

FCC SAR TEST REPORT

Report No: E5/2019/30014
Applicant: Huawei Technologies Co., Ltd.
Manufacturer: Huawei Technologies Co., Ltd.
Factory: Huawei Technologies Co., Ltd.
Product Name: Smart Phone
Model No.(EUT): MAR-LX1A
Trade Mark: HUAWEI
FCC ID: QISMAR-LX1A
Standards: FCC 47CFR §2.1093
Date of Receipt: 2019-03-06
Date of Test: 2019-03-08 to 2019-03-15
Date of Issue: 2019-03-18
Test conclusion: **PASS ***



* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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Signed on behalf of SGS

Sr. Engineer

Matt Kuo

Date: Mar. 18, 2019

Supervisor

John Yeh

Date: Mar. 18, 2019

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REVISION HISTORY

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-03-18		Original

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TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)			
	Head	Body-worn	Hotspot	Product specific 10g SAR
GSM850	0.51	0.35	0.61	/
GSM1900	0.38	0.22	0.58	/
WCDMA Band II	0.81	0.35	0.95	/
WCDMA Band IV	0.69	0.33	0.80	/
WCDMA Band V	0.51	0.39	0.74	/
LTE Band 4	0.68	0.25	0.70	/
LTE Band 7	0.56	0.27	0.63	/
LTE Band 38	0.60	0.16	0.39	/
WI-FI (2.4GHz)	0.23	0.12	0.29	/
WI-FI (5GHz)	0.09	0.13	0.40	1.24
BT	0.30	/	/	/
SAR Limited(W/kg)	1.6			4
Maximum Simultaneous Transmission SAR (W/kg)				
Scenario	Head	Body-worn	Hotspot	Product specific 10g SAR
Sum SAR	0.87	0.64	1.31	1.24
SPLSR	N/A	N/A	N/A	N/A
SPLSR Limited	0.04			0.1
Note: The Simultaneous transmission SAR is the same test position of the main/second antenna + WiFi/BT antenna.				

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1 General Information

1.1 Details of Client

Applicant:	Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Manufacturer:	Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Factory:	Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.2 Test Location

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1.3 General Description of EUT

Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Product Name:	Smart Phone		
Model No.(EUT):	MAR-LX1A		
FCC ID:	QISMAR-LX1A		
Trade Mark:	HUAWEI		
Product Phase:	production unit		
SN:	L2NDU19220000046/ L2NDU19220000020/ L2NDU19220000016/ L2NDU19220000029/ L2NDU19220000050		
Hardware Version:	HL3MARLM		
Software Version:	9.0.1.118(SP1C900E118R1P6)		
Antenna Type:	Inner Antenna		
Device Operating Configurations :			
Modulation Mode:	GSM: GMSK, 8PSK; WCDMA: QPSK; LTE: QPSK,16QAM,64QAM WIFI: DSSS, OFDM; BT: GFSK, $\pi/4$ DQPSK,8DPSK		
Device Class:	B		
GPRS Multi-slots Class:	12	EGPRS Multi-slots Class:	12
HSDPA UE Category:	14	HSUPA UE Category	6
DC-HSDPA UE Category:	24		
Power Class	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all 1”(WCDMA Band II/IV/V)		
	3, tested with power control Max Power(LTE Band 4/7/38)		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	GSM850	824~849	869~894
	GSM1900	1850~1910	1930~1990
	WCDMA Band II	1850~1910	1930~1990
	WCDMA Band IV	1710~1755	2110~2155
	WCDMA Band V	824~849	869~894
	LTE Band 4	1710~1755	2110~2155
	LTE Band 7	2500~2570	2620~2690
	LTE Band 38	2570~2620	2570~2620
	Bluetooth	2400~2483.5	2400~2483.5
	2.4G Wi-Fi	2400~2483.5	2400~2483.5
	5G Wi-Fi	5150~5250	5150~5250
		5250~5350	5250~5350
		5470~5725	5470~5725
		5725~5850	5725~5850
	NFC	13.56	13.56

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Battery Information1#:	Model:	HB356687ECW
	Normal Voltage:	+3.82V
	Rated capacity:	3240mAh
	Manufacturer:	Huawei Technologies Co., Ltd.(Manufacturer: Desay)
Battery Information2#:	Model:	HB356687ECW
	Normal Voltage:	+3.82V
	Rated capacity:	3240mAh
	Manufacturer:	Huawei Technologies Co., Ltd.(Manufacturer: SCUD)
Battery Information3#:	Model:	HB356687ECW
	Normal Voltage:	+3.82V
	Rated capacity:	3240mAh
	Manufacturer:	Huawei Technologies Co., Ltd.(Manufacturer: Sunwoda)
Headset Information1#:	Model:	MEND1532B528A02
	Manufacturer:	Jiangxi Lianchuang Hongsheng Electronic Co., LTD.
Headset Information2#:	Model:	1293-3283-3.5mm-322
	Manufacturer:	Boluo County Quancheng Electronic Co., Ltd.
Headset Information3#:	Model:	MEND1532B528B00
	Manufacturer:	Jiangxi Lianchuang Hongsheng Electronic Co., LTD.
Headset Information4#:	Model:	1293-3283-3.5mm-336
	Manufacturer:	Boluo County Quancheng Electronic Co., Ltd.
Headset Information5#:	Model:	EPAB542-2WH06-DH
	Manufacturer:	Hong Fu Jin Precision Industry (Shenzhen) Co., LTD.

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1.3.1 DUT Antenna Locations

Please see the Appendix E.

The test device is a mobile phone. The overall diagonal dimension of this device is 161 mm.

According to the distance between LTE/WCDMA/GSM&WIFI&BT antennas and the sides of the EUT we can draw the conclusion that:

EUT Sides for SAR Testing							
Mode	Exposure Condition	Front	Back	Left	Right	Top	Bottom
Ant.1(Main Ant.)	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	Yes	No	Yes
Ant.2(Second Ant.)	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	Yes	Yes	No
Ant.3(WIFI&BT Ant.)	Hotspot/Product specific 10g SAR	Yes	Yes	No	Yes	Yes	No

Table 1: EUT Sides for SAR Testing

Note:

- 1) When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
- 2) main antenna(Ant1) and Secondary antenna (Ant 2) can't transmit simultaneously which will be chosen based on the RSSI. Only one antenna can be used for 2G/3G/4G transmission at a time.

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1.3.2 Dynamic antenna switching specification

The device has two 2G/3G/4G Tx antennas (Main Antenna and Second Antenna). It can transmit from either Main Antenna or Second Antenna, but they cannot transmit simultaneously.

SAR test procedure for dynamic antenna switching is as below:

The Main Antenna and Second Antenna are set to the MAX transmit power level respectively and test the SAR respectively in all applicable RF exposure conditions. Some commands or test scripts are supplied to fix the operation state and choose the antenna so that only one TX antenna is chosen and tested at a time. All independent antennas will be completely covered by the appropriate SAR measurements and all simultaneous transmission possibilities will be fully considered to ensure SAR compliance.

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1.3.3 Downlink LTE CA additional specification

The device supports downlink LTE Carrier Aggregation (CA) only. When carrier aggregation applies, implementation and measurement details for the following are necessary.

- Intra-band carrier aggregation requirements for downlink.
- Support of contiguous component carriers for intra-band aggregation.

The possible downlink LTE CA combinations supported by this device are as below tables per 3GPP TS 36.101 V12.5.0. The conducted power measurement results of downlink LTE CA are provided in Section 8.3 of this report per 3GPP TS 36.521-1 V12.3.0. The downlink LTE CA SAR test is not required since the maximum output power for downlink LTE CA was not more than 0.25dB higher than the maximum output power for without downlink LTE CA.

Intra-band contiguous CA operating bands:

E-UTRA CA Band	E-UTRA Band	Uplink (UL) operating band			Downlink (DL) operating band			Duplex Mode
		BS receive / UE transmit			BS transmit / UE receive			
		$F_{UL_low} - F_{UL_high}$			$F_{DL_low} - F_{DL_high}$			
CA 7	7	2500 MHz	–	2570 MHz	2620 MHz	–	2690 MHz	FDD

contiguous intra-band CA:

E-UTRA CA configuration / Bandwidth combination set							
E-UTRA CA configuration	Uplink CA configurations	Component carriers in order of increasing carrier frequency				Maximum aggregated bandwidth [MHz]	Bandwidth combination set
		Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]		
CA_7C	NA	15	15			40	0
		20	20				
		10	20			40	1
		15	15, 20				
		20	10, 15, 20			40	2
		15	10, 15				
		20	15, 20				

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Test frequencies for CA_7C:

Range	CC-Combo / NRB_agg [RB]	CC1 Note1					CC2 Note1				
		BW [RB]	N _{UL}	f _{UL} [MHz]	N _{DL}	f _{DL} [MHz]	BW [RB]	N _{UL}	f _{UL} [MHz]	N _{DL}	f _{DL} [MHz]
Low	50+100	50	20805	2505.5	2805	2625.5	100	20949	2519.9	2949	2639.9
		100	20850	2510	2850	2630	50	20994	2524.4	2994	2644.4
	75+75	75	20825	2507.5	2825	2627.5	75	20975	2522.5	2975	2642.5
	75+100	75	20828	2507.8	2828	2627.8	100	20999	2524.9	2999	2644.9
		100	20850	2510	2850	2630	75	21021	2527.1	3021	2647.1
Mid	50+100	50	21006	2525.6	3006	2645.6	100	21150	2540	3150	2660
		100	21051	2530.1	3051	2650.1	50	21195	2544.5	3195	2664.5
	75+75	75	21025	2527.5	3025	2647.5	75	21175	2542.5	3175	2662.5
	75+100	75	21003	2525.3	3003	2645.3	100	21174	2542.4	3174	2662.4
		100	21026	2527.6	3026	2647.6	75	21197	2544.7	3197	2664.7
High	50+100	50	21206	2545.6	3206	2665.6	100	21350	2560	3350	2680
		100	21251	2550.1	3251	2670.1	50	21395	2564.5	3395	2684.5
	75+75	75	21225	2547.5	3225	2667.5	75	21375	2562.5	3375	2682.5
	75+100	75	21179	2542.9	3179	2662.9	100	21350	2560	3350	2680
		100	21201	2545.1	3201	2665.1	75	21372	2562.2	3372	2682.2
	100+100	100	21152	2540.2	3152	2660.2	100	21350	2560	3350	2680

Note 1: Carriers in increasing frequency order.

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1.3.4 Power reduction specification

This device uses a single fixed level of power reduction through static table look-up for SAR compliance and it is triggered by a single event or operation

- 1) A fixed level power reduction is applied for some frequency bands when hotspot mode becomes active. When the hotspot is disabled, the power value will be recovered.
- 2) A fixed level power reduction is applied for some frequency bands when handset operate "held to the ear" condition, the power reduction triggered by Accelerometer & Gyroscope and audio receiver detection. The audio receiver detection is used to determine head or body scenario. The Accelerometer & Gyroscope sensor is used to determine proximity to head scenario.

The following tables summarize the key power reduction information. The detailed full power which is the Max. power the state can use and reduced tune-up specifications and conducted power measurement results are provided in Section 8 of this report.

Second antenna Power Reduction Level Amount (dBm)							
Power Reduction Scenario	GSM850	WCDMA Band II	WCDMA Band IV	WCDMA Band V	LTE Band 4	LTE Band 7	LTE Band 38
Full Power/Receiver off(body)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Receiver on(head)	2.0	5.4	4.2	2.5	4.2	5.5	5.0
WiFi 2.4G (Connect/P2P/Hotspot)、BT off or WiFi 5.0G (Connect/P2P/Hotspot)、BTNA or WiFi 2.4G + P2P 5.0G + BT off /WiFi 5.0G + P2P 2.4G + BT off (rec off)	0.0	0.5	0.0	0.0	0.0	0.0	0.0
WiFi 2.4G (Connect/P2P/Hotspot)、BT off or WiFi 5.0G (Connect/P2P/Hotspot)、BTNA or WiFi 2.4G + P2P 5.0G + BT off or WiFi 5.0G + P2P 2.4G + BT off (rec on)	0.0	4.6	0.0	0.0	0.0	0.0	0.0

Main antenna Power Reduction Level Amount (dBm)	
Power Reduction Scenario	WCDMA Band II
Full Power/Receiver on(head)	0.0
Receiver off(body)	0.5

WiFi antenna Power Reduction Level Amount (dBm)		
Power Reduction Scenario	WiFi 2.4G	WiFi 5G
Receiver off	0.0	0.0
Receiver on	6.9	8.4

Note: For Head SAR test of 2G/3G/4G Antenna and WiFi 2.4G Antenna, Standalone Head SAR should be evaluated at with audio receiver on. As the audio receiver only works in voice mode when the user is making a call in head scenario, and the lack of the third-party VoIP server and the unstandardized VOIP operating characteristics, so a test script is used to trigger the receiver on during the test. The test script function is only used to trigger audio receiver on and simulate voice and VOIP usage scene. It can be ensured that the unmodified settings in production units, including maximum output power, amplifier gain and other RF performance or tuning parameters, are used for SAR measurement.

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- 3) This device uses the mobile country code (MCC) to indicate whether the users in CE countries or FCC countries. The selection between CE countries and FCC countries power levels is based on the country code detection mechanism. It can determine the countries where users are and set the relevant power level for 4G and WiFi antennas accordingly. The conducted power measurement results are provided in Section 8 of this report.

Power Reduction Level Amount (dBm)					
Band/Mode(Ant)	MCC OF CE COUNTRY		MCC OF FCC COUNTRY		Full Power
	Receiver on	Receiver off	Receiver on	Receiver off	
LTE Band 7 (Second antenna)	3.0	0.0	5.5	0.0	0.0
LTE Band 38 (Second antenna)	2.2	0.0	5.0	0.0	0.0
WiFi 2.4G 802.11b	7.0	0.0	6.9	0.0	0.0
WiFi 2.4G 802.11g	7.9	0.0	8.5	5.0	0.0
WiFi 2.4G 802.11n 20M	6.5	0.0	7.0	4.5	0.0
WiFi 2.4G 802.11n 40M	6.8	0.0	7.0	6.5	0.0
WiFi 5G 802.11a	9.4	0.0	9.4	1.0	0.0
WiFi 5G 802.11n 20M	9.0	0.0	9.0	1.0	0.0
WiFi 5G 802.11n 40M	9.0	0.0	9.0	3.0	0.0
WiFi 5G 802.11ac 20M	9.0	0.0	9.0	1.0	0.0
WiFi 5G 802.11ac 40M	9.0	0.0	9.0	3.0	0.0
WiFi 5G 802.11ac 80M	9.0	0.0	9.0	3.0	0.0

For FCC SAR test, SAR test should be evaluated at the power level of FCC mobile country code for each exposure conditions.

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1.4 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
IEEE Std C95.1 – 1991	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 941225 D01	3G SAR Measurement Procedures v03r01
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D05A	LTE Rel.10 KDB Inquiry Sheet v01r02
KDB 941225 D06	Hotspot Mode SAR v02r01
KDB 248227 D01	SAR Guidance for IEEE 802.11 Wi-Fi SAR v02r02
KDB 648474 D04	Handset SAR v01r03
KDB447498 D01	General RF Exposure Guidance v06
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 616217 D04	SAR for laptop and tablets v01r02
KDB 690783 D01	SAR Listings on Grants v01r03

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1.5 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	1.60 mW/g	8.00 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g	0.40 mW/g
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

Notes:

* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

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.)

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2 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards.	
Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

Table 2: The Ambient Conditions

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3 SAR Measurements System Configuration

3.1 The SAR Measurement System

This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E|)^2 / \rho$ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

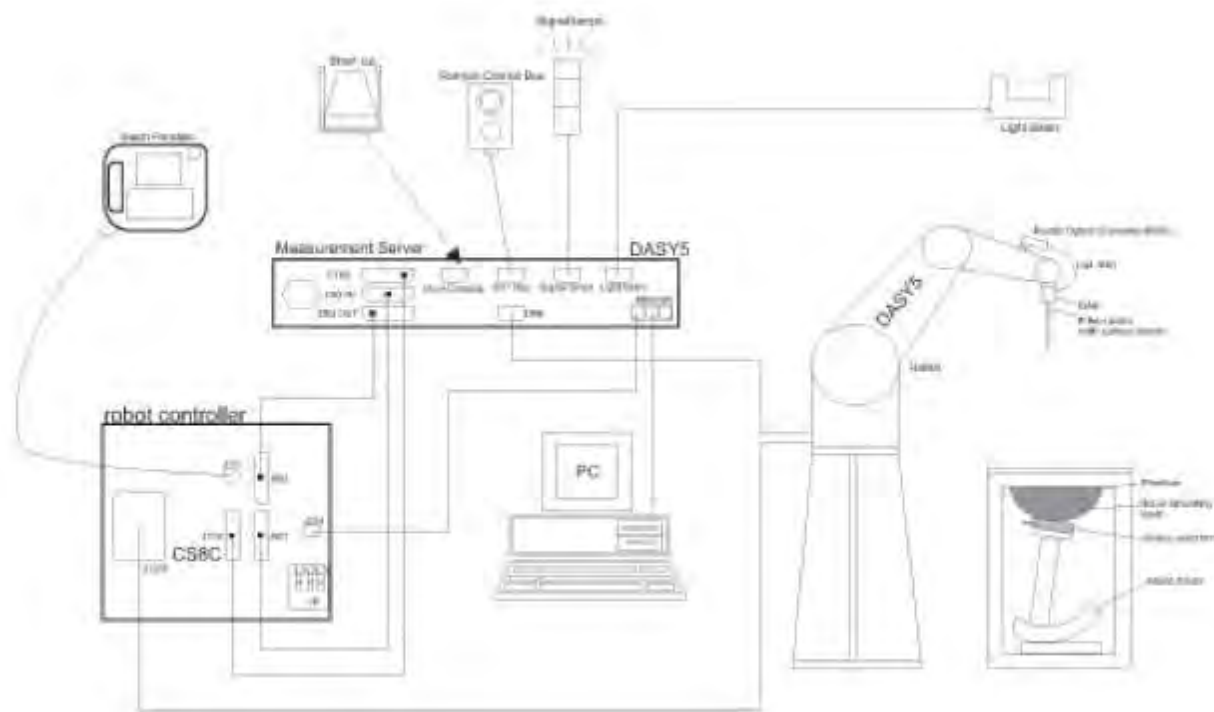
The DASY5 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software .An arm extension for accommodation the data acquisition electronics (DAE).

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

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 between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration

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- 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.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

3.2 Isotropic E-field Probe EX3DV4

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 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 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

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3.3 Data Acquisition Electronics (DAE)

Model	DAE
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)
Input Offset Voltage	< 5 μ V (with auto zero)
Input Bias Current	< 50 f A
Dimensions	60 x 60 x 68 mm



3.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 $\pm$ 0.2 mm (6 $\pm$ 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters
Wooden Support	SPEAG standard phantom table



The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.

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3.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.

ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure.

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3.6 Device Holder for Transmitters



F-2. Device Holder for Transmitters

- The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon=3$ and loss tangent $\delta=0.02$. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

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3.7 Measurement procedure

3.7.1 Scanning procedure

Step 1: Power reference measurement

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: Area scan

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Zoom scan

Around this point, a volume of 32mm*32mm*30mm ($f \leq 2\text{GHz}$), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points ($f \leq 2\text{GHz}$), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification). The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.

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			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: 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 $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
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 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Step 4: Power reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. $\pm 5\%$

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3.7.2 Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “.DAE4”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

3.7.3 Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
- Conversion factor	ConvFi	
- Diode compression point	Dcpi	
Device parameters:	- Frequency	f
- Crest factor	cf	
Media parameters:	- Conductivity	ε
- Density	ρ	

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcpi$$

With V_i = compensated signal of channel i (i = x, y, z)

U_i = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

dcpi = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes:

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$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1}f + a_{i2}f^2) / f$$

With V_i = compensated signal of channel i (i = x, y, z)

Normi = sensor sensitivity of channel i (i = x, y, z)

[mV/(V/m)²] for E-field Probes

ConvF = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (E_{tot}^2 \cdot \sigma) / (\epsilon \cdot 1000)$$

with SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

ϵ = equivalent tissue density in g/cm³

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

E_{tot} = total electric field strength in V/m

H_{tot} = total magnetic field strength in A/m

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4 SAR measurement variability and uncertainty

4.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
 - 2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
 - 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).
 - 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
- 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.

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4.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

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5 Description of Test Position

5.1 Head Exposure Condition

5.1.1 SAM Phantom Shape

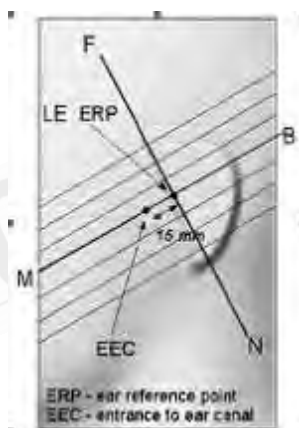


F-3. Front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only—procedures in this recommended practice are intended primarily for the phantom setup.

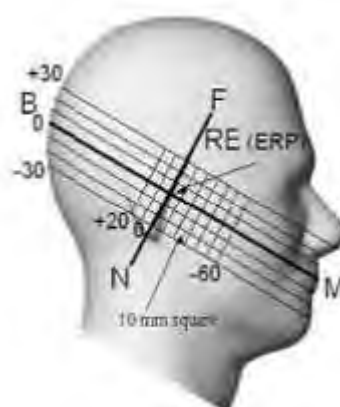
Note: The centre strip including the nose region has a different thickness tolerance.



F-4. Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)



F-5. Close-up side view of phantom, showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations

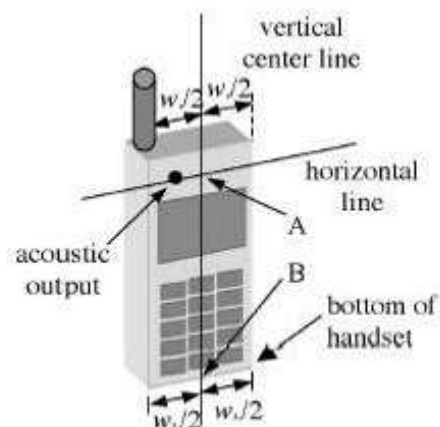


F-6. Side view of the phantom showing relevant markings and seven cross-sectional plane locations

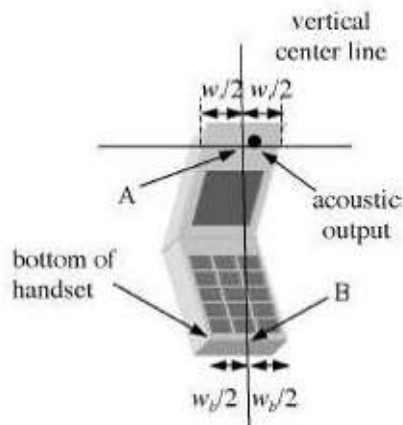
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5.1.2 EUT constructions



F-7. Handset vertical and horizontal reference lines—"fixed case"



F-8. Handset vertical and horizontal reference lines—"clam-shell case"

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5.1.3 Definition of the “cheek” position

- a) Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom ("initial position"). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE.
- b) Translate the mobile phone box towards the phantom with the ear piece aligned with the line LE-RE until telephone touches the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.

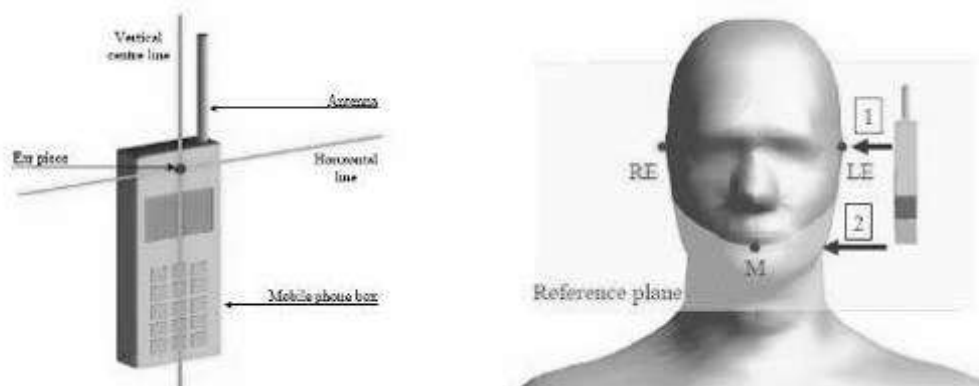
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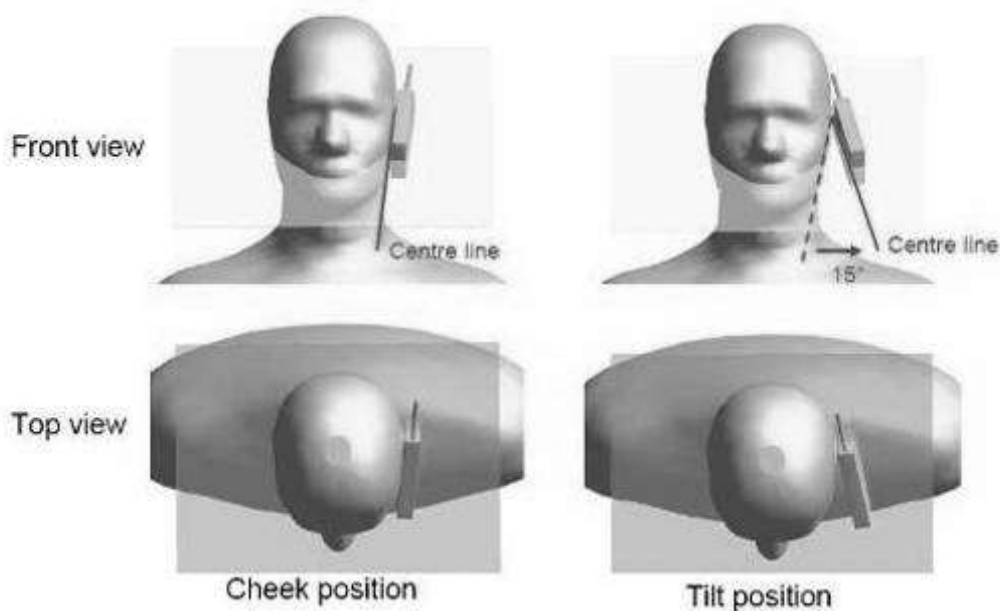
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5.1.4 Definition of the “tilted” position

- Position the device in the “cheek” position described above;
- While maintaining the device in the reference plane described above and pivoting against the ear, move it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.



F-9. Definition of the reference lines and points, on the phone and on the phantom and initial position



F-10. “Cheek” and “tilt” positions of the mobile phone on the left side

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5.2 Body Exposure Condition

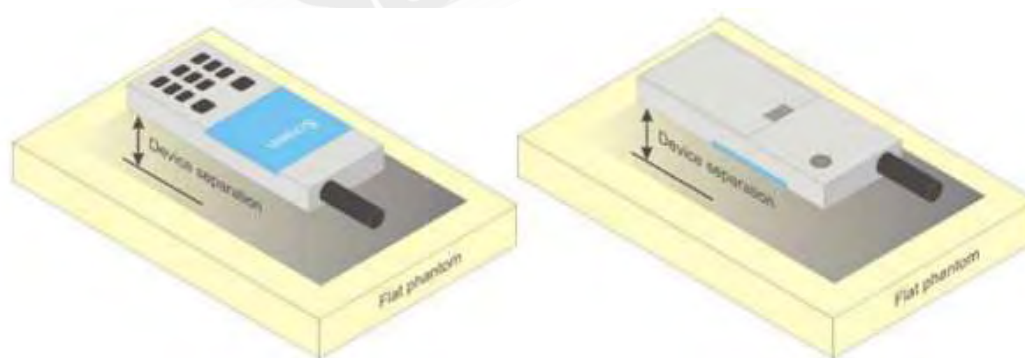
5.2.1 Body-worn accessory exposure conditions

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

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. Per FCC KDB Publication 648474 D04, 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 Publication 447498 D01 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 a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset 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 tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.



F-11. Test positions for body-worn devices

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5.2.2 Wireless Router exposure conditions

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. For devices with form factors smaller than $9 \text{ cm} \times 5 \text{ cm}$, a test separation distance of 5 mm is required.

5.3 Extremity exposure conditions

Per FCC KDB 648474D04, for smart phones with a display diagonal dimension $> 15.0 \text{ cm}$ or an overall diagonal dimension $> 16.0 \text{ cm}$ that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the device is marketed as "Phablet".

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

Due to the SAR result, the main/second antenna frequency bands are not required to test with 0mm for the Product Specific 10-g SAR.

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6 SAR System Verification Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands:

Ingredients (% by weight)	Frequency (MHz)							
	450		700-950		1700-2000		2300-2700	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	40.30	50.75	55.24	70.17	55.00	68.53
Salt (NaCl)	3.95	1.49	1.38	0.94	0.31	0.39	0.2	0.1
Sucrose	56.32	46.78	57.90	48.21	0	0	0	0
HEC	0.98	0.52	0.24	0	0	0	0	0
Bactericide	0.19	0.05	0.18	0.10	0	0	0	0
Tween	0	0	0	0	44.45	29.44	44.80	31.37
Salt: 99+% Pure Sodium Chloride Water: De-ionized, 16 MΩ ⁺ resistivity Tween: Polyoxyethylene (20) sorbitan monolaurate Sucrose: 98+% Pure Sucrose HEC: Hydroxyethyl Cellulose								
HSL5GHz is composed of the following ingredients: Water: 50-65% Mineral oil: 10-30% Emulsifiers: 8-25% Sodium salt: 0-1.5%								
MSL5GHz is composed of the following ingredients: Water: 64-78% Mineral oil: 11-18% Emulsifiers: 9-15% Sodium salt: 2-3%								

Table 3: Recipe of Tissue Simulate Liquid

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6.1.2 Measurement for Tissue Simulate Liquid

The dielectric properties for this Tissue Simulate Liquids were measured by using the Agilent Model 85070E Dielectric Probe in conjunction with Agilent E5071C Network Analyzer (300 KHz-8500 MHz). The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was $22 \pm 2^\circ\text{C}$.

