FCC SAR Test Report

APPLICANT	: Guangdong OPPO Mobile Telecommunications Corp., Ltd.
EQUIPMENT	: Mobile Phone
BRAND NAME	: OPPO
MODEL NAME	: CPH2639, A402OP
FCC ID	: R9C-OP23303
STANDARD	: FCC 47 CFR Part 2 (2.1093)

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

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

Si Zhang

Approved by: Si Zhang

ACCREDITED Cert #5145.01

Sporton International Inc. (Shenzhen)
1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055
People's Republic of China

Table of Contents

1. Statement of Compliance 4
2. Administration Data 5
3. Data Reuse Approach 5
3.1 Introduction Section 5
3.2 Model Difference Information 5
3.3 Reference detail Section 6
4. Guidance Applied 6
5. Equipment Under Test (EUT) Information 7
5.1 General Information 7
5.2 General LTE SAR Test and Reporting Considerations 8
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 23
12. RF Exposure Positions 24
12.1 Ear and handset reference point 24
12.2 Definition of the cheek position 25
12.3 Definition of the tilt position 26
12.4 Body Worn Accessory 27
12.5 Product Specific 10g SAR Exposure 28
12.6 Wireless Router 28
13. Conducted RF Output Power (Unit: dBm) 29
14. Antenna Location 40
15. SAR Test Results 41
15.1 Head SAR 43
15.2 Hotspot SAR 46
15.3 Body Worn Accessory SAR 49
15.4 Product specific 10g SAR 51
15.5 Repeated SAR Measurement 52
15.6 TDD LTE Linearity Data Analysis 53
16. Simultaneous Transmission Analysis 54
16.1 Head Exposure Conditions 55
16.2 Hotspot Exposure Conditions 56
16.3 Body-Worn Accessory Exposure Conditions 57
16.4 Product specific 10g SAR Exposure Conditions 58
17. Uncertainty Assessment 59
18. References 61
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

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA431518	Rev. 01	Initial issue of report.	Jun. 03, 2024

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Guangdong OPPO Mobile Telecommunications Corp., Ltd., Mobile Phone, CPH2639, A402OP,** 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	1.00	0.39	0.25	1.59
		GSM1900	1.00	0.53	0.29	
	WCDMA	WCDMA IV	0.97	0.43	0.28	
		WCDMA II	1.04	0.58	0.42	
	LTE	LTE Band 12/17	0.71	0.19	0.22	
		LTE Band 13	0.76	0.31	0.28	
		LTE Band 26/5	0.70	0.29	0.18	
		LTE Band 4	0.92	0.47	0.29	
		LTE Band 2	0.92	0.50	0.35	
		LTE Band 7	0.88	0.58	0.29	
		LTE Band 38/41	0.96	0.42	0.46	
		LTE Band 42	0.92	0.56	0.46	
DTS	WLAN	2.4GHz WLAN	**1.10**	0.32	0.14	1.45
NII		5GHz WLAN	0.60	**0.79**	**0.79**	1.59
DSS	Bluetooth	2.4GHz Bluetooth	0.39	0.13	<0.10	1.59

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
NII	WLAN	5GHz WLAN	**1.66**	1.66
DXX	NFC	13.56MHz	<0.10	1.66
Date of Testing:			2024/4/22 ~ 2024/5/7	

Remark:

1. This device supports LTE B5 / B17 / B38 and B26 / B12 / B41. Since the supported frequency span for LTE B5 / B17 / B38 falls completely within the supports frequency span for LTE B26 / B12 / B41, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B26 / B12 / 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. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR02-SZ SAR03-SZ	CN1256	421272

Applicant	
Company Name	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	NO.18 HaiBin Road, Wusha Village, Chang'an Town, DongGuan City, Guangdong Province, P.R. China

Manufacturer	
Company Name	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	NO.18 HaiBin Road, Wusha Village, Chang'an Town, DongGuan City, Guangdong Province, P.R. China

3. Data Reuse Approach

3.1 Introduction Section

This application re-uses data collected on a similar device, FCC ID: R9C-OP23302 (reference model) and FCC ID: R9C-OP23303 (variant model). Due to the same design are identical between parent model and variant model, SAR data reuse is requested and spot check data in this report is used to justify the SAR data reuse.

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

The applicant should take full responsibility that the test data as referenced in this report represent compliance for this FCC ID: R9C-OP23303

3.2 Model Difference Information

The **main** difference between FCC ID: R9C-OP23302 and FCC ID: R9C-OP23303 is as below:

- Remove WCDMA Band V/VI, LTE Band 20/66/7C, and 5G NR bands.
- Add LTE Band 42.
- Change frequency range of LTE B41 to 2545~2655MHz and add HPUE mode.
- Change NFC Chip.
- Other differences and all the details of similarity and difference can be found in the confidential documents (CPH2639, A402OP_Operational Description of Product Equality Declaration).

3.3 Reference detail Section

Rule Part	Equipment Class	Wireless Technology	Frequency Band (MHz)	FCC ID (Reference)	Type Grant/ Permissive Change	Reference Title	FCC ID Filling (Variant)	Test on the variant
Part 2.1093	PCE	GSM	GSM850/1900	R9C-OP23302	Original Grant	FA431509	R9C-OP23303	Spot check
		WCDMA	B2/4	R9C-OP23302	Original Grant	FA431509	R9C-OP23303	Spot check
		LTE	B2/4/5/7/12/13/17/26	R9C-OP23302	Original Grant	FA431509	R9C-OP23303	Spot check
		LTE	B38/41/42				R9C-OP23303	Full Test
	DTS	BLE/WiFi	2400~2483.5	R9C-OP23302	Original Grant	FA431509	R9C-OP23303	Spot check
	NII	Wi-Fi	5150 ~ 5250 5250 ~ 5350 5470 ~ 5725 5725 ~ 5850	R9C-OP23302	Original Grant	FA431509	R9C-OP23303	Spot check
	DSS	Bluetooth	2400~2483.5	R9C-OP23302	Original Grant	FA431509	R9C-OP23303	Spot check
	DXX	NFC	13.56	R9C-OP23302	Original Grant	FA431509	R9C-OP23303	Spot check

4. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- IEC/IEEE 62209-1528:2020
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01
- FCC KDB 484596 D01 Referencing Test Data v02r03

5. Equipment Under Test (EUT) Information

5.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Phone
Brand Name	OPPO
Model Name	CPH2639, A402OP
FCC ID	R9C-OP23303
IMEI Code	IMEI 1: 862696070044930 IMEI 2: 862696070044922
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2545 MHz ~ 2655 MHz LTE Band 42: 3450 MHz ~ 3550 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11ac VHT20/VHT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC: ASK
HW Version	11
SW Version	ColorOS 14.0.1
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:

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
3. This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only).
4. This device does not support DTM operation and support GRPS/EGRPS mode up to multi-slot class 12.
5. For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 slot to perform all tests.
6. The device implements receiver detect mechanism trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
7. For WLAN when transmit, when transmit simultaneously together with WWAN/BT, the device power will be reduced power at head, body worn and extremity exposure conditions.

8. This device supports HPUE for LTE band 41 with class 2 level, HPUE power have been measured separately. For HPUE power is higher than power class 3 but with lower duty cycle, the maximum average power for class 2 and class 3 is almost the same，so we chose power class 3 full SAR testing and power class 2 verify the worst case of power class 3 SAR.
9. The two model names are only for different market purpose, and all the others are the same.
10. The device has two batteries. For battery 1/2 only suppliers are different, so only battery 1 was chosen to perform full SAR testing.

5.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	R9C-OP23303
Equipment Name	Mobile Phone
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2545 MHz ~ 2655 MHz LTE Band 42: 3450 MHz ~ 3550 MHz
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 42: 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM / 64QAM
LTE Voice / Data requirements	Voice and Data
LTE Release Version	R15, Cat13
CA Support	Yes, Downlink only
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 | ≤ 1 16 QAM: ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 16 QAM: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2 64 QAM: ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 2 64 QAM: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 3 256 QAM: ≥ 1 | ≤ 5
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, when operating in receiver detect mechanism, head/ body-worn /hotspot/extremity will trigger reduced power for some bands applied to satisfy SAR compliance, the detail please referred to section 13.
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power verification please referred to section 13.
LTE Carrier Aggregation Additional Information	This device supports maximum of 2 carriers in the downlink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.

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

LTE Band 2

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

LTE Band 4

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

LTE Band 5

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

LTE Band 7

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

LTE Band 12

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

LTE Band 13

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

LTE Band 17

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

LTE Band 26

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

LTE Band 38

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

LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	40165	2547.5	40190	2550	40215	2552.5	40240	2555
M	40485	2579.5	40490	2580	40495	2580.5	40500	2581
HM	40805	2611.5	40790	2610	40785	2609.5	40770	2608
H	41215	2652.5	41190	2650	41165	2647.5	41140	2645

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

<For LTE Overlap Bands Description>

1) LTE Bands BW

Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
LTE Band 5	Yes	Yes	Yes	Yes		
LTE Band 26	Yes	Yes	Yes	Yes	Yes	
LTE Band 12	Yes	Yes	Yes	Yes		
LTE Band 17			Yes	Yes		
LTE Band 38			Yes	Yes	Yes	Yes
LTE Band 41			Yes	Yes	Yes	Yes

2) LTE Bands tune up:

Band	Ant	Full	ECI 6	ECI 7	ECI 8	ECI 9
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
LTE Band 5	Ant.0	24.8	24.8	24.8	23.8	24.8
LTE Band 26	Ant.0	24.8	24.8	24.8	23.8	24.8
LTE Band 12	Ant.0	24.8	24.8	24.8	23.8	24.8
LTE Band 17	Ant.0	24.8	24.8	24.8	23.8	24.8
LTE Band 38	Ant.0	24.8	23.8	24.8	21.3	24.8
LTE Band 41	Ant.0	24.8	24.8	24.8	23.9	24.8

Band	Ant	Full	ECI 6	ECI 7	ECI 8	ECI 9
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
LTE Band 5	Ant.1	24.8	24.8	20.8	24.8	19.8
LTE Band 26	Ant.1	24.8	24.8	20.8	24.8	19.8
LTE Band 12	Ant.1	24.8	24.8	22.8	24.3	21.8
LTE Band 17	Ant.1	24.8	24.8	22.8	24.3	21.8
LTE Band 38	Ant.1	24.8	19.8	16.8	17.3	15.8
LTE Band 41	Ant.1	24.8	22.4	17.4	17.9	16.4

Band	Ant	Full	ECI 6	ECI 7	ECI 8	ECI 9
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
LTE Band 38	Ant.4	24.1	23.6	24.1	21.1	23.6
LTE Band 41	Ant.4	24.1	24.1	24.1	23.7	24.1

6. RF Exposure Limits

6.1 Uncontrolled Environment

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

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

7. Specific Absorption Rate (SAR)

7.1 Introduction

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

7.2 SAR Definition

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

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

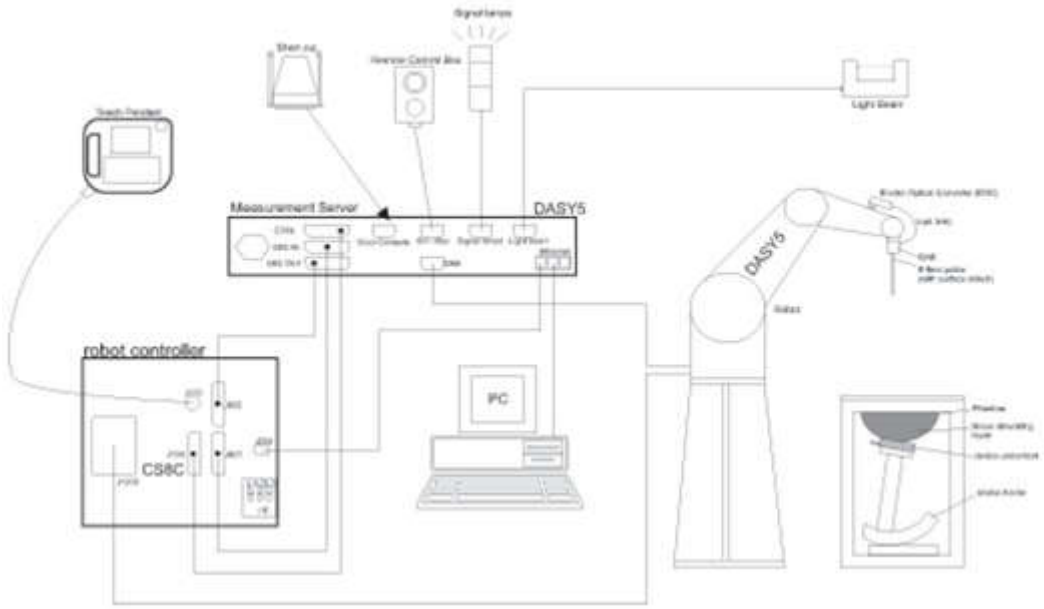
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

The DASY5 system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY 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	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

8.2 Data Acquisition Electronics (DAE)

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

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

Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

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

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

<ELI Phantom>

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

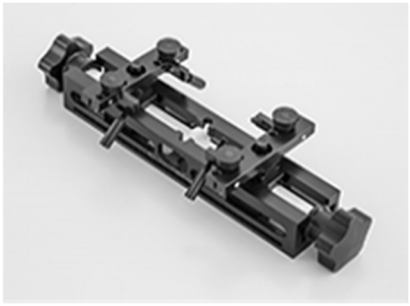
The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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

Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

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

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

Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 Power Reference Measurement

