

FCC SAR Test Report

APPLICANT : vivo Mobile Communication Co., Ltd.
EQUIPMENT : Mobile Phone
BRAND NAME : vivo
MODEL NAME : V2549
FCC ID : 2AUCY-V2549
STANDARD : FCC 47 CFR Part 2 (2.1093)

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

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



Approved by: Si Zhang



Sporton International Inc. (Kunshan)

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

Table of Contents

1. Statement of Compliance	4
2. Administration Data	5
3. Guidance Applied	5
4. Equipment Under Test (EUT) Information	6
4.1 General Information.....	6
4.2 General LTE SAR Test and Reporting Considerations	7
5. Proximity Sensor Triggering Test.....	10
6. RF Exposure Limits.....	11
6.1 Uncontrolled Environment	11
6.2 Controlled Environment.....	11
7. Specific Absorption Rate (SAR)	12
7.1 Introduction	12
7.2 SAR Definition	12
8. System Description and Setup.....	13
8.1 E-Field Probe	14
8.2 Data Acquisition Electronics (DAE)	14
8.3 Phantom.....	15
8.4 Device Holder.....	16
9. Measurement Procedures.....	17
9.1 Spatial Peak SAR Evaluation	17
9.2 Power Reference Measurement.....	18
9.3 Area Scan.....	18
9.4 Zoom Scan.....	19
9.5 Volume Scan Procedures.....	19
9.6 Power Drift Monitoring.....	19
10. Test Equipment List	20
11. System Verification	21
11.1 Tissue Simulating Liquids	21
11.2 Tissue Verification.....	21
11.3 System Performance Check Results	22
12. RF Exposure Positions	23
12.1 Ear and handset reference point	23
12.2 Definition of the cheek position	24
12.3 Definition of the tilt position	25
12.4 Body Worn Accessory	26
12.5 Product Specific 10g SAR Exposure	27
12.6 Wireless Router.....	27
13. Conducted RF Output Power (Unit: dBm)	28
14. Antenna Location	38
15. SAR Test Results	39
15.1 Head SAR	42
15.2 Hotspot SAR	45
15.3 Body Worn Accessory SAR	49
15.4 Product specific 10g SAR.....	51
15.5 Repeated SAR Measurement	52
16. Simultaneous Transmission Analysis	53
16.1 Head Exposure Conditions.....	54
16.2 Hotspot Exposure Conditions.....	54
16.3 Body-Worn Accessory Exposure Conditions	55
16.4 Product specific 10g SAR Exposure Conditions.....	55
17. Uncertainty Assessment.....	56
18. References	57
Appendixes	58
Appendix A. Plots of System Performance Check.....	58
Appendix B. Plots of High SAR Measurement	58
Appendix C. DASY Calibration Certificate.....	58
Appendix D. Test Setup Photos.....	58
Appendix E. Conducted RF Output Power Table	58
Appendix F. Power reduction mechanism verification	58

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA571001	Rev. 01	Initial issue of report.	Aug. 15, 2025

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **vivo Mobile Communication Co., Ltd., Mobile Phone, V2549**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 10mm)	Body-worn (Separation 15mm)	Highest Simultaneous Transmission
			1g SAR (W/kg)			1g SAR (W/kg)
Licensed	GSM	GSM850	0.71	0.43	0.30	1.44
		GSM1900	0.83	1.00	0.47	
	WCDMA	WCDMA II	0.22	0.82	0.51	
		WCDMA IV	0.14	0.57	0.39	
		WCDMA V	0.94	0.34	0.25	
	LTE	LTE Band 2	0.19	0.81	0.47	
		LTE Band 7	0.39	0.59	1.11	
		LTE Band 13	0.72	0.25	0.23	
		LTE Band 26/5	0.83	0.31	0.25	
		LTE Band 41/38	0.29	0.58	1.14	
LTE Band 66/4		0.15	0.61	0.42		
DTS	WLAN	2.4GHz WLAN	0.82	0.42	0.18	1.44
NII		5GHz WLAN	0.48	0.36	0.28	1.42
DSS	Bluetooth	2.4GHz Bluetooth	0.27	<0.10	<0.10	1.17
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	2.09			2.45
NII	WLAN	5GHz WLAN	0.95			2.45
Date of Testing:			2025/7/29 ~ 2025/8/9			
Remark:						
1. This device supports LTE B4/B5/B38 and B66/B26/B41. Since the supported frequency span for LTE B4/B5/B38 falls completely within the support's frequency span for LTE B66/B26/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/B41.						

Declaration of Conformity:

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

Comments and Explanations:

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

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

2. Administration Data

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR06-KS	CN1257	314309

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

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

3. Guidance Applied

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

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

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Phone
Brand Name	vivo
Model Name	V2549
FCC ID	2AUCY-V2549
IMEI Code	869820089994975, 869820089994439, 869820089994173, 869820089993696
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850MHz ~ 1910MHz 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 13: 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 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 WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11 VHT20/VHT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	MP_0.1
SW Version	PD2513GF_EX_A_15.0.9.32.W30
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Production Unit
Remark: - This device supports VoIP in GPRS, EGPRS, WCDMA, and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation. - 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 WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only). - This device does not support DTM operation and support GRPS/EGPRS mode up to multi-slot class 33. - For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). - The device implements Proximity sensors/receiver detect mechanism/hotspot trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). The device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to appendix E. power table.	

7. For WLAN transmitter, while the device WLAN is transmitting simultaneously with the WWAN/BT antenna, the device WLAN power will be reduced power at head, hotspot, body-worn and extremity exposure conditions.
8. When the user is making a call-in head scenario and the receiver detect mechanism trigger, WCDMA II/IV and LTE B2/4/7/38/41/66 at Antenna 13 cannot be transmitted, so the Head SAR test for WCDMA II/IV and LTE B2/4/7/38/41/66 at Antenna 13 were not required.

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05							
FCC ID	2AUCY-V2549						
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 13: 777 MHz ~ 787 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 13: 5MHz, 10MHz LTE Band 26: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz						
uplink modulations used	QPSK / 16QAM / 64QAM						
LTE Voice / Data requirements	Voice and Data						
LTE Release Version	R10						
CA Support	Not Supported						
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3						
	Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})					MPR (dB)
		1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
	QPSK	> 5	> 4	> 8	> 12	> 16	> 18
	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18
	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18
	256 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18
		> 5	> 4	> 8	> 12	> 16	> 18
≥ 1							≤ 5
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)						
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.						
Power reduction applied to satisfy SAR compliance	Yes, when operating in Proximity sensors/receiver/hotspot detect mechanism; head/body-worn/hotspot/extremity will trigger reduced power for some bands applied to satisfy SAR compliance, the detail please referred to section 13.						

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844				
LTE Band 7												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510				
M	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560				
LTE Band 13												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)					
L	23205		779.5		23230		782					
M	23230		782									
H	23255		784.5									
LTE Band 26												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz			
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5	26965	841.5
LTE Band 38												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	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	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)	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	40620	2593	40620	2593
HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5				
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680				
LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

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

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

2) LTE Bands tune up:

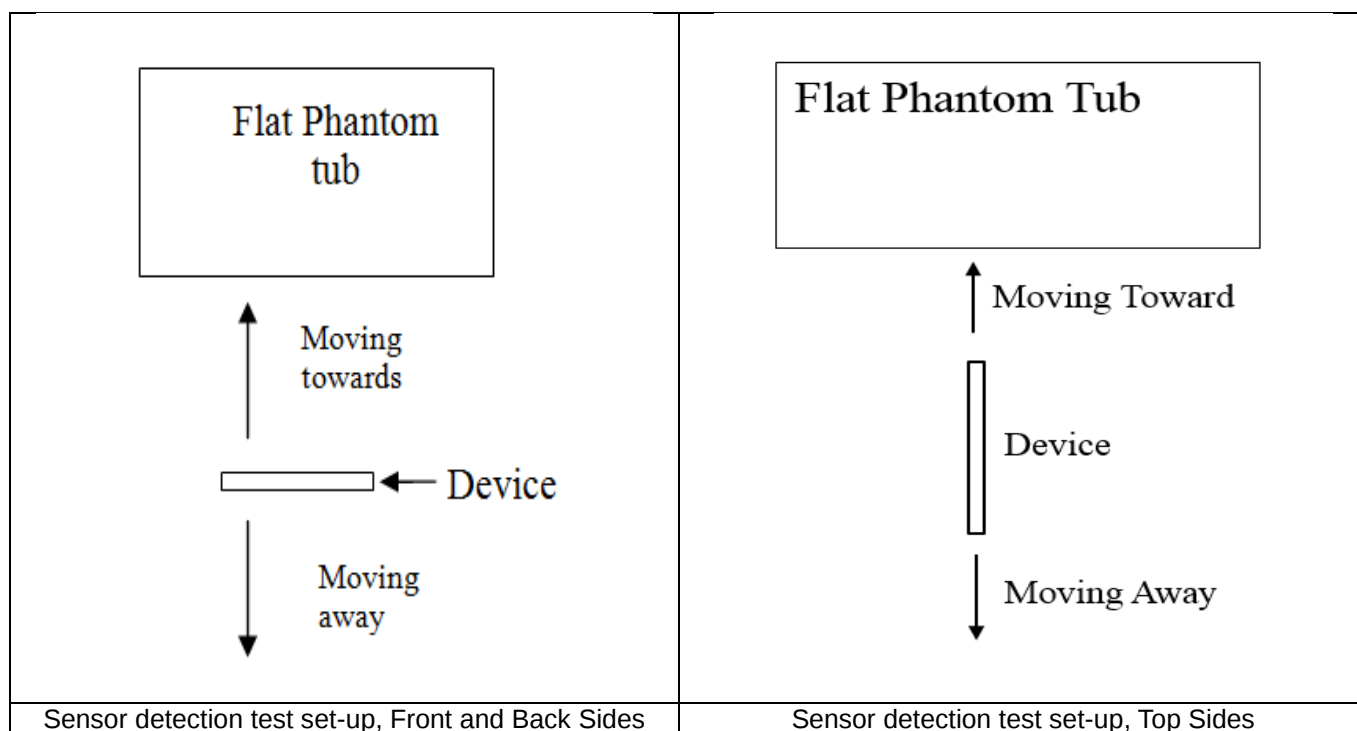
Band	Antenna	Full Power	DSI 2	DSI 3	DSI 6	DSI 7	DSI 4
			Receiver on	Head Simultaneous	Hotspot	Sensor off	Sensor on
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
LTE Band 5	Ant 13	24.8	22.8	22.3	24.8	24.8	24.8
LTE Band 26	Ant 13	24.8	22.8	22.3	24.8	24.8	24.8
LTE Band 5	Ant 31	24.8	24.8	24.8	24.8	24.8	24.8
LTE Band 26	Ant 31	24.8	24.8	24.8	24.8	24.8	24.8
LTE Band 4	Ant 13	24.8			20.3	24.8	21.8
LTE Band 66	Ant 13	24.8			19.3	24.8	21.8
LTE Band 4	Ant 31	24.8	24.8	24.8	20.3	21.8	21.8
LTE Band 66	Ant 31	24.8	24.8	24.8	20.3	21.3	21.3
LTE Band 38	Ant 13	24.8			18.3	24.8	19.8
LTE Band 41	Ant 13	24.8			18.8	24.8	20.3
LTE Band 38	Ant 31	24.8	24.8	24.8	23.3	24.8	24.8
LTE Band 41	Ant 31	24.8	24.8	24.8	23.3	24.8	24.8

Note: For some bands/antennas at some exposure conditions which cannot be covered were fully tested for RF exposure compliance.

5. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance>:

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (2600MHz) and lowest frequency (1750MHz) was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the top end of the phone are utilized to determine when the device comes in proximity of the user's body or finger or hand at the front or back or top side of the device. There is no need to do sensor coverage testing for the proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna.
3. The sensors can use to detect the proximity of the user's body or handheld states at the front or back or top side of the device use a detection threshold distance. When front/back/top sides of body or handheld condition is detected reduced power will be active. The trigger distance shown in the sections below.
4. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed.



<Sensor on for ANT13>

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Top Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	8	8	12	12	14	14

6. RF Exposure Limits

6.1 Uncontrolled Environment

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

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

7. Specific Absorption Rate (SAR)

7.1 Introduction

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

7.2 SAR Definition

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

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

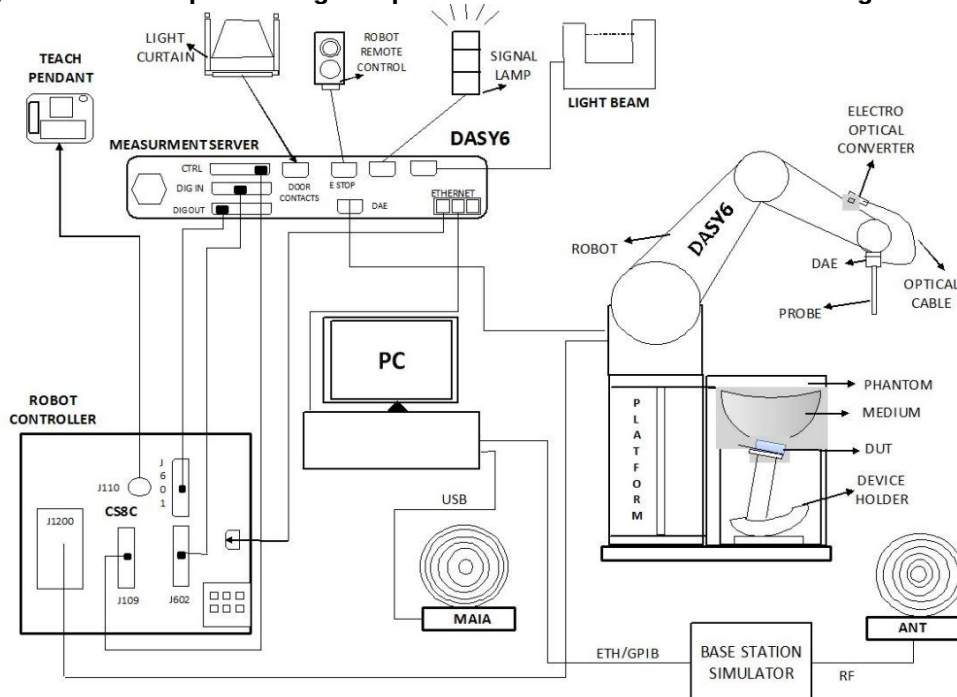
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

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



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

8.1 E-Field Probe

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

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	4 MHz – 10 GHz Linearity: ± 0.2 dB (30 MHz – 10 GHz)	
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 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	

8.2 Data Acquisition Electronics (DAE)

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

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



Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

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

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

<ELI Phantom>

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

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

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

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

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



Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values 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

9.2 Power Reference Measurement

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

9.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in 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.	

9.4 Zoom Scan

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

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

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

9.5 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.