Tissue Type	Measured Frequency (MHz)	Target Tissue ($\pm 5\%$)		Measured Tissue		Liquid Temp. ($^\circ\text{C}$)	Measured Date
		ϵ_r	$\sigma(\text{S/m})$	ϵ_r	$\sigma(\text{S/m})$		
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	42.040	0.909	22.1	2019/3/11
835 Body	835	55.2 (52.44~57.96)	0.97 (0.92~1.02)	57.435	1.012	22.1	2019/3/12
1750 Head	1750	40.1 (38.10~42.11)	1.37 (1.30~1.44)	39.548	1.333	22.2	2019/3/9
1750 Body	1750	53.4 (50.73~56.07)	1.49 (1.42~1.56)	54.624	1.448	22.2	2019/3/10
1900 Head	1900	40.0 (38.00~42.00)	1.40 (1.33~1.47)	40.221	1.369	22.3	2019/3/8
1900 Body	1900	53.3 (50.64~55.97)	1.52 (1.44~1.60)	53.190	1.513	22.3	2019/3/11
2450 Head	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	40.177	1.803	22.0	2019/3/15
2450 Body	2450	52.70 (50.07~55.34)	1.95 (1.85~2.05)	51.490	1.889	22.0	2019/3/14
2600 Head	2600	39.0 (37.05~40.95)	1.96 (1.86~2.06)	39.679	1.966	22.1	2019/3/13
2600 Body	2600	52.50 (49.88~55.13)	2.16 (2.05~2.27)	51.124	2.055	22.1	2019/3/14
5250Head	5250	35.9 (34.11~37.70)	4.71 (4.47~4.95)	36.011	4.767	22.2	2019/3/14
5250 Body	5250	48.9 (46.46~51.35)	5.36 (5.09~5.63)	48.122	5.426	22.2	2019/3/15
5600 Head	5600	35.5 (33.73~37.28)	5.07 (4.82~5.32)	35.059	5.157	22.2	2019/3/14
5600 Body	5600	48.5 (46.08~50.93)	5.77 (5.48~6.06)	47.190	5.850	22.2	2019/3/15
5750 Head	5750	35.4 (33.63~37.17)	5.22 (4.96~5.48)	34.695	5.329	22.2	2019/3/14
5750 Body	5750	48.3 (45.89~50.72)	5.94 (5.64~6.24)	46.850	6.017	22.2	2019/3/15

Table 4: Measurement result of Tissue electric parameters

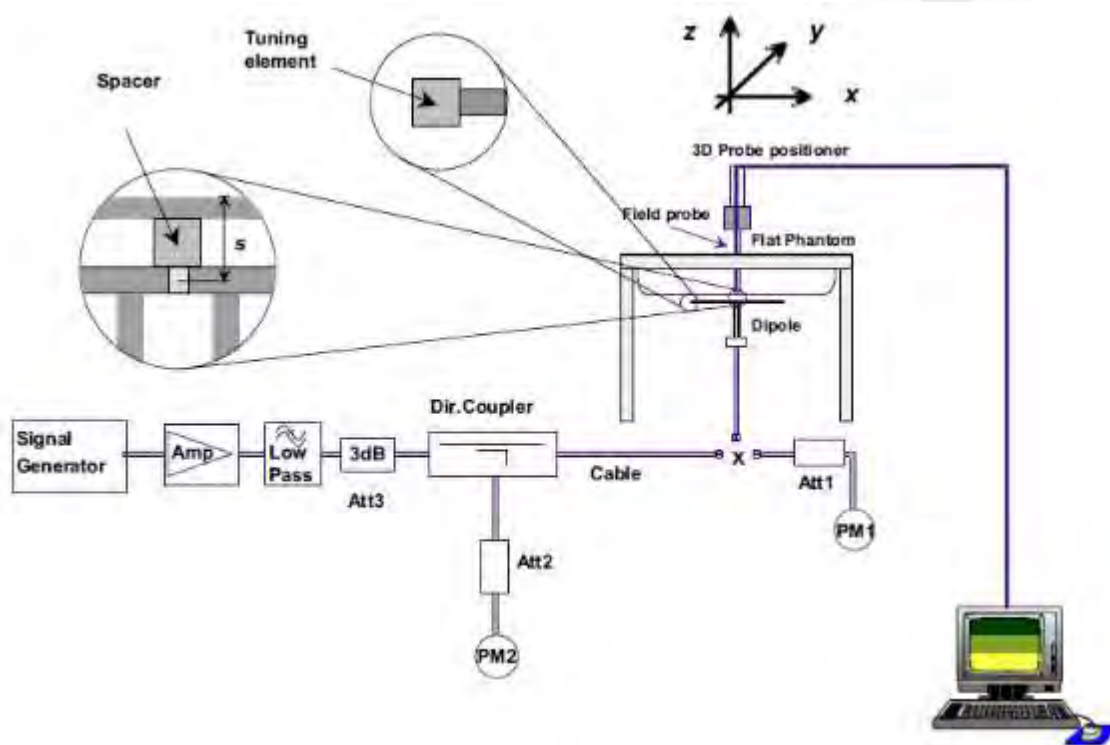
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6.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-12. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within $\pm 10\%$ from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range $22\pm 2^{\circ}\text{C}$, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above $15\pm 0.5\text{ cm}$ in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-12. the microwave circuit arrangement used for SAR system check

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6.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

- a) There is no physical damage on the dipole;
- b) System check with specific dipole is within 10% of calibrated value;
- c) Return-loss is within 10% of calibrated measurement;
- d) Impedance is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

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6.2.2 Summary System Check Result(s)

Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W) (±10%)	Target SAR (normalized to 1W) (±10%)	Liquid Temp. (°C)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D835V2	Head	2.40	1.58	9.60	6.32	9.59 (8.63~10.55)	6.29 (5.66~6.92)	22.1	2019/3/11
	Body	2.45	1.61	9.80	6.44	9.65 (8.69~10.62)	6.46 (5.81~7.11)	22.1	2019/3/12
D1750V2	Head	8.96	4.80	35.84	19.20	36.7 (33.03~40.37)	19.5 (17.55~21.45)	22.2	2019/3/9
	Body	9.20	4.90	36.80	19.60	37 (33.30~40.70)	19.7 (17.73~21.67)	22.2	2019/3/10
D1900V2	Head	10.20	5.28	40.80	21.12	40.7 (36.63~44.77)	21.1 (18.99~23.21)	22.3	2019/3/8
	Body	10.00	5.29	40.00	21.16	41.6 (37.44~45.76)	21.4 (19.26~23.54)	22.3	2019/3/11
D2450V2	Head	13.30	6.10	53.20	24.40	53.1 (47.79~58.41)	24.9 (22.41~27.39)	22.0	2019/3/15
	Body	11.60	5.45	46.40	21.80	51.0 (45.9~56.1)	23.5 (21.15~25.85)	22.0	2019/3/14
D2600V2	Head	13.90	6.13	55.60	24.52	56.6 (50.94~62.26)	25.4 (22.86~27.94)	22.1	2019/3/13
	Body	12.80	5.79	51.20	23.16	54.2 (48.78~59.62)	24.3 (21.87~26.73)	22.1	2019/3/14
Validation Kit		Measured SAR 100mW	Measured SAR 100mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W) (±10%)	Target SAR (normalized to 1W) (±10%)	Liquid Temp. (°C)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D5GHzV2	Head (5.25GHz)	7.10	2.02	71.00	20.20	76.6 (68.94~84.26)	21.9 (19.71~24.09)	22.2	2019/3/14
	Body (5.25GHz)	8.11	2.21	81.10	22.10	75.6 (68.04~83.16)	21.3 (19.17~23.43)	22.2	2019/3/15
	Head (5.6GHz)	7.92	2.23	79.20	22.30	80.4 (72.36~88.44)	22.8 (20.52~25.08)	22.2	2019/3/14
	Body (5.6GHz)	8.71	2.40	87.10	24.00	81.1 (72.99~89.21)	22.9 (20.61~25.19)	22.2	2019/3/15
	Head (5.75GHz)	8.14	2.32	81.40	23.20	80 (72~88)	22.7 (20.43~24.97)	22.2	2019/3/14
	Body (5.75GHz)	7.15	1.94	71.50	19.40	74.8 (67.32~82.28)	21 (18.9~23.1)	22.2	2019/3/15

Table 5: SAR System Check Result

6.2.3 Detailed System Check Results

Please see the Appendix A

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7 Test Configuration

7.1 3G SAR Test Reduction Procedure

According to KDB 941225D01, in the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as "otherwise" in the applicable procedures; SAR measurement is required for the secondary mode.

7.2 Operation Configurations

7.2.1 GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a base station by air link. Using CMU200 the power lever is set to "5" and "0" in SAR of GSM 850 and GSM 1900. The tests in the band of GSM 850 and GSM 1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data 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.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode

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7.2.2 WCDMA Test Configuration

1) . Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1's" for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are required in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

2) . Head SAR

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure

3) . Body SAR

SAR for body configurations is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the handset, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

4) . HSDPA / HSUPA / DC-HSDPA

According to KDB 941225 D01v03, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is $\leq \frac{1}{4}$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA

a) HSDPA

HSDPA is configured according to the applicable UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms and a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors (β_c , β_d), and HS-DPCCH power offset parameters (Δ_{ACK} , Δ_{NACK} , Δ_{CQI}) are set according to values indicated in the following table. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

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Sub-test	β_c	Bd	$\beta_d(\text{SF})$	β_c/β_d	β_{hs}	CM(dB)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0	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
Note1: ΔACK, ΔNACK and $\Delta\text{CQI} = 8$ Ahs = $\beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$ Note2: 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 5.13.1.A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, ΔACK and $\Delta\text{NACK} = 8$ (Ahs = 30/15) with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta\text{CQI} = 7$ (Ahs = 24/15) with $\beta_{hs} = 24/15 * \beta_c$. Note3: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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.							

The measurements were performed with a Fixed Reference Channel (FRC) and H-Set 1 QPSK.

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI"s
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

Table 6: settings of required H-Set 1 QPSK acc. to 3GPP 34.121

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HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	Maximum H S-DSCH Transport Block Bits/HS-DSCH TTI	Total Soft Channel Bits
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

Table 7: HSDPA UE category

b) HSUPA

Due to inner loop power control requirements in HSUPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSUPA should be configured according to the values indicated below as well as other applicable procedures described in the „WCDMA Handset“ and „Release 5 HSUPA Data Device“ sections of 3G device.

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Sub-test ^⓪	$\beta_{\text{e}}^{\text{⓪}}$	$\beta_{\text{d}}^{\text{⓪}}$	β_{d} (SF) ^⓪	$\beta_{\text{e}}/\beta_{\text{d}}^{\text{⓪}}$	$\beta_{\text{hs}}^{\text{(1)⓪}}$	$\beta_{\text{ec}}^{\text{⓪}}$	$\beta_{\text{ed}}^{\text{⓪}}$	β_{e} (SF) ^⓪	$\beta_{\text{ed}}^{\text{(code)⓪}}$	CM ^{(2)⓪} (dB) ^⓪	MP R ^⓪ (dB) ^⓪	AG ^{(4)⓪} Inde x ^⓪	E- TFC I ^⓪
1 ^⓪	11/15 ^{(3)⓪}	15/15 ^{(3)⓪}	64 ^⓪	11/15 ^{(3)⓪}	22/15 ^⓪	209/225 ^⓪	1039/225 ^⓪	4 ^⓪	1 ^⓪	1.0 ^⓪	0.0 ^⓪	20 ^⓪	75 ^⓪
2 ^⓪	6/15 ^⓪	15/15 ^⓪	64 ^⓪	6/15 ^⓪	12/15 ^⓪	12/15 ^⓪	94/75 ^⓪	4 ^⓪	1 ^⓪	3.0 ^⓪	2.0 ^⓪	12 ^⓪	67 ^⓪
3 ^⓪	15/15 ^⓪	9/15 ^⓪	64 ^⓪	15/9 ^⓪	30/15 ^⓪	30/15 ^⓪	$\beta_{\text{ed1}}: 47/15^{\text{⓪}}$ $\beta_{\text{ed2}}: 47/15^{\text{⓪}}$	4 ^⓪	2 ^⓪	2.0 ^⓪	1.0 ^⓪	15 ^⓪	92 ^⓪
4 ^⓪	2/15 ^⓪	15/15 ^⓪	64 ^⓪	2/15 ^⓪	4/15 ^⓪	2/15 ^⓪	56/75 ^⓪	4 ^⓪	1 ^⓪	3.0 ^⓪	2.0 ^⓪	17 ^⓪	71 ^⓪
5 ^⓪	15/15 ^{(4)⓪}	15/15 ^{(4)⓪}	64 ^⓪	15/15 ^{(4)⓪}	30/15 ^⓪	24/15 ^⓪	134/15 ^⓪	4 ^⓪	1 ^⓪	1.0 ^⓪	0.0 ^⓪	21 ^⓪	81 ^⓪
Note 1: ΔACK , ΔNACK and $\Delta \text{CQI} = 8$ $A_{\text{hs}} = \beta_{\text{hs}}/\beta_{\text{e}} = 30/15$ $\beta_{\text{hs}} = 30/15 * \beta_{\text{e}}^{\text{⓪}}$ Note 2: CM = 1 for $\beta_{\text{e}}/\beta_{\text{d}} = 12/15$, $\beta_{\text{hs}}/\beta_{\text{e}} = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference ^⓪ Note 3 : For subtest 1 the $\beta_{\text{e}}/\beta_{\text{d}}$ ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_{\text{e}} = 10/15$ and $\beta_{\text{d}} = 15/15^{\text{⓪}}$ Note 4 : For subtest 5 the $\beta_{\text{e}}/\beta_{\text{d}}$ ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_{\text{e}} = 14/15$ and $\beta_{\text{d}} = 15/15^{\text{⓪}}$ Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g ^⓪ Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value. ^⓪													

Table 8: Subtests for UMTS Release 6 HSUPA

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Spreading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF	11484	5.76
	4	4	2	4	20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF	22996	?
	4	4	10	4	20000	?
NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4. UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM. (TS 25.306-7.3.0).						

Table 9: HSUPA UE category

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c) DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a Second serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0.

A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/lor	dB	-10
P-CCPCH and SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/lor	dB	-5
OCNS_Ec/lor	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13.

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK.

Parameter	Value
Nominal average inf. bit rate	60 kbit/s
Inter-TTI Distance	1 TTI's
Number of HARQ Processes	6 Processes
Information Bit Payload	120 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	960 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	3200 SMLs
Coding Rate	0.15
Number of Physical Channel Codes	1

Table 10: settings of required H-Set 12 QPSK acc. to 3GPP 34.121

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 above.
2. Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

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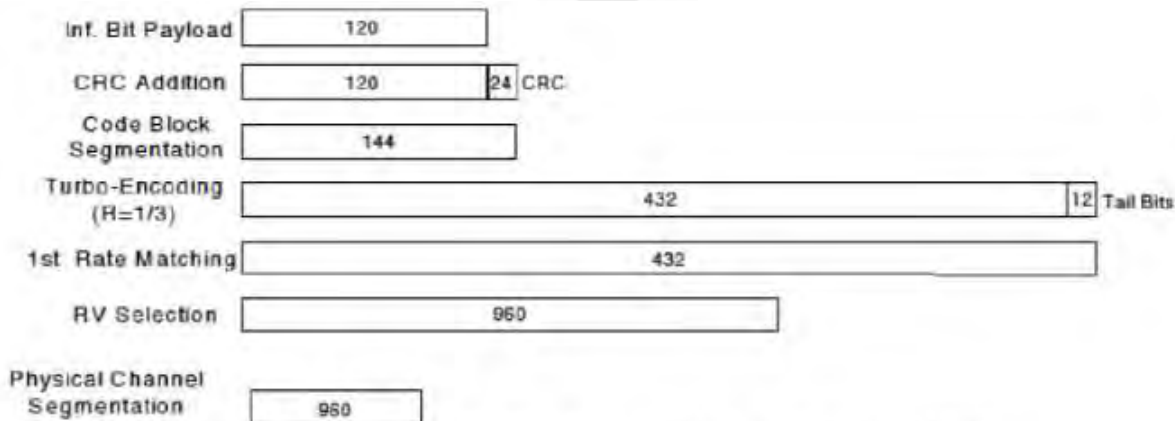


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 5 procedures. A summary of subtest settings are illustrated below:

Sub-test ^o	β_c ^o	β_d ^o	β_d ·(SF) ^o	β_c/β_d ^o	$\beta_{hs}(1)$ ^o	CM(dB)(2) ^o	MPR·(dB) ^o
1 ^o	2/15 ^o	15/15 ^o	64 ^o	2/15 ^o	4/15 ^o	0.0 ^o	0 ^o
2 ^o	12/15(3) ^o	15/15(3) ^o	64 ^o	12/15(3) ^o	24/15 ^o	1.0 ^o	0 ^o
3 ^o	15/15 ^o	8/15 ^o	64 ^o	15/8 ^o	30/15 ^o	1.5 ^o	0.5 ^o
4 ^o	15/15 ^o	4/15 ^o	64 ^o	15/4 ^o	30/15 ^o	1.5 ^o	0.5 ^o

Note 1: Δ ACK, Δ NACK and Δ CQI=8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$
 Note 2: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH 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 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$

Up commands are set continuously to set the UE to Max power.

Note:

1. The Dual Carriers transmission only applies to HSDPA physical channels
2. The Dual Carriers belong to the same Node and are on adjacent carriers.
3. The Dual Carriers do not support MIMO to serve UEs configured for dual cell operation
4. The Dual Carriers operate in the same frequency band.
5. The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.
6. The device doesn't support carrier aggregation for it just can operate in Release 8.

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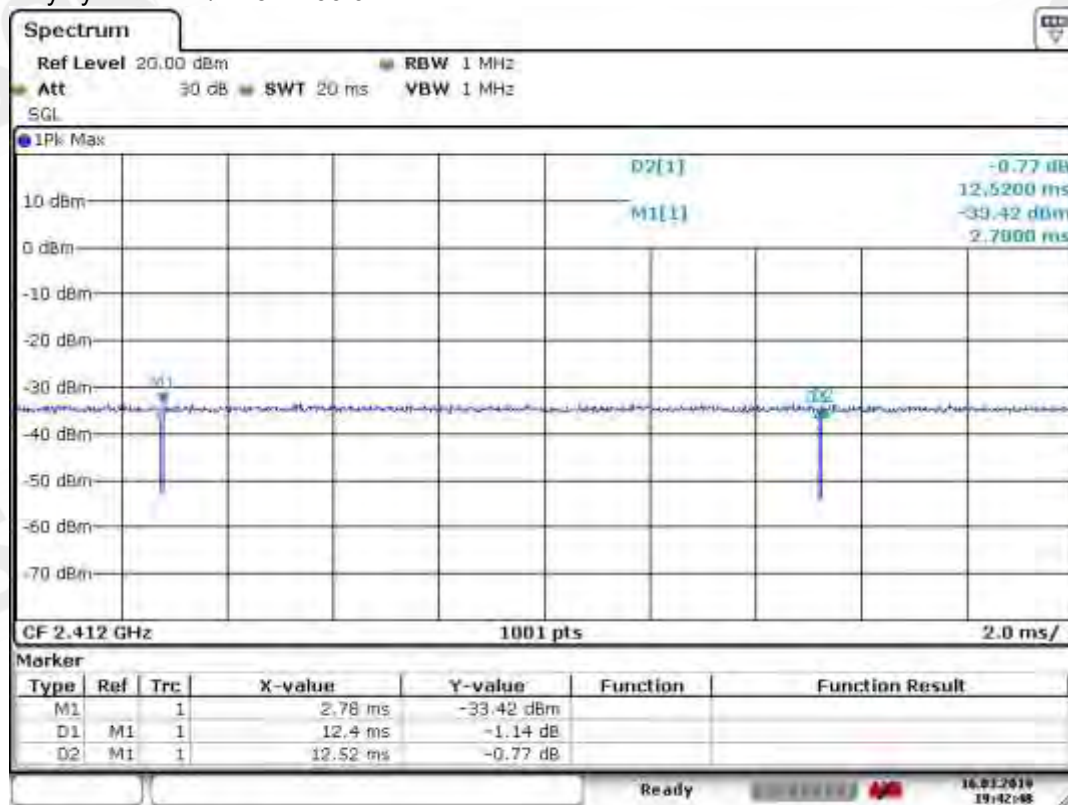
7.2.3 WiFi Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

7.2.3.1 Duty cycle

1) 2.4GHz Wi-Fi 802.11b:

duty cycle = $12.4/12.52 = 99.04\%$



Date: 16.MAR.2019 19:42:49

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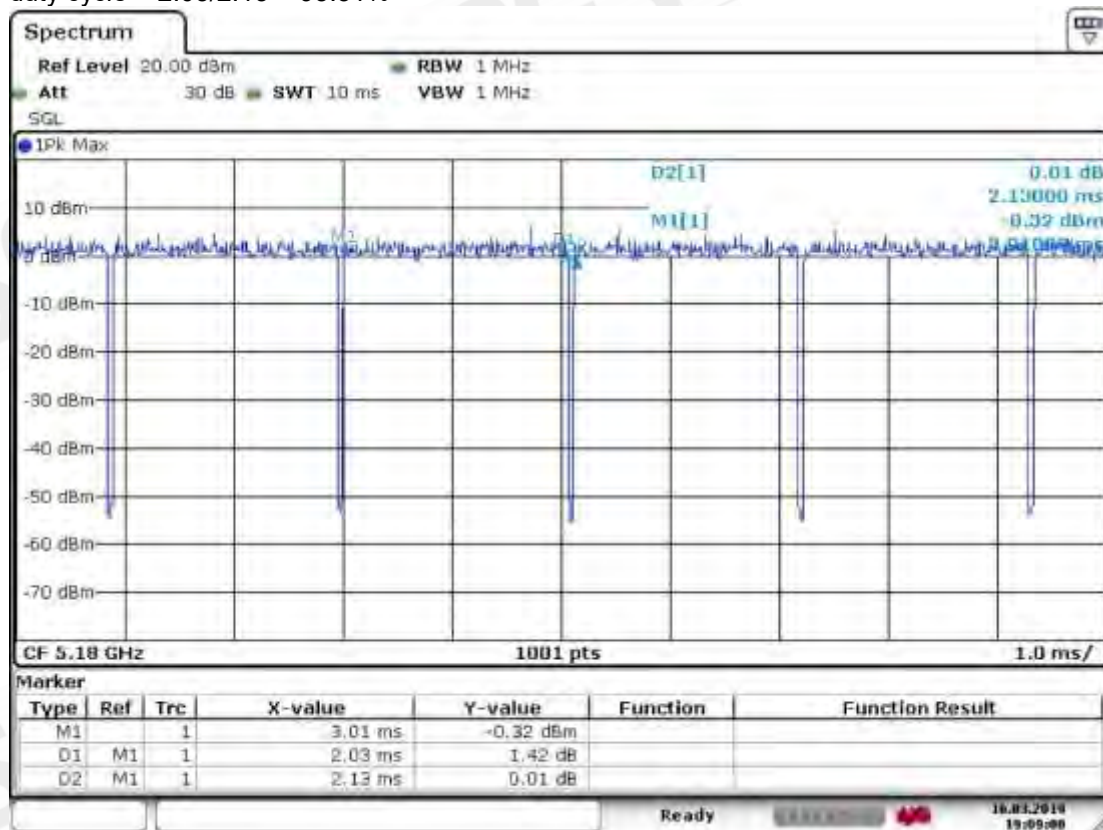
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2) 5GHz Wi-Fi 802.11a:
duty cycle = 2.03/2.13 = 95.31%



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7.2.3.2 Initial Test Position SAR Test Reduction Procedure

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. The initial test position procedure is described in the following:

- 1) . When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
- 2) . When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
- 3) . For all positions/configurations tested using the initial test position and subsequent test positions, 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. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

7.2.3.3 Initial Test Configuration Procedures

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required. SAR test reduction for subsequent highest output test channels is determined according to *reported* SAR of the initial test configuration. For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

When the *reported* SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

7.2.3.4 Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

- 1) . When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.

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- 2) . When the highest *reported* SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.
- 3) . The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.
 - a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.
 - b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the *reported* SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.
- 4) . SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:
 - a) replace "subsequent test configuration" with "next subsequent test configuration" (i.e., subsequent next highest specified maximum output power configuration)
 - b) replace "initial test configuration" with "all tested higher output power configurations"

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7.2.3.5 2.4 GHz WiFi SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

- **802.11b DSSS SAR Test Requirements**

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) . When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) . When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

- **2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). SAR is not required for the following 2.4 GHz OFDM conditions.

- 1) . When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
- 2) . When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

- **SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

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7.2.3.6 5 GHz WiFi SAR Procedures

- **U-NII-1 and U-NII-2A Bands**

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following:

- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
- 2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.
- 3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

- **U-NII-2C and U-NII-3 Bands**

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

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- **OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements**

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

- 1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
- 2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
- 3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
- 4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n. After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.
 - a) The channel closest to mid-band frequency is selected for SAR measurement.
 - b) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

- **SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

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7.2.4 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The Anritsu MT8821C was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

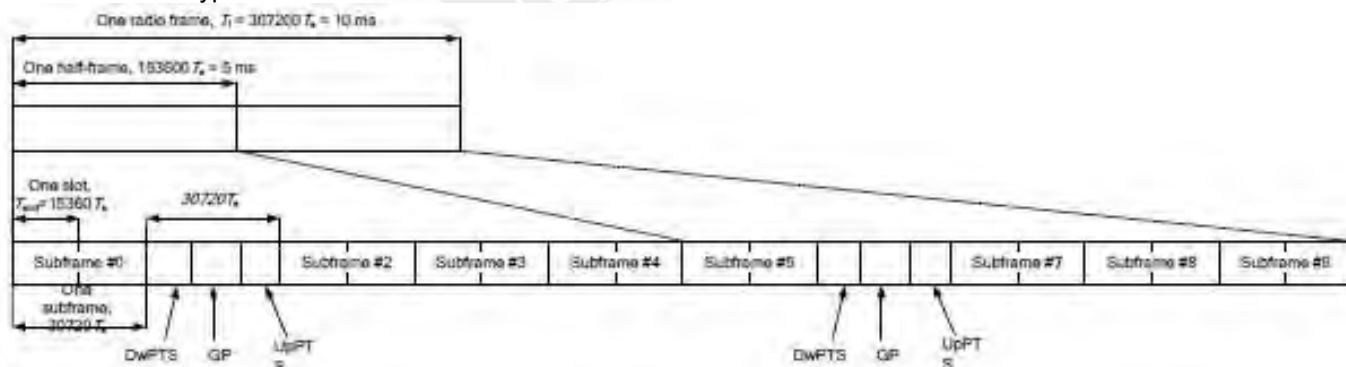
TDD LTE test consideration

For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Band support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Frame structure type 2:



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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.Ts	2192.Ts	2560.Ts	7680.Ts	2192.Ts	2560.Ts
1	19760.Ts			20480.Ts		
2	21952.Ts			23040.Ts		
3	24144.Ts			25600.Ts		
4	26336.Ts			7680.Ts		
5	6592.Ts	4384.Ts	5120.Ts	20480.Ts	4384.Ts	5120.Ts
6	19760.Ts			23040.Ts		
7	21952.Ts			25600.Ts		
8	24144.Ts			-	-	-
9	13168.Ts			-	-	-

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

Calculated Duty Cycle=[Extended cyclic prefix in uplink x (Ts) x # of S + # of U]/10ms

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

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A) Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

B) MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

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
64 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

C) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

D) Largest channel bandwidth standalone SAR test requirements**1) QPSK with 1 RB allocation**

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. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation

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 in 1) and 2) 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) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

E) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is $> \frac{1}{2}$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

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8 Test Result

8.1 Measurement of RF conducted Power

8.1.1 Conducted Power of Main Antenna

8.1.1.1 Conducted Power of GSM

GSM 850										
Burst Output Power(dBm)					Tune up	Division Factors	Frame-Average Output Power(dBm)			Tune up
Channel		128	190	251			128	190	251	
GSM(GMSK)	GSM	32.38	32.34	32.33	33.60	-9.19	23.19	23.15	23.14	24.41
GPRS/EGPRS (GMSK)	1 TX Slot	32.38	32.39	32.29	33.60	-9.19	23.19	23.20	23.10	24.41
	2 TX Slots	29.47	29.43	29.36	30.60	-6.18	23.29	23.25	23.18	24.42
	3 TX Slots	27.65	27.64	27.62	28.80	-4.42	23.23	23.22	23.20	24.38
	4 TX Slots	26.36	26.39	26.37	27.60	-3.17	23.19	23.22	23.20	24.43
EGPRS (8PSK)	1 TX Slot	25.95	25.58	25.65	28.50	-9.19	16.76	16.39	16.46	19.31
	2 TX Slots	22.51	22.54	22.63	25.50	-6.18	16.33	16.36	16.45	19.32
	3 TX Slots	20.57	20.67	20.72	23.70	-4.42	16.15	16.25	16.30	19.28
	4 TX Slots	19.17	19.21	19.19	22.50	-3.17	16.00	16.04	16.02	19.33
GSM 1900										
Burst Output Power(dBm)					Tune up	Division Factors	Frame-Average Output Power(dBm)			Tune up
Channel		512	661	810			512	661	810	
GSM(GMSK)	GSM	29.99	29.94	30.24	31.30	-9.19	20.80	20.75	21.05	22.11
GPRS/EGPRS (GMSK)	1 TX Slot	30.01	29.95	30.29	31.30	-9.19	20.82	20.76	21.10	22.11
	2 TX Slots	27.11	27.02	27.14	28.30	-6.18	20.93	20.84	20.96	22.12
	3 TX Slots	25.28	25.23	25.36	26.50	-4.42	20.86	20.81	20.94	22.08
	4 TX Slots	24.04	23.98	24.13	25.30	-3.17	20.87	20.81	20.96	22.13
EGPRS (8PSK)	1 TX Slot	25.61	25.51	25.56	28.00	-9.19	16.42	16.32	16.37	18.81
	2 TX Slots	22.19	22.12	22.18	25.00	-6.18	16.01	15.94	16.00	18.82
	3 TX Slots	20.21	20.11	20.17	23.20	-4.42	15.79	15.69	15.75	18.78
	4 TX Slots	18.76	18.72	18.79	22.00	-3.17	15.59	15.55	15.62	18.83

Table 11: Conducted Power of GSM

Note:

- 1) . CMU200 measures GSM peak and average output power for active timeslots. For SAR the time based average power is relevant. The difference in between depends on the duty cycle of the TDMA signal:

No. of timeslots	1	2	3	4
Duty Cycle	1:8.3	1:4.15	1:2.77	1:2.075
Time based avg. power compared to slotted avg. power	-9.19	-6.18	-4.42	-3.17