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

9.3 Area Scan

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

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

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

9.4 Zoom Scan

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

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

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

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

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

9.5 Volume Scan Procedures

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

9.6 Power Drift Monitoring

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

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1099	Dec. 15, 2021	Dec. 13, 2024
SPEAG	835MHz System Validation Kit	D835V2	4d162	Dec. 17, 2021	Dec. 15, 2024
SPEAG	1750MHz System Validation Kit	D1750V2	1137	Oct. 19, 2021	Oct. 17, 2024
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	Dec. 20, 2021	Dec. 18, 2024
SPEAG	2450MHz System Validation Kit	D2450V2	924	Nov. 03, 2023	Nov. 02, 2024
SPEAG	2600MHz System Validation Kit	D2600V2	1070	Dec. 20, 2021	Dec. 18, 2024
SPEAG	3500MHz System Validation Kit	D3500V2	1076	May 09, 2022	May 08, 2025
SPEAG	5000MHz System Validation Kit	D5GHzV2	1341	Dec. 13, 2021	Dec. 11, 2024
SPEAG	13MHz System Validation Kit	CLA13	1020	May 11, 2023	May 10, 2024
SPEAG	Data Acquisition Electronics	DAE4	715	Jan. 25, 2024	Jan. 24, 2025
SPEAG	Data Acquisition Electronics	DAE4	1664	Jun. 06, 2023	Jun. 05, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	3819	Jun. 06, 2023	Jun. 05, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7641	Apr. 24, 2023	Apr. 23, 2024
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1670	NCR	NCR
SPEAG	ELI Phantom	QD OVA 002 AA	1233	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300653	Jul. 05, 2023	Jul. 04, 2024
Anritsu	Radio communication analyzer	MT8821C	6262314715	Jul. 05, 2023	Jul. 04, 2024
Anritsu	Radio communication analyzer	MT8821C	6272278319	Jul. 05, 2023	Jul. 04, 2024
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Jul. 05, 2023	Jul. 04, 2024
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 16, 2023	Oct. 15, 2024
Speag	Dielectric Assessment KIT	DAK-3.5	1071	Feb. 19, 2024	Feb. 18, 2025
Speag	Dielectric Assessment KIT	DAK-12	1169	Aug. 24, 2023	Aug. 23, 2024
Agilent	Signal Generator	N5181A	MY50145381	Dec. 28, 2023	Dec. 27, 2024
R&S	Signal Generator	SMB100A	175779	Dec. 28, 2023	Dec. 27, 2024
Anritsu	Power Senor	MA2411B	1306099	Oct. 16, 2023	Oct. 15, 2024
Anritsu	Power Meter	ML2495A	1349001	Oct. 16, 2023	Oct. 15, 2024
Anritsu	Power Sensor	MA2411B	1542004	Dec. 28, 2023	Dec. 27, 2024
Anritsu	Power Meter	ML2495A	1339473	Dec. 28, 2023	Dec. 27, 2024
R&S	CBT BLUETOOTH TESTER	CBT	100963	Dec. 28, 2023	Dec. 27, 2024
R&S	Spectrum Analyzer	FSP7	100818	Jul. 05, 2023	Jul. 04, 2024
TES	Hygrometer	1310	200505600	Jul. 08, 2023	Jul. 07, 2024
Anymetre	Thermo-Hygrometer	JR593	2015030903	Jan. 02, 2024	Jan. 01, 2025
Anymetre	Thermo-Hygrometer	JR593	2020062101	Jul. 08, 2023	Jul. 07, 2024
SPEAG	Device Holder	N/A	N/A	N/A	N/A
AR	Amplifier	5S1G4	0333096	Note 1	
Mini-Circuits	Amplifier	ZVE-3W-83+	599201528	Note 1	
Mini-Circuits	Amplifier	ZVA-183W-S+	726202215	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
ET Industries	Dual Directional Coupler	C-058-10	N/A	Note 1	
Weinschel	Attenuator 1	3M-10	N/A	Note 1	
Weinschel	Attenuator 2	3M-20	N/A	Note 1	

Note:

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

11. System Verification

11.1 Tissue Simulating Liquids

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

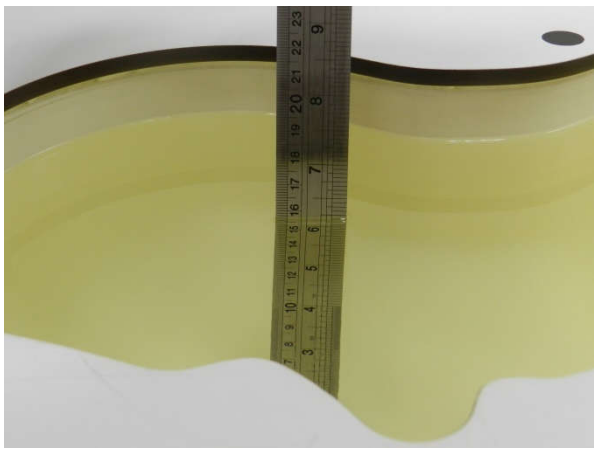


Fig 11.1 Photo of Liquid Height for Head SAR

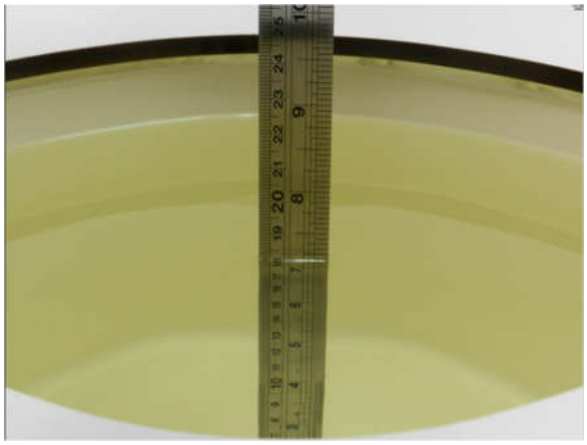


Fig 11.2 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

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

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

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Head	22.1	0.890	40.938	0.89	41.90	0.00	-2.30	±5	2024/4/22
835	Head	22.3	0.893	40.775	0.90	41.50	-0.78	-1.75	±5	2024/4/23
1750	Head	22.2	1.363	41.258	1.37	40.10	-0.51	2.89	±5	2024/4/24
1900	Head	22.4	1.423	38.640	1.40	40.00	1.64	-3.40	±5	2024/4/25
2450	Head	22.3	1.751	39.227	1.80	39.20	-2.72	0.07	±5	2024/4/26
2600	Head	22.5	1.891	40.140	1.96	39.00	-3.52	2.92	±5	2024/4/27
2600	Head	22.1	1.892	40.280	1.96	39.00	-3.47	3.28	±5	2024/5/6
3500	Head	22.3	2.889	36.791	2.91	37.90	-0.72	-2.93	±5	2024/4/28
3500	Head	22.2	2.895	36.561	2.91	37.90	-0.52	-3.53	±5	2024/5/7
5250	Head	22.4	4.751	36.922	4.71	35.95	0.87	2.70	±5	2024/4/29
5600	Head	22.5	5.191	36.113	5.07	35.50	2.39	1.73	±5	2024/4/30
5750	Head	22.3	5.362	35.831	5.22	35.35	2.72	1.36	±5	2024/5/1
13	Head	22.3	0.768	55.765	0.75	55.00	2.40	1.39	±5	2024/4/22

11.3 System Performance Check Results

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

<1g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2024/4/22	750	Head	250	1099	3819	715	2.050	8.540	8.2	-3.98
2024/4/23	835	Head	250	4d162	3819	715	2.530	9.640	10.12	4.98
2024/4/24	1750	Head	250	1137	3819	715	8.910	36.500	35.64	-2.36
2024/4/25	1900	Head	250	5d182	3819	715	10.200	39.600	40.8	3.03
2024/4/26	2450	Head	250	924	3819	715	13.000	52.300	52	-0.57
2024/4/27	2600	Head	250	1070	3819	715	14.700	56.200	58.8	4.63
2024/5/6	2600	Head	250	1070	3819	715	13.700	56.200	54.8	-2.49
2024/4/28	3500	Head	100	1076	3819	715	6.650	66.200	66.5	0.45
2024/5/7	3500	Head	100	1076	3819	715	6.800	66.200	68	2.72
2024/4/29	5250	Head	100	1341	3819	715	7.980	80.700	79.8	-1.12
2024/4/30	5600	Head	100	1341	3819	715	8.460	84.500	84.6	0.12
2024/5/1	5750	Head	100	1341	3819	715	7.670	80.600	76.7	-4.84
2024/4/22	13	Head	250	1020	7641	1664	0.133	0.563	0.532	-5.00

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2024/4/22	750	Head	250	1099	3819	715	1.350	5.650	5.4	-4.42
2024/4/23	835	Head	250	4d162	3819	715	1.650	6.260	6.6	5.43
2024/4/24	1750	Head	250	1137	3819	715	4.820	19.200	19.28	0.42
2024/4/25	1900	Head	250	5d182	3819	715	5.150	20.200	20.6	1.98
2024/4/26	2450	Head	250	924	3819	715	6.110	24.500	24.44	-0.24
2024/4/27	2600	Head	250	1070	3819	715	6.560	24.600	26.24	6.67
2024/5/6	2600	Head	250	1070	3819	715	6.220	24.600	24.88	1.14
2024/4/28	3500	Head	100	1076	3819	715	2.590	25.500	25.9	1.57
2024/5/7	3500	Head	100	1076	3819	715	2.530	25.500	25.3	-0.78
2024/4/29	5250	Head	100	1341	3819	715	2.360	23.100	23.6	2.16
2024/4/30	5600	Head	100	1341	3819	715	2.470	24.000	24.7	2.92
2024/5/1	5750	Head	100	1341	3819	715	2.260	22.700	22.6	-0.44
2024/4/22	13	Head	250	1020	7641	1664	0.082	0.347	0.328	-6.29

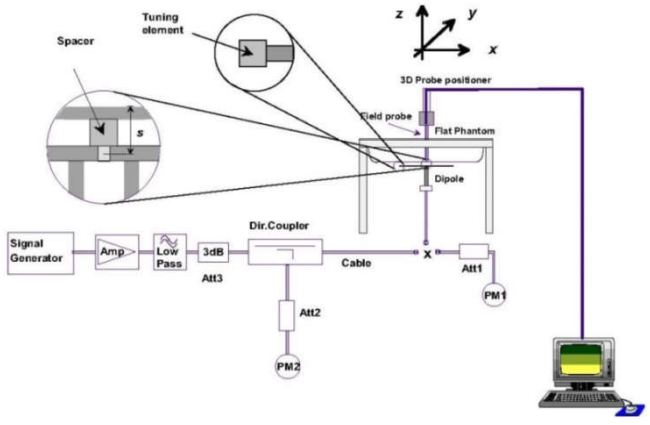


Fig 11.3.1 System Performance Check Setup

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.

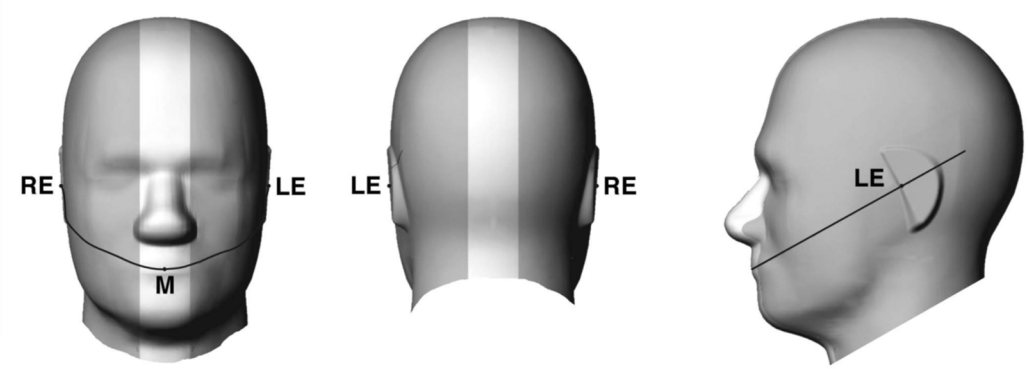


Fig 12.1.1 Front, back, and side views of SAM twin phantom

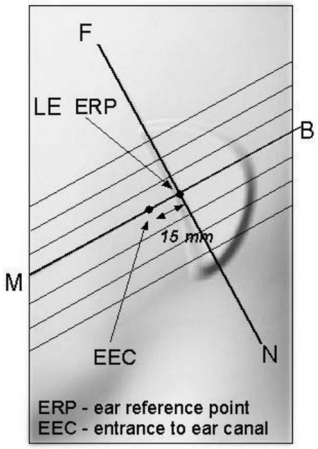


Fig 12.1.2 Close-up side view of phantom showing the ear region.

