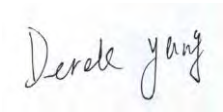
FCC SAR TEST REPORT

Report No:	ZR/2020/60037
Applicant:	Xiaomi Communications Co., Ltd.
Manufacturer:	Xiaomi Communications Co., Ltd.
Product Name:	Mobile Phone
Model No.(EUT):	M2007J17G
Trade Mark:	MI
FCC ID:	2AFZZJ17G
Standards:	FCC 47CFR §2.1093
Date of Receipt:	2020-07-22
Date of Test:	2020-07-27 to 2020-08-15
Date of Issue:	2020-09-10
Test conclusion:	**PASS ***

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

Authorized Signature:



Derek Yang

Wireless Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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REVISION HISTORY

Report Number	Revision	Description	Issue Date
ZR/2020/6003708	01	Original	2020-09-01
ZR/2020/6003708	02	Update the Power reduction of section 1.4.3	2020-09-10

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TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)			
	Head	Body-worn	Hotspot	Product specific 10g SAR
GSM850	0.786	0.239	0.487	/
GSM1900	0.979	0.557	0.905	2.455
WCDMA Band II	0.905	0.994	1.064	2.452
WCDMA Band IV	0.193	0.983	**1.071**	2.363
WCDMA Band V	0.709	0.280	0.703	/
LTE Band 2	0.785	**0.994**	0.869	**2.677**
LTE Band 4	0.170	0.880	0.866	2.561
LTE Band 5	0.701	0.289	0.654	/
LTE Band 7	0.535	0.405	0.474	/
LTE Band 38	0.467	0.690	0.402	/
LTE Band 41	0.508	0.594	0.335	/
5G NR n5	0.630	0.309	0.412	/
WI-FI (2.4GHz)	0.914	0.114	0.437	1.482
WI-FI (5GHz)	**1.057**	0.253	0.907	2.047
BT	1.028	0.243	0.581	/
SAR Limited(W/kg)	1.6			4.0
Maximum Simultaneous Transmission SAR (W/kg)				
Scenario	Head	Body-worn	Hotspot	Product specific 10g SAR
Sum SAR	1.586	1.490	1.292	3.551
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 WWAN antenna + WiFi/BT antenna.

Approved & Released by

Simon Ling

SAR Manager

Tested by

Jackson Li

SAR Engineer

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1 General Information

1.1 Details of Client

Applicant:	Xiaomi Communications Co., Ltd.
Address:	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
Manufacturer:	Xiaomi Communications Co., Ltd.
Address:	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.2 Test Location

Company: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

Address: No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China

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1.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

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• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Industry Canada (IC)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006

IC#: 4620C.

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1.4 General Description of EUT

Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Product Name:	Mobile Phone		
Model No.(EUT):	M2007J17G		
FCC ID:	2AFZZJ17G		
Trade Mark:	MI		
Product Phase:	Identical Prototype		
IMEI:	865723050021030/865723050021154/865723050021238/865723050021618		
Hardware Version:	P2		
Software Version:	MIUI 12		
Antenna Type:	Fixed Internal Antenna		
Device Operating Configurations :			
Modulation Mode:	**GSM:** GMSK, 8PSK; **WCDMA:** QPSK, 16QAM(HSPA+); **LTE:** QPSK,16QAM,64QAM **5G NR:** DFT-s-OFDM (PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM), CP-OFDM (QPSK, 16QAM, 64QAM, 256QAM) **WIFI:** DSSS, OFDM; **BT:** GFSK, π/4DQPSK,8DPSK		
Device Class:	B		
GPRS Multi-slots Class:	33	EGPRS Multi-slots Class:	33
HSDPA UE Category:	24	HSUPA UE Category	7
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 2/4/5/7/38/41)		
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 2	1850 ~1910	1930 ~1990
	LTE Band 4	1710~1755	2110~2155
	LTE Band 5	824~849	869-894
	LTE Band 7	2500~2570	2620~2690
	LTE Band 38	2570~2620	2570~2620
	LTE Band 41	2496~2690	2496~2690
	NR Band n5	824~849	869~894
	Bluetooth	2400~2483.5	2400~2483.5
	Wi-Fi 2.4G	2402~2472	2402~2472
	Wi-Fi 5G	5150~5250	5150~5250
		5250~5350	5250~5350
		5470~5725	5470~5725
		5725~5825	5725~5825

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Battery Information:	Model:	BM4W
	Normal Voltage:	+3.87V
	Rated capacity:	4720mAh
	Manufacturer:	Zhuhai CosMX Battery Co., Ltd.
Headset Information:	Model:	EM023
	Manufacturer:	Tiinlab Acoustic Technology (Shenzhen) Co., Ltd.

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1.4.1 DUT Antenna Locations(Back View)

DUT Antenna Locations refer to Appendix D Photographs

Note:
1) SAR Proximity sensor location is same as main Ant1.
2) The test device is a smart phone. The overall diagonal dimension of this device is 177 mm. Per KDB 648474 D04, because the diagonal distance of this device is ≥160mm, so it is a phablet.
3) WLAN 2.4G/5GHz can transmit in MIMO antenna mode only, and it has no SISO antenna mode.

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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
Ant1	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	Yes	No	Yes
Ant4	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	No	Yes	No
Ant5	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	No	Yes	No
WIFI 2.4G MIMO (Ant7+ Ant9)	Hotspot/Product specific 10g SAR	Yes	Yes	No	Yes	Yes	No
WIFI 5G MIMO (Ant7+ Ant9)	Hotspot/Product specific 10g SAR	Yes	Yes	No	Yes	Yes	No
BT Ant9	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) WWAN antenna(Ant1/4/5) can't transmit simultaneously which will be chosen based on the RSSI. Only one antenna can be used transmission at a time.

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1.4.2 LTE CA additional specification

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

a) Intra-band carrier aggregation requirements for uplink.

b) Intra-band and inter-band carrier aggregation requirements for downlink.

The possible downlink and uplink LTE CA combinations supported by this device are as below tables per 3GPP TS 36.101 V15.4.0. The conducted power measurement results of downlink and uplink LTE CA are provided in Section 8 of this report per 3GPP TS 36.521-1 V14.4.0. 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.

SAR test procedure for intra-band contiguous UL LTE CA is as below:

1)Maximum output power is measured for each UL CA configuration for the required test channels described in KDB 941225 D05

- UL PCC configuration is determined by the required test channel

- SCC and subsequent CCs are added alternatively to either side of the PCC or within the transmission band for channels at the ends of a frequency band.

2)SAR for UL CA is required in each exposure condition and frequency band combination

3)For this device , as the maximum output for Intra-band uplink LTE CA is ≤ standalone LTE mode (without CA),

- PCC is configured according to the highest standalone SAR configuration tested.

- SCC and subsequent CCs are configured according to procedures used for power measurement and parameters (BW, RB etc.) similar to that used for the PCC

4)When the reported SAR for UL CA configuration, described above, is > 1.2 W/kg, UL CA SAR is also required for all required test channels (PCC based)

5)UL CA SAR is also required for standalone SAR configurations > 1.2 W/kg when they are scaled to the UL CA power level.

Intra-band contiguous CA operating bands：

E-UTRA CA Band	E-UTRA Band	Uplink (UL) operating band BS receive / UE transmit $F_{UL_low} - F_{UL_high}$			Downlink (DL) operating band BS transmit / UE receive $F_{DL_low} - F_{DL_high}$			Duplex Mode
CA_7	7	2500 MHz	–	2570 MHz	2620 MHz	–	2690 MHz	FDD
CA_38	38	2570 MHz	–	2620 MHz	2570 MHz	–	2620 MHz	TDD

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contiguous intra-band CA:

E-UTRA CA configuration	E-UTRA CA configuration / Bandwidth combination set						
	Uplink CA configurations (NOTE 3)	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	CA_7C	15	15			40	0
		20	20				
		10	20			40	1
		15	15, 20				
		20	10, 15, 20				
		15	10, 15			40	2
		20	15, 20				
CA_38C	CA_38C	15	15			40	0
		20	20				

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
	100+100	100	20850	2510	2850	2630	100	21048	2529.8	3048	2649.8
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
	100+100	100	21001	2525.1	3001	2645.1	100	21199	2544.9	3199	2664.9
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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Test frequencies for CA_38C：

Range	CC-Combo / NRB_agg [RB]	CC1 Note1			CC2 Note1		
		BW [RB]	$N_{UL/DL}$	$f_{UL/DL}$ [MHz]	BW [RB]	$N_{UL/DL}$	$f_{UL/DL}$ [MHz]
Low	75+75	75	37825	2577.5	75	37975	2592.5
	100+100	100	37850	2580	100	38048	2599.8
Mid	75+75	75	37925	2587.5	75	38075	2602.5
	100+100	100	37901	2585.1	100	38099	2604.9
High	75+75	75	38025	2597.5	75	38175	2612.5
	100+100	100	37952	2590.2	100	38150	2610
Note 1: Carriers in increasing frequency order.							

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1.4.3 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 simultaneously transmitting with the other antennas in certain simultaneous transmission conditions. The standalone SAR compliance still uses the standalone SAR results tested at the maximum output power level without any power reduction

3) A fixed level power reduction is applied for some frequency bands when handset operate "held to the ear" condition, the power reduction triggered by audio receiver detection. The audio receiver detection is used to determine head or body scenario.

4) The proximity sensor is used to indicate when the device is held close to a user's body exposure condition. It utilizes the proximity sensor to reduce the output power in specific wireless and operating modes of main antenna to ensure SAR compliance(Refer to section 5.4 for detailed proximity Sensor information and validation data per KDB 616217).

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.

Ant1 Power Level(dBm)								
Power Reduction Scenario	GSM 1900	WCDMA Band II	WCDMA Band IV	LTE Band 2	LTE Band 4	LTE Band 7	LTE Band 38	LTE Band 41
Hotspot off	30.5	23.5	23.5	23.5	24.0	21.5	25.0	25.0
Hotspot on	28.0	18.0	20.0	17.5	18.5	18.0	20.0	19.5

Ant1 Power Level(dBm)								
Power Reduction Scenario	GSM 1900	WCDMA Band II	WCDMA Band IV	LTE Band 2	LTE Band 4	LTE Band 7	LTE Band 38	LTE Band 41
Sensor off	30.5	23.5	23.5	23.5	24.0	21.5	25.0	25.0
Sensor on	30.0	20.0	20.0	21.0	21.0	18.0	20.0	19.5

Ant1 Power Level(dBm)								
Power Reduction Scenario	GSM 1900	WCDMA Band II	WCDMA Band IV	LTE Band 2	LTE Band 4	LTE Band 7	LTE Band 38	LTE Band 41
Receiver off	30.5	23.5	23.5	23.5	24.0	21.5	25.0	25.0
Receiver on	30.5	25.0	25.0	25.0	25.0	25.0	25.0	25.0

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Ant4 Power Level(dBm)	
Power Reduction Scenario	LTE Band 5
Receiver off/Hotspot off	24.5
Receiver on/Hotspot on	23.5

Ant5 Power Level(dBm)								
Power Reduction Scenario	GSM 1900	WCDMA Band II	WCDMA Band IV	LTE Band 2	LTE Band 4	LTE Band 7	LTE Band 38	LTE Band 41
Receiver off/Hotspot off	30.5	24.0	24.5	24.5	24.8	20.0	24.0	24.0
Receiver on/Hotspot on	28.5	18.5	18.5	19.0	19.3	14.0	16.0	16.0

EN-DC Ant5 Power Level(dBm)	
Power Reduction Scenario	LTE Band 7
Receiver off/Hotspot off	20.5
Receiver on/Hotspot on	14.5

5G NR(EN-DC)Ant5 Power Level(dBm)	
Power Reduction Scenario	n5
Receiver off/Hotspot off	24.0
Receiver on/Hotspot on	22.5

BT Power Level(dBm)					
Power Reduction Scenario	GFSK	π/4DQPSK	8DPSK	BLE 1M	BLE 2M
BT only	18.5	17.5	17.5	9.0	9.0
WWAN + BT/ WiFi 5G + BT	14.0	13.0	13.0	9.0	9.0

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WiFi antenna Power Level(dBm)					
Power Reduction Scenario		Receiver off/ Hotspot off	WWAN transmit simultaneusly with WiFi (Receiver off)	Receiver on/ Hotspot on	WWAN transmit simultaneusly with WiFi (Receiver on)
WiFi 2.4G MIMO (Ant7+Ant9)	802.11 b	23.0	23.0	18.0	16.0
	802.11 g	21.0	21.0	18.0	16.0
	802.11 n 20M	19.0	19.0	18.0	16.0
	802.11 n 40M	16.5	16.5	16.5	14.5
WiFi 5G MIMO (Ant7+Ant9)	802.11a (5150-5250,5250-5350)	20.5	20.5	16.5	14.5
	802.11a (5470-5725)	20.0	20.0	16.5	14.5
	802.11a (5725-5825)	21.0	21.0	19.0	16.0
	802.11n 20M (5150-5250,5250-5350)	20.5	20.5	16.5	14.5
	802.11n 20M (5470-5725)	20.0	20.0	16.5	14.5
	802.11n 20M (5725-5825)	21.0	21.0	19.0	16.0
	802.11n 40M (5150-5250,5250-5350)	19.0	19.0	16.5	14.5
	802.11n 40M (5470-5725)	20.0	20.0	16.5	14.5
	802.11n 40M (5725-5825)	21.0	21.0	19.0	16.0
	802.11ac 20M (5150-5250,5250-5350)	20.5	20.5	16.5	14.5
	802.11ac 20M (5470-5725)	20.0	20.0	16.5	14.5
	802.11ac 20M (5725-5825)	21.0	21.0	19.0	16.0
	802.11ac 40M (5150-5250,5250-5350)	18.0	18.0	16.5	14.5
	802.11ac 40M (5470-5725)	20.0	20.0	16.5	14.5
	802.11ac 40M (5725-5825)	21.0	21.0	19.0	16.0
	802.11ac 80M (5150-5250,5250-5350)	17.0	17.0	16.5	14.5
	802.11ac 80M (5470-5725)	20.0	20.0	16.5	14.5
	802.11ac 80M (5725-5825)	21.0	21.0	19.0	16.0

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1.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE C95.1-1992	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 690783 D01	SAR Listings on Grants v01r03
KDB 616217 D04	SAR for laptop and tablets v01r02

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1.6 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℃, Max. = 25 ℃
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

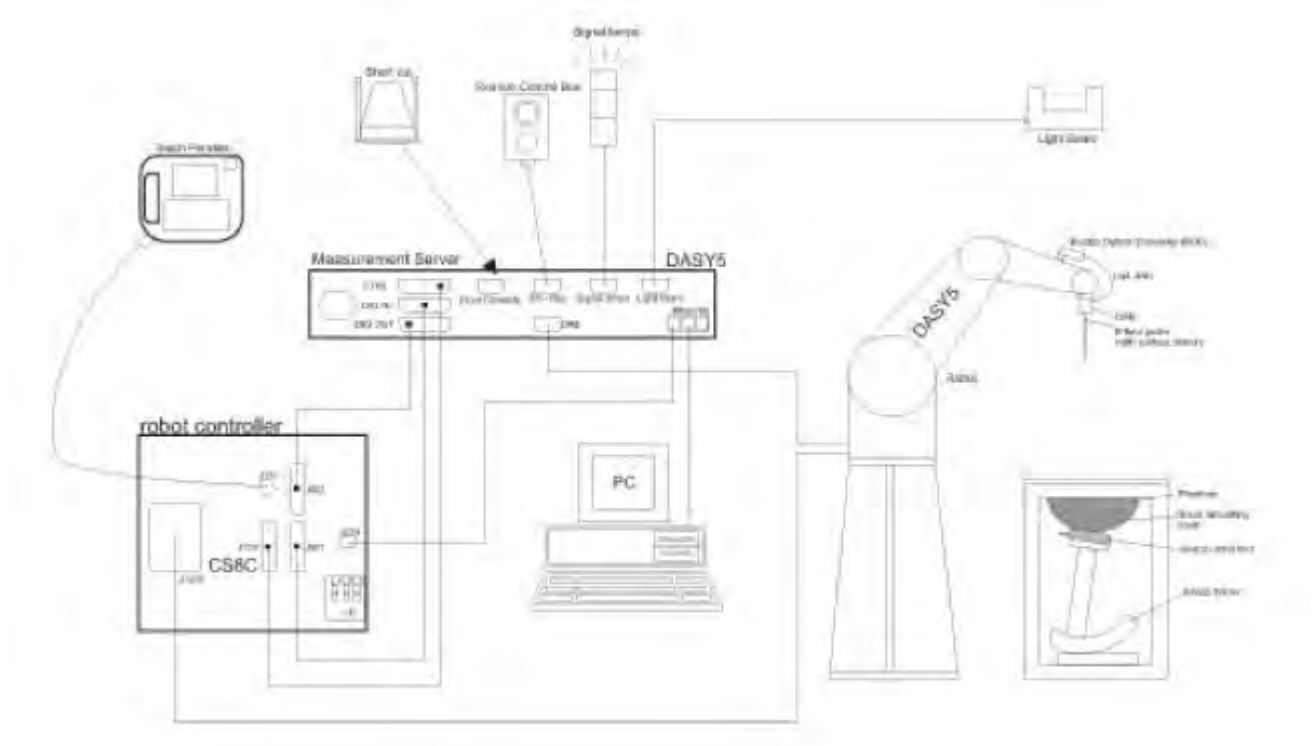
This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the 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 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
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	< 5µV (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 ± 0.2 mm (6 ± 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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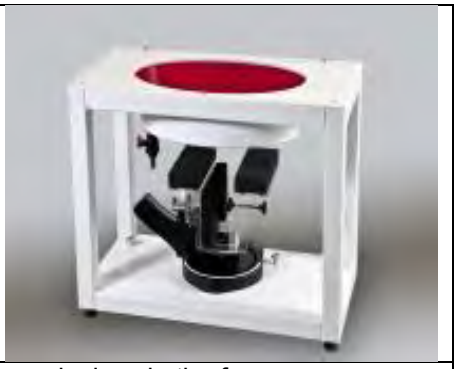
3.5 ELI Phantom

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 ε=3 and loss tangent δ=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≤2GHz), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points (f≤2GHz), 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	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

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. ± 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:

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

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp i = diode compression point (DASY parameter)

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

E-field probes:

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

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H-field probes:

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

With Vi = 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
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = 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.

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

with SAR = local specific absorption rate in mW/g
Etot = 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.

$$P_{pwe} = {E_{tot}}^2{}_2 / 3770 \text{ or } \quad P_{pwe} = {H_{tot}}^2 \cdot 37.7$$

with Ppwe = equivalent power density of a plane wave in mW/cm2
Etot = total electric field strength in V/m
Htot = 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 (~ 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.

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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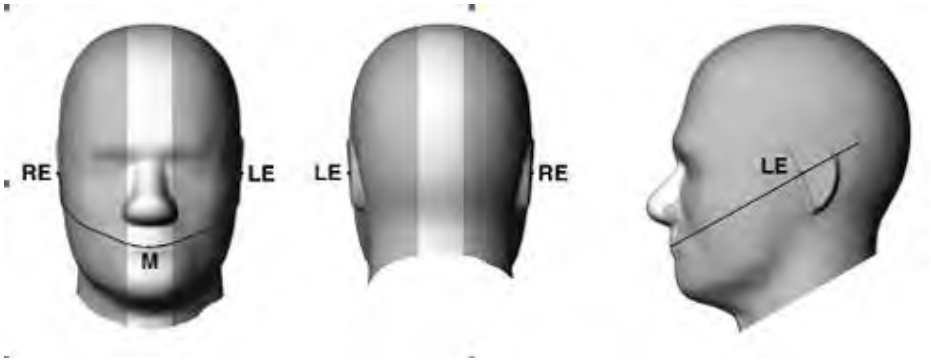
5 Description of Test Position

5.1 Head Exposure Condition

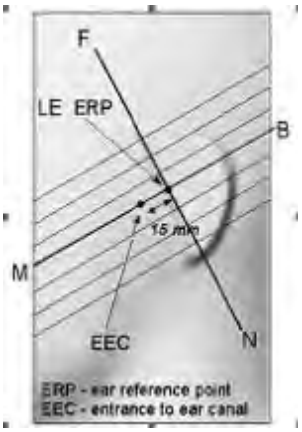
5.1.1 SAM Phantom Shape



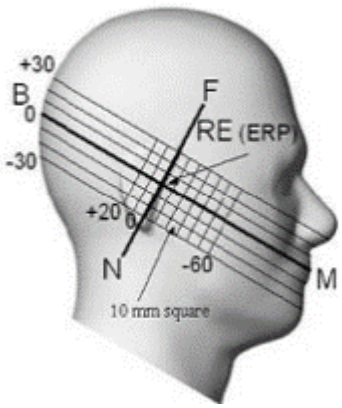
F-3. Front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only-procedures in this recommended practice are intended primarily for the phantom setup.