- 2) . The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:

$$\text{Frame-averaged power} = 10 \times \log (\text{Burst-averaged power mW} \times \text{Slot used} / 8)$$

- 3) . When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel must be used

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8.1.1.2 Conducted Power of WCDMA

WCDMA Band II Full Power/Receiver on(head)					
Average Conducted Power(dBm)					
Channel		9262	9400	9538	Tune up
WCDMA	12.2kbps RMC	23.21	23.25	23.17	24.50
	12.2kbps AMR	23.20	23.24	23.14	24.50
HSDPA	Subtest 1	22.65	22.72	22.56	24.00
	Subtest 2	21.84	21.92	21.75	23.00
	Subtest 3	21.39	21.46	21.26	22.80
	Subtest 4	21.37	21.49	21.22	22.80
HSUPA	Subtest 1	21.64	21.48	21.17	23.00
	Subtest 2	20.32	20.16	20.07	22.00
	Subtest 3	21.23	21.02	20.85	23.00
	Subtest 4	20.01	20.99	20.09	22.50
	Subtest 5	23.00	23.10	22.90	24.50
DC-HSDPA	Subtest 1	22.57	22.66	22.51	24.00
	Subtest 2	21.77	21.86	21.68	23.00
	Subtest 3	21.34	21.38	21.20	22.80
	Subtest 4	21.29	21.46	21.14	22.80
WCDMA Band II Receiver off (body)					
Average Conducted Power(dBm)					
Channel		9262	9400	9538	Tune up
WCDMA	12.2kbps RMC	22.71	22.78	22.67	24.00
	12.2kbps AMR	22.72	22.74	22.66	24.00
HSDPA	Subtest 1	22.18	22.23	22.13	23.50
	Subtest 2	21.38	21.46	21.37	22.50
	Subtest 3	20.90	20.97	20.80	22.30
	Subtest 4	20.82	20.97	20.83	22.30
HSUPA	Subtest 1	20.89	20.86	20.61	22.50
	Subtest 2	19.78	19.84	19.50	21.50
	Subtest 3	20.66	20.59	20.39	22.50
	Subtest 4	19.52	19.45	19.65	22.00
	Subtest 5	22.50	22.60	22.50	24.00
DC-HSDPA	Subtest 1	22.15	22.20	22.09	23.50
	Subtest 2	21.30	21.42	21.32	22.50
	Subtest 3	20.82	20.92	20.72	22.30
	Subtest 4	20.74	20.89	20.79	22.30

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WCDMA Band IV					
Average Conducted Power(dBm)					
Channel		1312	1412	1513	Tune up
WCDMA	12.2kbps RMC	22.42	22.53	22.39	23.50
	12.2kbps AMR	22.30	22.34	22.26	23.50
HSDPA	Subtest 1	21.56	21.62	21.57	23.00
	Subtest 2	20.82	20.82	20.84	22.50
	Subtest 3	20.17	20.26	20.34	21.80
	Subtest 4	20.21	20.31	20.22	21.80
HSUPA	Subtest 1	20.48	20.26	20.24	22.50
	Subtest 2	19.58	19.32	19.32	21.50
	Subtest 3	20.22	20.54	20.08	22.50
	Subtest 4	19.24	19.60	19.23	21.50
	Subtest 5	21.90	21.90	21.90	23.50
DC-HSDPA	Subtest 1	21.52	21.57	21.51	23.00
	Subtest 2	20.75	20.74	20.80	22.50
	Subtest 3	20.11	20.21	20.30	21.80
	Subtest 4	20.13	20.28	20.14	21.80
WCDMA Band V					
Average Conducted Power(dBm)					
Channel		4132	4182	4233	Tune up
WCDMA	12.2kbps RMC	23.89	24.07	23.95	25.00
	12.2kbps AMR	23.87	24.05	23.95	25.00
HSDPA	Subtest 1	23.35	23.40	23.31	24.50
	Subtest 2	22.91	22.92	22.79	24.00
	Subtest 3	22.41	22.48	22.36	23.30
	Subtest 4	22.50	22.53	22.37	23.30
HSUPA	Subtest 1	22.86	23.04	22.70	24.00
	Subtest 2	22.10	21.64	21.55	23.00
	Subtest 3	22.95	23.08	23.12	24.00
	Subtest 4	21.81	21.36	21.26	23.00
	Subtest 5	23.70	23.80	23.70	25.00
DC-HSDPA	Subtest 1	23.32	23.37	23.22	24.50
	Subtest 2	22.87	22.89	22.70	24.00
	Subtest 3	22.33	22.42	22.31	23.30
	Subtest 4	23.89	24.07	23.95	25.00

Table 12: Conducted Power of WCDMA

Note:

1) when the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel must be used.

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8.1.1.3 Conducted Power of LTE

LTE Band 4				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 19957	Channel 20175	Channel 20393	Tune up
1.4MHz	QPSK	1	0	22.55	22.69	22.57	23.50
		1	2	22.73	22.82	22.32	23.50
		1	5	22.57	22.58	22.53	23.50
		3	0	22.50	22.34	22.38	23.50
		3	2	22.30	22.54	22.36	23.50
		3	3	22.51	22.42	22.45	23.50
		6	0	21.43	21.37	21.22	22.50
	16QAM	1	0	21.82	21.82	22.00	22.50
		1	2	21.44	21.56	21.83	22.50
		1	5	21.71	21.77	21.62	22.50
		3	0	21.55	21.75	21.71	22.50
		3	2	21.21	21.18	21.44	22.50
		3	3	21.55	21.63	21.41	22.50
		6	0	20.44	20.35	20.58	21.50
	64QAM	1	0	20.71	20.55	20.72	21.50
		1	2	20.70	20.34	20.32	21.50
		1	5	20.69	21.01	20.26	21.50
		3	0	20.60	20.53	20.56	21.50
		3	2	20.28	20.26	20.30	21.50
		3	3	20.29	20.39	20.24	21.50
		6	0	19.31	19.53	19.22	20.50
Bandwidth	Modulation	RB size	RB offset	Channel 19965	Channel 20175	Channel 20385	Tune up
3MHz	QPSK	1	0	22.67	22.57	22.56	23.50
		1	7	21.69	22.08	22.16	23.50
		1	14	22.68	22.46	22.61	23.50
		8	0	21.52	21.50	21.58	22.50
		8	4	21.57	21.45	21.59	22.50
		8	7	21.63	21.34	21.50	22.50
		15	0	21.59	21.59	21.47	22.50
	16QAM	1	0	22.04	21.75	21.91	22.50
		1	7	20.99	21.69	20.93	22.50
		1	14	22.11	21.44	22.06	22.50
		8	0	20.42	20.63	20.56	21.50
		8	4	20.62	20.32	20.45	21.50
		8	7	20.53	20.36	20.55	21.50
		15	0	20.57	20.27	20.51	21.50
	64QAM	1	0	20.71	20.82	20.56	21.50
		1	7	21.28	20.12	20.08	21.50
		1	14	20.34	20.48	20.34	21.50
		8	0	19.53	19.44	19.41	20.50
		8	4	19.54	19.50	19.44	20.50
		8	7	19.51	19.48	19.61	20.50

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		15	0	19.43	19.48	19.35	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19975	20175	20375	
5MHz	QPSK	1	0	22.78	22.63	22.60	23.50
		1	13	22.82	22.77	22.97	23.50
		1	24	22.85	22.70	22.64	23.50
		12	0	21.63	21.70	21.73	22.50
		12	6	21.61	21.71	21.71	22.50
		12	13	21.76	21.63	21.69	22.50
		25	0	21.63	21.52	21.66	22.50
	16QAM	1	0	21.75	21.87	22.10	22.50
		1	13	21.53	22.22	21.88	22.50
		1	24	22.31	21.40	21.80	22.50
		12	0	20.52	20.67	20.66	21.50
		12	6	20.65	20.67	20.62	21.50
		12	13	20.75	20.56	20.68	21.50
		25	0	20.54	20.66	20.63	21.50
	64QAM	1	0	20.79	20.61	20.64	21.50
		1	13	21.06	20.40	20.81	21.50
		1	24	20.39	20.91	20.93	21.50
		12	0	19.53	19.63	19.62	20.50
		12	6	19.59	19.67	19.59	20.50
		12	13	19.70	19.62	19.43	20.50
		25	0	19.61	19.55	19.60	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20000	20175	20350	
10MHz	QPSK	1	0	22.59	22.56	22.49	23.50
		1	25	22.71	22.29	22.11	23.50
		1	49	22.60	22.46	22.52	23.50
		25	0	21.56	21.62	21.67	22.50
		25	13	21.75	21.62	21.73	22.50
		25	25	21.71	21.61	21.62	22.50
		50	0	21.72	21.45	21.64	22.50
	16QAM	1	0	21.86	21.76	21.53	22.50
		1	25	22.06	21.41	21.98	22.50
		1	49	22.12	21.53	21.82	22.50
		25	0	20.60	20.56	20.67	21.50
		25	13	20.59	20.44	20.47	21.50
		25	25	20.66	20.55	20.63	21.50
		50	0	20.61	20.42	20.54	21.50
	64QAM	1	0	20.31	20.40	20.49	21.50
		1	25	20.02	20.03	20.56	21.50
		1	49	20.41	20.60	20.36	21.50
		25	0	19.63	19.59	19.52	20.50
		25	13	19.59	19.60	19.65	20.50
		25	25	19.61	19.46	19.49	20.50
		50	0	19.58	19.50	19.57	20.50

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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20025	20175	20325	
15MHz	QPSK	1	0	22.45	22.60	22.58	23.50
		1	38	22.88	22.59	22.72	23.50
		1	74	22.59	22.61	22.69	23.50
		36	0	21.75	21.71	21.68	22.50
		36	18	21.69	21.66	21.66	22.50
		36	39	21.72	21.68	21.66	22.50
		75	0	21.73	21.67	21.63	22.50
	16QAM	1	0	21.98	21.57	21.86	22.50
		1	38	21.95	22.04	21.75	22.50
		1	74	21.92	21.23	21.80	22.50
		36	0	20.48	20.62	20.52	21.50
		36	18	20.66	20.59	20.45	21.50
		36	39	20.65	20.64	20.66	21.50
		75	0	20.66	20.55	20.66	21.50
	64QAM	1	0	20.63	20.68	20.63	21.50
		1	38	20.80	20.51	20.59	21.50
		1	74	20.94	20.42	20.59	21.50
		36	0	19.64	19.55	19.62	20.50
		36	18	19.69	19.62	19.56	20.50
		36	39	19.62	19.53	19.64	20.50
		75	0	19.57	19.44	19.54	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20050	20175	20300	
20MHz	QPSK	1	0	22.64	22.70	22.52	23.50
		1	50	22.26	22.52	22.43	23.50
		1	99	22.68	22.67	22.71	23.50
		50	0	21.71	21.72	21.62	22.50
		50	25	21.60	21.65	21.64	22.50
		50	50	21.68	21.64	21.73	22.50
		100	0	21.73	21.65	21.55	22.50
	16QAM	1	0	21.91	21.90	21.52	22.50
		1	50	21.23	21.28	21.51	22.50
		1	99	21.59	22.07	22.06	22.50
		50	0	20.67	20.64	20.63	21.50
		50	25	20.60	20.54	20.57	21.50
		50	50	20.62	20.52	20.67	21.50
		100	0	20.64	20.50	20.59	21.50
	64QAM	1	0	20.35	20.54	20.42	21.50
		1	50	20.47	20.61	20.41	21.50
		1	99	20.60	20.80	20.93	21.50
		50	0	19.55	19.55	19.60	20.50
		50	25	19.53	19.53	19.56	20.50
		50	50	19.54	19.50	19.54	20.50
		100	0	19.58	19.58	19.58	20.50

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LTE Band 7				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20775	21100	21425	
5MHz	QPSK	1	0	23.21	23.38	23.00	24.20
		1	13	23.14	23.11	23.52	24.20
		1	24	23.24	23.10	23.28	24.20
		12	0	21.70	21.59	21.61	22.70
		12	6	21.50	21.36	21.59	22.70
		12	13	21.63	21.56	21.64	22.70
		25	0	21.65	21.58	21.64	22.70
	16QAM	1	0	21.86	21.99	21.83	23.20
		1	13	21.79	21.81	21.67	23.20
		1	24	22.05	21.69	21.59	23.20
		12	0	20.67	20.51	20.50	22.20
		12	6	20.81	20.65	20.68	22.20
		12	13	20.83	20.57	20.65	22.20
		25	0	20.77	20.79	20.95	22.20
	64QAM	1	0	21.46	21.36	21.02	22.20
		1	13	21.45	21.01	20.99	22.20
		1	24	21.18	21.01	21.11	22.20
		12	0	20.11	19.98	19.93	21.20
		12	6	19.90	20.17	20.09	21.20
		12	13	20.04	20.04	20.02	21.20
		25	0	19.88	20.00	20.02	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20800	21100	21400	
10MHz	QPSK	1	0	23.34	23.27	23.52	24.20
		1	25	23.16	23.26	22.93	24.20
		1	49	23.18	22.80	23.26	24.20
		25	0	21.49	21.39	21.40	22.70
		25	13	21.41	21.39	21.27	22.70
		25	25	21.43	21.32	21.35	22.70
		50	0	21.42	21.40	21.69	22.70
	16QAM	1	0	21.90	21.91	21.54	23.20
		1	25	21.07	21.71	21.34	23.20
		1	49	21.57	21.55	21.14	23.20
		25	0	20.59	20.47	20.49	22.20
		25	13	20.79	20.52	20.49	22.20
		25	25	20.69	20.36	20.56	22.20
		50	0	20.76	20.55	20.76	22.20
	64QAM	1	0	21.49	21.04	21.14	22.20
		1	25	20.76	20.74	20.66	22.20
		1	49	21.14	20.87	20.84	22.20
		25	0	19.92	20.00	19.88	21.20
		25	13	20.00	20.03	20.05	21.20
		25	25	19.94	20.02	20.06	21.20

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Bandwidth	Modulation	50 RB size	0 RB offset	19.94 Channel 20825	20.00 Channel 21100	20.20 Channel 21375	21.20 Tune up
15MHz	QPSK	1	0	23.04	23.01	23.13	24.20
		1	38	23.30	23.27	23.00	24.20
		1	74	23.06	22.80	22.98	24.20
		36	0	21.48	21.47	21.50	22.70
		36	18	21.49	21.41	21.30	22.70
		36	39	21.43	21.39	21.37	22.70
		75	0	21.49	21.52	21.66	22.70
	16QAM	1	0	21.93	21.94	21.10	23.20
		1	38	21.90	21.98	22.03	23.20
		1	74	22.04	21.79	21.64	23.20
		36	0	20.80	20.60	20.54	22.20
		36	18	20.74	20.50	20.44	22.20
		36	39	20.64	20.45	20.39	22.20
		75	0	20.81	20.57	20.97	22.20
	64QAM	1	0	21.02	20.95	21.53	22.20
		1	38	21.07	21.20	21.34	22.20
		1	74	21.01	21.02	20.73	22.20
		36	0	19.95	20.03	20.07	21.20
		36	18	19.93	20.11	19.88	21.20
		36	39	19.90	20.07	19.95	21.20
		75	0	20.01	20.16	20.23	21.20
Bandwidth	Modulation	RB size	RB offset	Channel 20850	Channel 21100	Channel 21350	Tune up
20MHz	QPSK	1	0	23.06	23.04	23.54	24.20
		1	50	22.82	22.91	23.07	24.20
		1	99	23.24	23.54	23.09	24.20
		50	0	21.64	21.63	21.63	22.70
		50	25	21.62	21.48	21.48	22.70
		50	50	21.57	21.48	21.52	22.70
		100	0	21.73	21.57	21.74	22.70
	16QAM	1	0	21.90	21.73	21.61	23.20
		1	50	21.83	21.84	21.83	23.20
		1	99	22.05	22.12	22.02	23.20
		50	0	20.65	20.60	20.63	22.20
		50	25	20.61	20.50	20.51	22.20
		50	50	20.69	20.48	20.65	22.20
		100	0	20.72	20.82	20.77	22.20
	64QAM	1	0	21.10	21.11	20.96	22.20
		1	50	21.05	20.98	20.69	22.20
		1	99	21.34	21.22	21.69	22.20
		50	0	20.04	20.06	19.93	21.20
		50	25	19.91	19.90	19.92	21.20
		50	50	19.82	20.02	19.84	21.20
		100	0	20.09	20.06	20.13	21.20

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LTE Band 38				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37775	38000	38225	
5MHz	QPSK	1	0	22.99	23.11	22.93	24.20
		1	13	23.02	22.96	22.99	24.20
		1	24	22.97	23.14	22.90	24.20
		12	0	22.21	22.29	22.16	23.20
		12	6	22.09	22.22	22.05	23.20
		12	13	21.94	22.21	21.97	23.20
		25	0	21.92	22.17	22.02	23.20
	16QAM	1	0	22.03	22.26	22.29	23.20
		1	13	21.88	22.55	21.94	23.20
		1	24	21.83	22.06	22.28	23.20
		12	0	20.86	20.97	21.00	22.20
		12	6	20.76	20.97	20.70	22.20
		12	13	20.74	21.05	20.93	22.20
		25	0	20.65	21.07	20.90	22.20
	64QAM	1	0	21.21	21.06	21.20	22.20
		1	13	21.05	21.18	21.28	22.20
		1	24	20.91	20.81	20.90	22.20
		12	0	19.88	19.94	19.98	21.20
		12	6	19.90	19.94	19.99	21.20
		12	13	19.73	20.00	19.93	21.20
		25	0	19.91	19.96	19.92	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37800	38000	38200	
10MHz	QPSK	1	0	22.94	22.95	22.99	24.20
		1	25	22.22	22.50	22.88	24.20
		1	49	23.03	23.05	22.83	24.20
		25	0	22.02	22.18	22.09	23.20
		25	13	22.00	22.20	21.98	23.20
		25	25	21.90	22.12	21.91	23.20
		50	0	21.88	22.20	22.02	23.20
	16QAM	1	0	21.76	22.02	21.61	23.20
		1	25	21.20	22.04	22.02	23.20
		1	49	21.80	22.11	21.51	23.20
		25	0	20.76	20.94	20.78	22.20
		25	13	20.78	20.94	20.91	22.20
		25	25	20.63	20.95	20.82	22.20
		50	0	20.69	20.92	20.85	22.20
	64QAM	1	0	21.06	21.01	20.84	22.20
		1	25	20.83	20.89	20.56	22.20
		1	49	20.96	20.89	20.86	22.20
		25	0	19.79	20.01	20.01	21.20
		25	13	19.86	20.03	19.85	21.20
		25	25	19.73	20.07	19.86	21.20
		50	0	19.75	20.07	19.92	21.20

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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37825	38000	38175	
15MHz	QPSK	1	0	23.08	23.08	22.95	24.20
		1	38	23.11	23.05	23.05	24.20
		1	74	23.08	23.06	22.90	24.20
		36	0	22.15	22.13	22.11	23.20
		36	18	22.08	22.21	22.03	23.20
		36	39	22.09	22.16	22.02	23.20
		75	0	22.01	22.23	22.02	23.20
	16QAM	1	0	21.91	21.90	21.96	23.20
		1	38	21.68	22.17	22.31	23.20
		1	74	21.96	21.72	22.00	23.20
		36	0	20.74	21.03	20.96	22.20
		36	18	20.77	21.08	20.97	22.20
		36	39	20.83	21.10	20.93	22.20
		75	0	20.79	20.97	20.95	22.20
	64QAM	1	0	20.82	20.92	21.11	22.20
		1	38	20.75	21.03	21.20	22.20
		1	74	20.85	21.15	20.90	22.20
		36	0	19.86	20.04	19.93	21.20
		36	18	19.97	19.93	19.82	21.20
		36	39	19.89	20.10	19.92	21.20
		75	0	19.91	20.12	19.97	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37850	38000	38150	
20MHz	QPSK	1	0	22.68	22.92	22.90	24.20
		1	50	22.77	22.89	22.85	24.20
		1	99	22.53	22.54	22.53	24.20
		50	0	21.89	21.85	21.76	23.20
		50	25	21.73	21.83	21.64	23.20
		50	50	21.83	21.74	21.78	23.20
		100	0	21.84	21.81	21.68	23.20
	16QAM	1	0	21.86	21.92	21.76	23.20
		1	50	21.75	21.34	21.51	23.20
		1	99	21.69	21.68	21.60	23.20
		50	0	20.72	20.81	20.72	22.20
		50	25	20.73	20.66	20.55	22.20
		50	50	20.64	20.58	20.54	22.20
		100	0	20.74	20.66	20.65	22.20
	64QAM	1	0	21.17	21.09	21.08	22.20
		1	50	20.54	20.80	20.61	22.20
		1	99	20.61	21.02	20.87	22.20
		50	0	20.09	20.15	20.00	21.20
		50	25	20.00	20.06	19.99	21.20
		50	50	19.96	20.04	19.96	21.20
		100	0	19.92	20.12	20.02	21.20

Table 13: Conducted Power of LTE

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8.1.2 Conducted Power of Second Antenna

8.1.2.1 Conducted Power of GSM

GSM 850 Receiver on(head)										
Burst Output Power(dBm)					Tune up	Division Factors	Frame-Average Output Power(dBm)			Tune up
Channel		128	190	251			128	190	251	
GSM(GMSK)	GSM	31.22	31.11	30.97	32.10	-9.19	22.03	21.92	21.78	22.91
GPRS/EGPRS (GMSK)	1 TX Slot	31.19	31.11	30.90	32.10	-9.19	22.00	21.92	21.71	22.91
	2 TX Slots	28.14	28.02	27.84	29.10	-6.18	21.96	21.84	21.66	22.92
	3 TX Slots	26.27	26.19	26.06	27.30	-4.42	21.85	21.77	21.64	22.88
	4 TX Slots	25.12	25.05	24.92	26.10	-3.17	21.95	21.88	21.75	22.93
EGPRS (8PSK)	1 TX Slot	23.82	23.79	23.72	27.00	-9.19	14.63	14.60	14.53	17.81
	2 TX Slots	20.74	20.60	20.54	24.00	-6.18	14.56	14.42	14.36	17.82
	3 TX Slots	19.02	18.85	18.86	22.20	-4.42	14.60	14.43	14.44	17.78
	4 TX Slots	17.89	17.80	17.71	21.00	-3.17	14.72	14.63	14.54	17.83
GSM 850 Full Power /Receiver off(body)										
Burst Output Power(dBm)					Tune up	Division Factors	Frame-Average Output Power(dBm)			Tune up
Channel		128	190	251			128	190	251	
GSM(GMSK)	GSM	33.16	33.09	32.99	34.10	-9.19	23.97	23.90	23.80	24.91
GPRS/EGPRS (GMSK)	1 TX Slot	33.19	33.11	32.90	34.10	-9.19	24.00	23.92	23.71	24.91
	2 TX Slots	30.21	30.11	29.88	31.10	-6.18	24.03	23.93	23.70	24.92
	3 TX Slots	28.35	28.29	28.16	29.30	-4.42	23.93	23.87	23.74	24.88
	4 TX Slots	27.09	26.99	26.89	28.10	-3.17	23.92	23.82	23.72	24.93
EGPRS (8PSK)	1 TX Slot	26.13	26.06	26.03	29.00	-9.19	16.94	16.87	16.84	19.81
	2 TX Slots	22.65	22.52	22.53	26.00	-6.18	16.47	16.34	16.35	19.82
	3 TX Slots	20.98	20.89	20.92	24.20	-4.42	16.56	16.47	16.50	19.78
	4 TX Slots	19.78	19.63	19.56	23.00	-3.17	16.61	16.46	16.39	19.83

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GSM 1900										
Burst Output Power(dBm)					Tune up	Division Factors	Frame-Average Output Power(dBm)			Tune up
Channel		512	661	810			512	661	810	
GSM(GMSK)	GSM	23.93	23.75	24.03	25.30	-9.19	14.74	14.56	14.84	16.11
GPRS/EGPRS(GMSK)	1 TX Slot	23.92	23.76	24.02	25.30	-9.19	14.73	14.57	14.83	16.11
	2 TX Slots	21.06	20.96	21.14	22.30	-6.18	14.88	14.78	14.96	16.12
	3 TX Slots	19.37	19.28	19.60	20.50	-4.42	14.95	14.86	15.18	16.08
	4 TX Slots	18.26	18.12	18.37	19.30	-3.17	15.09	14.95	15.20	16.13
EGPRS(8PSK)	1 TX Slot	19.63	19.54	19.74	22.00	-9.19	10.44	10.35	10.55	12.81
	2 TX Slots	16.38	16.29	16.58	19.00	-6.18	10.20	10.11	10.40	12.82
	3 TX Slots	14.73	14.82	14.86	17.20	-4.42	10.31	10.40	10.44	12.78
	4 TX Slots	13.57	13.52	13.85	16.00	-3.17	10.40	10.35	10.68	12.83

Table 14: Conducted Power of GSM

Note:

1) . CMU200 measures GSM peak and average output power for active timeslots. For SAR the time based average power is relevant. The difference in between depends on the duty cycle of the TDMA signal:

No. of timeslots	1	2	3	4
Duty Cycle	1:8.3	1:4.15	1:2.77	1:2.075
Time based avg. power compared to slotted avg. power	-9.19	-6.18	-4.42	-3.17

2) . The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:

Frame-averaged power = 10 x log (Burst-averaged power mW x Slot used / 8

3) . When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used

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8.1.2.2 Conducted Power of WCDMA

WCDMA Band II Receiver on(head)					
Average Conducted Power(dBm)					
Channel		9262	9400	9538	Tune up
WCDMA	12.2kbps RMC	17.70	17.76	17.71	19.10
	12.2kbps AMR	17.66	17.72	17.59	19.10
HSDPA	Subtest 1	17.26	17.35	17.21	18.60
	Subtest 2	16.47	16.49	16.29	17.60
	Subtest 3	16.07	16.08	15.95	17.40
	Subtest 4	16.05	16.05	15.86	17.40
HSUPA	Subtest 1	16.33	16.11	15.71	17.60
	Subtest 2	14.97	14.81	14.65	16.60
	Subtest 3	15.82	15.57	15.51	17.60
	Subtest 4	14.56	15.64	14.73	17.10
	Subtest 5	17.62	17.72	17.43	19.10
DC-HSDPA	Subtest 1	17.19	17.27	17.18	18.60
	Subtest 2	16.40	16.43	16.22	17.60
	Subtest 3	16.00	16.05	15.89	17.40
	Subtest 4	16.02	15.99	15.82	17.40
WCDMA Band II Full Power/Receiver off (body)					
Average Conducted Power(dBm)					
Channel		9262	9400	9538	Tune up
WCDMA	12.2kbps RMC	23.58	23.63	23.44	24.50
	12.2kbps AMR	23.56	23.59	23.41	24.50
HSDPA	Subtest 1	22.81	22.92	22.77	24.00
	Subtest 2	22.02	22.08	21.88	23.00
	Subtest 3	21.63	21.66	21.50	22.80
	Subtest 4	21.58	21.62	21.45	22.80
HSUPA	Subtest 1	21.88	21.66	21.29	23.00
	Subtest 2	20.50	20.37	20.18	22.00
	Subtest 3	21.35	21.14	21.08	23.00
	Subtest 4	20.13	21.22	20.27	22.50
	Subtest 5	23.15	23.26	23.02	24.50
DC-HSDPA	Subtest 1	22.76	22.88	22.69	24.00
	Subtest 2	21.97	22.01	21.82	23.00
	Subtest 3	21.56	21.58	21.43	22.80
	Subtest 4	21.51	21.56	21.37	22.80

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WCDMA Band II + WiFi 2.4G (Connect/P2P/Hotspot)、BT off or WiFi 5.0G (Connect/P2P/Hotspot)、BTNA or WiFi 2.4G + P2P 5.0G + BT off or WiFi 5.0G + P2P 2.4G + BT off Receiver off (body)					
Average Conducted Power(dBm)					
Channel		9262	9400	9538	Tune up
WCDMA	12.2kbps RMC	23.06	23.05	23.02	24.00
	12.2kbps AMR	23.03	23.01	22.98	24.00
HSDPA	Subtest 1	22.27	22.37	22.23	23.50
	Subtest 2	21.47	21.50	21.30	22.50
	Subtest 3	21.10	21.12	20.97	22.30
	Subtest 4	21.03	21.08	20.89	22.30
HSUPA	Subtest 1	21.34	21.12	20.70	22.50
	Subtest 2	19.95	19.83	19.65	21.50
	Subtest 3	20.82	20.55	20.51	22.50
	Subtest 4	19.55	20.63	19.72	22.00
	Subtest 5	22.58	22.67	22.47	24.00
DC-HSDPA	Subtest 1	22.24	22.32	22.18	23.50
	Subtest 2	21.43	21.47	21.23	22.50
	Subtest 3	21.03	21.05	20.89	22.30
	Subtest 4	21.00	21.02	20.82	22.30
WCDMA Band II + WiFi 2.4G (Connect/P2P/Hotspot)、BT off or WiFi 5.0G (Connect/P2P/Hotspot)、BTNA or WiFi 2.4G + P2P 5.0G + BT off or WiFi 5.0G + P2P 2.4G + BT off Receiver on(head)					
Average Conducted Power(dBm)					
Channel		9262	9400	9538	Tune up
WCDMA	12.2kbps RMC	18.19	18.24	18.16	19.90
	12.2kbps AMR	18.16	18.23	18.12	19.90
HSDPA	Subtest 1	17.82	17.88	17.78	19.40
	Subtest 2	17.05	17.04	16.85	18.40
	Subtest 3	16.61	16.64	16.50	18.20
	Subtest 4	16.60	16.60	16.41	18.20
HSUPA	Subtest 1	16.92	16.70	16.28	18.40
	Subtest 2	15.53	15.34	15.24	17.40
	Subtest 3	16.39	16.12	16.06	18.40
	Subtest 4	15.09	16.22	15.26	17.90
	Subtest 5	18.15	18.26	17.96	19.90
DC-HSDPA	Subtest 1	17.79	17.83	17.75	19.40
	Subtest 2	16.99	16.99	16.81	18.40
	Subtest 3	16.58	16.56	16.47	18.20
	Subtest 4	16.54	16.57	16.34	18.20

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WCDMA Band IV Receiver on(head)					
Average Conducted Power(dBm)					
Channel		1312	1412	1513	Tune up
WCDMA	12.2kbps RMC	18.43	18.56	18.55	19.30
	12.2kbps AMR	18.42	18.52	18.53	19.30
HSDPA	Subtest 1	17.66	17.74	17.63	18.80
	Subtest 2	16.94	16.94	16.91	18.30
	Subtest 3	16.29	16.35	16.44	17.60
	Subtest 4	16.33	16.41	16.34	17.60
HSUPA	Subtest 1	16.56	16.36	16.33	18.30
	Subtest 2	15.70	15.44	15.44	17.30
	Subtest 3	16.30	16.62	16.19	18.30
	Subtest 4	15.36	15.70	15.32	17.30
	Subtest 5	18.02	17.98	17.99	19.30
DC-HSDPA	Subtest 1	17.61	17.65	17.60	18.80
	Subtest 2	16.82	16.87	16.82	18.30
	Subtest 3	16.15	16.29	16.33	17.60
	Subtest 4	16.20	16.33	16.26	17.60
WCDMA Band IV Full Power/Receiver off (body)					
Average Conducted Power(dBm)					
Channel		1312	1412	1513	Tune up
WCDMA	12.2kbps RMC	22.59	22.69	22.70	23.50
	12.2kbps AMR	22.57	22.65	22.67	23.50
HSDPA	Subtest 1	21.73	21.79	21.69	23.00
	Subtest 2	20.99	20.96	20.97	22.50
	Subtest 3	20.33	20.39	20.51	21.80
	Subtest 4	20.36	20.44	20.37	21.80
HSUPA	Subtest 1	20.62	20.41	20.41	22.50
	Subtest 2	19.74	19.49	19.47	21.50
	Subtest 3	20.34	20.70	20.21	22.50
	Subtest 4	19.40	19.75	19.40	21.50
	Subtest 5	22.06	22.03	22.04	23.50
DC-HSDPA	Subtest 1	21.66	21.69	21.62	23.00
	Subtest 2	20.90	20.91	20.91	22.50
	Subtest 3	20.24	20.35	20.42	21.80
	Subtest 4	20.28	20.36	20.28	21.80

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WCDMA Band V Receiver on(head)					
Average Conducted Power(dBm)					
Channel		4132	4182	4233	Tune up
WCDMA	12.2kbps RMC	21.49	21.63	21.41	22.50
	12.2kbps AMR	21.48	21.61	21.39	22.50
HSDPA	Subtest 1	20.85	20.92	20.76	22.00
	Subtest 2	20.37	20.46	20.26	21.50
	Subtest 3	19.84	20.00	19.84	20.80
	Subtest 4	20.00	19.98	19.83	20.80
HSUPA	Subtest 1	20.33	20.50	20.18	21.50
	Subtest 2	19.56	19.11	19.02	20.50
	Subtest 3	20.38	20.55	20.62	21.50
	Subtest 4	19.33	18.89	18.76	20.50
	Subtest 5	21.23	21.29	21.20	22.50
DC-HSDPA	Subtest 1	20.80	20.88	20.69	22.00
	Subtest 2	20.35	20.41	20.24	21.50
	Subtest 3	19.78	19.90	19.80	20.80
	Subtest 4	19.97	20.00	19.82	20.80
WCDMA Band V Full Power/Receiver off (body)					
Average Conducted Power(dBm)					
Channel		4132	4182	4233	Tune up
WCDMA	12.2kbps RMC	23.97	24.07	23.88	25.00
	12.2kbps AMR	23.94	24.03	23.87	25.00
HSDPA	Subtest 1	23.36	23.44	23.34	24.50
	Subtest 2	22.92	22.97	22.81	24.00
	Subtest 3	22.42	22.53	22.38	23.30
	Subtest 4	22.52	22.54	22.40	23.30
HSUPA	Subtest 1	22.91	23.05	22.71	24.00
	Subtest 2	22.12	21.66	21.60	23.00
	Subtest 3	22.96	23.12	23.14	24.00
	Subtest 4	21.86	21.40	21.29	23.00
	Subtest 5	23.74	23.83	23.73	25.00
DC-HSDPA	Subtest 1	23.37	23.39	23.27	24.50
	Subtest 2	22.90	22.93	22.75	24.00
	Subtest 3	22.34	22.43	22.35	23.30
	Subtest 4	22.49	22.54	22.34	23.30

Table 15: Conducted Power of WCDMA

Note:

- 1) when the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel must be used.

