1 n7	50M	QPSK	135	68	DFT-15	Right Tilted	0mm	Ant 13	ECI 2	507000	2535	16.96	18.00	1.271	-	-	0.16	0.719	0.914
	FR1 n7	50M	QPSK	135	68	DFT-15	Right Cheek	0mm	Ant 31	ECI 2	507000	2535	24.11	25.00	1.227	-	-	-0.1	0.436	0.535
	FR1 n7	50M	QPSK	1	1	DFT-15	Right Cheek	0mm	Ant 11	ECI 2	507000	2535	19.20	20.50	1.349	-	-	0.16	0.571	0.770
	FR1 n41	100M	QPSK	1	1	DFT-30	Right Tilted	0mm	Ant 13	ECI 2	518598	2592.99	16.40	17.50	1.288	-	-	0.15	0.550	0.709
	FR1 n41	100M	QPSK	1	1	DFT-30	Right Cheek	0mm	Ant 31	ECI 2	518598	2592.99	25.28	26.20	1.236	-	-	-0.08	0.608	0.751
17	FR1 n41	100M	QPSK	135	69	DFT-30	Right Cheek	0mm	Ant 11	ECI 2	518598	2592.99	18.88	20.20	1.355	-	-	-0.16	0.694	0.941
3500MHz-4100MHz																				



FCC SAR Test Report

Report No. : FA5N1402-01

	FR1 n77 Part27Q	100M	QPSK	135	69	DFT-30	Right Cheek	0mm	Ant 11	ECI 2	633332	3499.98	18.53	19.20	1.167	-	-	-0.05	0.493	0.575
	FR1 n77 Part27O	100M	QPSK	1	1	DFT-30	Right Cheek	0mm	Ant 12	ECI 2	656000	3840	15.55	16.50	1.245	-	-	0.02	0.459	0.571
18	FR1 n77 Part27O	100M	QPSK	135	69	DFT-30	Left Tilted	0mm	Ant 21	ECI 2	656000	3840	16.18	17.00	1.208	-	-	-0.02	0.698	0.843
	FR1 n77 Part27Q	100M	QPSK	135	69	DFT-30	Left Cheek	0mm	Ant 23	ECI 2	633332	3499.98	15.90	17.00	1.288	-	-	0.02	0.518	0.667
	FR1 n78 Part27O	100M	QPSK	135	69	DFT-30	Right Cheek	0mm	Ant 12	ECI 2	650000	3750	16.13	17.50	1.371	-	-	0.07	0.561	0.769
	FR1 n78 Part27O	100M	QPSK	135	69	DFT-30	Left Cheek	0mm	Ant 21	ECI 2	650000	3750	16.56	18.00	1.393	-	-	-0.01	0.666	0.928
19	FR1 n78 Part27Q	100M	QPSK	135	69	DFT-30	Left Cheek	0mm	Ant 23	ECI 2	633332	3499.98	17.45	19.00	1.429	-	-	-0.01	0.723	1.033

Plot 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)
WLAN&BT																
20	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Ant 22	Full	39	2441	10.30	11.50	1.318	76.6	1.305	0.01	0.047	0.081
21	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 22	Standalone	6	2437	16.00	17.50	1.413	99.64	1.004	0.11	0.592	0.840
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 22	Simultaneous	6	2437	14.43	16.00	1.435	99.64	1.004	0.05	0.400	0.576
22	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 22	Standalone	54	5270	14.64	16.50	1.535	95.59	1.046	-0.07	0.608	0.976
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 22	Simultaneous	54	5270	12.68	14.50	1.521	95.59	1.046	0.07	0.380	0.604
23	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 22	Standalone	138	5690	15.66	16.50	1.213	86.11	1.161	-0.05	0.585	0.824
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 22	Simultaneous	138	5690	14.68	16.50	1.521	86.11	1.161	0.02	0.390	0.688
24	WLAN5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 22	Standalone	159	5795	15.69	17.50	1.517	95.59	1.046	-0.18	0.467	0.741