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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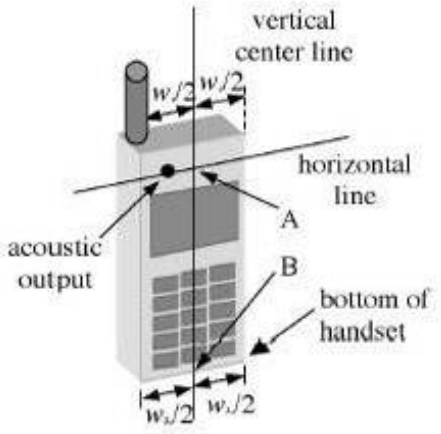
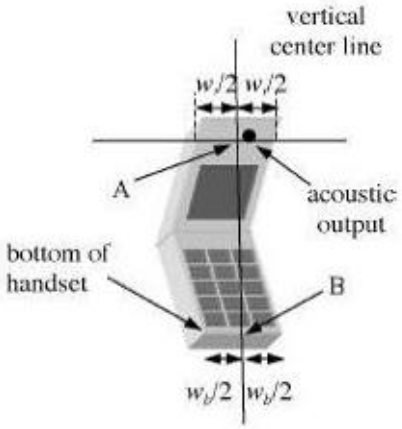
5.1.2 EUT constructions



F-7. Handset vertical and horizontal reference lines-“fixed case”



F-8. Handset vertical and horizontal reference lines-“clam-shell case”

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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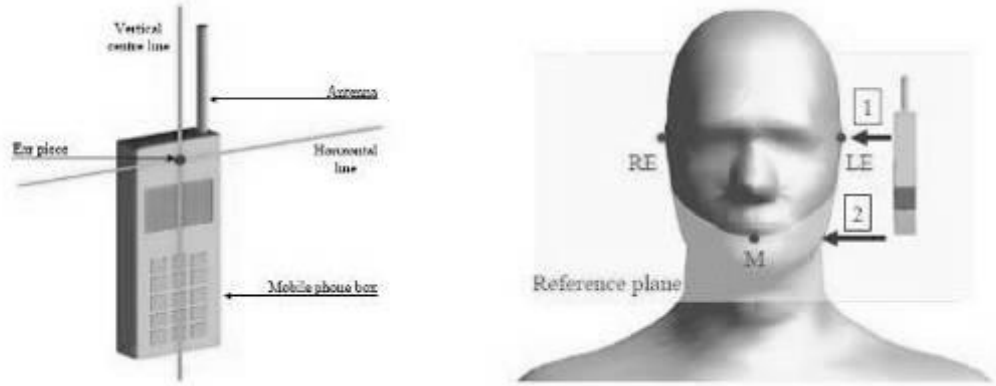
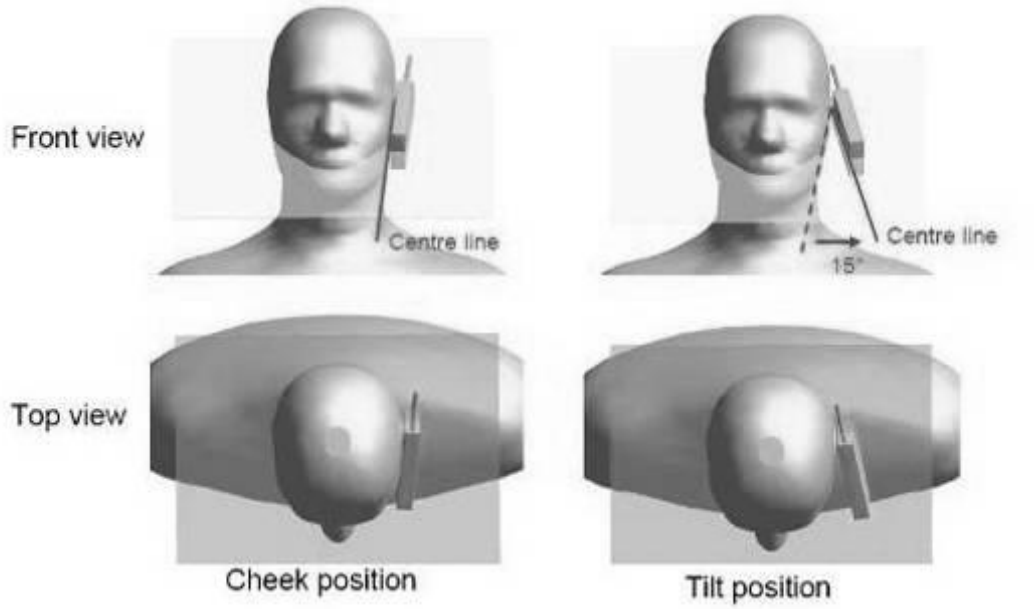
5.1.4 Definition of the “tilted” position

a) Position the device in the “cheek” position described above;
b) 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

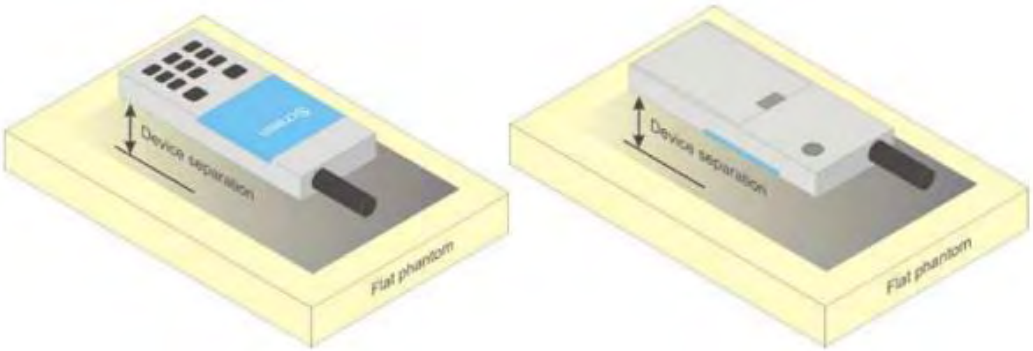
5.2.1 Body-worn accessory exposure conditions

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 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 x W ≥ 9 cm x 5 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 cm x 5 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 cm or an overall diagonal dimension > 16.0 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 ≤ 25 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 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, only the following frequency bands need to test with 0mm for the Product Specific 10-g SAR, the others are not required.

GSM1900(Ant1):

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 1-g (W/kg)	Product Specific 10-g SAR SAR Exclusion
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	661/1880	1:2.075	0.253	0.16	20.83	24.50	2.328	0.589	Yes
Back side	GPRS 4TS	661/1880	1:2.075	0.422	-0.15	20.83	24.50	2.328	0.982	Yes
Left side	GPRS 4TS	661/1880	1:2.075	0.008	-0.12	20.83	24.50	2.328	0.019	Yes
Right side	GPRS 4TS	661/1880	1:2.075	0.022	-0.07	20.83	24.50	2.328	0.051	Yes
Bottom side	GPRS 4TS	661/1880	1:2.075	0.666	-0.13	20.83	24.50	2.328	1.551	No
Bottom side	GPRS 4TS	512/1850.2	1:2.075	0.645	-0.16	20.85	24.50	2.317	1.495	No
Bottom side	GPRS 4TS	810/1909.8	1:2.075	0.699	-0.17	20.88	24.50	2.301	**1.609**	No

WCDMA Band II(Ant1):

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 1-g (W/kg)	Product Specific 10-g SAR SAR Exclusion
Hotspot Test data(Separate 10mm)										
Front side	RMC	9400/1880	1:1	0.151	0.17	16.62	23.50	4.875	0.736	Yes
Back side	RMC	9400/1880	1:1	0.298	0.13	16.62	23.50	4.875	1.453	No
Left side	RMC	9400/1880	1:1	0.046	0.06	16.62	23.50	4.875	0.224	Yes
Right side	RMC	9400/1880	1:1	0.034	-0.08	16.62	23.50	4.875	0.166	Yes
Bottom side	RMC	9400/1880	1:1	0.657	0.01	16.62	23.50	4.875	3.203	No
Bottom side	RMC	9262/1852.4	1:1	0.704	0.11	16.49	23.50	5.023	3.536	No
Bottom side	RMC	9538/1907.6	1:1	0.760	-0.08	16.54	23.50	4.966	**3.774**	No

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WCDMA Band IV(Ant1):

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 1-g (W/kg)	Product Specific 10-g SAR SAR Exclusion
Hotspot Test data(Separate 10mm)										
Front side	RMC	1412/1732.4	1:1	0.363	0.09	18.61	23.50	3.083	1.119	Yes
Back side	RMC	1412/1732.4	1:1	0.550	0.07	18.61	23.50	3.083	1.696	No
Left side	RMC	1412/1732.4	1:1	0.051	0.03	18.61	23.50	3.083	0.157	Yes
Right side	RMC	1412/1732.4	1:1	0.067	0.04	18.61	23.50	3.083	0.207	Yes
Bottom side	RMC	1412/1732.4	1:1	0.694	-0.02	18.61	23.50	3.083	2.140	No
Bottom side	RMC	1312/1712.4	1:1	0.538	-0.03	18.57	23.50	3.112	1.674	No
Bottom side	RMC	1513/1752.6	1:1	0.807	0.02	18.77	23.50	2.972	**2.398**	No
Bottom side-repeat	RMC	1513/1752.6	1:1	0.785	-0.04	18.77	23.50	2.972	2.333	No

LTE Band 2(Ant1):

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)	Product Specific 10-g SAR SAR Exclusion
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	18700/1860	1:1	0.202	-0.07	17.12	23.50	4.345	0.878	Yes
Back side	20	QPSK 1RB_99	18700/1860	1:1	0.318	-0.18	17.12	23.50	4.345	1.382	No
Left side	20	QPSK 1RB_99	18700/1860	1:1	0.025	0.09	17.12	23.50	4.345	0.109	Yes
Right side	20	QPSK 1RB_99	18700/1860	1:1	0.015	0.15	17.12	23.50	4.345	0.065	Yes
Bottom side	20	QPSK 1RB_99	18700/1860	1:1	0.599	-0.09	17.12	23.50	4.345	2.603	No
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_50	18900/1880	1:1	0.181	-0.16	16.69	23.50	4.797	0.868	Yes
Back side	20	QPSK 50RB_50	18900/1880	1:1	0.290	-0.01	16.69	23.50	4.797	1.391	No
Left side	20	QPSK 50RB_50	18900/1880	1:1	0.021	-0.13	16.69	23.50	4.797	0.101	Yes
Right side	20	QPSK 50RB_50	18900/1880	1:1	0.011	0.06	16.69	23.50	4.797	0.053	Yes
Bottom side	20	QPSK 50RB_50	18900/1880	1:1	0.666	-0.14	16.69	23.50	4.797	3.195	No
Bottom side	20	QPSK 50RB_25	18700/1860	1:1	0.695	-0.04	16.53	23.50	4.977	**3.459**	No
Bottom side	20	QPSK 50RB_0	19100/1900	1:1	0.625	0.16	16.57	23.50	4.932	3.082	No
Hotspot Test data (Separate 10mm 100%RB)											
Bottom side	20	QPSK 100RB_0	18700/1860	1:1	0.550	0.11	16.63	23.50	4.864	2.675	No

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LTE Band 4(Ant1):

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)	Product Specific 10-g SAR SAR Exclusion
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_50	20175/1732.5	1:1	0.257	0.01	17.66	24.00	4.305	1.106	Yes
Back side	20	QPSK 1RB_50	20175/1732.5	1:1	0.376	0.17	17.66	24.00	4.305	1.619	No
Left side	20	QPSK 1RB_50	20175/1732.5	1:1	0.021	-0.14	17.66	24.00	4.305	0.090	Yes
Right side	20	QPSK 1RB_50	20175/1732.5	1:1	0.013	0.16	17.66	24.00	4.305	0.056	Yes
Bottom side	20	QPSK 1RB_50	20175/1732.5	1:1	0.582	0.17	17.66	24.00	4.305	2.506	No
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	20300/1745	1:1	0.268	0.19	17.36	24.00	4.613	1.236	No
Back side	20	QPSK 50RB_0	20300/1745	1:1	0.406	0.00	17.36	24.00	4.613	1.873	No
Left side	20	QPSK 50RB_0	20300/1745	1:1	0.032	0.14	17.36	24.00	4.613	0.148	Yes
Right side	20	QPSK 50RB_0	20300/1745	1:1	0.020	0.12	17.36	24.00	4.613	0.092	Yes
Bottom side	20	QPSK 50RB_0	20300/1745	1:1	0.666	0.01	17.36	24.00	4.613	**3.072**	No
Bottom side	20	QPSK 50RB_50	20050/1720	1:1	0.459	0.05	17.25	24.00	4.732	2.172	No
Bottom side	20	QPSK 50RB_0	20175/1732.5	1:1	0.568	0.11	17.27	24.00	4.710	2.675	No
Hotspot Test data (Separate 10mm 100%RB)											
Bottom side	20	QPSK 100RB_0	20300/1745	1:1	0.653	0.15	17.29	24.00	4.688	3.061	No

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)	Product Specific 10-g SAR SAR Exclusion
Hotspot Test data (Separate 10mm)											
Front side	802.11b	6/2437	99.31%	1.007	0.248	-0.12	17.55	23.00	3.508	0.876	Yes
Back side	802.11b	6/2437	99.31%	1.007	0.358	0.05	17.55	23.00	3.508	1.264	No
Right side	802.11b	6/2437	99.31%	1.007	0.391	0.00	17.55	23.00	3.508	**1.381**	No
Top side	802.11b	6/2437	99.31%	1.007	0.230	0.14	17.55	23.00	3.508	0.812	Yes

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)	Product Specific 10-g SAR SAR Exclusion
Hotspot Test data of U-NII-1(Separate 10mm)											
Front side	802.11ac 80M	42/5210	87.10%	1.148	0.308	-0.03	16.02	20.50	2.805	**0.992**	Yes
Back side	802.11ac 80M	42/5210	87.10%	1.148	0.288	-0.07	16.02	20.50	2.805	0.928	Yes
Right side	802.11ac 80M	42/5210	87.10%	1.148	0.277	-0.04	16.02	20.50	2.805	0.892	Yes
Top side	802.11ac 80M	42/5210	87.10%	1.148	0.200	-0.01	16.02	20.50	2.805	0.644	Yes
Hotspot Test data of U-NII-3 (Separate 10mm)											
Front side	802.11ac 80M	155/5775	87.10%	1.148	0.218	0.11	18.73	21.00	1.687	0.422	Yes
Back side	802.11ac 80M	155/5775	87.10%	1.148	0.226	-0.04	18.73	21.00	1.687	0.438	Yes
Right side	802.11ac 80M	155/5775	87.10%	1.148	0.742	0.04	18.73	21.00	1.687	**1.437**	No
Top side	802.11ac 80M	155/5775	87.10%	1.148	0.198	0.14	18.73	21.00	1.687	0.383	Yes

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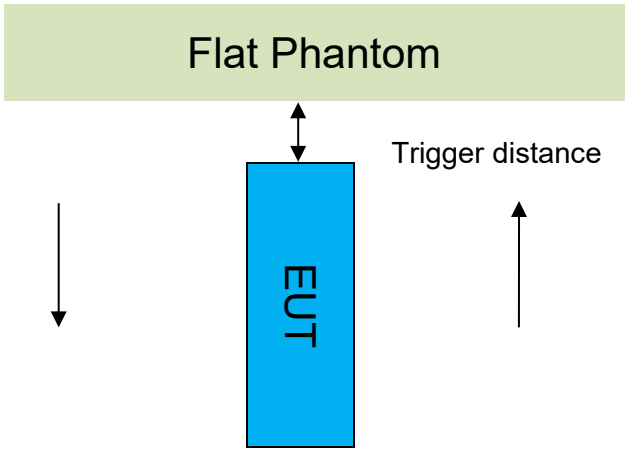
5.1 Proximity Sensor Triggering Test

Proximity sensor triggering distances：

The Proximity sensor triggering was applied to GSM1900(Ant1),WCDMA Band II/IV(Ant 1) and LTE Band 2/4/7/38/41(Ant1). Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed.



Proximity Sensor Triggering Distance(mm)			
Position	Front side	Back side	Bottom side
Minimum	16	16	16
Required SAR Test	15	15	15

Note:

SAR tests with proximity sensor power reduction are only required for the sides of frequency bands in the table above. For the other sides or other frequency bands of the device, SAR is still tested at the maximum power level with sensor off.

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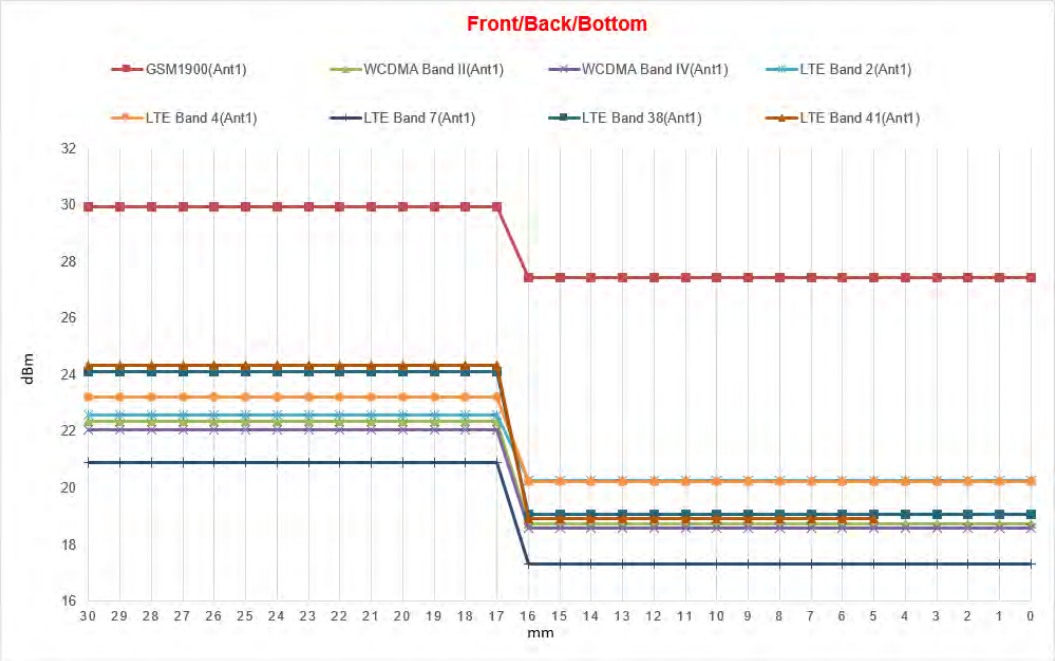
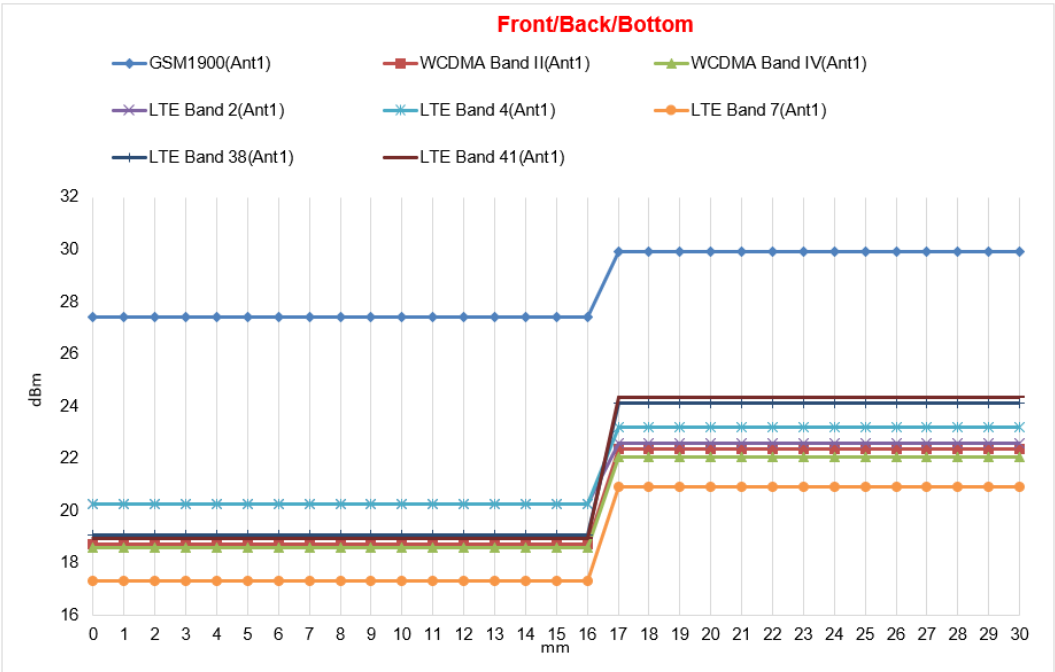
- DUT Moving Toward(Trigger)the Phantom



- DUT Moving Away(Release) from the Phantom



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Proximity sensor coverage

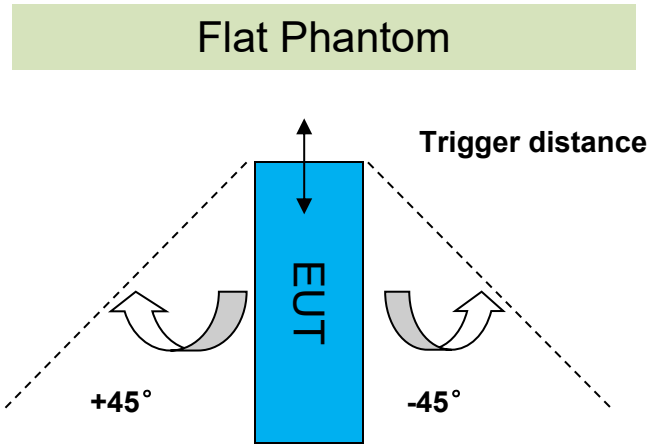
If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and “along the direction of maximum antenna and sensor offset”.

The proximity sensor and main antenna use same metallic electrode, so there is no spatial offset.

Device tilt angle influences to proximity sensor triggering

The influence of device tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at 16mm separation.

Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.



Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering for Top Side												
Band (MHz)	Minimum trigger distance Per KDB616217§6.2	Minimum trigger distance at which power reduction was maintained over ±45°	Power Reduction Status									
			-45°	-35°	-25°	-15°	-5°	0°	5°	15°	25°	35°	45°
GSM1900 (Ant 1)	Bottom side:16mm	Bottom side:16mm	on	on	on	on	on	on	on	on	on	on	on
WCDMA Band II (Ant 1)	Bottom side:16mm	Bottom side:16mm	on	on	on	on	on	on	on	on	on	on	on
WCDMA Band II (Ant 1)	Bottom side:16mm	Bottom side:16mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 2 (Ant 1)	Bottom side:16mm	Bottom side:16mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 4 (Ant 1)	Bottom side:16mm	Bottom side:16mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 7 (Ant 1)	Bottom side:16mm	Bottom side:16mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 38 (Ant 1)	Bottom side:16mm	Bottom side:16mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band 41 (Ant 1)	Bottom side:16mm	Bottom side:16mm	on	on	on	on	on	on	on	on	on	on	on

SAR test plan:

For front/back/bottom side, the worst trigger distance of proximity sensor is 16mm, thus we test front/back/bottom side SAR in 15mm without power reduction and 0mm with power reduction.

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6 SAR System Verification Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

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

Ingredients (% by weight)	Frequency (MHz)				
	450	700-900	1750-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85
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%					

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±2°C.