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8.1.2.3 Conducted Power of LTE

LTE Band 4 Receiver on(head)				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19957	20175	20393	
1.4MHz	QPSK	1	0	18.56	18.51	18.56	19.30
		1	2	18.79	18.18	18.82	19.30
		1	5	18.59	18.62	18.69	19.30
		3	0	18.23	18.44	18.45	19.30
		3	2	18.37	18.00	18.55	19.30
		3	3	18.24	18.48	18.52	19.30
		6	0	18.62	18.38	18.67	19.30
	16QAM	1	0	18.74	18.73	18.95	19.30
		1	2	18.38	18.71	18.19	19.30
		1	5	18.56	18.51	18.92	19.30
		3	0	18.54	18.92	18.64	19.30
		3	2	18.53	18.70	18.45	19.30
		3	3	18.49	18.55	18.65	19.30
		6	0	18.67	18.59	18.62	19.30
	64QAM	1	0	18.30	18.70	18.70	19.30
		1	2	18.73	18.26	18.51	19.30
		1	5	18.63	18.97	18.49	19.30
		3	0	18.28	18.66	18.53	19.30
		3	2	18.91	18.80	18.68	19.30
		3	3	18.39	18.42	18.43	19.30
		6	0	18.70	18.64	18.47	19.30
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19965	20175	20385	
3MHz	QPSK	1	0	18.71	18.53	18.67	19.30
		1	7	18.48	18.58	18.33	19.30
		1	14	18.60	18.55	18.63	19.30
		8	0	18.57	18.51	18.69	19.30
		8	4	18.64	18.55	18.46	19.30
		8	7	18.56	18.78	18.67	19.30
		15	0	18.54	18.58	18.59	19.30
	16QAM	1	0	19.10	18.98	18.73	19.30
		1	7	18.50	18.37	17.46	19.30
		1	14	18.70	18.77	18.85	19.30
		8	0	18.46	18.42	18.66	19.30
		8	4	18.61	18.63	18.61	19.30
		8	7	18.54	18.50	18.40	19.30
		15	0	18.51	18.73	18.64	19.30
	64QAM	1	0	18.76	18.51	18.85	19.30
		1	7	18.71	17.62	19.01	19.30
		1	14	19.02	18.70	18.86	19.30
		8	0	18.37	18.44	18.56	19.30
		8	4	18.51	18.61	18.37	19.30
		8	7	18.50	18.62	18.41	19.30

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		15	0	18.57	18.35	18.49	19.30
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19975	20175	20375	
5MHz	QPSK	1	0	18.46	18.50	18.58	19.30
		1	13	18.64	18.51	18.58	19.30
		1	24	18.51	18.57	18.68	19.30
		12	0	18.69	18.52	18.64	19.30
		12	6	18.67	18.58	18.64	19.30
		12	13	18.60	18.52	18.58	19.30
		25	0	18.60	18.55	18.58	19.30
	16QAM	1	0	18.45	19.00	18.76	19.30
		1	13	18.07	18.54	18.86	19.30
		1	24	18.57	18.64	18.87	19.30
		12	0	18.48	18.62	18.45	19.30
		12	6	18.55	18.60	18.65	19.30
		12	13	18.66	18.29	18.50	19.30
		25	0	18.51	18.49	18.59	19.30
	64QAM	1	0	18.83	18.42	18.93	19.30
		1	13	18.84	18.75	18.81	19.30
		1	24	18.56	18.92	18.51	19.30
		12	0	18.63	18.51	18.65	19.30
		12	6	18.61	18.54	18.61	19.30
		12	13	18.60	18.59	18.47	19.30
		25	0	18.40	18.40	18.50	19.30
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20000	20175	20350	
10MHz	QPSK	1	0	18.51	18.52	18.58	19.30
		1	25	18.55	18.64	18.28	19.30
		1	49	18.77	18.49	18.68	19.30
		25	0	18.55	18.52	18.65	19.30
		25	13	18.62	18.55	18.61	19.30
		25	25	18.63	18.48	18.59	19.30
		50	0	18.60	18.54	18.55	19.30
	16QAM	1	0	19.19	18.49	18.48	19.30
		1	25	19.04	18.46	18.49	19.30
		1	49	18.55	18.65	18.95	19.30
		25	0	18.48	18.57	18.48	19.30
		25	13	18.66	18.53	18.73	19.30
		25	25	18.56	18.56	18.52	19.30
		50	0	18.61	18.44	18.45	19.30
	64QAM	1	0	18.59	18.63	18.55	19.30
		1	25	18.61	18.32	18.13	19.30
		1	49	18.63	18.72	18.74	19.30
		25	0	18.62	18.50	18.53	19.30
		25	13	18.54	18.42	18.65	19.30
		25	25	18.60	18.45	18.44	19.30
		50	0	18.58	18.46	18.48	19.30

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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20025	20175	20325	
15MHz	QPSK	1	0	18.53	18.50	18.45	19.30
		1	38	18.61	18.54	18.57	19.30
		1	74	18.44	18.49	18.48	19.30
		36	0	18.57	18.57	18.59	19.30
		36	18	18.57	18.53	18.62	19.30
		36	39	18.58	18.52	18.54	19.30
		75	0	18.55	18.47	18.53	19.30
	16QAM	1	0	19.12	18.74	18.40	19.30
		1	38	18.98	18.66	19.12	19.30
		1	74	18.81	18.77	18.89	19.30
		36	0	18.54	18.48	18.54	19.30
		36	18	18.51	18.49	18.49	19.30
		36	39	18.48	18.50	18.48	19.30
		75	0	18.45	18.46	18.49	19.30
	64QAM	1	0	18.87	18.30	18.53	19.30
		1	38	18.62	19.09	18.57	19.30
		1	74	18.61	18.49	18.88	19.30
		36	0	18.57	18.56	18.49	19.30
		36	18	18.69	18.58	18.51	19.30
		36	39	18.45	18.59	18.52	19.30
		75	0	18.47	18.56	18.63	19.30
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20050	20175	20300	
20MHz	QPSK	1	0	18.46	18.55	18.43	19.30
		1	50	18.30	18.53	18.62	19.30
		1	99	18.57	18.52	18.73	19.30
		50	0	18.61	18.53	18.58	19.30
		50	25	18.49	18.56	18.58	19.30
		50	50	18.52	18.62	18.64	19.30
		100	0	18.60	18.65	18.67	19.30
	16QAM	1	0	18.79	18.77	18.70	19.30
		1	50	18.79	18.97	18.56	19.30
		1	99	18.83	18.51	18.79	19.30
		50	0	18.68	18.48	18.60	19.30
		50	25	18.46	18.49	18.53	19.30
		50	50	18.55	18.47	18.56	19.30
		100	0	18.52	18.54	18.47	19.30
	64QAM	1	0	18.56	18.64	18.60	19.30
		1	50	18.59	18.92	18.56	19.30
		1	99	18.63	18.75	18.80	19.30
		50	0	18.50	18.57	18.52	19.30
		50	25	18.43	18.48	18.53	19.30
		50	50	18.49	18.59	18.63	19.30
		100	0	18.47	18.50	18.48	19.30

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LTE Band 4 Full Power/Receiver off (body)				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19957	20175	20393	
1.4MHz	QPSK	1	0	22.78	22.94	23.10	23.50
		1	2	22.89	22.63	22.96	23.50
		1	5	22.89	22.91	22.95	23.50
		3	0	22.97	22.92	23.15	23.50
		3	2	22.89	22.98	22.85	23.50
		3	3	22.70	22.71	22.65	23.50
		6	0	21.62	21.79	21.97	22.50
	16QAM	1	0	22.23	22.09	22.10	22.50
		1	2	22.43	22.06	22.15	22.50
		1	5	21.84	22.22	22.31	22.50
		3	0	21.56	21.86	21.83	22.50
		3	2	21.65	21.93	21.51	22.50
		3	3	21.72	21.60	21.77	22.50
		6	0	20.49	20.85	20.78	21.50
	64QAM	1	0	20.55	20.97	21.24	21.50
		1	2	21.01	21.19	21.09	21.50
		1	5	21.23	20.68	20.60	21.50
		3	0	20.86	20.92	20.95	21.50
		3	2	20.58	20.76	20.26	21.50
		3	3	20.53	20.71	20.88	21.50
		6	0	19.56	19.63	19.74	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19965	20175	20385	
3MHz	QPSK	1	0	22.97	22.99	23.05	23.50
		1	7	21.93	22.61	23.05	23.50
		1	14	22.93	22.88	22.96	23.50
		8	0	21.69	21.92	21.95	22.50
		8	4	21.72	21.79	21.84	22.50
		8	7	21.84	21.83	21.77	22.50
		15	0	21.80	21.84	21.94	22.50
	16QAM	1	0	21.36	21.42	22.27	22.50
		1	7	21.89	21.56	21.84	22.50
		1	14	22.19	22.43	22.45	22.50
		8	0	21.00	20.82	20.99	21.50
		8	4	20.60	20.87	20.86	21.50
		8	7	20.67	20.80	21.01	21.50
		15	0	20.77	20.83	20.86	21.50
	64QAM	1	0	20.82	20.59	21.24	21.50
		1	7	20.60	20.36	20.84	21.50
		1	14	21.00	20.96	21.44	21.50
		8	0	19.79	19.57	19.96	20.50
		8	4	19.74	19.66	19.87	20.50
		8	7	19.62	19.58	20.03	20.50
		15	0	19.68	19.79	19.89	20.50

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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19975	20175	20375	
5MHz	QPSK	1	0	22.82	22.81	22.83	23.50
		1	13	22.95	22.89	23.09	23.50
		1	24	22.84	22.96	22.99	23.50
		12	0	21.98	21.92	22.02	22.50
		12	6	22.01	21.78	21.95	22.50
		12	13	21.94	21.93	21.93	22.50
		25	0	21.97	21.91	21.93	22.50
	16QAM	1	0	22.15	22.32	22.23	22.50
		1	13	22.00	22.21	22.23	22.50
		1	24	22.34	22.42	21.95	22.50
		12	0	20.82	20.87	21.02	21.50
		12	6	20.82	20.88	20.80	21.50
		12	13	20.82	20.88	20.89	21.50
		25	0	20.89	20.82	20.90	21.50
	64QAM	1	0	20.96	20.96	20.93	21.50
		1	13	21.40	20.85	21.17	21.50
		1	24	21.19	20.66	21.12	21.50
		12	0	19.88	19.78	20.00	20.50
		12	6	19.76	19.72	20.10	20.50
		12	13	19.99	19.87	19.94	20.50
		25	0	19.79	19.86	19.84	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20000	20175	20350	
10MHz	QPSK	1	0	22.84	22.78	22.88	23.50
		1	25	22.74	22.67	22.86	23.50
		1	49	23.03	23.03	22.84	23.50
		25	0	21.86	21.83	21.97	22.50
		25	13	21.82	21.88	21.90	22.50
		25	25	21.94	21.83	21.89	22.50
		50	0	21.89	21.80	21.94	22.50
	16QAM	1	0	22.30	22.45	21.62	22.50
		1	25	21.88	21.37	21.83	22.50
		1	49	22.35	22.03	22.36	22.50
		25	0	20.85	20.81	20.92	21.50
		25	13	20.84	20.84	20.89	21.50
		25	25	20.88	20.82	20.83	21.50
		50	0	20.79	20.72	20.82	21.50
	64QAM	1	0	20.71	20.96	20.84	21.50
		1	25	20.82	20.82	20.60	21.50
		1	49	21.24	21.26	21.39	21.50
		25	0	19.84	19.83	19.75	20.50
		25	13	19.82	19.72	19.86	20.50
		25	25	19.83	19.74	19.87	20.50
		50	0	19.94	19.86	19.91	20.50

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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20025	20175	20325	
15MHz	QPSK	1	0	22.83	22.93	22.77	23.50
		1	38	22.96	22.91	22.95	23.50
		1	74	22.79	22.85	22.91	23.50
		36	0	21.89	21.98	22.00	22.50
		36	18	21.94	21.91	21.87	22.50
		36	39	21.97	21.96	21.98	22.50
		75	0	21.94	21.84	21.91	22.50
	16QAM	1	0	22.45	22.05	22.12	22.50
		1	38	22.17	22.40	22.11	22.50
		1	74	22.24	22.00	22.17	22.50
		36	0	20.69	20.84	20.92	21.50
		36	18	20.87	20.85	20.94	21.50
		36	39	20.86	20.87	20.93	21.50
		75	0	20.85	20.83	20.87	21.50
	64QAM	1	0	20.70	20.75	20.74	21.50
		1	38	21.00	20.88	20.70	21.50
		1	74	20.66	21.22	20.86	21.50
		36	0	19.88	19.86	19.88	20.50
		36	18	19.84	19.77	19.80	20.50
		36	39	19.86	19.85	19.94	20.50
		75	0	19.85	19.82	19.95	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20050	20175	20300	
20MHz	QPSK	1	0	22.94	23.03	22.76	23.50
		1	50	22.69	22.16	22.41	23.50
		1	99	22.99	22.78	23.14	23.50
		50	0	21.87	21.93	21.91	22.50
		50	25	21.92	21.93	21.81	22.50
		50	50	21.92	21.93	21.96	22.50
		100	0	21.99	21.88	21.96	22.50
	16QAM	1	0	22.20	22.28	22.16	22.50
		1	50	21.80	22.06	21.84	22.50
		1	99	22.07	22.05	22.32	22.50
		50	0	20.92	20.79	20.86	21.50
		50	25	20.82	20.80	20.81	21.50
		50	50	20.83	20.83	20.91	21.50
		100	0	20.87	20.87	20.81	21.50
	64QAM	1	0	20.75	20.91	21.07	21.50
		1	50	20.86	20.45	21.11	21.50
		1	99	20.75	20.47	20.75	21.50
		50	0	19.79	19.83	19.88	20.50
		50	25	19.91	19.81	19.78	20.50
		50	50	19.87	19.90	19.95	20.50

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		100	0	19.92	19.83	19.89	20.50
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LTE Band 7 (MCC of CE countries, Receiver ON)				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20775	21100	21425	
5MHz	QPSK	1	0	19.22	18.91	19.20	19.90
		1	13	19.01	19.01	19.06	19.90
		1	24	18.83	18.95	18.91	19.90
		12	0	18.86	19.02	19.01	19.90
		12	6	18.94	18.97	18.87	19.90
		12	13	18.84	18.91	19.02	19.90
		25	0	18.89	18.95	18.92	19.90
	16QAM	1	0	19.17	18.33	18.38	19.90
		1	13	18.82	19.26	19.03	19.90
		1	24	19.15	18.81	18.35	19.90
		12	0	18.74	18.71	18.42	19.90
		12	6	18.70	18.79	18.32	19.90
		12	13	18.85	18.81	18.61	19.90
		25	0	18.64	18.67	18.53	19.90
	64QAM	1	0	19.19	18.38	18.42	19.90
		1	13	18.87	19.31	19.06	19.90
		1	24	19.19	18.84	18.40	19.90
		12	0	18.76	18.76	18.46	19.90
		12	6	18.73	18.83	18.35	19.90
		12	13	18.89	18.83	18.63	19.90
		25	0	18.68	18.71	18.55	19.90
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20800	21100	21400	
10MHz	QPSK	1	0	18.87	18.97	18.51	19.90
		1	25	18.89	18.48	18.60	19.90
		1	49	19.00	18.89	18.86	19.90
		25	0	18.89	18.93	18.70	19.90
		25	13	18.99	18.93	18.94	19.90
		25	25	18.93	18.84	18.86	19.90
		50	0	19.04	19.01	19.06	19.90
	16QAM	1	0	18.40	18.66	18.89	19.90
		1	25	18.93	18.95	18.63	19.90
		1	49	18.63	18.89	18.22	19.90
		25	0	18.64	18.65	18.45	19.90
		25	13	18.77	18.62	18.45	19.90
		25	25	18.74	18.69	18.47	19.90
		50	0	18.68	18.80	18.71	19.90
	64QAM	1	0	18.44	18.70	18.92	19.90
		1	25	18.95	18.99	18.68	19.90
		1	49	18.68	18.91	18.27	19.90

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		25	0	18.69	18.67	18.49	19.90
		25	13	18.79	18.66	18.49	19.90
		25	25	18.77	18.72	18.51	19.90
		50	0	18.70	18.82	18.75	19.90
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20825	21100	21375	
15MHz	QPSK	1	0	18.94	18.87	18.70	19.90
		1	38	19.07	19.04	18.83	19.90
		1	74	18.88	18.91	18.93	19.90
		36	0	18.97	19.04	18.76	19.90
		36	18	18.97	18.94	18.79	19.90
		36	39	18.94	18.86	19.00	19.90
		75	0	18.91	18.92	19.11	19.90
	16QAM	1	0	18.93	18.14	18.64	19.90
		1	38	19.01	19.08	18.45	19.90
		1	74	18.95	18.90	18.93	19.90
		36	0	18.73	18.71	18.43	19.90
		36	18	18.66	18.71	18.51	19.90
		36	39	18.63	18.68	18.40	19.90
		75	0	18.70	18.82	18.86	19.90
	64QAM	1	0	18.96	18.19	18.67	19.90
		1	38	19.06	19.13	18.48	19.90
		1	74	19.00	18.92	18.96	19.90
		36	0	18.76	18.74	18.47	19.90
		36	18	18.68	18.75	18.56	19.90
		36	39	18.68	18.72	18.44	19.90
		75	0	18.73	18.84	18.91	19.90
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20850	21100	21350	
20MHz	QPSK	1	0	18.69	18.75	18.81	19.70
		1	50	18.50	18.42	18.48	19.70
		1	99	19.36	19.35	19.33	19.70
		50	0	18.99	18.82	18.86	19.70
		50	25	19.04	18.75	18.85	19.70
		50	50	18.96	18.87	18.96	19.70
		100	0	19.00	18.88	19.06	19.70
	16QAM	1	0	18.49	18.31	18.34	19.70
		1	50	18.66	18.49	18.18	19.70
		1	99	18.87	18.63	19.07	19.70
		50	0	18.77	18.66	18.53	19.70
		50	25	18.69	18.62	18.63	19.70
		50	50	18.75	18.63	18.44	19.70
		100	0	18.75	18.56	18.59	19.70
	64QAM	1	0	18.53	18.34	18.38	19.70
		1	50	18.69	18.54	18.22	19.70
		1	99	18.89	18.67	19.10	19.70
		50	0	18.82	18.70	18.55	19.70

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		50	25	18.71	18.67	18.65	19.70
		50	50	18.79	18.68	18.49	19.70
		100	0	18.77	18.59	18.64	19.70

LTE Band 7 (MCC of FCC countries, Receiver ON)				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 20775	Channel 21100	Channel 21425	Tune up
5MHz	QPSK	1	0	16.29	16.40	16.51	17.20
		1	13	16.28	16.40	16.34	17.20
		1	24	16.28	16.38	16.26	17.20
		12	0	16.30	16.34	16.38	17.20
		12	6	16.27	16.29	16.39	17.20
		12	13	16.25	16.41	16.38	17.20
		25	0	16.24	16.36	16.37	17.20
	16QAM	1	0	16.38	16.53	16.83	17.20
		1	13	16.23	16.13	16.67	17.20
		1	24	16.34	16.47	16.66	17.20
		12	0	16.26	16.33	16.36	17.20
		12	6	16.31	16.34	16.37	17.20
		12	13	16.23	16.37	16.49	17.20
		25	0	16.20	16.35	16.33	17.20
	64QAM	1	0	16.20	16.46	16.10	17.20
		1	13	16.52	16.39	16.52	17.20
		1	24	16.26	16.43	16.57	17.20
		12	0	16.09	16.47	16.28	17.20
		12	6	16.19	16.45	16.37	17.20
		12	13	16.22	16.38	16.44	17.20
		25	0	16.12	16.31	16.22	17.20
Bandwidth	Modulation	RB size	RB offset	Channel 20800	Channel 21100	Channel 21400	Tune up
10MHz	QPSK	1	0	16.36	16.47	16.49	17.20
		1	25	16.11	15.95	16.03	17.20
		1	49	16.28	16.30	16.30	17.20
		25	0	16.37	16.52	16.40	17.20
		25	13	16.35	16.52	16.36	17.20
		25	25	16.29	16.38	16.44	17.20
		50	0	16.33	16.33	16.32	17.20
	16QAM	1	0	16.49	16.13	16.25	17.20
		1	25	15.99	16.68	16.60	17.20
		1	49	16.57	16.23	16.49	17.20
		25	0	16.17	16.47	16.48	17.20
		25	13	16.14	16.35	16.29	17.20
		25	25	16.17	16.33	16.26	17.20
		50	0	16.12	16.24	16.26	17.20
	64QAM	1	0	16.31	16.45	16.09	17.20
		1	25	16.07	16.12	15.74	17.20

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		1	49	16.41	16.63	16.39	17.20
		25	0	16.10	16.37	16.32	17.20
		25	13	16.27	16.40	16.33	17.20
		25	25	16.19	16.24	16.26	17.20
		50	0	16.19	16.29	16.23	17.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20825	21100	21375	
15MHz	QPSK	1	0	16.25	16.38	16.46	17.20
		1	38	16.35	16.51	16.43	17.20
		1	74	16.17	16.32	16.31	17.20
		36	0	16.29	16.53	16.51	17.20
		36	18	16.22	16.30	16.40	17.20
		36	39	16.37	16.36	16.32	17.20
		75	0	16.25	16.29	16.41	17.20
	16QAM	1	0	16.25	16.20	16.38	17.20
		1	38	16.70	16.83	16.63	17.20
		1	74	16.43	16.64	16.74	17.20
		36	0	16.18	16.38	16.39	17.20
		36	18	16.22	16.35	16.31	17.20
		36	39	16.24	16.30	16.32	17.20
		75	0	16.21	16.29	16.26	17.20
	64QAM	1	0	16.07	16.39	16.54	17.20
		1	38	16.52	16.50	16.54	17.20
		1	74	16.24	16.21	16.58	17.20
		36	0	16.22	16.47	16.38	17.20
		36	18	16.27	16.22	16.39	17.20
		36	39	16.27	16.31	16.32	17.20
		75	0	16.20	16.26	16.38	17.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20850	21100	21350	
20MHz	QPSK	1	0	16.28	16.35	16.34	17.20
		1	50	16.05	15.94	16.11	17.20
		1	99	16.59	16.69	16.63	17.20
		50	0	16.22	16.44	16.41	17.20
		50	25	16.15	16.21	16.28	17.20
		50	50	16.12	16.25	16.19	17.20
		100	0	16.21	16.25	16.34	17.20
	16QAM	1	0	16.10	16.83	16.87	17.20
		1	50	16.09	16.45	15.97	17.20
		1	99	16.89	16.88	16.57	17.20
		50	0	16.15	16.29	16.35	17.20
		50	25	16.11	16.12	16.17	17.20
		50	50	16.05	16.16	16.08	17.20
		100	0	16.11	16.19	16.24	17.20
	64QAM	1	0	16.14	16.11	16.65	17.20
		1	50	15.73	16.22	15.88	17.20
		1	99	16.52	16.48	16.24	17.20

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	50	0	16.05	16.22	16.33	17.20
	50	25	16.01	16.17	16.15	17.20
	50	50	16.11	16.13	16.13	17.20
	100	0	16.07	16.18	16.20	17.20

LTE Band 7 Full power/Receiver off(body)				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20775	21100	21425	
5MHz	QPSK	1	0	22.03	22.10	22.11	22.70
		1	13	22.15	22.27	22.14	22.70
		1	24	22.07	22.10	22.13	22.70
		12	0	22.00	21.98	22.00	22.70
		12	6	22.04	22.04	21.98	22.70
		12	13	22.03	21.98	21.97	22.70
		25	0	21.97	21.88	21.90	22.70
	16QAM	1	0	21.76	21.75	22.01	22.70
		1	13	21.74	22.21	21.60	22.70
		1	24	21.83	21.66	21.57	22.70
		12	0	21.18	21.12	21.01	22.20
		12	6	21.08	21.16	20.83	22.20
		12	13	21.11	21.13	20.96	22.20
		25	0	21.12	21.15	21.04	22.20
	64QAM	1	0	21.13	21.21	20.84	22.20
		1	13	21.22	20.95	21.40	22.20
		1	24	21.09	20.90	20.88	22.20
		12	0	20.33	20.52	20.40	21.20
		12	6	20.32	20.35	20.18	21.20
		12	13	20.51	20.53	20.46	21.20
		25	0	20.33	20.46	20.31	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20800	21100	21400	
10MHz	QPSK	1	0	21.86	22.09	21.65	22.70
		1	25	21.49	21.90	22.02	22.70
		1	49	22.05	21.90	21.86	22.70
		25	0	21.80	21.84	21.84	22.70
		25	13	21.97	21.85	21.72	22.70
		25	25	21.98	21.98	21.87	22.70
		50	0	22.01	22.05	22.06	22.70
	16QAM	1	0	21.77	21.62	21.04	22.70
		1	25	21.55	21.29	21.52	22.70
		1	49	21.77	22.03	21.27	22.70
		25	0	21.01	21.18	20.93	22.20
		25	13	21.12	21.14	20.93	22.20
		25	25	21.07	21.05	20.92	22.20
		50	0	21.09	21.16	21.36	22.20
	64QAM	1	0	20.88	20.76	20.68	22.20
		1	25	20.42	20.35	20.67	22.20