9.6 Power Drift Monitoring

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

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	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	Mar. 13, 2025	Mar. 12, 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. 16, 2025
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	Sep. 23, 2022	Sep. 21, 2025
SPEAG	Data Acquisition Electronics	DAE4	1691	Jun. 04, 2025	Jun. 03, 2026
SPEAG	Dosimetric E-Field Probe	EX3DV4	7706	May 22, 2025	May 21, 2026
SPEAG	Dosimetric E-Field Probe	EX3DV4	7630	Aug. 22, 2024	Aug. 21, 2025
SPEAG	SAM Twin Phantom	SAM Twin	TP-2022	NCR	NCR
Beichuang	Thermo-Hygrometer	HTC-1	1959631	May 27, 2025	May 26, 2026
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio Communication Analyzer	MT8820C	6201563900	Jul. 02, 2025	Jul. 01, 2026
Agilent	ENA Series Network Analyzer	E5071C	MY46112129	Jul. 02, 2025	Jul. 01, 2026
SPEAG	Dielectric Probe Kit	DAK-3.5	1144	Aug. 20, 2024	Aug. 19, 2025
Anritsu	Vector Signal Generator	MG3710A	6201682672	Jan. 03, 2025	Jan. 02, 2026
Rohde & Schwarz	Power Meter	NRVD	102081	Jul. 02, 2025	Jul. 01, 2026
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	Jul. 02, 2025	Jul. 01, 2026
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	Jul. 02, 2025	Jul. 01, 2026
R&S	BLUETOOTH TESTER	CBT	101246	Jul. 03, 2025	Jul. 02, 2026
Rohde & Schwarz	Spectrum Analyzer	FSV7	101631	Oct. 11, 2024	Oct. 10, 2025
TES	DIGITAC THERMOMETER	TYPE-K	220305411	Jan. 02, 2025	Jan. 01, 2026
ARRA	Power Divider	A3200-2	N/A	Note 1	
MCL	Attenuation1	BW-S10W5+	N/A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note 1	

Note:

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

11. System Verification

11.1 Tissue Simulating Liquids

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

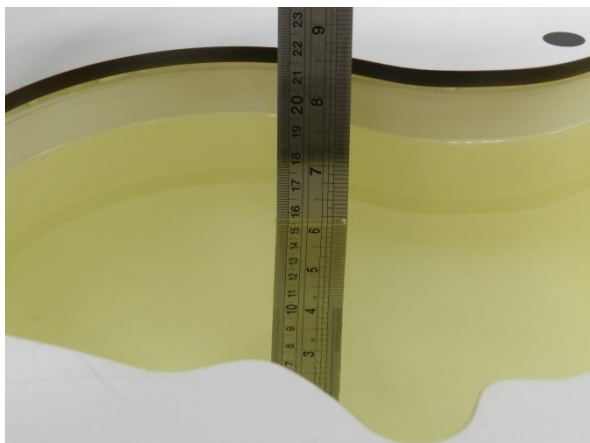


Fig 11.1 Photo of Liquid Height for Head SAR



Fig 11.2 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (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)	Liquid Temp (°C)	Conductivity (σ)	Permittivity (εr)	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
750	22.7	0.887	42.9	0.89	41.9	-0.34	2.39	±5.0	2025-07-29
750	22.6	0.889	42.9	0.89	41.9	-0.11	2.39	±5.0	2025-08-03
835	22.7	0.915	42.5	0.9	41.5	1.67	2.41	±5.0	2025-07-30
835	22.8	0.921	42.4	0.9	41.5	2.33	2.17	±5.0	2025-08-04
1750	22.7	1.38	40.7	1.37	40.1	0.73	1.50	±5.0	2025-07-31
1750	22.7	1.37	40.7	1.37	40.1	0.00	1.50	±5.0	2025-08-05
1900	22.8	1.46	39.1	1.4	40.0	4.29	-2.25	±5.0	2025-08-01
1900	22.7	1.45	39.2	1.4	40.0	3.57	-2.00	±5.0	2025-08-06
2450	22.7	1.77	39.3	1.8	39.2	-1.67	0.26	±5.0	2025-08-08
2600	22.6	1.92	38.8	1.96	39.0	-2.04	-0.51	±5.0	2025-08-02
2600	22.7	1.92	38.9	1.96	39.0	-2.04	-0.26	±5.0	2025-08-07
5250	22.7	4.7	36.2	4.71	35.95	-0.21	0.70	±5.0	2025-08-09
5600	22.7	5.01	35.8	5.07	35.5	-1.18	0.85	±5.0	2025-08-09
5750	22.7	5.22	35.6	5.22	35.35	0.00	0.71	±5.0	2025-08-09

11.3 System Performance Check Results

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

Date	Frequency (MHz)	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 (%)
2025-07-29	750	50.00	D750V3 - 1087	EX3DV4 - SN7706	DAE4 Sn1691	0.403	8.680	8.060	-7.14	0.276	5.610	5.520	-1.60
2025-08-03	750	50.00	D750V3 - 1087	EX3DV4 - SN7706	DAE4 Sn1691	0.405	8.680	8.100	-6.68	0.277	5.610	5.540	-1.25
2025-07-30	835	50.00	D835V2 - 4d298	EX3DV4 - SN7706	DAE4 Sn1691	0.486	9.890	9.720	-1.72	0.328	6.450	6.560	1.71
2025-08-04	835	50.00	D835V2 - 4d298	EX3DV4 - SN7706	DAE4 Sn1691	0.488	9.890	9.760	-1.31	0.330	6.450	6.600	2.33
2025-07-31	1750	50.00	D1750V2 - 1090	EX3DV4 - SN7706	DAE4 Sn1691	1.910	36.600	38.200	4.37	1.060	19.500	21.200	8.72
2025-08-05	1750	50.00	D1750V2 - 1090	EX3DV4 - SN7706	DAE4 Sn1691	1.860	36.600	37.200	1.64	1.050	19.500	21.000	7.69
2025-08-01	1900	50.00	D1900V2 - 5d170	EX3DV4 - SN7706	DAE4 Sn1691	2.020	39.100	40.400	3.32	1.100	20.600	22.000	6.80
2025-08-06	1900	50.00	D1900V2 - 5d170	EX3DV4 - SN7706	DAE4 Sn1691	2.010	39.100	40.200	2.81	1.100	20.600	22.000	6.80
2025-08-08	2450	50.00	D2450V2 - 1095	EX3DV4 - SN7630	DAE4 Sn1691	2.640	52.600	52.800	0.38	1.270	24.700	25.400	2.83
2025-08-02	2600	50.00	D2600V2 - 1112	EX3DV4 - SN7706	DAE4 Sn1691	2.600	55.100	52.000	-5.63	1.210	24.800	24.200	-2.42
2025-08-07	2600	50.00	D2600V2 - 1112	EX3DV4 - SN7706	DAE4 Sn1691	2.590	55.100	51.800	-5.99	1.200	24.800	24.000	-3.23
2025-08-09	5250	50.00	D5GHzV2 - 1113	EX3DV4 - SN7630	DAE4 Sn1691	4.020	81.500	80.400	-1.35	1.180	23.300	23.600	1.29
2025-08-09	5600	50.00	D5GHzV2 - 1113	EX3DV4 - SN7630	DAE4 Sn1691	4.350	82.600	87.000	5.33	1.260	23.700	25.200	6.33
2025-08-09	5750	50.00	D5GHzV2 - 1113	EX3DV4 - SN7630	DAE4 Sn1691	4.010	80.800	80.200	-0.74	1.160	23.000	23.200	0.87

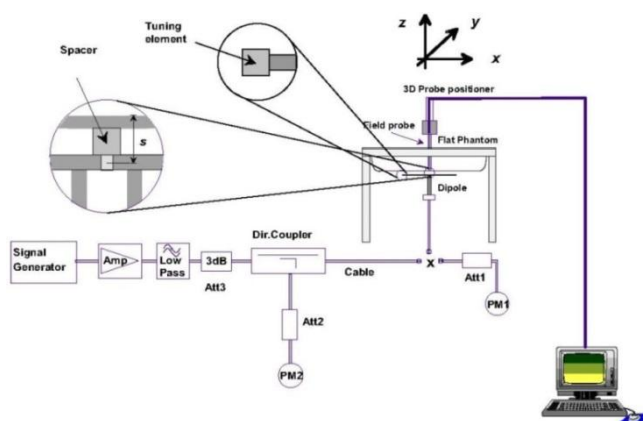


Fig 11.3.1 System Performance Check Setup



Fig 11.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

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

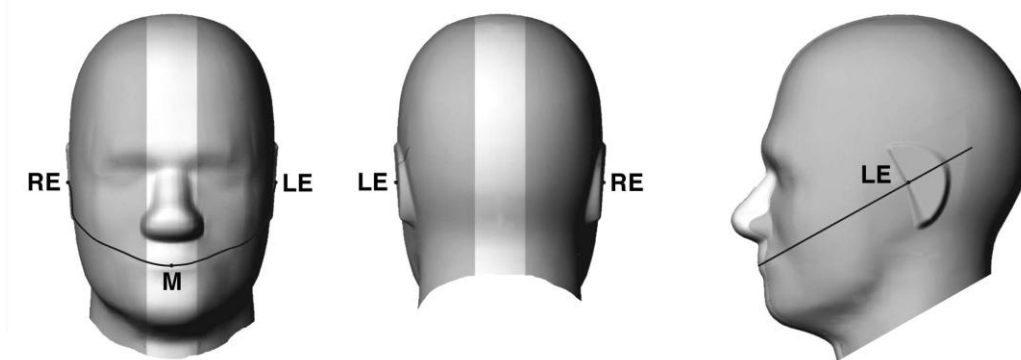


Fig 12.1.1 Front, back, and side views of SAM twin phantom

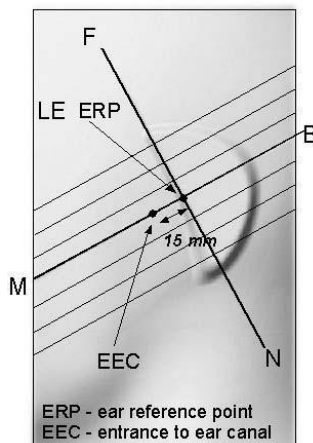


Fig 12.1.2 Close-up side view of phantom showing the ear region.

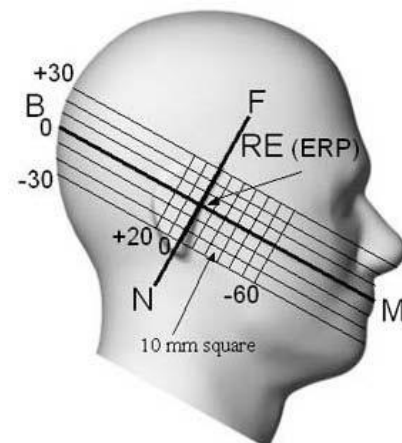


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width 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.

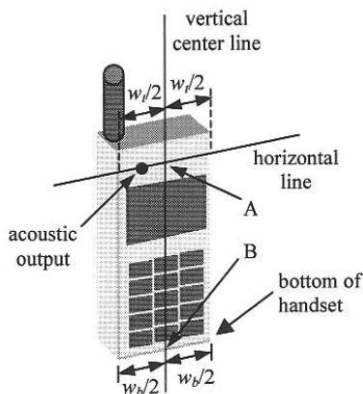


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case"

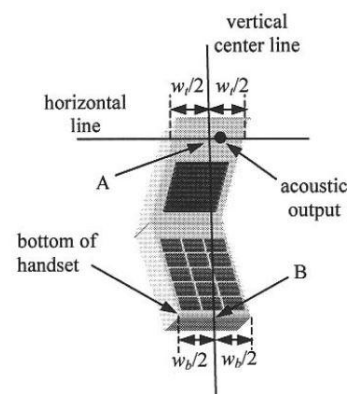


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

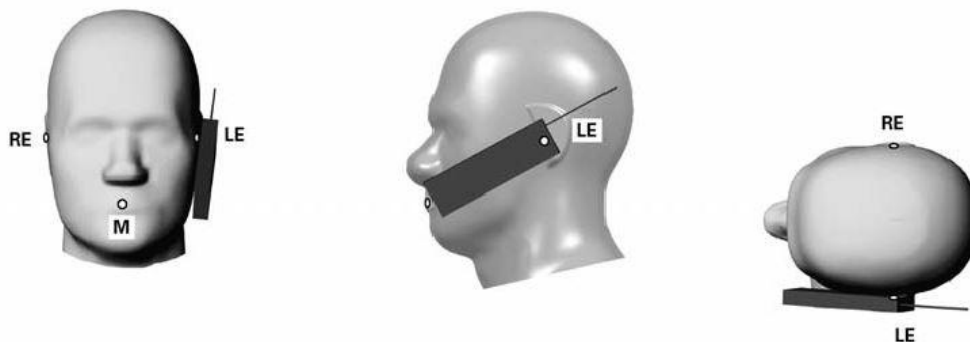


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

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

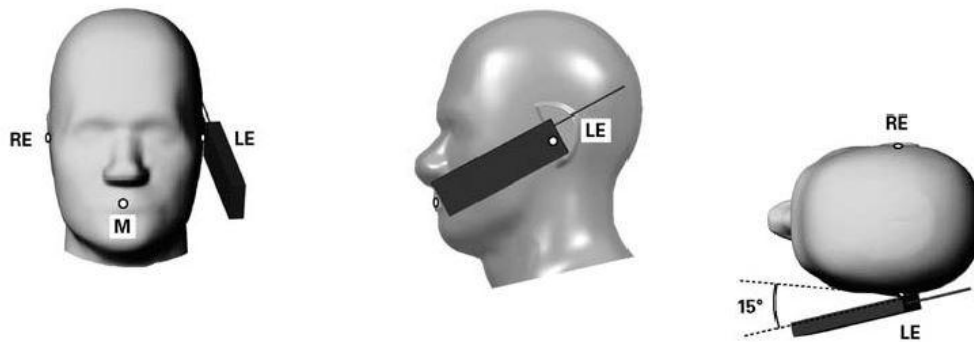


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

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

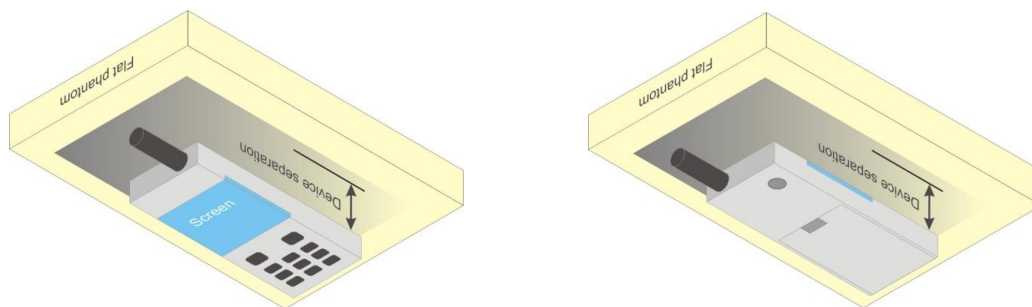


Fig 12.4 Body Worn Position

12.5 Product Specific 10g SAR Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, that can provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets and support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.
2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

