FCC SAR Compliance Test Report

Product Name:	Smart phone
Model:	WAS-LX1
Report No.:	SYBH(Z-SAR)022022017-2
FCC ID:	QISWAS-LX1

	APPROVED (Lab Manager)	PREPARED (Test Engineer)
BY	Wei Huanbin	He Peng
DATE	2017-03-17	2017-03-17

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Compliance and Testing Center of Huawei Technologies Co., Ltd)

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Tel: +86 755 28780808 Fax: +86 755 89652518

※ ※ Notice ※ ※

1. The laboratory has passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.

2. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01 & 2174.02 & 2174.03

3. The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named “Global Compliance and Testing Center of Huawei Technologies Co., Ltd”, the both names have coexisted since 2009.

4. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

5. The test report is invalid if there is any evidence of erasure and/or falsification.

6. The test report is only valid for the test samples.

7. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

Table of Contents

※ ※ Modified History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release. This test report shares the same test data of WAS-LX1(Report No:SYBH(Z-SAR)029112016-2) and adds a new optional battery test data.	2017-03-17	He Peng

1 General Information

1.1 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for WAS-LX1 are as below Table 1.

Band	Max Reported SAR(W/kg)		
	1-g Head	1-g Body-worn	1-g Hotspot
GSM850	0.92	0.50	0.64
GSM1900	0.61	0.59	0.85
UMTS Band II	0.97	**1.02**	0.89
UMTS Band V	1.13	0.38	0.63
LTE Band VII	0.78	0.71	**1.34**
WiFi 2.4G	1.03	0.09	0.18
WiFi 5G	**1.14**	0.07	0.10
The highest reported SAR for head, body-worn accessory, hotspot, and simultaneous transmission exposure conditions are 1.14W/kg, 1.02W/kg, 1.34W/kg and 1.52W/kg, respectively per KDB690783 D01.			

Table 1:Summary of test result

Note:

1)* For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and that positions the handset a minimum of 15mm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

The device is in compliance with Specific Absorption Rate（SAR）for general population/uncontraolled exposure limits according to the FCC rule §2.1093, the ANSI C95.1:1992/IEEE C95.1:1991, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013.

1.2 RF exposure limits

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

Table 2: RF exposure limits

The limit applied in this test report is shown in **bold** letters

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.

1.3 EUT Description

Device Information：			
Product Name:	Smart Phone		
Model:	WAS-LX1		
FCC ID :	QISWAS-LX1		
SN:	1#: 014EUW16B8001634 2#: 014EUW16B8001598 3#: PMF0116B12000479 4#: PMF0116B12000386 5#: 014EUW16B8001729		
Device Type :	Portable device		
Device Phase:	Identical Prototype		
Exposure Category:	Uncontrolled environment / general population		
Hardware Version :	HL2WASM		
Software Version :	WAS-LX1C900B083		
Antenna Type :	Internal antenna		
Others Accessories	Headset		
Device Operating Configurations:			
Supporting Mode(s)	GSM850/1900, UMTS Band II/V, LTE Band VII, WiFi 2.4G, WiFi 5G, BT, NFC		
Test Modulation	GSM(GMSK/8PSK),UMTS(QPSK), LTE(QPSK/16QAM), WiFi(DSSS/OFDM),BT(GFSK)		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM850	824-849	869-894
	GSM1900	1850-1910	1930-1990
	UMTS Band II	1850-1910	1930-1990
	UMTS Band V	824-849	869-894
	LTE Band VII	2500-2570	2620-2690
	BT	2400-2483.5	
	WiFi 2.4G	2400-2483.5	
	WiFi 5G	5150-5350 5470-5725	
	NFC	13.56	
GPRS Multislot Class(12)	Max Number of Timeslots in Uplink:		4
	Max Number of Timeslots in Downlink:		4
	Max Total Timeslot:		5
EGPRS Multislot Class(12)	Max Number of Timeslots in Uplink:		4
	Max Number of Timeslots in Downlink:		4
	Max Total Timeslot:		5
HSDPA UE Category	14		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		
Power Class:	1,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all 1”(UMTS Band II)		
	3, tested with power control “all 1”(UMTS Band V)		
	3, tested with power control all Max.(LTE Band VII)		
Test Channels (low-mid-high):	128-190-251(GSM850)		
	512-661-810(GSM1900)		

	9262-9400-9538(UMTS Band II)
	4132-4182-4233(UMTS Band V)
	20775-21100-21425(LTE Band VII BW=5MHz)
	20800-21100-21400(LTE Band VII BW=10MHz)
	20825-21100-21375(LTE Band VII BW=15MHz)
	20850-21100-21350(LTE Band VII BW=20MHz)
	802.11b/g/n 20M:1-6-11 (WiFi 2.4G) 802.11n 40M:3-6-9 (WiFi 2.4G) 802.11a/n/ac 20M: 36-40-44-48-52-56-60-64-100-104-108-112-116-120-124-128-132-136-140 802.11n/ac 40M: 38-46-54-62-102-110-118-126-134 802.11ac 80M: 42-58-106-122 (WiFi 5G)

Table 3:Device information and operating configuration

1.3.1 General Description

WAS-LX1 is subscriber equipment in the GSM/UMTS/LTE system.The GSM frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. but only GSM850 and GSM1900 test data included in this report. The UMTS frequency band is band 1/2/5/8,but only band 2/5 test data included in this report. The LTE frequency band is band 7. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) . It also provides bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other bluetooth devices.

Battery information:

Name	Manufacture	Serials number	Description
Rechargeable Li-ion	Desay	NA	Battery Model: HB366481ECW Rated capacity: 2900mAh Nominal Voltage:3.82 V
	Sunwoda	NA	
	Scud	NA	

Difference between WAS-L03T and WAS-LX1 is as below:

Model	WAS-L03T	WAS-LX1
Trade mark	HUAWEI	HUAWEI
PCB layout	the same	the same
Frequency	GSM: B2/B3/B5/B8 WCDMA: B1/B2/B4/B5/B8 LTE: B2/B4/B5/B7/B12/B17 WiFi 2.4G 802.11 b/g/n	GSM: B2/B3/B5/B8 WCDMA：B1/B2/B5/B8 LTE：B7 WIFI：2.4G+5G 802.11 a/b/g/n/ac Frequency disabled by hardware, Changes are followed: 1. change B4 duplexer to B3 duplexer. 2. add B8 div SAW. 3 delete B28 div SAW. 4. add B20 div SAW. 5. change B28A duplexer to B20 duplexer. 6. delete B28B duplexer. 7. add B3 div LNA and SAW 9 delete B2 div SAW 10 . add PRX/DRX HBMB_LB Diplexer 11. add PRX/DRX HB_MBLB Diplexer 12. add wifi 5G SAW/FEM
SIM Card	single	double
RAM	3GB	3GB
NFC	Not support NFC Delete NFC chip in PCB	Support NFC
Hardware Version	The same	The same
Software Version	different	different
Dimensions	the same	the same
Appearance	the same	the same
main antenna	the same	the same
BT/Wi-Fi antenna	2.4G： the same 5G：not support	2.4G： the same 5G：support
NFC antenna	Delete NFC antenna	NFC antenna
SAR sensor	NO	Main antenna Use in LTE B7
CA band*	Inter-band CA:B4+B7， B4+B12，B4+B17	Inter-band CA:B7+B3，B7+B20，B3+B20 Intra-band non-contiguous CA：B3+B3 Intra-band contiguous CA： B1+B1/B7+B7/B20+B20/B3+B3
Others	The same	The same

According to the difference description above,

1) For the same frequency bands(GSM850/1900, UMTS Band II /V, LTE Band VII of second antenna, GSM850/1900, UMTS Band II /V of main antenna, WiFi 2.4G/BT), WAS-LX1 SAR is tested at the SAR worst case of WAS-L03T (report No.: SYBH(Z-SAR)014122016-2) for each antenna, frequency band and RF exposure condition.
2) For the different band(LTE Band VII of main antenna), new full test is performded on WAS-LX1 as the SAR sensor and power level is different from WAS-L03T.
3) For the new added band(WiFi 5G), new full test is performded on WAS-LX1;
4) * The device supports downlink LTE-CA only.Testing is not required in bands or modes not intended/allowed for US operation in this report.

The difference with WAS-LX1(old) and WAS-LX1(new) are as below:

Model	WAS-LX1(old)	WAS-LX1(new)
Trade mark	HUAWEI	HUAWEI
PCB layout	The same	The same
Frequency	The same	The same
SIM Card	The same	The same
RAM	The same	The same
NFC	The same	The same
Hardware Version	The same	The same
Software Version	The same	The same
Dimensions	The same	The same
Appearance	The same	The same
main antenna	The same	The same
BT/Wi-Fi antenna	The same	The same
CA band	The same	The same
Battery	Type: Li-Polymer Battery Manufacture: Desay Battery Co.,Ltd Sunwoda Electronic Co.,Ltd Description: Battery Model: HB366481ECW Rated capacity: 2900mAh Nominal Voltage:3.82 V	Type: Li-Polymer Battery Manufacture: Scud (Fujian) Electronics Co.,Ltd Description: Battery Model: HB366481ECW Rated capacity: 2900mAh Nominal Voltage:3.82 V
Others	the same	the same

According to the difference above, this test report shares the same test data of WAS-LX1(Report No.: SYBH(Z-SAR)029112016-2) and adds the new optional battery test data(Manufacture:Scud) at SAR the worst case of each frequency band and RF exposure condition.

1.3.2 Dynamic antenna switching specification

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

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

1.3.3 Dynamic antenna tuning Test Configurations

The device also supports the dynamic antenna tuning function to optimize transmission efficiency for 690MHz~960MHz frequency operations, especially in any hand usage scenario. The antenna tuning and operating parameters are implemented using a fixed table look-up mechanism that is fully contained within the approved transmitter; therefore, antenna tuning is static and remains unchanged for the same device operating configurations.The PAG exclusion clause in KDB388624D02 note 7 can be satisfied.

The dynamic antenna tuning function is only applicable for some frequency bands of the 2G/3G/4G second Tx antenna: GSM850 and UMTS Band V. The 2G/3G/4G second antenna has two fixed states for these tuning bands: The two states (state 1 and state 2) shares the same antenna, RF path, test channel and conductive power. The software will choose better RSSI as the working state of the TX antenna based on the RSSI comparison and switch algorithm.

SAR test procedure for dynamic antenna tuning is as below:
a) Firstly, some test scripts are used to fix the tuning state at state1 or state 2, so that only one antenna tuning state is chosen at a time for SAR test.
b) Secondly, in order to reduce the number of SAR tests required to demonstrate compliance for the two tuning states, one single point zoom scan SAR measurement between state1 and state 2 for each antenna tuning band and applicable RF exposure condition is considered to identify the higher SAR tuning state that need the full set of normally required SAR measurements and allow SAR test reduction for the other lower SAR conditions.
c) Thirdly, full normally required SAR measurements are performed for the chosen higher SAR tuning state. The SAR worst case will also be checked for the other state in each antenna tuning band and applicable RF exposure condition to ensure the SAR compliance.

1.3.4 Power reduction specification

This device uses a single fixed level of power reduction through static table look-up for SAR compliance and it is triggered by a single event or operation:
1) A fixed level power reduction is applied for some frequency bands when hotspot mode becomes active. When the hotspot is disabled, the power value will be recovered.
2) A fixed level power reduction is applied for some frequency bands when 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) This device uses a proximity sensor that shares the same metallic electrode as the main transmitting antenna to facilitate triggering in typical user interactivity with the device.
Due to the operating configurations and exposure conditions required by the device, 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. The test procedures in KDB 616217 is applied to determine proximity sensor triggering distances, and sensor coverage for normal and tilt positions. The detailed test configuration description are provided in Section 6 of this report.

The following tables summerize the key power reduction information.The detailed full power and reduced tune-up specifications and conducted power measurement results are provided in Section 7 of this report.

Band	Power Reduction Level Amount (dB)	
	Main Antenna	
	Hotspot is active	Hotspot is disabled
GSM1900	3.0	0
UMTS Band II	4.8	0

Band	Power Reduction Level Amount (dB)	
	Main Antenna	
	Sensor on	Sensor off
LTE Band VII	6.0	0

Band	Power Reduction Amount (dB)
	Second Antenna + WiFi simultaneous transmission (WiFi station)
WIFI 2.4G 802.11b	6.0
WIFI 2.4G 802.11g	7.0
WIFI 2.4G 802.11n 20M	6.0
WIFI 2.4G 802.11n 40M	6.0
WiFi 5G 802.11a	5.5
WiFi 5G 802.11n(20M)	5.5
WiFi 5G 802.11n(40M)	5.5
WiFi 5G 802.11ac(20M)	5.0
WiFi 5G 802.11ac(40M)	6.5
WiFi 5G 802.11ac(80M)	7.5

1.3.5 Downlink LTE CA additional specification

The device supports downlink LTE Carrier Aggregation (CA) only. Other Release 10 or higher features are not supported, including Uplink Carrier Aggregation, Enhanced SC-FDMA and Uplink MIMO or other antenna diversity configurations etc. All uplink communications are identical to the Release 8 Specifications.

The possible downlink LTE CA combinations supported by this device are as below tables per 3GPP TS 36.101 V14.1.0. The conducted power measurement results of downlink LTE CA are provided in Section 7 of this report per 3GPP TS 36.521-1 V14.0.0. According to KDB 941225 D05A, the downlink LTE CA SAR test is not required and PAG requirements can be excluded.

	E-UTRA CA configuration / Bandwidth combination set					
E-UTRA CA configuration	**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	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				
	20	5, 10, 15				

Test frequencies for CA_7C

Range	**CC-Combo / N_{RB_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.											

inter-band CA (two bands)

E-UTRA CA configuration / Bandwidth combination set									
E-UTRA CA Configuration	**E-UTRA Bands**	**1.4 MHz**	**3 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**	**Maximum aggregated bandwidth [MHz]**	**Bandwidth combination set**
CA_3A-7A	3			Yes	Yes	Yes	Yes	40	0
	7				Yes	Yes	Yes		
CA_7A-20A	7				Yes	Yes	Yes	30	0
	20			Yes	Yes				
	7				Yes	Yes	Yes	40	1
	20			Yes	Yes	Yes	Yes		
NOTE 1: The CA Configuration refers to a combination of an operating band and a CA bandwidth class specified in Table 5.4.2A-1 (the indexing letter). Absence of a CA bandwidth class for an operating band implies support of all classes. NOTE 2: For each band combination, all combinations of indicated bandwidths belong to the set NOTE 3: For the supported CC bandwidth combinations, the CC downlink and uplink bandwidths are equal									

Note:

1) The channel spacing and aggregated channel bandwidth for CA are identical to the associated specification in 3GPP TS 36.101 V14.1.0

2) The reference test frequencies for CA refers to 3GPP TS 36.508 V13.1.0.

1.4 Test specification(s)

ANSI C95.1:1992	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991)
IEEE Std 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB941225 D01	3G SAR Procedures v03r01
KDB941225 D05	SAR for LTE Devices v02r05
KDB941225 D05A	LTE Rel.10 KDB Inquiry Sheet v01r02
KDB941225 D06	Hotspot SAR v02r01
KDB447498 D01	General RF Exposure Guidance v06
KDB648474 D04	Handsets SAR v01r03
KDB248227 D01	SAR Guidance for IEEE 802 11 Wi-Fi SAR v02r02
KDB865664 D01	SAR measurement 100 MHz to 6 GHz v01r04
KDB865664 D02	RF Exposure Reporting v01r02
KDB690783 D01	SAR Listings on Grants v01r03
KDB616217 D04	SAR for laptop and tablets v01r02

1.5 Testing laboratory

Test Site	The Reliability Laboratory of Huawei Technologies Co., Ltd.
Test Location	Section G1,Huawei Base Bantian, Longgang District, Shenzhen 518129, P.R. China
Telephone	+86 755 28780808
Fax	+86 755 89652518
State of accreditation	The Test laboratory (area of testing) is accredited according to ISO/IEC 17025. CNAS Registration number: L0310 A2LA TESTING CERT #2174.01 & 2174.02 & 2174.03

1.6 Applicant and Manufacturer

Company Name	HUAWEI TECHNOLOGIES CO., LTD
Address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.7 Application details

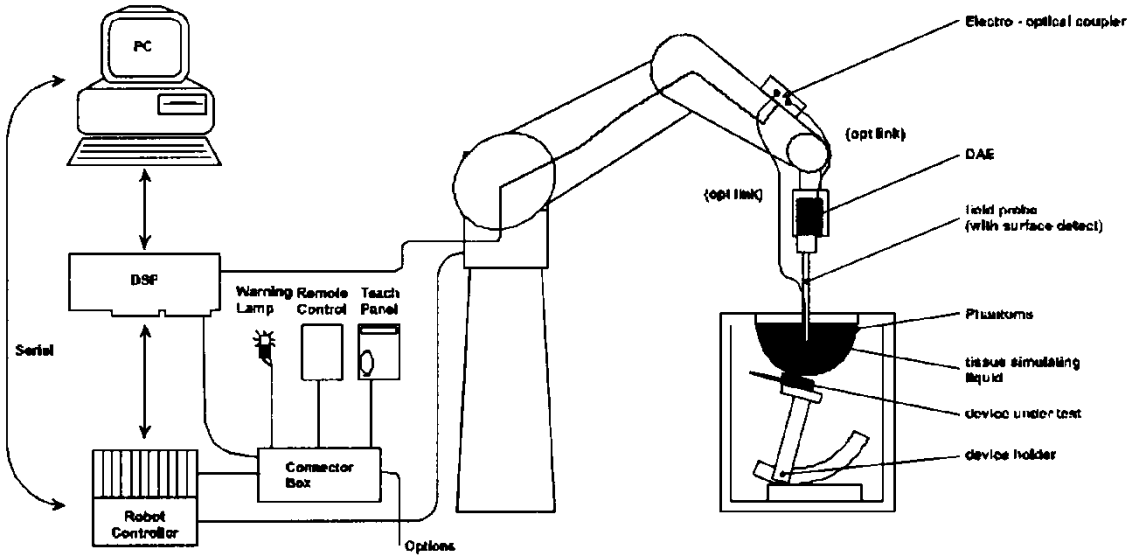
Start Date of test	2017-01-12	2017-03-01
End Date of test	2017-01-25	2017-03-01

1.8 Ambient Condition

Ambient temperature	20°C – 24°C
Relative Humidity	30% – 70%

2 SAR Measurement System

2.1 SAR Measurement Set-up



The DASY5/6 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating 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 electronic (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.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5/6 measurement server.
- The DASY5/6 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 7.
- DASY5/6 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System check dipoles allowing to validate the proper functioning of the system.

2.2 Test environment

The DASY5/6 measurement system is placed at the head end of a room with dimensions:
5 x 2.5 x 3 m³, the SAM phantom is placed in a distance of 75 cm from the side walls and 1.1m from the rear wall. Above the test system a 1.5 x 1.5 m² array of pyramid absorbers is installed to reduce reflections from the ceiling.
Picture 1 of the photo documentation shows a complete view of the test environment.
The system allows the measurement of SAR values larger than 0.005 mW/g.