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		1	49	20.83	20.95	21.00	22.20
		25	0	20.41	20.46	20.24	21.20
		25	13	20.34	20.34	20.35	21.20
		25	25	20.45	20.35	20.27	21.20
		50	0	20.40	20.49	20.49	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20825	21100	21375	
15MHz	QPSK	1	0	22.00	21.81	21.82	22.70
		1	38	22.03	21.90	21.90	22.70
		1	74	21.95	21.90	21.68	22.70
		36	0	21.84	21.86	21.86	22.70
		36	18	21.99	21.89	21.93	22.70
		36	39	22.01	21.96	21.93	22.70
		75	0	21.95	22.08	22.21	22.70
	16QAM	1	0	21.71	22.11	21.10	22.70
		1	38	21.94	22.13	22.19	22.70
		1	74	21.81	21.99	21.66	22.70
		36	0	21.02	21.30	21.11	22.20
		36	18	21.18	21.13	21.04	22.20
		36	39	21.20	21.08	21.00	22.20
		75	0	21.01	21.24	21.39	22.20
	64QAM	1	0	20.98	20.85	21.09	22.20
		1	38	21.13	20.82	20.84	22.20
		1	74	21.20	21.41	20.73	22.20
		36	0	20.34	20.46	20.31	21.20
		36	18	20.40	20.58	20.34	21.20
		36	39	20.50	20.42	20.42	21.20
		75	0	20.43	20.50	20.50	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20850	21100	21350	
20MHz	QPSK	1	0	21.78	21.72	21.91	22.70
		1	50	21.72	21.72	21.52	22.70
		1	99	22.48	22.48	21.93	22.70
		50	0	22.01	21.94	21.97	22.70
		50	25	22.00	21.94	21.92	22.70
		50	50	21.94	21.94	21.86	22.70
		100	0	21.99	22.14	21.98	22.70
	16QAM	1	0	21.44	21.61	21.55	22.70
		1	50	21.58	21.37	21.40	22.70
		1	99	22.04	22.03	22.02	22.70
		50	0	21.18	21.10	21.09	22.20
		50	25	21.20	21.01	20.95	22.20
		50	50	21.20	21.16	20.95	22.20
		100	0	21.27	21.27	21.15	22.20
	64QAM	1	0	20.75	20.64	20.88	22.20
		1	50	20.70	20.76	20.16	22.20
		1	99	21.10	21.23	21.36	22.20

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	50	0	20.42	20.51	20.45	21.20
	50	25	20.27	20.38	20.31	21.20
	50	50	20.34	20.38	20.18	21.20
	100	0	20.44	20.51	20.51	21.20

LTE Band 38 (MCC of CE countries, Receiver ON)				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37775	38000	38225	
5MHz	QPSK	1	0	21.13	21.07	21.19	22.00
		1	13	21.28	21.31	21.24	22.00
		1	24	21.22	21.16	21.09	22.00
		12	0	21.04	21.22	21.25	22.00
		12	6	20.90	21.24	21.25	22.00
		12	13	21.00	21.19	21.24	22.00
		25	0	20.97	21.13	21.17	22.00
	16QAM	1	0	20.70	21.12	21.14	22.00
		1	13	20.75	21.20	21.16	22.00
		1	24	20.91	21.10	21.28	22.00
		12	0	20.78	20.97	21.02	22.00
		12	6	20.61	20.98	21.01	22.00
		12	13	20.70	21.03	21.08	22.00
		25	0	20.73	21.04	21.06	22.00
	64QAM	1	0	20.60	20.80	21.07	22.00
		1	13	21.03	20.71	20.96	22.00
		1	24	20.77	20.65	20.88	22.00
		12	0	19.94	20.12	20.12	21.20
		12	6	19.95	20.08	19.96	21.20
		12	13	19.97	20.13	20.19	21.20
		25	0	19.90	20.16	20.06	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37800	38000	38200	
10MHz	QPSK	1	0	21.12	21.01	21.25	22.00
		1	25	20.91	20.92	20.54	22.00
		1	49	20.99	21.24	21.06	22.00
		25	0	20.98	21.09	21.05	22.00
		25	13	20.82	21.16	21.06	22.00
		25	25	20.82	21.08	21.00	22.00
		50	0	20.82	21.02	21.06	22.00
	16QAM	1	0	20.82	21.13	21.24	22.00
		1	25	20.44	20.89	20.72	22.00
		1	49	20.94	21.06	21.13	22.00
		25	0	20.61	20.93	20.94	22.00
		25	13	20.60	20.90	21.07	22.00
		25	25	20.80	20.94	20.95	22.00
		50	0	20.69	20.81	20.94	22.00
	64QAM	1	0	21.08	20.92	20.79	22.00

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		1	25	20.60	20.79	20.47	22.00
		1	49	20.60	20.80	20.86	22.00
		25	0	19.93	20.17	20.13	21.20
		25	13	19.94	20.21	20.21	21.20
		25	25	19.82	20.11	20.04	21.20
		50	0	19.90	20.06	20.05	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37825	38000	38175	
15MHz	QPSK	1	0	21.04	21.03	21.20	22.00
		1	38	21.24	21.26	21.16	22.00
		1	74	20.98	21.18	21.05	22.00
		36	0	20.88	21.05	21.06	22.00
		36	18	20.92	21.03	21.00	22.00
		36	39	20.92	21.00	21.08	22.00
		75	0	20.88	21.01	21.07	22.00
	16QAM	1	0	20.81	21.11	21.47	22.00
		1	38	20.92	21.03	21.25	22.00
		1	74	20.71	21.04	21.07	22.00
		36	0	20.77	20.91	20.95	22.00
		36	18	20.72	21.01	20.91	22.00
		36	39	20.73	21.00	20.94	22.00
		75	0	20.73	20.81	20.91	22.00
	64QAM	1	0	20.63	21.06	20.84	22.00
		1	38	21.08	21.05	21.03	22.00
		1	74	20.72	21.13	20.82	22.00
		36	0	20.00	20.15	20.19	21.20
		36	18	20.06	20.22	20.05	21.20
		36	39	19.96	20.21	20.12	21.20
		75	0	19.88	20.18	20.05	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37850	38000	38150	
20MHz	QPSK	1	0	20.78	20.89	20.91	22.00
		1	50	20.11	20.46	20.19	22.00
		1	99	20.81	20.72	20.79	22.00
		50	0	20.80	20.85	20.88	22.00
		50	25	20.81	20.76	20.78	22.00
		50	50	20.75	20.81	20.85	22.00
		100	0	20.71	20.82	20.83	22.00
	16QAM	1	0	20.75	20.63	21.02	22.00
		1	50	20.42	20.16	20.78	22.00
		1	99	20.79	20.79	20.48	22.00
		50	0	20.66	20.66	20.78	22.00
		50	25	20.80	20.78	20.71	22.00
		50	50	20.72	20.80	20.68	22.00
		100	0	20.72	20.84	20.70	22.00
	64QAM	1	0	20.60	20.76	21.08	22.00
		1	50	20.32	20.03	20.81	22.00

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	1	99	20.39	20.47	20.66	22.00
	50	0	19.70	20.10	20.27	21.20
	50	25	19.75	20.11	20.17	21.20
	50	50	19.92	20.13	20.06	21.20
	100	0	19.85	20.16	20.14	21.20

LTE Band 38 (MCC of FCC countries, Receiver ON)				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37775	38000	38225	
5MHz	QPSK	1	0	18.51	18.49	18.47	19.20
		1	13	18.35	18.56	18.54	19.20
		1	24	18.39	18.43	18.42	19.20
		12	0	18.46	18.56	18.53	19.20
		12	6	18.40	18.47	18.52	19.20
		12	13	18.33	18.46	18.48	19.20
		25	0	18.35	18.46	18.48	19.20
	16QAM	1	0	18.31	18.59	18.73	19.20
		1	13	18.59	18.73	18.54	19.20
		1	24	18.48	18.38	18.40	19.20
		12	0	18.48	18.71	18.41	19.20
		12	6	18.32	18.47	18.35	19.20
		12	13	18.39	18.44	18.26	19.20
		25	0	18.26	18.38	18.43	19.20
	64QAM	1	0	18.46	18.51	18.31	19.20
		1	13	18.43	18.51	18.63	19.20
		1	24	18.15	18.31	18.28	19.20
		12	0	18.38	18.58	18.35	19.20
		12	6	18.09	18.50	18.20	19.20
		12	13	18.50	18.53	18.30	19.20
		25	0	18.27	18.41	18.24	19.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37800	38000	38200	
10MHz	QPSK	1	0	18.50	18.49	18.51	19.20
		1	25	18.15	18.23	18.01	19.20
		1	49	18.40	18.44	18.44	19.20
		25	0	18.38	18.39	18.52	19.20
		25	13	18.42	18.56	18.45	19.20
		25	25	18.36	18.49	18.52	19.20
		50	0	18.31	18.38	18.51	19.20
	16QAM	1	0	18.49	18.41	18.23	19.20
		1	25	18.37	18.60	18.02	19.20
		1	49	18.33	18.60	18.14	19.20
		25	0	18.19	18.49	18.38	19.20
		25	13	18.35	18.54	18.23	19.20
		25	25	18.19	18.49	18.40	19.20

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		50	0	18.18	18.41	18.34	19.20
		1	0	18.15	18.39	18.33	19.20
		1	25	18.11	17.86	18.35	19.20
		1	49	18.22	18.44	18.35	19.20
		25	0	18.25	18.48	18.26	19.20
		25	13	18.29	18.42	18.31	19.20
		25	25	18.38	18.36	18.27	19.20
		50	0	18.27	18.44	18.28	19.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37825	38000	38175	
15MHz	QPSK	1	0	18.33	18.39	18.67	19.20
		1	38	18.44	18.57	18.60	19.20
		1	74	18.28	18.33	18.39	19.20
		36	0	18.32	18.48	18.55	19.20
		36	18	18.26	18.54	18.48	19.20
		36	39	18.25	18.48	18.54	19.20
		75	0	18.15	18.53	18.46	19.20
		75	0	18.03	18.56	18.26	19.20
	16QAM	1	0	18.22	18.54	18.64	19.20
		1	38	18.17	18.38	18.32	19.20
		1	74	18.25	18.70	18.52	19.20
		36	0	18.12	18.40	18.45	19.20
		36	18	18.11	18.44	18.41	19.20
		36	39	18.20	18.55	18.33	19.20
		75	0	18.03	18.56	18.26	19.20
		75	0	18.03	18.56	18.26	19.20
	64QAM	1	0	18.25	18.20	18.28	19.20
		1	38	18.33	18.55	18.44	19.20
		1	74	18.36	18.25	18.32	19.20
		36	0	18.23	18.35	18.28	19.20
		36	18	18.28	18.40	18.32	19.20
		36	39	18.43	18.47	18.34	19.20
		75	0	18.45	18.35	18.29	19.20
		75	0	18.45	18.35	18.29	19.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37850	38000	38150	
20MHz	QPSK	1	0	17.99	18.26	18.62	19.20
		1	50	17.84	18.21	17.89	19.20
		1	99	17.84	18.32	18.30	19.20
		50	0	18.09	18.33	18.49	19.20
		50	25	18.07	18.30	18.46	19.20
		50	50	18.10	18.31	18.43	19.20
		100	0	17.94	18.35	18.48	19.20
		100	0	17.94	18.35	18.48	19.20
	16QAM	1	0	18.11	18.37	18.47	19.20
		1	50	17.84	18.08	18.34	19.20
		1	99	17.96	18.12	18.42	19.20
		50	0	17.94	18.28	18.26	19.20
		50	25	17.96	18.21	18.23	19.20
		50	50	18.05	18.23	18.32	19.20
		100	0	18.01	18.27	18.38	19.20
		100	0	18.01	18.27	18.38	19.20

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64QAM	1	0	18.26	18.13	18.33	19.20
	1	50	18.32	18.62	18.31	19.20
	1	99	18.28	18.12	18.07	19.20
	50	0	18.29	18.49	18.41	19.20
	50	25	18.34	18.40	18.28	19.20
	50	50	18.42	18.53	18.27	19.20
	100	0	18.26	18.39	18.37	19.20

LTE Band 38 Full power/Receiver off(body)				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37775	38000	38225	
5MHz	QPSK	1	0	23.10	23.30	23.29	24.20
		1	13	23.14	23.40	23.33	24.20
		1	24	22.92	23.19	23.13	24.20
		12	0	22.12	22.30	22.18	23.20
		12	6	21.99	22.13	21.88	23.20
		12	13	22.08	22.20	22.03	23.20
		25	0	21.98	22.09	22.14	23.20
	16QAM	1	0	22.03	22.12	22.26	23.20
		1	13	21.89	22.36	22.44	23.20
		1	24	21.98	22.16	22.37	23.20
		12	0	21.05	21.21	21.11	22.20
		12	6	20.86	21.11	21.08	22.20
		12	13	20.96	21.18	20.98	22.20
		25	0	20.98	21.00	21.19	22.20
	64QAM	1	0	20.83	21.05	21.31	22.20
		1	13	21.30	20.96	21.23	22.20
		1	24	21.00	20.90	21.15	22.20
		12	0	19.99	20.17	20.17	21.20
		12	6	19.98	20.17	20.00	21.20
		12	13	20.03	20.18	20.27	21.20
		25	0	19.94	20.20	20.13	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37800	38000	38200	
10MHz	QPSK	1	0	23.34	23.33	23.41	24.20
		1	25	22.32	22.58	22.27	24.20
		1	49	23.11	23.16	23.10	24.20
		25	0	22.06	22.24	22.12	23.20
		25	13	21.95	22.24	21.98	23.20
		25	25	21.95	22.12	22.09	23.20
		50	0	21.95	22.11	22.10	23.20
	16QAM	1	0	22.07	22.30	22.37	23.20
		1	25	22.07	21.90	21.88	23.20
		1	49	22.07	21.67	21.98	23.20
		25	0	20.96	21.07	21.10	22.20
		25	13	20.88	21.08	20.97	22.20
		25	25	20.96	21.13	21.02	22.20

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		50	0	21.03	21.07	21.05	22.20
		1	0	21.35	21.16	21.06	22.20
		1	25	20.86	21.03	20.71	22.20
		1	49	20.83	21.03	21.12	22.20
		25	0	19.98	20.21	20.22	21.20
		25	13	19.98	20.29	20.29	21.20
		25	25	19.91	20.20	20.13	21.20
		50	0	19.98	20.13	20.13	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37825	38000	38175	
15MHz	QPSK	1	0	23.08	23.17	23.02	24.20
		1	38	23.15	23.46	23.13	24.20
		1	74	23.10	22.94	22.98	24.20
		36	0	22.12	22.26	22.09	23.20
		36	18	22.08	22.20	22.02	23.20
		36	39	22.05	22.20	22.04	23.20
		75	0	22.08	22.23	22.05	23.20
	16QAM	1	0	22.01	22.09	22.20	23.20
		1	38	22.34	22.37	22.27	23.20
		1	74	22.09	22.24	22.07	23.20
		36	0	21.01	21.18	20.99	22.20
		36	18	20.91	21.13	20.96	22.20
		36	39	20.98	21.07	20.99	22.20
		75	0	21.02	21.05	20.96	22.20
	64QAM	1	0	20.87	21.29	21.07	22.20
		1	38	21.32	21.31	21.26	22.20
		1	74	20.99	21.37	21.09	22.20
		36	0	20.05	20.22	20.23	21.20
		36	18	20.09	20.28	20.14	21.20
		36	39	20.00	20.26	20.19	21.20
		75	0	19.94	20.25	20.08	21.20
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37850	38000	38150	
20MHz	QPSK	1	0	23.15	23.22	23.13	24.20
		1	50	22.79	22.55	22.22	24.20
		1	99	23.04	23.13	23.09	24.20
		50	0	22.26	22.27	22.18	23.20
		50	25	22.20	22.12	21.96	23.20
		50	50	22.13	22.16	22.02	23.20
		100	0	22.18	22.23	21.98	23.20
	16QAM	1	0	22.56	22.43	22.16	23.20
		1	50	21.93	21.43	22.04	23.20
		1	99	21.70	22.13	21.93	23.20
		50	0	21.21	21.23	21.13	22.20
		50	25	21.07	21.13	20.90	22.20
		50	50	21.06	21.22	20.97	22.20
		100	0	21.07	21.16	20.94	22.20

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	64QAM	1	0	20.86	21.01	21.33	22.20
		1	50	20.58	20.28	21.04	22.20
		1	99	20.66	20.70	20.90	22.20
		50	0	19.78	20.15	20.35	21.20
		50	25	19.78	20.20	20.21	21.20
		50	50	19.95	20.21	20.11	21.20
		100	0	19.91	20.25	20.20	21.20

Table 16: Conducted Power of LTE

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8.1.3 Conducted Power of Downlink LTE CA

In this section, the following conducted power measurement results of downlink LTE carrier aggregation are provided to quantify downlink only carrier aggregation SAR test exclusion per KDB 941225 D05A. Uplink maximum output power is measured with downlink carrier aggregation active, using the channel with highest measured maximum output power when downlink carrier aggregation is inactive, 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 $\frac{1}{4}$ dB higher than the maximum output power measured when downlink carrier aggregation is inactive, therefore SAR evaluation with downlink carrier aggregation can be excluded.

Power test equipment: Anritsu Radio Communication Analyzer MT8821C

The possible downlink LTE CA combinations supported by this device are as below tables per 3GPP TS 36.101 V12.5.0. The detailed conducted power measurement results of downlink LTE CA are provided in the SAR report per 3GPP TS 36.521-1 V12.3.0. According to KDB 941225 D05A, the downlink only carrier aggregation conditions for this device can be excluded from SAR testing and PAG requirements can be excluded.

The conducted power measurement results of downlink LTE CA Conducted Power are as below, so the downlink only carrier aggregation conditions for this device can be excluded from SAR testing

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8.1.3.1 Conducted Power of Downlink LTE CA:

Main Antenna Full power/Receiver on(head)														
DL LTE CA Class	PCC							SCC1				Power(dBm)		
	LTE Band	BW (MHz)	Modulation	UL Freq. (MHz)	UL Channel	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	DL LTE CA Tx.Power	LTE Rel 8 Tx.Power	Tune-up
CA_7C	Band 7	20M	QPSK	2560	21350	1	0	Band 7	20M	2660.2	3152	23.47	23.54	24.20
Second Antenna Receiver on(head)														
DL LTE CA Class	PCC							SCC1				Power(dBm)		
	LTE Band	BW (MHz)	Modulation	UL Freq. (MHz)	UL Channel	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	DL LTE CA Tx.Power	LTE Rel 8 Tx.Power	Tune-up
CA_7C	Band 7	20M	16QAM	2510	20850	1	99	Band 7	20M	2649.8	3048	16.84	16.89	17.20
Second Antenna Receiver off(body)														
DL LTE CA Class	PCC							SCC1				Power(dBm)		
	LTE Band	BW (MHz)	Modulation	UL Freq. (MHz)	UL Channel	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	DL LTE CA Tx.Power	LTE Rel 8 Tx.Power	Tune-up
CA_7C	Band 7	20M	QPSK	2510	20850	1	99	Band 7	20M	2649.8	3048	22.41	22.48	22.70

Table 17: Conducted Power of Downlink LTE CA

Note: The downlink LTE CA SAR test is not required since the maximum output power for downlink LTE CA was not more than 0.25dB higher than the maximum output power for without downlink LTE CA.

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8.1.4 Conducted Power of WIFI and BT

WiFi 2.4G (MCC of CE countries, Receiver ON)						
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11b	1	2412	1	12.00	11.94	No
	4	2427		12.00	11.90	No
	5	2432		11.00	10.97	No
	7	2442		11.00	10.53	No
	13	2472		11.00	10.94	No
802.11g	1	2412	6	12.10	11.30	No
	4	2427		12.10	11.01	No
	5	2432		11.10	10.65	No
	7	2442		11.10	10.30	No
	13	2472		11.10	11.06	No
802.11n HT20	1	2412	6.5	12.00	10.56	No
	4	2427		12.00	10.76	No
	5	2432		11.00	10.41	No
	7	2442		11.00	10.06	No
	13	2472		11.00	10.32	No
802.11n HT40	3	2422	13.5	12.00	10.50	No
	4	2427		12.00	10.96	No
	5	2432		10.70	10.66	No
	7	2442		10.70	10.68	No
	11	2462		10.70	9.65	No

WiFi 2.4G (MCC of CE countries, Receiver OFF)						
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11b	1	2412	1	19.00	18.37	No
	4	2427		19.00	17.52	No
	5	2432		18.00	17.15	No
	7	2442		18.00	16.61	No
	13	2472		18.00	16.99	No
802.11g	1	2412	6	20.00	19.16	No
	4	2427		20.00	18.19	No
	5	2432		19.00	18.15	No
	7	2442		19.00	17.85	No
	13	2472		19.00	18.05	No
802.11n HT20	1	2412	6.5	18.50	17.86	No
	4	2427		18.50	16.94	No
	5	2432		17.50	17.09	No
	7	2442		17.50	16.65	No
	13	2472		17.50	16.88	No
802.11n HT40	3	2422	13.5	18.50	16.98	No
	4	2427		18.50	17.25	No
	5	2432		17.50	17.14	No
	7	2442		17.50	16.90	No
	11	2462		17.50	16.47	No

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WiFi 2.4G (MCC of FCC countries, Receiver ON)						
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11b	1	2412	1	12.10	11.42	Yes
	2	2417		11.60	11.41	No
	4	2427		11.60	11.38	No
	5	2432		11.10	10.93	No
	6	2437		11.10	10.77	No
	10	2457		11.10	11.07	No
	11	2462		11.10	11.03	No
802.11g	1	2412	6	12.00	11.58	No
	2	2417		11.50	10.81	No
	4	2427		11.50	10.80	No
	5	2432		11.00	10.33	No
	6	2437		11.00	10.18	No
	10	2457		11.00	10.25	No
	11	2462		11.00	10.22	No
802.11n HT20	1	2412	6.5	12.00	11.60	No
	2	2417		11.50	10.63	No
	4	2427		11.50	10.93	No
	5	2432		11.00	10.48	No
	6	2437		11.00	10.31	No
	10	2457		11.00	10.47	No
	11	2462		11.00	10.43	No
802.11n HT40	3	2422	13.5	12.00	10.70	No
	4	2427		11.50	10.85	No
	6	2437		11.50	10.56	No
	8	2447		11.50	11.00	No
	9	2452		11.00	10.55	No

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WiFi 2.4G (MCC of FCC countries, Receiver OFF)						
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11b	1	2412	1	19.00	17.09	Yes
	2	2417		18.50	17.05	No
	4	2427		18.50	17.03	No
	5	2432		18.00	16.70	No
	6	2437		18.00	16.50	No
	10	2457		18.00	16.65	No
	11	2462		18.10	16.58	No
802.11g	1	2412	6	15.00	14.40	No
	2	2417		15.50	14.45	No
	4	2427		15.50	14.88	No
	5	2432		15.00	14.44	No
	6	2437		15.00	14.23	No
	10	2457		15.00	14.06	No
	11	2462		14.00	13.98	No
802.11n HT20	1	2412	6.5	14.00	13.61	No
	2	2417		14.50	13.55	No
	4	2427		14.50	13.82	No
	5	2432		14.00	13.50	No
	6	2437		14.00	13.18	No
	10	2457		14.00	13.05	No
	11	2462		13.00	12.96	No
802.11n HT40	3	2422	13.5	12.00	10.74	No
	4	2427		14.50	13.82	No
	6	2437		14.50	13.66	No
	8	2447		14.50	13.83	No
	9	2452		12.00	10.30	No

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WiFi 5G (MCC of CE countries, Receiver OFF)						
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11a	36	5180	6	18.50	18.00	No
	52	5260		18.50	17.80	No
	64	5320		18.50	18.01	No
	100	5500		18.50	18.06	No
	120	5600		18.50	18.10	No
	140	5700		18.50	17.66	No
	149	5745		10.60	8.53	No
	157	5785		10.60	8.60	No
	165	5825		10.60	8.90	No
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11n-HT20	36	5180	MCS0	18.00	17.02	No
	52	5260		18.00	17.01	No
	64	5320		18.00	17.46	No
	100	5500		18.00	17.20	No
	120	5600		18.00	17.10	No
	140	5700		18.00	17.18	No
	149	5745		10.50	9.12	No
	157	5785		10.50	9.21	No
	165	5825		10.50	8.93	No
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11n-HT40	38	5190	MCS0	18.00	16.90	No
	54	5270		18.00	16.93	No
	62	5310		18.00	17.15	No
	102	5510		18.00	17.28	No
	118	5590		18.00	17.20	No
	134	5670		18.00	17.14	No
	151	5755		10.50	8.13	No
	159	5795		10.50	8.33	No
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11ac 20M	36	5180	MCS0	18.00	17.40	No
	52	5260		18.00	17.36	No
	64	5320		18.00	17.50	No
	100	5500		18.00	17.68	No
	120	5600		18.00	17.33	No
	140	5700		18.00	17.14	No

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	149	5745		10.50	8.53	No
	157	5785		10.50	8.71	No
	165	5825		10.50	8.75	No
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11ac 40M	38	5190	MCS0	18.00	17.00	No
	54	5270		18.00	17.02	No
	62	5310		18.00	17.11	No
	102	5510		18.00	17.27	No
	118	5590		18.00	17.02	No
	134	5670		18.00	17.05	No
	151	5755		10.50	8.32	No
	159	5795		10.50	8.76	No
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11ac 80M	42	5210	MCS0	18.00	17.05	No
	58	5290		18.00	17.03	No
	106	5530		18.00	17.00	No
	122	5610		18.00	17.18	No
	138	5690		18.00	16.97	No
	155	5775		10.50	8.52	No

WiFi 5G Receiver ON							
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11a	U-NII-1	36	5180	MCS0	9.10	7.45	No
		40	5200		9.10	7.41	No
		44	5220		9.10	7.36	No
		48	5240		9.10	7.66	No
	U-NII-2A	52	5260		9.10	7.21	No
		56	5280		9.10	7.22	No
		60	5300		9.10	7.33	No
		64	5320		9.10	7.42	Yes
	U-NII-2C	100	5500		9.10	7.29	No
		104	5520		9.10	7.32	No
		108	5540		9.10	7.51	No
		112	5560		9.10	7.76	Yes
		116	5580		9.10	7.12	No
		120	5600		9.10	7.58	No
		124	5620		9.10	7.36	No
		128	5640		9.10	7.11	No
		132	5660		9.10	7.19	No
		136	5680		9.10	7.22	No

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	U-NII-3	140	5700		9.10	7.26	No
		144	5720		9.10	7.21	No
		149	5745		9.10	7.28	No
		153	5765		9.10	7.17	No
		157	5785		9.10	7.45	No
		161	5805		9.10	7.42	No
		165	5825		9.10	7.61	Yes
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11n-HT20	U-NII-1	36	5180	MCS0	9.00	6.96	No
		40	5200		9.00	7.17	No
		44	5220		9.00	7.49	No
		48	5240		9.00	7.24	No
	U-NII-2A	52	5260		9.00	6.81	No
		56	5280		9.00	6.57	No
		60	5300		9.00	7.47	No
		64	5320		9.00	7.15	No
	U-NII-2C	100	5500		9.00	7.15	No
		104	5520		9.00	7.34	No
		108	5540		9.00	7.48	No
		112	5560		9.00	7.61	No
		116	5580		9.00	6.53	No
		120	5600		9.00	6.72	No
		124	5620		9.00	6.89	No
		128	5640		9.00	6.98	No
		132	5660		9.00	6.49	No
		136	5680		9.00	6.62	No
		140	5700		9.00	6.89	No
		144	5720		9.00	7.31	No
	U-NII-3	149	5745		9.00	7.27	No
		153	5765		9.00	7.23	No
		157	5785		9.00	7.11	No
		161	5805		9.00	7.21	No
		165	5825		9.00	7.11	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11n-HT40	U-NII-1	38	5190	MCS0	9.00	7.01	No
		46	5230		9.00	7.61	No
	U-NII-2A	54	5270		9.00	7.01	No
		62	5310		9.00	7.16	No
	U-NII-2C	102	5510		9.00	7.11	No
		110	5550		9.00	7.74	No
		118	5590		9.00	7.44	No
		126	5630		9.00	7.29	No
		134	5670		9.00	7.38	No

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		142	5710		9.00	7.21	No
	U-NII-3	151	5755		9.00	7.38	No
		159	5795		9.00	7.75	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11ac 20M	U-NII-1	36	5180	MCS0	9.00	6.71	No
		40	5200		9.00	7.22	No
		44	5220		9.00	7.37	No
		48	5240		9.00	7.65	No
	U-NII-2A	52	5260		9.00	6.71	No
		56	5280		9.00	7.05	No
		60	5300		9.00	7.07	No
		64	5320		9.00	7.19	No
	U-NII-2C	100	5500		9.00	7.03	No
		104	5520		9.00	7.21	No
		108	5540		9.00	7.39	No
		112	5560		9.00	7.51	No
		116	5580		9.00	6.95	No
		120	5600		9.00	7.24	No
		124	5620		9.00	7.26	No
		128	5640		9.00	7.39	No
		132	5660		9.00	7.04	No
		136	5680		9.00	7.23	No
		140	5700		9.00	7.36	No
		144	5720		9.00	7.51	No
	U-NII-3	149	5745		9.00	6.97	No
		153	5765		9.00	7.27	No
		157	5785		9.00	7.35	No
		161	5805		9.00	7.43	No
		165	5825		9.00	7.31	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11ac 40M	U-NII-1	38	5190	MCS0	9.00	7.01	No
		46	5230		9.00	7.44	No
	U-NII-2A	54	5270		9.00	6.91	No
		62	5310		9.00	7.47	No
	U-NII-2C	102	5510		9.00	7.77	No
		110	5550		9.00	7.96	No
		118	5590		9.00	7.21	No
		126	5630		9.00	7.45	No
		134	5670		9.00	7.34	No
		142	5710		9.00	7.53	No
		151	5755		9.00	7.53	No
	U-NII-3	159	5795		9.00	7.45	No

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5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11ac 80M	U-NII-1	42	5210	MCS0	9.00	7.41	No
	U-NII-2A	58	5290		9.00	7.55	No
	U-NII-2C	106	5530		9.00	7.93	No
		122	5610		9.00	7.26	No
		138	5690		9.00	7.36	No
	U-NII-3	155	5775		9.00	7.53	No

WiFi 5G(MCC of FCC countries, Receiver OFF)

5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11a	U-NII-1	36	5180	6	17.50	16.91	No
		40	5200		17.50	16.90	No
		44	5220		17.50	16.94	No
		48	5240		17.50	17.32	Yes
	U-NII-2A	52	5260		17.50	17.11	No
		56	5280		17.50	17.32	No
		60	5300		17.50	17.46	Yes
		64	5320		17.50	17.13	No
	U-NII-2C	100	5500		17.50	17.47	Yes
		104	5520		17.50	17.42	No
		108	5540		17.50	17.45	No
		112	5560		17.50	17.37	No
		116	5580		17.50	17.26	No
		120	5600		17.50	17.23	No
		124	5620		17.50	17.16	No
		128	5640		17.50	17.04	No
		132	5660		17.50	17.23	No
		136	5680		17.50	17.20	No
		140	5700		17.50	17.06	No
		144	5720		17.50	16.79	No
	U-NII-3	149	5745		17.50	17.31	Yes
		153	5765		17.50	17.19	No
		157	5785		17.50	17.04	No
		161	5805		17.50	16.83	No
		165	5825		17.50	16.49	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11n- HT20	U-NII-1	36	5180	MCS0	17.00	16.21	No
		40	5200		17.00	16.51	No
		44	5220		17.00	16.34	No
		48	5240		17.00	16.43	No
	U-NII-2A	52	5260		17.00	16.21	No

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		56	5280		17.00	16.42	No
		60	5300		17.00	16.30	No
		64	5320		17.00	16.44	No
	U-NII-2C	100	5500		17.00	16.57	No
		104	5520		17.00	16.38	No
		108	5540		17.00	16.17	No
		112	5560		17.00	16.24	No
		116	5580		17.00	16.28	No
		120	5600		17.00	16.38	No
		124	5620		17.00	16.23	No
		128	5640		17.00	15.86	No
		132	5660		17.00	16.38	No
		136	5680		17.00	16.29	No
		140	5700		17.00	16.12	No
		144	5720		17.00	15.93	No
	U-NII-3	149	5745		17.00	16.22	No
		153	5765		17.00	16.16	No
		157	5785		17.00	15.94	No
		161	5805		17.00	15.77	No
		165	5825		17.00	15.38	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11n-HT40	U-NII-1	38	5190	MCS0	15.00	14.20	No
		46	5230		15.00	14.15	No
	U-NII-2A	54	5270		15.00	13.99	No
		62	5310		15.00	14.03	No
	U-NII-2C	102	5510		15.00	14.36	No
		110	5550		15.00	14.29	No
		118	5590		15.00	14.19	No
		126	5630		15.00	14.17	No
		134	5670		15.00	14.19	No
		142	5710		15.00	14.11	No
	U-NII-3	151	5755		15.00	13.96	No
		159	5795		15.00	13.61	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11ac 20M	U-NII-1	36	5180	MCS0	17.00	15.75	No
		40	5200		17.00	15.93	No
		44	5220		17.00	16.02	No
		48	5240		17.00	15.89	No
	U-NII-2A	52	5260		17.00	15.58	No
		56	5280		17.00	15.76	No
		60	5300		17.00	15.84	No
		64	5320		17.00	15.78	No
	U-NII-2C	100	5500		17.00	15.74	No

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		104	5520		17.00	16.01	No
		108	5540		17.00	15.83	No
		112	5560		17.00	15.52	No
		116	5580		17.00	15.79	No
		120	5600		17.00	15.71	No
		124	5620		17.00	15.58	No
		128	5640		17.00	15.40	No
		132	5660		17.00	15.62	No
		136	5680		17.00	15.47	No
		140	5700		17.00	15.45	No
		144	5720		17.00	15.25	No
	U-NII-3	149	5745		17.00	15.89	No
		153	5765		17.00	15.62	No
		157	5785		17.00	15.44	No
		161	5805		17.00	15.07	No
		165	5825		17.00	14.96	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11ac 40M	U-NII-1	38	5190	MCS0	15.00	13.89	No
		46	5230		15.00	13.91	No
	U-NII-2A	54	5270		15.00	13.81	No
		62	5310		15.00	13.83	No
	U-NII-2C	102	5510		15.00	13.86	No
		110	5550		15.00	13.85	No
		118	5590		15.00	13.84	No
		126	5630		15.00	13.77	No
		134	5670		15.00	14.01	No
		142	5710		15.00	13.67	No
	U-NII-3	151	5755		15.00	13.71	No
		159	5795		15.00	13.42	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11ac 80M	U-NII-1	42	5210	MCS0	15.00	14.02	No
	U-NII-2A	58	5290		15.00	13.91	No
	U-NII-2C	106	5530		15.00	13.85	No
		122	5610		15.00	13.69	No
		138	5690		15.00	13.81	No
	U-NII-3	155	5775		15.00	13.63	No

Table 18: Conducted Power of WiFi

Note:

- a) Power must be measured at each transmit antenna port according to the DSSS and OFDM transmission configurations in each standalone and aggregated frequency band.
- b) Power measurement is required for the transmission mode configuration with the highest maximum output power specified for production units.