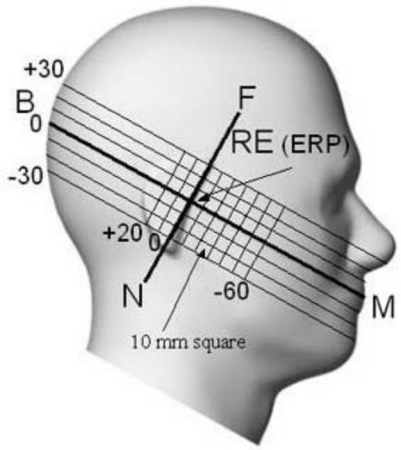


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

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

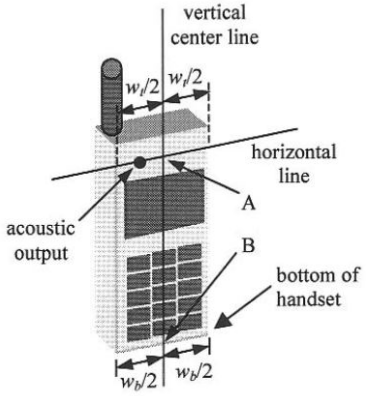


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case

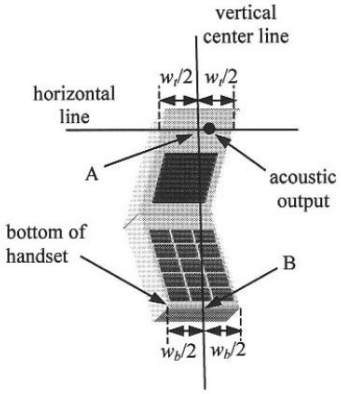


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

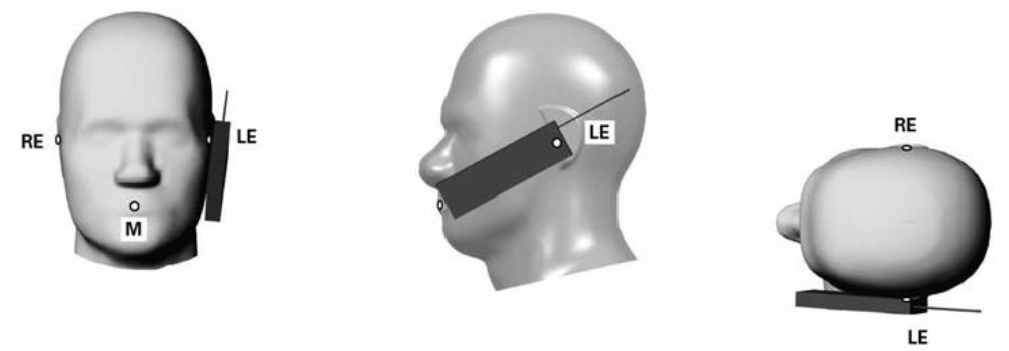


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

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

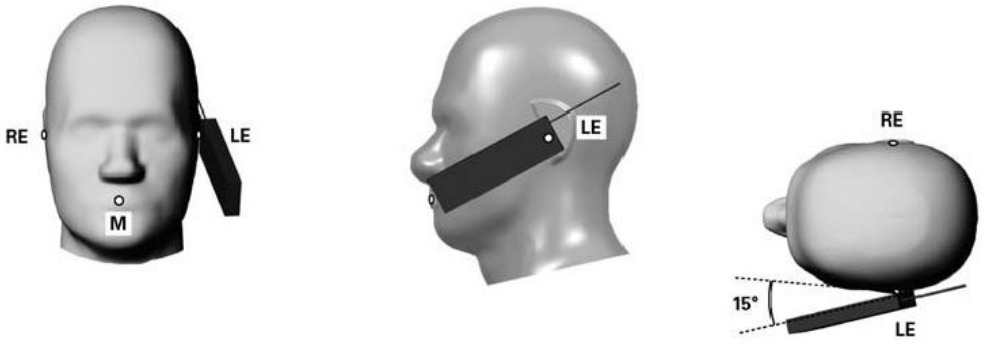


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

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

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

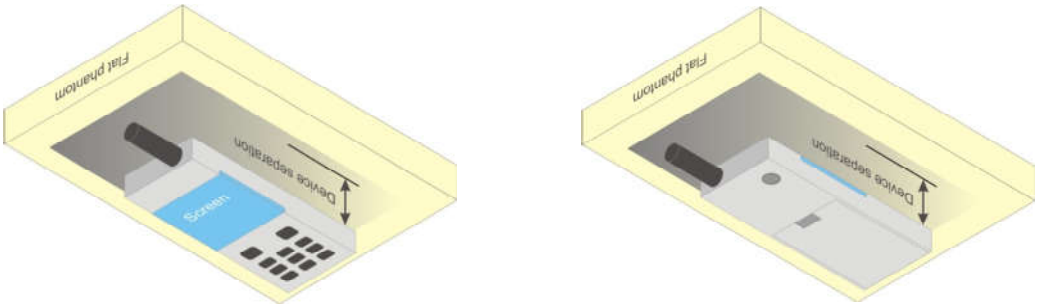


Fig 12.4 Body Worn Position

12.5 Product Specific 10g SAR Exposure

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

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

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

12.6 Wireless Router

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

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

13. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<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 ≤ ¼ 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} (Note1, 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 Δ_{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 Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

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

Note 4: For subtest 2 the β_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 β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA 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. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   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, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. 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} (Note1)	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	209/225	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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 47/15	4 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 Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_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 β_c = 10/15 and β_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: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_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	Proces ses	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.		

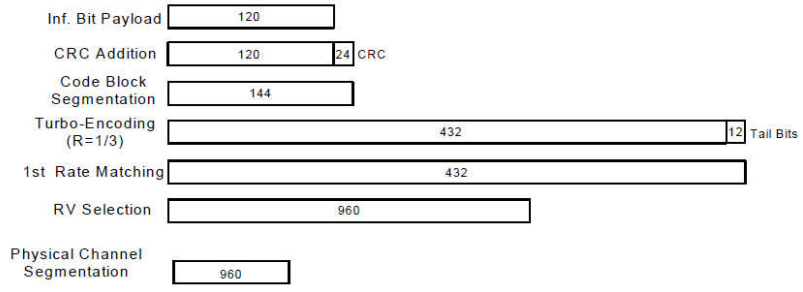


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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 Parms
   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	$\beta_{ed}1$: 30/15 $\beta_{ed}2$: 30/15	$\beta_{ed}3$: 24/15 $\beta_{ed}4$: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_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 β_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:

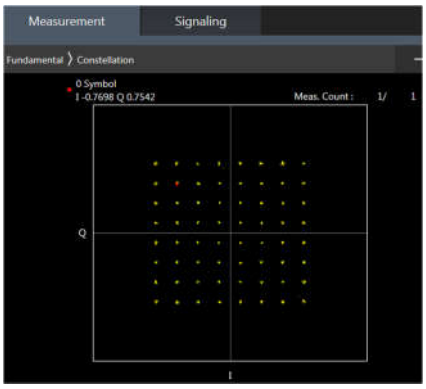
1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is ≤ ¼ 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 ¼ 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 ½ 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 ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B12 / B17 / B26 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE B5 / B17 SAR test was covered by B26 / B12; 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 ≤ 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.

16QAM



64QAM

<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.

a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
b. "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
c. 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.

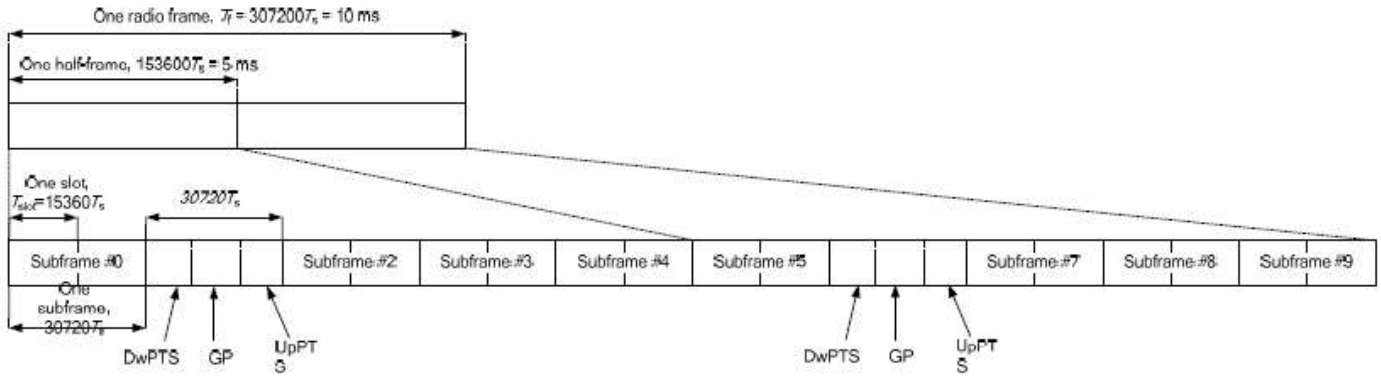


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

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

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

The highest duty factor is resulted from:

For LTE TDD Power class 2

i. Uplink-downlink configuration: 1. In a half-frame consisted of 5 subfames, uplink operation is in 2 uplink subframes and 1 special subframe.
ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (2+0.167)/5 = 43.3%
iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (2+0.143)/5 = 42.9%
v. For TDD LTE SAR measurement, the duty cycle 1:2.33 (42.9 %) was used perform testing and considering the theoretical duty cycle of 43.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 42.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 43.3%/42.9% = 1.009 is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

For LTE TDD Power class 3

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, uplink operation is in 3 uplink subframes and 1 special subframe.
ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
iii. 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%
iv. 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%
v. 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.

The device can adjust uplink/downlink configuration automatically according to the transmitting power class level, as followings:

LTE TDD Band	Power Class level	support uplink/downlink configuration
LTE Band 41	> 23	1,2,3,4,5
	=23	0,1,2,3,4,5,6
	< 23	0,1,2,3,4,5,6

<LTE Carrier Aggregation>

General Note:

1. This device supports Carrier Aggregation on downlink for inter and intra band. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.
2. In applying the existing power measurement procedures of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of frequency bands and CCs in each row need combination, and for this device that all the configurations were choose to power measurement.
3. All permutations exist. No restrictions on Pcell & Scell combinations.

2CC Downlink Carrier Aggregation	
Number	Combination
1	CA_42C
2	CA_41C
3	CA_41A-42A

LTE Carrier Aggregation Conducted Power (Downlink)

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

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

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

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

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

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

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

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

<WLAN Conducted Power>

General Note:

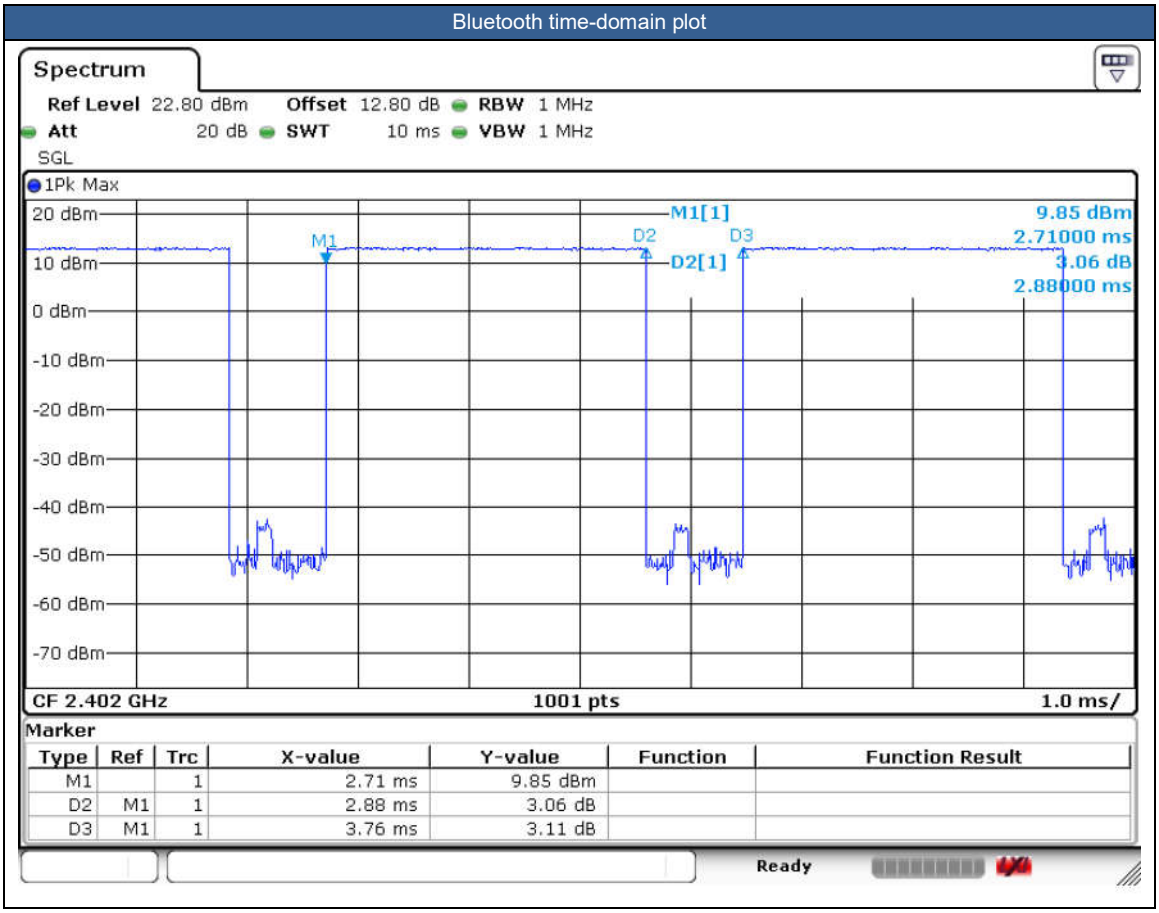
1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default 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 76.6% as following figure, according to Oct. 2016 TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to100% for Bluetooth reported SAR calculation

Bluetooth time-domain plot



14. Antenna Location

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

15. SAR Test Results

Spot Check General Note:

1. According to section 3.3, spot check conducted power test against the variant project based on the worst-case SAR condition from the original project was performed in this filing to demonstrate the test data from original project remains representative for the variant project. Detail Conducted power measurement referred to appendix E.
2. SAR spot check verification on the worst cases from the original model was performed to demonstrate the test data from original model remains representative for the variant model.
3. Per KDB 484596 D01 v02r03, the variant filings must demonstrate that the referenced test data remain valid for the variant device by including spot-check measurements that meet the following criteria:
   a. Spot-check measurements shall be made in correspondence to the worst-case scenario reported in the reference device filing, i.e., for those conditions that are the closest to non-compliance
   b. Spot-check measurements, while being always compliant with the applicable rule part(s) for the test under consideration, may show a deviation ddB from the reference data no larger than 3 dB:
   $$d_{dB} = | VdB – RdB | \leq 3\ dB \quad (1)$$
   where between VdB, the variant spot-check level in dB, and RdB is the corresponding measurement level in dB for the reference model.
4. The Spot check results showed that Deviation of the SAR results did not exceed 30%, therefore referring to the guidance in the KDB inquiry, SAR data reuse is justified.
5. 1st as parent model, 2nd as variant model.