12.6 Wireless Router

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

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

13. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<GSM Conducted Power>

1. Per KDB 447498 D01, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4$ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
4. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set Gain Factors (β_c and β_d) and parameters were set according to each
 - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - iii. Set RMC 12.2Kbps + HSDPA mode.
 - iv. Set Cell Power = -86 dBm
 - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
 - vi. Select HSDPA Uplink Parameters
 - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
 - viii. Set Ack-Nack Repetition Factor to 3
 - ix. Set CQI Feedback Cycle (k) to 4 ms
 - x. Set CQI Repetition Factor to 2
 - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPCCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Setup Configuration

HSUPA Setup Configuration:

- The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- The RF path losses were compensated into the measurements.
- A call was established between EUT and Base Station with following setting * :
 - Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
 - Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
 - Set Cell Power = -86 dBm
 - Set Channel Type = 12.2k + HSPA
 - Set UE Target Power
 - Power Ctrl Mode= Alternating bits
 - Set and observe the E-TFCI
 - Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
- The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{hs} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

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

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

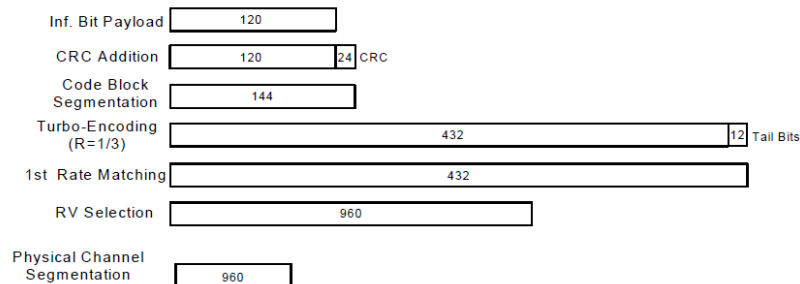


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK) Setup Configuration

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

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

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

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{fs} = 30/15 * \beta_c$.
 Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
 Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default.
 Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
 Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

Setup Configuration

<WCDMA Conducted Power>

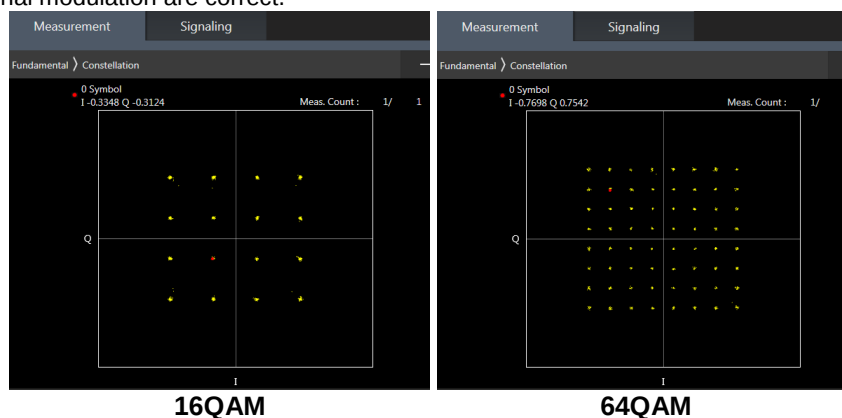
General Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is $\leq \frac{1}{4}$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B26 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE B4 / B5 / B38 SAR test was covered by B66 / B26 / B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to May 2017 TCB workshop, for 16QAM and 64QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

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

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

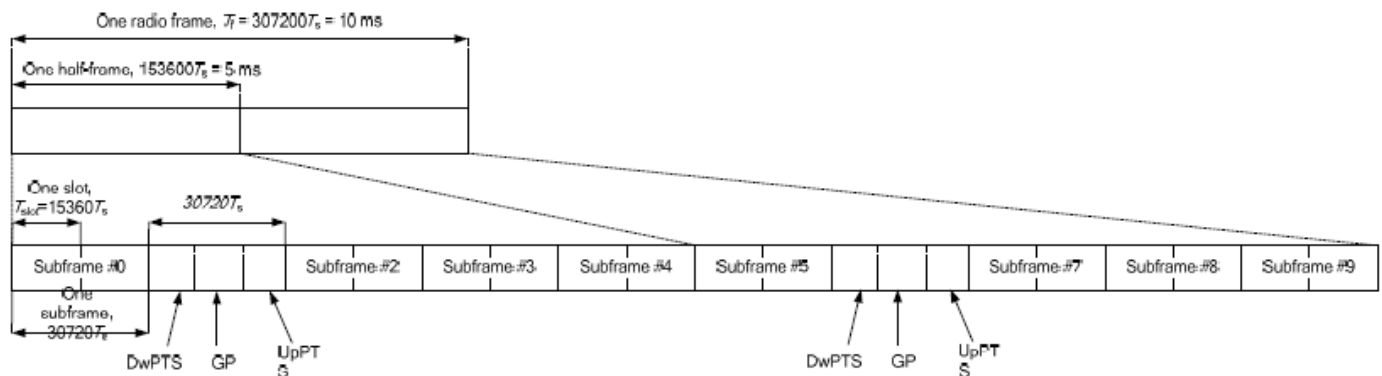


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

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

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

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

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

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

The highest duty factor is resulted from:

For LTE TDD Power class 3

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

<WLAN Conducted Power>

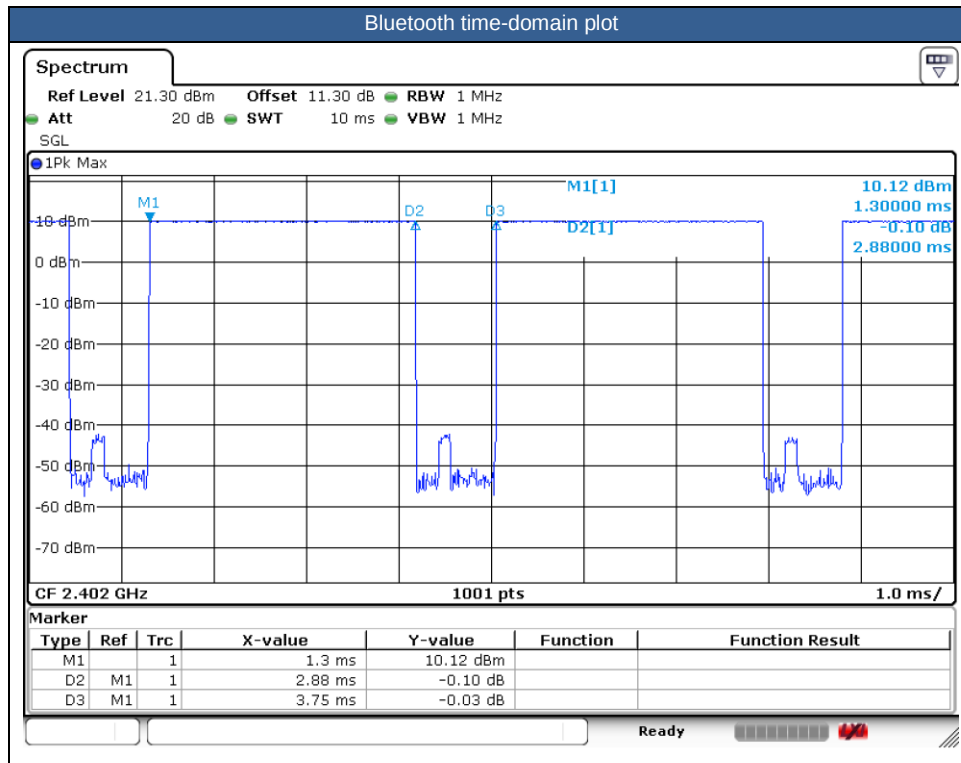
General Note:

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

<2.4GHz Bluetooth>

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle are 76.8% as following figure, Bluetooth SAR scaling need further consideration and the theoretical duty cycle is 83.3%, therefore the actual duty cycle will be scaled up to the theoretical value of Bluetooth reported SAR calculation.





14. Antenna Location

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

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
 - c. For SAR testing of Bluetooth signal with 83.3% theoretical duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle) *83.3%".
 - d. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
 - e. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
 - f. For TDD LTE SAR measurement of power class 3, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The reported TDD LTE SAR (W/kg) = Measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8 W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
5. The device implements Proximity sensors/receiver detect mechanism/hotspot trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). The device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to appendix E. power table.
6. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power (for handheld on state, the maximum full power means reduced power), including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
 - a. For this device SAR for WWAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of GSM1900 therefore product specific 10g SAR is necessary.
 - b. WLAN 5.3/5.5GHz tested the product specific 10g SAR since it has no hotspot mode.
 - c. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.
7. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hotspot SAR.
8. For Phablet devices, when hotspot mode is not supported, Product specific 10-g SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

WCDMA Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is $\leq \frac{1}{4}$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is $> \text{not } \frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $> \text{not } \frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 / B26 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE B4 / B5 / B38 SAR test was covered by B66 / B26 / B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

WLAN/Bluetooth Note:

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

DSI status description:

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

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

For WLAN, the following reduced power state which used at different exposure condition.

Trigger conditions	Exposure Condition
Receiver on	Head Standalone
Receiver on+ WLAN+WWAN	Head Simultaneous
Receiver off	Body/Limbs Standalone
Receiver off+ WLAN+WWAN	Body/Limbs Simultaneous



15.1 Head SAR

【GSM SAR】

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	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
01	GSM850	GPRS 4 Tx slots	Right Cheek	0mm	Ant 13	DSI 2	189	836.4	23.50	24.50	1.259	-0.09	0.560	0.705
	GSM850	GPRS 4 Tx slots	Right Tilted	0mm	Ant 13	DSI 2	189	836.4	23.50	24.50	1.259	0.04	0.526	0.662
	GSM850	GPRS 4 Tx slots	Left Cheek	0mm	Ant 13	DSI 2	189	836.4	23.50	24.50	1.259	0.02	0.401	0.505
	GSM850	GPRS 4 Tx slots	Left Tilted	0mm	Ant 13	DSI 2	189	836.4	23.50	24.50	1.259	0.01	0.373	0.470
	GSM850	GPRS 4 Tx slots	Right Cheek	0mm	Ant 13	DSI 3	189	836.4	22.96	24.00	1.271	0.02	0.535	0.680
	GSM850	GPRS 3 Tx slots	Right Cheek	0mm	Ant 31	DSI 2	189	836.4	29.08	30.50	1.387	0.13	0.080	0.111
	GSM850	GPRS 3 Tx slots	Right Tilted	0mm	Ant 31	DSI 2	189	836.4	29.08	30.50	1.387	-0.06	0.037	0.051
	GSM850	GPRS 3 Tx slots	Left Cheek	0mm	Ant 31	DSI 2	189	836.4	29.08	30.50	1.387	-0.08	0.097	0.135
	GSM850	GPRS 3 Tx slots	Left Tilted	0mm	Ant 31	DSI 2	189	836.4	29.08	30.50	1.387	-0.16	0.050	0.069
	GSM1900	GPRS 2 Tx slots	Right Cheek	0mm	Ant 13	DSI 2	661	1880	25.34	26.00	1.164	0.08	0.621	0.723
02	GSM1900	GPRS 2 Tx slots	Right Tilted	0mm	Ant 13	DSI 2	661	1880	25.34	26.00	1.164	0.02	0.714	0.831
	GSM1900	GPRS 2 Tx slots	Right Tilted	0mm	Ant 13	DSI 2	512	1850.2	25.31	26.00	1.172	0.06	0.665	0.779
	GSM1900	GPRS 2 Tx slots	Right Tilted	0mm	Ant 13	DSI 2	810	1909.8	25.27	26.00	1.183	-0.13	0.667	0.789
	GSM1900	GPRS 2 Tx slots	Left Cheek	0mm	Ant 13	DSI 2	661	1880	25.34	26.00	1.164	0.06	0.381	0.443
	GSM1900	GPRS 2 Tx slots	Left Tilted	0mm	Ant 13	DSI 2	661	1880	25.34	26.00	1.164	0.03	0.474	0.552
	GSM1900	GPRS 2 Tx slots	Right Tilted	0mm	Ant 13	DSI 3	661	1880	24.87	25.50	1.156	0.02	0.660	0.763
	GSM1900	GPRS 2 Tx slots	Right Cheek	0mm	Ant 31	DSI 2	661	1880	28.43	29.00	1.14	0.05	0.103	0.117
	GSM1900	GPRS 2 Tx slots	Right Tilted	0mm	Ant 31	DSI 2	661	1880	28.43	29.00	1.14	0.17	0.100	0.114
	GSM1900	GPRS 2 Tx slots	Left Cheek	0mm	Ant 31	DSI 2	661	1880	28.43	29.00	1.14	0.03	0.145	0.165
	GSM1900	GPRS 2 Tx slots	Left Tilted	0mm	Ant 31	DSI 2	661	1880	28.43	29.00	1.14	0.01	0.092	0.105

【WCDMA SAR】

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	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Right Cheek	0mm	Ant 31	DSI 2	9400	1880	23.67	24.70	1.268	-0.12	0.126	0.160
	WCDMA II	RMC 12.2Kbps	Right Tilted	0mm	Ant 31	DSI 2	9400	1880	23.67	24.70	1.268	0.15	0.130	0.165
03	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	DSI 2	9400	1880	23.67	24.70	1.268	-0.05	0.176	0.223
	WCDMA II	RMC 12.2Kbps	Left Tilted	0mm	Ant 31	DSI 2	9400	1880	23.67	24.70	1.268	0.15	0.111	0.141
	WCDMA IV	RMC 12.2Kbps	Right Cheek	0mm	Ant 31	DSI 2	1413	1732.6	23.65	24.70	1.274	0.15	0.089	0.113
	WCDMA IV	RMC 12.2Kbps	Right Tilted	0mm	Ant 31	DSI 2	1413	1732.6	23.65	24.70	1.274	-0.12	0.071	0.090
04	WCDMA IV	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	DSI 2	1413	1732.6	23.65	24.70	1.274	0.04	0.108	0.138
	WCDMA IV	RMC 12.2Kbps	Left Tilted	0mm	Ant 31	DSI 2	1413	1732.6	23.65	24.70	1.274	0.05	0.064	0.082
05	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 2	4182	836.4	21.38	22.50	1.294	-0.02	0.729	0.943
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 2	4132	826.4	21.25	22.50	1.334	0.08	0.695	0.927
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 2	4233	846.6	21.37	22.50	1.297	0.11	0.697	0.904
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 2	4182	836.4	21.38	22.50	1.294	0.18	0.654	0.846
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 2	4132	826.4	21.25	22.50	1.334	0.07	0.640	0.854
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 2	4233	846.6	21.37	22.50	1.297	0.06	0.651	0.844
	WCDMA V	RMC 12.2Kbps	Left Cheek	0mm	Ant 13	DSI 2	4182	836.4	21.38	22.50	1.294	0.19	0.481	0.622
	WCDMA V	RMC 12.2Kbps	Left Tilted	0mm	Ant 13	DSI 2	4182	836.4	21.38	22.50	1.294	0.13	0.462	0.598
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 3	4182	836.4	20.86	22.00	1.3	0.01	0.660	0.858
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 3	4132	826.4	20.79	22.00	1.321	0.05	0.623	0.823
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 3	4233	846.6	20.78	22.00	1.324	-0.15	0.641	0.849
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	Ant 31	DSI 2	4182	836.4	23.97	25.00	1.268	-0.02	0.110	0.139
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	Ant 31	DSI 2	4182	836.4	23.97	25.00	1.268	0.15	0.051	0.065
	WCDMA V	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	DSI 2	4182	836.4	23.97	25.00	1.268	-0.01	0.133	0.169
	WCDMA V	RMC 12.2Kbps	Left Tilted	0mm	Ant 31	DSI 2	4182	836.4	23.97	25.00	1.268	-0.04	0.068	0.086