Tissue Type	Measured Frequency (MHz)	Target Tissue (±5%)		Measured Tissue		Liquid Temp.(℃)	Measured Date
		ε_r	σ(S/m)	ε_r	σ(S/m)		
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	43.207	0.916	22.1	2020/7/27
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	42.535	0.928	22.1	2020/8/6
1750 Head	1750	40.1 (38.10~42.11)	1.37 (1.30~1.44)	40.410	1.318	22.2	2020/7/29
1900 Head	1900	40.0 (38.00~42.00)	1.40 (1.33~1.47)	41.526	1.408	22.3	2020/8/1
2450 Head	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.232	1.806	22.0	2020/8/12
2600 Head	2600	39.0 (37.05~40.95)	1.96 (1.86~2.06)	37.735	1.969	22.1	2020/8/15
5250Head	5250	35.9 (34.11~37.70)	4.71 (4.47~4.95)	36.011	4.767	22.2	2020/8/7
5600 Head	5600	35.5 (33.73~37.28)	5.07 (4.82~5.32)	35.059	5.157	22.2	2020/8/7
5750 Head	5750	35.4 (33.63~37.17)	5.22 (4.96~5.48)	34.695	5.329	22.2	2020/8/7

Table 4： Measurement result of Tissue electric parameters

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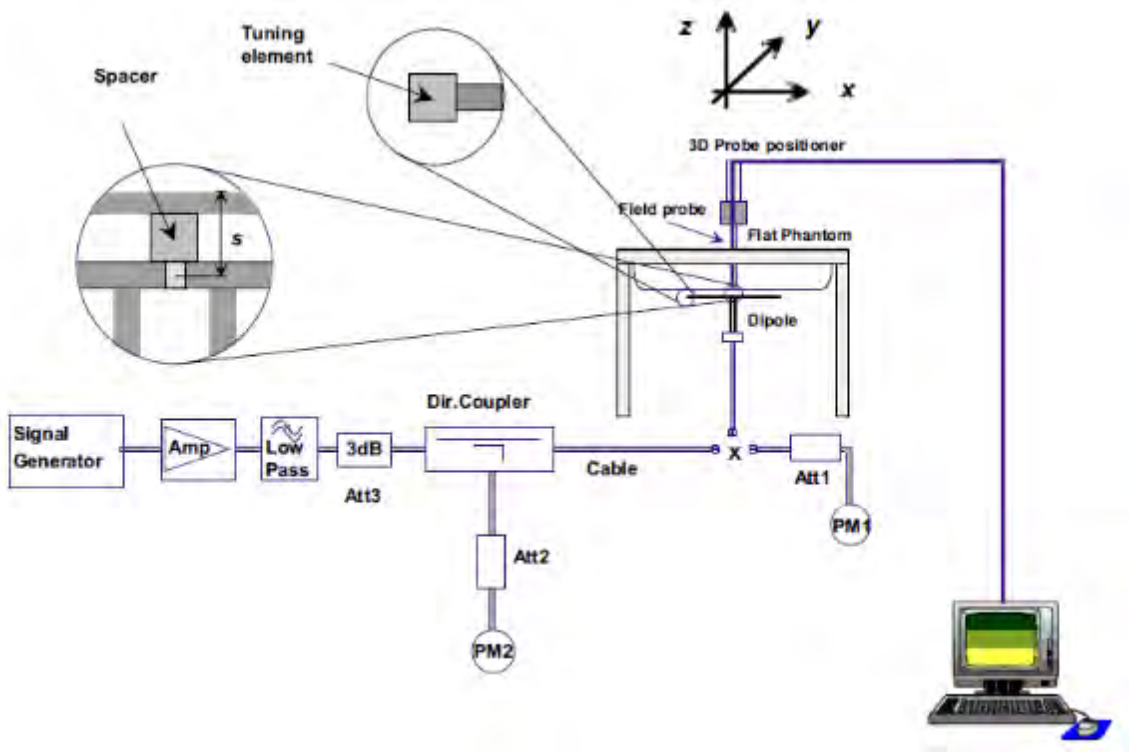
6.2 SAR System Check

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 +/- 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±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15±0.5 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. (℃)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D835V2	Head	2.53	1.66	10.12	6.64	9.64 (8.68~10.60)	6.29 (5.66~6.92)	22.1	2020/7/27
D835V2	Head	2.47	1.61	9.88	6.44	9.64 (8.68~10.60)	6.29 (5.66~6.92)	22.1	2020/8/6
D1750V2	Head	8.74	4.65	34.96	18.60	36.3 (32.67~39.93)	19.2 (17.28~21.12)	22.2	2020/7/29
D1900V2	Head	10.40	5.38	41.60	21.52	39.3 (35.37~43.23)	20.2 (18.18~22.22)	22.3	2020/8/1
D2450V2	Head	13.20	6.10	52.80	24.40	51.9 (46.71~57.09)	23.8 (21.42~26.18)	22.0	2020/8/12
D2600V2	Head	13.90	6.23	55.60	24.92	56.8 (51.12~62.48)	24.9 (22.41~27.39)	22.1	2020/8/15
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. (℃)	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)	7.35	2.12	73.50	21.20	75.2 (67.68~82.72)	21.5 (19.35~23.65)	22.2	2020/8/7
	Head (5.6GHz)	8.01	2.28	80.10	22.80	80.0 (72.0~88.0)	22.7 (20.43~24.97)	22.2	2020/8/7
	Head (5.75GHz)	7.32	2.08	73.20	20.80	78.7 (70.83~86.57)	22.3 (20.07~24.53)	22.2	2020/8/7

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 ≤ ¼ 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 CMW500 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 33 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 33 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 spreaing 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 ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA 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(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) 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	βc	Bd	βd(SF)	βc/βd	βhs	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: △ACK, △NACK and △CQI= 8 Ahs = βhs/βc=30/15 βhs=30/15*βc
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, △ACK and △NACK= 8 (Ahs=30/15) with βhs=30/15*βc,and △CQI=
7 (Ahs=24/15) with βhs=24/15*βc.
Note3: CM=1 forβc/βd =12/15, βhs/βc=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	MaximumH S-DSCH Transport BlockBits/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	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_c (SF)	β_{ed} (code)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

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, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference

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

Note 4 : For subtest 5 the β_c/β_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 $\beta_c = 14/15$ and $\beta_d = 15/15$

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

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

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 Speading 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&2SF4	11484	5.76
	4	4	2		20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF4	22996	?
	4	4	10		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.(TS25.306-7.3.0).

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/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	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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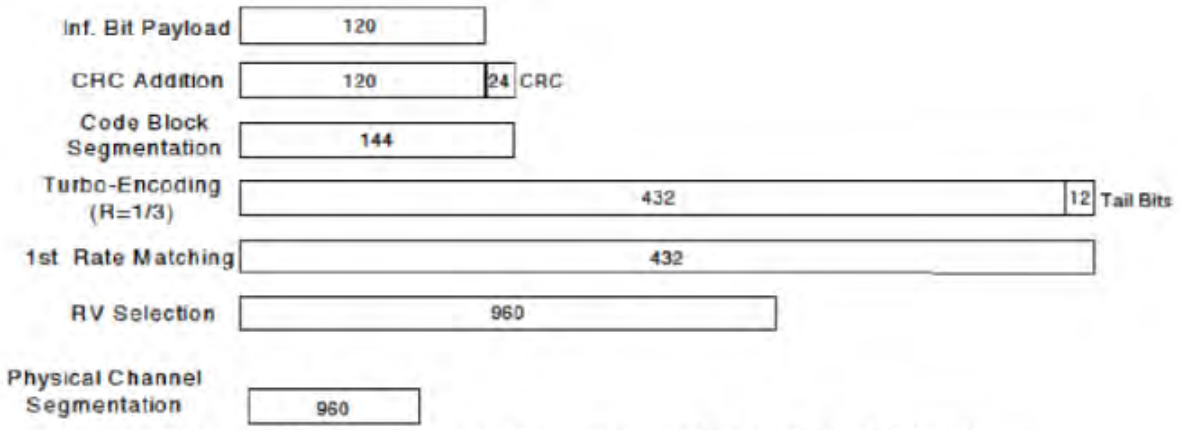

Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM(dB)(2)	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

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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d) HSPA+

Per KDB941225D01, SAR is required for Rel. 7 HSPA+ when SAR is required for Rel. 6 HSPA; otherwise, the 3G SAR test reduction procedure is applied to (uplink) HSPA+ with 12.2 kbps RMC as the primary mode. Power is measured for HSPA+ that supports uplink 16 QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.

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

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

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

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.

Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

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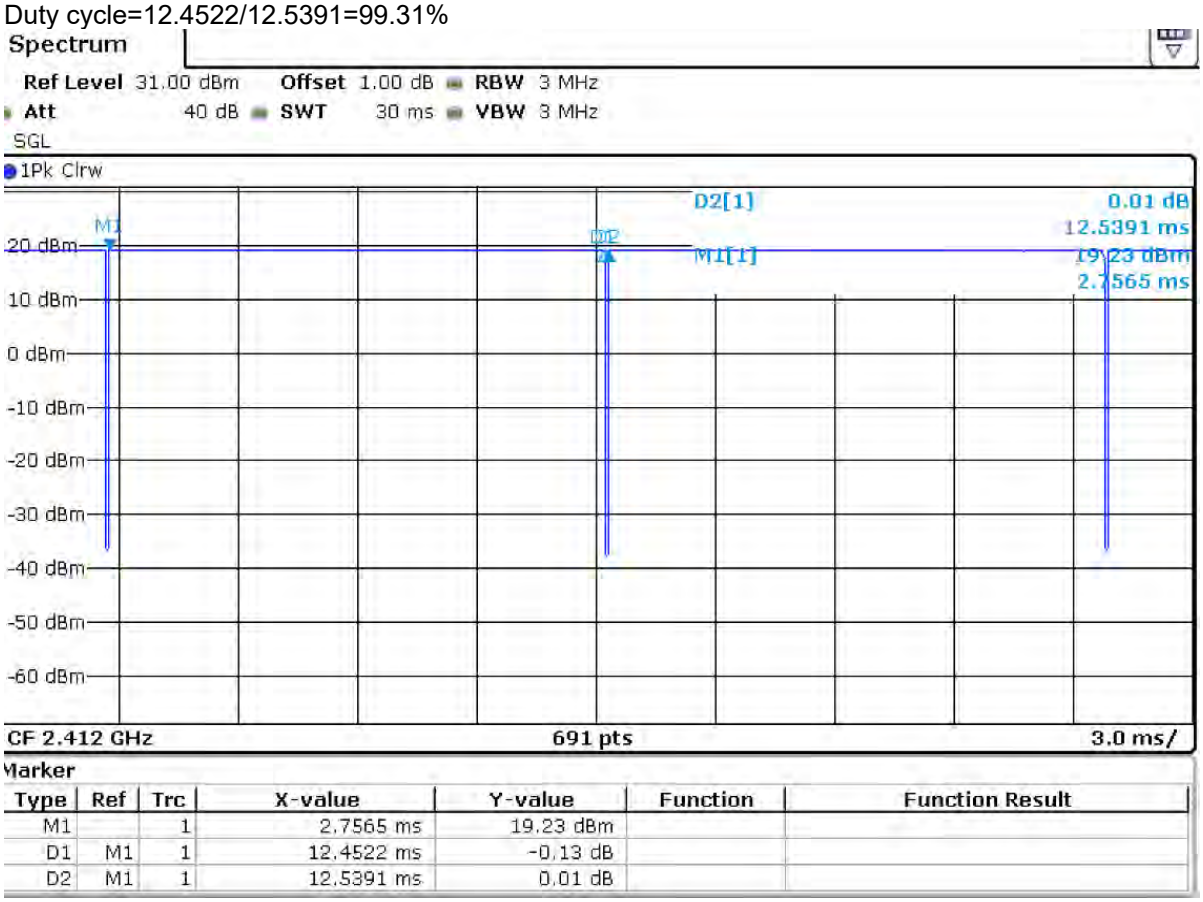
7.2.3 WiFi Test Configuration

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) Wi-Fi 2.4GHz MIMO 802.11b:

Duty cycle=12.4522/12.5391=99.31%



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.7565 ms	19.23 dBm		
D1	M1	1	12.4522 ms	-0.13 dB		
D2	M1	1	12.5391 ms	0.01 dB		

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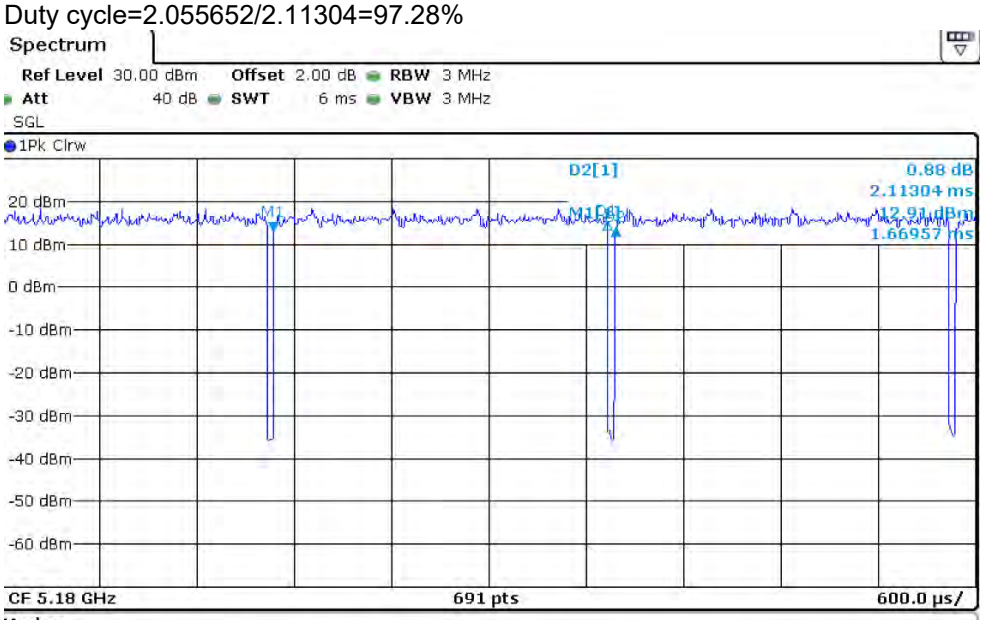
2) Wi-Fi 5GHz MIMO 802.11a:
Duty cycle=2.055652/2.11304=97.28%



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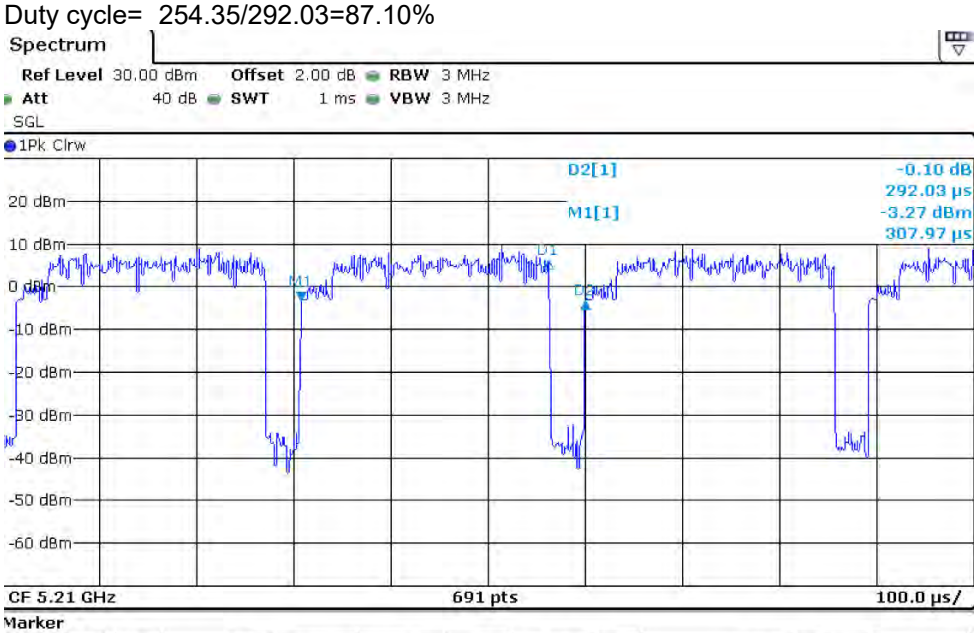
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.66957 ms	12.91 dBm		
D1	M1	1	2.05652 ms	2.54 dB		
D2	M1	1	2.11304 ms	0.88 dB		

3) Wi-Fi 5GHz MIMO 802.11ac 80M:
Duty cycle= 254.35/292.03=87.10%



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	307.97 µs	-3.27 dBm		
D1	M1	1	254.35 µs	9.41 dB		
D2	M1	1	292.03 µs	-0.10 dB		

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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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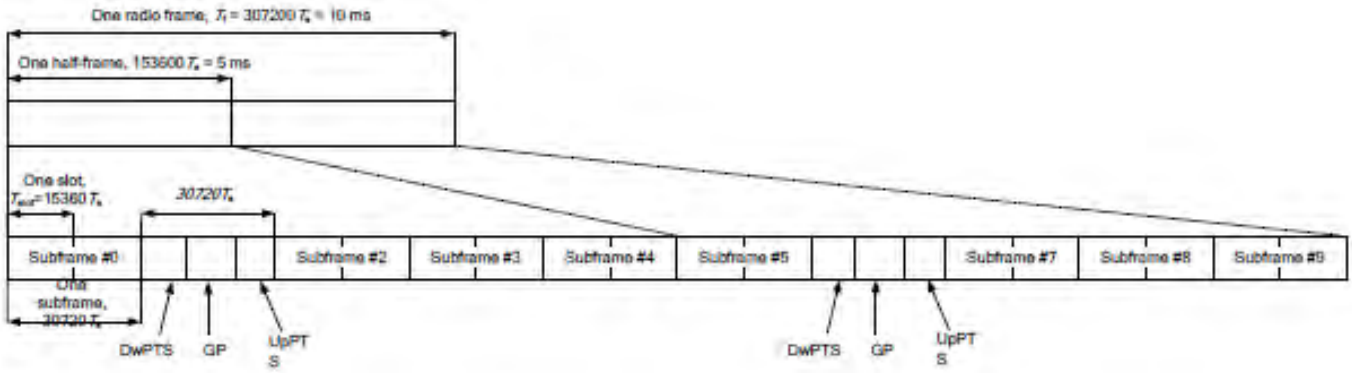
7.2.4 LTE Test Configuration

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	4384.Ts	5120.Ts
5	6592.Ts	4384.Ts	5120.Ts	20480.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
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3

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 > ½ 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 > ½ 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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7.2.5 NR Band Test Configuration

1. NR Band n5 support NSA mode. LTE+NR Band n5 operations are possible only with LTE under EN-DC mode and the operations are possible as following table:

Band/Antenna		LTE Band 7	
		Ant1	Ant5
n5	Ant1	/	√
	Ant4	√	√

2. The following NR Band n5 performed 20/15/10/5MHz base on DFT-s-OFDM/CP-OFDM QPSK/16QAM /64QAM/256QAM SCS 15kHz declared by manufacturer.
3. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
   a. For DFT-OFDM and CP-OFDM output power measurement reduction, according to 3GPP 38.101 maximum power reduction for power class 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KDB 941225 D05 procedure for other modulation output power for each RB allocation configuration is > not ½ dB higher than the same configuration in DFT-QPSK and the reported SAR for the DFT-QPSK configuration is ≤ 1.45 W/kg; CP-OFDM testing is not required.
   b. For DFT-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class 3, for PI/2 BPSK/16QAM/64QMA/256QAM and smaller bandwidth output power will spot check largest channel bandwidth worst RB configuration to ensure the PI/2 BPSK/16QAM/64QMA/256QAM and smaller bandwidth output power will not ½ dB higher than the same configuration in the largest supported bandwidth.
   c. SAR testing start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
   d. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
   e. QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
   f. PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, PI/2 BPSK/16QAM/64QAM/256QAM SAR testing are not required.
   g. Smaller bandwidth output power for each RB allocation configuration for this device will not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device

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4. 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 TS 38.101-1 Section 6.2.2 under Table 6.2.2 -1.

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	PI/2 BPSK	≤ 3.5[1]	≤ 1.2[1]	≤ 0.2[1]
		≤ 0.5[2]	≤ 0.5[2]	0[2]
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM	≤ 2.5		
	256 QAM	≤ 4.5		
CP-OFDM	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM	≤ 3.5		
	256 QAM	≤ 6.5		

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability powerBoosting-pi2BPSK and if the IE powerBoostPi2BPSK is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0 dB MPR is 26dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE powerBoostPi2BPSK is set to 0 and if more than 40 % of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

5. For FDD NR Band operation does not have the fixed UL/DL frame structure, but during the transmitting/ receiving it can be operated in the slot structure of 100% UL duty cycle, we are proposing the conservative way to evaluate SAR at 100% duty cycle. For the purpose of test NR Band standalone SAR, and also test SAR level at 100% TX duty cycle.

6. For 5G NR Sub6GHz SISO Mode, SAR Test plan as below:

1) For 5G NR NSA mode with the same UL EN_DC combination but different DL EN_DC combinations, eg: EN-DC configuration: UL DC_7A_n5 (UL two bands) with DL DC_7C_n5 (DL two bands)

a) The UL EN-DC configuration, including the Tx antenna configuration, RF path, the channel bandwidth and other operating parameters are the same.

b) The maximum output power, including tolerance, for the UL EN-DC configuration with DL two or more bands must be ≤ the same UL EN-DC configuration with DL two bands only to qualify for the SAR test exclusion.

7. For EN-DC SAR, as the existing SAR test system cannot test the multiple different frequency bands simultaneous Transmission SAR at the same time, we suggest that the conservative “max + max” multi-Tx and SAR scaling method can be used to evaluate the inter-band Uplink EN-DC SAR from standalone SAR test results of each LTE and NR EN-DC component band and the conservative “max + max” multi-Tx method to combine the scaled SAR value from each EN-DC component band as the inter-band Uplink EN-DC SAR. All Simultaneous Transmission Scenarios will be evaluated independently in the final SAR report.

8. When the reported SAR for and EN DC configuration is greater than 1.2 W/kg, EN DC SAR is also required for other NR based test channels.

9. EN DC SAR is also required for standalone NR configurations greater than 1.2 W/kg when scaled to the EN DC power level.

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8 Test Result

8.1 Measurement of RF conducted Power

Note: The detailed conducted power table can refer to Appendix E.

8.1.1 Conducted Power of GSM

Note:
1）. CMW500 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

8.1.2 Conducted Power of WCDMA

Note:
1) 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.

8.1.3 Conducted Power of LTE

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8.1.4 Conducted Power of Uplink & Downlink LTE CA

The following conducted power measurement results of downlink LTE carrier aggregation are provided to quantify downlink only carrier aggregation SAR test exclusion. 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 ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.
Power test equipment: Anritsu Radio Communication Analyzer MT8821C were used.

8.1.4.1 Conducted Power of uplink LTE CA

Note:
1) This device supports uplink carrier aggregation for LTE CA_7C, CA_38C with a maximum of two 20MHz component carriers.
2) According to FCC guidance, the output power with uplink CA active was measured for the high / middle / low channel configuration with the highest reported SAR for each exposure condition, the power was measured with wideband signal integration over both component carriers.
3) In applying the power measurement procedures of KDB 941225 D05A for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the subset in each row with the largest combination of frequency bands and CCs.
4) Maximum output power measurement is required for each UL CA configuration for the required test channels described in KDB 941225 D05.

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8.1.4.2 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 ¼ dB higher than the maximum output power measured when downlink carrier aggregation 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 V15.4.0. The detailed conducted power measurement results of downlink LTE CA are provided in the SAR report per 3GPP TS 36.521-1 V14.4.0. According to KDB 941225 D05A, the downlink only carrier aggregation conditions for this device can be excluded from SAR testing.