12.2 Hotspot SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
750MHz																				
	LTE Band 12	10M	QPSK	1	0	-	Top Side	10mm	Ant 13	ECI 10	23095	707.5	24.00	25.00	1.259	-	-	0.08	0.144	0.181
25	LTE Band 12	10M	QPSK	1	0	-	Back	10mm	Ant 31	ECI 10	23095	707.5	24.35	25.00	1.161	-	-	0.08	0.193	0.224
	LTE Band 13	10M	QPSK	1	0	-	Back	10mm	Ant 13	ECI 10	23230	782	23.70	25.00	1.349	-	-	-0.14	0.151	0.204
26	LTE Band 13	10M	QPSK	1	0	-	Left Side	10mm	Ant 31	ECI 10	23230	782	24.10	25.00	1.230	-	-	-0.04	0.209	0.257
835MHz																				
27	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	10mm	Ant 13	ECI 10	189	836.4	30.13	31.50	1.371	-	-	-0.14	0.316	0.433
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 13	ECI 10	4182	836.4	23.60	25.00	1.380	-	-	0.14	0.266	0.367
28	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 31	ECI 10	4182	836.4	23.90	25.00	1.288	-	-	-0.15	0.322	0.415
	LTE Band 26	15M	QPSK	1	0	-	Top Side	10mm	Ant 13	ECI 10	26865	831.5	23.98	25.00	1.265	-	-	-0.13	0.211	0.267
29	LTE Band 26	15M	QPSK	1	0	-	Bottom Side	10mm	Ant 31	ECI 10	26865	831.5	24.40	25.00	1.148	-	-	-0.12	0.252	0.289
	FR1 n26	20M	QPSK	50	28	DFT-15	Top Side	10mm	Ant 13	ECI 10	166300	831.5	23.68	25.00	1.355	-	-	-0.16	0.213	0.289
30	FR1 n26	20M	QPSK	50	28	DFT-15	Bottom Side	10mm	Ant 31	ECI 10	166300	831.5	24.05	25.50	1.396	-	-	0.03	0.306	0.427
1750MHz																				
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 13	ECI 10	1413	1732.6	19.33	20.20	1.222	-	-	-0.15	0.556	0.679
31	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 31	ECI 10	1413	1732.6	21.90	22.20	1.072	-	-	0.16	0.767	0.822
	LTE Band 66	20M	QPSK	1	0	-	Top Side	10mm	Ant 13	ECI 10	132322	1745	16.38	17.30	1.236	-	-	0.15	0.262	0.324
32	LTE Band 66	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 31	ECI 10	132322	1745	21.18	21.50	1.076	-	-	-0.09	0.615	0.662
	LTE Band 66	20M	QPSK	50	0	-	Left Side	10mm	Ant 11	ECI 10	132322	1745	20.53	21.00	1.114	-	-	-0.04	0.495	0.552
	FR1 n66	40M	QPSK	108	54	DFT-15	Top Side	10mm	Ant 13	ECI 10	349000	1745	16.93	18.30	1.371	-	-	-0.15	0.368	0.504
33	FR1 n66	40M	QPSK	108	54	DFT-15	Bottom Side	10mm	Ant 31	ECI 10	349000	1745	20.23	21.30	1.279	-	-	-0.13	0.527	0.674
	FR1 n66	40M	QPSK	108	54	DFT-15	Left Side	10mm	Ant 11	ECI 10	349000	1745	19.63	20.80	1.309	-	-	0.11	0.363	0.475
1900MHz																				
	GSM1900	-	-	-	-	GPRS 4 TX Slot	Top Side	10mm	Ant 13	ECI 10	661	1880	18.02	19.50	1.406	-	-	0.02	0.220	0.309
34	GSM1900	-	-	-	-	GPRS 1 TX Slot	Bottom Side	10mm	Ant 31	ECI 10	661	1880	29.56	30.20	1.159	-	-	-0.02	0.469	0.543
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 13	ECI 10	9400	1880	17.61	18.70	1.285	-	-	-0.14	0.425	0.546
35	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 31	ECI 10	9400	1880	20.51	21.20	1.172	-	-	-0.01	0.526	0.617
	LTE Band 2	20M	QPSK	50	0	-	Top Side	10mm	Ant 13	ECI 10	18900	1880	17.62	18.80	1.312	-	-	-0.16	0.435	0.571