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN/BT 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 WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. 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.
   f. For TDD LTE SAR measurement of power class 2, the duty cycle 1:2.33 (42.9 %) was used perform testing and considering the theoretical duty cycle of 43.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 42.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 43.3%/42.9% = 1.009 is applied to scale-up the measured SAR result. The reported TDD LTE SAR (W/kg) = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The device implements receiver detect mechanism trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
5. For WLAN when transmit, when transmit simultaneously together with WWAN/BT, the device power will be reduced power at head, body worn and extremity exposure conditions.
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, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

a. WLAN 5.3/5.5GHz tested the product specific 10g SAR since it has no hotspot mode.
b. 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. For head, body worn and extremity exposure conditions with WWAN bands, standalone SAR test pass and simultaneous transmission analysis more conservatively, so Simultaneous SAR additional testing is not required.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 / B12 / B17 / B26 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE B5 / B17 SAR test was covered by B26 / B12; 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 ≤ 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

ECI status description：

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

Exposure Condition	ECI	Trigger conditions
Head SAR-Standalone	ECI 7	Receiver on
Head SAR- Simultaneous	ECI 9	Receiver on+WLAN
Body worn/Extremity SAR-Standalone	ECI 6	Receiver off
Body worn/Hotspot/Extremity SAR- Simultaneous	ECI 8	Receiver off+WLAN

15.1 Head SAR

Plot No.	No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation d_{dB} (dB)
750MHz																				
	1st	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	23095	707.5	21.95	22.80	1.216	-0.03	0.584	0.710	0.05
01	2nd	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 7	23095	707.5	21.92	22.80	1.225	-0.02	0.573	**0.702**	
	1st	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	23095	707.5	23.90	24.80	1.230	0.13	0.092	0.113	0.28
	2nd	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 7	23095	707.5	23.56	24.80	1.330	-0.05	0.080	0.106	
	1st	LTE Band 13	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	23230	782	21.94	22.80	1.219	-0.05	0.597	0.728	0.20
02	2nd	LTE Band 13	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 7	23230	782	22.01	22.80	1.199	0.01	0.635	**0.762**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	23230	782	23.98	24.80	1.208	-0.15	0.130	0.157	0.64
	2nd	LTE Band 13	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 7	23230	782	23.40	24.80	1.380	0.06	0.132	0.182	
835MHz																				
	1st	GSM850	-	-	-	-	GPRS(4 Tx slots)	Right Cheek	0mm	Ant 1	ECI 2	189	836.4	23.49	25.00	1.416	0.07	0.612	0.866	0.61
03	2nd	GSM850	-	-	-	-	GPRS(4 Tx slots)	Right Cheek	0mm	Ant 1	ECI 7	189	836.4	23.17	25.00	1.524	0.02	0.654	**0.997**	
	1st	GSM850	-	-	-	-	GPRS(4 Tx slots)	Left Cheek	0mm	Ant 0	ECI 2	189	836.4	26.74	28.00	1.337	-0.04	0.140	0.187	0.14
	2nd	GSM850	-	-	-	-	GPRS(4 Tx slots)	Left Cheek	0mm	Ant 0	ECI 7	189	836.4	26.45	28.00	1.429	-0.11	0.135	0.193	
	1st	LTE Band 26	15M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 2	26865	831.5	20.10	20.80	1.175	-0.11	0.555	0.652	0.30
04	2nd	LTE Band 26	15M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	ECI 7	26865	831.5	19.95	20.80	1.216	0.03	0.575	**0.699**	
	1st	LTE Band 26	15M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	26865	831.5	24.03	24.80	1.194	-0.09	0.126	0.150	0.06
	2nd	LTE Band 26	15M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 7	26865	831.5	23.31	24.80	1.409	0.06	0.105	0.148	
1750MHz																				
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	1413	1732.6	18.10	18.80	1.175	0.04	0.828	0.973	0.16
05	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 7	1413	1732.6	18.05	18.80	1.189	0.07	0.788	**0.937**	
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 2	1413	1732.6	24.07	24.80	1.183	0.14	0.095	0.112	0.71
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 7	1413	1732.6	23.59	24.80	1.321	-0.08	0.100	0.132	
	1st	LTE Band 66	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	132322	1745	18.12	18.80	1.169	0.04	0.786	0.919	0.72
06	2nd	LTE Band 4	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 7	20175	1732.5	18.41	18.80	1.094	0.03	0.711	**0.778**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	132322	1745	24.15	24.80	1.161	-0.07	0.092	0.107	1.26
	2nd	LTE Band 4	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 7	20175	1732.5	23.10	24.80	1.479	0.11	0.097	0.143	
	1st	LTE Band 66	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 2	132322	1745	23.65	24.30	1.161	0.02	0.050	0.058	0.49
	2nd	LTE Band 4	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	ECI 7	20175	1732.5	22.63	24.30	1.469	0.03	0.044	0.065	
1900MHz																				
	1st	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Right Tilted	0mm	Ant 1	ECI 2	661	1880	20.15	21.00	1.216	-0.03	0.705	0.857	0.69
07	2nd	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Right Tilted	0mm	Ant 1	ECI 7	661	1880	20.10	21.00	1.230	0.02	0.816	**1.004**	
	1st	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Left Cheek	0mm	Ant 0	ECI 2	661	1880	26.64	28.00	1.368	0	0.051	0.070	0.24
	2nd	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Left Cheek	0mm	Ant 0	ECI 7	661	1880	26.13	28.00	1.538	0.02	0.048	0.074	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 2	9400	1880	16.82	17.80	1.253	-0.05	0.806	1.010	0.14
08	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 1	ECI 7	9400	1880	16.64	17.80	1.306	0.04	0.799	**1.044**	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 2	9400	1880	23.90	24.80	1.230	0.18	0.133	0.164	0.43
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 7	9400	1880	23.43	24.80	1.371	-0.03	0.132	0.181	
	1st	LTE Band 2	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	18900	1880	17.16	17.80	1.159	0.03	0.792	0.918	0.28
09	2nd	LTE Band 2	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 7	18900	1880	17.35	17.80	1.109	0.15	0.776	**0.861**	
	1st	LTE Band 2	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 2	18900	1880	23.05	23.80	1.189	-0.19	0.104	0.124	1.00
	2nd	LTE Band 2	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	ECI 7	18900	1880	22.20	23.80	1.445	0.05	0.108	0.156	
2600MHz																				
	1st	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 2	21350	2560	13.52	14.30	1.197	0.01	0.732	0.876	0.32
10	2nd	LTE Band 7	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	ECI 7	21350	2560	13.62	14.30	1.169	0.05	0.695	**0.813**	
	1st	LTE Band 7	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 2	21100	2535	24.50	24.80	1.072	0.08	0.343	0.368	2.06
	2nd	LTE Band 7	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	ECI 7	21100	2535	22.92	24.80	1.542	0.13	0.384	0.592	

Plot No.	No.	Band	BW (MHz)	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)
2600MHz																				
	2nd	LTE Band 41	20M	QPSK	1	49	Right Cheek	0mm	Ant 1	ECI 7	40770	2608	17.15	17.40	1.059	62.9	1.006	-0.07	0.515	0.549
	2nd	LTE Band 41	20M	QPSK	1	49	Right Tilted	0mm	Ant 1	ECI 7	40770	2608	17.15	17.40	1.059	62.9	1.006	-0.13	0.643	0.685
	2nd	LTE Band 41	20M	QPSK	1	49	Left Cheek	0mm	Ant 1	ECI 7	40770	2608	17.15	17.40	1.059	62.9	1.006	-0.16	0.179	0.191
	2nd	LTE Band 41	20M	QPSK	1	49	Left Tilted	0mm	Ant 1	ECI 7	40770	2608	17.15	17.40	1.059	62.9	1.006	-0.12	0.212	0.226
11	2nd	LTE Band 41	20M	QPSK	1	49	Right Tilted	0mm	Ant 1	ECI 7	40240	2555	16.75	17.40	1.161	62.9	1.006	0.06	0.819	**0.957**
	2nd	LTE Band 41	20M	QPSK	1	49	Right Tilted	0mm	Ant 1	ECI 7	40500	2581	16.93	17.40	1.114	62.9	1.006	0.06	0.684	0.767
	2nd	LTE Band 41	20M	QPSK	1	49	Right Tilted	0mm	Ant 1	ECI 7	41140	2645	17.09	17.40	1.074	62.9	1.006	-0.14	0.819	0.885
	2nd	LTE Band 41_PC2	20M	QPSK	1	49	Right Tilted	0mm	Ant 1	ECI 7	40240	2555	16.15	16.80	1.161	42.9	1.009	-0.1	0.450	0.527
	2nd	LTE Band 41	20M	QPSK	50	0	Right Cheek	0mm	Ant 1	ECI 7	40770	2608	17.05	17.40	1.084	62.9	1.006	0.18	0.503	0.548
	2nd	LTE Band 41	20M	QPSK	50	0	Right Tilted	0mm	Ant 1	ECI 7	40770	2608	17.05	17.40	1.084	62.9	1.006	-0.07	0.633	0.690
	2nd	LTE Band 41	20M	QPSK	50	0	Left Cheek	0mm	Ant 1	ECI 7	40770	2608	17.05	17.40	1.084	62.9	1.006	-0.13	0.170	0.185
	2nd	LTE Band 41	20M	QPSK	50	0	Left Tilted	0mm	Ant 1	ECI 7	40770	2608	17.05	17.40	1.084	62.9	1.006	-0.04	0.205	0.224
	2nd	LTE Band 41	20M	QPSK	50	0	Right Tilted	0mm	Ant 1	ECI 7	40240	2555	16.71	17.40	1.172	62.9	1.006	0.01	0.784	0.925
	2nd	LTE Band 41	20M	QPSK	50	0	Right Tilted	0mm	Ant 1	ECI 7	40500	2581	16.81	17.40	1.146	62.9	1.006	-0.03	0.653	0.753
	2nd	LTE Band 41	20M	QPSK	50	0	Right Tilted	0mm	Ant 1	ECI 7	41140	2645	17.02	17.40	1.091	62.9	1.006	-0.02	0.870	0.955
	2nd	LTE Band 41	20M	QPSK	100	0	Right Tilted	0mm	Ant 1	ECI 7	40770	2608	17.02	17.40	1.091	62.9	1.006	0.17	0.613	0.673
	2nd	LTE Band 41	20M	QPSK	1	49	Right Cheek	0mm	Ant 0	ECI 7	40770	2608	24.13	24.80	1.167	62.9	1.006	0.03	0.287	0.337
	2nd	LTE Band 41	20M	QPSK	1	49	Right Tilted	0mm	Ant 0	ECI 7	40770	2608	24.13	24.80	1.167	62.9	1.006	-0.1	0.150	0.176
	2nd	LTE Band 41	20M	QPSK	1	49	Left Cheek	0mm	Ant 0	ECI 7	40770	2608	24.13	24.80	1.167	62.9	1.006	0.04	0.145	0.170
	2nd	LTE Band 41	20M	QPSK	1	49	Left Tilted	0mm	Ant 0	ECI 7	40770	2608	24.13	24.80	1.167	62.9	1.006	-0.19	0.105	0.123
	2nd	LTE Band 41_PC2	20M	QPSK	1	49	Right Cheek	0mm	Ant 0	ECI 7	40770	2608	25.08	25.80	1.180	42.9	1.009	-0.02	0.242	0.288
	2nd	LTE Band 41	20M	QPSK	50	0	Right Cheek	0mm	Ant 0	ECI 7	40770	2608	23.65	23.80	1.035	62.9	1.006	-0.06	0.261	0.272
	2nd	LTE Band 41	20M	QPSK	50	0	Right Tilted	0mm	Ant 0	ECI 7	40770	2608	23.65	23.80	1.035	62.9	1.006	0.01	0.129	0.134
	2nd	LTE Band 41	20M	QPSK	50	0	Left Cheek	0mm	Ant 0	ECI 7	40770	2608	23.65	23.80	1.035	62.9	1.006	-0.12	0.130	0.135
	2nd	LTE Band 41	20M	QPSK	50	0	Left Tilted	0mm	Ant 0	ECI 7	40770	2608	23.65	23.80	1.035	62.9	1.006	-0.04	0.097	0.101
	2nd	LTE Band 41	20M	QPSK	1	49	Right Cheek	0mm	Ant 4	ECI 7	40770	2608	23.38	24.10	1.180	62.9	1.006	-0.06	0.223	0.265
	2nd	LTE Band 41	20M	QPSK	1	49	Right Tilted	0mm	Ant 4	ECI 7	40770	2608	23.38	24.10	1.180	62.9	1.006	-0.14	0.096	0.114
	2nd	LTE Band 41	20M	QPSK	1	49	Left Cheek	0mm	Ant 4	ECI 7	40770	2608	23.38	24.10	1.180	62.9	1.006	0.08	0.122	0.145
	2nd	LTE Band 41	20M	QPSK	1	49	Left Tilted	0mm	Ant 4	ECI 7	40770	2608	23.38	24.10	1.180	62.9	1.006	0.13	0.064	0.076
	2nd	LTE Band 41_PC2	20M	QPSK	1	49	Right Cheek	0mm	Ant 4	ECI 7	40770	2608	24.23	25.10	1.222	42.9	1.009	0.1	0.199	0.245
	2nd	LTE Band 41	20M	QPSK	50	0	Right Cheek	0mm	Ant 4	ECI 7	40770	2608	22.91	23.10	1.045	62.9	1.006	0.14	0.208	0.219
	2nd	LTE Band 41	20M	QPSK	50	0	Right Tilted	0mm	Ant 4	ECI 7	40770	2608	22.91	23.10	1.045	62.9	1.006	0.16	0.081	0.085
	2nd	LTE Band 41	20M	QPSK	50	0	Left Cheek	0mm	Ant 4	ECI 7	40770	2608	22.91	23.10	1.045	62.9	1.006	0.06	0.119	0.125
	2nd	LTE Band 41	20M	QPSK	50	0	Left Tilted	0mm	Ant 4	ECI 7	40770	2608	22.91	23.10	1.045	62.9	1.006	0.07	0.059	0.062
3000MHz																				
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Cheek	0mm	Ant 3	ECI 7	42590	3500	18.88	19.50	1.153	62.9	1.006	-0.1	0.156	0.181
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Tilted	0mm	Ant 3	ECI 7	42590	3500	18.88	19.50	1.153	62.9	1.006	-0.03	0.145	0.168
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 3	ECI 7	42590	3500	18.88	19.50	1.153	62.9	1.006	0.08	0.701	0.813
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Tilted	0mm	Ant 3	ECI 7	42590	3500	18.88	19.50	1.153	62.9	1.006	0.09	0.288	0.334
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 3	ECI 7	42190	3460	18.83	19.50	1.167	62.9	1.006	-0.05	0.601	0.705
12	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 3	ECI 7	42990	3540	18.81	19.50	1.172	62.9	1.006	0.08	0.779	**0.919**
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 3	ECI 9	42590	3500	17.88	18.50	1.153	62.9	1.006	-0.04	0.601	0.697
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Cheek	0mm	Ant 3	ECI 7	42590	3500	18.87	19.50	1.156	62.9	1.006	0.15	0.148	0.172
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Tilted	0mm	Ant 3	ECI 7	42590	3500	18.87	19.50	1.156	62.9	1.006	-0.12	0.134	0.156
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Left Cheek	0mm	Ant 3	ECI 7	42590	3500	18.87	19.50	1.156	62.9	1.006	0	0.600	0.698
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Left Tilted	0mm	Ant 3	ECI 7	42590	3500	18.87	19.50	1.156	62.9	1.006	-0.14	0.300	0.349
	2nd	LTE Band 42 Part27Q	20M	QPSK	100	0	Left Cheek	0mm	Ant 3	ECI 7	42590	3500	18.84	19.50	1.164	62.9	1.006	0.02	0.583	0.683
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Cheek	0mm	Ant 4	ECI 7	42590	3500	21.28	21.80	1.127	62.9	1.006	0.11	0.541	0.613
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Tilted	0mm	Ant 4	ECI 7	42590	3500	21.28	21.80	1.127	62.9	1.006	0.05	0.266	0.302
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 4	ECI 7	42590	3500	21.28	21.80	1.127	62.9	1.006	-0.19	0.318	0.361
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Tilted	0mm	Ant 4	ECI 7	42590	3500	21.28	21.80	1.127	62.9	1.006	-0.08	0.110	0.125
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Cheek	0mm	Ant 4	ECI 7	42590	3500	21.14	21.80	1.164	62.9	1.006	0.04	0.505	0.591