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

In applying the existing power measurement procedures for DL CA SAR test exclusion, the configurations that require power measurements are highlighted in the table as below:

1 Band / 2CC	2 Bands / 2CC	2 Bands / 3CC
CA_7C		CA_5A-7C
CA_7A-7A		CA_5A-7A-7A
	CA_5A-7A	CA_5A-7A-7A
	CA_7A-38A	
CA_38C		

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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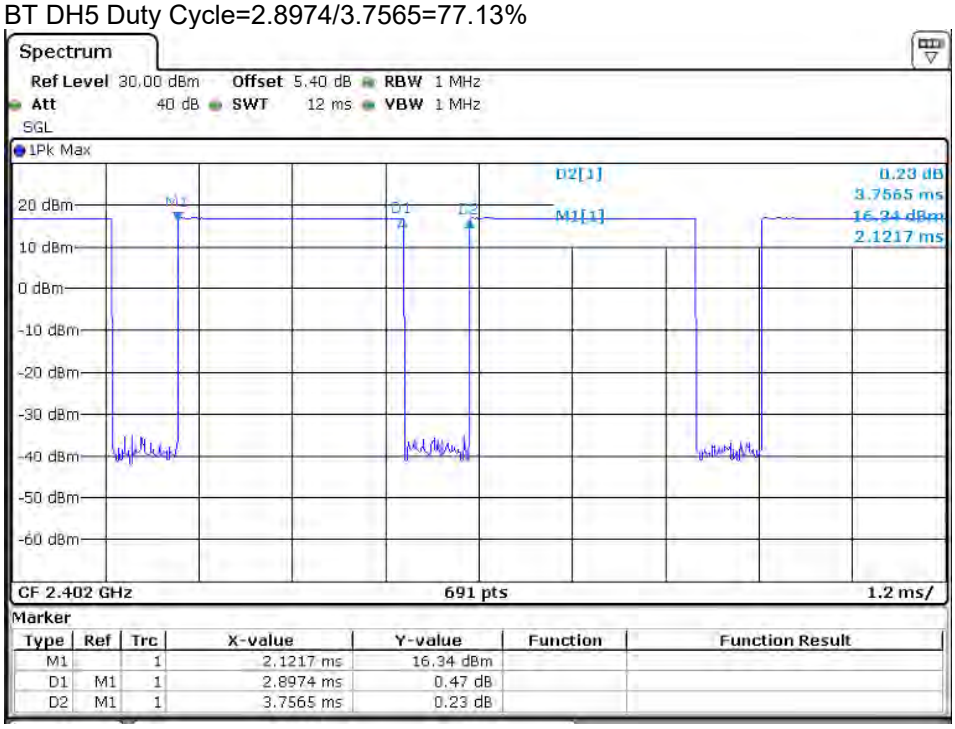
8.1.5 Conducted Power of WIFI

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.
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.

8.1.6 Conducted Power of BT

BT DH5 Duty Cycle=2.8974/3.7565=77.13%



Note:
1)The conducted power of BT is measured with RMS detector.

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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 2.4G MIMO	2.472	Head	18.0	63.10	5	19.84	3	N
		Body-worn	23.0	199.53	15	20.91	3	N
		Hotspot	18.0	63.10	10	9.92	3	N
Wi-Fi 5G MIMO	5.85	Head	19.0	79.43	5	38.42	3	N
		Body-worn	21.0	125.89	15	20.30	3	N
		Hotspot	19.0	79.43	10	19.21	3	N
Bluetooth Ant9	2.48	Head	18.5	70.79	5	22.30	3	N
		Body-worn	18.5	70.79	15	7.43	3	N
		Hotspot	18.5	70.79	10	11.15	3	N

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:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
• f(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

ANT1 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	0.099	0.07	33.46	34.00	1.132	0.112	22.1
Left tilted	GSM	190/836.6	1:8.3	0.058	0.03	33.46	34.00	1.132	0.066	22.1
Right cheek	GSM	190/836.6	1:8.3	0.153	0.05	33.46	34.00	1.132	**0.173**	22.1
Right tilted	GSM	190/836.6	1:8.3	0.068	0.04	33.46	34.00	1.132	0.077	22.1
Body worn Test data(Separate 15mm)										
Front side	GSM	190/836.6	1:8.3	0.125	-0.01	33.46	34.00	1.132	0.142	22.1
Back side	GSM	190/836.6	1:8.3	0.200	0.09	33.46	34.00	1.132	**0.226**	22.1
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	190/836.6	1:2.075	0.194	-0.03	27.36	28.00	1.159	0.225	22.1
Back side	GPRS 4TS	190/836.6	1:2.075	0.321	-0.03	27.36	28.00	1.159	**0.372**	22.1
Left side	GPRS 4TS	190/836.6	1:2.075	0.032	0.02	27.36	28.00	1.159	0.037	22.1
Right side	GPRS 4TS	190/836.6	1:2.075	0.108	0.03	27.36	28.00	1.159	0.125	22.1
Bottom side	GPRS 4TS	190/836.6	1:2.075	0.221	-0.19	27.36	28.00	1.159	0.256	22.1
ANT4 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	0.730	0.06	33.68	34.00	1.076	**0.786**	22.1
Left tilted	GSM	190/836.6	1:8.3	0.099	0.03	33.68	34.00	1.076	0.107	22.1
Right cheek	GSM	190/836.6	1:8.3	0.470	-0.09	33.68	34.00	1.076	0.506	22.1
Right tilted	GSM	190/836.6	1:8.3	0.085	0.02	33.68	34.00	1.076	0.091	22.1
Body worn Test data(Separate 15mm)										
Front side	GSM	190/836.6	1:8.3	0.178	0.02	33.68	34.00	1.076	0.192	22.1
Back side	GSM	190/836.6	1:8.3	0.222	-0.05	33.68	34.00	1.076	**0.239**	22.1
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	190/836.6	1:2.075	0.195	0.12	27.58	28.00	1.102	0.215	22.1
Back side	GPRS 4TS	190/836.6	1:2.075	0.234	-0.08	27.58	28.00	1.102	0.258	22.1
Left side	GPRS 4TS	190/836.6	1:2.075	0.442	-0.07	27.58	28.00	1.102	**0.487**	22.1
Top side	GPRS 4TS	190/836.6	1:2.075	0.016	0.02	27.58	28.00	1.102	0.018	22.1

Table 11： SAR of GSM850 for Head and Body

Note:

1) The maximum 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) Per KDB648474D04, 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 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.

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8.3.2 SAR Result of GSM1900

ANT1 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	0.027	0.08	29.94	30.50	1.138	**0.030**	22.3
Left tilted	GSM	661/1880	1:8.3	0.012	0.10	29.94	30.50	1.138	0.014	22.3
Right cheek	GSM	661/1880	1:8.3	0.008	-0.14	29.94	30.50	1.138	0.009	22.3
Right tilted	GSM	661/1880	1:8.3	0.001	0.03	29.94	30.50	1.138	0.001	22.3
Body worn Test data(Separate 15mm)										
Front side	GSM	661/1880	1:8.3	0.242	-0.12	29.94	30.50	1.138	0.275	22.3
Back side	GSM	661/1880	1:8.3	0.490	-0.19	29.94	30.50	1.138	**0.557**	22.3
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	661/1880	1:2.075	0.253	0.16	20.83	22.00	1.309	0.331	22.3
Back side	GPRS 4TS	661/1880	1:2.075	0.422	-0.15	20.83	22.00	1.309	0.552	22.3
Left side	GPRS 4TS	661/1880	1:2.075	0.008	-0.12	20.83	22.00	1.309	0.010	22.3
Right side	GPRS 4TS	661/1880	1:2.075	0.022	-0.07	20.83	22.00	1.309	0.029	22.3
Bottom side	GPRS 4TS	661/1880	1:2.075	0.666	-0.13	20.83	22.00	1.309	0.872	22.3
Bottom side	GPRS 4TS	512/1850.2	1:2.075	0.645	-0.16	20.85	22.00	1.303	0.841	22.3
Bottom side	GPRS 4TS	810/1909.8	1:2.075	0.699	-0.17	20.88	22.00	1.294	**0.905**	22.3
Test position	**Test mode**	**Test Ch./Freq.**	**Duty Cycle**	**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 with sensor on(Separate 0mm)										
Bottom side	GPRS 4TS	661/1880	1:2.075	2.080	-0.01	23.28	24.00	1.180	**2.455**	22.3
Bottom side-repeat	GPRS 4TS	661/1880	1:2.075	2.020	0.14	23.28	24.00	1.180	2.384	22.3
Bottom side	GPRS 4TS	512/1850.2	1:2.075	1.610	0.03	23.48	24.00	1.127	1.815	22.3
Bottom side	GPRS 4TS	810/1909.8	1:2.075	1.830	0.11	23.24	24.00	1.191	2.180	22.3
Product specific 10g SAR Test data with sensor off(Separate 15mm)										
Bottom side	GPRS 4TS	661/1880	1:2.075	0.180	-0.07	23.78	24.50	1.180	0.212	22.3

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ANT5 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	0.241	-0.17	27.53	28.50	1.250	0.301	22.3
Left tilted	GSM	661/1880	1:8.3	0.298	0.07	27.53	28.50	1.250	0.373	22.3
Right cheek	GSM	661/1880	1:8.3	0.682	-0.05	27.53	28.50	1.250	0.853	22.3
Right cheek	GSM	512/1850.2	1:8.3	0.602	0.10	27.39	28.50	1.291	0.777	22.3
Right cheek	GSM	810/1909.8	1:8.3	0.801	0.03	27.63	28.50	1.222	**0.979**	22.3
Right cheek-repeat	GSM	810/1909.8	1:8.3	0.800	0.10	27.63	28.50	1.222	0.977	22.3
Right tilted	GSM	661/1880	1:8.3	0.525	-0.15	27.53	28.50	1.250	0.656	22.3
Body worn Test data(Separate 15mm)										
Front side	GSM	661/1880	1:8.3	0.137	0.12	29.45	30.50	1.274	0.174	22.3
Back side	GSM	661/1880	1:8.3	0.165	-0.12	29.45	30.50	1.274	**0.210**	22.3
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	661/1880	1:2.075	0.102	0.12	21.21	22.50	1.346	0.137	22.3
Back side	GPRS 4TS	661/1880	1:2.075	0.146	0.07	21.21	22.50	1.346	**0.196**	22.3
Left side	GPRS 4TS	661/1880	1:2.075	0.092	0.19	21.21	22.50	1.346	0.124	22.3
Top side	GPRS 4TS	661/1880	1:2.075	0.150	-0.01	21.21	22.50	1.346	0.202	22.3

Table 12： SAR of GSM1900 for Head and Body and Product specific 10g SAR.

Note:

1) The maximum 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).

Test Position	Channel/ Frequency (MHz)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	3rd Repeated SAR (1g)
Bottom side 0mm (Ant1)	661/1880	2.080	2.020	1.030	N/A	N/A
Right cheek (Ant5)	810/1909.8	0.801	0.800	1.001	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

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8.3.3 SAR Result of WCDMA Band II

ANT1 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	0.069	0.08	23.75	25.00	1.334	0.092	22.3
Left tilted	RMC	9400/1880	1:1	0.057	0.05	23.75	25.00	1.334	0.076	22.3
Right cheek	RMC	9400/1880	1:1	0.079	0.04	23.75	25.00	1.334	**0.105**	22.3
Right tilted	RMC	9400/1880	1:1	0.051	-0.15	23.75	25.00	1.334	0.068	22.3
Body worn Test data(Separate 15mm)										
Front side	RMC	9400/1880	1:1	0.305	-0.07	22.37	23.50	1.297	0.396	22.3
Back side	RMC	9400/1880	1:1	0.695	0.06	22.37	23.50	1.297	0.902	22.3
Back side	RMC	9262/1852.4	1:1	0.793	0.08	22.52	23.50	1.253	**0.994**	22.3
Back side	RMC	9538/1907.6	1:1	0.750	-0.18	22.29	23.50	1.321	0.991	22.3
Hotspot Test data(Separate 10mm)										
Front side	RMC	9400/1880	1:1	0.151	0.17	16.62	18.00	1.374	0.207	22.3
Back side	RMC	9400/1880	1:1	0.298	0.13	16.62	18.00	1.374	0.409	22.3
Left side	RMC	9400/1880	1:1	0.046	0.06	16.62	18.00	1.374	0.063	22.3
Right side	RMC	9400/1880	1:1	0.034	-0.08	16.62	18.00	1.374	0.047	22.3
Bottom side	RMC	9400/1880	1:1	0.657	0.01	16.62	18.00	1.374	0.903	22.3
Bottom side	RMC	9262/1852.4	1:1	0.704	0.11	16.49	18.00	1.416	0.997	22.3
Bottom side	RMC	9538/1907.6	1:1	0.760	-0.08	16.54	18.00	1.400	**1.064**	22.3
Test position	**Test mode**	**Test Ch./Freq.**	**Duty Cycle**	**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 with sensor on(Separate 0mm)										
Back side	RMC	9400/1880	1:1	1.590	0.11	18.73	20.00	1.340	2.130	22.3
Back side	RMC	9262/1852.4	1:1	1.700	0.05	18.77	20.00	1.327	2.257	22.3
Back side	RMC	9538/1907.6	1:1	1.670	0.04	18.80	20.00	1.318	2.201	22.3
Bottom side	RMC	9400/1880	1:1	1.610	0.15	18.73	20.00	1.340	2.157	22.3
Bottom side	RMC	9538/1907.6	1:1	1.860	-0.07	18.80	20.00	1.318	**2.452**	22.3
Bottom side	RMC	9262/1852.4	1:1	1.530	-0.06	18.77	20.00	1.327	2.031	22.3
Product specific 10g SAR Test data with sensor off(Separate 15mm)										
Back side	RMC	9400/1880	1:1	0.402	-0.11	22.37	23.50	1.297	0.521	22.3
Bottom side	RMC	9400/1880	1:1	0.763	0.09	22.37	23.50	1.297	0.990	22.3

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ANT5 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	0.230	0.18	17.38	18.50	1.294	0.298	22.3
Left tilted	RMC	9400/1880	1:1	0.278	0.09	17.38	18.50	1.294	0.360	22.3
Right cheek	RMC	9400/1880	1:1	0.699	0.10	17.38	18.50	1.294	**0.905**	22.3
Right tilted	RMC	9400/1880	1:1	0.360	-0.03	17.38	18.50	1.294	0.466	22.3
Right cheek	RMC	9262/1852.4	1:1	0.621	-0.09	17.44	18.50	1.276	0.793	22.3
Right cheek	RMC	9538/1907.6	1:1	0.650	-0.09	17.32	18.50	1.312	0.853	22.3
Body worn Test data(Separate 15mm)										
Front side	RMC	9400/1880	1:1	0.232	0.05	22.95	24.00	1.274	0.295	22.3
Back side	RMC	9400/1880	1:1	0.383	0.02	22.95	24.00	1.274	**0.488**	22.3
Hotspot Test data(Separate 10mm)										
Front side	RMC	9400/1880	1:1	0.097	0.10	17.38	18.50	1.294	0.126	22.3
Back side	RMC	9400/1880	1:1	0.175	0.01	17.38	18.50	1.294	0.226	22.3
Left side	RMC	9400/1880	1:1	0.074	0.15	17.38	18.50	1.294	0.096	22.3
Top side	RMC	9400/1880	1:1	0.198	0.03	17.38	18.50	1.294	**0.256**	22.3

Table 13： SAR of WCDMA Band II for Head and Body and Product specific 10g SAR.

Note:

1) The maximum 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

ANT1 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	0.107	0.02	23.66	25.00	1.361	0.146	22.2
Left tilted	RMC	1412/1732.4	1:1	0.079	-0.16	23.66	25.00	1.361	0.108	22.2
Right cheek	RMC	1412/1732.4	1:1	0.142	-0.04	23.66	25.00	1.361	**0.193**	22.2
Right tilted	RMC	1412/1732.4	1:1	0.075	0.01	23.66	25.00	1.361	0.102	22.2
Body worn Test data(Separate 15mm)										
Front side	RMC	1412/1732.4	1:1	0.386	-0.12	22.06	23.50	1.393	0.538	22.2
Back side	RMC	1412/1732.4	1:1	0.580	-0.10	22.06	23.50	1.393	0.808	22.2
Back side	RMC	1312/1712.4	1:1	0.529	0.06	21.95	23.50	1.429	0.756	22.2
Back side	RMC	1513/1752.6	1:1	0.724	0.10	22.17	23.50	1.358	**0.983**	22.2
Hotspot Test data(Separate 10mm)										
Front side	RMC	1412/1732.4	1:1	0.363	0.09	18.61	20.00	1.377	0.500	22.2
Back side	RMC	1412/1732.4	1:1	0.550	0.07	18.61	20.00	1.377	0.757	22.2
Left side	RMC	1412/1732.4	1:1	0.051	0.03	18.61	20.00	1.377	0.070	22.2
Right side	RMC	1412/1732.4	1:1	0.067	0.04	18.61	20.00	1.377	0.092	22.2
Bottom side	RMC	1412/1732.4	1:1	0.694	-0.02	18.61	20.00	1.377	0.956	22.2
Bottom side	RMC	1312/1712.4	1:1	0.538	-0.03	18.57	20.00	1.390	0.748	22.2
Bottom side	RMC	1513/1752.6	1:1	0.807	0.02	18.77	20.00	1.327	**1.071**	22.2
Bottom side-repeat	RMC	1513/1752.6	1:1	0.785	-0.04	18.77	20.00	1.327	1.042	22.2
Test position	**Test mode**	**Test Ch./Freq.**	**Duty Cycle**	**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 with sensor on(Separate 0mm)										
Back side	RMC	1412/1732.4	1:1	1.700	0.00	18.61	20.00	1.377	2.341	22.2
Back side	RMC	1312/1712.4	1:1	1.190	0.11	18.57	20.00	1.390	1.654	22.2
Back side	RMC	1513/1752.6	1:1	1.780	0.02	18.77	20.00	1.327	**2.363**	22.2
Bottom side	RMC	1412/1732.4	1:1	1.440	-0.01	18.61	20.00	1.377	1.983	22.2
Product specific 10g SAR Test data with sensor off(Separate 15mm)										
Back side	RMC	1412/1732.4	1:1	0.486	-0.14	22.06	23.50	1.393	0.677	22.3
Bottom side	RMC	1412/1732.4	1:1	0.696	0.16	22.06	23.50	1.393	0.970	22.3

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ANT5 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	0.042	-0.19	17.61	18.50	1.227	0.052	22.2
Left tilted	RMC	1412/1732.4	1:1	0.046	-0.02	17.61	18.50	1.227	0.056	22.2
Right cheek	RMC	1412/1732.4	1:1	0.151	-0.03	17.61	18.50	1.227	**0.185**	22.2
Right tilted	RMC	1412/1732.4	1:1	0.066	-0.06	17.61	18.50	1.227	0.081	22.2
Body worn Test data(Separate 15mm)										
Front side	RMC	1412/1732.4	1:1	0.047	0.07	23.62	24.50	1.225	0.058	22.2
Back side	RMC	1412/1732.4	1:1	0.071	0.13	23.62	24.50	1.225	**0.087**	22.2
Hotspot Test data(Separate 10mm)										
Front side	RMC	1412/1732.4	1:1	0.022	-0.08	17.61	18.50	1.227	0.027	22.2
Back side	RMC	1412/1732.4	1:1	0.037	0.03	17.61	18.50	1.227	**0.045**	22.2
Left side	RMC	1412/1732.4	1:1	0.017	0.14	17.61	18.50	1.227	0.021	22.2
Top side	RMC	1412/1732.4	1:1	0.032	-0.02	17.61	18.50	1.227	0.039	22.2

Table 14： SAR of WCDMA Band IV for Head and Body and Product specific 10g SAR.

Note:

1) The maximum 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).

Test Position	Channel/ Frequency (MHz)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	3rd Repeated SAR (1g)
Bottom side 0mm (Ant1)	1513/1752.6	0.807	0.785	1.028	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

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8.3.5 SAR Result of WCDMA Band V

ANT1 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	0.095	-0.02	23.55	25.00	1.396	0.132	22.1
Left tilted	RMC	4182/836.4	1:1	0.065	-0.02	23.55	25.00	1.396	0.091	22.1
Right cheek	RMC	4182/836.4	1:1	0.165	0.02	23.55	25.00	1.396	**0.230**	22.1
Right tilted	RMC	4182/836.4	1:1	0.071	0.03	23.55	25.00	1.396	0.100	22.1
Body worn Test data(Separate 15mm)										
Front side	RMC	4182/836.4	1:1	0.129	0.03	23.55	25.00	1.396	0.180	22.1
Back side	RMC	4182/836.4	1:1	0.171	-0.03	23.55	25.00	1.396	**0.239**	22.1
Hotspot Test data(Separate 10mm)										
Front side	RMC	4182/836.4	1:1	0.318	0.03	23.55	25.00	1.396	0.444	22.1
Back side	RMC	4182/836.4	1:1	0.435	0.06	23.55	25.00	1.396	**0.607**	22.1
Left side	RMC	4182/836.4	1:1	0.038	0.02	23.55	25.00	1.396	0.053	22.1
Right side	RMC	4182/836.4	1:1	0.148	0.03	23.55	25.00	1.396	0.207	22.1
Bottom side	RMC	4182/836.4	1:1	0.283	0.02	23.55	25.00	1.396	0.395	22.1
ANT4 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	0.260	0.08	23.36	24.50	1.300	0.338	22.1
Left tilted	RMC	4182/836.4	1:1	0.012	0.03	23.36	24.50	1.300	0.016	22.1
Right cheek	RMC	4182/836.4	1:1	0.545	-0.07	23.36	24.50	1.300	**0.709**	22.1
Right tilted	RMC	4182/836.4	1:1	0.112	-0.03	23.36	24.50	1.300	0.146	22.1
Body worn Test data(Separate 15mm)										
Front side	RMC	4182/836.4	1:1	0.156	0.09	23.36	24.50	1.300	0.203	22.1
Back side	RMC	4182/836.4	1:1	0.215	-0.06	23.36	24.50	1.300	**0.280**	22.1
Hotspot Test data(Separate 10mm)										
Front side	RMC	4182/836.4	1:1	0.244	-0.03	23.36	24.50	1.300	0.317	22.1
Back side	RMC	4182/836.4	1:1	0.320	-0.02	23.36	24.50	1.300	0.416	22.1
Left side	RMC	4182/836.4	1:1	0.541	-0.14	23.36	24.50	1.300	**0.703**	22.1
Top side	RMC	4182/836.4	1:1	0.027	-0.03	23.36	24.50	1.300	0.035	22.1

Table 15： SAR of WCDMA Band V for Head and Body.

Note:

1) The maximum 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) Per KDB648474D04, 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 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.