2.3 Data Acquisition Electronics description

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

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

DAE4

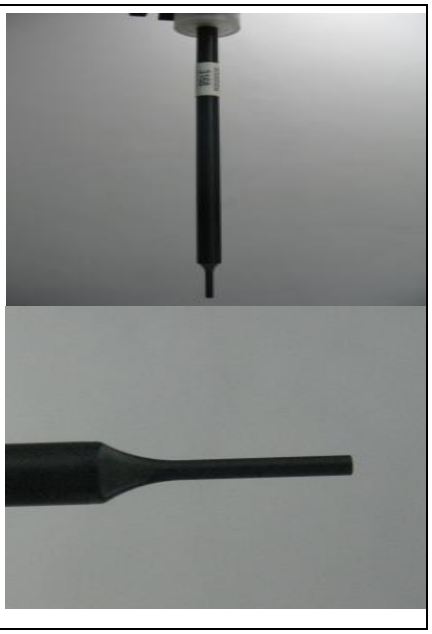
Input Impedance	200MOhm	
The Inputs	symmetrical and floating	
Common mode rejection	above 80 dB	

2.4 Probe description

These probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor (±2 dB). The dosimetric probes have special calibrations in various liquids at different frequencies.

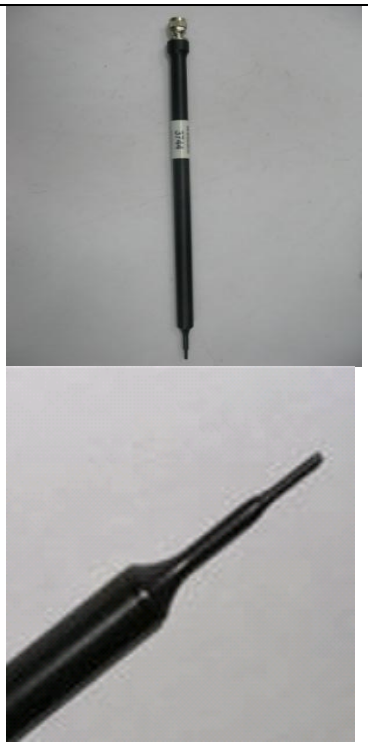
Isotropic E-Field Probe ES3DV3 for Dosimetric Measurements

Construction	Symmetrical design with triangular core Interleaved sensors 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 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones



Isotropic E-Field Probe EX3DV4 for Dosimetric Measurements

Construction	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 HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic range	10 µW/g to > 100 mW/g; Linearity: ± 0.2 dB(noise:typically<1µW/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: 1mm
Application	High precision dosimetric measurements in any exposure scenario(e.g.,very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%

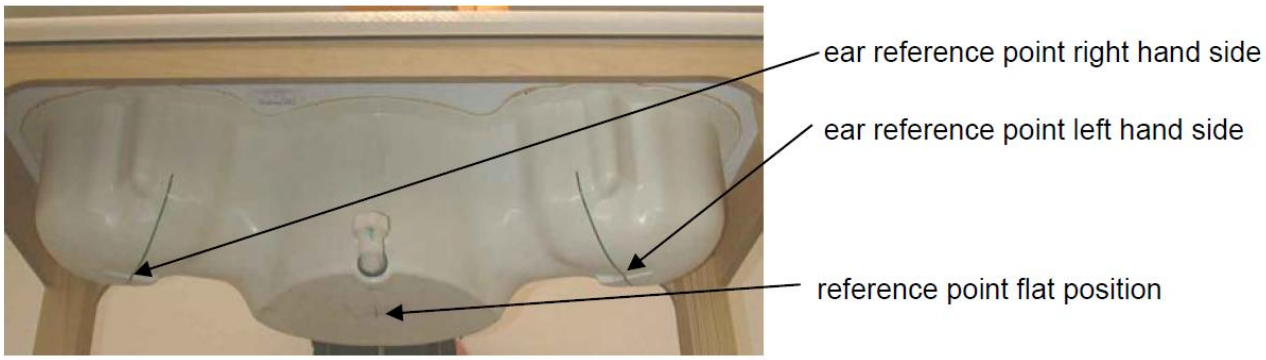


2.5 Phantom description

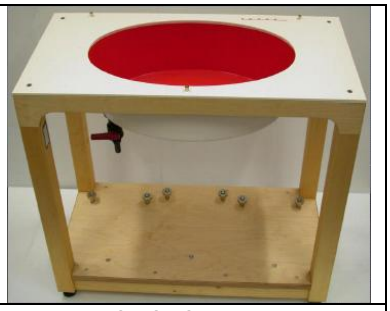
SAM Twin Phantom

Shell Thickness	2mm±0.2mm;The ear region:6.0±0.2mm	
Filling Volume	Approximately 25 liters	
Dimensions	Length:1000mm; Width:500mm; Height: adjustable feet	
Measurement Areas	Left hand Right hand Flat phantom	
The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on top of this phantom cover are possible. Three reference marks are provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.		

The following figure shows the definition of reference point:



ELI4 Phantom

Shell Thickness	2mm±0.2mm	
Filling Volume	Approximately 30 liters	
Dimensions	Major axis:600mm; Minor axis:400mm;	
Measurement Areas	Flat phantom	
The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30MHz to 6GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209-2 and all known tissue simulating liquids.		

The phantom shell material is resistant to all ingredients used in the tissue-equivalent liquid recipes. The shell of the phantom including ear spacers is constructed from low permittivity and low loss material, with a relative permittivity $2 \leq \varepsilon r \leq 5$ at ≤3 GHz, $3 \leq \varepsilon r \leq 4$ at >3 GHz and and a loss tangent $\leqslant 0.05$.

2.6 Device holder description

The DASY5/6 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA's only. If necessary an additional support of polystyrene material is used.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε =3 and loss tangent σ =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.
The device holder permits the device to be positioned with a tolerance of ±1° in the tilt angle.

Larger DUT's (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values.
Therefore those devices are normally only tested at the flat part of the SAM.

2.7 Test Equipment List

This table gives a complete overview of the SAR measurement equipment.
Devices used during the test described are marked ☒

	Manufacturer	Device	Type	Serial number	Date of last calibration	Valid period
☒	SPEAG	Dosimetric E-Field Probe	ES3DV3	3168	2016-09-27	One year
☒	SPEAG	Dosimetric E-Field Probe	EX3DV4	3744	2016-07-26	One year
☒	SPEAG	Dosimetric E-Field Probe	EX3DV4	3736	2016-04-26	One year
☒	SPEAG	835 MHz Dipole	D835V2	4d059	2016-04-20	Three years
☒	SPEAG	1900 MHz Dipole	D1900V2	5d091	2015-09-21	Three years
☒	SPEAG	2450 MHz Dipole	D2450V2	860	2016-11-23	Three years
☒	SPEAG	2600 MHz Dipole	D2600V2	1021	2016-07-25	Three years
☒	SPEAG	5GHz Dipole	D5GHzV2	1155	2016-04-26	Three years
☒	SPEAG	Data acquisition electronics	DAE4	1236	2016-11-22	One year
☒	SPEAG	Data acquisition electronics	DAE4	852	2016-04-20	One year
☒	SPEAG	Software	DASY 5	N/A	NCR	NCR
☒	SPEAG	Twin Phantom	SAM1	TP-1475	NCR	NCR
☒	SPEAG	Twin Phantom	SAM2	TP-1474	NCR	NCR
☒	SPEAG	Twin Phantom	SAM3	TP-1597	NCR	NCR
☒	SPEAG	Twin Phantom	SAM4	TP-1620	NCR	NCR
☐	SPEAG	Flat Phantom	ELI 4.0	TP-1038	NCR	NCR
☐	SPEAG	Flat Phantom	ELI 4.0	TP-1111	NCR	NCR
☒	R & S	Universal Radio Communication Tester	CMU 200	111389	2016-05-12	One year
☒	R & S	Universal Radio Communication Tester	CMW500	158850	2016-06-09	One year
☒	Agilent	Network Analyser	E5071B	MY42404956	2016-05-24	One year
☒	Agilent	Dielectric Probe Kit	85070E	2484	NCR	NCR
☒	Agilent	Signal Generator	E8257D	MY49281095	2016-08-05	One year
☒	MINI-CIRCUITS	Amplifier	ZHL-42W	QA1402001	NCR	NCR
☒	MINI-CIRCUITS	Amplifier	ZVE-8G+	N523101139	NCR	NCR
☒	AR	Directional Coupler	DC7144M1	31190	2016-05-13	One year
☒	Agilent	Dual Directional Coupler	772D	MY52180173	2017-01-03	One year
☒	R & S	Power Meter	NRP	100740	2016-07-20	One year
☒	R & S	Power Meter Sensor	NRP-Z11	106288	2016-07-07	One year
☒	Agilent	Power Meter	E4417A	MY54100027	2016-03-31	One year
☒	Agilent	Power Meter Sensor	E9321A	MY54130007	2016-03-31	One year
☒	Agilent	Power Meter Sensor	E9321A	MY54130001	2016-03-31	One year

Note:

1) Per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. 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) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.
d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually 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.

3 SAR Measurement Procedure

3.1 Scanning procedure

The DASY5/6 installation includes predefined files with recommended procedures for measurements and system check. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

- 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. The indicated drift is mainly the variation of the DUT’s output power and should vary max. +/- 5 %.

- The “surface check” measurement tests the optical surface detection system of the DASY5/6 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

- The “area scan” measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid spacing for head measurements is 15 mm in x- and y- dimension(≤2GHz)，12 mm in x- and y-dimension(2-4 GHz) and 10mm in x- and y- dimension(4-6GHz). If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation.
  Results of this coarse scan are shown in Appendix B.

- A “zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine grid with maximum scan spatial resolution: Δx_{zoom}, Δy_{zoom}≤ 2GHz - ≤8mm, 2-4GHz - ≤5 mm and 4-6 GHz-≤4mm; Δz_{zoom} ≤3GHz - ≤5 mm, 3-4 GHz- ≤4mm and 4-6GHz-≤2mm where the robot additionally moves the probe along the z-axis away from the bottom of the Phantom. DASY is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in Appendix B. Test results relevant for the specified standard (see chapter 1.4.)are shown in table form form in chapter 7.2.

- A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 2 mm steps. This measurement shows the continuity of the liquid and can - depending in the field strength – also show the liquid depth. A z-axis scan of the measurement with maximum SAR value is shown in Appendix B.

The following table summarizes the area scan and zoom scan resolutions per FCC KDB 865664D01:

Frequency	Maximun Area Scan resolution (Δx_{area}, Δy_{area})	Maximun Zoom Scan spatial resolution (Δx_{Zoom}, Δy_{Zoom})	Maximun Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			$\Delta z_{Zoom}(n)$	$\Delta z_{Zoom}(1)$*	$\Delta z_{Zoom}(n>1)$*	
≤2GHz	≤15mm	≤8mm	≤5mm	≤4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥30mm
2-3GHz	≤12mm	≤5mm	≤5mm	≤4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥30mm
3-4GHz	≤12mm	≤5mm	≤4mm	≤3mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥28mm
4-5GHz	≤10mm	≤4mm	≤3mm	≤2.5mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥25mm
5-6GHz	≤10mm	≤4mm	≤2mm	≤2mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥22mm

3.2 Spatial Peak SAR Evaluation

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 5 x 5 x 7 points(with 8mm horizontal resolution) or 7 x 7 x 7 points(with 5mm horizontal resolution) or 8 x 8 x 7 points(with 4mm horizontal resolution). The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting 'Graph Evaluated'.

- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.

- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.

Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computermathematik, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].

Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

Advanced Extrapolation

DASY5/6 uses the advanced extrapolation option which is able to compansate boundary effects on E-field probes.

3.3 Data Storage and Evaluation

Data Storage

The DASY5/6 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], [mW/g], [mW/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.

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	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- 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 DASY5/6 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 V_i = compensated signal of channel i (i = x, y, z)
U_i = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
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: $E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$

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

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

$Norm_i$ = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)^2] for E-field Probes

ConvF = sensitivity enhancement in solution

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

f = carrier frequency [GHz]

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

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

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

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

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

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

with SAR = local specific absorption rate in mW/g

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

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

ρ = equivalent tissue density in g/cm^3

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

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

with P_{pwe} = equivalent power density of a plane wave in mW/cm^2

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

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

4 System Verification Procedure

4.1 Tissue Verification

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectic parameter are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within ± 5% of the target values.

The following materials are used for producing the tissue-equivalent materials.

Ingredients (% of weight)	**Head Tissue**					
Frequency Band (MHz)	750	**835**	1750	**1900**	**2450**	**2600**
Water	39.2	41.45	52.64	55.242	62.7	55.242
Salt (NaCl)	2.7	1.45	0.36	0.306	0.5	0.306
Sugar	57.0	56.0	0.0	0.0	0.0	0.0
HEC	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.0	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	47.0	44.542	36.8	44.452
Ingredients (% of weight)	**Body Tissue**					
Frequency Band (MHz)	750	**835**	1750	**1900**	**2450**	**2600**
Water	50.3	52.4	69.91	69.91	73.2	64.493
Salt (NaCl)	1.60	1.40	0.13	0.13	0.04	0.024
Sugar	47.0	45.0	0.0	0.0	0.0	0.0
HEC	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.0	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	29.96	29.96	26.7	32.252

Table 4: Tissue Dielectric Properties

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16MΩ+ resistivity
HEC: Hydroxyethyl Cellulose; DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100(ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

☒**Simulating Head Liquid for 5G(HBBL3500-5800MHz), Manufactured by SPEAG:**

Ingredients	(% by weight)
Water	50-65%
Mineral oil	10-30%
Emulsifiers	8-25%
Sodium salt	0-1.5%

☒**Simulating Body Liquid for 5G(MBBL3500-5800MHz),Manufactured by SPEAG:**

Ingredients	(% by weight)
Water	60-80%
Esters,Emulsifiers,Inhibitors	20-40%
Sodium salt	0-1.5%

Tissue Type	Target Frequency	Target Tissue		Measured Tissue		Deviation (Within +/-5%)		Liquid Temp.	Test Date
		Permit-tivity	Conduc-tivity [S/m]	Permit-tivity	Condu c-tivity [S/m]	$\Delta\varepsilon_r$	$\Delta\sigma$		
835MHz Head	825	41.60	0.90	41.73	0.891	0.31%	-0.98%	22.0°C	2017/1/12
	835	41.50	0.90	41.65	0.900	0.36%	0.02%		
	850	41.50	0.92	41.53	0.913	0.07%	-0.77%		
835MHz Head	825	41.60	0.90	41.84	0.926	0.58%	2.84%	21.5°C	2017/1/18
	835	41.50	0.90	41.81	0.929	0.75%	3.23%		
	850	41.50	0.92	41.75	0.935	0.60%	1.67%		
1900MHz Head	1850	40.00	1.40	39.04	1.378	-2.40%	-1.57%	21.5°C	2017/1/19
	1880	40.00	1.40	39.00	1.399	-2.50%	-0.07%		
	1900	40.00	1.40	38.97	1.409	-2.58%	0.64%		
	1910	40.00	1.40	38.95	1.415	-2.62%	1.07%		
2450MHz Head	2410	39.30	1.76	38.20	1.766	-2.80%	0.34%	21.7°C	2017/1/14
	2435	39.20	1.79	38.17	1.782	-2.63%	-0.45%		
	2450	39.20	1.80	38.16	1.793	-2.65%	-0.39%		
	2460	39.20	1.81	38.15	1.799	-2.68%	-0.61%		
2600MHz Head	2510	39.12	1.86	39.81	1.905	1.76%	2.42%	21.7°C	2017/1/22
	2535	39.10	1.89	39.78	1.924	1.74%	1.80%		
	2560	39.00	1.92	39.76	1.947	1.95%	1.56%		
	2600	39.00	1.96	39.71	1.981	1.82%	1.07%		
5GHz Head	5250	35.90	4.71	35.33	4.715	-1.59%	0.11%	21.9°C	2017/1/19
	5600	35.50	5.07	34.67	5.152	-2.34%	1.62%	21.9°C	2017/1/20
835MHz Body	825	55.20	0.97	53.37	0.994	-3.32%	2.44%	22.0°C	2017/1/16
	835	55.20	0.97	53.33	0.998	-3.39%	2.90%		
	850	55.20	0.99	53.27	1.006	-3.50%	1.62%		
1900MHz Body	1850	53.30	1.52	55.10	1.530	3.38%	0.66%	22.0°C	2017/1/20
	1880	53.30	1.52	55.24	1.554	3.64%	2.24%		
	1900	53.30	1.52	55.12	1.565	3.41%	2.96%		
	1910	53.30	1.52	55.03	1.574	3.25%	3.55%		
2450MHz Body	2410	52.80	1.91	52.69	1.972	-0.21%	3.25%	21.8°C	2017/1/13
	2435	52.70	1.94	52.66	1.992	-0.08%	2.68%		
	2450	52.70	1.95	52.64	2.005	-0.11%	2.82%		
	2460	52.70	1.96	52.63	2.013	-0.13%	2.70%		
2600MHz Body	2510	52.62	2.03	54.58	2.127	3.72%	4.78%	21.5°C	2017/1/23
	2535	52.59	2.07	54.55	2.151	3.73%	3.91%		
	2560	52.57	2.09	54.52	2.176	3.71%	4.11%		
	2600	52.50	2.16	54.47	2.215	3.75%	2.55%		
2600MHz Body	2510	52.62	2.03	51.75	2.096	-1.65%	3.25%	21.7°C	2017/3/1
	2535	52.59	2.07	51.71	2.122	-1.67%	2.51%		
	2560	52.57	2.09	51.67	2.147	-1.71%	2.73%		
	2600	52.50	2.16	51.60	2.187	-1.71%	1.25%		
5GHz Head	5250	48.90	5.36	49.68	5.415	1.57%	1.03%	21.8°C	2017/1/20
	5600	48.50	5.77	49.25	5.810	1.55%	0.69%	21.8°C	2017/1/20

Table 5:Measured Tissue Parameter

Note: 1）The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.

2）KDB 865664 was ensured to be applied for probe calibration frequencies greater than or equal to 50MHz of the EUT frequencies.

3）The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies. The SAR test plots may slightly differ from the table above since the DASY rounds to three significant digits.

4.2 System Check

The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests(Graphic Plot(s) see Appendix A).