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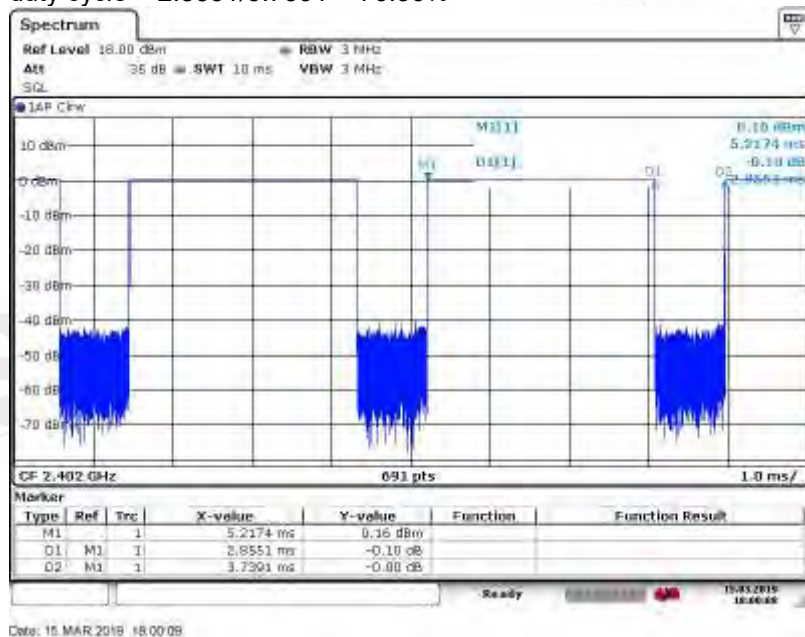
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- 1) When the same highest maximum output power specification applies to multiple transmission modes, the largest channel bandwidth configuration with the lowest order modulation and lowest data rate is measured.
- 2) When the same highest maximum output power is specified for multiple largest channel bandwidth configurations with the same lowest order modulation or lowest order modulation and lowest data rate, power measurement is required for all equivalent 802.11 configurations with the same maximum output power.
- c) For each transmission mode configuration, power must be measured for the highest and lowest channels; and at the mid-band channel(s) when there are at least 3 channels. For configurations with multiple mid-band channels, due to an even number of channels, both channels should be measured.

BT			Tune up (dBm)	Average Conducted Power(dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	12.40	10.41
	39	2441	12.40	10.48
	78	2480	12.40	10.46
π/4DQPSK	0	2402	10.40	8.75
	39	2441	10.40	9.38
	78	2480	10.40	9.48
8DPSK	0	2402	10.40	8.68
	39	2441	10.40	9.36
	78	2480	10.40	9.43
BLE			Tune up (dBm)	Average Conducted Power(dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	9.40	4.89
	19	2440	9.40	4.72
	39	2480	9.40	4.18

Table 19: Conducted Power of BT

duty cycle = $2.8551/3.7391 = 76.36\%$



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8.2 Stand-alone SAR test evaluation

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and Product specific 10g SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

Freq. Band	Frequency (GHz)	Position	Average Power		Test Separation (mm)	Calculate Value	Exclusion Threshold	Exclusion (Y/N)
			dBm	mW				
Wi-Fi	2.462	Head	12.10	16.22	0	5.1	3	N
		Body-worn	19.00	79.43	15	8.3	3	N
		Hotspot	19.00	79.43	10	12.5	3	N
Wi-Fi	5.825	Head	9.10	8.13	0	3.9	3	N
		Body-worn	17.50	56.23	15	9.0	3	N
		Hotspot	17.50	56.23	10	13.6	3	N
Bluetooth	2.48	Head	12.40	17.38	0	5.5	3	N
		Body-worn	12.40	17.38	15	1.8	3	Y
		Hotspot	12.40	17.38	10	2.7	3	Y

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

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8.3 Measurement of SAR Data

8.3.1 SAR Result of GSM850

Ant 1 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data										
Left cheek	GSM	190/836.6	1:8.3	0.041	0.14	32.34	33.60	1.337	0.055	22.1
Left tilted	GSM	190/836.6	1:8.3	0.032	0.01	32.34	33.60	1.337	0.042	22.1
Right cheek	GSM	190/836.6	1:8.3	0.063	0.06	32.34	33.60	1.337	0.084	22.1
Right tilted	GSM	190/836.6	1:8.3	0.025	0.06	32.34	33.60	1.337	0.034	22.1
Head Test Data at the worst case with SIM 2										
Right cheek	GSM	190/836.6	1:8.3	0.054	0.08	32.34	33.60	1.337	0.072	22.1
Head Test Data at the worst case with Battery 2#										
Right cheek	GSM	190/836.6	1:8.3	0.061	0.06	32.34	33.60	1.337	0.082	22.1
Head Test Data at the worst case with Battery 3#										
Right cheek	GSM	190/836.6	1:8.3	0.058	0.00	32.34	33.60	1.337	0.077	22.1
Body worn Test data(Separate 15mm)										
Front side	GSM	190/836.6	1:8.3	0.184	-0.06	32.34	33.60	1.337	0.246	22.1
Back side	GSM	190/836.6	1:8.3	0.258	-0.07	32.34	33.60	1.337	0.345	22.1
Front side	GPRS 4TS	190/836.6	1:2.075	0.172	0.02	26.39	27.60	1.321	0.227	22.1
Back side	GPRS 4TS	190/836.6	1:2.075	0.243	-0.02	26.39	27.60	1.321	0.321	22.1
Body Test Data at the worst case with SIM 2										
Back side	GSM	190/836.6	1:8.3	0.256	0.08	32.34	33.60	1.337	0.342	22.1
Body Test Data at the worst case with Battery 2#(15mm)										
Back side	GSM	190/836.6	1:8.3	0.246	-0.11	32.34	33.60	1.337	0.329	22.1
Body Test Data at the worst case with Battery 3#(15mm)										
Back side	GSM	190/836.6	1:8.3	0.254	-0.09	32.34	33.60	1.337	0.339	22.1
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	190/836.6	1:2.075	0.260	-0.02	26.39	27.60	1.321	0.344	22.1
Back side	GPRS 4TS	190/836.6	1:2.075	0.465	-0.03	26.39	27.60	1.321	0.614	22.1
Left side	GPRS 4TS	190/836.6	1:2.075	0.225	0.12	26.39	27.60	1.321	0.297	22.1
Right side	GPRS 4TS	190/836.6	1:2.075	0.060	0.00	26.39	27.60	1.321	0.079	22.1
Bottom side	GPRS 4TS	190/836.6	1:2.075	0.170	-0.04	26.39	27.60	1.321	0.225	22.1
Body Test Data at the worst case with SIM 2										
Back side	GPRS 4TS	190/836.6	1:2.075	0.458	0.00	26.39	27.60	1.321	0.605	22.1
Body Test Data at the worst case with Battery 2#(10mm)										
Back side	GPRS 4TS	190/836.6	1:2.075	0.454	0.01	26.39	27.60	1.321	0.600	22.1
Body Test Data at the worst case with Battery 3#(10mm)										
Back side	GPRS 4TS	190/836.6	1:2.075	0.445	-0.17	26.39	27.60	1.321	0.588	22.1
Ant 2 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data Receiver on										
Left cheek	GSM	190/836.6	1:8.3	0.405	-0.01	31.11	32.10	1.256	0.509	22.1
Left tilted	GSM	190/836.6	1:8.3	0.293	0.00	31.11	32.10	1.256	0.368	22.1
Right cheek	GSM	190/836.6	1:8.3	0.374	-0.05	31.11	32.10	1.256	0.470	22.1
Right tilted	GSM	190/836.6	1:8.3	0.328	0.04	31.11	32.10	1.256	0.412	22.1
Head Test Data at the worst case with SIM 2										
Left cheek	GSM	190/836.6	1:8.3	0.399	0.03	31.11	32.10	1.256	0.501	22.1
Head Test Data at the worst case with Battery 2#										
Left cheek	GSM	190/836.6	1:8.3	0.396	0.01	31.11	32.10	1.256	0.497	22.1

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Head Test Data at the worst case with Battery 3#										
Left cheek	GSM	190/836.6	1:8.3	0.392	0.03	31.11	32.10	1.256	0.492	22.1
Body worn Test data(Separate 15mm)										
Front side	GSM	190/836.6	1:8.3	0.122	0.06	33.09	34.10	1.262	0.154	22.1
Back side	GSM	190/836.6	1:8.3	0.159	0.00	33.09	34.10	1.262	0.201	22.1
Front side	GPRS 4TS	190/836.6	1:2.075	0.177	0.02	26.99	28.10	1.291	0.229	22.1
Back side	GPRS 4TS	190/836.6	1:2.075	0.222	-0.02	26.99	28.10	1.291	0.287	22.1
Body Test Data at the worst case with SIM 2										
Back side	GPRS 4TS	190/836.6	1:2.075	0.220	-0.07	26.99	28.10	1.291	0.284	22.1
Body Test Data at the worst case with Battery 2#(15mm)										
Back side	GPRS 4TS	190/836.6	1:2.075	0.215	-0.13	26.99	28.10	1.291	0.278	22.1
Body Test Data at the worst case with Battery 3#(15mm)										
Back side	GPRS 4TS	190/836.6	1:2.075	0.211	0.08	26.99	28.10	1.291	0.272	22.1
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	190/836.6	1:2.075	0.163	-0.01	26.99	28.10	1.291	0.210	22.1
Back side	GPRS 4TS	190/836.6	1:2.075	0.241	-0.01	26.99	28.10	1.291	0.311	22.1
Left side	GPRS 4TS	190/836.6	1:2.075	0.315	0.04	26.99	28.10	1.291	0.407	22.1
Right side	GPRS 4TS	190/836.6	1:2.075	0.151	-0.05	26.99	28.10	1.291	0.195	22.1
Top side	GPRS 4TS	190/836.6	1:2.075	0.139	0.00	26.99	28.10	1.291	0.179	22.1
Body Test Data at the worst case with SIM 2										
Left side	GPRS 4TS	190/836.6	1:2.075	0.307	-0.05	26.99	28.10	1.291	0.396	22.1
Body Test Data at the worst case with Battery 2#(10mm)										
Left side	GPRS 4TS	190/836.6	1:2.075	0.302	-0.09	26.99	28.10	1.291	0.390	22.1
Body Test Data at the worst case with Battery 3#(10mm)										
Left side	GPRS 4TS	190/836.6	1:2.075	0.296	-0.01	26.99	28.10	1.291	0.382	22.1

Table 20: SAR of GSM850 for Head and Body

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

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8.3.2 SAR Result of GSM1900

Ant 1 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data										
Left cheek	GSM	661/1880	1:8.3	0.111	0.15	29.94	31.30	1.368	0.152	22.3
Left tilted	GSM	661/1880	1:8.3	0.058	-0.03	29.94	31.30	1.368	0.079	22.3
Right cheek	GSM	661/1880	1:8.3	0.086	0.03	29.94	31.30	1.368	0.117	22.3
Right tilted	GSM	661/1880	1:8.3	0.057	0.03	29.94	31.30	1.368	0.078	22.3
Head Test Data at the worst case with SIM 2										
Left cheek	GSM	661/1880	1:8.3	0.109	-0.07	29.94	31.30	1.368	0.149	22.3
Head Test Data at the worst case with Battery 2#										
Left cheek	GSM	661/1880	1:8.3	0.105	0.05	29.94	31.30	1.368	0.144	22.3
Head Test Data at the worst case with Battery 3#										
Left cheek	GSM	661/1880	1:8.3	0.104	0.01	29.94	31.30	1.368	0.142	22.3
Body worn Test data(Separate 15mm)										
Front side	GSM	661/1880	1:8.3	0.152	-0.04	29.94	31.30	1.368	0.208	22.3
Back side	GSM	661/1880	1:8.3	0.162	0.05	29.94	31.30	1.368	0.222	22.3
Front side	GPRS 4TS	661/1880	1:2.075	0.124	0.03	23.98	25.30	1.355	0.168	22.3
Back side	GPRS 4TS	661/1880	1:2.075	0.138	0.03	23.98	25.30	1.355	0.187	22.3
Body Test Data at the worst case with SIM 2										
Back side	GSM	661/1880	1:8.3	0.157	0.07	29.94	31.30	1.368	0.215	22.3
Body Test Data at the worst case with Battery 2#(15mm)										
Back side	GSM	661/1880	1:8.3	0.153	-0.02	29.94	31.30	1.368	0.209	22.3
Body Test Data at the worst case with Battery 3#(15mm)										
Back side	GSM	661/1880	1:8.3	0.150	0.09	29.94	31.30	1.368	0.205	22.3
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	661/1880	1:2.075	0.241	-0.01	23.98	25.30	1.355	0.327	22.3
Back side	GPRS 4TS	661/1880	1:2.075	0.269	0.07	23.98	25.30	1.355	0.365	22.3
Left side	GPRS 4TS	661/1880	1:2.075	0.113	-0.02	23.98	25.30	1.355	0.153	22.3
Right side	GPRS 4TS	661/1880	1:2.075	0.068	-0.01	23.98	25.30	1.355	0.092	22.3
Bottom side	GPRS 4TS	661/1880	1:2.075	0.429	0.04	23.98	25.30	1.355	0.581	22.3
Body Test Data at the worst case with SIM 2										
Bottom side	GPRS 4TS	661/1880	1:2.075	0.390	0.01	23.98	25.30	1.355	0.529	22.3
Body Test Data at the worst case with Battery 2#(10mm)										
Bottom side	GPRS 4TS	661/1880	1:2.075	0.420	-0.06	23.98	25.30	1.355	0.569	22.3
Body Test Data at the worst case with Battery 3#(10mm)										
Bottom side	GPRS 4TS	661/1880	1:2.075	0.412	-0.01	23.98	25.30	1.355	0.558	22.3
Ant 2 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data										
Left cheek	GSM	661/1880	1:8.3	0.169	0.15	23.75	25.30	1.429	0.241	22.3
Left tilted	GSM	661/1880	1:8.3	0.146	-0.03	23.75	25.30	1.429	0.209	22.3
Right cheek	GSM	661/1880	1:8.3	0.263	0.03	23.75	25.30	1.429	0.376	22.3
Right tilted	GSM	661/1880	1:8.3	0.171	0.07	23.75	25.30	1.429	0.244	22.3
Head Test Data at the worst case with SIM 2										
Right cheek	GSM	661/1880	1:8.3	0.257	-0.04	23.75	25.30	1.429	0.367	22.3
Head Test Data at the worst case with Battery 2#										
Right cheek	GSM	661/1880	1:8.3	0.249	-0.12	23.75	25.30	1.429	0.356	22.3
Head Test Data at the worst case with Battery 3#										
Right cheek	GSM	661/1880	1:8.3	0.260	0.14	23.75	25.30	1.429	0.372	22.3

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Body worn Test data(Separate 15mm)										
Front side	GSM	661/1880	1:8.3	0.018	0.00	23.75	25.30	1.429	0.025	22.3
Back side	GSM	661/1880	1:8.3	0.018	0.01	23.75	25.30	1.429	0.025	22.3
Front side	GPRS 4TS	661/1880	1:2.075	0.019	0.02	18.12	19.30	1.312	0.025	22.3
Back side	GPRS 4TS	661/1880	1:2.075	0.019	-0.17	18.12	19.30	1.312	0.025	22.3
Body Test Data at the worst case with SIM 2										
Back side	GPRS 4TS	661/1880	1:2.075	0.016	0.02	18.12	19.30	1.312	0.021	22.3
Body Test Data at the worst case with Battery 2#(15mm)										
Back side	GPRS 4TS	661/1880	1:2.075	0.015	-0.01	18.12	19.30	1.312	0.020	22.3
Body Test Data at the worst case with Battery 3#(15mm)										
Back side	GPRS 4TS	661/1880	1:2.075	0.015	-0.11	18.12	19.30	1.312	0.020	22.3
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	661/1880	1:2.075	0.027	-0.07	18.12	19.30	1.312	0.036	22.3
Back side	GPRS 4TS	661/1880	1:2.075	0.039	0.05	18.12	19.30	1.312	0.051	22.3
Left side	GPRS 4TS	661/1880	1:2.075	0.031	0.06	18.12	19.30	1.312	0.040	22.3
Right side	GPRS 4TS	661/1880	1:2.075	0.007	0.10	18.12	19.30	1.312	0.009	22.3
Top side	GPRS 4TS	661/1880	1:2.075	0.028	-0.06	18.12	19.30	1.312	0.036	22.3
Body Test Data at the worst case with SIM 2										
Back side	GPRS 4TS	661/1880	1:2.075	0.039	0.00	18.12	19.30	1.312	0.051	22.3
Body Test Data at the worst case with Battery 2#(10mm)										
Back side	GPRS 4TS	661/1880	1:2.075	0.038	0.05	18.12	19.30	1.312	0.050	22.3
Body Test Data at the worst case with Battery 3#(10mm)										
Back side	GPRS 4TS	661/1880	1:2.075	0.037	0.04	18.12	19.30	1.312	0.049	22.3

Table 21: SAR of GSM1900 for Head and Body.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

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8.3.3 SAR Result of WCDMA Band II

Ant 1 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data										
Left cheek	RMC	9400/1880	1:1	0.196	-0.04	23.25	24.50	1.334	0.261	22.3
Left tilted	RMC	9400/1880	1:1	0.111	-0.08	23.25	24.50	1.334	0.148	22.3
Right cheek	RMC	9400/1880	1:1	0.151	0.07	23.25	24.50	1.334	0.201	22.3
Right tilted	RMC	9400/1880	1:1	0.110	0.05	23.25	24.50	1.334	0.147	22.3
Head Test Data at the worst case with SIM 2										
Left cheek	RMC	9400/1880	1:1	0.189	-0.03	23.25	24.50	1.334	0.252	22.3
Head Test Data at the worst case with Battery 2#										
Left cheek	RMC	9400/1880	1:1	0.185	0.02	23.25	24.50	1.334	0.247	22.3
Head Test Data at the worst case with Battery 3#										
Left cheek	RMC	9400/1880	1:1	0.181	0.14	23.25	24.50	1.334	0.241	22.3
Body worn Test data(Separate 15mm)										
Front side	RMC	9400/1880	1:1	0.238	-0.09	22.78	24.00	1.324	0.315	22.3
Back side	RMC	9400/1880	1:1	0.261	-0.17	22.78	24.00	1.324	0.346	22.3
Body Test Data at the worst case with SIM 2										
Back side	RMC	9400/1880	1:1	0.251	-0.16	22.78	24.00	1.324	0.332	22.3
Body Test Data at the worst case with Battery 2#(15mm)										
Back side	RMC	9400/1880	1:1	0.246	0.01	22.78	24.00	1.324	0.326	22.3
Body Test Data at the worst case with Battery 3#(15mm)										
Back side	RMC	9400/1880	1:1	0.241	0.09	22.78	24.00	1.324	0.319	22.3
Hotspot Test data(Separate 10mm)										
Front side	RMC	9400/1880	1:1	0.448	0.01	22.78	24.00	1.324	0.593	22.3
Back side	RMC	9400/1880	1:1	0.514	-0.04	22.78	24.00	1.324	0.681	22.3
Left side	RMC	9400/1880	1:1	0.209	0.04	22.78	24.00	1.324	0.277	22.3
Right side	RMC	9400/1880	1:1	0.138	-0.02	22.78	24.00	1.324	0.183	22.3
Bottom side	RMC	9400/1880	1:1	0.688	0.04	22.78	24.00	1.324	0.911	22.3
Bottom side	RMC	9262/1852.4	1:1	0.674	0.07	22.71	24.00	1.346	0.907	22.3
Bottom side	RMC	9538/1907.6	1:1	0.697	0.05	22.67	24.00	1.358	0.947	22.3
Body Test Data at the worst case with SIM 2										
Bottom side	RMC	9538/1907.6	1:1	0.669	-0.15	22.67	24.00	1.358	0.909	22.3
Body Test Data at the worst case with Battery 2#(10mm)										
Bottom side	RMC	9538/1907.6	1:1	0.641	-0.09	22.67	24.00	1.358	0.871	22.3
Body Test Data at the worst case with Battery 3#(10mm)										
Bottom side	RMC	9538/1907.6	1:1	0.650	0.03	22.67	24.00	1.358	0.883	22.3
Ant 2 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data										
Left cheek	RMC	9400/1880	1:1	0.341	-0.05	17.76	19.10	1.361	0.464	22.3
Left tilted	RMC	9400/1880	1:1	0.238	-0.03	17.76	19.10	1.361	0.324	22.3
Right cheek	RMC	9400/1880	1:1	0.595	0.06	17.76	19.10	1.361	0.810	22.3
Right tilted	RMC	9400/1880	1:1	0.347	0.14	17.76	19.10	1.361	0.472	22.3
Right cheek	RMC	9262/1852.4	1:1	0.583	-0.06	17.70	19.10	1.380	0.805	22.3
Right cheek	RMC	9538/1907.6	1:1	0.586	0.04	17.71	19.10	1.377	0.807	22.3
Head Test Data at the worst case with SIM 2										
Right cheek	RMC	9400/1880	1:1	0.566	0.17	17.76	19.10	1.361	0.771	22.3
Head Test Data at the worst case with Battery 2#										
Right cheek	RMC	9400/1880	1:1	0.553	-0.07	17.76	19.10	1.361	0.753	22.3

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Head Test Data at the worst case with Battery 3#										
Right cheek	RMC	9400/1880	1:1	0.573	0.16	17.76	19.10	1.361	0.780	22.3
Body worn Test data(Separate 15mm)										
Front side	RMC	9400/1880	1:1	0.164	-0.04	23.63	24.50	1.222	0.200	22.3
Back side	RMC	9400/1880	1:1	0.163	-0.01	23.63	24.50	1.222	0.199	22.3
Body Test Data at the worst case with SIM 2										
Front side	RMC	9400/1880	1:1	0.160	-0.05	23.63	24.50	1.222	0.195	22.3
Body Test Data at the worst case with Battery 2#(15mm)										
Front side	RMC	9400/1880	1:1	0.156	-0.07	23.63	24.50	1.222	0.191	22.3
Body Test Data at the worst case with Battery 3#(15mm)										
Front side	RMC	9400/1880	1:1	0.158	0.14	23.63	24.50	1.222	0.193	22.3
Hotspot Test data(Separate 10mm)										
Front side	RMC	9400/1880	1:1	0.238	0.01	23.63	24.50	1.222	0.291	22.3
Back side	RMC	9400/1880	1:1	0.346	0.01	23.63	24.50	1.222	0.423	22.3
Left side	RMC	9400/1880	1:1	0.291	0.05	23.63	24.50	1.222	0.356	22.3
Right side	RMC	9400/1880	1:1	0.053	-0.01	23.63	24.50	1.222	0.065	22.3
Top side	RMC	9400/1880	1:1	0.238	0.04	23.63	24.50	1.222	0.291	22.3
Body Test Data at the worst case with SIM 2										
Back side	RMC	9400/1880	1:1	0.327	0.06	23.63	24.50	1.222	0.400	22.3
Body Test Data at the worst case with Battery 2#(10mm)										
Back side	RMC	9400/1880	1:1	0.323	-0.01	23.63	24.50	1.222	0.395	22.3
Body Test Data at the worst case with Battery 3#(10mm)										
Back side	RMC	9400/1880	1:1	0.314	-0.05	23.63	24.50	1.222	0.384	22.3

Table 22: SAR of WCDMA Band II for Head and Body.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

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8.3.4 SAR Result of WCDMA Band IV

Ant 1 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data										
Left cheek	RMC	1412/1732.4	1:1	0.195	0.12	22.53	23.50	1.250	0.244	22.2
Left tilted	RMC	1412/1732.4	1:1	0.097	0.19	22.53	23.50	1.250	0.122	22.2
Right cheek	RMC	1412/1732.4	1:1	0.173	0.11	22.53	23.50	1.250	0.216	22.2
Right tilted	RMC	1412/1732.4	1:1	0.074	0.03	22.53	23.50	1.250	0.093	22.2
Head Test Data at the worst case with SIM 2										
Left cheek	RMC	1412/1732.4	1:1	0.193	-0.01	22.53	23.50	1.250	0.241	22.2
Head Test Data at the worst case with Battery 2#										
Left cheek	RMC	1412/1732.4	1:1	0.190	0.07	22.53	23.50	1.250	0.238	22.2
Head Test Data at the worst case with Battery 3#										
Left cheek	RMC	1412/1732.4	1:1	0.188	-0.08	22.53	23.50	1.250	0.235	22.2
Body worn Test data(Separate 15mm)										
Front side	RMC	1412/1732.4	1:1	0.258	-0.02	22.53	23.50	1.250	0.323	22.2
Back side	RMC	1412/1732.4	1:1	0.262	-0.01	22.53	23.50	1.250	0.328	22.2
Body Test Data at the worst case with SIM 2										
Back side	RMC	1412/1732.4	1:1	0.247	-0.01	22.53	23.50	1.250	0.309	22.2
Body Test Data at the worst case with Battery 2#(15mm)										
Back side	RMC	1412/1732.4	1:1	0.242	0.07	22.53	23.50	1.250	0.303	22.2
Body Test Data at the worst case with Battery 3#(15mm)										
Back side	RMC	1412/1732.4	1:1	0.244	-0.19	22.53	23.50	1.250	0.305	22.2
Hotspot Test data(Separate 10mm)										
Front side	RMC	1412/1732.4	1:1	0.398	0.03	22.53	23.50	1.250	0.498	22.2
Back side	RMC	1412/1732.4	1:1	0.446	-0.02	22.53	23.50	1.250	0.558	22.2
Left side	RMC	1412/1732.4	1:1	0.257	0.12	22.53	23.50	1.250	0.321	22.2
Right side	RMC	1412/1732.4	1:1	0.127	-0.02	22.53	23.50	1.250	0.159	22.2
Bottom side	RMC	1412/1732.4	1:1	0.638	0.06	22.53	23.50	1.250	0.798	22.2
Body Test Data at the worst case with SIM 2										
Bottom side	RMC	1412/1732.4	1:1	0.634	-0.15	22.53	23.50	1.250	0.793	22.2
Body Test Data at the worst case with Battery 2#(10mm)										
Bottom side	RMC	1412/1732.4	1:1	0.628	-0.07	22.53	23.50	1.250	0.785	22.2
Body Test Data at the worst case with Battery 3#(10mm)										
Bottom side	RMC	1412/1732.4	1:1	0.620	0.09	22.53	23.50	1.250	0.775	22.2
Ant 2 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data										
Left cheek	RMC	1412/1732.4	1:1	0.314	0.01	18.56	19.30	1.186	0.372	22.2
Left tilted	RMC	1412/1732.4	1:1	0.291	0.00	18.56	19.30	1.186	0.345	22.2
Right cheek	RMC	1412/1732.4	1:1	0.581	0.08	18.56	19.30	1.186	0.689	22.2
Right tilted	RMC	1412/1732.4	1:1	0.401	-0.03	18.56	19.30	1.186	0.475	22.2
Head Test Data at the worst case with SIM 2										
Right cheek	RMC	1412/1732.4	1:1	0.575	-0.04	18.56	19.30	1.186	0.682	22.2
Head Test Data at the worst case with Battery 2#										
Right cheek	RMC	1412/1732.4	1:1	0.570	-0.01	18.56	19.30	1.186	0.676	22.2
Head Test Data at the worst case with Battery 3#										
Right cheek	RMC	1412/1732.4	1:1	0.563	-0.17	18.56	19.30	1.186	0.668	22.2
Body worn Test data(Separate 15mm)										
Front side	RMC	1412/1732.4	1:1	0.167	0.01	22.69	23.50	1.205	0.201	22.2