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8.3.6 SAR Result of LTE Band 2

Ant1 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	19100/1900	1:1	0.085	-0.06	24.30	25.00	1.175	0.100	22.3
Left tilted	20	QPSK 1RB_99	19100/1900	1:1	0.059	0.11	24.30	25.00	1.175	0.069	22.3
Right cheek	20	QPSK 1RB_99	19100/1900	1:1	0.089	-0.02	24.30	25.00	1.175	**0.104**	22.3
Right tilted	20	QPSK 1RB_99	19100/1900	1:1	0.044	0.15	24.30	25.00	1.175	0.052	22.3
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_50	19100/1900	1:1	0.078	0.12	23.39	24.00	1.151	0.090	22.3
Left tilted	20	QPSK 50RB_50	19100/1900	1:1	0.052	0.09	23.39	24.00	1.151	0.060	22.3
Right cheek	20	QPSK 50RB_50	19100/1900	1:1	0.067	0.18	23.39	24.00	1.151	0.077	22.3
Right tilted	20	QPSK 50RB_50	19100/1900	1:1	0.061	0.13	23.39	24.00	1.151	0.070	22.3
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_0	18700/1860	1:1	0.403	-0.09	22.60	23.50	1.230	0.496	22.3
Back side	20	QPSK 1RB_0	18700/1860	1:1	0.808	0.11	22.60	23.50	1.230	**0.994**	22.3
Back side-repeat	20	QPSK 1RB_0	18700/1860	1:1	0.801	0.01	22.60	23.50	1.230	0.985	22.3
Back side	20	QPSK 1RB_0	18900/1880	1:1	0.557	0.19	22.54	23.50	1.247	0.695	22.3
Back side	20	QPSK 1RB_99	19100/1900	1:1	0.629	0.02	22.45	23.50	1.274	0.801	22.3
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_50	18700/1860	1:1	0.409	0.02	22.38	23.50	1.294	0.529	22.3
Back side	20	QPSK 50RB_50	18700/1860	1:1	0.503	-0.02	22.38	23.50	1.294	0.651	22.3
Body worn Test data (Separate 15mm 100%RB)											
Back side	20	QPSK 100RB_0	18700/1860	1:1	0.509	0.11	22.36	23.50	1.300	0.662	22.3
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	18700/1860	1:1	0.202	-0.07	17.12	17.50	1.091	0.220	22.3
Back side	20	QPSK 1RB_99	18700/1860	1:1	0.318	-0.18	17.12	17.50	1.091	0.347	22.3
Left side	20	QPSK 1RB_99	18700/1860	1:1	0.025	0.09	17.12	17.50	1.091	0.027	22.3
Right side	20	QPSK 1RB_99	18700/1860	1:1	0.015	0.15	17.12	17.50	1.091	0.016	22.3
Bottom side	20	QPSK 1RB_99	18700/1860	1:1	0.599	-0.09	17.12	17.50	1.091	0.654	22.3
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_50	18900/1880	1:1	0.181	-0.16	16.69	17.50	1.205	0.218	22.3
Back side	20	QPSK 50RB_50	18900/1880	1:1	0.290	-0.01	16.69	17.50	1.205	0.349	22.3
Left side	20	QPSK 50RB_50	18900/1880	1:1	0.021	-0.13	16.69	17.50	1.205	0.025	22.3
Right side	20	QPSK 50RB_50	18900/1880	1:1	0.011	0.06	16.69	17.50	1.205	0.013	22.3
Bottom side	20	QPSK 50RB_50	18900/1880	1:1	0.666	-0.14	16.69	17.50	1.205	0.803	22.3
Bottom side	20	QPSK 50RB_25	18700/1860	1:1	0.695	-0.04	16.53	17.50	1.250	**0.869**	22.3
Bottom side	20	QPSK 50RB_0	19100/1900	1:1	0.625	0.16	16.57	17.50	1.239	0.774	22.3
Hotspot Test data (Separate 10mm 100%RB)											
Bottom side	20	QPSK 100RB_0	18700/1860	1:1	0.550	0.11	16.63	17.50	1.222	0.672	22.3
Test position	**BW.**	**Test mode**	**Test Ch./Freq.**	**Duty Cycle**	**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 with sensor on(Separate 0mm 1RB)											
Back side	20	QPSK 1RB_99	18900/1880	1:1	2.050	0.11	20.40	21.00	1.148	2.354	22.3
Back side	20	QPSK 1RB_99	18700/1860	1:1	2.090	0.09	20.26	21.00	1.186	2.478	22.3
Back side	20	QPSK 1RB_99	19100/1900	1:1	2.010	-0.13	20.39	21.00	1.151	2.313	22.3
Bottom side	20	QPSK 1RB_99	18900/1880	1:1	2.260	-0.07	20.40	21.00	1.148	2.595	22.3
Bottom side	20	QPSK 1RB_99	18700/1860	1:1	1.550	0.17	20.26	21.00	1.186	1.838	22.3
Bottom side	20	QPSK 1RB_99	19100/1900	1:1	1.890	0.03	20.39	21.00	1.151	2.175	22.3
Product specific 10g SAR Test data with sensor on(Separate 0mm 50%RB)											
Back side	20	QPSK 50RB_25	18900/1880	1:1	2.010	0.03	20.49	21.00	1.125	2.260	22.3
Back side	20	QPSK 50RB_50	18700/1860	1:1	2.050	-0.09	20.31	21.00	1.172	2.403	22.3
Back side	20	QPSK 50RB_50	19100/1900	1:1	2.040	0.00	20.29	21.00	1.178	2.402	22.3
Bottom side	20	QPSK 50RB_25	18900/1880	1:1	2.380	-0.04	20.49	21.00	1.125	**2.677**	22.3
Bottom side-repeat	20	QPSK 50RB_25	18900/1880	1:1	2.290	0.13	20.49	21.00	1.125	2.575	22.3
Bottom side	20	QPSK 50RB_50	18700/1860	1:1	1.820	0.01	20.31	21.00	1.172	2.133	22.3
Bottom side	20	QPSK 50RB_50	19100/1900	1:1	2.010	-0.13	20.29	21.00	1.178	2.367	22.3
Product specific 10g SAR Test data with sensor on(Separate 0mm 100%RB)											
Back side	20	QPSK 100RB_0	18900/1880	1:1	1.970	-0.07	20.43	21.00	1.140	2.246	22.3
Bottom side	20	QPSK 100RB_0	18900/1880	1:1	2.160	0.15	20.43	21.00	1.140	2.463	22.3

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Product specific 10g SAR Test data with sensor off(Separate 15mm 1RB)											
Back side	20	QPSK 1RB_0	18700/1860	1:1	0.451	0.11	22.60	23.50	1.230	0.555	22.3
Bottom side	20	QPSK 1RB_0	18700/1860	1:1	0.724	0.07	22.60	23.50	1.230	0.891	22.3
Product specific 10g SAR Test data with sensor off(Separate 15mm 50%RB)											
Back side	20	QPSK 50RB_50	18700/1860	1:1	0.369	-0.05	22.38	23.50	1.294	0.478	22.3
Bottom side	20	QPSK 50RB_50	18700/1860	1:1	0.603	-0.14	22.38	23.50	1.294	0.780	22.3
Ant5 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	18900/1880	1:1	0.240	0.03	18.90	19.00	1.023	0.246	22.3
Left tilted	20	QPSK 1RB_99	18900/1880	1:1	0.258	0.10	18.90	19.00	1.023	0.264	22.3
Right cheek	20	QPSK 1RB_99	18900/1880	1:1	0.486	0.06	18.90	19.00	1.023	0.497	22.3
Right tilted	20	QPSK 1RB_99	18900/1880	1:1	0.370	0.12	18.90	19.00	1.023	0.379	22.3
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_0	18900/1880	1:1	0.202	0.19	18.55	19.00	1.109	0.224	22.3
Left tilted	20	QPSK 50RB_0	18900/1880	1:1	0.275	-0.02	18.55	19.00	1.109	0.305	22.3
Right cheek	20	QPSK 50RB_0	18900/1880	1:1	0.708	0.18	18.55	19.00	1.109	**0.785**	22.3
Right tilted	20	QPSK 50RB_0	18900/1880	1:1	0.386	-0.18	18.55	19.00	1.109	0.428	22.3
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_0	18900/1880	1:1	0.189	-0.15	23.95	24.50	1.000	0.189	22.3
Back side	20	QPSK 1RB_0	18900/1880	1:1	0.369	0.19	23.95	24.50	1.000	**0.369**	22.3
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_50	18900/1880	1:1	0.162	-0.07	22.94	23.50	1.138	0.184	22.3
Back side	20	QPSK 50RB_50	18900/1880	1:1	0.214	0.09	22.94	23.50	1.138	0.243	22.3
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	18900/1880	1:1	0.087	-0.06	18.90	19.00	1.023	0.089	22.3
Back side	20	QPSK 1RB_99	18900/1880	1:1	0.106	0.03	18.90	19.00	1.023	0.108	22.3
Left side	20	QPSK 1RB_99	18900/1880	1:1	0.085	0.15	18.90	19.00	1.023	0.087	22.3
Top side	20	QPSK 1RB_99	18900/1880	1:1	0.187	0.10	18.90	19.00	1.023	0.191	22.3
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	18900/1880	1:1	0.091	0.01	18.55	19.00	1.109	0.101	22.3
Back side	20	QPSK 50RB_0	18900/1880	1:1	0.182	0.04	18.55	19.00	1.109	0.202	22.3
Left side	20	QPSK 50RB_0	18900/1880	1:1	0.092	0.02	18.55	19.00	1.109	0.102	22.3
Top side	20	QPSK 50RB_0	18900/1880	1:1	0.216	-0.02	18.55	19.00	1.109	**0.240**	22.3

Table 16：SAR of LTE Band 2 for Head and Body and Product specific 10g SAR.

Note:

1) The maximum 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).

Test Position	**Channel/ Frequency (MHz)**	**Measured SAR (1g)**	**1st Repeated SAR (1g)**	**Ratio**	**2nd Repeated SAR (1g)**	**3rd Repeated SAR (1g)**
Back side 15mm(Ant1)	18700/1860	0.808	0.801	1.009	N/A	N/A
Bottom side 0mm(Ant1)	18900/1880	2.380	2.290	1.039	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

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8.3.7 SAR Result of LTE Band 4

Ant1 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	20300/1745	1:1	0.110	0.18	24.12	25.00	1.225	0.135	22.2
Left tilted	20	QPSK 1RB_0	20300/1745	1:1	0.076	-0.02	24.12	25.00	1.225	0.093	22.2
Right cheek	20	QPSK 1RB_0	20300/1745	1:1	0.128	0.06	24.12	25.00	1.225	**0.157**	22.2
Right tilted	20	QPSK 1RB_0	20300/1745	1:1	0.053	0.14	24.12	25.00	1.225	0.065	22.2
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_50	20050/1720	1:1	0.086	-0.18	23.25	24.00	1.189	0.102	22.2
Left tilted	20	QPSK 50RB_50	20050/1720	1:1	0.065	-0.07	23.25	24.00	1.189	0.077	22.2
Right cheek	20	QPSK 50RB_50	20050/1720	1:1	0.112	0.08	23.25	24.00	1.189	0.133	22.2
Right tilted	20	QPSK 50RB_50	20050/1720	1:1	0.054	0.10	23.25	24.00	1.189	0.064	22.2
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_0	20300/1745	1:1	0.512	0.02	23.22	24.00	1.197	0.613	22.2
Back side	20	QPSK 1RB_0	20300/1745	1:1	0.735	0.04	23.22	24.00	1.197	**0.880**	22.2
Back side	20	QPSK 1RB_99	20050/1720	1:1	0.695	-0.17	23.00	24.00	1.259	0.875	22.2
Back side	20	QPSK 1RB_50	20175/1732.5	1:1	0.709	0.15	23.08	24.00	1.236	0.876	22.2
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_0	20175/1732.5	1:1	0.498	0.00	23.04	24.00	1.247	0.621	22.2
Back side	20	QPSK 50RB_0	20175/1732.5	1:1	0.705	-0.14	23.04	24.00	1.247	0.879	22.2
Back side	20	QPSK 50RB_50	20050/1720	1:1	0.700	0.07	23.02	24.00	1.253	0.877	22.2
Back side	20	QPSK 50RB_25	20300/1745	1:1	0.701	0.06	23.02	24.00	1.253	0.878	22.2
Body worn Test data (Separate 15mm 100%RB)											
Back side	20	QPSK 100RB_0	20175/1732.5	1:1	0.703	-0.18	23.05	24.00	1.245	0.875	22.2
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_50	20175/1732.5	1:1	0.257	0.01	17.66	18.50	1.213	0.312	22.2
Back side	20	QPSK 1RB_50	20175/1732.5	1:1	0.376	0.17	17.66	18.50	1.213	0.456	22.2
Left side	20	QPSK 1RB_50	20175/1732.5	1:1	0.021	-0.14	17.66	18.50	1.213	0.025	22.2
Right side	20	QPSK 1RB_50	20175/1732.5	1:1	0.013	0.16	17.66	18.50	1.213	0.016	22.2
Bottom side	20	QPSK 1RB_50	20175/1732.5	1:1	0.582	0.17	17.66	18.50	1.213	0.706	22.2
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	20300/1745	1:1	0.268	0.19	17.36	18.50	1.300	0.348	22.2
Back side	20	QPSK 50RB_0	20300/1745	1:1	0.406	0.00	17.36	18.50	1.300	0.528	22.2
Left side	20	QPSK 50RB_0	20300/1745	1:1	0.032	0.14	17.36	18.50	1.300	0.042	22.2
Right side	20	QPSK 50RB_0	20300/1745	1:1	0.020	0.12	17.36	18.50	1.300	0.026	22.2
Bottom side	20	QPSK 50RB_0	20300/1745	1:1	0.666	0.01	17.36	18.50	1.300	**0.866**	22.2
Bottom side	20	QPSK 50RB_50	20050/1720	1:1	0.459	0.05	17.25	18.50	1.334	0.612	22.2
Bottom side	20	QPSK 50RB_0	20175/1732.5	1:1	0.568	0.11	17.27	18.50	1.327	0.754	22.2
Hotspot Test data (Separate 10mm 100%RB)											
Bottom side	20	QPSK 100RB_0	20300/1745	1:1	0.653	0.15	17.29	18.50	1.321	0.863	22.2
Test position	**BW.**	**Test mode**	**Test Ch./Freq.**	**Duty Cycle**	**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 with sensor on(Separate 0mm 1RB)											
Front side	20	QPSK 1RB_0	20300/1745	1:1	1.380	-0.06	20.24	21.00	1.191	1.644	22.2
Back side	20	QPSK 1RB_0	20300/1745	1:1	2.040	0.07	20.24	21.00	1.191	2.430	22.2
Back side	20	QPSK 1RB_50	20175/1732.5	1:1	2.020	0.08	20.12	21.00	1.225	2.474	22.2
Back side	20	QPSK 1RB_99	20050/1720	1:1	1.510	-0.10	20.11	21.00	1.227	1.853	22.2
Bottom side	20	QPSK 1RB_0	20300/1745	1:1	2.100	-0.11	20.24	21.00	1.191	2.502	22.2
Bottom side	20	QPSK 1RB_50	20175/1732.5	1:1	1.650	0.00	20.12	21.00	1.225	2.021	22.2
Bottom side	20	QPSK 1RB_99	20050/1720	1:1	1.250	-0.08	20.11	21.00	1.227	1.534	22.2
Product specific 10g SAR Test data with sensor on(Separate 0mm 50%RB)											
Front side	20	QPSK 50RB_25	20300/1745	1:1	1.500	-0.11	20.22	21.00	1.197	1.795	22.2
Back side	20	QPSK 50RB_25	20300/1745	1:1	2.140	0.01	20.22	21.00	1.197	**2.561**	22.2
Back side-repeat	20	QPSK 50RB_25	20300/1745	1:1	2.080	-0.16	20.22	21.00	1.197	2.489	22.2
Back side	20	QPSK 50RB_50	20050/1720	1:1	1.570	0.04	20.20	21.00	1.202	1.888	22.2
Back side	20	QPSK 50RB_25	20175/1732.5	1:1	2.090	0.06	20.14	21.00	1.219	2.548	22.2
Bottom side	20	QPSK 50RB_25	20300/1745	1:1	2.110	-0.02	20.22	21.00	1.197	2.525	22.2
Bottom side	20	QPSK 50RB_50	20050/1720	1:1	1.320	-0.05	20.20	21.00	1.202	1.587	22.2
Bottom side	20	QPSK 50RB_0	20175/1732.5	1:1	1.680	0.05	20.14	21.00	1.219	2.048	22.2

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Product specific 10g SAR Test data with sensor on(Separate 0mm 100%RB)											
Back side	20	QPSK 100RB_0	20300/1745	1:1	1.990	-0.06	20.16	21.00	1.213	2.415	22.2
Bottom side	20	QPSK 100RB_0	20300/1745	1:1	2.050	0.11	20.16	21.00	1.213	2.487	22.2
Product specific 10g SAR Test data with sensor off(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_0	20300/1745	1:1	0.342	0.14	23.22	24.00	1.197	0.409	22.3
Back side	20	QPSK 1RB_0	20300/1745	1:1	0.493	0.17	23.22	24.00	1.197	0.590	22.3
Bottom side	20	QPSK 1RB_0	20300/1745	1:1	0.694	0.08	23.22	24.00	1.197	0.831	22.3
Product specific 10g SAR Test data with sensor off(Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_0	20175/1732.5	1:1	0.262	-0.03	23.04	24.00	1.247	0.327	22.3
Back side	20	QPSK 50RB_0	20175/1732.5	1:1	0.381	0.11	23.04	24.00	1.247	0.475	22.3
Bottom side	20	QPSK 50RB_0	20175/1732.5	1:1	0.575	-0.16	23.04	24.00	1.247	0.717	22.3
Ant5 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	20175/1732.5	1:1	0.041	0.01	19.05	19.30	1.059	0.043	22.2
Left tilted	20	QPSK 1RB_0	20175/1732.5	1:1	0.044	0.07	19.05	19.30	1.059	0.047	22.2
Right cheek	20	QPSK 1RB_0	20175/1732.5	1:1	0.122	-0.19	19.05	19.30	1.059	0.129	22.2
Right tilted	20	QPSK 1RB_0	20175/1732.5	1:1	0.076	0.13	19.05	19.30	1.059	0.081	22.2
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_0	20175/1732.5	1:1	0.043	-0.15	18.57	19.30	1.183	0.051	22.2
Left tilted	20	QPSK 50RB_0	20175/1732.5	1:1	0.046	0.14	18.57	19.30	1.183	0.054	22.2
Right cheek	20	QPSK 50RB_0	20175/1732.5	1:1	0.144	0.08	18.57	19.30	1.183	**0.170**	22.2
Right tilted	20	QPSK 50RB_0	20175/1732.5	1:1	0.084	-0.14	18.57	19.30	1.183	0.099	22.2
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_0	20175/1732.5	1:1	0.013	0.04	24.15	24.80	1.161	0.015	22.2
Back side	20	QPSK 1RB_0	20175/1732.5	1:1	0.066	0.04	24.15	24.80	1.161	**0.077**	22.2
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_0	20175/1732.5	1:1	0.008	-0.02	23.31	23.80	1.119	0.009	22.2
Back side	20	QPSK 50RB_0	20175/1732.5	1:1	0.044	0.17	23.31	23.80	1.119	0.049	22.2
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_0	20175/1732.5	1:1	0.015	0.13	19.05	19.30	1.059	0.016	22.2
Back side	20	QPSK 1RB_0	20175/1732.5	1:1	0.034	-0.15	19.05	19.30	1.059	0.036	22.2
Left side	20	QPSK 1RB_0	20175/1732.5	1:1	0.009	0.19	19.05	19.30	1.059	0.010	22.2
Top side	20	QPSK 1RB_0	20175/1732.5	1:1	0.028	0.13	19.05	19.30	1.059	0.030	22.2
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	20175/1732.5	1:1	0.011	-0.02	18.57	19.30	1.183	0.013	22.2
Back side	20	QPSK 50RB_0	20175/1732.5	1:1	0.037	0.10	18.57	19.30	1.183	**0.044**	22.2
Left side	20	QPSK 50RB_0	20175/1732.5	1:1	0.010	0.06	18.57	19.30	1.183	0.012	22.2
Top side	20	QPSK 50RB_0	20175/1732.5	1:1	0.036	0.01	18.57	19.30	1.183	0.042	22.2

Table 17：SAR of LTE Band 4 for Head and Body and Product specific 10g SAR.

Note:

1) The maximum 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).

Test Position	**Channel/ Frequency (MHz)**	**Measured SAR (1g)**	**1st Repeated SAR (1g)**	**Ratio**	**2nd Repeated SAR (1g)**	**3rd Repeated SAR (1g)**
Back side 0mm(Ant1)	20300/1745	2.140	2.080	1.029	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

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8.3.8 SAR Result of LTE Band 5

Ant1 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	10	QPSK 1RB_25	20600/844	1:1	0.100	-0.04	23.93	25.00	1.279	0.128	22.1
Left tilted	10	QPSK 1RB_25	20600/844	1:1	0.071	0.07	23.93	25.00	1.279	0.091	22.1
Right cheek	10	QPSK 1RB_25	20600/844	1:1	0.121	0.08	23.93	25.00	1.279	**0.155**	22.1
Right tilted	10	QPSK 1RB_25	20600/844	1:1	0.079	-0.11	23.93	25.00	1.279	0.101	22.1
Head Test data(50%RB)											
Left cheek	10	QPSK 25RB_25	20600/844	1:1	0.087	0.11	22.98	24.00	1.265	0.110	22.1
Left tilted	10	QPSK 25RB_25	20600/844	1:1	0.065	0.01	22.98	24.00	1.265	0.082	22.1
Right cheek	10	QPSK 25RB_25	20600/844	1:1	0.116	0.04	22.98	24.00	1.265	0.147	22.1
Right tilted	10	QPSK 25RB_25	20600/844	1:1	0.068	-0.14	22.98	24.00	1.265	0.086	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	10	QPSK 1RB_25	20600/844	1:1	0.124	-0.07	23.93	25.00	1.279	0.159	22.1
Back side	10	QPSK 1RB_25	20600/844	1:1	0.148	-0.01	23.93	25.00	1.279	**0.189**	22.1
Body worn Test data (Separate 15mm 50%RB)											
Front side	10	QPSK 25RB_25	20600/844	1:1	0.105	0.16	22.98	24.00	1.265	0.133	22.1
Back side	10	QPSK 25RB_25	20600/844	1:1	0.115	0.05	22.98	24.00	1.265	0.145	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	10	QPSK 1RB_25	20600/844	1:1	0.192	0.03	23.93	25.00	1.279	0.246	22.1
Back side	10	QPSK 1RB_25	20600/844	1:1	0.354	0.01	23.93	25.00	1.279	**0.453**	22.1
Left side	10	QPSK 1RB_25	20600/844	1:1	0.063	0.17	23.93	25.00	1.279	0.081	22.1
Right side	10	QPSK 1RB_25	20600/844	1:1	0.121	0.05	23.93	25.00	1.279	0.155	22.1
Bottom side	10	QPSK 1RB_25	20600/844	1:1	0.198	0.12	23.93	25.00	1.279	0.253	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	10	QPSK 25RB_25	20600/844	1:1	0.168	-0.04	22.98	24.00	1.265	0.212	22.1
Back side	10	QPSK 25RB_25	20600/844	1:1	0.250	-0.10	22.98	24.00	1.265	0.316	22.1
Left side	10	QPSK 25RB_25	20600/844	1:1	0.056	-0.06	22.98	24.00	1.265	0.071	22.1
Right side	10	QPSK 25RB_25	20600/844	1:1	0.107	0.12	22.98	24.00	1.265	0.135	22.1
Bottom side	10	QPSK 25RB_25	20600/844	1:1	0.174	-0.04	22.98	24.00	1.265	0.220	22.1

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Ant4 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	10	QPSK 1RB_49	20600/844	1:1	0.565	-0.07	22.92	23.50	1.143	0.646	22.1
Left tilted	10	QPSK 1RB_49	20600/844	1:1	0.070	0.05	22.92	23.50	1.143	0.080	22.1
Right cheek	10	QPSK 1RB_49	20600/844	1:1	0.270	-0.03	22.92	23.50	1.143	0.309	22.1
Right tilted	10	QPSK 1RB_49	20600/844	1:1	0.065	-0.02	22.92	23.50	1.143	0.074	22.1
Head Test data(50%RB)											
Left cheek	10	QPSK 25RB_13	20600/844	1:1	0.612	-0.13	22.91	23.50	1.146	**0.701**	22.1
Left tilted	10	QPSK 25RB_13	20600/844	1:1	0.079	0.03	22.91	23.50	1.146	0.090	22.1
Right cheek	10	QPSK 25RB_13	20600/844	1:1	0.292	-0.08	22.91	23.50	1.146	0.334	22.1
Right tilted	10	QPSK 25RB_13	20600/844	1:1	0.066	-0.17	22.91	23.50	1.146	0.076	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	10	QPSK 1RB_25	20600/844	1:1	0.159	-0.18	23.85	24.50	1.161	0.185	22.1
Back side	10	QPSK 1RB_25	20600/844	1:1	0.249	0.02	23.85	24.50	1.161	**0.289**	22.1
Body worn Test data (Separate 15mm 50%RB)											
Front side	10	QPSK 25RB_13	20600/844	1:1	0.138	0.17	22.86	23.50	1.159	0.160	22.1
Back side	10	QPSK 25RB_13	20600/844	1:1	0.149	-0.11	22.86	23.50	1.159	0.173	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	10	QPSK 1RB_49	20600/844	1:1	0.298	0.09	22.92	23.50	1.143	0.341	22.1
Back side	10	QPSK 1RB_49	20600/844	1:1	0.290	-0.08	22.92	23.50	1.143	0.331	22.1
Left side	10	QPSK 1RB_49	20600/844	1:1	0.572	-0.14	22.92	23.50	1.143	**0.654**	22.1
Top side	10	QPSK 1RB_49	20600/844	1:1	0.023	-0.16	22.92	23.50	1.143	0.026	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	10	QPSK 25RB_13	20600/844	1:1	0.255	-0.03	22.91	23.50	1.146	0.292	22.1
Back side	10	QPSK 25RB_13	20600/844	1:1	0.250	0.08	22.91	23.50	1.146	0.286	22.1
Left side	10	QPSK 25RB_13	20600/844	1:1	0.423	0.11	22.91	23.50	1.146	0.485	22.1
Top side	10	QPSK 25RB_13	20600/844	1:1	0.020	-0.11	22.91	23.50	1.146	0.023	22.1

Table 18：SAR of LTE Band 5 for Head and Body.