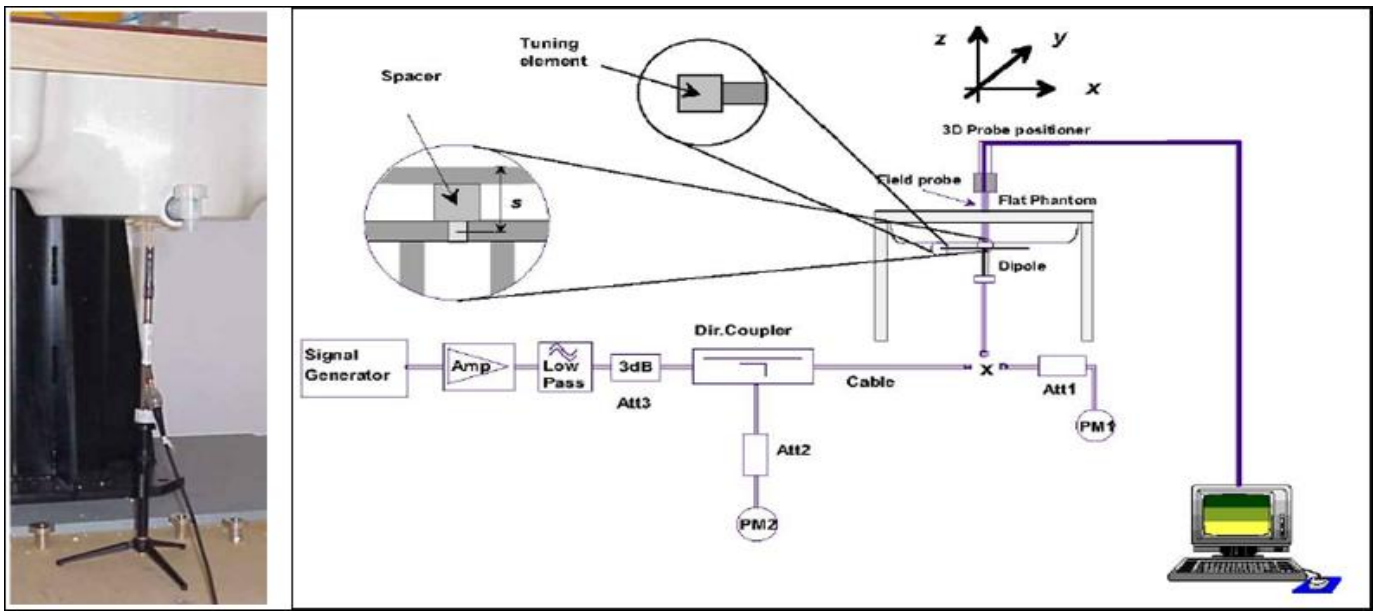
System Check	Target SAR (Normalized to 1W)		Measured SAR (Normalized to 1W)		Deviation (Within +/-10%)		Liquid Temp.	Test Date
	1-g (mW/g)	10-g (mW/g)	1-g (mW/g)	10-g (mW/g)	Δ1-g	Δ10-g		
835MHz Head	9.30	6.05	9.40	6.08	1.08%	0.50%	22.0°C	2017/1/12
835MHz Head	9.30	6.05	9.64	6.28	3.66%	3.80%	21.5°C	2017/1/18
1900MHz Head	40.20	21.10	40.80	20.84	1.49%	-1.23%	21.5°C	2017/1/19
2450MHz Head	51.90	24.40	50.00	23.20	-3.66%	-4.92%	21.7°C	2017/1/14
2600MHz Head	57.10	25.60	55.20	24.96	-3.33%	-2.50%	21.7°C	2017/1/22
5250MHz Head	74.40	21.60	79.20	22.30	6.45%	3.24%	21.9°C	2017/1/19
5600MHz Head	80.40	23.20	87.20	24.50	8.46%	5.60%	21.9°C	2017/1/20
835MHz Body	9.41	6.20	10.08	6.52	7.12%	5.16%	22.0°C	2017/1/16
1900MHz Body	39.90	21.00	42.80	21.92	7.27%	4.38%	22.0°C	2017/1/20
2450MHz Body	50.60	23.80	51.20	23.48	1.19%	-1.34%	21.8°C	2017/1/13
2600MHz Body	54.90	24.60	59.20	26.24	7.83%	6.67%	21.5°C	2017/1/23
2600MHz Body	54.90	24.60	58.80	26.00	7.10%	5.69%	21.7°C	2017/3/1
5250MHz Body	72.20	20.40	72.90	20.10	0.97%	-1.47%	21.8°C	2017/1/20
5600MHz Body	76.40	21.50	75.20	20.50	-1.57%	-4.65%	21.8°C	2017/1/20

Table 6:System Check Results

4.3 System check Procedure

The system check is performed by using a system check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250 mW(below 5GHz) or 100mW(above 5GHz). To adjust this power a power meter is used. The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



5 SAR measurement variability and uncertainty

5.1 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.

The detailed repeated measurement results are shown in Section 7.2.

5.2 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.

6 SAR Test Configuration

6.1 Test Positions Configuration

6.1.1 General considerations

Per IEEE 1528-2013, two imaginary lines on the handset were established: the vertical centerline and the horizontal line (See Figure 1).

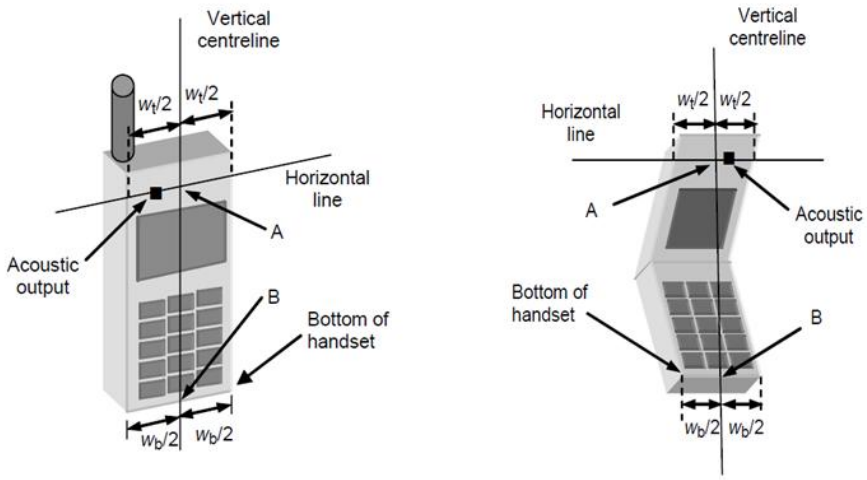


Figure 1 Hand Vertical Center & Horizontal Line Reference Points

6.1.2 Head Exposure Condition

Per IEEE 1528-2013, Head SAR measurements were made in the “cheek” position (See Figure 2) and the “tilt” position (See Figure 3). The device should be tested in both positions on left and right sides of the SAM phantom.

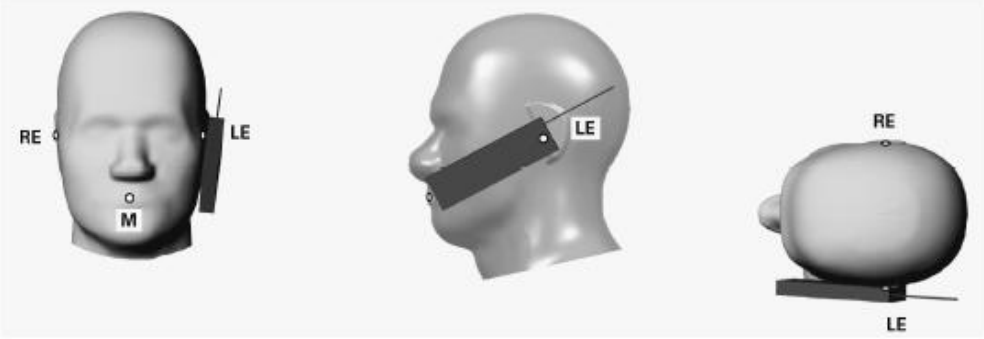


Figure 2 Front, Side and Top View of Cheek Position

Figure 3 Front, Side and Top View of Tilt 15° Position

Note:

M Mouth reference point

LE Left ear reference point (ERP)

RE Right ear reference point(ERP)

6.1.3 Body-worn Exposure Condition

Body-worn operating configurations are tested with the holder attached to the device and positioned against a flat phantom with test separation distance of 15mm in a normal use configuration (See Figure 4). Per FCC KDB648474 D04v01, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. 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.

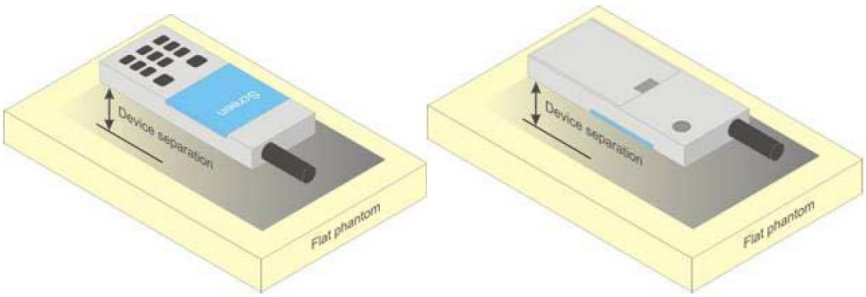


Figure 4 Test position for Body-Worn device

6.1.4 Hotspot Exposure Condition

Per FCC KDB 941225D06, The SAR test separation distance for hotspot mode is determined according to device form factor. When the overall length and width of a device is > 9 cm x 5 cm, a test separation distance of 10 mm is required for hotspot mode SAR measurements. A test separation distance of 5 mm or less is required for smaller devices. Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge; for the data modes, wireless technologies and frequency bands supporting hotspot mode. The SAR results are used to determine simultaneous transmission SAR test exclusion for hotspot mode; otherwise, simultaneous transmission SAR measurement is required.

6.2 3G SAR Test Reduction Procedure

Per KDB941225 D01, 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.

6.3 GSM Test Configuration

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using CMU200 the power lever is set to “5”and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

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.

6.4 UMTS 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 requied 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) WCDMA

a. Head SAR Measurements

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.

b. Body SAR Measurements

SAR for body-worn accessory 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

3) HSDPA

SAR for body exposure configurations is measured according to the “Body SAR Measurements’’ procedures of 3G device. 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.

Per KDB941225 D01v03, the 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures for the highest reported SAR body exposure configuration in 12.2 kbps RMC.

HSDPA should be configured according to UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HAPRQ 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 condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. The β_c and β_d gain factors for DPCCH and DPDCH were set according to the values in the below table, β_{hs} for HS-DPCCH is set automatically to the correct value when ΔACK, ΔNACK, ΔCQI = 8. The variation of the β_c /β_d ratio causes a power reduction at sub-tests 2 - 4.

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: △ACK, △NACK and △CQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$

Note 2 : CM=1 for β_c/β_d= 12/15, β_{hs}/β_c = 24/15. For all other combinations of DPDCH,DPCCH 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 β_c = 11/15 and β_d = 15/15

Table 7: Sub-tests for UMTS Release 5 HSDPA

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

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

Table 9:HSDPA UE category

4) HSUPA

SAR for body exposure configurations is measured according to the “Body SAR Measurements’’ procedures of 3G device. 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.

Per KDB941225 D01v03, the 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures for the highest reported body exposure SAR configuration in 12.2 kbps RMC.

Due to inner loop power control requirements in HSDPA, 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 HSDPA should be configured according to the values indicated below as well as other applicable procedures described in the ‘WCDMA Handset’ and ‘Release 5 HSDPA Data Device’ sections of 3G device.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ec} (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 10: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 11:HSUPA UE category

5) 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 12: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.

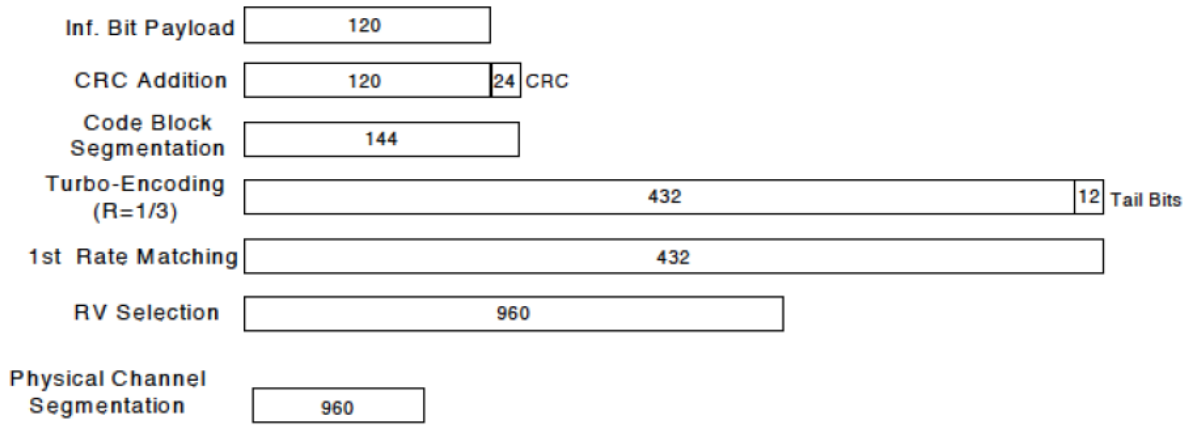


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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.

6.5 LTE Test Configuration

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices. The CMW500 WideBand Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing.SAR test were performed with the same number of RB and RB offsets transmitting on all TTI frames(Maximum TTI)

1) Spectrum Plots for RB configurations

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

2) MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.

The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (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

3) A-MPR

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signalling Value of “NS_01”on the base station simulator.

4) LTE procedures for SAR testing

A) Largest channel bandwidth standalone SAR test requirements

i) 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.

ii) QPSK with 50% RB allocation

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

iii) 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 i) and ii) 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.

iv) 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.

B) 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.

6.6 WiFi Test Configuration

For WiFi SAR testing, a communication link is set up with the testing software for WiFi mode test. During the test,at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The test procedures in KDB 248227D01 are applied.

6.6.1 Initial Test Position Procedure

For exposure condition with multiple test position, such as handsets operating next to the ear, devices with hotspot mode or UMPC mini-tablet , procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all position in an exposure condition. The test position with the highest extrapolated(peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4W/kg, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8W/kg or all test position are measured. 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.

6.6.2 Initial Test Configuration Procedure

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 (see section 5.3.2 of KDB 248227D01v02). SAR test reduction of subsequent highest output test channels is based on the *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 the subsequent next highest measured output power channel(s) in the initial test configuration until the *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

6.6.3 Sub Test Configuration Procedure

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.

When the highest reported SAR for the initial test configuration, 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.

6.6.4 WiFi 2.4G SAR Test 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.

A) 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 (section 3.1 of of KDB 248227D01v02) 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.

B) 2.4GHz 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 of of KDB 248227D01v02). 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.

6.6.5 WiFi 5G SAR Test Procedures

A) 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.

B) 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.

C) 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.

1) The channel closest to mid-band frequency is selected for SAR measurement.

2) 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.

D) 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.

6.7 Proximity sensor power reduction Configurations

This device uses a proximity sensor that shares the same metallic electrode as the main transmitting antenna to facilitate triggering in typical user interactivity with the device.

Due to the operating configurations and exposure conditions required by the device, 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.

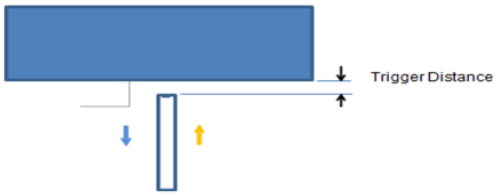
The following tables summerize the key power reduction information for proximity sensor. The similar test procedures in KDB 616217 should be applied to determine proximity sensor triggering distances, and sensor coverage for normal and tilt positions. To ensure all production units are compliant, it is generally necessary to reduce the triggering distance determined from the triggering tests by 1 mm, or more if it is necessary, and use the smallest distance for movements to and from the phantom, minus 1 mm, as the sensor triggering distance for determining the SAR measurement distance.

Main antenna		
Band	Sensor Trigger Distance	Power Reduction (dB)
LTE B7	Front side: 13mm Back side: 12mm Bottom side: 18mm	6.0

1) Procedures for determining proximity sensor triggering distances

The device was tested by the test lab to determine the proximity sensor triggering distances for the front side, back side and bottom side of the device. To ensure all production units are compliant, the smallest separation distance determined by the sensor triggering minus 1 mm, must be used as the test separation distance for SAR testing.

the proximity sensor triggering distance measurement method are as below:



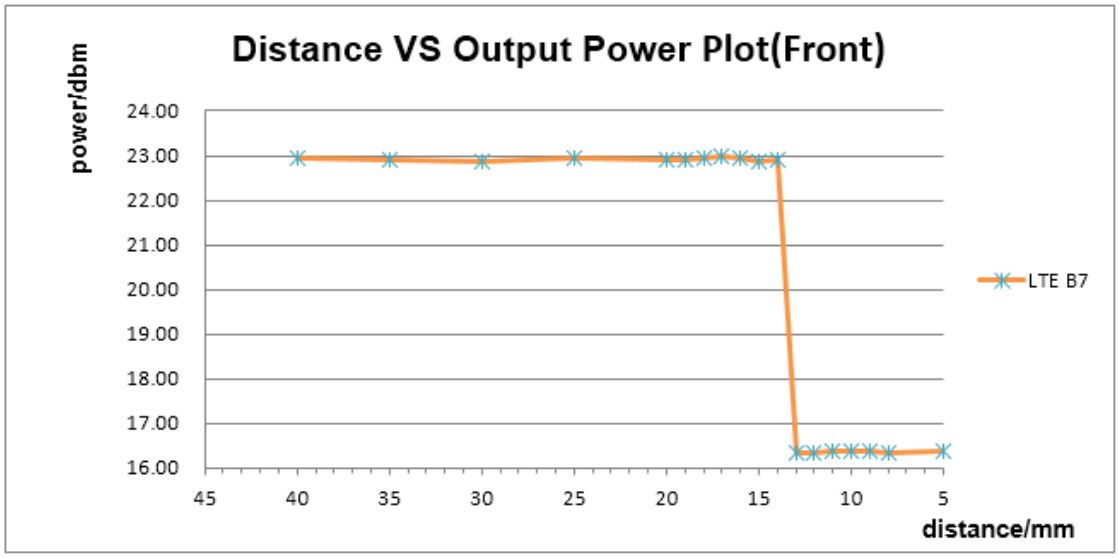
Picture: Proximity sensor triggering distances assessment Bottom Side

Picture: Proximity sensor triggering distances assessment Front Side and Back side

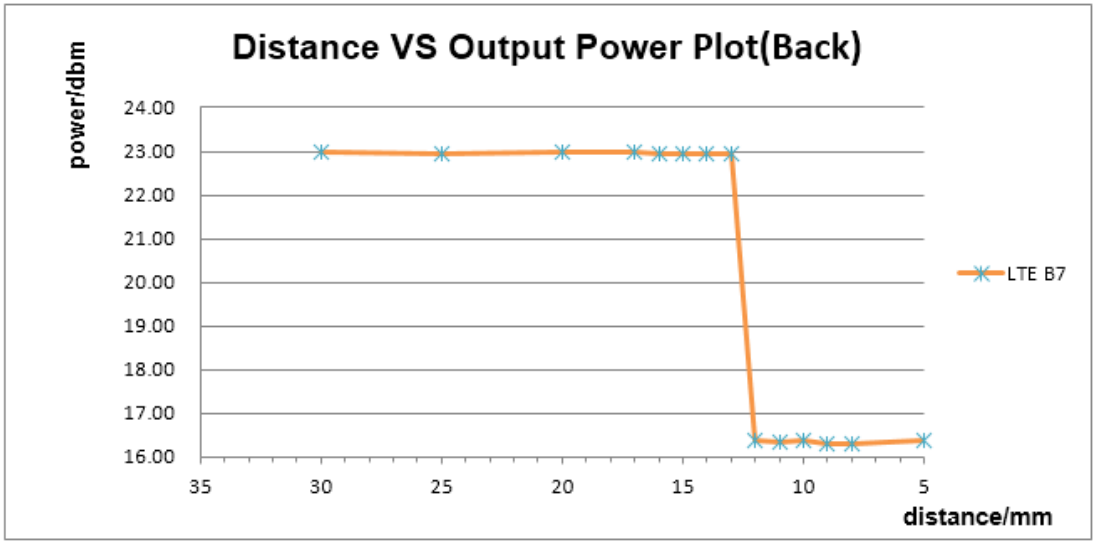
Table: Summary of Trigger Distances

Band(MHz)	Trigger distance-Front Side		Trigger distance-Bottom Side		Trigger distance-Back Side	
	Moving toward phantom	Moving away from phantom	Moving toward phantom	Moving away from phantom	Moving toward phantom	Moving away from phantom
LTE Band VII (Main Ant)	13mm	13mm	18mm	18mm	12mm	12mm