FCC SAR Test Report

Report No. : FA5N1402-01

36	LTE Band 2	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 31	ECI 10	18900	1880	20.32	20.80	1.117	-	-	0.02	0.518	0.579
	FR1 n2	20M	QPSK	1	1	DFT-15	Top Side	10mm	Ant 13	ECI 10	376000	1880	16.71	18.30	1.442	-	-	-0.16	0.378	0.545
37	FR1 n2	20M	QPSK	1	1	DFT-15	Bottom Side	10mm	Ant 31	ECI 10	376000	1880	20.45	21.80	1.365	-	-	0.07	0.527	0.719
	FR1 n2	20M	QPSK	1	1	DFT-15	Back	10mm	Ant 11	ECI 10	376000	1880	17.70	19.00	1.349	-	-	-0.11	0.189	0.255
2600MHz																				
	LTE Band 7	20M	QPSK	1	0	-	Top Side	10mm	Ant 13	ECI 10	21100	2535	16.71	17.50	1.199	-	-	0.1	0.478	0.573
38	LTE Band 7	20M	QPSK	1	0	-	Back	10mm	Ant 31	ECI 10	21100	2535	21.91	22.50	1.146	-	-	-0.06	0.503	0.576
	LTE Band 7	20M	QPSK	50	0	-	Left Side	10mm	Ant 11	ECI 10	21100	2535	16.99	18.00	1.262	-	-	0.19	0.443	0.559
39	LTE Band 41	20M	QPSK	1	0	-	Top Side	10mm	Ant 13	ECI 10	40185	2549.5	19.30	20.00	1.175	62.9	1.006	-0.09	0.619	0.732
	LTE Band 41	20M	QPSK	1	0	-	Back	10mm	Ant 31	ECI 10	40620	2593	21.96	22.00	1.009	62.9	1.006	-0.14	0.563	0.572
	LTE Band 41	20M	QPSK	1	0	-	Left Side	10mm	Ant 11	ECI 10	40620	2593	17.74	18.00	1.062	62.9	1.006	-0.14	0.355	0.379
	FR1 n7	50M	QPSK	135	68	DFT-15	Top Side	10mm	Ant 13	ECI 10	507000	2535	14.83	16.00	1.309	-	-	-0.12	0.355	0.465
40	FR1 n7	50M	QPSK	135	68	DFT-15	Back	10mm	Ant 31	ECI 10	507000	2535	20.66	21.50	1.213	-	-	0.02	0.392	0.476
	FR1 n7	50M	QPSK	135	68	DFT-15	Left Side	10mm	Ant 11	ECI 10	507000	2535	16.23	17.50	1.340	-	-	-0.19	0.350	0.469
41	FR1 n41	100M	QPSK	1	1	DFT-30	Top Side	10mm	Ant 13	ECI 10	518598	2592.99	15.82	17.00	1.312	-	-	0.07	0.433	0.568
	FR1 n41	100M	QPSK	1	1	DFT-30	Back	10mm	Ant 31	ECI 10	518598	2592.99	20.85	21.70	1.216	-	-	0.03	0.456	0.555
	FR1 n41	100M	QPSK	135	69	DFT-30	Left Side	10mm	Ant 11	ECI 10	518598	2592.99	14.76	16.20	1.393	-	-	0.09	0.366	0.510
3500MHz-4100MHz																				
42	FR1 n77 Part27Q	100M	QPSK	135	69	DFT-30	Left Side	10mm	Ant 11	ECI 10	633332	3499.98	14.96	15.70	1.186	-	-	-0.17	0.284	0.337
	FR1 n77 Part27Q	100M	QPSK	1	1	DFT-30	Left Side	10mm	Ant 12	ECI 10	656000	3840	16.93	18.00	1.279	-	-	-0.19	0.185	0.237
	FR1 n77 Part27Q	100M	QPSK	135	69	DFT-30	Back	10mm	Ant 21	ECI 10	656000	3840	11.56	12.50	1.242	-	-	0	0.156	0.194
	FR1 n77 Part27Q	100M	QPSK	135	69	DFT-30	Right Side	10mm	Ant 23	ECI 10	633332	3499.98	12.48	13.50	1.265	-	-	0.13	0.133	0.168
43	FR1 n78 Part27Q	100M	QPSK	1	1	DFT-30	Left Side	10mm	Ant 11	ECI 10	650000	3750	14.90	15.70	1.202	-	-	0.19	0.403	0.485
	FR1 n78 Part27Q	100M	QPSK	135	69	DFT-30	Left Side	10mm	Ant 12	ECI 10	650000	3750	18.04	19.50	1.400	-	-	-0.16	0.265	0.371
	FR1 n78 Part27Q	100M	QPSK	1	1	DFT-30	Top Side	10mm	Ant 21	ECI 10	633332	3499.98	12.23	13.50	1.340	-	-	0	0.091	0.122
	FR1 n78 Part27Q	100M	QPSK	135	69	DFT-30	Right Side	10mm	Ant 23	ECI 10	650000	3750	14.84	16.50	1.466	-	-	-0.03	0.238	0.349

Plot 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)
WLAN&BT																
44	Bluetooth	DH5 1Mbps	Back	10mm	Ant 22	Full	39	2441	10.30	11.50	1.318	76.6	1.305	0.01	0.027	0.046
45	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 22	Hotspot	6	2437	16.00	17.50	1.413	99.64	1.004	-0.11	0.184	0.261
46	WLAN5GHz	802.11n-HT40 MCS0	Back	10mm	Ant 22	Hotspot	46	5230	14.31	16.00	1.477	95.59	1.046	-0.04	0.319	0.493
47	WLAN5GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 22	Hotspot	155	5775	14.09	16.00	1.553	86.11	1.161	0.02	0.296	0.534