Note:

1)The maximum 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) Per KDB648474D04, 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 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.

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8.3.9 SAR Result of LTE Band 7

Ant 1 SAR 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	20850/2510	1:1	0.143	0.02	24.53	25.00	1.114	**0.159**	22.1
Left cheek	20	PCC QPSK 1_99	20850/2510	1:1	0.114	-0.03	24.11	25.00	1.227	0.140	22.1
		SCC QPSK 1_0	21048/2529.8								
Left tilted	20	QPSK 1RB_99	20850/2510	1:1	0.061	-0.13	24.53	25.00	1.114	0.068	22.1
Right cheek	20	QPSK 1RB_99	20850/2510	1:1	0.137	0.09	24.53	25.00	1.114	0.153	22.1
Right tilted	20	QPSK 1RB_99	20850/2510	1:1	0.120	0.11	24.53	25.00	1.114	0.134	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_25	21350/2560	1:1	0.124	0.08	23.14	24.00	1.219	0.151	22.1
Left tilted	20	QPSK 50RB_25	21350/2560	1:1	0.049	0.10	23.14	24.00	1.219	0.060	22.1
Right cheek	20	QPSK 50RB_25	21350/2560	1:1	0.109	-0.13	23.14	24.00	1.219	0.133	22.1
Right tilted	20	QPSK 50RB_25	21350/2560	1:1	0.094	-0.04	23.14	24.00	1.219	0.115	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_50	21350/2560	1:1	0.198	-0.04	20.91	21.50	1.146	0.227	22.1
Back side	20	QPSK 1RB_50	21350/2560	1:1	0.316	-0.04	20.91	21.50	1.146	**0.362**	22.1
Back side	20	PCC QPSK 1_0	21350/2560	1:1	0.273	0.07	20.53	21.50	1.250	0.341	22.1
		SCC QPSK 1_99	21152/2540.2								
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_50	21100/2535.5	1:1	0.214	-0.10	20.89	21.50	1.151	0.246	22.1
Back side	20	QPSK 50RB_50	21100/2535.5	1:1	0.352	0.01	20.89	21.50	1.151	0.405	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	20850/2510	1:1	0.139	-0.06	17.74	18.00	1.062	0.148	22.1
Back side	20	QPSK 1RB_99	20850/2510	1:1	0.309	0.02	17.74	18.00	1.062	0.328	22.1
Left side	20	QPSK 1RB_99	20850/2510	1:1	0.001	-0.10	17.74	18.00	1.062	0.001	22.1
Right side	20	QPSK 1RB_99	20850/2510	1:1	0.037	0.11	17.74	18.00	1.062	0.039	22.1
Bottom side	20	QPSK 1RB_99	20850/2510	1:1	0.208	-0.14	17.74	18.00	1.062	0.221	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_50	21350/2560	1:1	0.150	-0.13	17.19	18.00	1.205	0.181	22.1
Back side	20	QPSK 50RB_50	21350/2560	1:1	0.393	-0.02	17.19	18.00	1.205	**0.474**	22.1
Back side	20	PCC QPSK 1_0	21350/2560	1:1	0.342	0.17	17.11	18.00	1.227	0.420	22.1
		SCC QPSK 1_99	21152/2540.2								
Left side	20	QPSK 50RB_50	21350/2560	1:1	0.008	0.03	17.19	18.00	1.205	0.010	22.1
Right side	20	QPSK 50RB_50	21350/2560	1:1	0.041	0.11	17.19	18.00	1.205	0.049	22.1
Bottom side	20	QPSK 50RB_50	21350/2560	1:1	0.239	-0.01	17.19	18.00	1.205	0.288	22.1
Ant 5 SAR 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	0.156	-0.07	13.43	14.00	1.140	0.178	22.1
Left tilted	20	QPSK 1RB_99	21100/2535.5	1:1	0.184	-0.15	13.43	14.00	1.140	0.210	22.1
Right cheek	20	QPSK 1RB_99	21100/2535.5	1:1	0.422	0.17	13.43	14.00	1.140	0.481	22.1
Right tilted	20	QPSK 1RB_99	21100/2535.5	1:1	0.395	0.19	13.43	14.00	1.140	0.450	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_50	21100/2535.5	1:1	0.170	0.08	13.42	14.00	1.143	0.194	22.1
Left tilted	20	QPSK 50RB_50	21100/2535.5	1:1	0.210	-0.13	13.42	14.00	1.143	0.240	22.1
Right cheek	20	QPSK 50RB_50	21100/2535.5	1:1	0.468	0.02	13.42	14.00	1.143	**0.535**	22.1
Right cheek	20	PCC QPSK 1_99	21100/2535	1:1	0.405	-0.16	13.26	14.00	1.186	0.480	22.1
		SCC QPSK 1_0	21298/2515.2								
Right tilted	20	QPSK 50RB_50	21100/2535.5	1:1	0.421	0.01	13.42	14.00	1.143	0.481	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_99	20850/2510	1:1	0.139	0.06	18.97	20.00	1.268	0.176	22.1
Back side	20	QPSK 1RB_99	20850/2510	1:1	0.172	-0.04	18.97	20.00	1.268	**0.218**	22.1
Back side	20	PCC QPSK 1_99	20850/2510	1:1	0.149	0.15	18.82	20.00	1.312	0.196	22.1
		SCC QPSK 1_0	21048/2529.8								

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Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_50	20850/2510	1:1	0.108	0.15	17.98	19.00	1.265	0.137	22.1
Back side	20	QPSK 50RB_50	20850/2510	1:1	0.098	-0.18	17.98	19.00	1.265	0.124	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	21100/2535.5	1:1	0.055	0.18	13.43	14.00	1.140	0.063	22.1
Back side	20	QPSK 1RB_99	21100/2535.5	1:1	0.064	0.19	13.43	14.00	1.140	0.073	22.1
Left side	20	QPSK 1RB_99	21100/2535.5	1:1	0.011	0.18	13.43	14.00	1.140	0.013	22.1
Top side	20	QPSK 1RB_99	21100/2535.5	1:1	0.080	-0.12	13.43	14.00	1.140	0.091	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_50	21100/2535.5	1:1	0.058	0.03	13.42	14.00	1.143	0.066	22.1
Back side	20	QPSK 50RB_50	21100/2535.5	1:1	0.070	0.00	13.42	14.00	1.143	0.080	22.1
Left side	20	QPSK 50RB_50	21100/2535.5	1:1	0.023	0.19	13.42	14.00	1.143	0.026	22.1
Top side	20	QPSK 50RB_50	21100/2535.5	1:1	0.082	0.07	13.42	14.00	1.143	**0.093**	22.1
Top side	20	PCC QPSK 1_99 SCC QPSK 1_0	21100/2535 21298/2515.2	1:1	0.068	-0.09	13.26	14.00	1.186	0.081	22.1
Ant 5(ENDC) SAR 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	20850/2510	1:1	0.021	0.01	13.49	14.50	1.262	0.026	22.1
Left tilted	20	QPSK 1RB_99	20850/2510	1:1	0.009	-0.19	13.49	14.50	1.262	0.011	22.1
Right cheek	20	QPSK 1RB_99	20850/2510	1:1	0.033	-0.01	13.49	14.50	1.262	0.042	22.1
Right tilted	20	QPSK 1RB_99	20850/2510	1:1	0.014	-0.05	13.49	14.50	1.262	0.018	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_25	21350/2560	1:1	0.024	0.05	13.47	14.50	1.268	0.030	22.1
Left tilted	20	QPSK 50RB_25	21350/2560	1:1	0.010	0.04	13.47	14.50	1.268	0.013	22.1
Right cheek	20	QPSK 50RB_25	21350/2560	1:1	0.035	0.08	13.47	14.50	1.268	**0.044**	22.1
Right tilted	20	QPSK 50RB_25	21350/2560	1:1	0.015	0.11	13.47	14.50	1.268	0.019	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_50	21350/2560	1:1	0.015	0.03	19.54	20.50	1.247	0.019	22.1
Back side	20	QPSK 1RB_50	21350/2560	1:1	0.023	0.00	19.54	20.50	1.247	**0.029**	22.1
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_50	21100/2535.5	1:1	0.007	-0.05	18.54	19.50	1.247	0.009	22.1
Back side	20	QPSK 50RB_50	21100/2535.5	1:1	0.014	0.00	18.54	19.50	1.247	0.018	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	20850/2510	1:1	0.007	-0.16	13.49	14.50	1.262	0.009	22.1
Back side	20	QPSK 1RB_99	20850/2510	1:1	0.009	-0.02	13.49	14.50	1.262	0.011	22.1
Left side	20	QPSK 1RB_99	20850/2510	1:1	0.008	-0.02	13.49	14.50	1.262	0.010	22.1
Top side	20	QPSK 1RB_99	20850/2510	1:1	0.008	0.08	13.49	14.50	1.262	0.010	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_25	21350/2560	1:1	0.008	0.01	13.47	14.50	1.268	0.010	22.1
Back side	20	QPSK 50RB_25	21350/2560	1:1	0.010	0.00	13.47	14.50	1.268	**0.013**	22.1
Left side	20	QPSK 50RB_25	21350/2560	1:1	0.007	-0.12	13.47	14.50	1.268	0.009	22.1
Top side	20	QPSK 50RB_25	21350/2560	1:1	0.009	0.00	13.47	14.50	1.268	0.011	22.1

Table 19：SAR of LTE Band 7 for Head and Body.

Note:

1) The maximum 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) Per KDB648474D04, 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 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.

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8.3.10 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_50	37850/2580	1:1.58	0.082	0.04	24.13	25.00	1.222	**0.100**	22.1
Left cheek	20	PCC QPSK 1_99	37850/2580	1:1.58	0.071	-0.06	24.01	25.00	1.256	0.089	22.1
		SCC QPSK 1_0	38048/2599.8								
Left tilted	20	QPSK 1RB_50	37850/2580	1:1.58	0.045	-0.08	24.13	25.00	1.222	0.055	22.1
Right cheek	20	QPSK 1RB_50	37850/2580	1:1.58	0.073	-0.05	24.13	25.00	1.222	0.089	22.1
Right tilted	20	QPSK 1RB_50	37850/2580	1:1.58	0.066	0.00	24.13	25.00	1.222	0.081	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_0	37850/2580	1:1.58	0.077	0.07	23.18	24.00	1.208	0.093	22.1
Left tilted	20	QPSK 50RB_0	37850/2580	1:1.58	0.032	-0.03	23.18	24.00	1.208	0.039	22.1
Right cheek	20	QPSK 50RB_0	37850/2580	1:1.58	0.061	0.12	23.18	24.00	1.208	0.074	22.1
Right tilted	20	QPSK 50RB_0	37850/2580	1:1.58	0.052	-0.08	23.18	24.00	1.208	0.063	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_50	37850/2580	1:1.58	0.198	-0.02	24.13	25.00	1.222	0.242	22.1
Back side	20	QPSK 1RB_50	37850/2580	1:1.58	0.565	-0.10	24.13	25.00	1.222	**0.690**	22.1
Back side	20	PCC QPSK 1_99	37850/2580	1:1.58	0.498	0.13	24.01	25.00	1.256	0.626	22.1
		SCC QPSK 1_0	38048/2599.8								
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_0	37850/2580	1:1.58	0.159	-0.08	23.18	24.00	1.208	0.192	22.1
Back side	20	QPSK 50RB_0	37850/2580	1:1.58	0.381	-0.10	23.18	24.00	1.208	0.460	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_0	37850/2580	1:1.58	0.100	0.02	19.15	20.00	1.216	0.122	22.1
Back side	20	QPSK 1RB_0	37850/2580	1:1.58	0.307	-0.19	19.15	20.00	1.216	0.373	22.1
Left side	20	QPSK 1RB_0	37850/2580	1:1.58	0.027	0.11	19.15	20.00	1.216	0.033	22.1
Right side	20	QPSK 1RB_0	37850/2580	1:1.58	0.010	0.03	19.15	20.00	1.216	0.012	22.1
Bottom side	20	QPSK 1RB_0	37850/2580	1:1.58	0.186	0.12	19.15	20.00	1.216	0.226	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	37850/2580	1:1.58	0.115	-0.19	19.06	20.00	1.242	0.143	22.1
Back side	20	QPSK 50RB_0	37850/2580	1:1.58	0.324	0.02	19.06	20.00	1.242	**0.402**	22.1
Back side	20	PCC QPSK 1_99	37850/2580	1:1.58	0.261	-0.11	18.91	20.00	1.285	0.335	22.1
		SCC QPSK 1_0	38048/2599.8								
Left side	20	QPSK 50RB_0	37850/2580	1:1.58	0.036	0.15	19.06	20.00	1.242	0.045	22.1
Right side	20	QPSK 50RB_0	37850/2580	1:1.58	0.018	0.07	19.06	20.00	1.242	0.022	22.1
Bottom side	20	QPSK 50RB_0	37850/2580	1:1.58	0.205	-0.10	19.06	20.00	1.242	0.255	22.1

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Ant 5 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	37850/2580	1:1.58	0.118	-0.13	15.71	16.00	1.069	0.126	22.1
Left tilted	20	QPSK 1RB_0	37850/2580	1:1.58	0.120	0.06	15.71	16.00	1.069	0.128	22.1
Right cheek	20	QPSK 1RB_0	37850/2580	1:1.58	0.305	0.16	15.71	16.00	1.069	0.326	22.1
Right tilted	20	QPSK 1RB_0	37850/2580	1:1.58	0.240	0.14	15.71	16.00	1.069	0.257	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_0	37850/2580	1:1.58	0.125	0.13	15.63	16.00	1.089	0.136	22.1
Left tilted	20	QPSK 50RB_0	37850/2580	1:1.58	0.123	-0.19	15.63	16.00	1.089	0.134	22.1
Right cheek	20	QPSK 50RB_0	37850/2580	1:1.58	0.429	0.03	15.63	16.00	1.089	**0.467**	22.1
Right cheek	20	PCC QPSK 1_99	37850/2580	1:1.58	0.391	-0.06	15.50	16.00	1.122	0.439	22.1
		SCC QPSK 1_0	38048/2599.8								
Right tilted	20	QPSK 50RB_0	37850/2580	1:1.58	0.248	0.17	15.63	16.00	1.089	0.270	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_0	37850/2580	1:1.58	0.175	0.03	23.62	24.00	1.091	0.191	22.1
Back side	20	QPSK 1RB_0	37850/2580	1:1.58	0.228	-0.10	23.62	24.00	1.091	**0.249**	22.1
Back side	20	PCC QPSK 1_99	37850/2580	1:1.58	0.191	0.17	23.49	24.00	1.125	0.215	22.1
		SCC QPSK 1_0	38048/2599.8								
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_0	37850/2580	1:1.58	0.145	-0.01	22.77	23.00	1.054	0.153	22.1
Back side	20	QPSK 50RB_0	37850/2580	1:1.58	0.150	0.08	22.77	23.00	1.054	0.158	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_0	37850/2580	1:1.58	0.048	-0.02	15.71	16.00	1.069	0.051	22.1
Back side	20	QPSK 1RB_0	37850/2580	1:1.58	0.060	0.11	15.71	16.00	1.069	0.064	22.1
Left side	20	QPSK 1RB_0	37850/2580	1:1.58	0.015	0.00	15.71	16.00	1.069	0.016	22.1
Top side	20	QPSK 1RB_0	37850/2580	1:1.58	0.057	0.19	15.71	16.00	1.069	0.061	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_0	37850/2580	1:1.58	0.057	0.04	15.63	16.00	1.089	0.062	22.1
Back side	20	QPSK 50RB_0	37850/2580	1:1.58	0.064	0.00	15.63	16.00	1.089	**0.070**	22.1
Back side	20	PCC QPSK 1_99	37850/2580	1:1.58	0.051	-0.03	15.50	16.00	1.122	0.057	22.1
		SCC QPSK 1_0	38048/2599.8								
Left side	20	QPSK 50RB_0	37850/2580	1:1.58	0.027	0.02	15.63	16.00	1.089	0.029	22.1
Top side	20	QPSK 50RB_0	37850/2580	1:1.58	0.060	-0.01	15.63	16.00	1.089	0.065	22.1

Table 20：SAR of LTE Band 38 for Head and Body.

Note:

1) The maximum 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) Per KDB648474D04, 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 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.

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8.3.11 SAR Result of LTE Band 41

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_50	40185/2549.5	1:1.58	0.089	0.06	24.53	25.00	1.114	**0.099**	22.1
Left tilted	20	QPSK 1RB_50	40185/2549.5	1:1.58	0.046	0.13	24.53	25.00	1.114	0.051	22.1
Right cheek	20	QPSK 1RB_50	40185/2549.5	1:1.58	0.069	0.19	24.53	25.00	1.114	0.077	22.1
Right tilted	20	QPSK 1RB_50	40185/2549.5	1:1.58	0.056	-0.04	24.47	25.00	1.130	0.063	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_25	40185/2549.5	1:1.58	0.081	-0.07	23.50	24.00	1.122	0.091	22.1
Left tilted	20	QPSK 50RB_25	40185/2549.5	1:1.58	0.021	-0.13	23.50	24.00	1.122	0.024	22.1
Right cheek	20	QPSK 50RB_25	40185/2549.5	1:1.58	0.057	0.17	23.50	24.00	1.122	0.064	22.1
Right tilted	20	QPSK 50RB_25	40185/2549.5	1:1.58	0.049	0.17	23.50	24.00	1.122	0.055	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_50	40185/2549.5	1:1.58	0.201	0.00	24.53	25.00	1.114	0.224	22.1
Back side	20	QPSK 1RB_50	40185/2549.5	1:1.58	0.533	-0.09	24.53	25.00	1.114	**0.594**	22.1
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_25	40185/2549.5	1:1.58	0.159	0.05	23.50	24.00	1.122	0.178	22.1
Back side	20	QPSK 50RB_25	40185/2549.5	1:1.58	0.374	0.06	23.50	24.00	1.122	0.420	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_99	40620/2593	1:1.58	0.052	-0.02	19.12	19.50	1.091	0.057	22.1
Back side	20	QPSK 1RB_99	40620/2593	1:1.58	0.307	0.05	19.12	19.50	1.091	**0.335**	22.1
Left side	20	QPSK 1RB_99	40620/2593	1:1.58	0.018	-0.12	19.12	19.50	1.091	0.020	22.1
Right side	20	QPSK 1RB_99	40620/2593	1:1.58	0.061	-0.12	19.12	19.50	1.091	0.067	22.1
Bottom side	20	QPSK 1RB_99	40620/2593	1:1.58	0.057	0.11	19.12	19.50	1.091	0.062	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.058	0.04	19.07	19.50	1.104	0.064	22.1
Back side	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.208	0.06	19.07	19.50	1.104	0.230	22.1
Left side	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.041	-0.14	19.07	19.50	1.104	0.045	22.1
Right side	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.027	-0.15	19.07	19.50	1.104	0.030	22.1
Bottom side	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.037	0.01	19.07	19.50	1.104	0.041	22.1

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Ant5 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	40620/2593	1:1.58	0.109	0.09	15.64	16.00	1.086	0.118	22.1
Left tilted	20	QPSK 1RB_0	40620/2593	1:1.58	0.105	0.14	15.64	16.00	1.086	0.114	22.1
Right cheek	20	QPSK 1RB_0	40620/2593	1:1.58	0.357	0.15	15.64	16.00	1.086	0.388	22.1
Right tilted	20	QPSK 1RB_0	40620/2593	1:1.58	0.223	0.19	15.64	16.00	1.086	0.242	22.1
Head Test data(50%RB)											
Left cheek	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.108	-0.18	15.66	16.00	1.081	0.117	22.1
Left tilted	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.107	-0.12	15.66	16.00	1.081	0.116	22.1
Right cheek	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.470	0.04	15.66	16.00	1.081	**0.508**	22.1
Right tilted	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.220	-0.03	15.66	16.00	1.081	0.238	22.1
Body worn Test data(Separate 15mm 1RB)											
Front side	20	QPSK 1RB_50	40185/2549.5	1:1.58	0.183	0.13	23.66	24.00	1.081	0.198	22.1
Back side	20	QPSK 1RB_50	40185/2549.5	1:1.58	0.216	0.09	23.66	24.00	1.081	**0.234**	22.1
Body worn Test data (Separate 15mm 50%RB)											
Front side	20	QPSK 50RB_25	40185/2549.5	1:1.58	0.138	0.01	22.69	24.00	1.352	0.187	22.1
Back side	20	QPSK 50RB_25	40185/2549.5	1:1.58	0.144	-0.12	22.69	24.00	1.352	0.195	22.1
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1RB_0	40620/2593	1:1.58	0.055	-0.01	15.64	16.00	1.086	0.060	22.1
Back side	20	QPSK 1RB_0	40620/2593	1:1.58	0.065	-0.11	15.64	16.00	1.086	0.071	22.1
Left side	20	QPSK 1RB_0	40620/2593	1:1.58	0.008	0.16	15.64	16.00	1.086	0.009	22.1
Top side	20	QPSK 1RB_0	40620/2593	1:1.58	0.064	0.13	15.64	16.00	1.086	0.070	22.1
Hotspot Test data (Separate 10mm 50%RB)											
Front side	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.054	-0.11	15.66	16.00	1.081	0.058	22.1
Back side	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.069	0.00	15.66	16.00	1.081	**0.075**	22.1
Left side	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.011	0.01	15.66	16.00	1.081	0.012	22.1
Top side	20	QPSK 50RB_50	40185/2549.5	1:1.58	0.067	-0.06	15.66	16.00	1.081	0.072	22.1

Table 21：SAR of LTE Band 41 for Head and Body.