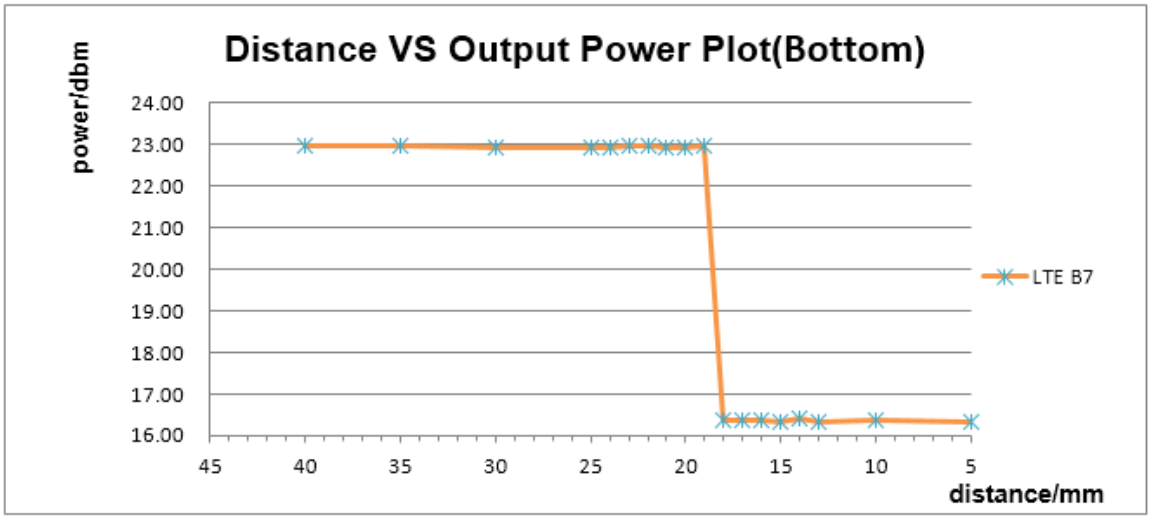
The detailed conducted power measurement data to determine the triggering distances is as below:
The DUT(Front side) is moved towards the flat phantom:



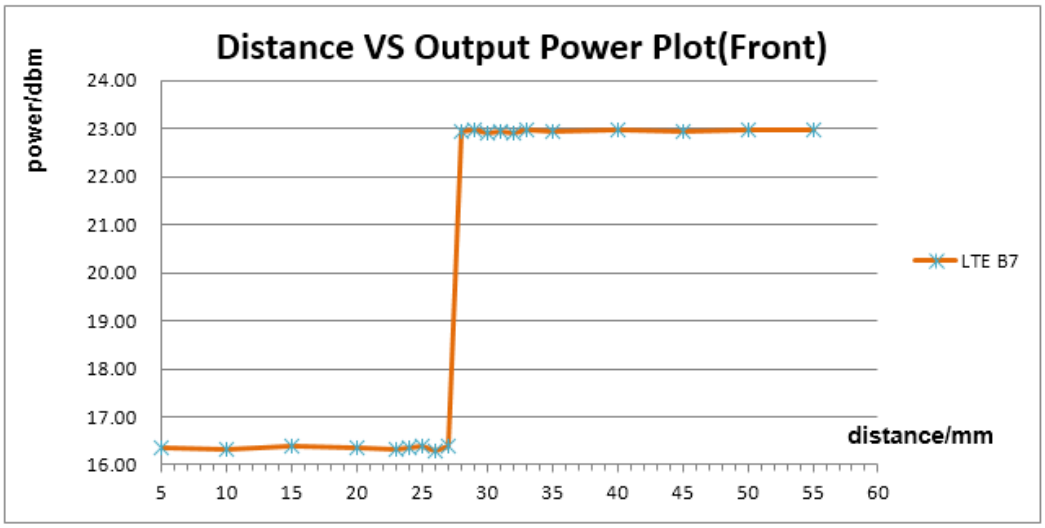
The DUT(Back side) is moved towards the flat phantom:



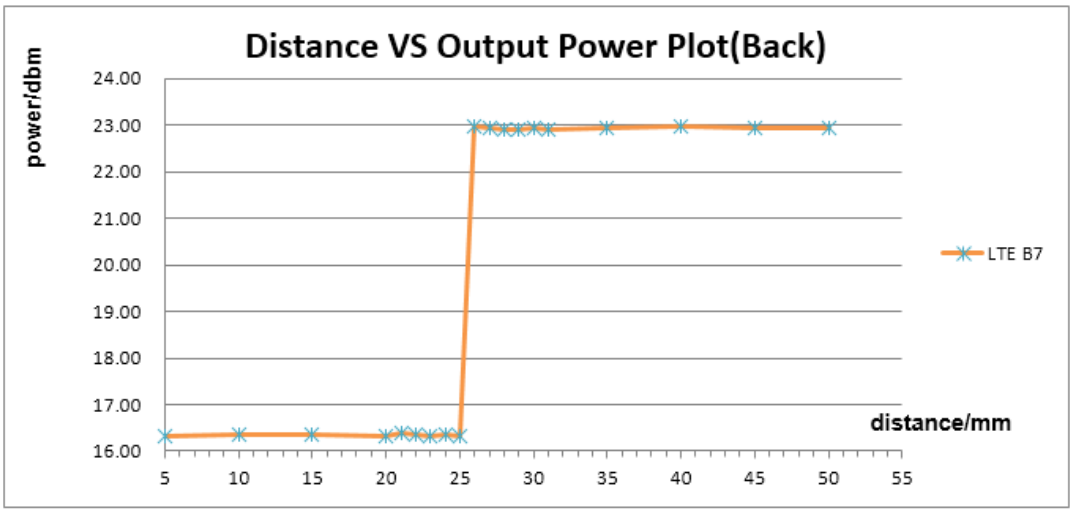
The DUT(Bootom side) is moved towards the flat phantom:



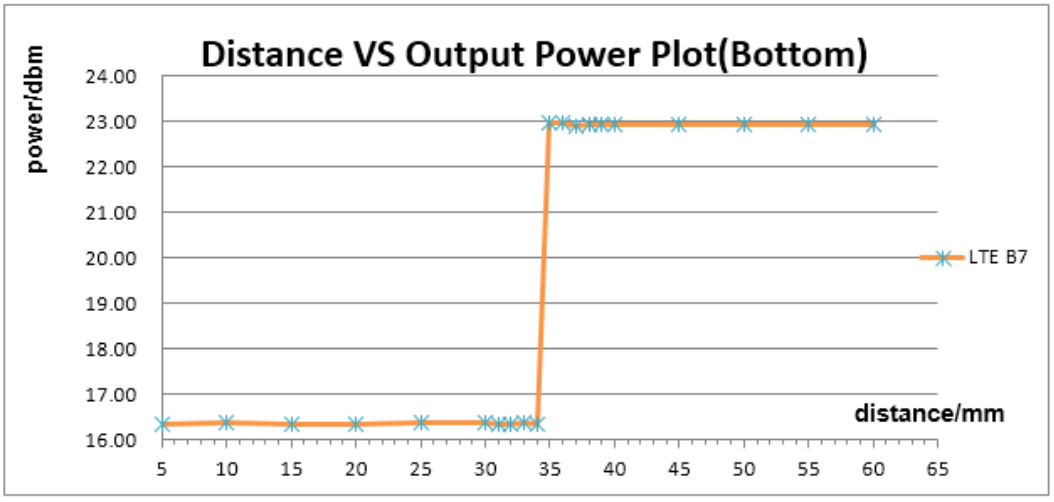
The DUT(Front side) is moved away from the flat phantom:



The DUT(Back side) is moved away from the flat phantom:



The DUT(Bottom side) is moved away from the flat phantom:



Conclusion: It can be ensured that the proximity sensor can be valid triggered for the body exposure condition(LTE Band VII of Main Antenna).

2) Procedures for determining antenna and proximity sensor coverage

There is no spatial offset between the Main antenna and the proximity sensor element, so procedures for determining the proximity sensor coverage does not need to be assessed.

3) Procedures for determining device tilt angle influences to proximity sensor triggering

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Bottom side parallel to the base of the flat phantom for each band.

The EUT was rotated about Bottom side for angles up to +/- 45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up to +/- 45°.

The proximity sensor triggering tilt angle measurement method are as below:

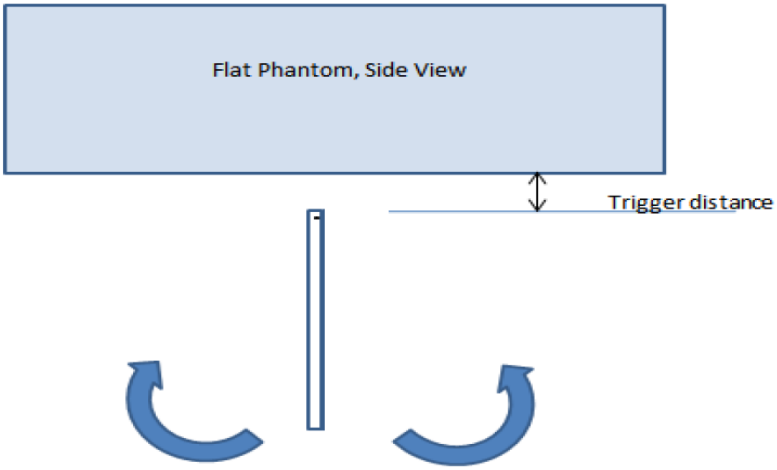


Table: Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering(Bottom side)

Band/Ant	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°
LTE Band VII Main Ant	18mm	on	on	on	on	on	on	on	on	on	on	on

Conclusion: It can be ensured that the proximity sensor can be valid triggered for the DUT tilt coverage exposure condition (LTE Band VII of Main Antenna)

Note: Per KDB616217, the most conservative triggering distance expected for production units, including hysteresis effects, is used in the SAR measurements:

1) Since the capacitive proximity sensor triggering distance for the front side is 13mm, a conservative distance of 12mm was requried for addtional SAR test at maximum power level with sensor off.
2) Since the capacitive proximity sensor triggering distance for the Back side is 12mm, a conservative distance of 11mm was requried for addtional SAR test at maximum power level with sensor off.

3) Since the capacitive proximity sensor triggering distance for the bottom side is 18mm, a conservative distance of 17mm was requried for addtional SAR test at maximum power level with sensor off.

4) 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.

7 SAR Measurement Results

7.1 Conducted power measurements

For the measurements a Rohde & Schwarz Radio Communication Tester CMU 200&CMW500 was used.
SAR drift measured at the same position in liquid before and after each SAR test as below 7.2 chapter.
Note: CMU200 measures GSM peak and average output power for active timeslots.For SAR the timebased 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	1:4.1	1:2.77	1:2.08
timebased avg. power compared to slotted avg. power	-9.19dB	-6.13dB	-4.42dB	-3.18dB

The signalling modes differ as follows:

mode	coding scheme	modulation
GPRS	CS1 to CS4	GMSK
EDGE	MCS1 to MCS4	GMSK
EDGE	MCS5 to MCS9	8PSK

Apart from modulation change (GMSK/8PSK) coding schemes differ in code rate without influence on the RF signal. Therefore one coding scheme per mode was selected for conducted power measurements.

7.1.1 Conducted power measurements of GSM850(Second Antenna)

GSM850		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	128CH	190CH	251CH		Tune-up	128CH	190CH	251CH
GSM (CS)		32.80	31.75	31.66	31.69	-9.19	23.61	22.56	22.47	22.50
GPRS/ EDGE (GMSK)	1 Tx Slot	32.80	31.78	31.66	31.71	-9.19	23.61	22.59	22.47	22.52
	2 Tx Slots	**31.00**	**29.87**	**29.85**	**29.76**	**-6.13**	**24.87**	**23.74**	**23.72**	**23.63**
	3 Tx Slots	29.00	27.82	27.80	27.74	-4.42	24.58	23.40	23.38	23.32
	4 Tx Slots	27.00	25.72	25.81	25.74	-3.18	23.82	22.54	22.63	22.56
EDGE (8PSK)	1 Tx Slot	27.00	26.22	26.38	26.50	-9.19	17.81	17.03	17.19	17.31
	2 Tx Slots	25.00	24.07	24.31	24.52	-6.13	18.87	17.94	18.18	18.39
	3 Tx Slots	23.00	21.80	22.14	22.26	-4.42	18.58	17.38	17.72	17.84
	4 Tx Slots	21.00	19.61	19.91	20.16	-3.18	17.82	16.43	16.73	16.98

Table 13:Conducted power measurement results of GSM850

Note:

1) The conducted power of GSM850 is measured with RMS detector.

2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timesolts.

3) Per KDB941225 D01v03, 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.

7.1.2 Conducted power measurements of GSM1900(Second Antenna)

GSM1900		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	512CH	661CH	810CH		Tune-up	512CH	661CH	810CH
GSM (CS)		29.30	28.94	29.00	29.16	-9.19	20.11	19.75	19.81	19.97
GPRS/ EDGE (GMSK)	1 Tx Slot	29.30	29.16	29.00	28.95	-9.19	20.11	19.97	19.81	19.76
	2 Tx Slots	**27.30**	**27.02**	**26.96**	**26.97**	**-6.13**	**21.17**	**20.89**	**20.83**	**20.84**
	3 Tx Slots	25.30	25.05	25.00	24.98	-4.42	20.88	20.63	20.58	20.56
	4 Tx Slots	23.30	22.95	22.91	22.93	-3.18	20.12	19.77	19.73	19.75
EDGE (8PSK)	1 Tx Slot	26.00	25.48	25.29	25.25	-9.19	16.81	16.29	16.10	16.06
	2 Tx Slots	24.00	23.23	23.18	23.17	-6.13	17.87	17.10	17.05	17.04
	3 Tx Slots	22.00	21.32	21.20	21.04	-4.42	17.58	16.90	16.78	16.62
	4 Tx Slots	19.50	18.85	18.61	19.10	-3.18	16.32	15.67	15.43	15.92

Table 14: Conducted power measurement results of GSM1900

Note:

1) The conducted power of GSM1900 is measured with RMS detector.

2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timesolts.

3) Per KDB941225 D01v03, 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.

7.1.3 Conducted power measurements of UMTS Band II(Second Antenna)

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	**22.90**	**21.15**	**21.17**	**21.16**
	12.2kbps AMR	22.90	21.06	21.03	20.96
HSDPA	Subtest 1	22.90	21.15	21.13	21.15
	Subtest 2	21.80	20.96	20.88	20.95
	Subtest 3	21.50	20.39	20.38	20.32
	Subtest 4	21.30	20.37	20.36	20.31
HSUPA	Subtest 1	21.00	20.04	20.17	19.96
	Subtest 2	18.80	17.69	17.76	17.97
	Subtest 3	19.50	18.31	18.57	19.28
	Subtest 4	19.20	18.13	18.26	18.36
	Subtest 5	21.50	20.42	20.53	20.29
DC-HSDPA	Subtest 1	22.90	21.14	21.10	21.12
	Subtest 2	21.80	20.92	20.85	20.91
	Subtest 3	21.50	20.35	20.37	20.31
	Subtest 4	21.30	20.36	20.35	20.30

Table 15: Conducted power measurement results of UMTS Band II

Note: 1) The conducted power of UMTS Band II is measured with RMS detector.
2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).
3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second 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 Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.4 Conducted power measurements of UMTS Band V(Second Antenna)

UMTS Band V		Tune-up	Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	**23.50**	**22.25**	**22.09**	**22.03**
	12.2kbps AMR	23.50	22.03	21.51	21.66
HSDPA	Subtest 1	23.00	22.27	22.07	22.09
	Subtest 2	22.80	22.05	21.91	21.84
	Subtest 3	22.00	21.38	21.24	21.20
	Subtest 4	22.00	21.41	21.21	21.19
HSUPA	Subtest 1	22.20	20.90	20.63	20.48
	Subtest 2	20.10	19.13	18.65	18.96
	Subtest 3	20.60	20.11	19.10	19.92
	Subtest 4	20.50	18.92	19.55	18.56
	Subtest 5	22.20	21.13	21.16	20.84
DC-HSDPA	Subtest 1	23.00	22.25	22.05	22.06
	Subtest 2	22.80	22.06	21.93	21.81
	Subtest 3	22.00	21.36	21.21	21.19
	Subtest 4	22.00	21.40	21.22	21.17

Table 16: Conducted power measurement results of UMTS Band V

Note: 1) The conducted power of UMTS Band V is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second 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 Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.5 Conducted power measurements of LTE Band VII(Second Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20775CH	21100CH	21425CH
5MHz	QPSK	1	0	22.20	20.91	21.06	20.96
		1	13	22.20	21.20	21.24	20.95
		1	24	22.20	20.84	20.91	20.48
		12	0	21.20	20.22	20.19	19.88
		12	6	21.20	20.31	20.19	19.88
		12	13	21.20	20.01	20.03	19.65
		25	0	21.20	20.22	20.08	19.77
	16QAM	1	0	21.20	20.33	20.67	20.35
		1	13	21.20	20.75	20.79	20.43
		1	24	21.20	20.44	20.50	19.92
		12	0	20.80	20.04	20.06	19.82
		12	6	20.80	20.13	20.05	19.82
		12	13	20.80	19.98	19.92	19.59
		25	0	20.80	20.07	19.96	19.62
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20800CH	21100CH	21400CH
10MHz	QPSK	1	0	22.20	20.84	21.05	20.86
		1	25	22.20	21.18	21.25	21.09
		1	49	22.20	20.89	20.95	20.55
		25	0	21.20	20.23	20.13	19.90
		25	13	21.20	20.12	20.15	19.92
		25	25	21.20	20.08	20.04	19.70
		50	0	21.20	20.33	20.06	19.80
	16QAM	1	0	21.20	20.27	20.48	20.47
		1	25	21.20	20.67	20.71	20.66
		1	49	21.20	20.31	20.21	20.08
		25	0	20.80	20.08	19.96	19.84
		25	13	20.80	19.98	19.98	19.80
		25	25	20.80	19.94	19.87	19.64
		50	0	20.80	20.12	19.92	19.71

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20825CH	21100CH	21375CH
15MHz	QPSK	1	0	22.20	20.65	20.78	20.75
		1	38	22.20	21.24	21.20	21.11
		1	74	22.20	20.66	20.72	20.44
		36	0	21.20	20.21	20.06	19.84
		36	18	21.20	20.13	20.13	19.95
		36	39	21.20	19.83	19.96	19.71
		75	0	21.20	20.14	20.02	19.77
	16QAM	1	0	21.20	20.26	20.33	20.37
		1	38	21.20	20.79	20.73	20.72
		1	74	21.20	20.18	20.27	20.01
		36	0	20.80	20.05	19.94	19.76
		36	18	20.80	19.96	19.99	19.85
		36	39	20.80	19.73	19.84	19.62
		75	0	20.80	19.86	19.86	19.67
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20850CH	21100CH	21350CH
20MHz	QPSK	1	0	22.20	20.78	20.87	20.74
		1	50	22.20	**21.21**	**21.12**	**21.11**
		1	99	22.20	20.77	20.82	20.60
		50	0	21.20	20.09	20.01	19.87
		50	25	21.20	19.95	19.98	19.91
		50	50	21.20	**20.10**	20.01	19.74
		100	0	21.20	19.96	20.02	19.81
	16QAM	1	0	21.20	20.52	20.48	20.20
		1	50	21.20	20.84	20.77	20.52
		1	99	21.20	20.55	20.43	19.93
		50	0	20.80	20.07	19.89	19.81
		50	25	20.80	19.86	19.98	19.84
		50	50	20.80	19.72	19.89	19.68
		100	0	20.80	19.89	19.90	19.74

Table 17: Conducted power measurement results of LTE Band VII

7.1.6Conducted power measurements of GSM850(Main Antenna)

GSM850		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	128CH	190CH	251CH		Tune-up	128CH	190CH	251CH
GSM (CS)		33.30	32.55	32.53	32.58	-9.19	24.11	23.36	23.34	23.39
GPRS/ EDGE (GMSK)	1 Tx Slot	33.30	32.53	32.55	32.50	-9.19	24.11	23.34	23.36	23.31
	2 Tx Slots	**31.50**	**30.63**	**30.60**	**30.48**	**-6.13**	**25.37**	**24.50**	**24.47**	**24.35**
	3 Tx Slots	29.50	28.57	28.55	28.43	-4.42	25.08	24.15	24.13	24.01
	4 Tx Slots	27.50	26.57	26.50	26.35	-3.18	24.32	23.39	23.32	23.17
EDGE (8PSK)	1 Tx Slot	27.50	26.63	26.74	26.84	-9.19	18.31	17.44	17.55	17.65
	2 Tx Slots	25.50	24.43	24.51	24.63	-6.13	19.37	18.30	18.38	18.50
	3 Tx Slots	23.50	22.10	22.26	22.40	-4.42	19.08	17.68	17.84	17.98
	4 Tx Slots	21.50	20.02	20.11	20.22	-3.18	18.32	16.84	16.93	17.04

Table 18:Conducted power measurement results of GSM850

Note:

1) The conducted power of GSM850 is measured with RMS detector.