【LTE SAR】

Plot No	Band	BW	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Right Cheek	0mm	Ant 31	DSI 2	18900	1880	23.45	24.50	1.274			0.15	0.101	0.129
	LTE Band 2	20M	QPSK	50	0	Right Cheek	0mm	Ant 31	DSI 2	18900	1880	22.34	23.50	1.306			-0.06	0.083	0.108
	LTE Band 2	20M	QPSK	1	0	Right Tilted	0mm	Ant 31	DSI 2	18900	1880	23.45	24.50	1.274			-0.13	0.093	0.118
	LTE Band 2	20M	QPSK	50	0	Right Tilted	0mm	Ant 31	DSI 2	18900	1880	22.34	23.50	1.306			-0.18	0.081	0.106
06	LTE Band 2	20M	QPSK	1	0	Left Cheek	0mm	Ant 31	DSI 2	18900	1880	23.45	24.50	1.274			0.04	0.149	0.190
	LTE Band 2	20M	QPSK	50	0	Left Cheek	0mm	Ant 31	DSI 2	18900	1880	22.34	23.50	1.306			0.16	0.123	0.161
	LTE Band 2	20M	QPSK	1	0	Left Tilted	0mm	Ant 31	DSI 2	18900	1880	23.45	24.50	1.274			0.13	0.114	0.145
	LTE Band 2	20M	QPSK	50	0	Left Tilted	0mm	Ant 31	DSI 2	18900	1880	22.34	23.50	1.306			0.14	0.088	0.115
07	LTE Band 7	20M	QPSK	1	0	Right Cheek	0mm	Ant 31	DSI 2	21100	2535	23.65	24.50	1.216			0.06	0.324	0.394
	LTE Band 7	20M	QPSK	50	0	Right Cheek	0mm	Ant 31	DSI 2	21100	2535	22.58	23.50	1.236			0.11	0.248	0.307
	LTE Band 7	20M	QPSK	1	0	Right Tilted	0mm	Ant 31	DSI 2	21100	2535	23.65	24.50	1.216			0.12	0.193	0.235
	LTE Band 7	20M	QPSK	50	0	Right Tilted	0mm	Ant 31	DSI 2	21100	2535	22.58	23.50	1.236			0.06	0.151	0.187
	LTE Band 7	20M	QPSK	1	0	Left Cheek	0mm	Ant 31	DSI 2	21100	2535	23.65	24.50	1.216			0.06	0.157	0.191
	LTE Band 7	20M	QPSK	50	0	Left Cheek	0mm	Ant 31	DSI 2	21100	2535	22.58	23.50	1.236			-0.08	0.121	0.150
	LTE Band 7	20M	QPSK	1	0	Left Tilted	0mm	Ant 31	DSI 2	21100	2535	23.65	24.50	1.216			0.02	0.135	0.164
	LTE Band 7	20M	QPSK	50	0	Left Tilted	0mm	Ant 31	DSI 2	21100	2535	22.58	23.50	1.236			-0.01	0.101	0.125
08	LTE Band 13	10M	QPSK	1	0	Right Cheek	0mm	Ant 13	DSI 2	23230	782	23.77	24.90	1.297			0.12	0.566	0.721
	LTE Band 13	10M	QPSK	25	0	Right Cheek	0mm	Ant 13	DSI 2	23230	782	22.67	23.90	1.327			-0.07	0.436	0.579
	LTE Band 13	10M	QPSK	1	0	Right Tilted	0mm	Ant 13	DSI 2	23230	782	23.77	24.90	1.297			-0.07	0.501	0.650
	LTE Band 13	10M	QPSK	25	0	Right Tilted	0mm	Ant 13	DSI 2	23230	782	22.67	23.90	1.327			0.17	0.393	0.522
	LTE Band 13	10M	QPSK	1	0	Left Cheek	0mm	Ant 13	DSI 2	23230	782	23.77	24.90	1.297			-0.09	0.382	0.495
	LTE Band 13	10M	QPSK	25	0	Left Cheek	0mm	Ant 13	DSI 2	23230	782	22.67	23.90	1.327			0.08	0.303	0.402
	LTE Band 13	10M	QPSK	1	0	Left Tilted	0mm	Ant 13	DSI 2	23230	782	23.77	24.90	1.297			-0.01	0.349	0.453
	LTE Band 13	10M	QPSK	25	0	Left Tilted	0mm	Ant 13	DSI 2	23230	782	22.67	23.90	1.327			0.09	0.286	0.380
	LTE Band 13	10M	QPSK	1	0	Right Cheek	0mm	Ant 31	DSI 2	23230	782	23.71	24.90	1.315			0.15	0.091	0.120
	LTE Band 13	10M	QPSK	25	0	Right Cheek	0mm	Ant 31	DSI 2	23230	782	22.67	23.90	1.327			-0.06	0.074	0.098
	LTE Band 13	10M	QPSK	1	0	Right Tilted	0mm	Ant 31	DSI 2	23230	782	23.71	24.90	1.315			-0.13	0.056	0.074
	LTE Band 13	10M	QPSK	25	0	Right Tilted	0mm	Ant 31	DSI 2	23230	782	22.67	23.90	1.327			-0.02	0.044	0.058
	LTE Band 13	10M	QPSK	1	0	Left Cheek	0mm	Ant 31	DSI 2	23230	782	23.71	24.90	1.315			-0.06	0.125	0.164
	LTE Band 13	10M	QPSK	25	0	Left Cheek	0mm	Ant 31	DSI 2	23230	782	22.67	23.90	1.327			0.01	0.099	0.131
	LTE Band 13	10M	QPSK	1	0	Left Tilted	0mm	Ant 31	DSI 2	23230	782	23.71	24.90	1.315			-0.19	0.072	0.095
	LTE Band 13	10M	QPSK	25	0	Left Tilted	0mm	Ant 31	DSI 2	23230	782	22.67	23.90	1.327			0.18	0.054	0.072
	LTE Band 26	15M	QPSK	1	0	Right Cheek	0mm	Ant 13	DSI 2	26865	831.5	21.73	22.80	1.279			0.13	0.604	0.773
	LTE Band 26	15M	QPSK	36	0	Right Cheek	0mm	Ant 13	DSI 2	26865	831.5	21.72	22.80	1.282			-0.06	0.640	0.820
09	LTE Band 26	15M	QPSK	75	0	Right Cheek	0mm	Ant 13	DSI 2	26865	831.5	21.69	22.80	1.291			0.00	0.644	0.831
	LTE Band 26	15M	QPSK	1	0	Right Tilted	0mm	Ant 13	DSI 2	26865	831.5	21.73	22.80	1.279			-0.06	0.570	0.729
	LTE Band 26	15M	QPSK	36	0	Right Tilted	0mm	Ant 13	DSI 2	26865	831.5	21.72	22.80	1.282			-0.17	0.590	0.756
	LTE Band 26	15M	QPSK	1	0	Left Cheek	0mm	Ant 13	DSI 2	26865	831.5	21.73	22.80	1.279			-0.15	0.453	0.579
	LTE Band 26	15M	QPSK	36	0	Left Cheek	0mm	Ant 13	DSI 2	26865	831.5	21.72	22.80	1.282			-0.03	0.462	0.592
	LTE Band 26	15M	QPSK	1	0	Left Tilted	0mm	Ant 13	DSI 2	26865	831.5	21.73	22.80	1.279			-0.05	0.425	0.544
	LTE Band 26	15M	QPSK	36	0	Left Tilted	0mm	Ant 13	DSI 2	26865	831.5	21.72	22.80	1.282			-0.07	0.433	0.555
	LTE Band 26	15M	QPSK	75	0	Right Cheek	0mm	Ant 13	DSI 3	26865	831.5	21.12	22.30	1.312			-0.09	0.573	0.752
	LTE Band 26	15M	QPSK	1	0	Right Cheek	0mm	Ant 31	DSI 2	26865	831.5	23.65	24.80	1.303			-0.13	0.094	0.122
	LTE Band 26	15M	QPSK	36	0	Right Cheek	0mm	Ant 31	DSI 2	26865	831.5	22.63	23.80	1.309			0.15	0.082	0.107
	LTE Band 26	15M	QPSK	1	0	Right Tilted	0mm	Ant 31	DSI 2	26865	831.5	23.65	24.80	1.303			0.02	0.049	0.064
	LTE Band 26	15M	QPSK	36	0	Right Tilted	0mm	Ant 31	DSI 2	26865	831.5	22.63	23.80	1.309			-0.08	0.001	0.001
	LTE Band 26	15M	QPSK	1	0	Left Cheek	0mm	Ant 31	DSI 2	26865	831.5	23.65	24.80	1.303			-0.06	0.115	0.150
	LTE Band 26	15M	QPSK	36	0	Left Cheek	0mm	Ant 31	DSI 2	26865	831.5	22.63	23.80	1.309			0.10	0.098	0.128
	LTE Band 26	15M	QPSK	1	0	Left Tilted	0mm	Ant 31	DSI 2	26865	831.5	23.65	24.80	1.303			-0.02	0.062	0.081
	LTE Band 26	15M	QPSK	36	0	Left Tilted	0mm	Ant 31	DSI 2	26865	831.5	22.63	23.80	1.309			-0.06	0.051	0.067
	LTE Band 66	20M	QPSK	1	0	Right Cheek	0mm	Ant 31	DSI 2	132322	1745	23.86	24.80	1.242			-0.13	0.106	0.132
	LTE Band 66	20M	QPSK	50	0	Right Cheek	0mm	Ant 31	DSI 2	132322	1745	22.79	23.80	1.262			-0.14	0.083	0.105
	LTE Band 66	20M	QPSK	1	0	Right Tilted	0mm	Ant 31	DSI 2	132322	1745	23.86	24.80	1.242			-0.04	0.078	0.097
	LTE Band 66	20M	QPSK	50	0	Right Tilted	0mm	Ant 31	DSI 2	132322	1745	22.79	23.80	1.262			0.03	0.065	0.082
10	LTE Band 66	20M	QPSK	1	0	Left Cheek	0mm	Ant 31	DSI 2	132322	1745	23.86	24.80	1.242			0.15	0.121	0.150
	LTE Band 66	20M	QPSK	50	0	Left Cheek	0mm	Ant 31	DSI 2	132322	1745	22.79	23.80	1.262			0.15	0.099	0.125
	LTE Band 66	20M	QPSK	1	0	Left Tilted	0mm	Ant 31	DSI 2	132322	1745	23.86	24.80	1.242			0.04	0.079	0.098
	LTE Band 66	20M	QPSK	50	0	Left Tilted	0mm	Ant 31	DSI 2	132322	1745	22.79	23.80	1.262			-0.13	0.065	0.082
11	LTE Band 41	20M	QPSK	1	0	Right Cheek	0mm	Ant 31	DSI 2	40620	2593	24.27	24.80	1.113	62.9	1.006	0.06	0.257	0.292
	LTE Band 41	20M	QPSK	50	0	Right Cheek	0mm	Ant 31	DSI 2	40620	2593	23.21	23.80	1.146	62.9	1.006	0.19	0.213	0.246
	LTE Band 41	20M	QPSK	1	0	Right Tilted	0mm	Ant 31	DSI 2	40620	2593	24.27	24.80	1.113	62.9	1.006	-0.02	0.115	0.131
	LTE Band 41	20M	QPSK	50	0	Right Tilted	0mm	Ant 31	DSI 2	40620	2593	23.21	23.80	1.146	62.9	1.006	-0.13	0.096	0.111
	LTE Band 41	20M	QPSK	1	0	Left Cheek	0mm	Ant 31	DSI 2	40620	2593	24.27	24.80	1.113	62.9	1.006	-0.07	0.129	0.147
	LTE Band 41	20M	QPSK	50	0	Left Cheek	0mm	Ant 31	DSI 2	40620	2593	23.21	23.80	1.146	62.9	1.006	-0.06	0.104	0.120
	LTE Band 41	20M	QPSK	1	0	Left Tilted	0mm	Ant 31	DSI 2	40620	2593	24.27	24.80	1.113	62.9	1.006	-0.12	0.131	0.149
	LTE Band 41	20M	QPSK	50	0	Left Tilted	0mm	Ant 31	DSI 2	40620	2593	23.21	23.80	1.146	62.9	1.006	0.16	0.108	0.125



【WLAN 2.4GHz_5GHz SAR】

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)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 22	Standalone	6	2437	17.00	18.50	1.413	98.65	1.014	-0.02	0.319	0.457
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Ant 22	Standalone	6	2437	17.00	18.50	1.413	98.65	1.014	-0.03	0.353	0.506
12	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 22	Standalone	6	2437	17.00	18.50	1.413	98.65	1.014	-0.01	0.570	0.817
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 22	Standalone	1	2412	16.70	18.50	1.514	98.65	1.014	-0.06	0.436	0.669
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 22	Standalone	11	2462	17.00	18.50	1.413	98.65	1.014	-0.07	0.416	0.596
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 22	Standalone	6	2437	17.00	18.50	1.413	98.65	1.014	-0.07	0.430	0.616
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 22	Standalone	46	5230	14.98	15.00	1.005	95.88	1.043	0.07	0.150	0.157
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 22	Standalone	46	5230	14.98	15.00	1.005	95.88	1.043	-0.03	0.158	0.166
13	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 22	Standalone	46	5230	14.98	15.00	1.005	95.88	1.043	0.05	0.456	0.478
	WLAN5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 22	Standalone	46	5230	14.98	15.00	1.005	95.88	1.043	0.15	0.361	0.378
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 22	Standalone	54	5270	13.55	14.00	1.109	95.88	1.043	-0.09	0.096	0.111
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 22	Standalone	54	5270	13.55	14.00	1.109	95.88	1.043	0.17	0.096	0.111
14	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 22	Standalone	54	5270	13.55	14.00	1.109	95.88	1.043	-0.04	0.224	0.259
	WLAN5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 22	Standalone	54	5270	13.55	14.00	1.109	95.88	1.043	-0.06	0.173	0.200
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 22	Standalone	122	5610	14.28	15.00	1.18	94.0	1.064	-0.06	0.227	0.285
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 22	Standalone	122	5610	14.28	15.00	1.18	94.0	1.064	-0.02	0.294	0.369
15	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 22	Standalone	122	5610	14.28	15.00	1.18	94.0	1.064	-0.08	0.339	0.426
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 22	Standalone	122	5610	14.28	15.00	1.18	94.0	1.064	-0.11	0.321	0.403
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 22	Standalone	155	5775	13.22	13.50	1.067	94.0	1.064	-0.14	0.118	0.134
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 22	Standalone	155	5775	13.22	13.50	1.067	94.0	1.064	0.02	0.143	0.162
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 22	Standalone	155	5775	13.22	13.50	1.067	94.0	1.064	-0.00	0.156	0.177
16	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 22	Standalone	155	5775	13.22	13.50	1.067	94.0	1.064	-0.06	0.236	0.268