Note:

1)The maximum 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) Per KDB648474D04, 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 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.

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8.3.12 SAR Result of 5G NR n5

NSA Ant1 Test Record											
Test position	Test mode			Test ch./Freq.	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
	BW.	Modulation	RB Size_RB offset								
Head Test Data 1RB											
Left cheek	20	QPSK	1_1	166800/834	0.023	0.02	23.36	24.00	1.159	0.027	22.1
Left tilted	20	QPSK	1_1	166800/834	0.011	0.15	23.36	24.00	1.159	0.013	22.1
Right cheek	20	QPSK	1_1	166800/834	0.028	0.03	23.36	24.00	1.159	0.032	22.1
Right tilted	20	QPSK	1_1	166800/834	0.012	0.13	23.36	24.00	1.159	0.014	22.1
Head Test Data 50%RB											
Left cheek	20	QPSK	50_28	167800/839	0.109	0.08	23.16	24.00	1.213	0.132	22.1
Left tilted	20	QPSK	50_28	167800/839	0.062	0.09	23.16	24.00	1.213	0.075	22.1
Right cheek	20	QPSK	50_28	167800/839	0.150	0.04	23.16	24.00	1.213	**0.182**	22.1
Right tilted	20	QPSK	50_28	167800/839	0.068	0.08	23.16	24.00	1.213	0.083	22.1
Body worn Test Data (15mm 1RB)											
Front side	20	QPSK	1_1	166800/834	0.192	0.00	23.36	24.00	1.159	0.222	22.1
Back side	20	QPSK	1_1	166800/834	0.267	-0.08	23.36	24.00	1.159	**0.309**	22.1
Body worn Test Data (15mm 50%RB)											
Front side	20	QPSK	50_28	167800/839	0.122	0.03	23.16	24.00	1.213	0.148	22.1
Back side	20	QPSK	50_28	167800/839	0.161	-0.06	23.16	24.00	1.213	0.195	22.1
Hotspot Test Data (10mm 1RB)											
Front side	20	QPSK	1_1	166800/834	0.221	-0.11	23.36	24.00	1.159	0.256	22.1
Back side	20	QPSK	1_1	166800/834	0.327	-0.05	23.36	24.00	1.159	0.379	22.1
Left side	20	QPSK	1_1	166800/834	0.019	0.12	23.36	24.00	1.159	0.021	22.1
Right side	20	QPSK	1_1	166800/834	0.032	0.01	23.36	24.00	1.159	0.037	22.1
Bottom side	20	QPSK	1_1	166800/834	0.057	0.00	23.36	24.00	1.159	0.066	22.1
Hotspot Test Data (10mm 50%RB)											
Front side	20	QPSK	50_28	167800/839	0.237	0.14	23.16	24.00	1.213	0.288	22.1
Back side	20	QPSK	50_28	167800/839	0.334	0.04	23.16	24.00	1.213	**0.405**	22.1
Left side	20	QPSK	50_28	167800/839	0.082	-0.04	23.16	24.00	1.213	0.100	22.1
Right side	20	QPSK	50_28	167800/839	0.149	-0.07	23.16	24.00	1.213	0.181	22.1
Bottom side	20	QPSK	50_28	167800/839	0.283	-0.03	23.16	24.00	1.213	0.343	22.1

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NSA Ant4 Test Record											
Test position	Test mode			Test ch./Freq.	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
	BW.	Modulation	RB Size_RB offset								
Head Test Data 1RB											
Left cheek	20	QPSK	1_1	167300/836.5	0.542	0.09	21.88	22.50	1.153	0.625	22.1
Left tilted	20	QPSK	1_1	167300/836.5	0.073	-0.01	21.88	22.50	1.153	0.084	22.1
Right cheek	20	QPSK	1_1	167300/836.5	0.291	0.02	21.88	22.50	1.153	0.336	22.1
Right tilted	20	QPSK	1_1	167300/836.5	0.066	-0.06	21.88	22.50	1.153	0.076	22.1
Head Test Data 50%RB											
Left cheek	20	QPSK	50_28	166800/834	0.572	0.06	22.08	22.50	1.102	**0.630**	22.1
Left tilted	20	QPSK	50_28	166800/834	0.078	-0.18	22.08	22.50	1.102	0.086	22.1
Right cheek	20	QPSK	50_28	166800/834	0.292	0.16	22.08	22.50	1.102	0.322	22.1
Right tilted	20	QPSK	50_28	166800/834	0.068	-0.12	22.08	22.50	1.102	0.075	22.1
Body worn Test Data (15mm 1RB)											
Front side	20	QPSK	1_1	167300/836.5	0.129	0.04	23.26	24.00	1.186	0.153	22.1
Back side	20	QPSK	1_1	167300/836.5	0.140	0.19	23.26	24.00	1.186	0.166	22.1
Body worn Test Data (15mm 50%RB)											
Front side	20	QPSK	50_28	166800/834	0.136	0.18	23.18	24.00	1.208	0.164	22.1
Back side	20	QPSK	50_28	166800/834	0.151	0.00	23.18	24.00	1.208	**0.182**	22.1
Hotspot Test Data (10mm 1RB)											
Front side	20	QPSK	1_1	167300/836.5	0.223	0.04	21.88	22.50	1.153	0.257	22.1
Back side	20	QPSK	1_1	167300/836.5	0.235	-0.18	21.88	22.50	1.153	0.271	22.1
Left side	20	QPSK	1_1	167300/836.5	0.357	0.16	21.88	22.50	1.153	**0.412**	22.1
Top side	20	QPSK	1_1	167300/836.5	0.012	-0.03	21.88	22.50	1.153	0.014	22.1
Hotspot Test Data (10mm 50%RB)											
Front side	20	QPSK	50_28	166800/834	0.240	0.06	22.08	22.50	1.102	0.264	22.1
Back side	20	QPSK	50_28	166800/834	0.277	-0.04	22.08	22.50	1.102	0.305	22.1
Left side	20	QPSK	50_28	166800/834	0.288	-0.08	22.08	22.50	1.102	0.317	22.1
Top side	20	QPSK	50_28	166800/834	0.044	0.18	22.08	22.50	1.102	0.048	22.1

Table 22：SAR of 5G NR n5 for Head and Body.

Note:

1)The maximum 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)Per KDB648474D04, 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 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

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8.3.13 SAR Result of WIFI 2.4G

MIMO SAR Test Record											
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	6/2437	99.31%	1.007	0.718	0.01	17.55	18.00	1.109	0.802	22
Left cheek	802.11b	1/2412	99.31%	1.007	0.771	0.01	17.29	18.00	1.178	**0.914**	22
Left cheek	802.11b	11/2462	99.31%	1.007	0.650	0.10	17.46	18.00	1.132	0.741	22
Left tilted	802.11b	6/2437	99.31%	1.007	0.358	-0.02	17.55	18.00	1.109	0.400	22
Right cheek	802.11b	6/2437	99.31%	1.007	0.268	0.09	17.55	18.00	1.109	0.299	22
Right tilted	802.11b	6/2437	99.31%	1.007	0.231	0.08	17.55	18.00	1.109	0.258	22
Body worn Test data(Separate 15mm)											
Front side	802.11b	6/2437	99.31%	1.007	0.089	-0.02	22.36	23.00	1.159	0.104	22
Back side	802.11b	6/2437	99.31%	1.007	0.097	0.01	22.36	23.00	1.159	**0.114**	22
Hotspot Test data (Separate 10mm)											
Front side	802.11b	6/2437	99.31%	1.007	0.248	-0.12	17.55	18.00	1.109	0.277	22
Back side	802.11b	6/2437	99.31%	1.007	0.358	0.05	17.55	18.00	1.109	0.400	22
Right side	802.11b	6/2437	99.31%	1.007	0.391	0.00	17.55	18.00	1.109	**0.437**	22
Top side	802.11b	6/2437	99.31%	1.007	0.230	0.14	17.55	18.00	1.109	0.257	22
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 with(Separate 0mm)											
Back side	802.11b	6/2437	99.31%	1.007	0.848	-0.07	22.36	23.00	1.159	0.990	22
Right side	802.11b	6/2437	99.31%	1.007	1.270	0.08	22.36	23.00	1.159	1.482	22
Additional Test data(simultaneous transmission with (WWAN+WiFi 2.4G MIMO)											
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	6/2437	99.31%	1.007	0.429	-0.17	15.67	16.00	1.079	0.466	22

Table 23：SAR of WIFI 2.4G for Head and Body and Product specific 10g SAR.

Note:

1) The maximum 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) 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.

Test Position	Channel/ Frequency (MHz)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	3rd Repeated SAR (1g)
Left cheek	6/2437	0.829	0.821	1.010	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

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8.3.14 SAR Result of WIFI 5G

Wi-Fi 5G MIMO SAR Test Record											
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	802.11ac 80M	58/5290	87.10%	1.148	0.592	-0.06	16.37	16.50	1.030	0.700	22.2
Left tilted	802.11ac 80M	58/5290	87.10%	1.148	0.306	0.00	16.37	16.50	1.030	0.362	22.2
Right cheek	802.11ac 80M	58/5290	87.10%	1.148	0.123	-0.04	16.37	16.50	1.030	0.146	22.2
Right tilted	802.11ac 80M	58/5290	87.10%	1.148	0.116	-0.03	16.37	16.50	1.030	0.137	22.2
Head Test data of U-NII-2C											
Left cheek	802.11ac 80M	106/5530	87.10%	1.148	0.737	0.05	16.16	16.50	1.081	0.915	22.2
Left cheek	802.11ac 80M	122/5610	87.10%	1.148	0.701	0.15	16.08	16.50	1.102	0.887	22.2
Left tilted	802.11ac 80M	106/5530	87.10%	1.148	0.431	-0.03	16.16	16.50	1.081	0.535	22.2
Right cheek	802.11ac 80M	106/5530	87.10%	1.148	0.187	0.19	16.16	16.50	1.081	0.232	22.2
Right tilted	802.11ac 80M	106/5530	87.10%	1.148	0.218	-0.15	16.16	16.50	1.081	0.271	22.2
Head Test data of U-NII-3											
Left cheek	802.11ac 80M	155/5775	87.10%	1.148	0.865	0.07	18.73	19.00	1.064	**1.057**	22.2
Left cheek-repeat	802.11ac 80M	155/5775	87.10%	1.148	0.857	0.09	18.73	19.00	1.064	1.047	22.2
Left tilted	802.11ac 80M	155/5775	87.10%	1.148	0.557	0.10	18.73	19.00	1.064	0.681	22.2
Right cheek	802.11ac 80M	155/5775	87.10%	1.148	0.248	0.10	18.73	19.00	1.064	0.303	22.2
Right tilted	802.11ac 80M	155/5775	87.10%	1.148	0.229	0.09	18.73	19.00	1.064	0.280	22.2
Body worn Test data of U-NII-2A (Separate 15mm)											
Front side	802.11a	52/5260	97.28%	1.028	0.199	-0.08	20.23	20.50	1.064	0.218	22.2
Back side	802.11a	52/5260	97.28%	1.028	0.187	0.04	20.23	20.50	1.064	0.205	22.2
Body worn Test data of U-NII-2C(Separate 15mm)											
Front side	802.11ac 80M	106/5530	87.10%	1.148	0.165	-0.15	19.42	20.00	1.143	0.217	22.2
Back side	802.11ac 80M	106/5530	87.10%	1.148	0.192	0.07	19.42	20.00	1.143	0.252	22.2
Body worn Test data of U-NII-3(Separate 15mm)											
Front side	802.11ac 80M	155/5775	87.10%	1.148	0.153	-0.19	20.14	21.00	1.219	0.214	22.2
Back side	802.11ac 80M	155/5775	87.10%	1.148	0.181	0.03	20.14	21.00	1.219	**0.253**	22.2
Hotspot Test data of U-NII-1(Separate 10mm)											
Front side	802.11ac 80M	42/5210	87.10%	1.148	0.308	-0.03	16.02	16.50	1.117	0.395	22.2
Back side	802.11ac 80M	42/5210	87.10%	1.148	0.288	-0.07	16.02	16.50	1.117	0.369	22.2
Right side	802.11ac 80M	42/5210	87.10%	1.148	0.277	-0.04	16.02	16.50	1.117	0.355	22.2
Top side	802.11ac 80M	42/5210	87.10%	1.148	0.200	-0.01	16.02	16.50	1.117	0.256	22.2
Hotspot Test data of U-NII-3 (Separate 10mm)											
Front side	802.11ac 80M	155/5775	87.10%	1.148	0.218	0.11	18.73	19.00	1.064	0.266	22.2
Back side	802.11ac 80M	155/5775	87.10%	1.148	0.226	-0.04	18.73	19.00	1.064	0.276	22.2
Right side	802.11ac 80M	155/5775	87.10%	1.148	0.742	0.04	18.73	19.00	1.064	**0.907**	22.2
Top side	802.11ac 80M	155/5775	87.10%	1.148	0.198	0.14	18.73	19.00	1.064	0.242	22.2
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	52/5260	97.28%	1.028	0.645	0.11	20.23	20.50	1.064	0.706	22.2
Back side	802.11a	52/5260	97.28%	1.028	0.345	-0.14	20.23	20.50	1.064	0.377	22.2
Right side	802.11a	52/5260	97.28%	1.028	1.530	0.05	20.23	20.50	1.064	1.674	22.2
Top side	802.11a	52/5260	97.28%	1.028	0.713	0.00	20.23	20.50	1.064	0.780	22.2
Product specific 10g SAR Test data of U-NII-2C(Separate 0mm)											
Front side	802.11ac 80M	106/5530	87.10%	1.148	0.645	0.09	19.42	20.00	1.143	0.846	22.2
Back side	802.11ac 80M	106/5530	87.10%	1.148	0.319	-0.01	19.42	20.00	1.143	0.419	22.2
Right side	802.11ac 80M	106/5530	87.10%	1.148	1.560	-0.04	19.42	20.00	1.143	**2.047**	22.2

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Right side	802.11ac 80M	122/5610	87.10%	1.148	1.420	-0.04	19.33	20.00	1.167	1.902	22.2
Top side	802.11ac 80M	106/5530	87.10%	1.148	0.720	-0.02	19.42	20.00	1.143	0.945	22.2
Product specific 10g SAR Test data of U-NII-3(Separate 0mm)											
Right side	802.11ac 80M	155/5775	87.10%	1.148	1.440	0.13	20.14	21.00	1.219	2.015	22.2
Additional Test data(simultaneous transmission with (WWAN+WiFi 5G MIMO/ WiFi 5G MIMO+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(W/kg)**	**Liquid Temp.**
Head Test data of U-NII-2A											
Left cheek	802.11ac 80M	58/5290	87.10%	1.148	0.365	0.08	14.45	14.50	1.012	0.424	22.2
Head Test data of U-NII-2C											
Left cheek	802.11ac 80M	106/5530	87.10%	1.148	0.403	0.07	14.23	14.50	1.064	0.492	22.2
Head Test data of U-NII-3											
Left cheek	802.11ac 80M	155/5775	87.10%	1.148	0.401	0.07	15.68	16.00	1.076	0.496	22.2

Table 24：SAR of WIFI 5G for Head, Body and Product specific 10g SAR.

Note:

1) The maximum 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.

Test Position	**Channel/ Frequency (MHz)**	**Measured SAR (1g)**	**1st Repeated SAR (1g)**	**Ratio**	**2nd Repeated SAR (1g)**	**3rd Repeated SAR (1g)**
Left cheek	155/5775	0.865	0.857	1.009	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

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8.3.15 SAR Result of BT

Bluetooth SAR Test Record											
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	DH5	78/2480	77.13%	1.297	0.614	0.04	17.39	18.50	1.291	**1.028**	22.0
Left tilted	DH5	78/2480	77.13%	1.297	0.333	-0.11	17.39	18.50	1.291	0.558	22.0
Right cheek	DH5	78/2480	77.13%	1.302	0.165	-0.03	17.39	18.50	1.291	0.277	22.0
Right tilted	DH5	78/2480	77.13%	1.297	0.387	0.09	17.39	18.50	1.291	0.648	22.0
Left cheek	DH5	0/2402	77.13%	1.297	0.571	0.04	17.38	18.50	1.294	0.958	22.0
Left cheek	DH5	39/2441	77.13%	1.297	0.522	0.01	17.31	18.50	1.315	0.890	22.0
Body worn Test data (Separate 15mm)											
Front side	DH5	78/2480	77.13%	1.297	0.093	0.15	17.39	18.50	1.291	0.156	22.0
Back side	DH5	78/2480	77.13%	1.297	0.145	-0.03	17.39	18.50	1.291	**0.243**	22.0
Hotspot Test data (Separate 10mm)											
Front side	DH5	78/2480	77.13%	1.297	0.157	0.06	17.39	18.50	1.291	0.263	22.0
Back side	DH5	78/2480	77.13%	1.297	0.260	0.11	17.39	18.50	1.291	0.435	22.0
Right side	DH5	78/2480	77.13%	1.297	0.347	-0.02	17.39	18.50	1.291	**0.581**	22.0
Top side	DH5	78/2480	77.13%	1.297	0.228	0.08	17.39	18.50	1.291	0.382	22.0
Additional Test data(simultaneous transmission with (WWAN+BT/ WiFi 5G MIMO+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 (W/kg)**	**Liquid Temp.**
Head Test data											
Left cheek	DH5	78/2480	77.13%	1.297	0.182	0.03	12.95	14.00	1.274	**0.301**	22.0
Left tilted	DH5	78/2480	77.13%	1.297	0.103	0.01	12.95	14.00	1.274	0.170	22.0
Right cheek	DH5	78/2480	77.13%	1.302	0.041	-0.09	12.95	14.00	1.274	0.068	22.0
Hotspot Test data (Separate 10mm)											
Back side	DH5	78/2480	77.13%	1.297	0.087	-0.14	12.95	14.00	1.274	0.144	22.0
Right side	DH5	78/2480	77.13%	1.297	0.108	0.17	12.95	14.00	1.274	0.178	22.0

Table 25：SAR of BT for Head and Body.

Note:

1) The maximum 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) Per KDB648474D04, 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 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.

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8.4 Multiple Transmitter Evaluation

8.4.1 Simultaneous SAR SAR test evaluation

- **Simultaneous Transmission Possibilities**

NO	Simultaneous TX Combination	Head	Body-worn	Hotspot	Product Specific 10-g (0mm)
1	WWAN+BT	Y	Y	Y	Y
2	WWAN+WIFI 2.4G MIMO	Y	Y	Y	Y
3	WWAN+WIFI 5G MIMO	Y	Y	Y	Y
4	WWAN+BT+WIFI 5G MIMO	Y	Y	Y	Y
5	BT+WIFI 5G MIMO	Y	Y	Y	Y

Note:
1) The device does not support DTM function.
2) For Wi-Fi 5G, U-NII-2A (5250-5350 MHz) and U-NII-2C (5470-5725 MHz) bands does not support hotspot function.