	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Tilted	0mm	Ant 4	ECI 7	42590	3500	21.14	21.80	1.164	62.9	1.006	0.07	0.260	0.304
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Left Cheek	0mm	Ant 4	ECI 7	42590	3500	21.14	21.80	1.164	62.9	1.006	0.13	0.311	0.364
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Left Tilted	0mm	Ant 4	ECI 7	42590	3500	21.14	21.80	1.164	62.9	1.006	0.06	0.100	0.117
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Cheek	0mm	Ant 5	ECI 7	42590	3500	23.32	23.40	1.019	62.9	1.006	0.03	0.111	0.114
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Tilted	0mm	Ant 5	ECI 7	42590	3500	23.32	23.40	1.019	62.9	1.006	-0.18	0.140	0.143
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 5	ECI 7	42590	3500	23.32	23.40	1.019	62.9	1.006	-0.17	0.368	0.377
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Tilted	0mm	Ant 5	ECI 7	42590	3500	23.32	23.40	1.019	62.9	1.006	-0.03	0.247	0.253
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 5	ECI 7	42190	3460	23.25	23.40	1.035	62.9	1.006	0.19	0.343	0.357
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 5	ECI 7	42990	3540	23.21	23.40	1.045	62.9	1.006	0.19	0.342	0.359
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Cheek	0mm	Ant 5	ECI 7	42590	3500	22.26	22.40	1.033	62.9	1.006	-0.19	0.098	0.102
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Tilted	0mm	Ant 5	ECI 7	42590	3500	22.26	22.40	1.033	62.9	1.006	-0.01	0.113	0.117
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Left Cheek	0mm	Ant 5	ECI 7	42590	3500	22.26	22.40	1.033	62.9	1.006	0.06	0.310	0.322
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Left Tilted	0mm	Ant 5	ECI 7	42590	3500	22.26	22.40	1.033	62.9	1.006	0	0.212	0.220
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Cheek	0mm	Ant 6	ECI 7	42590	3500	17.90	18.50	1.148	62.9	1.006	-0.17	0.325	0.375
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Tilted	0mm	Ant 6	ECI 7	42590	3500	17.90	18.50	1.148	62.9	1.006	0.06	0.343	0.396
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 6	ECI 7	42590	3500	17.90	18.50	1.148	62.9	1.006	0.12	0.698	0.806
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Tilted	0mm	Ant 6	ECI 7	42590	3500	17.90	18.50	1.148	62.9	1.006	0.01	0.485	0.560
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 6	ECI 7	42190	3460	17.87	18.50	1.156	62.9	1.006	-0.01	0.719	0.836
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 6	ECI 7	42990	3540	17.71	18.50	1.199	62.9	1.006	0.1	0.517	0.624
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Cheek	0mm	Ant 6	ECI 9	42590	3500	16.90	17.50	1.148	62.9	1.006	0.14	0.571	0.660
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Cheek	0mm	Ant 6	ECI 7	42590	3500	17.89	18.50	1.151	62.9	1.006	-0.19	0.320	0.370
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Tilted	0mm	Ant 6	ECI 7	42590	3500	17.89	18.50	1.151	62.9	1.006	-0.05	0.335	0.388
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Left Cheek	0mm	Ant 6	ECI 7	42590	3500	17.89	18.50	1.151	62.9	1.006	0.19	0.549	0.636
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Left Tilted	0mm	Ant 6	ECI 7	42590	3500	17.89	18.50	1.151	62.9	1.006	-0.01	0.474	0.549
	2nd	LTE Band 42 Part27Q	20M	QPSK	100	0	Left Cheek	0mm	Ant 6	ECI 7	42590	3500	17.85	18.50	1.161	62.9	1.006	0.03	0.553	0.646

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation d_{dB} (dB)
2450MHz																		
	1st	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 7	Standalone	6	2437	17.05	17.50	1.109	100	1.000	0.04	0.991	1.099	0.70
13	2nd	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 7	Standalone	6	2437	17.10	17.50	1.096	100	1.000	-0.09	0.854	**0.936**	
	1st	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Ant 7	Standalone	39	2441	12.20	14.00	1.514	76.6	1.305	-0.08	0.198	0.391	2.93
14	2nd	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Ant 7	Standalone	39	2441	12.00	14.00	1.585	76.6	1.305	-0.05	0.096	**0.199**	
5000MHz																		
	1st	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 7	Standalone	54	5270	11.56	13.50	1.563	94.74	1.056	-0.19	0.354	0.584	0.29
15	2nd	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 7	Standalone	54	5270	11.74	13.50	1.500	94.74	1.056	0.05	0.345	**0.546**	
	1st	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 7	Standalone	122	5610	11.63	13.50	1.538	90.56	1.104	-0.06	0.312	0.530	0.35
16	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 7	Standalone	122	5610	11.76	13.50	1.493	90.56	1.104	0.07	0.348	**0.574**	
	1st	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 7	Standalone	155	5775	11.55	13.50	1.567	90.56	1.104	-0.15	0.348	0.602	0.86
17	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 7	Standalone	155	5775	11.63	13.50	1.538	90.56	1.104	0.11	0.291	**0.494**	

15.2 Hotspot SAR

Plot No.	No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation d_{dB} (dB)
750MHz																				
	1st	LTE Band 12	10M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	23095	707.5	23.56	24.30	1.186	-0.06	0.127	0.151	0.88
18	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 8	23095	707.5	23.42	24.30	1.225	0.03	0.151	**0.185**	
	1st	LTE Band 12	10M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	23095	707.5	22.92	23.80	1.225	0.11	0.122	0.149	0.25
	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 8	23095	707.5	22.58	23.80	1.324	-0.04	0.119	0.158	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	23230	782	23.97	24.80	1.211	0.04	0.253	0.306	0.42
19	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 8	23230	782	23.96	24.80	1.213	0.13	0.229	**0.278**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	23230	782	23.98	24.80	1.208	-0.15	0.167	0.202	0.49
	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 8	23230	782	23.40	24.80	1.380	0.08	0.164	0.226	
835MHz																				
	1st	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 1	ECI 3	189	836.4	26.73	28.00	1.340	0.05	0.218	0.292	0.07
	2nd	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 1	ECI 8	189	836.4	26.62	28.00	1.374	-0.06	0.216	0.297	
	1st	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 0	ECI 3	189	836.4	26.74	28.00	1.337	0.14	0.294	0.393	0.22
20	2nd	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 0	ECI 8	189	836.4	26.45	28.00	1.429	0.11	0.262	**0.374**	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 3	26865	831.5	23.95	24.80	1.216	-0.12	0.180	0.219	0.14
	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	10mm	Ant 1	ECI 8	26865	831.5	23.95	24.80	1.216	0.05	0.174	0.212	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	26865	831.5	22.92	23.80	1.225	0.03	0.192	0.235	0.90
21	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 8	26865	831.5	22.31	23.80	1.409	-0.08	0.205	**0.289**	
1750MHz																				
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 1	ECI 3	1413	1732.6	18.65	19.30	1.161	0.19	0.268	0.311	0.19
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 1	ECI 8	1413	1732.6	18.53	19.30	1.194	0.13	0.272	0.325	
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	ECI 3	1413	1732.6	19.50	20.30	1.202	-0.12	0.353	0.424	0.04
22	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	ECI 8	1413	1732.6	19.10	20.30	1.318	0.05	0.325	**0.428**	
	1st	LTE Band 66	20M	QPSK	50	0	-	Top Side	10mm	Ant 1	ECI 3	132322	1745	19.06	19.80	1.186	0.05	0.291	0.345	0.03
	2nd	LTE Band 4	20M	QPSK	50	0	-	Top Side	10mm	Ant 1	ECI 8	20175	1732.5	19.37	19.80	1.104	-0.12	0.311	0.343	
	1st	LTE Band 66	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	ECI 3	132322	1745	19.55	20.30	1.189	-0.14	0.383	0.455	0.13
23	2nd	LTE Band 4	20M	QPSK	1	0	-	Bottom Side	10mm	Ant 0	ECI 8	20175	1732.5	18.56	20.30	1.493	0.03	0.314	**0.469**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Back	10mm	Ant 4	ECI 3	132322	1745	23.65	24.30	1.161	0.03	0.046	0.053	0.47
	2nd	LTE Band 4	20M	QPSK	1	0	-	Back	10mm	Ant 4	ECI 8	20175	1732.5	22.63	24.30	1.469	0.01	0.040	0.059	
1900MHz																				
	1st	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Top Side	10mm	Ant 1	ECI 3	661	1880	21.74	22.50	1.191	-0.15	0.393	0.468	0.52
24	2nd	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Top Side	10mm	Ant 1	ECI 8	661	1880	21.55	22.50	1.245	0.02	0.424	**0.528**	
	1st	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 0	ECI 3	661	1880	22.74	23.50	1.191	0.15	0.299	0.356	0.02
	2nd	GSM1900	-	-	-	-	GPRS(4 Tx slots)	Back	10mm	Ant 0	ECI 8	661	1880	22.34	23.50	1.306	-0.03	0.274	0.358	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 1	ECI 3	9400	1880	18.82	19.80	1.253	-0.12	0.372	0.466	0.13
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 1	ECI 8	9400	1880	18.75	19.80	1.274	0.03	0.377	0.480	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	ECI 3	9400	1880	19.88	20.80	1.236	-0.17	0.387	0.478	0.87
25	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 0	ECI 8	9400	1880	19.41	20.80	1.377	-0.09	0.424	**0.584**	
	1st	LTE Band 2	20M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	18900	1880	18.44	19.30	1.219	0.16	0.361	0.440	0.55
26	2nd	LTE Band 2	20M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 8	18900	1880	18.75	19.30	1.135	0.05	0.440	**0.499**	
	1st	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	ECI 3	18900	1880	19.20	20.30	1.288	-0.09	0.324	0.417	0.41
	2nd	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 0	ECI 8	18900	1880	18.68	20.30	1.452	0.13	0.261	0.379	
2600MHz																				
	1st	LTE Band 7	20M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 3	21100	2535	14.44	15.30	1.219	0.02	0.467	0.569	0.07
27	2nd	LTE Band 7	20M	QPSK	1	0	-	Top Side	10mm	Ant 1	ECI 8	21100	2535	14.65	15.30	1.161	-0.07	0.498	**0.578**	
	1st	LTE Band 7	20M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 3	21100	2535	19.27	19.80	1.130	0.06	0.182	0.206	1.69
	2nd	LTE Band 7	20M	QPSK	1	0	-	Back	10mm	Ant 0	ECI 8	21100	2535	18.45	19.80	1.365	0.12	0.223	0.304	