2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timesolts.

3) Per KDB941225 D01v03, 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.

7.1.7 Conducted power measurements of GSM1900(Main Antenna)

GSM1900		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	512CH	661CH	810CH		Tune-up	512CH	661CH	810CH
GSM (CS)		29.80	29.50	29.27	29.25	-9.19	20.61	20.31	20.08	20.06
GPRS/ EDGE (GMSK)	1 Tx Slot	29.80	29.50	29.27	29.25	-9.19	20.61	20.31	20.08	20.06
	2 Tx Slots	28.00	27.22	27.15	27.29	-6.13	21.87	21.09	21.02	21.16
	3 Tx Slots	26.00	25.24	25.16	25.32	-4.42	21.58	20.82	20.74	20.90
	4 Tx Slots	24.20	23.11	23.07	23.24	-3.18	21.02	19.93	19.89	20.06
EDGE (8PSK)	1 Tx Slot	26.50	25.80	25.67	25.77	-9.19	17.31	16.61	16.48	16.58
	2 Tx Slots	24.50	23.54	23.50	23.63	-6.13	18.37	17.41	17.37	17.50
	3 Tx Slots	22.50	21.60	21.49	21.53	-4.42	18.08	17.18	17.07	17.11
	4 Tx Slots	20.50	19.04	19.01	19.60	-3.18	17.32	15.86	15.83	16.42

Table 19: Conducted power measurement results of GSM1900(Hotspot disable)

GSM1900		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	512CH	661CH	810CH		Tune-up	512CH	661CH	810CH
GSM (CS)		26.80	26.25	26.18	26.36	-9.19	17.61	17.06	16.99	17.17
GPRS/ EDGE (GMSK)	1 Tx Slot	26.80	26.25	26.18	26.36	-9.19	17.61	17.06	16.99	17.17
	2 Tx Slots	**24.80**	**24.20**	**24.35**	**24.14**	**-6.13**	**18.67**	**18.07**	**18.22**	**18.01**
	3 Tx Slots	22.80	22.14	22.12	22.30	-4.42	18.38	17.72	17.70	17.88
	4 Tx Slots	20.80	20.27	20.26	20.46	-3.18	17.62	17.09	17.08	17.28
EDGE (8PSK)	1 Tx Slot	23.00	22.86	22.68	22.94	-9.19	13.81	13.67	13.49	13.75
	2 Tx Slots	21.00	20.67	20.59	20.82	-6.13	14.87	14.54	14.46	14.69
	3 Tx Slots	19.00	18.29	18.26	18.52	-4.42	14.58	11.84	13.84	14.10
	4 Tx Slots	17.00	16.26	16.27	16.33	-3.18	13.82	13.08	13.09	13.15

Table 20: Conducted power measurement results of GSM1900(Hotspot activated)

Note:

1) The conducted power of GSM1900 is measured with RMS detector.

2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timesolts.

3) Per KDB941225 D01v03, 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.

7.1.8 Conducted power measurements of UMTS Band II(Main Antenna)

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	**23.00**	**21.77**	**21.72**	**21.79**
	12.2kbps AMR	23.00	21.50	21.48	21.09
HSDPA	Subtest 1	23.00	21.69	21.70	21.77
	Subtest 2	23.00	21.56	21.51	21.47
	Subtest 3	22.70	20.91	20.84	20.92
	Subtest 4	22.70	20.96	20.84	20.91
HSUPA	Subtest 1	22.30	20.64	20.49	20.53
	Subtest 2	19.50	18.28	18.52	18.62
	Subtest 3	20.20	18.91	19.05	19.78
	Subtest 4	20.20	18.80	18.89	18.94
	Subtest 5	22.00	20.97	21.09	20.80
DC-HSDPA	Subtest 1	23.00	21.65	21.68	21.75
	Subtest 2	23.00	21.54	21.50	21.44
	Subtest 3	22.70	20.90	20.82	20.90
	Subtest 4	22.70	20.93	20.81	20.88

Table 21: Conducted power measurement results of UMTS Band II(Hotspot disable)

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	**18.20**	**16.70**	**16.66**	**16.76**
	12.2kbps AMR	18.20	16.64	16.51	16.58
HSDPA	Subtest 1	18.20	16.65	16.65	16.68
	Subtest 2	18.20	16.42	16.44	16.46
	Subtest 3	17.00	16.12	15.75	15.77
	Subtest 4	17.00	16.31	15.77	15.79
HSUPA	Subtest 1	16.50	15.05	15.35	15.44
	Subtest 2	15.00	13.25	13.33	13.58
	Subtest 3	15.50	15.12	14.05	14.97
	Subtest 4	14.50	13.85	13.32	13.22
	Subtest 5	17.00	15.94	16.06	16.10
DC-HSDPA	Subtest 1	18.20	16.62	16.62	16.65
	Subtest 2	18.20	16.40	16.43	16.42
	Subtest 3	17.00	16.11	15.74	15.75
	Subtest 4	17.00	16.30	15.75	15.76

Table 22: Conducted power measurement results of UMTS Band II(Hotspot activated)

Note: 1) The conducted power of UMTS Band II is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second 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 Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.9 Conducted power measurements of UMTS Band V(Main Antenna)

UMTS Band V		Tune-up	Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	**23.60**	**22.69**	**22.61**	**22.64**
	12.2kbps AMR	23.60	22.65	22.40	22.24
HSDPA	Subtest 1	23.50	22.68	22.63	22.57
	Subtest 2	23.00	22.47	22.40	22.39
	Subtest 3	22.50	21.84	21.73	21.72
	Subtest 4	22.50	21.83	21.73	21.74
HSUPA	Subtest 1	22.50	21.94	22.16	21.18
	Subtest 2	21.50	19.63	19.71	19.66
	Subtest 3	21.50	20.74	19.86	20.64
	Subtest 4	21.00	19.42	20.05	19.28
	Subtest 5	23.00	21.79	21.62	21.65
DC-HSDPA	Subtest 1	23.50	22.65	22.61	22.56
	Subtest 2	23.00	22.44	22.38	22.38
	Subtest 3	22.50	21.81	21.72	21.70
	Subtest 4	22.50	21.82	21.70	21.71

Table 23: Conducted power measurement results of UMTS Band V

Note: 1) The conducted power of UMTS Band V is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second 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 Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.10 Conducted power measurements of LTE Band VII(Main Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20775CH	21100CH	21425CH
5MHz	QPSK	1	0	23.00	22.05	22.11	22.34
		1	13	23.00	22.17	22.11	22.24
		1	24	23.00	21.90	21.77	21.57
		12	0	23.00	22.14	22.21	22.36
		12	6	23.00	22.19	22.17	22.29
		12	13	23.00	22.06	22.03	21.95
		25	0	23.00	22.08	22.10	22.16
	16QAM	1	0	22.60	21.92	22.41	22.13
		1	13	22.60	22.07	22.51	22.04
		1	24	22.60	21.86	22.23	21.45
		12	0	22.30	21.32	21.90	21.56
		12	6	22.30	21.35	21.90	21.47
		12	13	22.30	21.28	21.69	21.16
		25	0	22.30	21.26	21.85	21.41
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20800CH	21100CH	21400CH
10MHz	QPSK	1	0	23.00	21.87	22.06	22.47
		1	25	23.00	22.16	22.13	22.44
		1	49	23.00	22.12	21.77	21.59
		25	0	23.00	22.05	22.16	22.51
		25	13	23.00	22.20	22.11	22.42
		25	25	23.00	22.19	22.00	22.15
		50	0	23.00	22.14	22.07	22.38
	16QAM	1	0	22.60	21.81	22.28	22.32
		1	25	22.60	22.05	22.48	22.22
		1	49	22.60	22.06	22.17	21.63
		25	0	22.30	21.30	21.93	21.81
		25	13	22.30	21.44	21.90	21.68
		25	25	22.30	21.38	21.77	21.44
		50	0	22.30	21.40	21.88	21.70

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20825CH	21100CH	21375CH
15MHz	QPSK	1	0	23.00	21.75	22.52	22.50
		1	38	23.00	22.31	22.58	22.53
		1	74	23.00	22.47	22.06	21.51
		36	0	23.00	22.00	22.59	22.57
		36	18	23.00	22.22	22.57	22.52
		36	39	23.00	22.41	22.38	22.20
		75	0	23.00	22.26	22.53	22.38
	16QAM	1	0	22.60	21.61	22.33	22.36
		1	38	22.60	22.13	22.51	22.36
		1	74	22.60	22.21	22.11	21.50
		36	0	22.30	21.31	21.87	21.86
		36	18	22.30	21.50	21.87	21.81
		36	39	22.30	21.68	21.69	21.51
		75	0	22.30	21.51	21.82	21.74
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20850CH	21100CH	21350CH
20MHz	QPSK	1	0	23.00	21.72	**22.21**	22.16
		1	50	23.00	**22.93**	22.11	**22.64**
		1	99	23.00	22.35	22.19	21.59
		50	0	23.00	22.09	**22.12**	**22.76**
		50	25	23.00	22.43	22.10	22.57
		50	50	23.00	**22.70**	22.03	22.34
		100	0	23.00	**22.53**	22.46	22.45
	16QAM	1	0	22.60	21.82	21.99	22.07
		1	50	22.60	22.39	22.10	22.25
		1	99	22.60	22.41	21.81	21.50
		50	0	22.30	21.37	21.57	21.90
		50	25	22.30	21.75	21.41	21.92
		50	50	22.30	22.05	21.14	21.73
		100	0	22.30	21.75	21.39	21.81

Table 24: Conducted power measurement results of LTE Band VII(Full power)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20775CH	21100CH	21425CH
5MHz	QPSK	1	0	17.00	15.91	15.91	16.14
		1	13	17.00	16.07	16.06	15.96
		1	24	17.00	15.59	15.51	15.55
		12	0	17.00	16.03	16.09	16.22
		12	6	17.00	16.04	16.04	16.07
		12	13	17.00	15.82	15.79	15.75
		25	0	17.00	15.97	15.98	16.04
	16QAM	1	0	17.00	15.90	15.89	16.38
		1	13	17.00	16.06	16.02	16.23
		1	24	17.00	15.57	15.46	15.49
		12	0	16.00	15.09	15.04	15.23
		12	6	16.00	15.09	14.98	15.13
		12	13	16.00	14.84	14.72	14.72
		25	0	16.00	14.90	14.89	15.07
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20800CH	21100CH	21400CH
10MHz	QPSK	1	0	17.00	15.80	16.00	16.50
		1	25	17.00	16.04	16.13	16.55
		1	49	17.00	15.84	15.51	15.51
		25	0	17.00	15.90	16.04	16.56
		25	13	17.00	15.96	16.01	16.40
		25	25	17.00	15.95	15.71	16.05
		50	0	17.00	15.98	15.96	16.40
	16QAM	1	0	17.00	15.93	16.16	16.68
		1	25	17.00	16.23	16.25	16.67
		1	49	17.00	16.02	15.67	15.57
		25	0	16.00	14.99	15.08	15.59
		25	13	16.00	15.02	14.98	15.41
		25	25	16.00	14.94	14.75	15.02
		50	0	16.00	14.94	14.92	15.38

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20825CH	21100CH	21375CH
15MHz	QPSK	1	0	17.00	15.66	16.00	16.18
		1	38	17.00	16.24	16.03	16.82
		1	74	17.00	15.96	15.57	15.54
		36	0	17.00	15.99	16.09	16.59
		36	18	17.00	16.18	16.01	16.61
		36	39	17.00	16.24	15.71	16.21
		75	0	17.00	16.11	15.92	16.46
	16QAM	1	0	17.00	15.82	16.12	16.15
		1	38	17.00	16.34	16.27	16.83
		1	74	17.00	16.12	15.38	15.42
		36	0	16.00	14.91	15.10	15.55
		36	18	16.00	15.09	14.96	15.60
		36	39	16.00	15.18	14.63	15.20
		75	0	16.00	14.96	14.92	15.42
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20850CH	21100CH	21350CH
20MHz	QPSK	1	0	17.00	15.76	16.11	15.71
		1	50	17.00	**16.36**	**16.25**	**16.66**
		1	99	17.00	16.31	15.58	15.52
		50	0	17.00	15.87	16.39	16.18
		50	25	17.00	16.26	16.01	16.51
		50	50	17.00	**16.52**	15.57	16.36
		100	0	17.00	16.32	16.01	16.31
	16QAM	1	0	17.00	16.10	16.46	15.97
		1	50	17.00	16.62	16.31	16.94
		1	99	17.00	16.78	15.74	15.68
		50	0	16.00	14.85	15.44	15.19
		50	25	16.00	15.16	15.01	15.54
		50	50	16.00	15.43	14.55	15.41
		100	0	16.00	15.22	15.00	15.33

Table 25: Conducted power measurement results of LTE Band VII(Hotspot activated)

7.1.11 Conducted power measurements 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.

Power test equipment: R&S Radio Communication Tester CMW500 and/or Anritsu Radio Communication Analyzer MT8821C were used.

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.

The conducted power measurement results of downlink LTE CA conducted Power are as below:

DL LTE CA Class	PCC								SCC1			Power		
	PCC Band	PCC Bandwidth (MHz)	PCC UL RB size	PCC UL RB offset	PCC DL RB size	PCC DL RB offset	PCC UL Channel	PCC DL Channel	SCC Band	SCC Bandwidth (MHz)	SCC DL Channel	Rel 8 LTE Tx Power (dBm)	DL LTE CA Tx Power (dBm)	Tune-up
CA_7C	7	20	1	50	100	0	20850	2850	7	20	3048	21.24	21.16	22.20
CA_3A-7A	7	10	1	25	75	0	21100	3100	3	20	1300	21.25	21.11	22.20
CA_7A-20A	7	10	1	25	75	0	21100	3100	20	20	6250	21.25	21.00	22.20

Table 26: DL LTE CA conducted power measurement results of second antenna

DL LTE CA Class	PCC								SCC1			Power		
	PCC Band	PCC Bandwidth (MHz)	PCC UL RB size	PCC UL RB offset	PCC DL RB size	PCC DL RB offset	PCC UL Channel	PCC DL Channel	SCC Band	SCC Bandwidth (MHz)	SCC DL Channel	Rel 8 LTE Tx Power (dBm)	DL LTE CA Tx Power (dBm)	Tune-up
CA_7C	7	20	1	50	100	0	21350	3350	7	20	3350	22.93	22.90	23.00
CA_3A-7A	7	20	1	50	100	0	21350	3350	3	20	1850	22.93	22.91	23.00
CA_7A-20A	7	20	1	50	100	0	21350	3350	20	20	6350	22.93	22.87	23.00

Table 27: DL LTE CA conducted power measurement results of main antenna

Note: Testing is not required in bands or modes not intended/allowed for US operation.
According to KDB 941225 D05A, the downlink LTE CA SAR test is not required and PAG requirements can be excluded.

7.1.12 Conducted power measurements of WiFi 2.4G

The output power of WiFi antenna is as following:

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11b	1	2412	1	18.00	16.63	Yes
	6	2437		18.00	17.08	Yes
	11	2462		18.00	16.35	Yes
802.11g	1	2412	6	17.00	Not required	No
	6	2437		17.00	Not required	No
	11	2462		17.00	Not required	No
802.11n 20M	1	2412	6.5	15.00	Not required	No
	6	2437		15.00	Not required	No
	11	2462		15.00	Not required	No
802.11n 40M	3	2422	13.5	15.00	Not required	No
	6	2437		15.00	Not required	No
	9	2452		15.00	Not required	No

Table 28: Conducted power measurement results of WiFi 2.4G.(Full power level)

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

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11b	1	2412	1	12.00	11.24	Yes
	6	2437		12.00	11.72	Yes
	11	2462		12.00	11.19	Yes
802.11g	1	2412	6	10.00	Not required	No
	6	2437		10.00	Not required	No
	11	2462		10.00	Not required	No
802.11n 20M	1	2412	6.5	9.00	Not required	No
	6	2437		9.00	Not required	No
	11	2462		9.00	Not required	No
802.11n 40M	3	2422	13.5	9.00	Not required	No
	6	2437		9.00	Not required	No
	9	2452		9.00	Not required	No

Table 29: Conducted power measurement results of WiFi 2.4G.(2G&3G&4G second antenna + WiFi station simultaneous transmission)

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

7.1.13 Conducted power measurements of WiFi 5G

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11a	CH 36	5180	13.50	12.21	Yes
	CH 40	5200		12.08	No
	CH 44	5220		11.99	No
	CH 48	5240		11.91	No
	CH 52	5260		12.05	Yes
	CH 56	5280		12.01	Yes
	CH 60	5300		11.97	Yes
	CH 64	5320		11.98	Yes
	CH 100	5500		12.13	No
	CH 104	5520		12.05	No
	CH 108	5540		11.97	No
	CH 112	5560		11.81	No
	CH 116	5580		12.10	No
	CH 120	5600		12.11	No
	CH 124	5620		12.06	No
	CH 128	5640		12.28	Yes
	CH 132	5660		11.67	No
	CH 136	5680		11.54	No
	CH 140	5700		11.52	No

Table 30: Conducted power measurement results of WiFi 5G 802.11a (Full Power).