【Bluetooth SAR】

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)
	Bluetooth	1Mbps	Right Cheek	0mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	0.11	0.093	0.156
	Bluetooth	1Mbps	Right Tilted	0mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	-0.19	0.105	0.176
17	Bluetooth	1Mbps	Left Cheek	0mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	0.01	0.161	0.271
	Bluetooth	1Mbps	Left Tilted	0mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	0.15	0.125	0.210



15.2 Hotspot SAR

【GSM SAR】

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	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS 2 Tx slots	Front	10mm	Ant 13	DSI 6	189	836.4	31.44	32.50	1.276	-0.04	0.217	0.277
	GSM850	GPRS 2 Tx slots	Back	10mm	Ant 13	DSI 6	189	836.4	31.44	32.50	1.276	-0.17	0.302	0.385
	GSM850	GPRS 2 Tx slots	Left Edge	10mm	Ant 13	DSI 6	189	836.4	31.44	32.50	1.276	-0.07	0.088	0.112
	GSM850	GPRS 2 Tx slots	Right Edge	10mm	Ant 13	DSI 6	189	836.4	31.44	32.50	1.276	-0.16	0.095	0.121
18	GSM850	GPRS 2 Tx slots	Top Edge	10mm	Ant 13	DSI 6	189	836.4	31.44	32.50	1.276	-0.05	0.337	0.430
	GSM850	GPRS 3 Tx slots	Front	10mm	Ant 31	DSI 6	189	836.4	29.08	30.50	1.387	0.08	0.091	0.126
	GSM850	GPRS 3 Tx slots	Back	10mm	Ant 31	DSI 6	189	836.4	29.08	30.50	1.387	0.01	0.138	0.191
	GSM850	GPRS 3 Tx slots	Left Edge	10mm	Ant 31	DSI 6	189	836.4	29.08	30.50	1.387	0.03	0.063	0.087
	GSM850	GPRS 3 Tx slots	Right Edge	10mm	Ant 31	DSI 6	189	836.4	29.08	30.50	1.387	-0.08	0.060	0.083
	GSM850	GPRS 3 Tx slots	Bottom Edge	10mm	Ant 31	DSI 6	189	836.4	29.08	30.50	1.387	0.10	0.100	0.139
	GSM1900	GPRS 3 Tx slots	Front	10mm	Ant 13	DSI 6	661	1880	23.35	24.50	1.303	-0.12	0.142	0.185
	GSM1900	GPRS 3 Tx slots	Back	10mm	Ant 13	DSI 6	661	1880	23.35	24.50	1.303	0.09	0.209	0.272
	GSM1900	GPRS 3 Tx slots	Left Edge	10mm	Ant 13	DSI 6	661	1880	23.35	24.50	1.303	0.13	0.048	0.063
	GSM1900	GPRS 3 Tx slots	Right Edge	10mm	Ant 13	DSI 6	661	1880	23.35	24.50	1.303	0.04	0.001	0.001
	GSM1900	GPRS 3 Tx slots	Top Edge	10mm	Ant 13	DSI 6	661	1880	23.35	24.50	1.303	-0.04	0.345	0.450
	GSM1900	GPRS 2 Tx slots	Front	10mm	Ant 31	DSI 6	661	1880	26.95	27.50	1.135	-0.06	0.339	0.385
	GSM1900	GPRS 2 Tx slots	Back	10mm	Ant 31	DSI 6	661	1880	26.95	27.50	1.135	-0.11	0.593	0.673
	GSM1900	GPRS 2 Tx slots	Left Edge	10mm	Ant 31	DSI 6	661	1880	26.95	27.50	1.135	0.10	0.098	0.111
	GSM1900	GPRS 2 Tx slots	Right Edge	10mm	Ant 31	DSI 6	661	1880	26.95	27.50	1.135	0.18	0.172	0.195
19	GSM1900	GPRS 2 Tx slots	Bottom Edge	10mm	Ant 31	DSI 6	661	1880	26.95	27.50	1.135	-0.06	0.884	1.003
	GSM1900	GPRS 2 Tx slots	Bottom Edge	10mm	Ant 31	DSI 6	512	1850.2	26.84	27.50	1.164	-0.08	0.860	1.001
	GSM1900	GPRS 2 Tx slots	Bottom Edge	10mm	Ant 31	DSI 6	810	1909.8	26.92	27.50	1.143	0.17	0.863	0.986

【WCDMA SAR】

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	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	10mm	Ant 13	DSI 6	9400	1880	18.59	19.70	1.291	-0.09	0.187	0.241
	WCDMA II	RMC 12.2Kbps	Back	10mm	Ant 13	DSI 6	9400	1880	18.59	19.70	1.291	-0.14	0.254	0.328
	WCDMA II	RMC 12.2Kbps	Left Edge	10mm	Ant 13	DSI 6	9400	1880	18.59	19.70	1.291	-0.12	0.053	0.068
	WCDMA II	RMC 12.2Kbps	Right Edge	10mm	Ant 13	DSI 6	9400	1880	18.59	19.70	1.291	-0.00	0.001	0.001
	WCDMA II	RMC 12.2Kbps	Top Edge	10mm	Ant 13	DSI 6	9400	1880	18.59	19.70	1.291	-0.02	0.419	0.541
	WCDMA II	RMC 12.2Kbps	Front	10mm	Ant 31	DSI 6	9400	1880	19.66	20.70	1.271	0.18	0.253	0.322
	WCDMA II	RMC 12.2Kbps	Back	10mm	Ant 31	DSI 6	9400	1880	19.66	20.70	1.271	-0.18	0.453	0.576
	WCDMA II	RMC 12.2Kbps	Left Edge	10mm	Ant 31	DSI 6	9400	1880	19.66	20.70	1.271	-0.09	0.090	0.114
	WCDMA II	RMC 12.2Kbps	Right Edge	10mm	Ant 31	DSI 6	9400	1880	19.66	20.70	1.271	0.01	0.130	0.165
20	WCDMA II	RMC 12.2Kbps	Bottom Edge	10mm	Ant 31	DSI 6	9400	1880	19.66	20.70	1.271	-0.00	0.642	0.816
	WCDMA II	RMC 12.2Kbps	Bottom Edge	10mm	Ant 31	DSI 6	9262	1852.4	19.65	20.70	1.274	-0.10	0.627	0.799
	WCDMA II	RMC 12.2Kbps	Bottom Edge	10mm	Ant 31	DSI 6	9538	1907.6	19.63	20.70	1.279	-0.12	0.615	0.787
	WCDMA IV	RMC 12.2Kbps	Front	10mm	Ant 13	DSI 6	1413	1732.6	19.11	20.20	1.285	-0.07	0.217	0.279
	WCDMA IV	RMC 12.2Kbps	Back	10mm	Ant 13	DSI 6	1413	1732.6	19.11	20.20	1.285	-0.04	0.231	0.297
	WCDMA IV	RMC 12.2Kbps	Left Edge	10mm	Ant 13	DSI 6	1413	1732.6	19.11	20.20	1.285	-0.15	0.057	0.073
	WCDMA IV	RMC 12.2Kbps	Right Edge	10mm	Ant 13	DSI 6	1413	1732.6	19.11	20.20	1.285	-0.04	0.001	0.001
	WCDMA IV	RMC 12.2Kbps	Top Edge	10mm	Ant 13	DSI 6	1413	1732.6	19.11	20.20	1.285	-0.02	0.352	0.452
	WCDMA IV	RMC 12.2Kbps	Front	10mm	Ant 31	DSI 6	1413	1732.6	19.17	20.20	1.268	-0.15	0.194	0.246
	WCDMA IV	RMC 12.2Kbps	Back	10mm	Ant 31	DSI 6	1413	1732.6	19.17	20.20	1.268	0.18	0.356	0.451
	WCDMA IV	RMC 12.2Kbps	Left Edge	10mm	Ant 31	DSI 6	1413	1732.6	19.17	20.20	1.268	0.03	0.041	0.052
	WCDMA IV	RMC 12.2Kbps	Right Edge	10mm	Ant 31	DSI 6	1413	1732.6	19.17	20.20	1.268	0.19	0.087	0.110
21	WCDMA IV	RMC 12.2Kbps	Bottom Edge	10mm	Ant 31	DSI 6	1413	1732.6	19.17	20.20	1.268	-0.01	0.448	0.568
	WCDMA V	RMC 12.2Kbps	Front	10mm	Ant 13	DSI 6	4182	836.4	23.89	25.00	1.291	-0.10	0.226	0.292
22	WCDMA V	RMC 12.2Kbps	Back	10mm	Ant 13	DSI 6	4182	836.4	23.89	25.00	1.291	0.05	0.266	0.343
	WCDMA V	RMC 12.2Kbps	Left Edge	10mm	Ant 13	DSI 6	4182	836.4	23.89	25.00	1.291	-0.03	0.097	0.125
	WCDMA V	RMC 12.2Kbps	Right Edge	10mm	Ant 13	DSI 6	4182	836.4	23.89	25.00	1.291	-0.07	0.115	0.148
	WCDMA V	RMC 12.2Kbps	Top Edge	10mm	Ant 13	DSI 6	4182	836.4	23.89	25.00	1.291	0.04	0.249	0.321
	WCDMA V	RMC 12.2Kbps	Front	10mm	Ant 31	DSI 6	4182	836.4	23.03	24.00	1.25	0.11	0.113	0.141
	WCDMA V	RMC 12.2Kbps	Back	10mm	Ant 31	DSI 6	4182	836.4	23.03	24.00	1.25	-0.02	0.165	0.206
	WCDMA V	RMC 12.2Kbps	Left Edge	10mm	Ant 31	DSI 6	4182	836.4	23.03	24.00	1.25	-0.01	0.106	0.133
	WCDMA V	RMC 12.2Kbps	Right Edge	10mm	Ant 31	DSI 6	4182	836.4	23.03	24.00	1.25	-0.10	0.068	0.085
	WCDMA V	RMC 12.2Kbps	Bottom Edge	10mm	Ant 31	DSI 6	4182	836.4	23.03	24.00	1.25	-0.01	0.113	0.141



[LTE SAR]