Plot No.	No.	Band	BW (MHz)	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)
2600MHz																				
	2nd	LTE Band 41	20M	QPSK	1	49	Front	10mm	Ant 1	ECI 8	40770	2608	17.65	17.90	1.059	62.9	1.006	-0.02	0.123	0.131
	2nd	LTE Band 41	20M	QPSK	1	49	Back	10mm	Ant 1	ECI 8	40770	2608	17.65	17.90	1.059	62.9	1.006	0.16	0.242	0.258
	2nd	LTE Band 41	20M	QPSK	1	49	Left Side	10mm	Ant 1	ECI 8	40770	2608	17.65	17.90	1.059	62.9	1.006	0.14	0.136	0.145
	2nd	LTE Band 41	20M	QPSK	1	49	Top Side	10mm	Ant 1	ECI 8	40770	2608	17.65	17.90	1.059	62.9	1.006	0.06	0.299	0.319
	2nd	LTE Band 41_PC2	20M	QPSK	1	49	Top Side	10mm	Ant 1	ECI 8	40770	2608	16.90	17.30	1.096	42.9	1.009	-0.07	0.184	0.204
	2nd	LTE Band 41	20M	QPSK	50	0	Front	10mm	Ant 1	ECI 8	40770	2608	17.55	17.90	1.084	62.9	1.006	0.08	0.115	0.125
	2nd	LTE Band 41	20M	QPSK	50	0	Back	10mm	Ant 1	ECI 8	40770	2608	17.55	17.90	1.084	62.9	1.006	-0.19	0.233	0.254
	2nd	LTE Band 41	20M	QPSK	50	0	Left Side	10mm	Ant 1	ECI 8	40770	2608	17.55	17.90	1.084	62.9	1.006	-0.17	0.125	0.136
	2nd	LTE Band 41	20M	QPSK	50	0	Top Side	10mm	Ant 1	ECI 8	40770	2608	17.55	17.90	1.084	62.9	1.006	0.18	0.256	0.279
	2nd	LTE Band 41	20M	QPSK	1	49	Front	10mm	Ant 0	ECI 8	40770	2608	23.63	23.90	1.064	62.9	1.006	0.13	0.254	0.272
	2nd	LTE Band 41	20M	QPSK	1	49	Back	10mm	Ant 0	ECI 8	40770	2608	23.63	23.90	1.064	62.9	1.006	0	0.353	0.378
	2nd	LTE Band 41	20M	QPSK	1	49	Left Side	10mm	Ant 0	ECI 8	40770	2608	23.63	23.90	1.064	62.9	1.006	-	n/a	n/a
	2nd	LTE Band 41	20M	QPSK	1	49	Right Side	10mm	Ant 0	ECI 8	40770	2608	23.63	23.90	1.064	62.9	1.006	-0.19	0.183	0.196
28	2nd	LTE Band 41	20M	QPSK	1	49	Bottom Side	10mm	Ant 0	ECI 8	40770	2608	23.63	23.90	1.064	62.9	1.006	-0.17	0.389	**0.416**
	2nd	LTE Band 41_PC2	20M	QPSK	1	49	Bottom Side	10mm	Ant 0	ECI 8	40770	2608	22.62	23.30	1.169	42.9	1.009	-0.15	0.219	0.258
	2nd	LTE Band 41	20M	QPSK	50	0	Front	10mm	Ant 0	ECI 8	40770	2608	23.15	23.80	1.161	62.9	1.006	-0.04	0.231	0.270
	2nd	LTE Band 41	20M	QPSK	50	0	Back	10mm	Ant 0	ECI 8	40770	2608	23.15	23.80	1.161	62.9	1.006	-0.07	0.322	0.376
	2nd	LTE Band 41	20M	QPSK	50	0	Left Side	10mm	Ant 0	ECI 8	40770	2608	23.15	23.80	1.161	62.9	1.006	-	n/a	n/a
	2nd	LTE Band 41	20M	QPSK	50	0	Right Side	10mm	Ant 0	ECI 8	40770	2608	23.15	23.80	1.161	62.9	1.006	-0.03	0.150	0.175
	2nd	LTE Band 41	20M	QPSK	50	0	Bottom Side	10mm	Ant 0	ECI 8	40770	2608	23.15	23.80	1.161	62.9	1.006	-0.17	0.344	0.402
	2nd	LTE Band 41	20M	QPSK	1	49	Front	10mm	Ant 4	ECI 8	40770	2608	23.18	23.70	1.127	62.9	1.006	0.14	0.063	0.071
	2nd	LTE Band 41	20M	QPSK	1	49	Back	10mm	Ant 4	ECI 8	40770	2608	23.18	23.70	1.127	62.9	1.006	-0.03	0.361	0.409
	2nd	LTE Band 41	20M	QPSK	1	49	Left Side	10mm	Ant 4	ECI 8	40770	2608	23.18	23.70	1.127	62.9	1.006	-0.02	0.185	0.210
	2nd	LTE Band 41	20M	QPSK	1	49	Top Side	10mm	Ant 4	ECI 8	40770	2608	23.18	23.70	1.127	62.9	1.006	-0.01	0.056	0.064
	2nd	LTE Band 41_PC2	20M	QPSK	1	49	Back	10mm	Ant 4	ECI 8	40770	2608	22.43	23.10	1.167	42.9	1.009	0.08	0.208	0.245
	2nd	LTE Band 41	20M	QPSK	50	0	Front	10mm	Ant 4	ECI 8	40770	2608	22.75	23.10	1.084	62.9	1.006	-0.02	0.058	0.063
	2nd	LTE Band 41	20M	QPSK	50	0	Back	10mm	Ant 4	ECI 8	40770	2608	22.75	23.10	1.084	62.9	1.006	-0.15	0.345	0.376
	2nd	LTE Band 41	20M	QPSK	50	0	Left Side	10mm	Ant 4	ECI 8	40770	2608	22.75	23.10	1.084	62.9	1.006	0.02	0.175	0.191
	2nd	LTE Band 41	20M	QPSK	50	0	Top Side	10mm	Ant 4	ECI 8	40770	2608	22.75	23.10	1.084	62.9	1.006	-0.02	0.054	0.059
3000MHz																				
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Front	10mm	Ant 3	ECI 8	42590	3500	18.38	19.00	1.153	62.9	1.006	-0.14	0.114	0.132
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	10mm	Ant 3	ECI 8	42590	3500	18.38	19.00	1.153	62.9	1.006	0.1	0.346	0.401
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Side	10mm	Ant 3	ECI 8	42590	3500	18.38	19.00	1.153	62.9	1.006	0.15	0.321	0.372
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Top Side	10mm	Ant 3	ECI 8	42590	3500	18.38	19.00	1.153	62.9	1.006	-0.07	0.090	0.104
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	10mm	Ant 3	ECI 8	42190	3460	18.33	19.00	1.167	62.9	1.006	-0.15	0.337	0.396
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	10mm	Ant 3	ECI 8	42990	3540	18.31	19.00	1.172	62.9	1.006	-0.15	0.326	0.384
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Front	10mm	Ant 3	ECI 8	42590	3500	18.37	19.00	1.156	62.9	1.006	0.17	0.110	0.128
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Back	10mm	Ant 3	ECI 8	42590	3500	18.37	19.00	1.156	62.9	1.006	0.13	0.338	0.393
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Side	10mm	Ant 3	ECI 8	42590	3500	18.37	19.00	1.156	62.9	1.006	0.11	0.318	0.370
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Top Side	10mm	Ant 3	ECI 8	42590	3500	18.37	19.00	1.156	62.9	1.006	0.15	0.088	0.102
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Front	10mm	Ant 4	ECI 8	42590	3500	18.28	18.80	1.127	62.9	1.006	-0.11	0.075	0.085
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	10mm	Ant 4	ECI 8	42590	3500	18.28	18.80	1.127	62.9	1.006	-0.07	0.289	0.328
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Left Side	10mm	Ant 4	ECI 8	42590	3500	18.28	18.80	1.127	62.9	1.006	-0.01	0.254	0.288
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Top Side	10mm	Ant 4	ECI 8	42590	3500	18.28	18.80	1.127	62.9	1.006	-	n/a	n/a
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Front	10mm	Ant 4	ECI 8	42590	3500	18.14	18.80	1.164	62.9	1.006	-0.15	0.068	0.080
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Back	10mm	Ant 4	ECI 8	42590	3500	18.14	18.80	1.164	62.9	1.006	0.02	0.278	0.326
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Left Side	10mm	Ant 4	ECI 8	42590	3500	18.14	18.80	1.164	62.9	1.006	-0.03	0.246	0.288
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Top Side	10mm	Ant 4	ECI 8	42590	3500	18.14	18.80	1.164	62.9	1.006	-	n/a	n/a
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Front	10mm	Ant 5	ECI 8	42590	3500	17.32	17.40	1.019	62.9	1.006	-	n/a	n/a
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	10mm	Ant 5	ECI 8	42590	3500	17.32	17.40	1.019	62.9	1.006	-0.16	0.162	0.166
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Side	10mm	Ant 5	ECI 8	42590	3500	17.32	17.40	1.019	62.9	1.006	-0.18	0.104	0.107
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Top Side	10mm	Ant 5	ECI 8	42590	3500	17.32	17.40	1.019	62.9	1.006	-	n/a	n/a

	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Front	10mm	Ant 5	ECI 8	42590	3500	17.26	17.40	1.033	62.9	1.006	-	n/a	n/a
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Back	10mm	Ant 5	ECI 8	42590	3500	17.26	17.40	1.033	62.9	1.006	0.03	0.156	0.162
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Side	10mm	Ant 5	ECI 8	42590	3500	17.26	17.40	1.033	62.9	1.006	0.05	0.100	0.104
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Top Side	10mm	Ant 5	ECI 8	42590	3500	17.26	17.40	1.033	62.9	1.006	-	n/a	n/a
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Front	10mm	Ant 6	ECI 8	42590	3500	20.40	21.00	1.148	62.9	1.006	0.09	0.203	0.234
29	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	10mm	Ant 6	ECI 8	42590	3500	20.40	21.00	1.148	62.9	1.006	0.11	0.481	**0.556**
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Right Side	10mm	Ant 6	ECI 8	42590	3500	20.40	21.00	1.148	62.9	1.006	-	n/a	n/a
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Top Side	10mm	Ant 6	ECI 8	42590	3500	20.40	21.00	1.148	62.9	1.006	-0.02	0.232	0.268
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	10mm	Ant 6	ECI 8	42190	3460	20.37	21.00	1.156	62.9	1.006	-0.06	0.341	0.397
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	10mm	Ant 6	ECI 8	42990	3540	20.21	21.00	1.199	62.9	1.006	-0.08	0.349	0.421
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Front	10mm	Ant 6	ECI 8	42590	3500	20.39	21.00	1.151	62.9	1.006	0	0.198	0.229
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Back	10mm	Ant 6	ECI 8	42590	3500	20.39	21.00	1.151	62.9	1.006	-0.13	0.344	0.398
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Right Side	10mm	Ant 6	ECI 8	42590	3500	20.39	21.00	1.151	62.9	1.006	-	n/a	n/a
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Top Side	10mm	Ant 6	ECI 8	42590	3500	20.39	21.00	1.151	62.9	1.006	0.05	0.226	0.262

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation d_{dB} (dB)
2450MHz																		
	1st	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 7	Full	11	2462	17.60	18.00	1.096	100	1.000	-0.13	0.264	0.289	0.37
30	2nd	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 7	Full	11	2462	17.70	18.00	1.072	100	1.000	0.19	0.294	**0.315**	
	1st	Bluetooth	DH5 1Mbps	Back	10mm	Ant 7	Full	39	2441	12.20	14.00	1.514	76.6	1.305	0.17	0.064	0.127	0.25
31	2nd	Bluetooth	DH5 1Mbps	Back	10mm	Ant 7	Full	39	2441	12.00	14.00	1.585	76.6	1.305	0.09	0.058	**0.120**	
5000MHz																		
	1st	WLAN5.2GHz	802.11n-HT40 MCS0	Back	10mm	Ant 7	Hotspot on	46	5230	14.28	16.00	1.486	94.74	1.056	-0.08	0.504	0.791	1.43
32	2nd	WLAN5.2GHz	802.11n-HT40 MCS0	Back	10mm	Ant 7	Hotspot on	46	5230	14.38	16.00	1.452	94.74	1.056	0.06	0.371	**0.569**	
	1st	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	10mm	Ant 7	Hotspot on	155	5775	14.56	16.00	1.393	90.56	1.104	0.05	0.476	0.732	1.17
33	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	10mm	Ant 7	Hotspot on	155	5775	14.67	16.00	1.358	90.56	1.104	0.08	0.373	**0.559**	