12.3 Body Worn Accessory SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
750MHz																				
	LTE Band 12	10M	QPSK	1	0	-	Back	15mm	Ant 13	ECI 4	23095	707.5	24.00	25.00	1.259	-	-	-0.05	0.098	0.123
48	LTE Band 12	10M	QPSK	1	0	-	Back	15mm	Ant 31	ECI 4	23095	707.5	24.35	25.00	1.161	-	-	0.11	0.190	0.221
	LTE Band 13	10M	QPSK	1	0	-	Back	15mm	Ant 13	ECI 4	23230	782	23.70	25.00	1.349	-	-	-0.16	0.103	0.139
49	LTE Band 13	10M	QPSK	1	0	-	Back	15mm	Ant 31	ECI 4	23230	782	24.10	25.00	1.230	-	-	0.05	0.189	0.233
835MHz																				
50	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	15mm	Ant 13	ECI 4	189	836.4	30.13	31.50	1.371	-	-	0.01	0.175	0.240
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 13	ECI 4	4182	836.4	23.60	25.00	1.380	-	-	0.18	0.113	0.156
51	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 31	ECI 4	4182	836.4	23.90	25.00	1.288	-	-	-0.03	0.184	0.237
	LTE Band 26	15M	QPSK	1	0	-	Back	15mm	Ant 13	ECI 4	26865	831.5	23.98	25.00	1.265	-	-	0.13	0.093	0.118
52	LTE Band 26	15M	QPSK	1	0	-	Back	15mm	Ant 31	ECI 4	26865	831.5	24.40	25.00	1.148	-	-	0.09	0.181	0.208
	FR1 n26	20M	QPSK	50	28	DFT-15	Back	15mm	Ant 13	ECI 4	166300	831.5	23.68	25.00	1.355	-	-	-0.03	0.110	0.149
53	FR1 n26	20M	QPSK	50	28	DFT-15	Back	15mm	Ant 31	ECI 4	166300	831.5	24.05	25.50	1.396	-	-	0.05	0.181	0.253
1750MHz																				
54	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 13	ECI 4	1413	1732.6	23.55	24.70	1.303	-	-	0.01	0.590	0.769
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 31	ECI 4	1413	1732.6	21.90	22.20	1.072	-	-	0.08	0.315	0.338
55	LTE Band 66	20M	QPSK	1	0	-	Back	15mm	Ant 13	ECI 4	132322	1745	23.70	24.80	1.288	-	-	0.06	0.635	0.818
	LTE Band 66	20M	QPSK	50	0	-	Back	15mm	Ant 31	ECI 4	132322	1745	21.08	21.50	1.102	-	-	-0.19	0.255	0.281
	LTE Band 66	20M	QPSK	1	0	-	Back	15mm	Ant 11	ECI 4	132322	1745	24.35	25.00	1.161	-	-	0.17	0.437	0.508
56	FR1 n66	40M	QPSK	108	54	DFT-15	Back	15mm	Ant 13	ECI 4	349000	1745	22.43	23.80	1.371	-	-	-0.06	0.514	0.705
	FR1 n66	40M	QPSK	1	1	DFT-15	Back	15mm	Ant 31	ECI 4	349000	1745	20.25	21.30	1.274	-	-	-0.14	0.221	0.281
	FR1 n66	40M	QPSK	108	54	DFT-15	Back	15mm	Ant 11	ECI 4	349000	1745	23.13	24.30	1.309	-	-	0.05	0.375	0.491
1900MHz																				
57	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	15mm	Ant 13	ECI 4	661	1880	27.30	28.00	1.175	-	-	0.02	0.308	0.362
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	15mm	Ant 31	ECI 4	661	1880	29.56	30.20	1.159	-	-	0.07	0.266	0.308
58	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 13	ECI 4	9400	1880	22.30	23.70	1.380	-	-	0.03	0.454	0.627
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 31	ECI 4	9400	1880	20.51	21.20	1.172	-	-	-0.08	0.231	0.271
59	LTE Band 2	20M	QPSK	1	0	-	Back	15mm	Ant 13	ECI 4	18900	1880	22.28	23.30	1.265	-	-	-0.07	0.425	0.538
	LTE Band 2	20M	QPSK	1	0	-	Back	15mm	Ant 31	ECI 4	18900	1880	20.32	20.80	1.117	-	-	-0.02	0.237	0.265
60	FR1 n2	20M	QPSK	50	28	DFT-15	Back	15mm	Ant 13	ECI 4	376000	1880	21.71	23.30	1.442	-	-	0.01	0.459	0.662
	FR1 n2	20M	QPSK	1	1	DFT-15	Back	15mm	Ant 31	ECI 4	376000	1880	20.45	21.80	1.365	-	-	-0.13	0.258	0.352
	FR1 n2	20M	QPSK	1	1	DFT-15	Back	15mm	Ant 11	ECI 4	376000	1880	23.15	24.50	1.365	-	-	0.12	0.295	0.403
2600MHz																				
61	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 13	ECI 4	21100	2535	21.57	22.50	1.239	-	-	-0.05	0.740	0.917
	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 13	ECI 10	21100	2535	16.71	17.50	1.199	-	-	0.01	0.213	0.255
	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 31	ECI 4	21100	2535	21.91	22.50	1.146	-	-	0.15	0.268	0.307
	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 11	ECI 4	21100	2535	23.95	25.00	1.274	-	-	0.14	0.634	0.807
62	LTE Band 41	20M	QPSK	1	0	-	Back	15mm	Ant 13	ECI 4	40620	2593	24.12	25.00	1.225	62.9	1.006	0.08	0.722	0.889
	LTE Band 41	20M	QPSK	1	0	-	Back	15mm	Ant 13	ECI 10	40620	2593	19.37	20.00	1.156	62.9	1.006	0.05	0.195	0.227
	LTE Band 41	20M	QPSK	1	0	-	Back	15mm	Ant 31	ECI 4	40620	2593	21.96	22.00	1.009	62.9	1.006	-0.03	0.253	0.257
	LTE Band 41C	20M	QPSK	1	0	-	Back	15mm	Ant 11	ECI 4	40620+40422	2593+2573.2	24.27	25.00	1.183	62.9	1.006	-0.05	0.487	0.580
63	FR1 n7	50M	QPSK	135	68	DFT-15	Back	15mm	Ant 13	ECI 4	507000	2535	20.95	22.00	1.274	-	-	0.03	0.649	0.827
	FR1 n7	50M	QPSK	135	68	DFT-15	Back	15mm	Ant 31	ECI 4	507000	2535	20.66	21.50	1.213	-	-	0.08	0.225	0.273
	FR1 n7	50M	QPSK	135	68	DFT-15	Back	15mm	Ant 11	ECI 4	507000	2535	22.23	23.50	1.340	-	-	0.05	0.515	0.690
	FR1 n41	100M	QPSK	1	1	DFT-30	Back	15mm	Ant 13	ECI 4	518598	2592.99	20.90	22.00	1.288	-	-	0.11	0.589	0.759
	FR1 n41	100M	QPSK	1	1	DFT-30	Back	15mm	Ant 31	ECI 4	518598	2592.99	20.85	21.70	1.216	-	-	-0.14	0.234	0.285
64	FR1 n41	100M	QPSK	135	69	DFT-30	Back	15mm	Ant 11	ECI 4	518598	2592.99	22.88	24.20	1.355	-	-	0.03	0.729	0.988
	FR1 n41	100M	QPSK	135	69	DFT-30	Back	15mm	Ant 11	ECI 9	518598	2592.99	14.76	16.20	1.393	-	-	0.08	0.126	0.176
3500MHz-4100MHz																				
65	FR1 n77 Part27Q	100M	QPSK	135	69	DFT-30	Back	15mm	Ant 11	ECI 4	633332	3499.98	20.57	21.20	1.156	-	-	0.03	0.291	0.336