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11n 20M (5GHz)	CH 36	5180	13.50	12.29	No
	CH 40	5200		12.35	No
	CH 44	5220		12.34	No
	CH 48	5240		12.28	No
	CH 52	5260		12.48	No
	CH 56	5280		12.44	No
	CH 60	5300		12.41	No
	CH 64	5320		12.37	No
	CH 100	5500		11.86	No
	CH 104	5520		11.90	No
	CH 108	5540		11.83	No
	CH 112	5560		11.75	No
	CH 116	5580		11.69	No
	CH 120	5600		11.57	No
	CH 124	5620		11.55	No
	CH 128	5640		12.41	No
	CH 132	5660		11.60	No
	CH 136	5680		11.61	No
	CH 140	5700		11.54	No

Table 31: Conducted power measurement results of WiFi 5G 802.11n 20M (Full Power).

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11n 40M (5GHz)	CH 38	5190	12.50	Not required	No
	CH 46	5230		Not required	No
	CH 54	5270		Not required	No
	CH 62	5310		Not required	No
	CH 102	5510		Not required	No
	CH 110	5550		Not required	No
	CH 118	5590		Not required	No
	CH 126	5630		Not required	No
	CH 134	5670		Not required	No

Table 32: Conducted power measurement results of WiFi 5G 802.11n 40M (Full Power).

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac-20M (5GHz)	CH 36	5180	13.00	Not required	No
	CH 40	5200		Not required	No
	CH 44	5220		Not required	No
	CH 48	5240		Not required	No
	CH 52	5260		Not required	No
	CH 56	5280		Not required	No
	CH 60	5300		Not required	No
	CH 64	5320		Not required	No
	CH 100	5500		Not required	No
	CH 104	5520		Not required	No
	CH 108	5540		Not required	No
	CH 112	5560		Not required	No
	CH 116	5580		Not required	No
	CH 120	5600		Not required	No
	CH 124	5620		Not required	No
	CH 128	5640		Not required	No
	CH 132	5660		Not required	No
	CH 136	5680		Not required	No
	CH 140	5700		Not required	No

Table 33: Conducted power measurement results of WiFi 5G 802.11ac 20M (Full Power).

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac-40M (5GHz)	CH 38	5190	12.50	Not required	No
	CH 46	5230		Not required	No
	CH 54	5270		Not required	No
	CH 62	5310		Not required	No
	CH 102	5510		Not required	No
	CH 110	5550		Not required	No
	CH 118	5590		Not required	No
	CH 126	5630		Not required	No
	CH 134	5670		Not required	No

Table 34: Conducted power measurement results of WiFi 5G 802.11ac 40M (Full Power).

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac 80M (5GHz)	CH 42	5210	12.50	Not required	No
	CH 58	5290		Not required	No
	CH 106	5530		Not required	No
	CH 122	5610		Not required	No

Table 35: Conducted power measurement results of WiFi 5G 802.11ac 80M (Full Power).

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11a	CH 36	5180	8.00	7.05	No
	CH 40	5200		7.10	No
	CH 44	5220		7.08	No
	CH 48	5240		7.04	No
	CH 52	5260		7.33	Yes
	CH 56	5280		7.39	No
	CH 60	5300		7.40	No
	CH 64	5320		7.49	No
	CH 100	5500		6.86	No
	CH 104	5520		6.86	Yes
	CH 108	5540		6.83	No
	CH 112	5560		6.74	No
	CH 116	5580		7.02	No
	CH 120	5600		6.78	No
	CH 124	5620		6.88	No
	CH 128	5640		6.75	No
	CH 132	5660		6.12	No
	CH 136	5680		6.40	No
	CH 140	5700		6.78	No

Table 36: Conducted power measurement results of WiFi 5G 802.11a(2G/3G/4G second antenna simultaneous transmission with WIFI station)

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11n 20M (5GHz)	CH 36	5180	8.00	7.18	No
	CH 40	5200		7.21	No
	CH 44	5220		7.25	No
	CH 48	5240		7.25	No
	CH 52	5260		7.00	No
	CH 56	5280		7.06	No
	CH 60	5300		7.02	No
	CH 64	5320		7.05	No
	CH 100	5500		6.63	No
	CH 104	5520		6.68	No
	CH 108	5540		6.97	No
	CH 112	5560		6.70	No
	CH 116	5580		6.55	No
	CH 120	5600		6.12	No
	CH 124	5620		6.14	No
	CH 128	5640		7.10	No
	CH 132	5660		6.57	No
	CH 136	5680		6.58	No
	CH 140	5700		6.51	No

Table 37: Conducted power measurement results of WiFi 5G 802.11n 20M (2G/3G/4G second antenna simultaneous transmission with WIFI station)

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11n 40M (5GHz)	CH 38	5190	7.00	Not required	No
	CH 46	5230		Not required	No
	CH 54	5270		Not required	No
	CH 62	5310		Not required	No
	CH 102	5510		Not required	No
	CH 110	5550		Not required	No
	CH 118	5590		Not required	No
	CH 126	5630		Not required	No
	CH 134	5670		Not required	No

Table 38: Conducted power measurement results of WiFi 5G 802.11n 40M(2G/3G/4G second antenna simultaneous transmission with WIFI station)

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac-20M (5GHz)	CH 36	5180	8.00	7.14	No
	CH 40	5200		7.30	No
	CH 44	5220		7.31	No
	CH 48	5240		7.34	No
	CH 52	5260		6.99	No
	CH 56	5280		7.03	No
	CH 60	5300		7.00	No
	CH 64	5320		7.06	No
	CH 100	5500		6.18	No
	CH 104	5520		7.43	No
	CH 108	5540		7.29	No
	CH 112	5560		7.35	No
	CH 116	5580		7.00	No
	CH 120	5600		7.01	No
	CH 124	5620		7.19	No
	CH 128	5640		6.58	No
	CH 132	5660		6.53	No
	CH 136	5680		6.46	No
	CH 140	5700		6.48	No

Table 39: Conducted power measurement results of WiFi 5G 802.11ac 20M (2G/3G/4G second antenna simultaneous transmission with WIFI station)

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac-40M (5GHz)	CH 38	5190	6.00	Not required	No
	CH 46	5230		Not required	No
	CH 54	5270		Not required	No
	CH 62	5310		Not required	No
	CH 102	5510		Not required	No
	CH 110	5550		Not required	No
	CH 118	5590		Not required	No
	CH 126	5630		Not required	No
	CH 134	5670		Not required	No

Table 40: Conducted power measurement results of WiFi 5G 802.11ac 40M (2G/3G/4G second antenna simultaneous transmission with WIFI station)

Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11ac 80M (5GHz)	CH 42	5210	5.00	Not required	No
	CH 58	5290		Not required	No
	CH 106	5530		Not required	No
	CH 122	5610		Not required	No
	CH 138	5690		Not required	No

Table 41: Conducted power measurement results of WiFi 5G 802.11ac 80M(2G/3G/4G second antenna simultaneous transmission with WIFI station)

7.1.14 Conducted power measurements of BT

The output power of BT antenna is as following:

BT 2450	Tune-up	Average Conducted Power (dBm)		
		0CH	39CH	78CH
DH5	11.00	10.52	10.75	**10.77**
2DH5	11.00	8.41	8.62	8.72
3DH5	11.00	8.34	8.51	8.81

BT 2450	Tune-up	Average Conducted Power (dBm)		
		0CH	19CH	39CH
BLE	10.00	5.67	5.84	6.17

Table 42: Conducted power measurement results of BT.

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

7.2 SAR measurement Results

General Notes:

1) Per KDB447498 D01, all SAR measurement results are scaled to the maximum tune-up tolerance limit to demonstrate SAR compliance.

2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

● ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.

● ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.

● ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.

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.

3) Per KDB865664 D01,for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤20%, and the measured SAR <1.45W/Kg, only one repeated measurement is required.

4) Per KDB941225 D06, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

5) Per KDB648474 D04, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.

6) Per KDB865664 D02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing(Refer to appendix B for details).

7) According to 201610 FCC TCB workshop RF exposure slides, when the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification is required for each antenna, using the highest SAR configuration among all applicable frequency bands.

8) Per KDB 648474D04, for handsets with additional batteries, the highest reported SAR for each wireless technology, frequency band, operating mode and applicable exposure condition (head, body-worn accessory, hotspot mode, etc.) must be repeated with the specific accessory attached. In addition, for test cases where the measured SAR for a handset is greater than 1.2 W/kg, these tests should also be repeated with the additional batteries.

9) Per KDB 648474 D04, Phones with built-in NFC functions do not require separate SAR testing and can generally be tested according to the SAR measurement procedures normally required for the phone. Influences of the hardware introduced by the built-in NFC functions are inherently considered through testing of the other transmitters that require SAR.

GSM Notes:

1) Per KDB941225 D01, 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.

2) Per KDB648474 D04, the device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.

UMTS Notes:

1) Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a Second 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 Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

LTE Notes:

1) The LTE test configurations are determined according to KDB941225D05.The general test procedures used for SAR testing can be found in Section 6.5.

2) A-MPR was disabled for all SAR test by setting NS_01 on the base station simulator.SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames(maximum TTI)

WiFi Notes:

Per KDB248227D01:

1) When reported SAR for the initial test position is ≤ 0.4W/kg, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8W/kg or all test position are measured. 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..

2) When the DSSS *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.

3) 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 measurement is not required for 2.4 GHz 802.11g/n OFDM configurations.

4) The highest SAR measured for the initial test position or initial test configuration should be used to determine SAR test exclusion according to the sum of 1-g SAR and SAR peak to location ratio provisions in KDB 447498. In addition, a test lab may also choose to perform standalone SAR measurements for test positions and 802.11 configurations that are not required by the initial test position or initial test configuration procedures and apply the results to determine simultaneous transmission SAR test exclusion, according to sum of 1-g and SAR peak to location ratio requirements to reduce the number of simultaneous transmission SAR measurements.

5) U-NII-2A band and U-NII-2C band don't support hotspot function, so hotspot SAR test is not required.

7.2.1 SAR measurement Result of GSM850(Second Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Right touch	190/836.6	GSM	0.308	0.152	-0.03	31.66	32.80	0.400	State 2
Right touch	190/836.6	GSM	0.701	0.352	-0.16	31.66	32.80	0.911	State 1
Right touch	128/824.2	GSM	0.677	0.339	-0.01	31.75	32.80	0.862	State 1
Right touch	251/848.8	GSM	0.693	0.349	0.01	31.69	32.80	0.895	State 1
Right tilt	190/836.6	GSM	0.628	0.298	-0.02	31.66	32.80	0.817	State 1
Right tilt	128/824.2	GSM	0.619	0.294	-0.02	31.66	32.80	0.805	State 1
Right tilt	251/848.8	GSM	0.637	0.302	-0.01	31.66	32.80	0.828	State 1
Left touch	190/836.6	GSM	0.468	0.257	-0.06	31.66	32.80	0.608	State 1
Left tilt	190/836.6	GSM	0.406	0.251	-0.16	31.66	32.80	0.528	State 1
Tested at the worst position with battery 2#									
Right touch	190/836.6	GSM	**0.705**	0.354	0.02	31.66	32.80	**0.917**	State 1
Right touch	190/836.6	GSM	0.308	0.150	0.00	31.66	32.80	0.400	State 2
WAS-LX1 Tested at the SAR worst case with battery 1#									
Right touch	190/836.6	GSM	0.541	0.262	-0.05	31.66	32.80	0.703	State 1
WAS-LX1 Tested at the SAR worst case with SIM2									
Right touch	190/836.6	GSM	0.502	0.247	0.07	31.66	32.80	0.653	State 1
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right touch	190/836.6	GSM	0.561	0.271	-0.03	31.66	32.80	0.729	State 1
Tested at the SAR worst case from the report no.:SYBH(Z-SAR) 029112016-2 with battery 3# (Scud)									
Right touch	190/836.6	GSM	0.533	0.258	-0.02	31.66	32.80	0.693	State 1

Table 43: Head SAR test results of GSM850

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Back Side	190/836.6	GSM	0.032	0.019	0.01	31.66	32.80	0.041	State 2
Back Side	190/836.6	GSM	0.100	0.059	-0.05	31.66	32.80	0.130	State 1
Front Side	190/836.6	GSM	0.105	0.063	0.01	31.66	32.80	0.137	State 1
Tested at the worst position with battery 2#									
Front Side	190/836.6	GSM	**0.106**	0.063	-0.11	31.66	32.80	**0.138**	State 1
Front Side	190/836.6	GSM	0.035	0.021	-0.05	31.66	32.80	0.046	State 2
WAS-LX1 Tested at the SAR worst case battery 1#									
Front Side	190/836.6	GSM	0.075	0.044	0.08	31.66	32.80	0.098	State 1
WAS-LX1 Tested at the SAR worst case with SIM2									
Front Side	190/836.6	GSM	0.075	0.043	0.02	31.66	32.80	0.097	State 1
WAS-LX1 Tested at the SAR worst case with battery 2#									
Front Side	190/836.6	GSM	0.068	0.040	0.10	31.66	32.80	0.089	State 1
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery3# (Scud)									
Front Side	190/836.6	GSM	0.070	0.041	0.07	31.66	32.80	0.091	State 1

Table 44: Body-Worn SAR test results of GSM850

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	190/836.6	GPRS 2TS	0.079	0.044	0.13	29.85	31.00	0.103	State 2
Front Side	190/836.6	GPRS 2TS	**0.231**	0.127	0.05	29.85	31.00	**0.301**	State 1
Back Side	190/836.6	GPRS 2TS	0.220	0.121	-0.06	29.85	31.00	0.287	State 1
Left Side	190/836.6	GPRS 2TS	0.180	0.121	0.00	29.85	31.00	0.235	State 1
Top Side	190/836.6	GPRS 2TS	0.172	0.085	-0.10	29.85	31.00	0.224	State 1
Tested at the worst position with battery 2#									
Front Side	190/836.6	GPRS 2TS	0.229	0.126	0.08	29.85	31.00	0.298	State 1
WAS-LX1 Tested at the SAR worst case with battery 1#									
Front Side	190/836.6	GPRS 2TS	0.166	0.090	-0.15	29.85	31.00	0.216	State 1
WAS-LX1 Tested at the SAR worst case with SIM2									
Front Side	190/836.6	GPRS 2TS	0.164	0.089	0.17	29.85	31.00	0.214	State 1
WAS-LX1 Tested at the SAR worst case with battery 2#									
Front Side	190/836.6	GPRS 2TS	0.172	0.093	0.03	29.85	31.00	0.224	State 1
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Front Side	190/836.6	GPRS 2TS	0.157	0.086	0.06	29.85	31.00	0.205	State 1

Table 45: Hotspot SAR test results of GSM850

7.2.2 SAR measurement Result of GSM1900(Second Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Left touch	661/1880	GSM	0.222	0.139	0.13	29.00	29.30	0.238	/
Left tilt	661/1880	GSM	0.195	0.112	0.00	29.00	29.30	0.209	/
Right touch	661/1880	GSM	0.547	0.299	0.02	29.00	29.30	0.586	/
Right tilt	661/1880	GSM	0.397	0.226	0.06	29.00	29.30	0.425	/
Right touch	512/1850.2	GSM	**0.559**	0.307	0.06	28.94	29.30	**0.607**	/
Right touch	810/1909.8	GSM	0.556	0.303	0.05	29.16	29.30	0.574	/
Tested at the worst position with battery 2#									
Right touch	512/1850.2	GSM	0.530	0.286	0.05	28.94	29.30	0.576	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Right touch	512/1850.2	GSM	0.476	0.260	0.14	28.94	29.30	0.517	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Right touch	512/1850.2	GSM	0.516	0.274	0.08	28.94	29.30	0.561	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right touch	512/1850.2	GSM	0.551	0.295	0.10	28.94	29.30	0.599	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery3# (Scud)									
Right touch	512/1850.2	GSM	0.501	0.269	0.08	28.94	29.30	0.544	/

Table 46: Head SAR test results of GSM1900

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	661/1880	GSM	0.053	0.033	0.11	29.00	29.30	0.056	/
Back Side	661/1880	GSM	0.049	0.031	0.16	29.00	29.30	0.052	/
Tested at the worst position with battery 2#									
Front Side	661/1880	GSM	0.054	0.035	-0.02	29.00	29.30	0.058	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Front Side	661/1880	GSM	**0.063**	0.040	0.03	29.00	29.30	**0.068**	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Front Side	661/1880	GSM	0.057	0.036	0.14	29.00	29.30	0.061	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Front Side	661/1880	GSM	0.055	0.035	0.08	29.00	29.30	0.059	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Front Side	661/1880	GSM	0.053	0.034	0.08	29.00	29.30	0.057	/

Table 47: Body-Worn SAR test results of GSM1900

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	661/1880	GPRS 2TS	0.085	0.045	0.12	26.96	27.30	0.092	/
Back Side	661/1880	GPRS 2TS	0.099	0.053	-0.16	26.96	27.30	0.107	/
Left Side	661/1880	GPRS 2TS	0.135	0.078	0.06	26.96	27.30	0.146	/
Top Side	661/1880	GPRS 2TS	0.039	0.019	0.13	26.96	27.30	0.042	/
Tested at the worst position with battery 2#									
Left Side	661/1880	GPRS 2TS	0.113	0.0635	0.04	26.96	27.30	0.122	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Left Side	661/1880	GPRS 2TS	**0.140**	0.081	0.14	26.96	27.30	**0.151**	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Left Side	661/1880	GPRS 2TS	0.139	0.080	-0.01	26.96	27.30	0.150	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Left Side	661/1880	GPRS 2TS	0.138	0.080	0.05	26.96	27.30	0.149	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Left Side	661/1880	GPRS 2TS	0.139	0.080	0.08	26.96	27.30	0.150	/

Table 48: Hotspot SAR test results of GSM1900

7.2.3 SAR measurement Result of UMTS Band II(Second Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Left touch	9400/1880	RMC	0.243	0.152	0.12	21.17	22.90	0.362	/
Left tilt	9400/1880	RMC	0.200	0.111	0.02	21.17	22.90	0.298	/
Right touch	9400/1880	RMC	0.631	0.347	0.10	21.17	22.90	0.940	/
Right tilt	9400/1880	RMC	0.430	0.220	0.11	21.17	22.90	0.640	/
Right touch	9262/1852.4	RMC	**0.645**	0.355	0.09	21.15	22.90	**0.965**	/
Right touch	9538/1907.6	RMC	0.581	0.318	0.04	21.16	22.90	0.867	/
Tested at the worst position with battery 2#									
Right touch	9262/1852.4	RMC	0.612	0.331	-0.03	21.15	22.90	0.916	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Right touch	9262/1852.4	RMC	0.585	0.321	-0.15	21.15	22.90	0.875	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Right touch	9262/1852.4	RMC	0.574	0.318	0.03	21.15	22.90	0.859	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right touch	9262/1852.4	RMC	0.565	0.312	-0.03	21.15	22.90	0.845	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Right touch	9262/1852.4	RMC	0.575	0.332	0.01	21.15	22.90	0.860	/