15.3 Body Worn Accessory SAR

Plot No.	No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation d_{dB} (dB)
750MHz																				
	1st	LTE Band 12	10M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 1	23095	707.5	24.06	24.80	1.186	0	0.135	0.160	0.51
	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 6	23095	707.5	23.95	24.80	1.216	0.02	0.148	0.180	
	1st	LTE Band 12	10M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 1	23095	707.5	23.90	24.80	1.230	0.08	0.137	0.169	1.18
34	2nd	LTE Band 12	10M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 6	23095	707.5	23.56	24.80	1.330	-0.12	0.167	**0.222**	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 1	23230	782	23.97	24.80	1.211	0.04	0.229	0.277	0.66
	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 6	23230	782	23.96	24.80	1.213	0.05	0.196	0.238	
	1st	LTE Band 13	10M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 1	23230	782	23.98	24.80	1.208	0.14	0.181	0.219	0.43
35	2nd	LTE Band 13	10M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 6	23230	782	23.40	24.80	1.380	0.06	0.175	**0.242**	
835MHz																				
	1st	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	15mm	Ant 1	ECI 1	189	836.4	26.73	28.00	1.340	0.02	0.153	0.205	0.93
36	2nd	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	15mm	Ant 1	ECI 6	189	836.4	26.62	28.00	1.374	-0.17	0.185	**0.254**	
	1st	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	15mm	Ant 0	ECI 1	189	836.4	26.74	28.00	1.337	0.18	0.119	0.159	0.19
	2nd	GSM850	-	-	-	-	GPRS(4 Tx slots)	Back	15mm	Ant 0	ECI 6	189	836.4	26.45	28.00	1.429	0.09	0.116	0.166	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 1	26865	831.5	23.95	24.80	1.216	-0.02	0.121	0.147	0.83
37	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 6	26865	831.5	23.95	24.80	1.216	0.11	0.146	**0.178**	
	1st	LTE Band 26	15M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 1	26865	831.5	24.03	24.80	1.194	0.03	0.111	0.133	0.13
	2nd	LTE Band 26	15M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 6	26865	831.5	23.31	24.80	1.409	0.05	0.097	0.137	
1750MHz																				
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 1	ECI 1	1413	1732.6	21.14	21.80	1.164	-0.05	0.189	0.220	0.02
	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 1	ECI 6	1413	1732.6	21.05	21.80	1.189	0.02	0.186	0.221	
	1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0	ECI 1	1413	1732.6	21.95	22.80	1.216	0.15	0.212	0.258	0.40
38	2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0	ECI 6	1413	1732.6	21.49	22.80	1.352	0.13	0.209	**0.283**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 1	132322	1745	21.89	22.30	1.099	-0.17	0.206	0.226	0.32
	2nd	LTE Band 4	20M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 6	20175	1732.5	21.85	22.30	1.109	0.11	0.189	0.210	
	1st	LTE Band 66	20M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 1	132322	1745	22.16	22.80	1.159	0.08	0.197	0.228	0.98
39	2nd	LTE Band 4	20M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 6	20175	1732.5	21.21	22.80	1.442	0.05	0.198	**0.286**	
	1st	LTE Band 66	20M	QPSK	1	0	-	Back	15mm	Ant 4	ECI 1	132322	1745	23.65	24.30	1.161	0.05	0.050	0.058	0.49
	2nd	LTE Band 4	20M	QPSK	1	0	-	Back	15mm	Ant 4	ECI 6	20175	1732.5	22.63	24.30	1.469	0.06	0.044	0.065	
1900MHz																				
	1st	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Back	15mm	Ant 1	ECI 1	661	1880	26.54	28.00	1.400	0.13	0.137	0.192	1.85
40	2nd	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Back	15mm	Ant 1	ECI 6	661	1880	26.20	28.00	1.514	-0.03	0.194	**0.294**	
	1st	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Back	15mm	Ant 0	ECI 1	661	1880	26.64	28.00	1.368	0.16	0.134	0.183	1.82
	2nd	GSM1900	-	-	-	-	GPRS(2 Tx slots)	Back	15mm	Ant 0	ECI 6	661	1880	26.13	28.00	1.538	0.11	0.181	0.278	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 1	ECI 1	9400	1880	21.30	22.30	1.259	0.04	0.259	0.326	0.65
	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 1	ECI 6	9400	1880	21.12	22.30	1.312	-0.12	0.289	0.379	
	1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0	ECI 1	9400	1880	22.24	23.30	1.276	-0.19	0.283	0.361	0.61
41	2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 0	ECI 6	9400	1880	21.77	23.30	1.422	0.05	0.292	**0.415**	
	1st	LTE Band 2	20M	QPSK	50	0	-	Back	15mm	Ant 1	ECI 1	18900	1880	21.13	21.80	1.167	-0.13	0.233	0.272	0.14
	2nd	LTE Band 2	20M	QPSK	50	0	-	Back	15mm	Ant 1	ECI 6	18900	1880	21.21	21.80	1.146	0.05	0.245	0.281	
	1st	LTE Band 2	20M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 1	18900	1880	22.06	22.80	1.186	-0.13	0.236	0.280	0.97
42	2nd	LTE Band 2	20M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 6	18900	1880	21.22	22.80	1.439	-0.08	0.243	**0.350**	
2600MHz																				
	1st	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 1	21100	2535	17.29	17.80	1.125	0.09	0.255	0.287	0.23
43	2nd	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 1	ECI 6	21100	2535	17.25	17.80	1.135	0.09	0.240	**0.272**	
	1st	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 1	21100	2535	21.90	22.30	1.096	-0.04	0.169	0.185	1.49
	2nd	LTE Band 7	20M	QPSK	1	0	-	Back	15mm	Ant 0	ECI 6	21100	2535	20.83	22.30	1.403	0.11	0.186	0.261	

Plot No.	No.	Band	BW (MHz)	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)
2600MHz																				
	2nd	LTE Band 41	20M	QPSK	1	49	Front	15mm	Ant 1	ECI 6	40770	2608	22.15	22.40	1.059	62.9	1.006	0.08	0.203	0.216
44	2nd	LTE Band 41	20M	QPSK	1	49	Back	15mm	Ant 1	ECI 6	40770	2608	22.15	22.40	1.059	62.9	1.006	-0.07	0.430	**0.458**
	2nd	LTE Band 41_PC2	20M	QPSK	1	49	Back	15mm	Ant 1	ECI 6	40770	2608	21.30	21.80	1.122	42.9	1.009	-0.19	0.221	0.250
	2nd	LTE Band 41	20M	QPSK	50	0	Front	15mm	Ant 1	ECI 6	40770	2608	21.95	22.40	1.109	62.9	1.006	-0.1	0.197	0.220
	2nd	LTE Band 41	20M	QPSK	50	0	Back	15mm	Ant 1	ECI 6	40770	2608	21.95	22.40	1.109	62.9	1.006	-0.01	0.390	0.435
	2nd	LTE Band 41	20M	QPSK	1	49	Front	15mm	Ant 0	ECI 6	40770	2608	24.13	24.80	1.167	62.9	1.006	0.11	0.179	0.210
	2nd	LTE Band 41	20M	QPSK	1	49	Back	15mm	Ant 0	ECI 6	40770	2608	24.13	24.80	1.167	62.9	1.006	-0.01	0.222	0.261
	2nd	LTE Band 41_PC2	20M	QPSK	1	49	Back	15mm	Ant 0	ECI 6	40770	2608	25.08	25.80	1.180	42.9	1.009	-0.14	0.193	0.230
	2nd	LTE Band 41	20M	QPSK	50	0	Front	15mm	Ant 0	ECI 6	40770	2608	23.65	23.80	1.035	62.9	1.006	0.14	0.165	0.172
	2nd	LTE Band 41	20M	QPSK	50	0	Back	15mm	Ant 0	ECI 6	40770	2608	23.65	23.80	1.035	62.9	1.006	0.1	0.203	0.211
	2nd	LTE Band 41	20M	QPSK	1	49	Front	15mm	Ant 4	ECI 6	40770	2608	23.38	24.10	1.180	62.9	1.006	-0.1	0.042	0.050
	2nd	LTE Band 41	20M	QPSK	1	49	Back	15mm	Ant 4	ECI 6	40770	2608	23.38	24.10	1.180	62.9	1.006	0.03	0.150	0.178
	2nd	LTE Band 41_PC2	20M	QPSK	1	49	Back	15mm	Ant 4	ECI 6	40770	2608	24.23	25.10	1.222	42.9	1.009	-0.19	0.126	0.155
	2nd	LTE Band 41	20M	QPSK	50	0	Front	15mm	Ant 4	ECI 6	40770	2608	22.91	23.10	1.045	62.9	1.006	0.05	0.038	0.040
	2nd	LTE Band 41	20M	QPSK	50	0	Back	15mm	Ant 4	ECI 6	40770	2608	22.91	23.10	1.045	62.9	1.006	0.15	0.140	0.147
3000MHz																				
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Front	15mm	Ant 3	ECI 6	42590	3500	20.78	21.50	1.180	62.9	1.006	0.04	0.110	0.131
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	15mm	Ant 3	ECI 6	42590	3500	20.78	21.50	1.180	62.9	1.006	0.13	0.300	0.356
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Front	15mm	Ant 3	ECI 6	42590	3500	20.77	21.50	1.183	62.9	1.006	-0.08	0.103	0.123
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Back	15mm	Ant 3	ECI 6	42590	3500	20.77	21.50	1.183	62.9	1.006	0.16	0.292	0.348
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Front	15mm	Ant 4	ECI 6	42590	3500	20.78	21.30	1.127	62.9	1.006	0.02	0.071	0.081
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	15mm	Ant 4	ECI 6	42590	3500	20.78	21.30	1.127	62.9	1.006	-0.1	0.291	0.330
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Front	15mm	Ant 4	ECI 6	42590	3500	20.64	21.30	1.164	62.9	1.006	-0.18	0.067	0.078
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Back	15mm	Ant 4	ECI 6	42590	3500	20.64	21.30	1.164	62.9	1.006	-0.09	0.283	0.331
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Front	15mm	Ant 5	ECI 6	42590	3500	19.32	19.40	1.019	62.9	1.006	0.05	0.026	0.027
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	15mm	Ant 5	ECI 6	42590	3500	19.32	19.40	1.019	62.9	1.006	-0.07	0.105	0.108
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Front	15mm	Ant 5	ECI 6	42590	3500	19.26	19.40	1.033	62.9	1.006	0.05	0.021	0.022
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Back	15mm	Ant 5	ECI 6	42590	3500	19.26	19.40	1.033	62.9	1.006	0.11	0.101	0.105
	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Front	15mm	Ant 6	ECI 6	42590	3500	23.10	23.50	1.096	62.9	1.006	-0.03	0.156	0.172
45	2nd	LTE Band 42 Part27Q	20M	QPSK	1	49	Back	15mm	Ant 6	ECI 6	42590	3500	23.10	23.50	1.096	62.9	1.006	0.1	0.415	**0.458**
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Front	15mm	Ant 6	ECI 6	42590	3500	22.09	22.50	1.099	62.9	1.006	0	0.149	0.165
	2nd	LTE Band 42 Part27Q	20M	QPSK	50	0	Back	15mm	Ant 6	ECI 6	42590	3500	22.09	22.50	1.099	62.9	1.006	-0.07	0.300	0.332

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Deviation d_{dB} (dB)
2450MHz																		
	1st	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 7	Standalone	11	2462	17.60	18.00	1.096	100	1.000	0.08	0.120	0.132	0.29
46	2nd	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 7	Standalone	11	2462	17.70	18.00	1.072	100	1.000	0.09	0.132	**0.141**	
	1st	Bluetooth	DH5 1Mbps	Back	15mm	Ant 7	Full	39	2441	12.20	14.00	1.514	76.6	1.305	-0.06	0.033	0.064	0.97
47	2nd	Bluetooth	DH5 1Mbps	Back	15mm	Ant 7	Full	39	2441	12.00	14.00	1.585	76.6	1.305	-0.01	0.039	**0.080**	
5000MHz																		
	1st	WLAN5.3GHz	802.11n-HT40 MCS0	Back	15mm	Ant 7	Standalone	54	5270	15.52	17.50	1.578	94.74	1.056	-0.18	0.378	0.630	0.12
48	2nd	WLAN5.3GHz	802.11n-HT40 MCS0	Back	15mm	Ant 7	Standalone	54	5270	15.60	17.50	1.549	94.74	1.056	-0.17	0.375	**0.613**	
	1st	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 7	Standalone	122	5610	15.65	17.50	1.531	90.56	1.104	-0.08	0.387	0.654	0.44
49	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 7	Standalone	122	5610	15.76	17.50	1.493	90.56	1.104	-0.06	0.439	**0.723**	
	1st	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 7	Standalone	155	5775	15.53	17.50	1.574	90.56	1.104	-0.02	0.382	0.664	0.74
50	2nd	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 7	Standalone	155	5775	15.60	17.50	1.549	90.56	1.104	0.18	0.460	**0.787**	

15.4 Product specific 10g SAR

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)	Deviation d_{dB} (dB)
5000MHz																		
	1st	WLAN5.3GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 7	Standalone	54	5270	15.52	17.50	1.578	94.74	1.056	0.07	0.989	1.648	0.25
51	2nd	WLAN5.3GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 7	Standalone	54	5270	15.60	17.50	1.549	94.74	1.056	0.09	0.951	**1.555**	
	1st	WLAN5.5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Ant 7	Standalone	122	5610	15.65	17.50	1.531	90.56	1.104	-0.19	0.980	1.656	0.28
52	2nd	WLAN5.5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Ant 7	Standalone	122	5610	15.76	17.50	1.493	90.56	1.104	-0.09	0.943	**1.554**	

<NFC>

Plot No.	No.	Band	Mode	Test Position	Gap (mm)	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)	Deviation d_{dB} (dB)
	1st	NFC	ASK	Back	0mm	13.56	0.08	0.028	0.028	2.77
53	2nd	NFC	ASK	Back	0mm	13.56	0	0.053	**0.053**	

15.5 Repeated SAR Measurement

<1g>

Plot No.	Band	BW (MHz)	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)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 41	20M	QPSK	50	0	Right Tilted	0mm	Ant 1	ECI 7	41140	2645	17.02	17.40	1.091	62.9	1.006	-0.02	0.870	1.000	0.955
2nd	LTE Band 41	20M	QPSK	50	0	Right Tilted	0mm	Ant 1	ECI 7	41140	2645	17.02	17.40	1.091	62.9	1.006	0.05	0.849	1.025	0.932

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. 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.