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Back side	RMC	1412/1732.4	1:1	0.109	0.04	22.69	23.50	1.205	0.131	22.2
Body Test Data at the worst case with SIM 2										
Front side	RMC	1412/1732.4	1:1	0.164	-0.03	22.69	23.50	1.205	0.198	22.2
Body Test Data at the worst case with Battery 2#(15mm)										
Front side	RMC	1412/1732.4	1:1	0.165	-0.03	22.69	23.50	1.205	0.199	22.2
Body Test Data at the worst case with Battery 3#(15mm)										
Front side	RMC	1412/1732.4	1:1	0.164	0.08	22.69	23.50	1.205	0.198	22.2
Hotspot Test data(Separate 10mm)										
Front side	RMC	1412/1732.4	1:1	0.261	0.02	22.69	23.50	1.205	0.315	22.2
Back side	RMC	1412/1732.4	1:1	0.183	-0.13	22.69	23.50	1.205	0.221	22.2
Left side	RMC	1412/1732.4	1:1	0.123	-0.05	22.69	23.50	1.205	0.148	22.2
Right side	RMC	1412/1732.4	1:1	0.052	0.02	22.69	23.50	1.205	0.063	22.2
Top side	RMC	1412/1732.4	1:1	0.184	-0.07	22.69	23.50	1.205	0.222	22.2
Body Test Data at the worst case with SIM 2										
Front side	RMC	1412/1732.4	1:1	0.205	-0.06	22.69	23.50	1.205	0.247	22.2
Body Test Data at the worst case with Battery 2#(10mm)										
Front side	RMC	1412/1732.4	1:1	0.214	-0.07	22.69	23.50	1.205	0.258	22.2
Body Test Data at the worst case with Battery 3#(10mm)										
Front side	RMC	1412/1732.4	1:1	0.217	0.08	22.69	23.50	1.205	0.261	22.2

Table 23: SAR of WCDMA Band IV for Head and Body.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

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8.3.5 SAR Result of WCDMA Band V

Ant 1 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data										
Left cheek	RMC	4182/836.4	1:1	0.055	0.01	24.07	25.00	1.239	0.068	22.1
Left tilted	RMC	4182/836.4	1:1	0.050	0.02	24.07	25.00	1.239	0.062	22.1
Right cheek	RMC	4182/836.4	1:1	0.083	0.09	24.07	25.00	1.239	0.103	22.1
Right tilted	RMC	4182/836.4	1:1	0.045	0.02	24.07	25.00	1.239	0.055	22.1
Head Test Data at the worst case with SIM 2										
Right cheek	RMC	4182/836.4	1:1	0.082	0.02	24.07	25.00	1.239	0.102	22.1
Head Test Data at the worst case with Battery 2#										
Right cheek	RMC	4182/836.4	1:1	0.081	0.01	24.07	25.00	1.239	0.101	22.1
Head Test Data at the worst case with Battery 3#										
Right cheek	RMC	4182/836.4	1:1	0.080	0.03	24.07	25.00	1.239	0.099	22.1
Body worn Test data(Separate 15mm)										
Front side	RMC	4182/836.4	1:1	0.223	0.01	24.07	25.00	1.239	0.276	22.1
Back side	RMC	4182/836.4	1:1	0.318	-0.01	24.07	25.00	1.239	0.394	22.1
Body Test Data at the worst case with SIM 2										
Back side	RMC	4182/836.4	1:1	0.317	0.08	24.07	25.00	1.239	0.393	22.1
Body Test Data at the worst case with Battery 2#(15mm)										
Back side	RMC	4182/836.4	1:1	0.311	-0.12	24.07	25.00	1.239	0.385	22.1
Body Test Data at the worst case with Battery 3#(15mm)										
Back side	RMC	4182/836.4	1:1	0.305	0.17	24.07	25.00	1.239	0.378	22.1
Hotspot Test data(Separate 10mm)										
Front side	RMC	4182/836.4	1:1	0.350	-0.02	24.07	25.00	1.239	0.434	22.1
Back side	RMC	4182/836.4	1:1	0.594	-0.01	24.07	25.00	1.239	0.736	22.1
Left side	RMC	4182/836.4	1:1	0.270	0.04	24.07	25.00	1.239	0.334	22.1
Right side	RMC	4182/836.4	1:1	0.079	0.14	24.07	25.00	1.239	0.098	22.1
Bottom side	RMC	4182/836.4	1:1	0.239	-0.04	24.07	25.00	1.239	0.296	22.1
Body Test Data at the worst case with SIM 2										
Back side	RMC	4182/836.4	1:1	0.575	-0.03	24.07	25.00	1.239	0.712	22.1
Body Test Data at the worst case with Battery 2#(10mm)										
Back side	RMC	4182/836.4	1:1	0.561	-0.01	24.07	25.00	1.239	0.695	22.1
Body Test Data at the worst case with Battery 3#(10mm)										
Back side	RMC	4182/836.4	1:1	0.554	0.09	24.07	25.00	1.239	0.686	22.1
Ant 2 Test Record										
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp
Head Test data Receiver on										
Left cheek	RMC	4182/836.4	1:1	0.419	-0.13	21.63	22.50	1.222	0.512	22.1
Left tilted	RMC	4182/836.4	1:1	0.295	-0.04	21.63	22.50	1.222	0.360	22.1
Right cheek	RMC	4182/836.4	1:1	0.397	0.13	21.63	22.50	1.222	0.485	22.1
Right tilted	RMC	4182/836.4	1:1	0.304	0.00	21.63	22.50	1.222	0.371	22.1
Head Test Data at the worst case with SIM 2										
Left cheek	RMC	4182/836.4	1:1	0.411	-0.06	21.63	22.50	1.222	0.502	22.1
Head Test Data at the worst case with Battery 2#										
Left cheek	RMC	4182/836.4	1:1	0.416	-0.03	21.63	22.50	1.222	0.508	22.1
Head Test Data at the worst case with Battery 3#										
Left cheek	RMC	4182/836.4	1:1	0.411	-0.01	21.63	22.50	1.222	0.502	22.1
Body worn Test data(Separate 15mm)										
Front side	RMC	4182/836.4	1:1	0.196	0.02	24.07	25.00	1.239	0.243	22.1

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Back side	RMC	4182/836.4	1:1	0.254	-0.01	24.07	25.00	1.239	0.315	22.1
Body Test Data at the worst case with SIM 2										
Back side	RMC	4182/836.4	1:1	0.251	0.01	24.07	25.00	1.239	0.311	22.1
Body Test Data at the worst case with Battery 2#(15mm)										
Back side	RMC	4182/836.4	1:1	0.251	0.09	24.07	25.00	1.239	0.311	22.1
Body Test Data at the worst case with Battery 3#(15mm)										
Back side	RMC	4182/836.4	1:1	0.248	-0.11	24.07	25.00	1.239	0.307	22.1
Hotspot Test data(Separate 10mm)										
Front side	RMC	4182/836.4	1:1	0.211	-0.14	24.07	25.00	1.239	0.261	22.1
Back side	RMC	4182/836.4	1:1	0.295	-0.05	24.07	25.00	1.239	0.365	22.1
Left side	RMC	4182/836.4	1:1	0.371	0.03	24.07	25.00	1.239	0.460	22.1
Right side	RMC	4182/836.4	1:1	0.183	0.02	24.07	25.00	1.239	0.227	22.1
Top side	RMC	4182/836.4	1:1	0.157	0.01	24.07	25.00	1.239	0.194	22.1
Body Test Data at the worst case with SIM 2										
Left side	RMC	4182/836.4	1:1	0.368	-0.02	24.07	25.00	1.239	0.456	22.1
Body Test Data at the worst case with Battery 2#(10mm)										
Left side	RMC	4182/836.4	1:1	0.364	0.02	24.07	25.00	1.239	0.451	22.1
Body Test Data at the worst case with Battery 3#(10mm)										
Left side	RMC	4182/836.4	1:1	0.359	0.15	24.07	25.00	1.239	0.445	22.1

Table 24: SAR of WCDMA Band V for Head and Body.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

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8.3.1 SAR Result of LTE Band 4

Ant 1 Test Record											
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp.
Head Test data(1RB)											
Left cheek	20	QPSK 1RB_99	20300/1745	1:1	0.202	0.08	22.71	23.50	1.199	0.242	22.2
Left tilted	20	QPSK 1RB_99	20300/1745	1:1	0.100	0.08	22.71	23.50	1.199	0.119	22.2
Right cheek	20	QPSK 1RB_99	20300/1745	1:1	0.179	0.06	22.71	23.50	1.199	0.215	22.2
Right tilted	20	QPSK 1RB_99	20300/1745	1:1	0.082	0.12	22.71	23.50	1.199	0.098	22.2
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_50	20300/1745	1:1	0.158	0.13	21.73	22.50	1.194	0.189	22.2
Left tilted	20	QPSK 50RB_50	20300/1745	1:1	0.079	0.10	21.73	22.50	1.194	0.094	22.2
Right cheek	20	QPSK 50RB_50	20300/1745	1:1	0.149	0.01	21.73	22.50	1.194	0.178	22.2
Right tilted	20	QPSK 50RB_50	20300/1745	1:1	0.060	0.09	21.73	22.50	1.194	0.072	22.2
Head Test Data at the worst case with SIM 2											
Left cheek	20	QPSK 1RB_99	20300/1745	1:1	0.199	0.04	22.71	23.50	1.199	0.239	22.2
Head Test Data at the worst case with Battery 2#											
Left cheek	20	QPSK 1RB_99	20300/1745	1:1	0.196	-0.18	22.71	23.50	1.199	0.235	22.2
Head Test Data at the worst case with Battery 3#											
Left cheek	20	QPSK 1RB_99	20300/1745	1:1	0.190	0.11	22.71	23.50	1.199	0.228	22.2
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.208	0.10	22.71	23.50	1.199	0.249	22.2
Back side	20	QPSK 1RB_99	20300/1745	1:1	0.212	0.04	22.71	23.50	1.199	0.254	22.2
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_50	20300/1745	1:1	0.168	0.05	21.73	22.50	1.194	0.201	22.2
Back side	20	QPSK 50RB_50	20300/1745	1:1	0.171	0.05	21.73	22.50	1.194	0.204	22.2
Body Test Data at the worst case with SIM 2											
Back side	20	QPSK 1RB_99	20300/1745	1:1	0.205	-0.01	22.71	23.50	1.199	0.246	22.2
Body Test Data at the worst case with Battery 2#(15mm)											
Back side	20	QPSK 1RB_99	20300/1745	1:1	0.201	0.09	22.71	23.50	1.199	0.241	22.2
Body Test Data at the worst case with Battery 3#(15mm)											
Back side	20	QPSK 1RB_99	20300/1745	1:1	0.196	0.12	22.71	23.50	1.199	0.235	22.2
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.366	0.03	22.71	23.50	1.199	0.439	22.2
Back side	20	QPSK 1RB_99	20300/1745	1:1	0.417	0.02	22.71	23.50	1.199	0.500	22.2
Left side	20	QPSK 1RB_99	20300/1745	1:1	0.286	0.09	22.71	23.50	1.199	0.343	22.2
Right side	20	QPSK 1RB_99	20300/1745	1:1	0.125	0.08	22.71	23.50	1.199	0.150	22.2
Bottom side	20	QPSK 1RB_99	20300/1745	1:1	0.581	-0.03	22.71	23.50	1.199	0.697	22.2
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_50	20300/1745	1:1	0.295	0.04	21.73	22.50	1.194	0.352	22.2
Back side	20	QPSK 50RB_50	20300/1745	1:1	0.330	0.15	21.73	22.50	1.194	0.394	22.2
Left side	20	QPSK 50RB_50	20300/1745	1:1	0.226	0.09	21.73	22.50	1.194	0.270	22.2
Right side	20	QPSK 50RB_50	20300/1745	1:1	0.100	-0.02	21.73	22.50	1.194	0.119	22.2
Bottom side	20	QPSK 50RB_50	20300/1745	1:1	0.456	-0.06	21.73	22.50	1.194	0.544	22.2
Body Test Data at the worst case with SIM 2											
Bottom side	20	QPSK 1RB_99	20300/1745	1:1	0.544	-0.05	22.71	23.50	1.199	0.653	22.2
Body Test Data at the worst case with Battery 2#(10mm)											
Bottom side	20	QPSK 1RB_99	20300/1745	1:1	0.533	-0.19	22.71	23.50	1.199	0.639	22.2
Body Test Data at the worst case with Battery 3#(10mm)											
Bottom side	20	QPSK 1RB_99	20300/1745	1:1	0.522	0.11	22.71	23.50	1.199	0.626	22.2
Ant 2 Test Record											
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp.
Head Test data(1RB)											
Left cheek	20	QPSK 1RB_99	20300/1745	1:1	0.453	0.02	18.73	19.30	1.140	0.517	22.2

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Left tilted	20	QPSK 1RB_99	20300/1745	1:1	0.281	-0.04	18.73	19.30	1.140	0.320	22.2
Right cheek	20	QPSK 1RB_99	20300/1745	1:1	0.562	-0.14	18.73	19.30	1.140	0.641	22.2
Right tilted	20	QPSK 1RB_99	20300/1745	1:1	0.393	0.00	18.73	19.30	1.140	0.448	22.2
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_50	20300/1745	1:1	0.460	0.15	18.64	19.30	1.164	0.535	22.2
Left tilted	20	QPSK 50RB_50	20300/1745	1:1	0.286	0.06	18.64	19.30	1.164	0.333	22.2
Right cheek	20	QPSK 50RB_50	20300/1745	1:1	0.586	0.06	18.64	19.30	1.164	0.682	22.2
Right tilted	20	QPSK 50RB_50	20300/1745	1:1	0.400	-0.01	18.64	19.30	1.164	0.466	22.2
Head Test Data at the worst case with SIM 2											
Right cheek	20	QPSK 50RB_50	20300/1745	1:1	0.573	-0.04	18.64	19.30	1.164	0.667	22.2
Head Test Data at the worst case with Battery 2#											
Right cheek	20	QPSK 50RB_50	20300/1745	1:1	0.572	-0.12	18.64	19.30	1.164	0.666	22.2
Head Test Data at the worst case with Battery 3#											
Right cheek	20	QPSK 50RB_50	20300/1745	1:1	0.564	0.09	18.64	19.30	1.164	0.657	22.2
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.177	0.01	23.14	23.50	1.086	0.192	22.2
Back side	20	QPSK 1RB_99	20300/1745	1:1	0.102	-0.03	23.14	23.50	1.086	0.111	22.2
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_50	20300/1745	1:1	0.131	0.04	21.96	22.50	1.132	0.148	22.2
Back side	20	QPSK 50RB_50	20300/1745	1:1	0.092	-0.07	21.96	22.50	1.132	0.104	22.2
Body Test Data at the worst case with SIM 2											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.162	-0.07	23.14	23.50	1.086	0.176	22.2
Body Test Data at the worst case with Battery 2#(15mm)											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.160	-0.11	23.14	23.50	1.086	0.174	22.2
Body Test Data at the worst case with Battery 3#(15mm)											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.157	0.06	23.14	23.50	1.086	0.171	22.2
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.280	0.03	23.14	23.50	1.086	0.304	22.2
Back side	20	QPSK 1RB_99	20300/1745	1:1	0.209	-0.02	23.14	23.50	1.086	0.227	22.2
Left side	20	QPSK 1RB_99	20300/1745	1:1	0.224	0.04	23.14	23.50	1.086	0.243	22.2
Right side	20	QPSK 1RB_99	20300/1745	1:1	0.067	0.11	23.14	23.50	1.086	0.073	22.2
Top side	20	QPSK 1RB_99	20300/1745	1:1	0.219	-0.15	23.14	23.50	1.086	0.238	22.2
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_50	20300/1745	1:1	0.204	-0.01	21.96	22.50	1.132	0.231	22.2
Back side	20	QPSK 50RB_50	20300/1745	1:1	0.165	0.14	21.96	22.50	1.132	0.187	22.2
Left side	20	QPSK 50RB_50	20300/1745	1:1	0.179	-0.01	21.96	22.50	1.132	0.203	22.2
Right side	20	QPSK 50RB_50	20300/1745	1:1	0.054	0.03	21.96	22.50	1.132	0.061	22.2
Top side	20	QPSK 50RB_50	20300/1745	1:1	0.178	-0.14	21.96	22.50	1.132	0.202	22.2
Body Test Data at the worst case with SIM 2											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.252	0.02	23.14	23.50	1.086	0.274	22.2
Body Test Data at the worst case with Battery 2#(10mm)											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.249	0.12	23.14	23.50	1.086	0.271	22.2
Body Test Data at the worst case with Battery 3#(10mm)											
Front side	20	QPSK 1RB_99	20300/1745	1:1	0.250	-0.05	23.14	23.50	1.086	0.272	22.2

Table 25: SAR of LTE Band 4 for Head and Body.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

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8.3.2 SAR Result of LTE Band 7

Ant 1 Test Record											
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp.
Head Test data(1RB)											
Left cheek	20	QPSK 1RB_99	21100/2535.5	1:1	0.249	0.09	23.54	24.20	1.164	0.290	22.1
Left tilted	20	QPSK 1RB_99	21100/2535.5	1:1	0.096	0.10	23.54	24.20	1.164	0.112	22.1
Right cheek	20	QPSK 1RB_99	21100/2535.5	1:1	0.213	0.07	23.54	24.20	1.164	0.248	22.1
Right tilted	20	QPSK 1RB_99	21100/2535.5	1:1	0.097	0.13	23.54	24.20	1.164	0.112	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_0	20850/2510	1:1	0.167	0.06	21.64	22.70	1.276	0.213	22.1
Left tilted	20	QPSK 50RB_0	20850/2510	1:1	0.078	0.17	21.64	22.70	1.276	0.099	22.1
Right cheek	20	QPSK 50RB_0	20850/2510	1:1	0.185	0.02	21.64	22.70	1.276	0.236	22.1
Right tilted	20	QPSK 50RB_0	20850/2510	1:1	0.075	0.16	21.64	22.70	1.276	0.095	22.1
Head Test Data at the worst case with SIM 2											
Left cheek	20	QPSK 1RB_99	21100/2535.5	1:1	0.245	-0.07	23.54	24.20	1.164	0.285	22.1
Head Test Data at the worst case with Battery 2#											
Left cheek	20	QPSK 1RB_99	21100/2535.5	1:1	0.246	-0.13	23.54	24.20	1.164	0.286	22.1
Head Test Data at the worst case with Battery 3#											
Left cheek	20	QPSK 1RB_99	21100/2535.5	1:1	0.242	0.01	23.54	24.20	1.164	0.282	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_99	21100/2535.5	1:1	0.185	-0.09	23.54	24.20	1.164	0.215	22.1
Back side	20	QPSK 1RB_99	21100/2535.5	1:1	0.235	0.09	23.54	24.20	1.164	0.274	22.1
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_0	20850/2510	1:1	0.144	0.14	21.64	22.70	1.276	0.184	22.1
Back side	20	QPSK 50RB_0	20850/2510	1:1	0.148	0.00	21.64	22.70	1.276	0.189	22.1
Body Test Data at the worst case with SIM 2											
Back side	20	QPSK 1RB_99	21100/2535.5	1:1	0.232	0.07	23.54	24.20	1.164	0.270	22.1
Body Test Data at the worst case with Battery 2#(15mm)											
Back side	20	QPSK 1RB_99	21100/2535.5	1:1	0.229	0.09	23.54	24.20	1.164	0.267	22.1
Body Test Data at the worst case with Battery 3#(15mm)											
Back side	20	QPSK 1RB_99	21100/2535.5	1:1	0.226	-0.13	23.54	24.20	1.164	0.263	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	21100/2535.5	1:1	0.414	-0.13	23.54	24.20	1.164	0.482	22.1
Back side	20	QPSK 1RB_99	21100/2535.5	1:1	0.350	-0.02	23.54	24.20	1.164	0.407	22.1
Left side	20	QPSK 1RB_99	21100/2535.5	1:1	0.239	0.01	23.54	24.20	1.164	0.278	22.1
Right side	20	QPSK 1RB_99	21100/2535.5	1:1	0.089	-0.19	23.54	24.20	1.164	0.104	22.1
Bottom side	20	QPSK 1RB_99	21100/2535.5	1:1	0.543	-0.02	23.54	24.20	1.164	0.632	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	20850/2510	1:1	0.283	-0.05	21.64	22.70	1.276	0.361	22.1
Back side	20	QPSK 50RB_0	20850/2510	1:1	0.248	0.04	21.64	22.70	1.276	0.317	22.1
Left side	20	QPSK 50RB_0	20850/2510	1:1	0.174	0.02	21.64	22.70	1.276	0.222	22.1
Right side	20	QPSK 50RB_0	20850/2510	1:1	0.069	0.06	21.64	22.70	1.276	0.088	22.1
Bottom side	20	QPSK 50RB_0	20850/2510	1:1	0.376	0.01	21.64	22.70	1.276	0.480	22.1
Body Test Data at the worst case with SIM 2											
Bottom side	20	QPSK 1RB_99	21100/2535.5	1:1	0.536	0.02	23.54	24.20	1.164	0.624	22.1
Body Test Data at the worst case with Battery 2#(10mm)											
Bottom side	20	QPSK 1RB_99	21100/2535.5	1:1	0.528	-0.17	23.54	24.20	1.164	0.615	22.1
Body Test Data at the worst case with Battery 3#(10mm)											
Bottom side	20	QPSK 1RB_99	21100/2535.5	1:1	0.520	0.14	23.54	24.20	1.164	0.605	22.1
Ant 2 Test Record											
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp.
Head Test data(1RB)											
Left cheek	20	QPSK 1RB_99	21100/2535.5	1:1	0.144	0.03	16.69	17.20	1.125	0.162	22.1
Left tilted	20	QPSK 1RB_99	21100/2535.5	1:1	0.162	0.06	16.69	17.20	1.125	0.182	22.1

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Right cheek	20	QPSK 1RB_99	21100/2535.5	1:1	0.484	0.01	16.69	17.20	1.125	0.544	22.1
Right tilted	20	QPSK 1RB_99	21100/2535.5	1:1	0.370	0.08	16.69	17.20	1.125	0.416	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_0	21100/2535.5	1:1	0.132	0.05	16.44	17.20	1.191	0.157	22.1
Left tilted	20	QPSK 50RB_0	21100/2535.5	1:1	0.167	0.05	16.44	17.20	1.191	0.199	22.1
Right cheek	20	QPSK 50RB_0	21100/2535.5	1:1	0.468	-0.05	16.44	17.20	1.191	0.558	22.1
Right tilted	20	QPSK 50RB_0	21100/2535.5	1:1	0.345	0.18	16.44	17.20	1.191	0.411	22.1
Head Test Data at the worst case with SIM 2											
Right cheek	20	QPSK 50RB_0	21100/2535.5	1:1	0.462	-0.15	16.44	17.20	1.191	0.551	22.1
Head Test Data at the worst case with Battery 2#											
Right cheek	20	QPSK 50RB_0	21100/2535.5	1:1	0.455	0.08	16.44	17.20	1.191	0.542	22.1
Head Test Data at the worst case with Battery 3#											
Right cheek	20	QPSK 50RB_0	21100/2535.5	1:1	0.448	-0.07	16.44	17.20	1.191	0.534	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_99	21100/2535.5	1:1	0.136	0.19	22.48	22.70	1.052	0.143	22.1
Back side	20	QPSK 1RB_99	21100/2535.5	1:1	0.149	0.16	22.48	22.70	1.052	0.157	22.1
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_0	20850/2510	1:1	0.144	-0.06	22.01	22.70	1.172	0.169	22.1
Back side	20	QPSK 50RB_0	20850/2510	1:1	0.142	-0.19	22.01	22.70	1.172	0.166	22.1
Body Test Data at the worst case with SIM 2											
Front side	20	QPSK 50RB_0	20850/2510	1:1	0.143	0.08	22.01	22.70	1.172	0.168	22.1
Body Test Data at the worst case with Battery 2#(15mm)											
Front side	20	QPSK 50RB_0	20850/2510	1:1	0.141	-0.03	22.01	22.70	1.172	0.165	22.1
Body Test Data at the worst case with Battery 3#(15mm)											
Front side	20	QPSK 50RB_0	20850/2510	1:1	0.142	0.04	22.01	22.70	1.172	0.166	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	21100/2535.5	1:1	0.236	0.09	22.48	22.70	1.052	0.248	22.1
Back side	20	QPSK 1RB_99	21100/2535.5	1:1	0.301	0.04	22.48	22.70	1.052	0.317	22.1
Left side	20	QPSK 1RB_99	21100/2535.5	1:1	0.376	0.00	22.48	22.70	1.052	0.396	22.1
Right side	20	QPSK 1RB_99	21100/2535.5	1:1	0.041	0.08	22.48	22.70	1.052	0.043	22.1
Top side	20	QPSK 1RB_99	21100/2535.5	1:1	0.177	-0.03	22.48	22.70	1.052	0.186	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	20850/2510	1:1	0.235	0.02	22.01	22.70	1.172	0.275	22.1
Back side	20	QPSK 50RB_0	20850/2510	1:1	0.306	0.01	22.01	22.70	1.172	0.359	22.1
Left side	20	QPSK 50RB_0	20850/2510	1:1	0.354	-0.09	22.01	22.70	1.172	0.415	22.1
Right side	20	QPSK 50RB_0	20850/2510	1:1	0.033	0.07	22.01	22.70	1.172	0.039	22.1
Top side	20	QPSK 50RB_0	20850/2510	1:1	0.175	-0.02	22.01	22.70	1.172	0.205	22.1
Body Test Data at the worst case with SIM 2											
Left side	20	QPSK 50RB_0	20850/2510	1:1	0.349	-0.10	22.01	22.70	1.172	0.409	22.1
Body Test Data at the worst case with Battery 2#(10mm)											
Left side	20	QPSK 50RB_0	20850/2510	1:1	0.345	0.04	22.01	22.70	1.172	0.404	22.1
Body Test Data at the worst case with Battery 3#(10mm)											
Left side	20	QPSK 50RB_0	20850/2510	1:1	0.340	0.02	22.01	22.70	1.172	0.399	22.1

Table 26: SAR of LTE Band 7 for Head and Body.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

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8.3.3 SAR Result of LTE Band 38

Ant 1 Test Record											
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp.
Head Test data(1RB)											
Left cheek	20	QPSK 1RB_0	38000/2595	1:1	0.166	0.05	22.92	24.20	1.343	0.223	22.1
Left tilted	20	QPSK 1RB_0	38000/2595	1:1	0.047	0.01	22.92	24.20	1.343	0.064	22.1
Right cheek	20	QPSK 1RB_0	38000/2595	1:1	0.128	0.02	22.92	24.20	1.343	0.172	22.1
Right tilted	20	QPSK 1RB_0	38000/2595	1:1	0.062	0.04	22.92	24.20	1.343	0.084	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_0	37850/2580	1:1	0.106	0.05	21.89	23.20	1.352	0.143	22.1
Left tilted	20	QPSK 50RB_0	37850/2580	1:1	0.032	0.08	21.89	23.20	1.352	0.043	22.1
Right cheek	20	QPSK 50RB_0	37850/2580	1:1	0.094	0.08	21.89	23.20	1.352	0.126	22.1
Right tilted	20	QPSK 50RB_0	37850/2580	1:1	0.047	0.04	21.89	23.20	1.352	0.064	22.1
Head Test Data at the worst case with SIM 2											
Left cheek	20	QPSK 1RB_0	38000/2595	1:1	0.164	-0.08	22.92	24.20	1.343	0.220	22.1
Head Test Data at the worst case with Battery 2#											
Left cheek	20	QPSK 1RB_0	38000/2595	1:1	0.161	-0.17	22.92	24.20	1.343	0.216	22.1
Head Test Data at the worst case with Battery 3#											
Left cheek	20	QPSK 1RB_0	38000/2595	1:1	0.158	0.03	22.92	24.20	1.343	0.212	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_0	38000/2595	1:1	0.117	0.11	22.92	24.20	1.343	0.157	22.1
Back side	20	QPSK 1RB_0	38000/2595	1:1	0.111	-0.02	22.92	24.20	1.343	0.149	22.1
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_0	37850/2580	1:1	0.094	0.04	21.89	23.20	1.352	0.127	22.1
Back side	20	QPSK 50RB_0	37850/2580	1:1	0.087	0.01	21.89	23.20	1.352	0.117	22.1
Body Test Data at the worst case with SIM 2											
Front side	20	QPSK 1RB_0	38000/2595	1:1	0.115	0.02	22.92	24.20	1.343	0.154	22.1
Body Test Data at the worst case with Battery 2#(15mm)											
Front side	20	QPSK 1RB_0	38000/2595	1:1	0.112	-0.07	22.92	24.20	1.343	0.150	22.1
Body Test Data at the worst case with Battery 3#(15mm)											
Front side	20	QPSK 1RB_0	38000/2595	1:1	0.113	-0.09	22.92	24.20	1.343	0.152	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_0	38000/2595	1:1	0.225	0.06	22.92	24.20	1.343	0.302	22.1
Back side	20	QPSK 1RB_0	38000/2595	1:1	0.199	0.05	22.92	24.20	1.343	0.267	22.1
Left side	20	QPSK 1RB_0	38000/2595	1:1	0.106	-0.03	22.92	24.20	1.343	0.142	22.1
Right side	20	QPSK 1RB_0	38000/2595	1:1	0.046	-0.01	22.92	24.20	1.343	0.061	22.1
Bottom side	20	QPSK 1RB_0	38000/2595	1:1	0.251	-0.08	22.92	24.20	1.343	0.337	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	37850/2580	1:1	0.160	0.07	21.89	23.20	1.352	0.216	22.1
Back side	20	QPSK 50RB_0	37850/2580	1:1	0.157	0.09	21.89	23.20	1.352	0.212	22.1
Left side	20	QPSK 50RB_0	37850/2580	1:1	0.081	0.04	21.89	23.20	1.352	0.109	22.1
Right side	20	QPSK 50RB_0	37850/2580	1:1	0.039	0.04	21.89	23.20	1.352	0.052	22.1
Bottom side	20	QPSK 50RB_0	37850/2580	1:1	0.206	-0.05	21.89	23.20	1.352	0.279	22.1
Body Test Data at the worst case with SIM 2											
Bottom side	20	QPSK 1RB_0	38000/2595	1:1	0.245	-0.02	22.92	24.20	1.343	0.329	22.1
Body Test Data at the worst case with Battery 2#(10mm)											
Bottom side	20	QPSK 1RB_0	38000/2595	1:1	0.241	0.06	22.92	24.20	1.343	0.324	22.1
Body Test Data at the worst case with Battery 3#(10mm)											
Bottom side	20	QPSK 1RB_0	38000/2595	1:1	0.243	0.12	22.92	24.20	1.343	0.326	22.1
Ant 2 Test Record											
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp.
Head Test data(1RB)											
Left cheek	20	QPSK 1RB_0	38150/2610	1:1	0.099	0.01	18.62	19.20	1.143	0.113	22.1