FCC SAR Test Report

Report No. : FA5N1402-01

	FR1 n77 Part270	100M	QPSK	1	1	DFT-30	Front	15mm	Ant 12	ECl 4	656000	3840	18.60	19.50	1.230	-	-	0.05	0.122	0.150
	FR1 n77 Part270	100M	QPSK	135	69	DFT-30	Back	15mm	Ant 21	ECl 4	656000	3840	16.73	17.50	1.194	-	-	0.03	0.233	0.278
	FR1 n77 Part270	100M	QPSK	135	69	DFT-30	Back	15mm	Ant 23	ECl 4	633332	3499.98	17.46	18.50	1.271	-	-	0.03	0.166	0.211
66	FR1 n78 Part270	100M	QPSK	1	1	DFT-30	Back	15mm	Ant 11	ECl 4	650000	3750	20.90	21.70	1.202	-	-	-0.01	0.389	0.468
	FR1 n78 Part270	100M	QPSK	135	69	DFT-30	Front	15mm	Ant 12	ECl 4	650000	3750	19.63	21.00	1.371	-	-	0.05	0.165	0.226
	FR1 n78 Part270	100M	QPSK	135	69	DFT-30	Back	15mm	Ant 21	ECl 4	650000	3750	17.03	18.50	1.403	-	-	0.03	0.137	0.192
	FR1 n78 Part270	100M	QPSK	1	1	DFT-30	Back	15mm	Ant 23	ECl 4	650000	3750	19.40	21.00	1.445	-	-	0.11	0.289	0.418

Plot 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)
WLAN&BT																
67	Bluetooth	DH5 1Mbps	Back	15mm	Ant 22	Full	39	2441	10.30	11.50	1.318	76.6	1.305	0.05	0.010	0.017
68	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 22	Standalone	6	2437	16.00	17.50	1.413	99.64	1.004	-0.11	0.093	0.132
69	WLAN5GHz	802.11a 6Mbps	Back	15mm	Ant 22	Standalone	48	5240	16.63	18.50	1.537	97.20	1.029	-0.03	0.599	0.947
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Simultaneous	46	5230	14.31	16.00	1.477	95.59	1.046	0.05	0.365	0.564
70	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Standalone	142	5710	16.10	18.00	1.550	95.59	1.046	-0.06	0.340	0.551
71	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Standalone	159	5795	16.65	18.50	1.533	95.59	1.046	-0.17	0.379	0.608
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 22	Simultaneous	155	5775	14.09	16.00	1.553	95.59	1.046	0.05	0.232	0.377