15.6 TDD LTE Linearity Data Analysis

General Note:
This device support Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operation is 43.3% using UL-DL configuration 1. Per FCC Guidance based on the device behavior, all SAR tests were performed using Power Class 3. Power Class 2 is tested using the highest SAR test configuration in Power Class 3 for each LTE configuration and exposure condition combination, according to the highest time averaged power for all applicable uplink-downlink configurations in Power Class 2. When the reported SAR vs. output power is linearly scaled with < 10% discrepancy between power classes and all reported SAR are < 1.4 W/kg for 1g and < 3.5 W/kg for 10g, Separate SAR testing for Power Class 2 is not required.

Head			Hopspot			Body-worn		
LTE Band 41_Ant 1(HPUE)-Linearity Data for ECI 7			**LTE Band 41_Ant 1(HPUE)-Linearity Data for ECI 8**			**LTE Band 41_Ant 1(HPUE)-Linearity Data for ECI 6**		
	LTE Band 41 (Power Class 3)	LTE Band 41 (Power Class 2)		LTE Band 41 (Power Class 3)	LTE Band 41 (Power Class 2)		LTE Band 41 (Power Class 3)	LTE Band 41 (Power Class 2)
Maximum Tune up Power (dBm)	17.40	16.80	Maximum Tune up Power (dBm)	17.90	17.30	Maximum Tune up Power (dBm)	22.40	21.80
Reported 1g SAR (W/kg)	0.957	0.527	Reported 1g SAR (W/kg)	0.319	0.204	Reported 1g SAR (W/kg)	0.458	0.250
Duty Cycle	63.30%	43.30%	Duty Cycle	63.30%	43.30%	Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	34.79	20.72	Frame Averaged (mW)	39.03	23.25	Frame Averaged (mW)	110.00	65.54
Linearity SAR (W/kg)	0.570		Linearity SAR (W/kg)	0.190		Linearity SAR (W/kg)	0.273	
% deviation from expected linearity		-7.57%	% deviation from expected linearity		7.34%	% deviation from expected linearity		-8.38%
LTE Band 41_Ant 0(HPUE)-Linearity Data for ECI 7			**LTE Band 41_Ant 0(HPUE)-Linearity Data for ECI 8**			**LTE Band 41_Ant 0(HPUE)-Linearity Data for ECI 6**		
	LTE Band 41 (Power Class 3)	LTE Band 41 (Power Class 2)		LTE Band 41 (Power Class 3)	LTE Band 41 (Power Class 2)		LTE Band 41 (Power Class 3)	LTE Band 41 (Power Class 2)
Maximum Tune up Power (dBm)	24.80	25.80	Maximum Tune up Power (dBm)	23.80	23.30	Maximum Tune up Power (dBm)	24.80	25.80
Reported 1g SAR (W/kg)	0.337	0.288	Reported 1g SAR (W/kg)	0.416	0.258	Reported 1g SAR (W/kg)	0.261	0.230
Duty Cycle	63.30%	43.30%	Duty Cycle	63.30%	43.30%	Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	191.16	164.62	Frame Averaged (mW)	151.85	92.57	Frame Averaged (mW)	191.16	164.62
Linearity SAR (W/kg)	0.290		Linearity SAR (W/kg)	0.254		Linearity SAR (W/kg)	0.225	
% deviation from expected linearity		-0.76%	% deviation from expected linearity		1.73%	% deviation from expected linearity		2.33%
LTE Band 41_Ant 4(HPUE)-Linearity Data for ECI 7			**LTE Band 41_Ant 4(HPUE)-Linearity Data for ECI 8**			**LTE Band 41_Ant 4(HPUE)-Linearity Data for ECI 6**		
	FR1 n41 (Power Class 3)	FR1 n41 (Power Class 2)		FR1 n41 (Power Class 3)	FR1 n41 (Power Class 2)		FR1 n41 (Power Class 3)	FR1 n41 (Power Class 2)
Maximum Tune up Power (dBm)	24.10	25.10	Maximum Tune up Power (dBm)	23.70	23.10	Maximum Tune up Power (dBm)	24.10	25.10
Reported 1g SAR (W/kg)	0.265	0.245	Reported 1g SAR (W/kg)	0.409	0.245	Reported 1g SAR (W/kg)	0.178	0.155
Duty Cycle	63.30%	43.30%	Duty Cycle	63.30%	43.30%	Duty Cycle	63.30%	43.30%
Frame Averaged (mW)	162.71	140.12	Frame Averaged (mW)	148.39	88.41	Frame Averaged (mW)	162.71	140.12
Linearity SAR (W/kg)	0.228		Linearity SAR (W/kg)	0.244		Linearity SAR (W/kg)	0.153	
% deviation from expected linearity		7.36%	% deviation from expected linearity		0.54%	% deviation from expected linearity		1.12%

16. Simultaneous Transmission Analysis

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

General Note:

1. This device supports VoIP in GPRS, EGPRS, WCDMA, and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. EUT will choose each GSM, WCDMA, and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
4. 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).
5. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
6. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth cannot transmit simultaneously.
7. According to the EUT characteristic, WLAN 5GHz and Bluetooth can transmit simultaneously.
8. According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz cannot transmit simultaneously.
9. NFC can transmit simultaneously with other Radios in extremity exposure condition.
10. When stand-alone SAR is not required for a transmitter or antenna, its SAR is considered zero in the SAR summing process to assess Multi-band transmission SAR compliance.
11. The maximum SAR summation is calculated based on the same configuration and test position.
12. 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.
13. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
    i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
    ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
    iii) If SPLSR ≤ 0.04 for 1g SAR and SPLSR≤ 0.10 for 10g SAR, simultaneously transmission SAR measurement is not necessary.
    iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.

Conclusion:

1. The Spot check results from chapter 15.1 to 15.4, showed that Deviation of the SAR results did not exceed 3dB, SAR data reuse is justified.
2. For the verified maximum SAR from chapter 15.1 to 15.4, when the SAR test results were less than reference model SAR results (Sporton SAR report no.: FA431509), there is no need to consider co-located SAR for reference model report had been performed conservatively. For the SAR results were higher than reference model SAR results and full tested bands, they were evaluated to do simultaneous transmission analysis with WLAN/BT. WLAN/BT SAR Chose higher SAR between reference model SAR results and variant model SAR results for each exposure position to perform co-located SAR analysis.

16.1 Head Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2	1+3+4
		WWAN	WLAN2.4GHz Ant 7	WLAN5GHz Ant 7	Bluetooth Ant 7	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Ant 0	Right Cheek	0.592	0.378	0.311	0.194	0.97	1.10
	Right Tilted	0.201	0.403	0.348	0.194	0.60	0.74
	Left Cheek	0.256	0.435	0.494	0.391	0.69	1.14
	Left Tilted	0.173	0.636	0.602	0.296	0.81	1.07
Ant 1	Right Cheek	0.997	0.378	0.311	0.194	1.38	1.50
	Right Tilted	1.044	0.403	0.348	0.194	**1.45**	**1.59**
	Left Cheek	0.569	0.435	0.494	0.391	1.00	1.45
	Left Tilted	0.613	0.636	0.602	0.296	1.25	1.51
Ant 3	Right Cheek	0.181	0.378	0.311	0.194	0.56	0.69
	Right Tilted	0.168	0.403	0.348	0.194	0.57	0.71
	Left Cheek	0.698	0.435	0.494	0.391	1.13	1.58
	Left Tilted	0.349	0.636	0.602	0.296	0.99	1.25
Ant 4	Right Cheek	0.897	0.378	0.311	0.194	1.28	1.40
	Right Tilted	0.394	0.403	0.348	0.194	0.80	0.94
	Left Cheek	0.436	0.435	0.494	0.391	0.87	1.32
	Left Tilted	0.234	0.636	0.602	0.296	0.87	1.13
Ant 5	Right Cheek	0.114	0.378	0.311	0.194	0.49	0.62
	Right Tilted	0.143	0.403	0.348	0.194	0.55	0.69
	Left Cheek	0.377	0.435	0.494	0.391	0.81	1.26
	Left Tilted	0.253	0.636	0.602	0.296	0.89	1.15
Ant 6	Right Cheek	0.375	0.378	0.311	0.194	0.75	0.88
	Right Tilted	0.396	0.403	0.348	0.194	0.80	0.94
	Left Cheek	0.660	0.435	0.494	0.391	1.10	1.55
	Left Tilted	0.560	0.636	0.602	0.296	1.20	1.46

16.2 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2	1+3+4
		WWAN	WLAN2.4GHz Ant 7	WLAN5GHz Ant 7	Bluetooth Ant 7	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Ant 0	Front	0.272	0.224	0.232	0.083	0.50	0.59
	Back	0.393	0.315	0.791	0.127	0.71	1.31
	Left side	0.193				0.19	0.19
	Right side	0.196	0.096	0.424	0.041	0.29	0.66
	Top side		0.250	0.732	0.119	0.25	0.85
	Bottom side	0.584				0.58	0.58
Ant 1	Front	0.335	0.224	0.232	0.083	0.56	0.65
	Back	0.389	0.315	0.791	0.127	0.70	1.31
	Left side	0.188				0.19	0.19
	Right side		0.096	0.424	0.041	0.10	0.47
	Top side	0.705	0.250	0.732	0.119	0.96	1.56
	Bottom side					0.00	0.00
Ant 3	Front	0.132	0.224	0.232	0.083	0.36	0.45
	Back	0.401	0.315	0.791	0.127	0.72	1.32
	Left side					0.00	0.00
	Right side	0.372	0.096	0.424	0.041	0.47	0.84
	Top side	0.104	0.250	0.732	0.119	0.35	0.96
	Bottom side					0.00	0.00
Ant 4	Front	0.141	0.224	0.232	0.083	0.37	0.46
	Back	0.490	0.315	0.791	0.127	0.81	1.41
	Left side	0.336				0.34	0.34
	Right side		0.096	0.424	0.041	0.10	0.47
	Top side	0.113	0.250	0.732	0.119	0.36	0.96
	Bottom side					0.00	0.00
Ant 5	Front		0.224	0.232	0.083	0.22	0.32
	Back	0.166	0.315	0.791	0.127	0.48	1.08
	Left side					0.00	0.00
	Right side	0.107	0.096	0.424	0.041	0.20	0.57
	Top side		0.250	0.732	0.119	0.25	0.85
	Bottom side					0.00	0.00
Ant 6	Front	0.234	0.224	0.232	0.083	0.46	0.55
	Back	0.556	0.315	0.791	0.127	0.87	1.47
	Left side					0.00	0.00
	Right side		0.096	0.424	0.041	0.10	0.47
	Top side	0.268	0.250	0.732	0.119	0.52	1.12
	Bottom side					0.00	0.00

16.3 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+2	1+3+4
		WWAN	WLAN2.4GHz Ant 7	WLAN5GHz Ant 7	Bluetooth Ant 7	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Ant 0	Front	0.210	0.120	0.190	0.041	0.33	0.44
	Back	0.415	0.141	0.787	0.080	0.56	1.28
Ant 1	Front	0.322	0.120	0.190	0.041	0.44	0.55
	Back	0.458	0.141	0.787	0.080	0.60	1.33
Ant 3	Front	0.131	0.120	0.190	0.041	0.25	0.36
	Back	0.356	0.141	0.787	0.080	0.50	1.22
Ant 4	Front	0.152	0.120	0.190	0.041	0.27	0.38
	Back	0.331	0.141	0.787	0.080	0.47	1.20
Ant 5	Front	0.027	0.120	0.190	0.041	0.15	0.26
	Back	0.108	0.141	0.787	0.080	0.25	0.98
Ant 6	Front	0.172	0.120	0.190	0.041	0.29	0.40
	Back	0.458	0.141	0.787	0.080	0.60	1.33

16.4 Product specific 10g SAR Exposure Conditions

Remark:

1. 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 Band	Exposure Position	3	5	3+5
		WLAN5GHz Ant 7	NFC	Summed
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
Ant 0	Front	1.031		1.03
	Back	1.283	0.053	1.34
	Left side			0.00
	Right side	1.026		1.03
	Top side	1.656		1.66
	Bottom side			0.00
Ant 1	Front	1.031		1.03
	Back	1.283	0.053	1.34
	Left side			0.00
	Right side	1.026		1.03
	Top side	1.656		1.66
	Bottom side			0.00
Ant 3	Front	1.031		1.03
	Back	1.283	0.053	1.34
	Left side			0.00
	Right side	1.026		1.03
	Top side	1.656		1.66
	Bottom side			0.00
Ant 4	Front	1.031		1.03
	Back	1.283	0.053	1.34
	Left side			0.00
	Right side	1.026		1.03
	Top side	1.656		1.66
	Bottom side			0.00
Ant 5	Front	1.031		1.03
	Back	1.283	0.053	1.34
	Left side			0.00
	Right side	1.026		1.03
	Top side	1.656		1.66
	Bottom side			0.00
Ant 6	Front	1.031		1.03
	Back	1.283	0.053	1.34
	Left side			0.00
	Right side	1.026		1.03
	Top side	1.656		1.66
	Bottom side			0.00

Test Engineer： Hank Huang, Kevin Xu, David Dai, Bin He

17. Uncertainty Assessment

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

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

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

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

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

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

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

(b) κ is the coverage factor

Standard Uncertainty for Assumed Distribution

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

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

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

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

18. References

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

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

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

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

[5] SPEAG DASY System Handbook

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

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

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

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

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

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

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

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

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

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

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