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Left tilted	20	QPSK 1RB_0	38150/2610	1:1	0.113	0.19	18.62	19.20	1.143	0.129	22.1
Right cheek	20	QPSK 1RB_0	38150/2610	1:1	0.507	0.19	18.62	19.20	1.143	0.579	22.1
Right tilted	20	QPSK 1RB_0	38150/2610	1:1	0.477	0.04	18.62	19.20	1.143	0.545	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_0	38150/2610	1:1	0.099	0.19	18.49	19.20	1.178	0.117	22.1
Left tilted	20	QPSK 50RB_0	38150/2610	1:1	0.113	0.09	18.49	19.20	1.178	0.133	22.1
Right cheek	20	QPSK 50RB_0	38150/2610	1:1	0.512	0.03	18.49	19.20	1.178	0.603	22.1
Right tilted	20	QPSK 50RB_0	38150/2610	1:1	0.469	0.05	18.49	19.20	1.178	0.552	22.1
Head Test Data at the worst case with SIM 2											
Right cheek	20	QPSK 50RB_0	38150/2610	1:1	0.504	-0.13	18.49	19.20	1.178	0.594	22.1
Head Test Data at the worst case with Battery 2#											
Right cheek	20	QPSK 50RB_0	38150/2610	1:1	0.501	0.04	18.49	19.20	1.178	0.590	22.1
Head Test Data at the worst case with Battery 3#											
Right cheek	20	QPSK 50RB_0	38150/2610	1:1	0.509	-0.06	18.49	19.20	1.178	0.599	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_0	38000/2595	1:1	0.103	-0.13	23.22	24.20	1.253	0.129	22.1
Back side	20	QPSK 1RB_0	38000/2595	1:1	0.127	-0.06	23.22	24.20	1.253	0.159	22.1
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_0	38000/2595	1:1	0.083	0.13	22.27	23.20	1.239	0.103	22.1
Back side	20	QPSK 50RB_0	38000/2595	1:1	0.103	-0.01	22.27	23.20	1.239	0.128	22.1
Body Test Data at the worst case with SIM 2											
Back side	20	QPSK 1RB_0	38000/2595	1:1	0.087	0.05	23.22	24.20	1.253	0.109	22.1
Body Test Data at the worst case with Battery 2#(15mm)											
Back side	20	QPSK 1RB_0	38000/2595	1:1	0.086	-0.01	23.22	24.20	1.253	0.108	22.1
Body Test Data at the worst case with Battery 3#(15mm)											
Back side	20	QPSK 1RB_0	38000/2595	1:1	0.085	0.11	23.22	24.20	1.253	0.106	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_0	38000/2595	1:1	0.183	0.05	23.22	24.20	1.253	0.229	22.1
Back side	20	QPSK 1RB_0	38000/2595	1:1	0.240	-0.04	23.22	24.20	1.253	0.301	22.1
Left side	20	QPSK 1RB_0	38000/2595	1:1	0.309	0.04	23.22	24.20	1.253	0.387	22.1
Right side	20	QPSK 1RB_0	38000/2595	1:1	0.031	0.16	23.22	24.20	1.253	0.038	22.1
Top side	20	QPSK 1RB_0	38000/2595	1:1	0.167	0.14	23.22	24.20	1.253	0.209	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	38000/2595	1:1	0.148	0.06	22.27	23.20	1.239	0.183	22.1
Back side	20	QPSK 50RB_0	38000/2595	1:1	0.191	0.00	22.27	23.20	1.239	0.237	22.1
Left side	20	QPSK 50RB_0	38000/2595	1:1	0.250	-0.01	22.27	23.20	1.239	0.310	22.1
Right side	20	QPSK 50RB_0	38000/2595	1:1	0.026	-0.01	22.27	23.20	1.239	0.032	22.1
Top side	20	QPSK 50RB_0	38000/2595	1:1	0.102	-0.15	22.27	23.20	1.239	0.126	22.1
Body Test Data at the worst case with SIM 2											
Left side	20	QPSK 1RB_0	38000/2595	1:1	0.271	0.02	23.22	24.20	1.253	0.340	22.1
Body Test Data at the worst case with Battery 2#(10mm)											
Left side	20	QPSK 1RB_0	38000/2595	1:1	0.269	-0.17	23.22	24.20	1.253	0.337	22.1
Body Test Data at the worst case with Battery 3#(10mm)											
Left side	20	QPSK 1RB_0	38000/2595	1:1	0.253	0.04	23.22	24.20	1.253	0.317	22.1

Table 27: SAR of LTE Band 38 for Head and Body.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

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8.3.4 SAR Result of WIFI 2.4G

Test position	Test mode	Test Ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg)1-g	Power drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp.
Head Test data											
Left cheek	802.11b	1/2412	99.04%	1.010	0.195	0.12	11.42	12.10	1.169	0.230	22.0
Left tilted	802.11b	1/2412	99.04%	1.010	0.078	0.19	11.42	12.10	1.169	0.092	22.0
Right cheek	802.11b	1/2412	99.04%	1.010	0.049	0.06	11.42	12.10	1.169	0.058	22.0
Right tilted	802.11b	1/2412	99.04%	1.010	0.039	0.07	11.42	12.10	1.169	0.046	22.0
Head Test Data at the worst case with Battery 2											
Left cheek	802.11b	1/2412	99.04%	1.010	0.190	0.11	11.42	12.10	1.169	0.222	22.0
Head Test Data at the worst case with Battery 3#											
Left cheek	802.11b	1/2412	99.04%	1.010	0.187	-0.17	11.42	12.10	1.169	0.219	22.0
Body worn Test data(Separate 15mm)											
Front side	802.11b	1/2412	99.04%	1.010	0.043	-0.18	17.09	19.00	1.552	0.068	22.0
Back side	802.11b	1/2412	99.04%	1.010	0.075	0.19	17.09	19.00	1.552	0.118	22.0
Body Test Data at the worst case with Battery 2#(15mm)											
Back side	802.11b	1/2412	99.04%	1.010	0.074	-0.08	17.09	19.00	1.552	0.116	22.0
Body Test Data at the worst case with Battery 3#(15mm)											
Back side	802.11b	1/2412	99.04%	1.010	0.072	-0.13	17.09	19.00	1.552	0.113	22.0
Hotspot Test data (Separate 10mm)											
Front side	802.11b	1/2412	99.04%	1.010	0.092	0.11	17.09	19.00	1.552	0.143	22.0
Back side	802.11b	1/2412	99.04%	1.010	0.134	0.01	17.09	19.00	1.552	0.210	22.0
Right side	802.11b	1/2412	99.04%	1.010	0.182	-0.07	17.09	19.00	1.552	0.285	22.0
Top side	802.11b	1/2412	99.04%	1.010	0.055	0.04	17.09	19.00	1.552	0.086	22.0
Body Test Data at the worst case with Battery 2#(10mm)											
Right side	802.11b	1/2412	99.04%	1.010	0.177	0.07	17.09	19.00	1.552	0.278	22.0
Body Test Data at the worst case with Battery 3#(10mm)											
Right side	802.11b	1/2412	99.04%	1.010	0.173	-0.03	17.09	19.00	1.552	0.271	22.0

Table 28: SAR of WIFI 2.4G for Head and Body.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).
- 3) Each channel was tested at the lowest data rate.

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Mode	Tune-up (dBm)	Tune-up (mw)	Max Reported SAR(W/kg)	Adjusted SAR(W/kg)	SAR test
Head					
802.11b	12.10	16.22	0.230	/	Yes
802.11g	12.00	15.85	/	0.22	No
802.1n 20M	12.00	15.85	/	0.22	No
802.11n 40M	12.00	15.85	/	0.22	No
Body worn					
802.11b	19.00	79.43	0.118	/	Yes
802.11g	15.50	35.48	/	0.05	No
802.1n 20M	14.50	28.18	/	0.04	No
802.11n 40M	14.50	28.18	/	0.04	No
Hotspot					
802.11b	19.00	79.43	0.285	/	Yes
802.11g	15.50	35.48	/	0.13	No
802.1n 20M	14.50	28.18	/	0.10	No
802.11n 40M	14.50	28.18	/	0.10	No

Note: Per KDB248227D01, for SAR test of WiFi 2.4G,

1) SAR is measured for 2.4 GHz 802.11b DSSS using the initial test position procedure.

2) As the highest reported SAR for DSSS is adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is < 1.2 W/kg, so SAR for 802.11g/n is not required.

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8.3.5 SAR Result of WIFI 5G

Test position	Test mode	Test Ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg)1-g	Power drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp.
Head Test data of U-NII-2A											
Left cheek	802.11a	64/5320	95.31%	1.049	0.026	0.00	7.42	9.10	1.472	0.040	22.2
Left tilted	802.11a	64/5320	95.31%	1.049	0.023	0.00	7.42	9.10	1.472	0.036	22.2
Right cheek	802.11a	64/5320	95.31%	1.049	0.003	-0.10	7.42	9.10	1.472	0.005	22.2
Right tilted	802.11a	64/5320	95.31%	1.049	0.008	0.00	7.42	9.10	1.472	0.013	22.2
Head Test data of U-NII-2C											
Left cheek	802.11a	112/5560	95.31%	1.049	0.064	0.04	7.76	9.10	1.361	0.091	22.2
Left tilted	802.11a	112/5560	95.31%	1.049	0.048	0.00	7.76	9.10	1.361	0.068	22.2
Right cheek	802.11a	112/5560	95.31%	1.049	0.003	0.00	7.76	9.10	1.361	0.005	22.2
Right tilted	802.11a	112/5560	95.31%	1.049	0.003	0.00	7.76	9.10	1.361	0.004	22.2
Head Test data of U-NII-3											
Left cheek	802.11a	165/5825	95.31%	1.049	0.044	0.00	7.61	9.10	1.409	0.065	22.2
Left tilted	802.11a	165/5825	95.31%	1.049	0.013	0.00	7.61	9.10	1.409	0.019	22.2
Right cheek	802.11a	165/5825	95.31%	1.049	0.002	0.00	7.61	9.10	1.409	0.003	22.2
Right tilted	802.11a	165/5825	95.31%	1.049	0.000	0.00	7.61	9.10	1.409	0.000	22.2
Head Test Data at the worst case with Battery 2#											
Left cheek	802.11a	112/5560	95.31%	1.049	0.062	0.04	7.76	9.10	1.361	0.085	22.2
Head Test Data at the worst case with Battery 3#											
Left cheek	802.11a	112/5560	95.31%	1.049	0.061	0.04	7.76	9.10	1.361	0.083	22.2
Body worn Test data of U-NII-2A (Separate 15mm)											
Front side	802.11a	60/5300	95.31%	1.049	0.050	0.00	17.46	17.50	1.009	0.053	22.2
Back side	802.11a	60/5300	95.31%	1.049	0.059	0.00	17.46	17.50	1.009	0.062	22.2
Body worn Test data of U-NII-2C(Separate 15mm)											
Front side	802.11a	100/5500	95.31%	1.049	0.080	0.00	17.47	17.50	1.007	0.084	22.2
Back side	802.11a	100/5500	95.31%	1.049	0.098	0.00	17.47	17.50	1.007	0.103	22.2
Body worn Test data of U-NII-3(Separate 15mm)											
Front side	802.11a	149/5745	95.31%	1.049	0.065	0.00	17.31	17.50	1.045	0.071	22.2
Back side	802.11a	149/5745	95.31%	1.049	0.116	0.03	17.31	17.50	1.045	0.127	22.2
Body Test Data at the worst case with Battery 2#(15mm)											
Back side	802.11a	149/5745	95.31%	1.049	0.114	0.02	17.31	17.50	1.045	0.125	22.2
Body Test Data at the worst case with Battery 3#(15mm)											
Back side	802.11a	149/5745	95.31%	1.049	0.112	0.03	17.31	17.50	1.045	0.123	22.2
Hotspot Test data of U-NII-1(Separate 10mm)											
Front side	802.11a	48/5240	95.31%	1.049	0.124	0.00	17.32	17.50	1.042	0.136	22.2
Back side	802.11a	48/5240	95.31%	1.049	0.183	0.01	17.32	17.50	1.042	0.200	22.2
Right side	802.11a	48/5240	95.31%	1.049	0.224	0.04	17.32	17.50	1.042	0.245	22.2
Top side	802.11a	48/5240	95.31%	1.049	0.077	0.07	17.32	17.50	1.042	0.085	22.2
Hotspot Test data of U-NII-3 (Separate 10mm)											
Front side	802.11a	149/5745	95.31%	1.049	0.101	0.00	17.31	17.50	1.045	0.111	22.2
Back side	802.11a	149/5745	95.31%	1.049	0.151	-0.02	17.31	17.50	1.045	0.165	22.2
Right side	802.11a	149/5745	95.31%	1.049	0.360	0.12	17.31	17.50	1.045	0.395	22.2
Top side	802.11a	149/5745	95.31%	1.049	0.132	0.09	17.31	17.50	1.045	0.145	22.2
Body Test Data at the worst case with Battery 2#(10mm)											
Right side	802.11a	149/5745	95.31%	1.049	0.309	0.07	17.31	17.50	1.045	0.339	22.2
Body Test Data at the worst case with Battery 3#(10mm)											
Right side	802.11a	149/5745	95.31%	1.049	0.329	0.03	17.31	17.50	1.045	0.361	22.2

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Test position	Test mode	Test Ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg)10-g	Power drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR(W/kg)	Liquid Temp.
Product specific 10g SAR Test data of U-NII-2A(Separate 0mm)											
Front side	802.11a	60/5300	95.31%	1.049	0.399	0.00	17.46	17.50	1.009	0.422	22.2
Back side	802.11a	60/5300	95.31%	1.049	0.284	0.09	17.46	17.50	1.009	0.301	22.2
Right side	802.11a	60/5300	95.31%	1.049	0.786	-0.07	17.46	17.50	1.009	0.832	22.2
Top side	802.11a	60/5300	95.31%	1.049	0.246	-0.07	17.46	17.50	1.009	0.260	22.2
Product specific 10g SAR Test data of U-NII-2C(Separate 0mm)											
Front side	802.11a	100/5500	95.31%	1.049	0.551	0.00	17.47	17.50	1.007	0.582	22.2
Back side	802.11a	100/5500	95.31%	1.049	0.515	0.09	17.47	17.50	1.007	0.544	22.2
Right side	802.11a	100/5500	95.31%	1.049	1.170	-0.07	17.47	17.50	1.007	1.236	22.2
Top side	802.11a	100/5500	95.31%	1.049	0.344	-0.03	17.47	17.50	1.007	0.363	22.2
Body Test Data at the worst case with Battery 2#(0mm)											
Right side	802.11a	100/5500	95.31%	1.049	0.944	-0.02	17.47	17.50	1.007	0.997	22.2
Body Test Data at the worst case with Battery 3#(0mm)											
Right side	802.11a	100/5500	95.31%	1.049	1.150	-0.07	17.47	17.50	1.007	1.215	22.2

Table 29: SAR of WIFI 5G for Head, Body and Product specific 10g SAR.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).
- 3) Each channel was tested at the lowest data rate.
- 4) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. As the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration.
- 5) For Wi-Fi 5G, U-NII-2A (5250-5350 MHz) and U-NII-2C (5470-5725 MHz) bands does not support hotspot function.
- 6) When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes are not required.

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8.3.1 SAR Result of BT

Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data											
Left cheek	GFSK	39/2480	76.36%	1.310	0.146	0.02	10.48	12.40	1.556	0.298	22.0
Left tilted	GFSK	39/2480	76.36%	1.310	0.044	-0.02	10.48	12.40	1.556	0.090	22.0
Right cheek	GFSK	39/2480	76.36%	1.310	0.019	0.08	10.48	12.40	1.556	0.040	22.0
Right tilted	GFSK	39/2480	76.36%	1.310	0.004	0.07	10.48	12.40	1.556	0.008	22.0
Head Test Data at the worst case with Battery 2#											
Left cheek	GFSK	39/2480	76.36%	1.310	0.108	0.05	10.48	12.40	1.556	0.220	22.0
Head Test Data at the worst case with Battery 3#											
Left cheek	GFSK	39/2480	76.36%	1.310	0.102	0.06	10.48	12.40	1.556	0.208	22.0

Table 30: SAR of BTs for Head.

Note:

- 1) The maximum measured SAR value and Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

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8.4 Multiple Transmitter Evaluation

8.4.1 Simultaneous SAR test evaluation

1) Simultaneous Transmission

NO.	Simultaneous Tx Combination	Head	Body-worn	hotspot	Product Specific 10-g SAR
1	GSM Voice(Ant 1) + BT	Yes	Yes	N/A	Yes
2	GSM DATA(Ant 1) + BT	N/A	Yes	N/A	Yes
3	GSM Voice(Ant 2) + BT	Yes	Yes	N/A	Yes
4	GSM DATA (Ant 2)+ BT	N/A	Yes	N/A	Yes
5	GSM Voice(Ant 1) + WiFi 2.4G	Yes	Yes	N/A	Yes
6	GSM DATA(Ant 1) + WiFi 2.4G	N/A	Yes	Yes	Yes
7	GSM Voice(Ant 2) + WiFi 2.4G	Yes	Yes	N/A	Yes
8	GSM DATA(Ant 2) + WiFi 2.4G	N/A	Yes	Yes	Yes
9	WCDMA (Ant 1) + BT	Yes	Yes	N/A	Yes
10	WCDMA (Ant 2) + BT	Yes	Yes	N/A	Yes
11	WCDMA (Ant 1) + WiFi 2.4G	Yes	Yes	Yes	Yes
12	WCDMA (Ant 2) + WiFi 2.4G	Yes	Yes	Yes	Yes
13	LTE (Ant 1) + WiFi 2.4G	Yes	Yes	Yes	Yes
14	LTE(Ant 1) + BT	Yes	Yes	N/A	Yes
15	LTE (Ant 2) + WiFi 2.4G	Yes	Yes	Yes	Yes
16	LTE (Ant 2) + BT	Yes	Yes	N/A	Yes
17	GSM Voice(Ant 1) + WiFi 5G	Yes	Yes	N/A	Yes
18	GSM DATA(Ant 1) + WiFi 5G	N/A	Yes	Yes	Yes
19	GSM Voice(Ant 2) + WiFi 5G	Yes	Yes	N/A	Yes
20	GSM DATA(Ant 2) + WiFi 5G	N/A	Yes	Yes	Yes
21	WCDMA (Ant 1) + WiFi 5G	Yes	Yes	Yes	Yes
22	WCDMA (Ant 2) + WiFi 5G	Yes	Yes	Yes	Yes
23	LTE (Ant 1) + WiFi 5G	Yes	Yes	Yes	Yes
24	LTE (Ant 2) + WiFi 5G	Yes	Yes	Yes	Yes

Note:

- 1) WiFi 2.4G and Bluetooth can't transmit simultaneously.
- 2) WiFi 5G and Bluetooth can't transmit simultaneously.
- 3) WiFi 2.4G and 5G can't transmit simultaneously.
- 4) 2G&3G&4G main antenna(Ant1) and second antenna(Ant 2) can't transmit simultaneously
- 5) For Wi-Fi 5G, U-NII-2A(5250-5350 MHz) and U-NII-2C(5470-5725 MHz) bands does not support hotspot function.
- 6) The device supports WiFi VOIP function.
- 7) The device supports VOLTE function.

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8.4.2 Estimated SAR

When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion:

- $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})}/x] \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$;

Where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.

When the minimum test separation distance is $< 5 \text{ mm}$, a distance of 5 mm is applied to determine SAR test exclusion.

Estimated SAR Result

Freq. Band	Frequency (GHz)	Test Position	max. power(dBm)	Test Separation (mm)	Estimated
					1g SAR (W/kg)
Bluetooth	2.48	Body-worn	12.40	15	0.243
		Hotspot	12.40	10	0.365
		Product specific 10g SAR	12.40	0	0.292

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8.4.3 Simultaneous Transmission SAR Summation Scenario

Test position		Main Antenna SARmax (W/kg)								WiFi Antenna SARmax (W/kg)			Summed 1g SARmax (W/kg)
		GSM850	GSM1900	WCDMA Band II	WCDMA Band IV	WCDMA Band V	LTE Band 4	LTE Band 7	LTE Band 38	WLAN 2.4G	WLAN 5G	BT	
Head	Left Touch	0.055	0.152	0.261	0.244	0.068	0.242	0.290	0.223	0.230	0.091	0.298	0.588
	Left Tilt	0.042	0.079	0.148	0.122	0.062	0.119	0.112	0.064	0.092	0.068	0.090	0.240
	Right Touch	0.084	0.117	0.201	0.216	0.103	0.215	0.248	0.172	0.058	0.005	0.040	0.306
	Right Tilt	0.034	0.078	0.147	0.093	0.055	0.098	0.112	0.084	0.046	0.013	0.008	0.193
Body-worn	Front	0.246	0.208	0.315	0.323	0.276	0.249	0.215	0.157	0.068	0.084	0.243	0.566
	Back	0.345	0.222	0.346	0.328	0.394	0.254	0.274	0.149	0.118	0.127	0.243	0.637
Hotspot	Front	0.344	0.327	0.593	0.498	0.434	0.439	0.482	0.302	0.143	0.136	0.365	0.958
	Back	0.614	0.365	0.681	0.558	0.736	0.500	0.407	0.267	0.210	0.200	0.365	1.101
	Left	0.297	0.153	0.277	0.321	0.334	0.343	0.278	0.142	/	/	0.365	0.708
	Right	0.079	0.092	0.183	0.159	0.098	0.150	0.104	0.061	0.285	0.395	0.365	0.578
	Top	/	/	/	/	/	/	/	/	0.086	0.145	0.365	0.365
	Bottom	0.225	0.581	0.947	0.798	0.296	0.697	0.632	0.337	/	/	0.365	1.312
Test position		Main Antenna SARmax (W/kg)								WiFi Antenna SARmax (W/kg)			Summed 10g SARmax
		GSM850	GSM1900	WCDMA Band II	WCDMA Band IV	WCDMA Band V	LTE Band 4	LTE Band 7	LTE Band 38	WLAN 2.4G	WLAN 5G	BT	
Limb	Front	/	/	/	/	/	/	/	/	/	0.582	0.292	0.582
	Back	/	/	/	/	/	/	/	/	/	0.544	0.292	0.544
	Left	/	/	/	/	/	/	/	/	/	0.157	0.292	0.292
	Right	/	/	/	/	/	/	/	/	/	1.236	0.292	1.236
	Top	/	/	/	/	/	/	/	/	/	0.363	0.292	0.363
	Bottom	/	/	/	/	/	/	/	/	/	/	/	/
Test position		Second Antenna SARmax (W/kg)								WiFi Antenna SARmax (W/kg)			Summed 1g SARmax (W/kg)
		GSM850	GSM1900	WCDMA Band II	WCDMA Band IV	WCDMA Band V	LTE Band 4	LTE Band 7	LTE Band 38	WLAN 2.4G	WLAN 5G	BT	
Head	Left Touch	0.509	0.241	0.464	0.372	0.512	0.535	0.162	0.117	0.230	0.091	0.298	0.833
	Left Tilt	0.368	0.209	0.324	0.345	0.360	0.333	0.199	0.133	0.092	0.068	0.090	0.460
	Right Touch	0.470	0.376	0.810	0.689	0.485	0.682	0.558	0.603	0.058	0.005	0.040	0.868
	Right Tilt	0.412	0.244	0.472	0.475	0.371	0.466	0.416	0.552	0.046	0.013	0.008	0.598
Body-worn	Front	0.229	0.025	0.200	0.201	0.243	0.192	0.169	0.129	0.068	0.084	0.243	0.486
	Back	0.287	0.025	0.199	0.131	0.315	0.111	0.166	0.159	0.118	0.127	0.243	0.558
Hotspot	Front	0.210	0.036	0.291	0.315	0.261	0.304	0.275	0.229	0.143	0.136	0.365	0.680
	Back	0.311	0.051	0.423	0.221	0.365	0.227	0.359	0.301	0.210	0.200	0.365	0.788
	Left	0.407	0.040	0.356	0.148	0.460	0.243	0.415	0.387	/	/	0.365	0.825
	Right	0.195	0.009	0.065	0.063	0.227	0.073	0.043	0.038	0.285	0.395	0.365	0.622
	Top	0.179	0.036	0.291	0.222	0.194	0.238	0.205	0.209	0.086	0.145	0.365	0.656
	Bottom	/	/	/	/	/	/	/	/	/	/	0.365	0.365
Test position		Second Antenna SARmax (W/kg)								WiFi Antenna SARmax (W/kg)			Summed 10g SARmax (W/kg)
		GSM850	GSM1900	WCDMA Band II	WCDMA Band IV	WCDMA Band V	LTE Band 4	LTE Band 7	LTE Band 38	WLAN 2.4G	WLAN 5G	BT	
Product specific 10g SAR	Front	/	/	/	/	/	/	/	/	/	0.582	0.292	0.582
	Back	/	/	/	/	/	/	/	/	/	0.544	0.292	0.544
	Left	/	/	/	/	/	/	/	/	/	0.157	0.292	0.292
	Right	/	/	/	/	/	/	/	/	/	1.236	0.292	1.236
	Top	/	/	/	/	/	/	/	/	/	0.363	0.292	0.363
	Bottom	/	/	/	/	/	/	/	/	/	/	/	/

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9 Equipment list

Test Platform		SPEAG DASY5 Professional				
Description		SAR Test System (Frequency range 300MHz-6GHz)				
Software Reference		DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)				
Hardware Reference						
Equipment		Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	Twin Phantom	SPEAG	SAM 1	1283	NCR	NCR
☒	Twin Phantom	SPEAG	SAM 2	1913	NCR	NCR
☒	Twin Phantom	SPEAG	SAM 3	1912	NCR	NCR
☒	Twin Phantom	SPEAG	SAM 4	1640	NCR	NCR
☒	DAE	SPEAG	DAE4	896	2018-11-08	2019-11-07
☒	DAE	SPEAG	DAE4	1428	2019-01-11	2020-01-10
☒	E-Field Probe	SPEAG	EX3DV4	3923	2018-09-30	2019-09-29
☒	E-Field Probe	SPEAG	ES3DV3	3121	2019-02-25	2020-02-24
☒	E-Field Probe	SPEAG	EX3DV4	3962	2019-02-25	2020-02-24
☒	Validation Kits	SPEAG	D835V2	4d105	2016-12-08	2019-12-07
☒	Validation Kits	SPEAG	D1900V2	5d028	2016-12-07	2019-12-06
☒	Validation Kits	SPEAG	D2450V2	733	2016-12-07	2019-12-06
☒	Validation Kits	SPEAG	D2600V2	1125	2016-06-22	2019-06-21
☒	Validation Kits	SPEAG	D5GHzV2	1165	2016-12-13	2019-12-12
☒	Agilent Network Analyzer	Agilent	E5071C	MY46523590	2018-03-13	2019-03-12
					2019-03-13	2020-03-12
☒	Dielectric Probe Kit	Agilent	85070E	US01440210	NCR	NCR
☒	Universal Radio Communication Tester	R&S	CMU200	123090	2018-06-21	2019-06-20
☒	Radio Communication Analyzer	Anritsu	MT8821C	6201502984	2018-05-02	2019-05-01
☒	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
☒	Signal Generator	Agilent	N5171B	MY53050736	2018-03-13	2019-03-12
					2019-03-13	2020-03-12
☒	Preamplifier	Mini-Circuits	ZHL-42W	15542	NCR	NCR
☒	Preamplifier	Compliance Directions Systems Inc.	AMP28-3W	073501433	NCR	NCR
☒	Power Meter	Agilent	E4416A	GB41292095	2018-03-13	2019-03-12
					2019-03-13	2020-03-12

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☒	Power Sensor	Agilent	8481H	MY41091234	2018-03-13	2019-03-12
					2019-03-13	2020-03-12
☒	Power Sensor	R&S	NRP-Z92	100025	2018-03-13	2019-03-12
					2019-03-13	2020-03-12
☒	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
☒	Coaxial low pass filter	Mini-Circuits	VLF-2500(+)	NA	NCR	NCR
☒	Coaxial low pass filter	Microlab Fxr	LA-F13	NA	NCR	NCR
☒	50 Ω coaxial load	Mini-Circuits	KARN-50+	00850	NCR	NCR
☒	DC POWER SUPPLY	SAKO	SK1730SL5A	NA	NCR	NCR
☒	Speed reading thermometer	MingGao	T809	NA	2018-03-19	2019-03-18
☒	Humidity and Temperature Indicator	KIMTOKA	KIMTOKA	NA	2018-03-19	2019-03-18

Note: All the equipments are within the valid period when the tests are performed.

10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

Appendix E: Antenna Locations

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