Table 49: Head SAR test results of UMTS Band II

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	9400/1880	RMC	0.056	0.035	0.17	21.17	22.90	0.083	/
Back Side	9400/1880	RMC	0.053	0.034	-0.19	21.17	22.90	0.079	/
Tested at the worst position with battery 2#									
Front Side	9400/1880	RMC	**0.059**	0.037	0.03	21.17	22.90	**0.087**	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Front Side	9400/1880	RMC	0.054	0.034	0.03	21.17	22.90	0.080	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Front Side	9400/1880	RMC	0.055	0.035	0.12	21.17	22.90	0.082	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Front Side	9400/1880	RMC	0.054	0.035	0.11	21.17	22.90	0.081	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Front Side	9400/1880	RMC	0.052	0.033	0.04	21.17	22.90	0.078	/

Table 50: Body-Worn SAR test results of UMTS Band II

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	9400/1880	RMC	0.101	0.054	0.03	21.17	22.90	0.150	/
Back Side	9400/1880	RMC	0.111	0.059	-0.02	21.17	22.90	0.165	/
Left Side	9400/1880	RMC	0.156	0.090	0.00	21.17	22.90	0.232	/
Top Side	9400/1880	RMC	0.096	0.049	0.10	21.17	22.90	0.143	/
Tested at the worst position with battery 2#									
Left Side	9400/1880	RMC	0.147	0.085	-0.15	21.17	22.90	0.219	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Left Side	9400/1880	RMC	**0.157**	0.091	-0.08	21.17	22.90	**0.234**	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Left Side	9400/1880	RMC	0.153	0.088	-0.14	21.17	22.90	0.228	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Left Side	9400/1880	RMC	0.156	0.090	-0.14	21.17	22.90	0.232	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Left Side	9400/1880	RMC	0.156	0.090	-0.14	21.17	22.90	0.232	/

Table 51: Hotspot SAR test results of UMTS Band II

7.2.4 SAR measurement Result of UMTS Band V(Second Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Right touch	4182/836.4	RMC	0.440	0.230	-0.07	22.09	23.50	0.609	State2
Right touch	4182/836.4	RMC	0.809	0.403	-0.03	22.09	23.50	1.119	State1
Right touch-Repeated	4182/836.4	RMC	**0.817**	0.404	-0.04	22.09	23.50	1.130	State1
Right touch	4132/826.4	RMC	0.795	0.393	-0.03	22.25	23.50	1.060	State1
Right touch	4233/846.6	RMC	0.808	0.403	-0.11	22.03	23.50	**1.133**	State1
Right touch	4233/846.6	RMC	0.444	0.215	0.07	22.03	23.50	0.623	State2
Right tilt	4182/836.4	RMC	0.608	0.357	-0.13	22.09	23.50	0.841	State1
Right tilt	4132/826.4	RMC	0.604	0.355	-0.13	22.25	23.50	0.805	State1
Right tilt	4233/846.6	RMC	0.615	0.361	-0.13	22.03	23.50	0.863	State1
Left touch	4182/836.4	RMC	0.494	0.274	-0.12	22.09	23.50	0.683	State1
Left tilt	4182/836.4	RMC	0.418	0.268	-0.08	22.09	23.50	0.578	State1
Tested at the worst position with battery 2#									
Right touch	4233/846.6	RMC	0.788	0.395	-0.11	22.03	23.50	1.105	State1
WAS-LX1 Tested at the SAR worst case with battery 1#									
Right touch	4233/846.6	RMC	0.692	0.337	0.05	22.03	23.50	0.971	State1
WAS-LX1 Tested at the SAR worst case with SIM2									
Right touch	4233/846.6	RMC	0.678	0.332	0.03	22.03	23.50	0.951	State1
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right touch	4233/846.6	RMC	0.691	0.338	0.00	22.03	23.50	0.969	State1
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Right touch	4233/846.6	RMC	0.627	0.309	0.00	22.03	23.50	0.880	State1

Table 52: Head SAR test results of UMTS Band V

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	4182/836.4	RMC	0.100	0.060	-0.05	22.09	23.50	0.138	State 1
Front Side	4182/836.4	RMC	0.043	0.026	0.02	22.09	23.50	0.059	State 2
Back Side	4182/836.4	RMC	0.095	0.057	0.02	22.09	23.50	0.132	State 1
Tested at the worst position with battery 2#									
Front Side	4182/836.4	RMC	0.103	0.061	0.06	22.09	23.50	0.143	State 1
Front Side	4182/836.4	RMC	0.051	0.030	0.06	22.09	23.50	0.070	State 2
WAS-LX1 Tested at the SAR worst case with battery 1#									
Front Side	4182/836.4	RMC	0.079	0.047	0.04	22.09	23.50	0.110	State 1
WAS-LX1 Tested at the SAR worst case with SIM2									
Front Side	4182/836.4	RMC	**0.105**	0.061	0.09	22.09	23.50	**0.145**	State 1
WAS-LX1 Tested at the SAR worst case with battery 2#									
Front Side	4182/836.4	RMC	0.071	0.042	0.14	22.09	23.50	0.098	State 1
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Front Side	4182/836.4	RMC	0.080	0.047	0.01	22.09	23.50	0.111	State 1

Table 53: Body-Worn SAR test results of UMTS Band V

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Left Side	4182/836.4	RMC	0.225	0.152	-0.06	22.09	23.50	0.311	state1
Left Side	4182/836.4	RMC	0.118	0.080	-0.13	22.09	23.50	0.163	state2
Front Side	4182/836.4	RMC	0.225	0.124	0.07	22.09	23.50	0.311	state1
Back Side	4182/836.4	RMC	0.211	0.117	-0.01	22.09	23.50	0.292	state1
Top Side	4182/836.4	RMC	0.172	0.083	-0.08	22.09	23.50	0.238	state1
Tested at the worst position with battery 2#									
Left Side	4182/836.4	RMC	**0.231**	0.155	-0.06	22.09	23.50	**0.320**	state1
Left Side	4182/836.4	RMC	0.118	0.080	-0.04	22.09	23.50	0.163	state2
WAS-LX1 Tested at the SAR worst case with battery 1#									
Left Side	4182/836.4	RMC	0.205	0.139	0.08	22.09	23.50	0.284	state1
WAS-LX1 Tested at the SAR worst case with SIM2									
Left Side	4182/836.4	RMC	0.199	0.135	-0.08	22.09	23.50	0.275	state1
WAS-LX1 Tested at the SAR worst case with battery 2#									
Left Side	4182/836.4	RMC	0.206	0.139	-0.04	22.09	23.50	0.285	state1
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Left Side	4182/836.4	RMC	0.203	0.138	0.01	22.09	23.50	0.281	state1

Table 54: Hotspot SAR test results of UMTS Band V

7.2.5 SAR measurement Result of LTE Band VII(Second Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Left touch	20850/2510	20M QPSK 1RB#50	0.094	0.049	-0.13	21.21	22.20	0.119	/
Left tilt	20850/2510	20M QPSK 1RB#50	0.155	0.058	0.00	21.21	22.20	0.195	/
Right touch	20850/2510	20M QPSK 1RB#50	0.392	0.194	-0.04	21.21	22.20	0.492	/
Right tilt	20850/2510	20M QPSK 1RB#50	0.252	0.115	0.03	21.21	22.20	0.317	/
Right touch	21100/2535	20M QPSK 1RB#50	0.437	0.000	-0.05	21.12	22.20	0.560	/
Right touch	21350/2560	20M QPSK 1RB#50	0.403	0.200	0.11	21.11	22.20	0.518	/
50%RB									
Left touch	20850/2510	20M QPSK 50%RB#50	0.061	0.032	0.14	20.10	21.20	0.078	/
Left tilt	20850/2510	20M QPSK 50%RB#50	0.066	0.029	0.14	20.10	21.20	0.085	/
Right touch	20850/2510	20M QPSK 50%RB#50	0.281	0.135	0.00	20.10	21.20	0.362	/
Right tilt	20850/2510	20M QPSK 50%RB#50	0.228	0.103	0.16	20.10	21.20	0.294	/
Tested at the worst position with battery 2#									
Right touch	21100/2535	20M QPSK 1RB#50	0.465	0.231	0.11	21.12	22.20	0.596	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Right touch	21100/2535	20M QPSK 1RB#50	0.484	0.243	0.12	21.12	22.20	0.621	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Right touch	21100/2535	20M QPSK 1RB#50	0.472	0.236	0.11	21.12	22.20	0.605	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right touch	21100/2535	20M QPSK 1RB#50	**0.604**	0.289	-0.01	21.12	22.20	**0.775**	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Right touch	21100/2535	20M QPSK 1RB#50	0.457	0.236	0.08	21.12	22.20	0.586	/

Table 55: Head SAR test results of LTE Band VII

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	20850/2510	20M QPSK 1RB#50	0.043	0.023	0.17	21.21	22.20	0.054	/
Back Side	20850/2510	20M QPSK 1RB#50	0.030	0.016	0.01	21.21	22.20	0.037	/
50%RB									
Front Side	20850/2510	20M QPSK 50%RB#50	0.026	0.014	0.05	20.10	21.20	0.033	/
Back Side	20850/2510	20M QPSK 50%RB#50	0.018	0.010	-0.04	20.10	21.20	0.024	/
Tested at the worst position with battery 2#									
Front Side	20850/2510	20M QPSK 1RB#50	0.032	0.017	0.03	21.21	22.20	0.040	/
WAS-LX1 Tested at the SAR worst case battery 1#									
Front Side	20850/2510	20M QPSK 1RB#50	**0.056**	0.031	0.10	21.21	22.20	**0.070**	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Front Side	20850/2510	20M QPSK 1RB#50	0.053	0.030	0.17	21.21	22.20	0.066	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Front Side	20850/2510	20M QPSK 1RB#50	0.053	0.029	0.15	21.21	22.20	0.066	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Front Side	20850/2510	20M QPSK 1RB#50	0.054	0.029	0.05	21.21	22.20	0.067	/

Table 56: Body-Worn SAR test results of LTE Band VII

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	20850/2510	20M QPSK 1RB#50	0.074	0.039	0.02	21.21	22.20	0.093	/
Back Side	20850/2510	20M QPSK 1RB#50	0.063	0.033	0.01	21.21	22.20	0.079	/
Left Side	20850/2510	20M QPSK 1RB#50	0.089	0.045	0.04	21.21	22.20	0.111	/
Top Side	20850/2510	20M QPSK 1RB#50	0.041	0.017	-0.08	21.21	22.20	0.052	/
50%RB									
Front Side	20850/2510	20M QPSK 50%RB#50	0.046	0.024	-0.10	20.10	21.20	0.059	/
Back Side	20850/2510	20M QPSK 50%RB#50	0.045	0.025	0.14	20.10	21.20	0.058	/
Left Side	20850/2510	20M QPSK 50%RB#50	0.057	0.029	0.17	20.10	21.20	0.073	/
Top Side	20850/2510	20M QPSK 50%RB#50	0.027	0.012	-0.11	20.10	21.20	0.035	/
Tested at the worst position with battery 2#									
Left Side	20850/2510	20M QPSK 1RB#50	0.071	0.035	-0.07	21.21	22.20	0.090	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Left Side	20850/2510	20M QPSK 1RB#50	**0.159**	0.083	-0.09	21.21	22.20	**0.200**	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Left Side	20850/2510	20M QPSK 1RB#50	0.142	0.072	0.00	21.21	22.20	0.178	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Left Side	20850/2510	20M QPSK 1RB#50	0.144	0.073	-0.06	21.21	22.20	0.181	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Left Side	20850/2510	20M QPSK 1RB#50	0.146	0.074	-0.05	21.21	22.20	0.183	/

Table 57: Hotspot SAR test results of LTE Band VII

7.2.6 SAR measurement Result of GSM850(Main Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Left touch	190/836.6	GSM	0.282	0.221	0.18	32.53	33.30	0.337	/
Left tilt	190/836.6	GSM	0.204	0.141	0.04	32.53	33.30	0.244	/
Right touch	190/836.6	GSM	0.332	0.257	0.14	32.53	33.30	0.396	/
Right tilt	190/836.6	GSM	0.204	0.141	0.01	32.53	33.30	0.244	/
Right touch	128/824.2	GSM	0.304	0.209	0.16	32.55	33.30	0.361	/
Right touch	251/848.8	GSM	**0.402**	0.310	0.05	32.58	33.30	**0.474**	/
Tested at the worst position with battery 2#									
Right touch	251/848.8	GSM	0.383	0.296	0.11	32.58	33.30	0.452	/
WAS-LX1 Tested at the SAR worst case with battey 1#									
Right touch	251/848.8	GSM	0.256	0.195	-0.03	32.58	33.30	0.302	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Right touch	251/848.8	GSM	0.251	0.190	0.19	32.58	33.30	0.296	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right touch	251/848.8	GSM	0.237	0.181	0.06	32.58	33.30	0.280	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Right touch	251/848.8	GSM	0.246	0.187	0.04	32.58	33.30	0.290	/

Table 58: Head SAR test results of GSM850

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	190/836.6	GSM	0.389	0.300	0.00	32.53	33.30	0.464	/
Back Side	190/836.6	GSM	**0.418**	0.323	-0.05	32.53	33.30	**0.499**	/
Tested at the worst position with battery 2#									
Back Side	190/836.6	GSM	0.379	0.295	-0.05	32.53	33.30	0.453	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Back Side	190/836.6	GSM	0.319	0.243	0.02	32.53	33.30	0.381	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Back Side	190/836.6	GSM	0.328	0.249	0.04	32.53	33.30	0.392	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Back Side	190/836.6	GSM	0.339	0.259	-0.02	32.53	33.30	0.405	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Back Side	190/836.6	GSM	0.304	0.231	-0.01	32.53	33.30	0.363	/

Table 59: Body-Worn SAR test results of GSM850

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	190/836.6	GPRS 2TS	0.411	0.319	0.01	30.60	31.50	0.506	/
Back Side	190/836.6	GPRS 2TS	0.429	0.332	0.03	30.60	31.50	0.528	/
Left Side	190/836.6	GPRS 2TS	0.346	0.236	-0.08	30.60	31.50	0.426	/
Right Side	190/836.6	GPRS 2TS	0.493	0.336	-0.10	30.60	31.50	0.607	/
Bottom Side	190/836.6	GPRS 2TS	0.174	0.087	-0.09	30.60	31.50	0.214	/
Tested at the worst position with battery 2#									
Right Side	190/836.6	GPRS 2TS	**0.522**	0.353	-0.13	30.60	31.50	**0.642**	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Right Side	190/836.6	GPRS 2TS	0.348	0.236	-0.03	30.60	31.50	0.428	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Right Side	190/836.6	GPRS 2TS	0.347	0.235	-0.03	30.60	31.50	0.427	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right Side	190/836.6	GPRS 2TS	0.375	0.254	-0.05	30.60	31.50	0.461	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Right Side	190/836.6	GPRS 2TS	0.323	0.219	-0.13	30.60	31.50	0.397	/

Table 60: Hotspot SAR test results of GSM850

7.2.7 SAR measurement Result of GSM1900(Main Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Left touch	661/1880	GSM	0.160	0.102	0.06	29.27	29.80	0.181	/
Left tilt	661/1880	GSM	0.040	0.022	0.18	29.27	29.80	0.045	/
Right touch	661/1880	GSM	0.115	0.074	0.16	29.27	29.80	0.130	/
Right tilt	661/1880	GSM	0.038	0.022	0.14	29.27	29.80	0.042	/
Left touch	512/1850.2	GSM	**0.188**	0.119	0.03	29.50	29.80	**0.201**	/
Left touch	810/1909.8	GSM	0.141	0.083	0.17	29.25	29.80	0.160	/
Tested at the worst position with battery 2#									
Left touch	512/1850.2	GSM	0.142	0.083	0.18	29.50	29.80	0.152	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Left touch	512/1850.2	GSM	0.119	0.073	0.16	29.50	29.80	0.128	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Left touch	512/1850.2	GSM	0.127	0.078	0.14	29.50	29.80	0.136	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Left touch	512/1850.2	GSM	0.115	0.071	-0.12	29.50	29.80	0.123	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Left touch	512/1850.2	GSM	0.114	0.070	0.11	29.50	29.80	0.122	/

Table 61: Head SAR test results of GSM1900

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	661/1880	GSM	0.434	0.253	0.03	29.27	29.80	0.490	/
Back Side	661/1880	GSM	**0.522**	0.302	-0.09	29.27	29.80	**0.590**	/
Tested at the worst position with battery 2#									
Back Side	661/1880	GSM	0.499	0.290	-0.03	29.27	29.80	0.564	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Back Side	661/1880	GSM	0.447	0.259	-0.04	29.27	29.80	0.505	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Back Side	661/1880	GSM	0.489	0.281	0.04	29.27	29.80	0.552	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Back Side	661/1880	GSM	0.473	0.272	0.07	29.27	29.80	0.534	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery3# (Scud)									
Back Side	661/1880	GSM	0.462	0.267	0.15	29.27	29.80	0.522	/

Table 62: Body-Worn SAR test results of GSM1900

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	661/1880	GPRS 2TS	0.387	0.209	-0.16	24.35	24.80	0.429	/
Back Side	661/1880	GPRS 2TS	0.455	0.242	-0.03	24.35	24.80	0.505	/
Left Side	661/1880	GPRS 2TS	0.070	0.039	-0.06	24.35	24.80	0.078	/
Right Side	661/1880	GPRS 2TS	0.089	0.049	-0.19	24.35	24.80	0.099	/
Bottom Side	661/1880	GPRS 2TS	0.706	0.367	-0.03	24.35	24.80	0.783	/
Bottom Side	512/1850.2	GPRS 2TS	**0.738**	0.386	-0.01	24.20	24.80	**0.847**	/
Bottom Side	810/1909.8	GPRS 2TS	0.714	0.371	-0.01	24.14	24.80	0.831	/
Tested at the worst position with battery 2#									
Bottom Side	512/1850.2	GPRS 2TS	0.675	0.352	-0.02	24.20	24.80	0.775	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Bottom Side	512/1850.2	GPRS 2TS	0.638	0.328	-0.17	24.20	24.80	0.733	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Bottom Side	512/1850.2	GPRS 2TS	0.661	0.339	-0.13	24.20	24.80	0.759	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Bottom Side	512/1850.2	GPRS 2TS	0.642	0.331	-0.14	24.20	24.80	0.737	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery3# (Scud)									
Bottom Side	512/1850.2	GPRS 2TS	0.640	0.33	0.00	24.20	24.80	0.735	/

Table 63: Hotspot SAR test results of GSM1900

7.2.8 SAR measurement Result of UMTS Band II(Main Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Left touch	9400/1880	RMC	0.220	0.137	0.15	21.72	23.00	0.295	/
Left tilt	9400/1880	RMC	0.055	0.031	0.10	21.72	23.00	0.074	/
Right touch	9400/1880	RMC	0.165	0.107	0.19	21.72	23.00	0.222	/
Right tilt	9400/1880	RMC	0.065	0.035	0.11	21.72	23.00	0.088	/
Left touch	9262/1852.4	RMC	**0.233**	0.147	0.13	21.77	23.00	**0.309**	/
Left touch	9538/1907.6	RMC	0.206	0.128	0.17	21.79	23.00	0.272	/
Tested at the worst position with battery 2#									
Left touch	9262/1852.4	RMC	0.221	0.139	0.15	21.77	23.00	0.293	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Left touch	9262/1852.4	RMC	0.189	0.118	-0.11	21.77	23.00	0.251	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Left touch	9262/1852.4	RMC	0.208	0.129	0.15	21.77	23.00	0.276	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Left touch	9262/1852.4	RMC	0.195	0.121	0.19	21.77	23.00	0.259	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Left touch	9262/1852.4	RMC	0.196	0.122	0.17	21.77	23.00	0.260	/