12.4 Product specific 10g SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
1750MHz																				
72	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	0mm	Ant 13	ECI 5	1513	1752.6	19.85	21.20	1.365	-	-	0.05	1.690	2.306
73	LTE Band 66	20M	QPSK	1	0	-	Top Side	0mm	Ant 13	ECI 5	132572	1770	20.36	21.30	1.242	-	-	-0.05	1.830	2.272
	LTE Band 66	20M	QPSK	50	0	-	Back	0mm	Ant 11	ECI 5	132322	1745	21.98	22.50	1.127	-	-	-0.12	1.610	1.815
	FR1 n66	40M	QPSK	108	54	DFT-15	Top Side	0mm	Ant 13	ECI 5	349000	1745	19.43	20.80	1.371	-	-	0.07	1.350	1.851
74	FR1 n66	40M	QPSK	108	54	DFT-15	Back	0mm	Ant 11	ECI 5	349000	1745	21.13	22.30	1.309	-	-	-0.07	1.510	1.977
1900MHz																				
75	GSM1900	-	-	-	-	GPRS 1 TX Slot	Top Side	0mm	Ant 13	ECI 5	810	1909.8	28.34	29.30	1.247	-	-	0.07	1.890	2.358
76	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	0mm	Ant 13	ECI 5	9262	1852.4	19.06	20.20	1.300	-	-	-0.15	1.830	2.379
77	LTE Band 2	20M	QPSK	1	0	-	Top Side	0mm	Ant 13	ECI 5	19100	1900	19.13	20.30	1.309	-	-	-0.19	1.770	2.317
78	FR1 n2	20M	QPSK	50	28	DFT-15	Top Side	0mm	Ant 13	ECI 5	376000	1880	18.18	19.80	1.452	-	-	0.02	1.650	2.396
2600MHz																				
	LTE Band 7	20M	QPSK	1	0	-	Top Side	0mm	Ant 13	ECI 5	21100	2535	18.23	19.00	1.194	-	-	0.14	1.980	2.364
79	LTE Band 7	20M	QPSK	1	0	-	Left Side	0mm	Ant 11	ECI 5	20850	2510	18.62	19.50	1.225	-	-	0.1	1.940	2.376
	LTE Band 41	20M	QPSK	1	0	-	Top Side	0mm	Ant 13	ECI 5	40620	2593	20.86	21.50	1.159	62.9	1.006	-0.19	2.010	2.343
80	LTE Band 41	20M	QPSK	1	0	-	Left Side	0mm	Ant 11	ECI 5	39750	2506	20.40	21.00	1.148	62.9	1.006	0.1	2.040	2.356
	LTE Band 41	20M	QPSK	1	0	-	Left Side	0mm	Ant 11	ECI 5	39750	2506	20.40	21.00	1.148	62.9	1.006	0.04	2.010	2.322
	FR1 n7	50M	QPSK	135	68	DFT-15	Top Side	0mm	Ant 13	ECI 5	507000	2535	16.33	17.50	1.309	-	-	0.17	1.430	1.872
81	FR1 n7	50M	QPSK	135	68	DFT-15	Left Side	0mm	Ant 11	ECI 5	507000	2535	17.73	19.00	1.340	-	-	0.05	1.870	2.505
82	FR1 n41	100M	QPSK	1	1	DFT-30	Top Side	0mm	Ant 13	ECI 5	518598	2592.99	17.40	18.50	1.288	-	-	-0.07	1.580	2.035
	FR1 n41	100M	QPSK	1	1	DFT-30	Left Side	0mm	Ant 11	ECI 5	518598	2592.99	16.40	17.70	1.349	-	-	0.03	1.240	1.673
3500MHz-4100MHz																				
83	FR1 n77 Part27Q	100M	QPSK	1	1	DFT-30	Left Side	0mm	Ant 11	ECI 5	633332	3499.98	17.08	17.70	1.153	-	-	0.13	0.945	1.090
84	FR1 n78 Part27Q	100M	QPSK	1	1	DFT-30	Left Side	0mm	Ant 11	ECI 5	633332	3499.98	16.85	17.70	1.216	-	-	-0.09	0.982	1.194

Plot 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)
WLAN																
85	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 22	Standalone	54	5270	16.17	18.00	1.525	95.59	1.046	0.05	0.969	1.546
86	WLAN5GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 22	Standalone	142	5710	16.10	18.00	1.550	95.59	1.046	0.13	0.701	1.137

**12.5 Repeated SAR Measurement**

<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	LTE Band 41	20M	QPSK	1	0	-	Left Side	0mm	Ant 11	ECI 5	39750	2506	20.40	21.00	1.148	62.9	1.006	0.1	2.040	1	2.356
2nd	LTE Band 41	20M	QPSK	1	0	-	Left Side	0mm	Ant 11	ECI 5	39750	2506	20.40	21.00	1.148	62.9	1.006	0.04	2.010	1.015	2.322