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8.4.2 Simultaneous Transmission SAR Summation Scenario

EN-DC Head:

LTE Band (EN_DC)	Exposure position	Ant5	n5 Ant1	EN_DC Summed SAR
Band 7	Left Touch	0.030	0.132	0.162
	Left Tilt	0.013	0.075	0.088
	Right Touch	0.044	0.182	0.226
	Right Tilt	0.019	0.083	0.102

LTE Band (EN_DC)	Exposure position	Ant1	Ant5	n5 Ant4	EN_DC Summed SAR
Band 7	Left Touch	0.159	0.030	0.630	0.789
	Left Tilt	0.068	0.013	0.086	0.154
	Right Touch	0.153	0.044	0.336	0.489
	Right Tilt	0.134	0.019	0.076	0.210

EN-DC Body-worn:

LTE Band (EN_DC)	Exposure position	Ant5	n5 Ant1	EN_DC Summed SAR
Band 7	Front side	0.019	0.222	0.241
	Back side	0.029	0.309	0.338

LTE Band (EN_DC)	Exposure position	Ant1	Ant5	n5 Ant4	EN_DC Summed SAR
Band 7	Front side	0.246	0.019	0.164	0.410
	Back side	0.405	0.029	0.182	0.587

EN-DC Hotspot:

LTE Band (EN_DC)	Exposure position	Ant5	n5 Ant1	EN_DC Summed SAR
Band 7	Front side	0.010	0.256	0.266
	Back side	0.013	0.379	0.392
	Left side	0.010	0.405	0.415
	Right side	/	0.100	0.100
	Top side	0.011	/	0.011
	Bottom side	/	0.343	0.343

LTE Band (EN_DC)	Exposure position	Ant1	Ant5	n5 Ant4	EN_DC Summed SAR
Band 7	Front side	0.181	0.010	0.264	0.274
	Back side	0.474	0.013	0.305	0.318
	Left side	0.010	0.010	0.412	0.422
	Right side	0.049	/	0.100	0.100
	Top side	/	0.011	0.048	0.059
	Bottom side	0.288	/	0.343	0.343

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Simultaneous Transmission SAR Summation Scenario for WLAN Head:

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant1	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
GSM850	Left Touch	0.112	0.914	0.496	0.301	1.026	0.608	0.413	0.909
	Left Tilt	0.066	0.400	0.887	0.170	0.466	0.953	0.236	1.123
	Right Touch	0.173	0.299	0.535	0.068	0.472	0.708	0.241	0.776
	Right Tilt	0.077	0.258	0.280	0.648	0.335	0.357	0.725	1.005
GSM1900	Left Touch	0.030	0.914	0.496	0.301	0.944	0.526	0.331	0.827
	Left Tilt	0.014	0.400	0.887	0.170	0.414	0.901	0.184	1.071
	Right Touch	0.009	0.299	0.535	0.068	0.308	0.544	0.077	0.612
	Right Tilt	0.001	0.258	0.280	0.648	0.259	0.281	0.649	0.929
WCDMA Band II	Left Touch	0.092	0.914	0.496	0.301	1.006	0.588	0.393	0.889
	Left Tilt	0.076	0.400	0.887	0.170	0.476	0.963	0.246	1.133
	Right Touch	0.105	0.299	0.535	0.068	0.404	0.640	0.173	0.708
	Right Tilt	0.068	0.258	0.280	0.648	0.326	0.348	0.716	0.996
WCDMA Band IV	Left Touch	0.146	0.914	0.496	0.301	1.060	0.642	0.447	0.943
	Left Tilt	0.108	0.400	0.887	0.170	0.508	0.995	0.278	1.165
	Right Touch	0.193	0.299	0.535	0.068	0.492	0.728	0.261	0.796
	Right Tilt	0.102	0.258	0.280	0.648	0.360	0.382	0.750	1.030
WCDMA Band V	Left Touch	0.132	0.914	0.496	0.301	1.046	0.628	0.433	0.929
	Left Tilt	0.091	0.400	0.887	0.170	0.491	0.978	0.261	1.148
	Right Touch	0.230	0.299	0.535	0.068	0.529	0.765	0.298	0.833
	Right Tilt	0.100	0.258	0.280	0.648	0.358	0.380	0.748	1.028
LTE Band 2	Left Touch	0.100	0.914	0.496	0.301	1.014	0.596	0.401	0.897
	Left Tilt	0.069	0.400	0.887	0.170	0.469	0.956	0.239	1.126
	Right Touch	0.104	0.299	0.535	0.068	0.403	0.639	0.172	0.707
	Right Tilt	0.070	0.258	0.280	0.648	0.328	0.350	0.718	0.998
LTE Band 4	Left Touch	0.135	0.914	0.496	0.301	1.049	0.631	0.436	0.932
	Left Tilt	0.093	0.400	0.887	0.170	0.493	0.980	0.263	1.150
	Right Touch	0.157	0.299	0.535	0.068	0.456	0.692	0.225	0.760
	Right Tilt	0.065	0.258	0.280	0.648	0.323	0.345	0.713	0.993
LTE Band 5	Left Touch	0.128	0.914	0.496	0.301	1.042	0.624	0.429	0.925
	Left Tilt	0.091	0.400	0.887	0.170	0.491	0.978	0.261	1.148
	Right Touch	0.155	0.299	0.535	0.068	0.454	0.690	0.223	0.758
	Right Tilt	0.101	0.258	0.280	0.648	0.359	0.381	0.749	1.029
LTE Band 7	Left Touch	0.159	0.914	0.496	0.301	1.073	0.655	0.460	0.956
	Left Tilt	0.068	0.400	0.887	0.170	0.468	0.955	0.238	1.125
	Right Touch	0.153	0.299	0.535	0.068	0.452	0.688	0.221	0.756
	Right Tilt	0.134	0.258	0.280	0.648	0.392	0.414	0.782	1.062
LTE Band 38	Left Touch	0.100	0.914	0.496	0.301	1.014	0.596	0.401	0.897
	Left Tilt	0.055	0.400	0.887	0.170	0.455	0.942	0.225	1.112
	Right Touch	0.089	0.299	0.535	0.068	0.388	0.624	0.157	0.692
	Right Tilt	0.081	0.258	0.280	0.648	0.339	0.361	0.729	1.009
LTE Band 41	Left Touch	0.099	0.914	0.496	0.301	1.013	0.595	0.400	0.896
	Left Tilt	0.051	0.400	0.887	0.170	0.451	0.938	0.221	1.108
	Right Touch	0.077	0.299	0.535	0.068	0.376	0.612	0.145	0.680
	Right Tilt	0.063	0.258	0.280	0.648	0.321	0.343	0.711	0.991

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Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant4	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
GSM850	Left Touch	0.786	0.466	0.496	0.301	1.252	1.282	1.087	1.583
	Left Tilt	0.107	0.400	0.887	0.170	0.507	0.994	0.277	1.164
	Right Touch	0.506	0.299	0.535	0.068	0.805	1.041	0.574	1.109
	Right Tilt	0.091	0.258	0.280	0.648	0.349	0.371	0.739	1.019
WCDMA Band V	Left Touch	0.338	0.466	0.496	0.301	0.804	0.834	0.639	1.135
	Left Tilt	0.016	0.400	0.887	0.170	0.416	0.903	0.186	1.073
	Right Touch	0.709	0.299	0.535	0.068	1.008	1.244	0.777	1.312
	Right Tilt	0.146	0.258	0.280	0.648	0.404	0.426	0.794	1.074
LTE Band 5	Left Touch	0.701	0.466	0.496	0.301	1.167	1.197	1.002	1.498
	Left Tilt	0.090	0.400	0.887	0.170	0.490	0.977	0.260	1.147
	Right Touch	0.334	0.299	0.535	0.068	0.633	0.869	0.402	0.937
	Right Tilt	0.076	0.258	0.280	0.648	0.334	0.356	0.724	1.004

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant5	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
GSM1900	Left Touch	0.301	0.466	0.496	0.301	0.767	0.797	0.602	1.098
	Left Tilt	0.373	0.400	0.887	0.170	0.773	1.260	0.543	1.430
	Right Touch	0.979	0.299	0.535	0.068	1.278	1.514	1.047	1.582
	Right Tilt	0.656	0.258	0.280	0.648	0.914	0.936	1.304	1.584
WCDMA Band II	Left Touch	0.298	0.466	0.496	0.301	0.764	0.794	0.599	1.095
	Left Tilt	0.360	0.400	0.887	0.170	0.760	1.247	0.530	1.417
	Right Touch	0.905	0.299	0.535	0.068	1.204	1.440	0.973	1.508
	Right Tilt	0.466	0.258	0.280	0.648	0.724	0.746	1.114	1.394
WCDMA Band IV	Left Touch	0.052	0.466	0.496	0.301	0.518	0.548	0.353	0.849
	Left Tilt	0.056	0.400	0.887	0.170	0.456	0.943	0.226	1.113
	Right Touch	0.185	0.299	0.535	0.068	0.484	0.720	0.253	0.788
	Right Tilt	0.081	0.258	0.280	0.648	0.339	0.361	0.729	1.009
LTE Band 2	Left Touch	0.246	0.466	0.496	0.301	0.712	0.742	0.547	1.043
	Left Tilt	0.305	0.400	0.887	0.170	0.705	1.192	0.475	1.362
	Right Touch	0.785	0.299	0.535	0.068	1.084	1.320	0.853	1.388
	Right Tilt	0.428	0.258	0.280	0.648	0.686	0.708	1.076	1.356
LTE Band 4	Left Touch	0.051	0.466	0.496	0.301	0.517	0.547	0.352	0.848
	Left Tilt	0.054	0.400	0.887	0.170	0.454	0.941	0.224	1.111
	Right Touch	0.170	0.299	0.535	0.068	0.469	0.705	0.238	0.773
	Right Tilt	0.099	0.258	0.280	0.648	0.357	0.379	0.747	1.027
LTE Band 7	Left Touch	0.194	0.466	0.496	0.301	0.660	0.690	0.495	0.991
	Left Tilt	0.240	0.400	0.887	0.170	0.640	1.127	0.410	1.297
	Right Touch	0.535	0.299	0.535	0.068	0.834	1.070	0.603	1.138
	Right Tilt	0.481	0.258	0.280	0.648	0.739	0.761	1.129	1.409
LTE Band 38	Left Touch	0.136	0.466	0.496	0.301	0.602	0.632	0.437	0.933
	Left Tilt	0.134	0.400	0.887	0.170	0.534	1.021	0.304	1.191
	Right Touch	0.467	0.299	0.535	0.068	0.766	1.002	0.535	1.070
	Right Tilt	0.270	0.258	0.280	0.648	0.528	0.550	0.918	1.198
LTE Band 41	Left Touch	0.118	0.466	0.496	0.301	0.584	0.614	0.419	0.915
	Left Tilt	0.116	0.400	0.887	0.170	0.516	1.003	0.286	1.173

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	Right Touch	0.508	0.299	0.535	0.068	0.807	1.043	0.576	1.111
	Right Tilt	0.242	0.258	0.280	0.648	0.500	0.522	0.890	1.170

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant5	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
EN_DC n5-B7	Left Touch	0.789	0.466	0.496	0.301	1.255	1.285	1.090	1.586
	Left Tilt	0.154	0.400	0.887	0.170	0.554	1.041	0.324	1.211
	Right Touch	0.489	0.299	0.535	0.068	0.788	1.024	0.557	1.092
	Right Tilt	0.210	0.258	0.280	0.648	0.468	0.490	0.858	1.138

WiFi 5G + BT:

Exposure position	SARmax (W/kg)		Summed SAR
	3	4	
	WiFi 5G MIMO	BT	3+4
Left Touch	0.496	0.301	0.797
Left Tilt	0.887	0.170	1.057
Right Touch	0.535	0.068	0.603
Right Tilt	0.280	0.648	0.928

Simultaneous Transmission SAR Summation Scenario for WLAN Body:
Body-worn:

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant1	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
GSM850	Front side	0.142	0.104	0.218	0.156	0.246	0.360	0.298	0.516
	Back side	0.226	0.114	0.253	0.243	0.340	0.479	0.469	0.722
GSM1900	Front side	0.275	0.104	0.218	0.156	0.379	0.493	0.431	0.649
	Back side	0.557	0.114	0.253	0.243	0.671	0.810	0.800	1.053
WCDMA Band II	Front side	0.396	0.104	0.218	0.156	0.500	0.614	0.552	0.770
	Back side	0.994	0.114	0.253	0.243	1.108	1.247	1.237	1.490
WCDMA Band IV	Front side	0.538	0.104	0.218	0.156	0.642	0.756	0.694	0.912
	Back side	0.983	0.114	0.253	0.243	1.097	1.236	1.226	1.479
WCDMA Band V	Front side	0.180	0.104	0.218	0.156	0.284	0.398	0.336	0.554
	Back side	0.239	0.114	0.253	0.243	0.353	0.492	0.482	0.735
LTE Band 2	Front side	0.529	0.104	0.218	0.156	0.633	0.747	0.685	0.903
	Back side	0.994	0.114	0.253	0.243	1.108	1.247	1.237	1.490
LTE Band 4	Front side	0.621	0.104	0.218	0.156	0.725	0.839	0.777	0.995
	Back side	0.880	0.114	0.253	0.243	0.994	1.133	1.123	1.376
LTE Band 5	Front side	0.159	0.104	0.218	0.156	0.263	0.377	0.315	0.533
	Back side	0.189	0.114	0.253	0.243	0.303	0.442	0.432	0.685
LTE Band 7	Front side	0.246	0.104	0.218	0.156	0.350	0.464	0.402	0.620
	Back side	0.405	0.114	0.253	0.243	0.519	0.658	0.648	0.901
LTE Band 38	Front side	0.242	0.104	0.218	0.156	0.346	0.460	0.398	0.616
	Back side	0.690	0.114	0.253	0.243	0.804	0.943	0.933	1.186
LTE	Front side	0.224	0.104	0.218	0.156	0.328	0.442	0.380	0.598

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Band 41	Back side	0.594	0.114	0.253	0.243	0.708	0.847	0.837	1.090

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant4	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
GSM850	Front side	0.192	0.104	0.218	0.156	0.296	0.410	0.348	0.566
	Back side	0.239	0.114	0.253	0.243	0.353	0.492	0.482	0.735
WCDMA Band V	Front side	0.203	0.104	0.218	0.156	0.307	0.421	0.359	0.577
	Back side	0.280	0.114	0.253	0.243	0.394	0.533	0.523	0.776
LTE Band 5	Front side	0.185	0.104	0.218	0.156	0.289	0.403	0.341	0.559
	Back side	0.289	0.114	0.253	0.243	0.403	0.542	0.532	0.785

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant5	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
GSM1900	Front side	0.174	0.104	0.218	0.156	0.278	0.392	0.330	0.548
	Back side	0.210	0.114	0.253	0.243	0.324	0.463	0.453	0.706
WCDMA Band II	Front side	0.295	0.104	0.218	0.156	0.399	0.513	0.451	0.669
	Back side	0.488	0.114	0.253	0.243	0.602	0.741	0.731	0.984
WCDMA Band IV	Front side	0.058	0.104	0.218	0.156	0.162	0.276	0.214	0.432
	Back side	0.087	0.114	0.253	0.243	0.201	0.340	0.330	0.583
LTE Band 2	Front side	0.189	0.104	0.218	0.156	0.293	0.407	0.345	0.563
	Back side	0.369	0.114	0.253	0.243	0.483	0.622	0.612	0.865
LTE Band 4	Front side	0.015	0.104	0.218	0.156	0.119	0.233	0.171	0.389
	Back side	0.077	0.114	0.253	0.243	0.191	0.330	0.320	0.573
LTE Band 7	Front side	0.176	0.104	0.218	0.156	0.280	0.394	0.332	0.550
	Back side	0.218	0.114	0.253	0.243	0.332	0.471	0.461	0.714
LTE Band 38	Front side	0.191	0.104	0.218	0.156	0.295	0.409	0.347	0.565
	Back side	0.249	0.114	0.253	0.243	0.363	0.502	0.492	0.745
LTE Band 41	Front side	0.198	0.104	0.218	0.156	0.302	0.416	0.354	0.572
	Back side	0.234	0.114	0.253	0.243	0.348	0.487	0.477	0.730

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant5	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
EN_DC n5-B7	Front side	0.410	0.104	0.218	0.156	0.514	0.628	0.566	0.784
	Back side	0.587	0.114	0.253	0.243	0.701	0.840	0.830	1.083

WiFi 5G MIMO+BT:

Exposure position	SARmax (W/kg)		Summed SAR
	3	4	
	WiFi 5G MIMO	BT	3+4
Front side	0.218	0.156	0.374
Back side	0.253	0.243	0.496

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Hotspot:

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant1	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
GSM850	Front side	0.225	0.277	0.395	0.263	0.502	0.620	0.488	0.883
	Back side	0.372	0.400	0.369	0.144	0.772	0.741	0.516	0.885
	Left side	0.037	/	/	/	0.037	0.037	0.037	0.037
	Right side	0.125	0.437	0.907	0.178	0.562	1.032	0.303	1.210
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	0.256	/	/	/	0.256	0.256	0.256	0.256
GSM1900	Front side	0.331	0.277	0.395	0.263	0.608	0.726	0.594	0.989
	Back side	0.552	0.400	0.369	0.144	0.952	0.921	0.696	1.065
	Left side	0.010	/	/	/	0.010	0.010	0.010	0.010
	Right side	0.029	0.437	0.907	0.178	0.466	0.936	0.207	1.114
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	0.905	/	/	/	0.905	0.905	0.905	0.905
WCDMA Band II	Front side	0.207	0.277	0.395	0.263	0.484	0.602	0.470	0.865
	Back side	0.409	0.400	0.369	0.144	0.809	0.778	0.553	0.922
	Left side	0.063	/	/	/	0.063	0.063	0.063	0.063
	Right side	0.047	0.437	0.907	0.178	0.484	0.954	0.225	1.132
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	1.064	/	/	/	1.064	1.064	1.064	1.064
WCDMA Band IV	Front side	0.500	0.277	0.395	0.263	0.777	0.895	0.763	1.158
	Back side	0.757	0.400	0.369	0.144	1.157	1.126	0.901	1.270
	Left side	0.070	/	/	/	0.070	0.070	0.070	0.070
	Right side	0.092	0.437	0.907	0.178	0.529	0.999	0.270	1.177
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	1.071	/	/	/	1.071	1.071	1.071	1.071
WCDMA Band V	Front side	0.444	0.277	0.395	0.263	0.721	0.839	0.707	1.102
	Back side	0.607	0.400	0.369	0.144	1.007	0.976	0.751	1.120
	Left side	0.053	/	/	/	0.053	0.053	0.053	0.053
	Right side	0.207	0.437	0.907	0.178	0.644	1.114	0.385	1.292
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	0.395	/	/	/	0.395	0.395	0.395	0.395
LTE Band 2	Front side	0.220	0.277	0.395	0.263	0.497	0.615	0.483	0.878
	Back side	0.349	0.400	0.369	0.144	0.749	0.718	0.493	0.862
	Left side	0.027	/	/	/	0.027	0.027	0.027	0.027
	Right side	0.016	0.437	0.907	0.178	0.453	0.923	0.194	1.101
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	0.869	/	/	/	0.869	0.869	0.869	0.869
LTE Band 4	Front side	0.348	0.277	0.395	0.263	0.625	0.743	0.611	1.006
	Back side	0.528	0.400	0.369	0.144	0.928	0.897	0.672	1.041
	Left side	0.042	/	/	/	0.042	0.042	0.042	0.042
	Right side	0.026	0.437	0.907	0.178	0.463	0.933	0.204	1.111
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638

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	Bottom side	0.866	/	/	/	0.866	0.866	0.866	0.866
LTE Band 5	Front side	0.246	0.277	0.395	0.263	0.523	0.641	0.509	0.904
	Back side	0.453	0.400	0.369	0.144	0.853	0.822	0.597	0.966
	Left side	0.081	/	/	/	0.081	0.081	0.081	0.081
	Right side	0.155	0.437	0.907	0.178	0.592	1.062	0.333	1.240
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	0.253	/	/	/	0.253	0.253	0.253	0.253
LTE Band 7	Front side	0.181	0.277	0.395	0.263	0.458	0.576	0.444	0.839
	Back side	0.474	0.400	0.369	0.144	0.874	0.843	0.618	0.987
	Left side	0.010	/	/	/	0.010	0.010	0.010	0.010
	Right side	0.049	0.437	0.907	0.178	0.486	0.956	0.227	1.134
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	0.288	/	/	/	0.288	0.288	0.288	0.288
LTE Band 38	Front side	0.143	0.277	0.395	0.263	0.420	0.538	0.406	0.801
	Back side	0.402	0.400	0.369	0.144	0.802	0.771	0.546	0.915
	Left side	0.045	/	/	/	0.045	0.045	0.045	0.045
	Right side	0.022	0.437	0.907	0.178	0.459	0.929	0.200	1.107
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	0.255	/	/	/	0.255	0.255	0.255	0.255
LTE Band 41	Front side	0.064	0.277	0.395	0.263	0.341	0.459	0.327	0.722
	Back side	0.335	0.400	0.369	0.144	0.735	0.704	0.479	0.848
	Left side	0.045	/	/	/	0.045	0.045	0.045	0.045
	Right side	0.067	0.437	0.907	0.178	0.504	0.974	0.245	1.152
	Top side	/	0.257	0.256	0.382	0.257	0.256	0.382	0.638
	Bottom side	0.062	/	/	/	0.062	0.062	0.062	0.062

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant4	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
GSM850	Front side	0.215	0.277	0.395	0.263	0.492	0.610	0.478	0.873
	Back side	0.258	0.400	0.369	0.144	0.658	0.627	0.402	0.771
	Left side	0.487	/	/	/	0.487	0.487	0.487	0.487
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.018	0.257	0.256	0.382	0.275	0.274	0.400	0.656
	Bottom side	/	/	/	/	/	/	/	/
WCDMA Band V	Front side	0.317	0.277	0.395	0.263	0.594	0.712	0.580	0.975
	Back side	0.416	0.400	0.369	0.144	0.816	0.785	0.560	0.929
	Left side	0.703	/	/	/	0.703	0.703	0.703	0.703
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.035	0.257	0.256	0.382	0.292	0.291	0.417	0.673
	Bottom side	/	/	/	/	/	/	/	/
LTE Band 5	Front side	0.341	0.277	0.395	0.263	0.618	0.736	0.604	0.999
	Back side	0.331	0.400	0.369	0.144	0.731	0.700	0.475	0.844
	Left side	0.654	/	/	/	0.654	0.654	0.654	0.654
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.026	0.257	0.256	0.382	0.283	0.282	0.408	0.664

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	Bottom side	/	/	/	/	/	/	/	/

Band	Exposure position	SARmax (W/kg)				Summed SAR	Summed SAR	Summed SAR	Summed SAR
		1	2	3	4				
		Ant5	WiFi 2.4G MIMO	WiFi 5G MIMO	BT	1+2	1+3	1+4	1+3+4
GSM1900	Front side	0.137	0.277	0.395	0.263	0.414	0.532	0.400	0.795
	Back side	0.196	0.400	0.369	0.144	0.596	0.565	0.340	0.709
	Left side	0.124	/	/	/	0.124	0.124	0.124	0.124
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.202	0.257	0.256	0.382	0.459	0.458	0.584	0.840
	Bottom side	/	/	/	/	/	/	/	/
WCDMA Band II	Front side	0.126	0.277	0.395	0.263	0.403	0.521	0.389	0.784
	Back side	0.226	0.400	0.369	0.144	0.626	0.595	0.370	0.739
	Left side	0.096	/	/	/	0.096	0.096	0.096	0.096
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.256	0.257	0.256	0.382	0.513	0.512	0.638	0.894
	Bottom side	/	/	/	/	/	/	/	/
WCDMA Band IV	Front side	0.027	0.277	0.395	0.263	0.304	0.422	0.290	0.685
	Back side	0.045	0.400	0.369	0.144	0.445	0.414	0.189	0.558
	Left side	0.021	/	/	/	0.021	0.021	0.021	0.021
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.039	0.257	0.256	0.382	0.296	0.295	0.421	0.677
	Bottom side	/	/	/	/	/	/	/	/
LTE Band 2	Front side	0.101	0.277	0.395	0.263	0.378	0.496	0.364	0.759
	Back side	0.202	0.400	0.369	0.144	0.602	0.571	0.346	0.715
	Left side	0.102	/	/	/	0.102	0.102	0.102	0.102
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.240	0.257	0.256	0.382	0.497	0.496	0.622	0.878
	Bottom side	/	/	/	/	/	/	/	/
LTE Band 4	Front side	0.016	0.277	0.395	0.263	0.293	0.411	0.279	0.674
	Back side	0.044	0.400	0.369	0.144	0.444	0.413	0.188	0.557
	Left side	0.012	/	/	/	0.012	0.012	0.012	0.012
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.042	0.257	0.256	0.382	0.299	0.298	0.424	0.680
	Bottom side	/	/	/	/	/	/	/	/
LTE Band 7	Front side	0.066	0.277	0.395	0.263	0.343	0.461	0.329	0.724
	Back side	0.080	0.400	0.369	0.144	0.480	0.449	0.224	0.593
	Left side	0.026	/	/	/	0.026	0.026	0.026	0.026
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.093	0.257	0.256	0.382	0.350	0.349	0.475	0.731
	Bottom side	/	/	/	/	/	/	/	/
LTE Band 38	Front side	0.062	0.277	0.395	0.263	0.339	0.457	0.325	0.720
	Back side	0.070	0.400	0.369	0.144	0.470	0.439	0.214	0.583
	Left side	0.029	/	/	/	0.029	0.029	0.029	0.029
	Right side	/	0.437	0.907	0.178	0.437	0.907	0.178	1.085
	Top side	0.065	0.257	0.256	0.382	0.322	0.321	0.447	0.703

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