Plot No	Band	BW	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	10mm	Ant 13	DSI 6	18900	1880	18.83	20.00	1.309			0.11	0.175	0.229
	LTE Band 2	20M	QPSK	50	0	Front	10mm	Ant 13	DSI 6	18900	1880	18.82	20.00	1.312			0.18	0.176	0.231
	LTE Band 2	20M	QPSK	1	0	Back	10mm	Ant 13	DSI 6	18900	1880	18.83	20.00	1.309			-0.05	0.243	0.318
	LTE Band 2	20M	QPSK	50	0	Back	10mm	Ant 13	DSI 6	18900	1880	18.82	20.00	1.312			-0.10	0.244	0.320
	LTE Band 2	20M	QPSK	1	0	Left Edge	10mm	Ant 13	DSI 6	18900	1880	18.83	20.00	1.309			-0.11	0.054	0.071
	LTE Band 2	20M	QPSK	50	0	Left Edge	10mm	Ant 13	DSI 6	18900	1880	18.82	20.00	1.312			-0.07	0.050	0.066
	LTE Band 2	20M	QPSK	1	0	Right Edge	10mm	Ant 13	DSI 6	18900	1880	18.83	20.00	1.309			-0.07	0.001	0.001
	LTE Band 2	20M	QPSK	50	0	Right Edge	10mm	Ant 13	DSI 6	18900	1880	18.82	20.00	1.312			0.01	0.028	0.037
	LTE Band 2	20M	QPSK	1	0	Top Edge	10mm	Ant 13	DSI 6	18900	1880	18.83	20.00	1.309			-0.06	0.395	0.517
	LTE Band 2	20M	QPSK	50	0	Top Edge	10mm	Ant 13	DSI 6	18900	1880	18.82	20.00	1.312			-0.06	0.382	0.501
	LTE Band 2	20M	QPSK	1	0	Front	10mm	Ant 31	DSI 6	18900	1880	20.01	21.00	1.256			0.04	0.251	0.315
	LTE Band 2	20M	QPSK	50	0	Front	10mm	Ant 31	DSI 6	18900	1880	19.98	21.00	1.265			-0.13	0.245	0.310
	LTE Band 2	20M	QPSK	1	0	Back	10mm	Ant 31	DSI 6	18900	1880	20.01	21.00	1.256			0.13	0.476	0.598
	LTE Band 2	20M	QPSK	50	0	Back	10mm	Ant 31	DSI 6	18900	1880	19.98	21.00	1.265			-0.08	0.447	0.565
	LTE Band 2	20M	QPSK	1	0	Left Edge	10mm	Ant 31	DSI 6	18900	1880	20.01	21.00	1.256			-0.01	0.082	0.103
	LTE Band 2	20M	QPSK	50	0	Left Edge	10mm	Ant 31	DSI 6	18900	1880	19.98	21.00	1.265			-0.02	0.072	0.091
	LTE Band 2	20M	QPSK	1	0	Right Edge	10mm	Ant 31	DSI 6	18900	1880	20.01	21.00	1.256			-0.16	0.124	0.156
	LTE Band 2	20M	QPSK	50	0	Right Edge	10mm	Ant 31	DSI 6	18900	1880	19.98	21.00	1.265			-0.14	0.132	0.167
	LTE Band 2	20M	QPSK	1	0	Bottom Edge	10mm	Ant 31	DSI 6	18900	1880	20.01	21.00	1.256			0.05	0.617	0.775
23	LTE Band 2	20M	QPSK	50	0	Bottom Edge	10mm	Ant 31	DSI 6	18900	1880	19.98	21.00	1.265			-0.00	0.642	0.812
	LTE Band 2	20M	QPSK	50	0	Bottom Edge	10mm	Ant 31	DSI 6	18700	1860	19.94	21.00	1.276			0.09	0.627	0.800
	LTE Band 2	20M	QPSK	50	0	Bottom Edge	10mm	Ant 31	DSI 6	19100	1900	19.96	21.00	1.271			0.03	0.635	0.807
	LTE Band 2	20M	QPSK	100	0	Bottom Edge	10mm	Ant 31	DSI 6	19100	1900	19.97	21.00	1.268			0.19	0.620	0.786
	LTE Band 4	20M	QPSK	1	0	Front	10mm	Ant 13	DSI 6	20175	1732.5	19.37	20.30	1.239			0.08	0.153	0.190
	LTE Band 4	20M	QPSK	50	0	Front	10mm	Ant 13	DSI 6	20175	1732.5	19.33	20.30	1.25			0.04	0.156	0.195
	LTE Band 4	20M	QPSK	1	0	Back	10mm	Ant 13	DSI 6	20175	1732.5	19.37	20.30	1.239			0.16	0.173	0.214
	LTE Band 4	20M	QPSK	50	0	Back	10mm	Ant 13	DSI 6	20175	1732.5	19.33	20.30	1.25			0.16	0.182	0.227
	LTE Band 4	20M	QPSK	1	0	Left Edge	10mm	Ant 13	DSI 6	20175	1732.5	19.37	20.30	1.239			-0.05	0.045	0.056
	LTE Band 4	20M	QPSK	50	0	Left Edge	10mm	Ant 13	DSI 6	20175	1732.5	19.33	20.30	1.25			-0.04	0.046	0.057
	LTE Band 4	20M	QPSK	1	0	Right Edge	10mm	Ant 13	DSI 6	20175	1732.5	19.37	20.30	1.239			-0.09	0.001	0.001
	LTE Band 4	20M	QPSK	50	0	Right Edge	10mm	Ant 13	DSI 6	20175	1732.5	19.33	20.30	1.25			0.18	0.001	0.001
	LTE Band 4	20M	QPSK	1	0	Top Edge	10mm	Ant 13	DSI 6	20175	1732.5	19.37	20.30	1.239			-0.12	0.289	0.358
24	LTE Band 4	20M	QPSK	50	0	Top Edge	10mm	Ant 13	DSI 6	20175	1732.5	19.33	20.30	1.25			-0.01	0.327	0.409
	LTE Band 7	20M	QPSK	1	0	Front	10mm	Ant 13	DSI 6	21100	2535	15.70	16.50	1.202			0.14	0.123	0.148
	LTE Band 7	20M	QPSK	50	0	Front	10mm	Ant 13	DSI 6	21100	2535	15.68	16.50	1.208			-0.06	0.109	0.132
	LTE Band 7	20M	QPSK	1	0	Back	10mm	Ant 13	DSI 6	21100	2535	15.70	16.50	1.202			0.01	0.376	0.452
	LTE Band 7	20M	QPSK	50	0	Back	10mm	Ant 13	DSI 6	21100	2535	15.68	16.50	1.208			0.02	0.366	0.442
	LTE Band 7	20M	QPSK	1	0	Left Edge	10mm	Ant 13	DSI 6	21100	2535	15.70	16.50	1.202			-0.11	0.065	0.078
	LTE Band 7	20M	QPSK	50	0	Left Edge	10mm	Ant 13	DSI 6	21100	2535	15.68	16.50	1.208			-0.02	0.063	0.076
	LTE Band 7	20M	QPSK	1	0	Right Edge	10mm	Ant 13	DSI 6	21100	2535	15.70	16.50	1.202			0.04	0.027	0.032
	LTE Band 7	20M	QPSK	50	0	Right Edge	10mm	Ant 13	DSI 6	21100	2535	15.68	16.50	1.208			0.12	0.001	0.001
25	LTE Band 7	20M	QPSK	1	0	Top Edge	10mm	Ant 13	DSI 6	21100	2535	15.70	16.50	1.202			-0.02	0.493	0.593
	LTE Band 7	20M	QPSK	50	0	Top Edge	10mm	Ant 13	DSI 6	21100	2535	15.68	16.50	1.208			0.17	0.448	0.541
	LTE Band 7	20M	QPSK	1	0	Front	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			-0.03	0.176	0.214
	LTE Band 7	20M	QPSK	50	0	Front	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			0.17	0.182	0.221
	LTE Band 7	20M	QPSK	1	0	Back	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			-0.01	0.212	0.258
	LTE Band 7	20M	QPSK	50	0	Back	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			0.10	0.199	0.242
	LTE Band 7	20M	QPSK	1	0	Left Edge	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			-0.16	0.046	0.056
	LTE Band 7	20M	QPSK	50	0	Left Edge	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			0.09	0.043	0.052
	LTE Band 7	20M	QPSK	1	0	Right Edge	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			-0.05	0.110	0.134
	LTE Band 7	20M	QPSK	50	0	Right Edge	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			0.15	0.118	0.143
	LTE Band 7	20M	QPSK	1	0	Bottom Edge	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			-0.05	0.146	0.178
	LTE Band 7	20M	QPSK	50	0	Bottom Edge	10mm	Ant 31	DSI 6	21100	2535	19.65	20.50	1.216			0.06	0.149	0.181
	LTE Band 13	10M	QPSK	1	0	Front	10mm	Ant 13	DSI 6	23230	782	23.77	24.90	1.297			-0.12	0.133	0.173
	LTE Band 13	10M	QPSK	25	0	Front	10mm	Ant 13	DSI 6	23230	782	22.67	23.90	1.327			0.13	0.106	0.141
26	LTE Band 13	10M	QPSK	1	0	Back	10mm	Ant 13	DSI 6	23230	782	23.77	24.90	1.297			0.07	0.194	0.252
	LTE Band 13	10M	QPSK	25	0	Back	10mm	Ant 13	DSI 6	23230	782	22.67	23.90	1.327			-0.13	0.150	0.199
	LTE Band 13	10M	QPSK	1	0	Left Edge	10mm	Ant 13	DSI 6	23230	782	23.77	24.90	1.297			-0.18	0.137	0.178
	LTE Band 13	10M	QPSK	25	0	Left Edge	10mm	Ant 13	DSI 6	23230	782	22.67	23.90	1.327			-0.02	0.110	0.146
	LTE Band 13	10M	QPSK	1	0	Right Edge	10mm	Ant 13	DSI 6	23230	782	23.77	24.90	1.297			-0.10	0.117	0.152
	LTE Band 13	10M	QPSK	25	0	Right Edge	10mm	Ant 13	DSI 6	23230	782	22.67	23.90	1.327			0.14	0.092	0.122
	LTE Band 13	10M	QPSK	1	0	Top Edge	10mm	Ant 13	DSI 6	23230	782	23.77	24.90	1.297			0.15	0.147	0.191
	LTE Band 13	10M	QPSK	25	0	Top Edge	10mm	Ant 13	DSI 6	23230	782	22.67	23.90	1.327			0.03	0.124	0.165
	LTE Band 13	10M	QPSK	1	0	Front	10mm	Ant 31	DSI 6	23230	782	23.71	24.90	1.315			-0.09	0.124	0.163
	LTE Band 13	10M	QPSK	25	0	Front	10mm	Ant 31	DSI 6	23230	782	22.67	23.90	1.327			-0.16	0.097	0.129
	LTE Band 13	10M	QPSK	1	0	Back	10mm	Ant 31	DSI 6	23230	782	23.71	24.90	1.315			0.03	0.165	0.217
	LTE Band 13	10M	QPSK	25	0	Back	10mm	Ant 31	DSI 6	23230	782	22.67	23.90	1.327			-0.02	0.127	0.169
	LTE Band 13	10M	QPSK	1	0	Left Edge	10mm	Ant 31	DSI 6	23230	782	23.71	24.90	1.315			-0.09	0.185	0.243



FCC SAR Test Report

Report No. : FA571001

	LTE Band 13	10M	QPSK	25	0	Left Edge	10mm	Ant 31	DSI 6	23230	782	22.67	23.90	1.327			0.12	0.138	0.183
	LTE Band 13	10M	QPSK	1	0	Right Edge	10mm	Ant 31	DSI 6	23230	782	23.71	24.90	1.315			0.08	0.083	0.109
	LTE Band 13	10M	QPSK	25	0	Right Edge	10mm	Ant 31	DSI 6	23230	782	22.67	23.90	1.327			0.14	0.066	0.088
	LTE Band 13	10M	QPSK	1	0	Bottom Edge	10mm	Ant 31	DSI 6	23230	782	23.71	24.90	1.315			0.19	0.180	0.237
	LTE Band 13	10M	QPSK	25	0	Bottom Edge	10mm	Ant 31	DSI 6	23230	782	22.67	23.90	1.327			0.15	0.140	0.186
	LTE Band 26	15M	QPSK	1	0	Front	10mm	Ant 13	DSI 6	26865	831.5	23.69	24.80	1.291			0.09	0.197	0.254
	LTE Band 26	15M	QPSK	36	0	Front	10mm	Ant 13	DSI 6	26865	831.5	22.53	23.80	1.34			0.03	0.161	0.216
27	LTE Band 26	15M	QPSK	1	0	Back	10mm	Ant 13	DSI 6	26865	831.5	23.69	24.80	1.291			0.06	0.239	0.309
	LTE Band 26	15M	QPSK	36	0	Back	10mm	Ant 13	DSI 6	26865	831.5	22.53	23.80	1.34			0.08	0.190	0.255
	LTE Band 26	15M	QPSK	1	0	Left Edge	10mm	Ant 13	DSI 6	26865	831.5	23.69	24.80	1.291			-0.04	0.106	0.137
	LTE Band 26	15M	QPSK	36	0	Left Edge	10mm	Ant 13	DSI 6	26865	831.5	22.53	23.80	1.34			0.18	0.093	0.125
	LTE Band 26	15M	QPSK	1	0	Right Edge	10mm	Ant 13	DSI 6	26865	831.5	23.69	24.80	1.291			-0.11	0.112	0.145
	LTE Band 26	15M	QPSK	36	0	Right Edge	10mm	Ant 13	DSI 6	26865	831.5	22.53	23.80	1.34			0.00	0.097	0.130
	LTE Band 26	15M	QPSK	1	0	Top Edge	10mm	Ant 13	DSI 6	26865	831.5	23.69	24.80	1.291			-0.12	0.229	0.296
	LTE Band 26	15M	QPSK	36	0	Top Edge	10mm	Ant 13	DSI 6	26865	831.5	22.53	23.80	1.34			0.04	0.181	0.243
	LTE Band 26	15M	QPSK	1	0	Front	10mm	Ant 31	DSI 6	26865	831.5	23.65	24.80	1.303			-0.17	0.097	0.126
	LTE Band 26	15M	QPSK	36	0	Front	10mm	Ant 31	DSI 6	26865	831.5	22.63	23.80	1.309			-0.13	0.080	0.105
	LTE Band 26	15M	QPSK	1	0	Back	10mm	Ant 31	DSI 6	26865	831.5	23.65	24.80	1.303			-0.01	0.141	0.184
	LTE Band 26	15M	QPSK	36	0	Back	10mm	Ant 31	DSI 6	26865	831.5	22.63	23.80	1.309			0.14	0.117	0.153
	LTE Band 26	15M	QPSK	1	0	Left Edge	10mm	Ant 31	DSI 6	26865	831.5	23.65	24.80	1.303			0.05	0.122	0.159
	LTE Band 26	15M	QPSK	36	0	Left Edge	10mm	Ant 31	DSI 6	26865	831.5	22.63	23.80	1.309			-0.03	0.097	0.127
	LTE Band 26	15M	QPSK	1	0	Right Edge	10mm	Ant 31	DSI 6	26865	831.5	23.65	24.80	1.303			-0.05	0.072	0.094
	LTE Band 26	15M	QPSK	36	0	Right Edge	10mm	Ant 31	DSI 6	26865	831.5	22.63	23.80	1.309			0.08	0.059	0.077
	LTE Band 26	15M	QPSK	1	0	Bottom Edge	10mm	Ant 31	DSI 6	26865	831.5	23.65	24.80	1.303			0.15	0.098	0.128
	LTE Band 26	15M	QPSK	36	0	Bottom Edge	10mm	Ant 31	DSI 6	26865	831.5	22.63	23.80	1.309			-0.04	0.094	0.123
	LTE Band 66	20M	QPSK	1	0	Front	10mm	Ant 13	DSI 6	132322	1745	18.45	19.30	1.216			-0.05	0.164	0.199
	LTE Band 66	20M	QPSK	50	0	Front	10mm	Ant 13	DSI 6	132322	1745	18.38	19.30	1.236			-0.09	0.161	0.199
	LTE Band 66	20M	QPSK	1	0	Back	10mm	Ant 13	DSI 6	132322	1745	18.45	19.30	1.216			0.07	0.181	0.220
	LTE Band 66	20M	QPSK	50	0	Back	10mm	Ant 13	DSI 6	132322	1745	18.38	19.30	1.236			-0.14	0.176	0.218
	LTE Band 66	20M	QPSK	1	0	Left Edge	10mm	Ant 13	DSI 6	132322	1745	18.45	19.30	1.216			-0.03	0.038	0.046
	LTE Band 66	20M	QPSK	50	0	Left Edge	10mm	Ant 13	DSI 6	132322	1745	18.38	19.30	1.236			-0.01	0.001	0.001
	LTE Band 66	20M	QPSK	1	0	Right Edge	10mm	Ant 13	DSI 6	132322	1745	18.45	19.30	1.216			-0.03	0.001	0.001
	LTE Band 66	20M	QPSK	50	0	Right Edge	10mm	Ant 13	DSI 6	132322	1745	18.38	19.30	1.236			0.01	0.001	0.001
	LTE Band 66	20M	QPSK	1	0	Top Edge	10mm	Ant 13	DSI 6	132322	1745	18.45	19.30	1.216			0.05	0.298	0.362
	LTE Band 66	20M	QPSK	50	0	Top Edge	10mm	Ant 13	DSI 6	132322	1745	18.38	19.30	1.236			0.18	0.292	0.361
	LTE Band 66	20M	QPSK	1	0	Front	10mm	Ant 31	DSI 6	132322	1745	19.38	20.30	1.236			0.03	0.192	0.237
	LTE Band 66	20M	QPSK	50	0	Front	10mm	Ant 31	DSI 6	132322	1745	19.36	20.30	1.242			0.13	0.190	0.236
	LTE Band 66	20M	QPSK	1	0	Back	10mm	Ant 31	DSI 6	132322	1745	19.38	20.30	1.236			0.13	0.364	0.450
	LTE Band 66	20M	QPSK	50	0	Back	10mm	Ant 31	DSI 6	132322	1745	19.36	20.30	1.242			0.16	0.365	0.453
	LTE Band 66	20M	QPSK	1	0	Left Edge	10mm	Ant 31	DSI 6	132322	1745	19.38	20.30	1.236			-0.09	0.037	0.046
	LTE Band 66	20M	QPSK	50	0	Left Edge	10mm	Ant 31	DSI 6	132322	1745	19.36	20.30	1.242			0.12	0.045	0.056
	LTE Band 66	20M	QPSK	1	0	Right Edge	10mm	Ant 31	DSI 6	132322	1745	19.38	20.30	1.236			-0.08	0.089	0.110
	LTE Band 66	20M	QPSK	50	0	Right Edge	10mm	Ant 31	DSI 6	132322	1745	19.36	20.30	1.242			0.12	0.087	0.108
	LTE Band 66	20M	QPSK	1	0	Bottom Edge	10mm	Ant 31	DSI 6	132322	1745	19.38	20.30	1.236			-0.14	0.484	0.598
28	LTE Band 66	20M	QPSK	50	0	Bottom Edge	10mm	Ant 31	DSI 6	132322	1745	19.36	20.30	1.242			0.02	0.488	0.606
	LTE Band 41	20M	QPSK	1	0	Front	10mm	Ant 13	DSI 6	40620	2593	18.07	18.80	1.183	62.9	1.006	-0.05	0.114	0.136
	LTE Band 41	20M	QPSK	50	0	Front	10mm	Ant 13	DSI 6	40620	2593	18.05	18.80	1.189	62.9	1.006	-0.06	0.113	0.135
	LTE Band 41	20M	QPSK	1	0	Back	10mm	Ant 13	DSI 6	40620	2593	18.07	18.80	1.183	62.9	1.006	-0.12	0.374	0.445
	LTE Band 41	20M	QPSK	50	0	Back	10mm	Ant 13	DSI 6	40620	2593	18.05	18.80	1.189	62.9	1.006	-0.07	0.399	0.477
	LTE Band 41	20M	QPSK	1	0	Left Edge	10mm	Ant 13	DSI 6	40620	2593	18.07	18.80	1.183	62.9	1.006	0.01	0.070	0.083
	LTE Band 41	20M	QPSK	50	0	Left Edge	10mm	Ant 13	DSI 6	40620	2593	18.05	18.80	1.189	62.9	1.006	0.04	0.071	0.085
	LTE Band 41	20M	QPSK	1	0	Right Edge	10mm	Ant 13	DSI 6	40620	2593	18.07	18.80	1.183	62.9	1.006	0.03	0.023	0.027
	LTE Band 41	20M	QPSK	50	0	Right Edge	10mm	Ant 13	DSI 6	40620	2593	18.05	18.80	1.189	62.9	1.006	0.16	0.019	0.023
29	LTE Band 41	20M	QPSK	1	0	Top Edge	10mm	Ant 13	DSI 6	40620	2593	18.07	18.80	1.183	62.9	1.006	-0.10	0.484	0.576
	LTE Band 41	20M	QPSK	50	0	Top Edge	10mm	Ant 13	DSI 6	40620	2593	18.05	18.80	1.189	62.9	1.006	0.08	0.467	0.559
	LTE Band 41	20M	QPSK	1	0	Front	10mm	Ant 31	DSI 6	40620	2593	22.73	23.30	1.14	62.9	1.006	0.01	0.289	0.331
	LTE Band 41	20M	QPSK	50	0	Front	10mm	Ant 31	DSI 6	40620	2593	22.71	23.30	1.146	62.9	1.006	0.08	0.272	0.314
	LTE Band 41	20M	QPSK	1	0	Back	10mm	Ant 31	DSI 6	40620	2593	22.73	23.30	1.14	62.9	1.006	0.17	0.350	0.401
	LTE Band 41	20M	QPSK	50	0	Back	10mm	Ant 31	DSI 6	40620	2593	22.71	23.30	1.146	62.9	1.006	-0.05	0.351	0.405
	LTE Band 41	20M	QPSK	1	0	Left Edge	10mm	Ant 31	DSI 6	40620	2593	22.73	23.30	1.14	62.9	1.006	0.12	0.069	0.079
	LTE Band 41	20M	QPSK	50	0	Left Edge	10mm	Ant 31	DSI 6	40620	2593	22.71	23.30	1.146	62.9	1.006	-0.17	0.068	0.078
	LTE Band 41	20M	QPSK	1	0	Right Edge	10mm	Ant 31	DSI 6	40620	2593	22.73	23.30	1.14	62.9	1.006	-0.08	0.209	0.240
	LTE Band 41	20M	QPSK	50	0	Right Edge	10mm	Ant 31	DSI 6	40620	2593	22.71	23.30	1.146	62.9	1.006	-0.00	0.195	0.225
	LTE Band 41	20M	QPSK	1	0	Bottom Edge	10mm	Ant 31	DSI 6	40620	2593	22.73	23.30	1.14	62.9	1.006	0.12	0.268	0.307
	LTE Band 41	20M	QPSK	50	0	Bottom Edge	10mm	Ant 31	DSI 6	40620	2593	22.71	23.30	1.146	62.9	1.006	-0.01	0.264	0.304