General Note:

1. 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.
2. The ratio is the difference in percentage between original and repeated *measured SAR*.
3. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

13. Simultaneous Transmission Analysis

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

General Note:

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

13.1 5G NR + LTE + WLAN + BT Sim-Tx analysis

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

Since BT do not employ time-averaging, 1gSAR and 10gSAR measurement for 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

$$\begin{aligned} x \cdot A + y \cdot B + m &\leq 1 \\ x + y &\leq 1 \\ g + m &\leq 1 \end{aligned}$$

Where, A is normalized reported time-averaged SAR exposure ratio from LTE, and $A \leq 1.0$; 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 $B \leq 1.0$.

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

$$x \cdot A + y \cdot B + m \leq 1.0 \quad (1)$$

$$x \cdot A + y \cdot B \leq x \cdot \max(A, B) + (g-x) \cdot \max(A, B) \leq \max(A, B)$$

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

If $A + m \leq 1.0$ and $B + m \leq 1.0$ can be proven, then " $x \cdot A + y \cdot B + m \leq 1.0$ ". 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. $y \cdot B + m \leq 1.0$, and
- iii. $x \cdot A + y \cdot B \leq 1.0$

Note iii. is covered in Part 2 report; i. and ii. should be addressed in Part 1 report.

Above analysis is also apply to LTE 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.

13.2 Head Exposure Conditions

WWAN Band	Exposure Position	1	3	10	17	1+3	1+10+17
		WWAN	WLAN2.4GHz Ant 22	WLAN5GHz Ant 22	Bluetooth Ant 22	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)
All Band Ant 11	Right Cheek	1.111	0.274	0.270	0.053	1.39	1.43
	Right Tilted	0.239	0.290	0.330	0.060	0.53	0.63
	Left Cheek	0.584	0.576	0.688	0.088	1.16	1.36
	Left Tilted	0.175	0.562	0.741	0.081	0.74	1.00
All Band Ant 12	Right Cheek	0.880	0.274	0.270	0.053	1.15	1.20
	Right Tilted	0.512	0.290	0.330	0.060	0.80	0.90
	Left Cheek	0.308	0.576	0.688	0.088	0.88	1.08
	Left Tilted	0.251	0.562	0.741	0.081	0.81	1.07
All Band Ant 13	Right Cheek	0.931	0.274	0.270	0.053	1.21	1.25
	Right Tilted	1.045	0.290	0.330	0.060	1.34	1.44
	Left Cheek	0.661	0.576	0.688	0.088	1.24	1.44
	Left Tilted	0.621	0.562	0.741	0.081	1.18	1.44
All Band Ant 21	Right Cheek	0.397	0.274	0.270	0.053	0.67	0.72
	Right Tilted	0.428	0.290	0.330	0.060	0.72	0.82
	Left Cheek	0.622	0.576	0.688	0.088	1.20	1.40
	Left Tilted	0.615	0.562	0.741	0.081	1.18	1.44
All Band Ant 23	Right Cheek	0.277	0.274	0.270	0.053	0.55	0.60
	Right Tilted	0.154	0.290	0.330	0.060	0.44	0.54
	Left Cheek	0.658	0.576	0.688	0.088	1.23	1.43
	Left Tilted	0.329	0.562	0.741	0.081	0.89	1.15
All Band Ant 31	Right Cheek	0.808	0.274	0.270	0.053	1.08	1.13
	Right Tilted	0.393	0.290	0.330	0.060	0.68	0.78
	Left Cheek	0.546	0.576	0.688	0.088	1.12	1.32
	Left Tilted	0.470	0.562	0.741	0.081	1.03	1.29

Exposure Position	10	17	10+17
	WLAN5GHz Ant 22	Bluetooth Ant 22	Summed
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Right Cheek	0.270	0.053	0.32
Right Tilted	0.330	0.060	0.39
Left Cheek	0.976	0.088	1.06
Left Tilted	0.741	0.081	0.82

**13.3 Hotspot Exposure Conditions**

WWAN Band	Exposure Position	1	3	10	17	1+3	1+10+17
		WWAN	WLAN2.4GHz Ant 22	WLAN5GHz Ant 22	Bluetooth Ant 22	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)
All Band Ant 11	Front	0.189	0.138	0.219	0.024	0.33	0.43
	Back	0.526	0.306	0.569	0.046	0.83	1.10
	Left side	0.636				0.64	0.64
	Right side		0.169	0.193	0.029	0.17	0.19
	Top side	0.054	0.200	0.476	0.036	0.25	0.53
	Bottom side					0.00	0.00
All Band Ant 12	Front	0.368	0.138	0.219	0.024	0.51	0.59
	Back	0.378	0.306	0.569	0.046	0.68	0.95
	Left side	0.403				0.40	0.40
	Right side		0.169	0.193	0.029	0.17	0.19
	Top side	0.199	0.200	0.476	0.036	0.40	0.68
	Bottom side					0.00	0.00
All Band Ant 13	Front	0.362	0.138	0.219	0.024	0.50	0.58
	Back	0.710	0.306	0.569	0.046	1.02	1.28
	Left side	0.181				0.18	0.18
	Right side		0.169	0.193	0.029	0.17	0.19
	Top side	0.839	0.200	0.476	0.036	1.04	1.32
	Bottom side					0.00	0.00
All Band Ant 21	Front	0.088	0.138	0.219	0.024	0.23	0.31
	Back	0.216	0.306	0.569	0.046	0.52	0.79
	Left side					0.00	0.00
	Right side	0.068	0.169	0.193	0.029	0.24	0.26
	Top side	0.140	0.200	0.476	0.036	0.34	0.62
	Bottom side					0.00	0.00
All Band Ant 23	Front	0.154	0.138	0.219	0.024	0.29	0.37
	Back	0.319	0.306	0.569	0.046	0.63	0.89
	Left side					0.00	0.00
	Right side	0.368	0.169	0.193	0.029	0.54	0.56
	Top side	0.117	0.200	0.476	0.036	0.32	0.59
	Bottom side					0.00	0.00
All Band Ant 31	Front	0.433	0.138	0.219	0.024	0.57	0.65
	Back	0.730	0.306	0.569	0.046	1.04	1.30
	Left side	0.354				0.35	0.35
	Right side	0.486	0.169	0.193	0.029	0.66	0.68
	Top side		0.200	0.476	0.036	0.20	0.48
	Bottom side	0.824				0.82	0.82

13.4 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	3	10	17	1+3	1+10+17
		WWAN	WLAN2.4GHz Ant 22	WLAN5GHz Ant 22	Bluetooth Ant 22	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)
All Band Ant 11	Front	0.389	0.082	0.337	0.012	0.47	0.74
	Back	0.830	0.135	0.587	0.019	0.97	1.44
All Band Ant 12	Front	0.273	0.082	0.337	0.012	0.36	0.62
	Back	0.247	0.135	0.587	0.019	0.38	0.85
All Band Ant 13	Front	0.543	0.082	0.337	0.012	0.63	0.89
	Back	0.830	0.135	0.587	0.019	0.97	1.44
All Band Ant 21	Front	0.077	0.082	0.337	0.012	0.16	0.43
	Back	0.166	0.135	0.587	0.019	0.30	0.77
All Band Ant 23	Front	0.105	0.082	0.337	0.012	0.19	0.45
	Back	0.243	0.135	0.587	0.019	0.38	0.85
All Band Ant 31	Front	0.234	0.082	0.337	0.012	0.32	0.58
	Back	0.368	0.135	0.587	0.019	0.50	0.97

WWAN Band	Exposure Position	10	17	10+17
		WLAN5GHz Ant 22	Bluetooth Ant 22	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
All Band Ant 11	Front	0.337	0.012	0.35
	Back	1.011	0.019	1.03

13.5 Product specific 10g SAR Exposure Conditions

Remark:

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

WWAN Band	Exposure Position	1	10	1+10
		WWAN	WLAN5GHz Ant 22	Summed
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
All Band Ant 11	Front	0.834	0.672	1.51
	Back	2.406	1.162	3.57
	Left side	2.992		2.99
	Right side		1.546	1.55
	Top side		1.137	1.14
	Bottom side			0.00
All Band Ant 12	Front		0.672	0.67
	Back		1.162	1.16
	Left side			0.00
	Right side		1.546	1.55
	Top side		1.137	1.14
	Bottom side			0.00
All Band Ant 13	Front		0.672	0.67
	Back	1.654	1.162	2.82
	Left side			0.00
	Right side		1.546	1.55
	Top side	2.657	1.137	3.79
	Bottom side			0.00
All Band Ant 21	Front		0.672	0.67
	Back		1.162	1.16
	Left side			0.00
	Right side		1.546	1.55
	Top side		1.137	1.14
	Bottom side			0.00
All Band Ant 23	Front		0.672	0.67
	Back		1.162	1.16
	Left side			0.00
	Right side		1.546	1.55
	Top side		1.137	1.14
	Bottom side			0.00
All Band Ant 31	Front		0.672	0.67
	Back		1.162	1.16
	Left side			0.00
	Right side		1.546	1.55
	Top side		1.137	1.14
	Bottom side			0.00

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14. Uncertainty Assessment

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

15. References

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

Appendixes

Please refer to separated files for the following appendixes

Appendix A. Plots of System Performance Check

Appendix B. Plots of High SAR and PD Measurement

Appendix C. DASY Calibration Certificate

Appendix D. Test Setup Photos

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