**【WLAN 2.4GHz_5GHz SAR】**

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)
30	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 22	Simultaneous	6	2437	17.90	19.50	1.445	98.65	1.014	-0.02	0.179	0.262
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 22	Simultaneous	6	2437	17.90	19.50	1.445	98.65	1.014	-0.02	0.284	0.416
	WLAN2.4GHz	802.11b 1Mbps	Right Edge	10mm	Ant 22	Simultaneous	6	2437	17.90	19.50	1.445	98.65	1.014	0.13	0.209	0.306
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	10mm	Ant 22	Simultaneous	6	2437	17.90	19.50	1.445	98.65	1.014	0.10	0.208	0.305
	WLAN5GHz	802.11a 6Mbps	Front	10mm	Ant 22	Simultaneous	48	5240	14.63	16.00	1.371	98.57	1.015	0.05	0.115	0.160
	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 22	Simultaneous	48	5240	14.63	16.00	1.371	98.57	1.015	-0.03	0.075	0.104
	WLAN5GHz	802.11a 6Mbps	Right Edge	10mm	Ant 22	Simultaneous	48	5240	14.63	16.00	1.371	98.57	1.015	-0.17	0.113	0.157
	WLAN5GHz	802.11a 6Mbps	Top Edge	10mm	Ant 22	Simultaneous	48	5240	14.63	16.00	1.371	98.57	1.015	-0.12	0.082	0.114
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	10mm	Ant 22	Simultaneous	155	5775	15.06	15.50	1.107	94.0	1.064	-0.06	0.076	0.090
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 22	Simultaneous	155	5775	15.06	15.50	1.107	94.0	1.064	0.09	0.191	0.225
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Edge	10mm	Ant 22	Simultaneous	155	5775	15.06	15.50	1.107	94.0	1.064	-0.03	0.251	0.296
32	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	10mm	Ant 22	Simultaneous	155	5775	15.06	15.50	1.107	94.0	1.064	-0.14	0.304	0.358

【Bluetooth SAR】

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)
33	Bluetooth	1Mbps	Front	10mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	-0.01	0.033	0.055
	Bluetooth	1Mbps	Back	10mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	-0.18	0.029	0.049
	Bluetooth	1Mbps	Right Edge	10mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	0.11	0.021	0.035
	Bluetooth	1Mbps	Top Edge	10mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	-0.07	0.001	0.002



15.3 Body Worn Accessory SAR

【GSM SAR】

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	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
34	GSM850	GPRS 2 Tx slots	Front	15mm	Ant 13	DSI 7	189	836.4	31.44	32.50	1.276	0.04	0.188	0.240
	GSM850	GPRS 2 Tx slots	Back	15mm	Ant 13	DSI 7	189	836.4	31.44	32.50	1.276	-0.00	0.238	0.304
	GSM850	GPRS 3 Tx slots	Front	15mm	Ant 31	DSI 7	189	836.4	29.08	30.50	1.387	0.00	0.057	0.079
	GSM850	GPRS 3 Tx slots	Back	15mm	Ant 31	DSI 7	189	836.4	29.08	30.50	1.387	0.02	0.081	0.112
	GSM1900	GPRS 2 Tx slots	Front	15mm	Ant 13	DSI 7	661	1880	28.35	29.00	1.161	0.11	0.124	0.144
	GSM1900	GPRS 2 Tx slots	Back	15mm	Ant 13	DSI 7	661	1880	28.35	29.00	1.161	-0.05	0.197	0.229
	GSM1900	GPRS 2 Tx slots	Front	15mm	Ant 31	DSI 7	661	1880	27.93	28.50	1.14	0.15	0.252	0.287
	GSM1900	GPRS 2 Tx slots	Back	15mm	Ant 31	DSI 7	661	1880	27.93	28.50	1.14	0.00	0.415	0.473

【WCDMA SAR】

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	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	15mm	Ant 13	DSI 7	9400	1880	23.59	24.70	1.291	0.01	0.250	0.323
	WCDMA II	RMC 12.2Kbps	Back	15mm	Ant 13	DSI 7	9400	1880	23.59	24.70	1.291	0.03	0.397	0.513
	WCDMA II	RMC 12.2Kbps	Front	15mm	Ant 31	DSI 7	9400	1880	20.15	21.20	1.274	-0.08	0.162	0.206
	WCDMA II	RMC 12.2Kbps	Back	15mm	Ant 31	DSI 7	9400	1880	20.15	21.20	1.274	-0.02	0.265	0.338
	WCDMA IV	RMC 12.2Kbps	Front	15mm	Ant 13	DSI 7	1413	1732.6	23.61	24.70	1.285	-0.04	0.257	0.330
	WCDMA IV	RMC 12.2Kbps	Back	15mm	Ant 13	DSI 7	1413	1732.6	23.61	24.70	1.285	-0.05	0.307	0.394
	WCDMA IV	RMC 12.2Kbps	Front	15mm	Ant 31	DSI 7	1413	1732.6	20.65	21.70	1.274	-0.08	0.146	0.186
	WCDMA IV	RMC 12.2Kbps	Back	15mm	Ant 31	DSI 7	1413	1732.6	20.65	21.70	1.274	-0.04	0.250	0.319
	WCDMA V	RMC 12.2Kbps	Front	15mm	Ant 13	DSI 7	4182	836.4	23.89	25.00	1.291	-0.17	0.131	0.169
	WCDMA V	RMC 12.2Kbps	Back	15mm	Ant 13	DSI 7	4182	836.4	23.89	25.00	1.291	-0.02	0.194	0.250
	WCDMA V	RMC 12.2Kbps	Front	15mm	Ant 31	DSI 7	4182	836.4	23.97	25.00	1.268	0.02	0.099	0.126
	WCDMA V	RMC 12.2Kbps	Back	15mm	Ant 31	DSI 7	4182	836.4	23.97	25.00	1.268	-0.07	0.123	0.156

【LTE SAR】

Plot No	Band	BW	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	15mm	Ant 13	DSI 7	18900	1880	23.28	24.50	1.324			-0.18	0.234	0.310
	LTE Band 2	20M	QPSK	50	0	Front	15mm	Ant 13	DSI 7	18900	1880	22.21	23.50	1.346			-0.02	0.180	0.242
39	LTE Band 2	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	18900	1880	23.28	24.50	1.324			0.17	0.351	0.465
	LTE Band 2	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	18900	1880	22.21	23.50	1.346			0.08	0.276	0.371
	LTE Band 2	20M	QPSK	1	0	Front	15mm	Ant 31	DSI 7	18900	1880	20.55	21.50	1.245			0.02	0.161	0.200
	LTE Band 2	20M	QPSK	50	0	Front	15mm	Ant 31	DSI 7	18900	1880	20.50	21.50	1.259			-0.01	0.167	0.210
	LTE Band 2	20M	QPSK	1	0	Back	15mm	Ant 31	DSI 7	18900	1880	20.55	21.50	1.245			0.01	0.274	0.341
	LTE Band 2	20M	QPSK	50	0	Back	15mm	Ant 31	DSI 7	18900	1880	20.50	21.50	1.259			0.08	0.278	0.350
	LTE Band 4	20M	QPSK	1	0	Front	15mm	Ant 31	DSI 7	20175	1732.5	20.94	21.80	1.219			0.04	0.150	0.183
	LTE Band 4	20M	QPSK	50	0	Front	15mm	Ant 31	DSI 7	20175	1732.5	20.93	21.80	1.222			0.07	0.154	0.188
40	LTE Band 4	20M	QPSK	1	0	Back	15mm	Ant 31	DSI 7	20175	1732.5	20.94	21.80	1.219			-0.06	0.295	0.360
	LTE Band 4	20M	QPSK	50	0	Back	15mm	Ant 31	DSI 7	20175	1732.5	20.93	21.80	1.222			0.07	0.290	0.354
	LTE Band 7	20M	QPSK	1	0	Front	15mm	Ant 13	DSI 7	21100	2535	22.76	23.50	1.186			0.11	0.282	0.334
	LTE Band 7	20M	QPSK	50	0	Front	15mm	Ant 13	DSI 7	21100	2535	22.59	23.50	1.233			-0.02	0.258	0.318
	LTE Band 7	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	21100	2535	22.76	23.50	1.186			0.04	0.867	1.028
	LTE Band 7	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	20850	2510	22.53	23.50	1.25			-0.17	0.843	1.054
41	LTE Band 7	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	21350	2560	22.67	23.50	1.211			-0.01	0.920	1.114
	LTE Band 7	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	21100	2535	22.59	23.50	1.233			0.04	0.809	0.997
	LTE Band 7	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	20850	2510	22.23	23.50	1.34			-0.17	0.796	1.067
	LTE Band 7	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	21350	2560	22.42	23.50	1.282			-0.10	0.805	1.032
	LTE Band 7	20M	QPSK	100	0	Back	15mm	Ant 13	DSI 7	21100	2535	22.64	23.50	1.219			0.06	0.832	1.014
	LTE Band 7	20M	QPSK	1	0	Front	15mm	Ant 31	DSI 7	21100	2535	21.17	22.00	1.211			-0.01	0.152	0.184
	LTE Band 7	20M	QPSK	50	0	Front	15mm	Ant 31	DSI 7	21100	2535	21.15	22.00	1.216			-0.03	0.151	0.184
	LTE Band 7	20M	QPSK	1	0	Back	15mm	Ant 31	DSI 7	21100	2535	21.17	22.00	1.211			-0.11	0.147	0.178
	LTE Band 7	20M	QPSK	50	0	Back	15mm	Ant 31	DSI 7	21100	2535	21.15	22.00	1.216			0.09	0.133	0.162
	LTE Band 13	10M	QPSK	1	0	Front	15mm	Ant 13	DSI 7	23230	782	23.77	24.90	1.297			0.14	0.123	0.160
	LTE Band 13	10M	QPSK	25	0	Front	15mm	Ant 13	DSI 7	23230	782	22.67	23.90	1.327			0.16	0.104	0.138
42	LTE Band 13	10M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	23230	782	23.77	24.90	1.297			-0.13	0.178	0.231
	LTE Band 13	10M	QPSK	25	0	Back	15mm	Ant 13	DSI 7	23230	782	22.67	23.90	1.327			0.11	0.151	0.200
	LTE Band 13	10M	QPSK	1	0	Front	15mm	Ant 31	DSI 7	23230	782	23.71	24.90	1.315			0.06	0.132	0.174
	LTE Band 13	10M	QPSK	25	0	Front	15mm	Ant 31	DSI 7	23230	782	22.67	23.90	1.327			0.09	0.101	0.134
	LTE Band 13	10M	QPSK	1	0	Back	15mm	Ant 31	DSI 7	23230	782	23.71	24.90	1.315			0.03	0.111	0.146
	LTE Band 13	10M	QPSK	25	0	Back	15mm	Ant 31	DSI 7	23230	782	22.67	23.90	1.327			-0.07	0.089	0.118



FCC SAR Test Report

Report No. : FA571001

	LTE Band 26	15M	QPSK	1	0	Front	15mm	Ant 13	DSI 7	26865	831.5	23.69	24.80	1.291			-0.00	0.131	0.169
	LTE Band 26	15M	QPSK	36	0	Front	15mm	Ant 13	DSI 7	26865	831.5	22.53	23.80	1.34			0.09	0.109	0.146
43	LTE Band 26	15M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	26865	831.5	23.69	24.80	1.291			-0.09	0.192	0.248
	LTE Band 26	15M	QPSK	36	0	Back	15mm	Ant 13	DSI 7	26865	831.5	22.53	23.80	1.34			-0.03	0.159	0.213
	LTE Band 26	15M	QPSK	1	0	Front	15mm	Ant 31	DSI 7	26865	831.5	23.65	24.80	1.303			-0.09	0.107	0.139
	LTE Band 26	15M	QPSK	36	0	Front	15mm	Ant 31	DSI 7	26865	831.5	22.63	23.80	1.309			-0.10	0.085	0.111
	LTE Band 26	15M	QPSK	1	0	Back	15mm	Ant 31	DSI 7	26865	831.5	23.65	24.80	1.303			0.05	0.122	0.159
	LTE Band 26	15M	QPSK	36	0	Back	15mm	Ant 31	DSI 7	26865	831.5	22.63	23.80	1.309			0.09	0.098	0.128
	LTE Band 66	20M	QPSK	1	0	Front	15mm	Ant 13	DSI 7	132322	1745	23.86	24.80	1.242			-0.11	0.294	0.365
	LTE Band 66	20M	QPSK	50	0	Front	15mm	Ant 13	DSI 7	132322	1745	22.80	23.80	1.259			-0.01	0.222	0.279
44	LTE Band 66	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	132322	1745	23.86	24.80	1.242			0.09	0.341	0.424
	LTE Band 66	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	132322	1745	22.80	23.80	1.259			0.01	0.253	0.319
	LTE Band 66	20M	QPSK	1	0	Front	15mm	Ant 31	DSI 7	132322	1745	20.42	21.30	1.225			0.06	0.125	0.153
	LTE Band 66	20M	QPSK	50	0	Front	15mm	Ant 31	DSI 7	132322	1745	20.37	21.30	1.239			-0.02	0.121	0.150
	LTE Band 66	20M	QPSK	1	0	Back	15mm	Ant 31	DSI 7	132322	1745	20.42	21.30	1.225			-0.03	0.218	0.267
	LTE Band 66	20M	QPSK	50	0	Back	15mm	Ant 31	DSI 7	132322	1745	20.37	21.30	1.239			0.05	0.230	0.285
	LTE Band 41	20M	QPSK	1	0	Front	15mm	Ant 13	DSI 7	40620	2593	24.03	24.80	1.194	62.9	1.006	-0.04	0.250	0.300
	LTE Band 41	20M	QPSK	50	0	Front	15mm	Ant 13	DSI 7	40620	2593	23.31	23.80	1.119	62.9	1.006	-0.17	0.191	0.215
	LTE Band 41	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	40620	2593	24.03	24.80	1.194	62.9	1.006	-0.03	0.719	0.864
	LTE Band 41	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	39750	2506	23.53	24.80	1.34	62.9	1.006	0.16	0.570	0.768
	LTE Band 41	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	40185	2549.5	23.59	24.80	1.321	62.9	1.006	0.06	0.640	0.851
	LTE Band 41	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	41055	2636.5	23.91	24.80	1.227	62.9	1.006	-0.02	0.891	1.100
45	LTE Band 41	20M	QPSK	1	0	Back	15mm	Ant 13	DSI 7	41490	2680	23.88	24.80	1.236	62.9	1.006	-0.02	0.916	1.139
	LTE Band 41	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	40620	2593	23.31	23.80	1.119	62.9	1.006	-0.07	0.586	0.660
	LTE Band 41	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	39750	2506	22.79	23.80	1.262	62.9	1.006	0.13	0.634	0.805
	LTE Band 41	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	40185	2549.5	22.77	23.80	1.268	62.9	1.006	0.05	0.591	0.754
	LTE Band 41	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	41055	2636.5	23.05	23.80	1.189	62.9	1.006	0.02	0.561	0.671
	LTE Band 41	20M	QPSK	50	0	Back	15mm	Ant 13	DSI 7	41490	2680	23.04	23.80	1.191	62.9	1.006	-0.17	0.586	0.702
	LTE Band 41	20M	QPSK	100	0	Back	15mm	Ant 13	DSI 7	40620	2593	22.94	23.80	1.219	62.9	1.006	-0.08	0.598	0.733
	LTE Band 41	20M	QPSK	1	0	Front	15mm	Ant 31	DSI 7	40620	2593	24.27	24.80	1.13	62.9	1.006	0.18	0.189	0.215
	LTE Band 41	20M	QPSK	50	0	Front	15mm	Ant 31	DSI 7	40620	2593	23.21	23.80	1.146	62.9	1.006	0.07	0.155	0.179
	LTE Band 41	20M	QPSK	1	0	Back	15mm	Ant 31	DSI 7	40620	2593	24.27	24.80	1.13	62.9	1.006	-0.07	0.214	0.243
	LTE Band 41	20M	QPSK	50	0	Back	15mm	Ant 31	DSI 7	40620	2593	23.21	23.80	1.146	62.9	1.006	0.16	0.174	0.201

【WLAN 2.4GHz_5GHz SAR】

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)
46	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Ant 22	Standalone	6	2437	17.90	19.50	1.445	98.65	1.014	-0.02	0.122	0.179
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 22	Standalone	6	2437	17.90	19.50	1.445	98.65	1.014	-0.07	0.042	0.062
	WLAN5GHz	802.11n-HT40 MCS0	Front	15mm	Ant 22	Standalone	54	5270	16.97	17.50	1.13	95.88	1.043	-0.05	0.099	0.117
47	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Standalone	54	5270	16.97	17.50	1.13	95.88	1.043	0.13	0.138	0.163
	WLAN5GHz	802.11n-HT40 MCS0	Front	15mm	Ant 22	Standalone	110	5550	17.46	18.00	1.132	95.88	1.043	0.13	0.091	0.107
48	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Standalone	110	5550	17.46	18.00	1.132	95.88	1.043	0.03	0.208	0.246
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Ant 22	Standalone	155	5775	16.77	17.50	1.183	94.0	1.064	-0.12	0.078	0.098
49	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 22	Standalone	155	5775	16.77	17.50	1.183	94.0	1.064	0.05	0.222	0.279

【Bluetooth SAR】

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)
50	Bluetooth	1Mbps	Front	15mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	-0.09	0.024	0.040
	Bluetooth	1Mbps	Back	15mm	Ant 22	Full Power	39	2441	11.10	13.00	1.549	76.8	1.085	-0.11	0.020	0.034



15.4 Product specific 10g SAR

【GSM SAR】

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	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	GSM1900	GPRS 2 Tx slots	Front	0mm	Ant 31	DSI 7	661	1880	27.93	28.50	1.14	0.02	1.680	1.915
	GSM1900	GPRS 2 Tx slots	Back	0mm	Ant 31	DSI 7	661	1880	27.93	28.50	1.14	-0.08	1.390	1.585
	GSM1900	GPRS 2 Tx slots	Left Edge	0mm	Ant 31	DSI 7	661	1880	27.93	28.50	1.14	0.18	0.252	0.287
	GSM1900	GPRS 2 Tx slots	Right Edge	0mm	Ant 31	DSI 7	661	1880	27.93	28.50	1.14	-0.08	0.606	0.691
51	GSM1900	GPRS 2 Tx slots	Bottom Edge	0mm	Ant 31	DSI 7	661	1880	27.93	28.50	1.14	0.09	1.830	2.086
	GSM1900	GPRS 2 Tx slots	Bottom Edge	0mm	Ant 31	DSI 7	512	1850.2	27.82	28.50	1.169	0.07	1.720	2.011
	GSM1900	GPRS 2 Tx slots	Bottom Edge	0mm	Ant 31	DSI 7	810	1909.8	27.89	28.50	1.151	-0.01	1.770	2.037

【WLAN 5GHz SAR】

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)
	WLAN5GHz	802.11n-HT40 MCS0	Front	0mm	Ant 22	Standalone	54	5270	16.97	17.50	1.13	95.88	1.043	0.18	0.282	0.332
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	Ant 22	Standalone	54	5270	16.97	17.50	1.13	95.88	1.043	-0.12	0.179	0.211
	WLAN5GHz	802.11n-HT40 MCS0	Right Edge	0mm	Ant 22	Standalone	54	5270	16.97	17.50	1.13	95.88	1.043	-0.03	0.340	0.401
52	WLAN5GHz	802.11n-HT40 MCS0	Top Edge	0mm	Ant 22	Standalone	54	5270	16.97	17.50	1.13	95.88	1.043	-0.14	0.369	0.435
	WLAN5GHz	802.11n-HT40 MCS0	Front	0mm	Ant 22	Standalone	110	5550	17.46	18.00	1.132	95.88	1.043	-0.06	0.452	0.534
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	Ant 22	Standalone	110	5550	17.46	18.00	1.132	95.88	1.043	-0.02	0.338	0.399
	WLAN5GHz	802.11n-HT40 MCS0	Right Edge	0mm	Ant 22	Standalone	110	5550	17.46	18.00	1.132	95.88	1.043	-0.11	0.520	0.614
53	WLAN5GHz	802.11n-HT40 MCS0	Top Edge	0mm	Ant 22	Standalone	110	5550	17.46	18.00	1.132	95.88	1.043	-0.01	0.807	0.953

15.5 Repeated SAR Measurement

【Repeat SAR 1g - FCC】

No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Ratio
1st	GSM1900	GPRS 2 Tx slots	Bottom Edge	10.0	Ant 31	DSI 6	661	1880	26.95	27.50	1.135	-0.06	0.884	1.003	-
2nd	GSM1900	GPRS 2 Tx slots	Bottom Edge	10.0	Ant 31	DSI 6	661	1880	26.95	27.50	1.135	0.03	0.857	0.973	1.03
1st	LTE Band 7	20M_QPSK_1_0	Back	15.0	Ant 13	DSI 7	21350	2560	22.67	23.50	1.211	-0.01	0.920	1.114	-
2nd	LTE Band 7	20M_QPSK_1_0	Back	15.0	Ant 13	DSI 7	21350	2560	22.67	23.50	1.211	-0.18	0.912	1.104	1.01

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is $\geq 0.8\text{W/kg}$.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR $< 1.45\text{W/kg}$, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

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

General Note:

- This device supports VoIP in GPRS, EGPRS, WCDMA, and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
- EUT will choose each GSM, WCDMA, and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
- This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
- This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WLAN Direct (GC/GO), and 5.3GHz / 5.5GHz supports WLAN Direct (GC only).
- WLAN 2.4GHz and Bluetooth share the same antenna so can't transmit simultaneously.
- According to the EUT characteristic, WLAN 5GHz and Bluetooth can't transmit simultaneously.
- According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz can't transmit simultaneously.
- The maximum SAR summation is calculated based on the same configuration and test position.
- All licensed modes share the same antenna part and cannot transmit simultaneously.
- For standalone WWAN, always choose the highest SAR among all the selected WWAN bands within the selected antenna for each exposure position to perform simultaneous transmission analysis with WLAN/BT. This is the worst co-located analysis and can represent each band.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
 - $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 - If $SPLSR \leq 0.04$ for 1g SAR and $SPLSR \leq 0.10$ for 10g SAR, simultaneously transmission SAR measurement is not necessary.
 - Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.

16.1 Head Exposure Conditions

WWAN		Exposure Position	1	3	4	5	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+5 Summed 1g SAR (W/kg)
			WWAN1	2.4GHz WLAN Ant 22	5GHz WLAN Ant 22	Bluetooth Ant 22			
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
All Bands	All Ant	Right Cheek	0.943	0.457	0.285	0.156	1.40	1.23	1.10
		Right Tilted	0.854	0.506	0.369	0.176	1.36	1.22	1.03
		Left Cheek	0.622	0.817	0.478	0.271	1.44	1.14	0.93
		Left Tilted	0.598	0.616	0.403	0.210	1.21	1.00	0.81

16.2 Hotspot Exposure Conditions

WWAN		Exposure Position	1	3	4	5	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+5 Summed 1g SAR (W/kg)
			WWAN1	2.4GHz WLAN Ant 22	5GHz WLAN Ant 22	Bluetooth Ant 22			
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
All Bands	All Ant	Front	0.385	0.262	0.160	0.055	0.65	0.55	0.44
		Back	0.673	0.416	0.225	0.049	1.09	0.90	0.72
		Left Edge	0.243				0.24	0.24	0.24
		Right Edge	0.240	0.306	0.296	0.035	0.55	0.54	0.28
		Top Edge	0.593	0.305	0.358	0.002	0.90	0.95	0.60
		Bottom Edge	1.003				1.00	1.00	1.00

16.3 Body-Worn Accessory Exposure Conditions

WWAN		Exposure Position	1	3	4	5	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+5 Summed 1g SAR (W/kg)
			WWAN1	2.4GHz WLAN Ant 22	5GHz WLAN Ant 22	Bluetooth Ant 22			
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
All Bands	All Ant	Front	0.365	0.179	0.117	0.040	0.54	0.48	0.40
		Back	1.139	0.062	0.279	0.034	1.20	1.42	1.17

16.4 Product specific 10g SAR Exposure Conditions

Remark:

- For WLAN2.4G/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		Exposure Position	1	3	1+3 Summed 10g SAR (W/kg)
			WWAN1	5GHz WLAN Ant 22	
			10g SAR (W/kg)	10g SAR (W/kg)	
All Bands	All Ant	Front	1.915	0.534	2.45
		Back	1.585	0.399	1.98
		Left Edge	0.287		0.29
		Right Edge	0.691	0.614	1.31
		Top Edge	0.024	0.953	0.98
		Bottom Edge	2.086		2.09

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

17. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be $\leq 30\%$, 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.

18. References

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

Appendix C. DASY Calibration Certificate

Appendix D. Test Setup Photos

Appendix E. Conducted RF Output Power Table

Appendix F. Power reduction mechanism verification

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