Table 64: Head SAR test results of UMTS Band II

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	9400/1880	RMC	0.645	0.373	0.15	21.72	23.00	0.866	/
Front Side	9262/1852.4	RMC	0.631	0.365	0.15	21.77	23.00	0.838	/
Front Side	9538/1907.6	RMC	0.657	0.380	0.15	21.79	23.00	0.868	/
Back Side	9400/1880	RMC	0.713	0.411	0.00	21.72	23.00	0.957	/
Back Side	9262/1852.4	RMC	0.637	0.368	0.04	21.77	23.00	0.846	/
Back Side	9538/1907.6	RMC	0.744	0.444	-0.01	21.79	23.00	0.983	/
Tested at the worst position with battery 2#									
Back Side	9538/1907.6	RMC	0.763	0.436	0.04	21.79	23.00	1.008	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Back Side	9538/1907.6	RMC	**0.775**	0.442	-0.11	21.79	23.00	**1.024**	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Back Side	9538/1907.6	RMC	0.751	0.427	0.03	21.79	23.00	0.992	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Back Side	9538/1907.6	RMC	0.750	0.427	0.03	21.79	23.00	0.991	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Back Side	9538/1907.6	RMC	0.750	0.427	0.03	21.79	23.00	0.991	/

Table 65: Body-Worn SAR test results of UMTS Band II

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	9400/1880	RMC	0.355	0.192	0.11	16.66	18.20	0.506	/
Back Side	9400/1880	RMC	0.381	0.206	0.10	16.66	18.20	0.543	/
Left Side	9400/1880	RMC	0.040	0.022	0.19	16.66	18.20	0.057	/
Right Side	9400/1880	RMC	0.062	0.035	-0.11	16.66	18.20	0.088	/
Bottom Side	9400/1880	RMC	0.565	0.294	-0.10	16.66	18.20	0.805	/
Bottom Side	9262/1852.4	RMC	0.553	0.288	-0.10	16.70	18.20	0.781	/
Bottom Side	9538/1907.6	RMC	0.576	0.300	-0.10	16.76	18.20	0.802	/
Tested at the worst position with battery 2#									
Bottom Side	9400/1880	RMC	0.571	0.296	-0.14	16.66	18.20	0.814	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Bottom Side	9400/1880	RMC	0.545	0.281	-0.06	16.66	18.20	0.777	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Bottom Side	9400/1880	RMC	0.538	0.278	-0.06	16.66	18.20	0.767	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Bottom Side	9400/1880	RMC	**0.621**	0.321	-0.04	16.66	18.20	**0.885**	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Bottom Side	9400/1880	RMC	0.535	0.257	-0.19	16.66	18.20	0.763	/

Table 66: Hotspot SAR test results of UMTS Band II

7.2.9 SAR measurement Result of UMTS Band V(Main Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Left touch	4182/836.4	RMC	0.256	0.196	0.17	22.61	23.60	0.322	/
Left tilt	4182/836.4	RMC	0.232	0.161	0.09	22.61	23.60	0.291	/
Right touch	4182/836.4	RMC	**0.316**	0.242	-0.14	22.61	23.60	**0.397**	/
Right tilt	4182/836.4	RMC	0.238	0.165	-0.02	22.61	23.60	0.299	/
Right touch	4132/826.4	RMC	0.282	0.215	-0.16	22.69	23.60	0.348	/
Right touch	4233/846.6	RMC	0.297	0.227	0.06	22.64	23.60	0.370	/
Tested at the worst position with battery 2#									
Right touch	4182/836.4	RMC	0.289	0.197	0.06	22.61	23.60	0.363	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Right touch	4182/836.4	RMC	0.231	0.179	0.11	22.61	23.60	0.290	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Right touch	4182/836.4	RMC	0.230	0.177	0.17	22.61	23.60	0.289	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right touch	4182/836.4	RMC	0.233	0.180	0.04	22.61	23.60	0.293	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Right touch	4182/836.4	RMC	0.230	0.178	-0.19	22.61	23.60	0.289	/

Table 67: Head SAR test results of UMTS Band V

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	4182/836.4	RMC	**0.304**	0.231	0.19	22.61	23.60	**0.382**	/
Back Side	4182/836.4	RMC	0.302	0.214	0.00	22.61	23.60	0.379	/
Tested at the worst position with battery 2#									
Front Side	4182/836.4	RMC	0.298	0.211	-0.06	22.61	23.60	0.374	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Front Side	4182/836.4	RMC	0.270	0.207	0.07	22.61	23.60	0.339	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Front Side	4182/836.4	RMC	0.243	0.173	-0.04	22.61	23.60	0.305	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Front Side	4182/836.4	RMC	0.277	0.212	-0.04	22.61	23.60	0.348	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery3# (Scud)									
Front Side	4182/836.4	RMC	0.242	0.186	0.01	22.61	23.60	0.304	/

Table 68: Body-Worn SAR test results of UMTS Band V

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Test data of WAS-L03T									
Front Side	4182/836.4	RMC	0.334	0.255	0.09	22.61	23.60	0.420	/
Back Side	4182/836.4	RMC	0.352	0.268	0.07	22.61	23.60	0.442	/
Left Side	4182/836.4	RMC	0.213	0.142	0.00	22.61	23.60	0.268	/
Right Side	4182/836.4	RMC	**0.498**	0.334	0.01	22.61	23.60	**0.626**	/
Bottom Side	4182/836.4	RMC	0.175	0.088	-0.09	22.61	23.60	0.220	/
Tested at the worst position with battery 2#									
Right Side	4182/836.4	RMC	0.426	0.289	0.18	22.61	23.60	0.535	/
WAS-LX1 Tested at the SAR worst case with battery 1#									
Right Side	4182/836.4	RMC	0.360	0.244	-0.08	22.61	23.60	0.452	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Right Side	4182/836.4	RMC	0.366	0.247	-0.09	22.61	23.60	0.460	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right Side	4182/836.4	RMC	0.346	0.233	0.02	22.61	23.60	0.435	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Right Side	4182/836.4	RMC	0.356	0.24	-0.10	22.61	23.60	0.447	/

Table 69: Hotspot SAR test results of UMTS Band V

7.2.10 SAR measurement Result of LTE Band VII(Main Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Left touch	20850/2510	20M QPSK 1RB#50	0.108	0.058	0.19	22.93	23.00	0.110	/
Left tilt	20850/2510	20M QPSK 1RB#50	0.050	0.024	0.19	22.93	23.00	0.051	/
Right touch	20850/2510	20M QPSK 1RB#50	**0.200**	0.116	0.05	22.93	23.00	**0.203**	/
Right tilt	20850/2510	20M QPSK 1RB#50	0.082	0.038	0.11	22.93	23.00	0.083	/
Right touch	21100/2535	20M QPSK 1RB#0	0.165	0.098	0.19	22.21	23.00	0.198	/
Right touch	21350/2560	20M QPSK 1RB#50	0.173	0.096	0.17	22.64	23.00	0.188	/
50%RB									
Left touch	21350/2560	20M QPSK 50%RB#0	0.118	0.064	0.12	22.76	23.00	0.125	/
Left tilt	21350/2560	20M QPSK 50%RB#0	0.052	0.025	0.11	22.76	23.00	0.055	/
Right touch	21350/2560	20M QPSK 50%RB#0	0.162	0.091	0.01	22.76	23.00	0.171	/
Right tilt	21350/2560	20M QPSK 50%RB#0	0.090	0.039	0.19	22.76	23.00	0.095	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Right touch	20850/2510	20M QPSK 1RB#50	0.144	0.083	0.14	22.93	23.00	0.146	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Right touch	20850/2510	20M QPSK 1RB#50	0.180	0.104	0.03	22.93	23.00	0.183	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Right touch	20850/2510	20M QPSK 1RB#50	0.145	0.084	0.18	22.93	23.00	0.147	/

Table 70: Head SAR test results of LTE Band VII

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Front Side	20850/2510	20M QPSK 1RB#50	0.537	0.299	-0.16	22.93	23.00	0.546	/
Back Side	20850/2510	20M QPSK 1RB#50	0.547	0.290	0.14	22.93	23.00	0.556	/
50%RB									
Front Side	21350/2560	20M QPSK 50%RB#0	0.577	0.326	0.02	22.76	23.00	0.610	/
Back Side	21350/2560	20M QPSK 50%RB#0	**0.674**	0.382	-0.16	22.76	23.00	**0.712**	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Back Side	21350/2560	20M QPSK 50%RB#0	0.628	0.357	0.17	22.76	23.00	0.664	/
WAS-LX1 Tested at the SAR worst case with battery 2#									
Back Side	21350/2560	20M QPSK 50%RB#0	0.624	0.344	0.19	22.76	23.00	0.659	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)									
Back Side	21350/2560	20M QPSK 50%RB#0	0.568	0.299	0.14	22.76	23.00	0.600	/

Table 71: Body-Worn SAR test results of LTE Band VII

Test Position of Hotspot	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported SAR1-g (W/kg)	Ant Tuning State
			1-g	10-g					
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)									
Front Side-10mm	21350/2560	20M QPSK 1RB#50	0.429	0.236	0.18	16.66	17.00	0.464	/
Back Side-10mm	21350/2560	20M QPSK 1RB#50	0.496	0.229	0.17	16.66	17.00	0.536	/
Left Side-10mm	20850/2510	20M QPSK 1RB#50	0.446	0.223	-0.19	22.93	23.00	0.453	/
Right Side-10mm	20850/2510	20M QPSK 1RB#50	0.309	0.161	-0.12	22.93	23.00	0.314	/
Bottom Side-10mm	21350/2560	20M QPSK 1RB#50	0.755	0.366	-0.18	16.66	17.00	0.816	/
Bottom Side-10mm	20850/2510	20M QPSK 1RB#50	0.721	0.347	-0.10	16.36	17.00	0.835	/
Bottom Side-10mm	21100/2535	20M QPSK 1RB#50	0.634	0.305	-0.10	16.25	17.00	0.754	/
50%RB									
Front Side-10mm	20850/2510	20M QPSK 50%RB#50	0.344	0.187	0.19	16.52	17.00	0.384	/
Back Side-10mm	20850/2510	20M QPSK 50%RB#50	0.383	0.181	0.19	16.52	17.00	0.428	/
Left Side-10mm	21350/2560	20M QPSK 50%RB#0	0.434	0.216	-0.12	22.76	23.00	0.459	/
Right Side-10mm	21350/2560	20M QPSK 50%RB#50	0.340	0.176	0.01	22.76	23.00	0.359	/

Bottom Side-10mm	20850/2510	20M QPSK 50%RB#50	0.502	0.243	-0.14	16.52	17.00	0.561	/
100%RB									
Bottom Side -10mm	20850/2510	20M QPSK 100RB#0	0.554	0.259	-0.13	16.32	17.00	0.648	/
WAS-LX1 Tested at the SAR worst case with SIM2									
Bottom Side-10mm	20850/2510	20M QPSK 1RB#50	0.800	0.392	-0.01	16.36	17.00	0.927	/
WAS-LX1 Tested at the SAR worst case with battery 2									
Bottom Side-10mm	20850/2510	20M QPSK 1RB#50	0.823	0.401	0.15	16.36	17.00	0.954	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3#(Scud)									
Bottom Side-10mm	20850/2510	20M QPSK 1RB#50	0.730	0.360	-0.02	16.36	17.00	0.846	/
Addition SAR test with sensor off									
Front Side-12mm	20850/2510	20M QPSK 1RB#50	0.976	0.548	-0.19	22.93	23.00	0.992	/
Front Side-12mm	21350/2560	20M QPSK 1RB#50	0.804	0.449	-0.19	22.64	23.00	0.873	/
Front Side-12mm	21100/2535	20M QPSK 1RB#0	0.898	0.507	0.17	22.21	23.00	1.077	/
Front Side-12mm	21350/2560	20M QPSK 50%RB#0	0.902	0.509	0.04	22.76	23.00	0.953	/
Front Side-12mm	20850/2510	20M QPSK 50%RB#50	0.833	0.464	0.12	22.70	23.00	0.893	/
Front Side-12mm	21100/2535	20M QPSK 50%RB#0	0.858	0.484	0.09	22.12	23.00	1.051	/
Front Side-12mm	20850/2510	20M QPSK 100%RB#0	0.830	0.462	0.15	22.53	23.00	0.925	/
Back Side-11mm	20850/2510	20M QPSK 1RB#50	1.150	0.556	-0.11	22.93	23.00	1.169	/
Back Side-Repeated-11mm	20850/2510	20M QPSK 1RB#50	1.090	0.523	-0.07	22.93	23.00	1.108	/
Back Side-11mm	21350/2560	20M QPSK 1RB#50	1.000	0.470	0.00	22.64	23.00	1.086	/
Back Side-11mm	21100/2535	20M QPSK 1RB#0	0.949	0.464	0.15	22.21	23.00	1.138	/
Back Side-11mm	21350/2560	20M QPSK 50%RB#0	0.959	0.473	-0.16	22.76	23.00	1.013	/
Back Side-11mm	20850/2510	20M QPSK 50%RB#50	0.843	0.395	0.02	22.70	23.00	0.903	/
Back Side-11mm	21100/2535	20M QPSK 50%RB#0	1.090	0.52	0.00	22.12	23.00	**1.335**	/
Back Side-holder perturbation verification-11mm	21100/2535	20M QPSK 50%RB#0	0.914	0.436	-0.08	22.12	23.00	1.119	/
Back Side-11mm	20850/2510	20M QPSK 100%RB#0	0.929	0.512	0.17	22.53	23.00	1.035	/
Bottom Side-17mm	20850/2510	20M QPSK 1RB#50	0.813	0.428	0.09	22.93	23.00	0.826	/

Bottom Side-17mm	21350/2560	20M QPSK 1RB#50	0.857	0.458	-0.01	22.64	23.00	0.931	/
Bottom Side-17mm	21100/2535	20M QPSK 1RB#0	0.847	0.444	-0.01	22.21	23.00	1.016	/
Bottom Side-17mm	21350/2560	20M QPSK 50%RB#0	0.805	0.418	0.04	22.76	23.00	0.851	/
Bottom Side-17mm	20850/2510	20M QPSK 50%RB#50	0.805	0.421	0.00	22.70	23.00	0.863	/
Bottom Side-17mm	21100/2535	20M QPSK 50%RB#0	0.723	0.378	0.05	22.12	23.00	0.885	/
Bottom Side-17mm	20850/2510	20M QPSK 100%RB#0	0.770	0.403	0.01	22.53	23.00	0.858	/
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3#(Scud)									
Back Side-11mm	21100/2535	20M QPSK 50%RB#0	0.941	0.465	-0.06	22.12	23.00	1.152	/

Table 72: Hotspot SAR test results of LTE Band VII

7.2.11 SAR measurement Result of WiFi 2.4G

Test Position of Head	Test channel /Freq. (MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Actual duty factor	Reported SAR1-g (W/kg)
			Area Scan	Zoom Scan						
			1-g	1-g						
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)										
Test data of WAS-L03T										
Left touch	6/2437	802.11 b	0.856	0.773	-0.04	17.08	18.00	0.955	98.57%	0.969
Left touch	1/2412	802.11 b	0.713	0.685	-0.04	16.63	18.00	0.939	98.57%	0.953
Left touch	11/2462	802.11 b	0.558	0.557	0.07	16.35	18.00	0.814	98.57%	0.826
Left tilt	6/2437	802.11 b	0.724	0.745	0.17	17.08	18.00	0.921	98.57%	0.934
Left tilt	1/2412	802.11 b	0.540	0.538	0.03	16.63	18.00	0.738	98.57%	0.748
Right touch	6/2437	802.11 b	0.174	0.177	0.03	17.08	18.00	0.219	98.57%	0.222
Right tilt	6/2437	802.11 b	0.181	0.203	0.08	17.08	18.00	0.251	98.57%	0.255
Tested at the worst position with battery 2#										
Left touch	6/2437	802.11 b	0.905	**0.818**	-0.02	17.08	18.00	**1.011**	98.57%	**1.026**
Left touch-repeated	6/2437	802.11 b	0.897	0.809	0.11	17.08	18.00	1.000	98.57%	1.014
Additional SAR test(WiFi station simultaneous transmission with 2/3/4G second antenna)										
Left touch	6/2437	802.11 b	0.689	0.589	0.08	11.72	12.00	0.728	98.57%	0.628
WAS-LX1 Tested at the SAR worst case with battery 1#										
Left touch	6/2437	802.11 b	0.958	**0.808**	0.14	17.08	18.00	**0.999**	98.57%	**1.013**
WAS-LX1 Tested at the SAR worst case with battery 2#										
Left touch	6/2437	802.11 b	0.861	0.741	-0.14	17.08	18.00	0.916	98.57%	0.929
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery3# (Scud)										
Left touch	6/2437	802.11 b	0.839	0.729	-0.07	17.08	18.00	0.901	98.57%	0.914

Table 73: Head SAR test results of WiFi 2.4G

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

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

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

Test Position of Body-Worn with 15mm	Test channel /Freq. (MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Actual duty factor	Reported SAR1-g (W/kg)
			Area Scan	Zoom Scan						
			1-g	1-g						
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)										
Test data of WAS-L03T										
Front Side	6/2437	802.11 b	0.062	/	-0.16	17.08	18.00	/	98.57%	/
Back Side	6/2437	802.11 b	0.071	0.071	0.04	17.08	18.00	0.088	98.57%	0.089
Tested at the worst position with battery 2#										
Back Side	6/2437	802.11 b	0.072	**0.072**	-0.03	17.08	18.00	**0.089**	98.57%	**0.091**
WAS-LX1 Tested at the SAR worst case with battery 1#										
Back Side	6/2437	802.11 b	0.062	0.062	0.12	17.08	18.00	0.076	98.57%	0.077
WAS-LX1 Tested at the SAR worst case with battery 2#										
Back Side	6/2437	802.11 b	0.047	0.047	0.16	17.08	18.00	0.058	98.57%	0.059
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery3# (Scud)										
Back Side	6/2437	802.11 b	0.048	0.048	0.18	17.08	18.00	0.059	98.57%	0.060

Table 74: Body-worn SAR test results of WiFi 2.4G

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

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

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

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Actual duty factor	Reported SAR1-g (W/kg)
			Area Scan	Zoom Scan						
			1-g	1-g						
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)										
Test data of WAS-L03T										
Front Side	6/2437	802.11 b	0.111	/	0.11	17.08	18.00	/	98.57%	/
Back Side	6/2437	802.11 b	0.140	/	0.09	17.08	18.00	/	98.57%	/
Right Side	6/2437	802.11 b	0.142	**0.146**	-0.08	17.08	18.00	**0.180**	98.57%	**0.183**
Top Side	6/2437	802.11 b	0.044	/	0.16	17.08	18.00	/	98.57%	/
Tested at the worst position with battery 2#										
Right Side	6/2437	802.11 b	0.140	0.142	-0.08	17.08	18.00	0.176	98.57%	0.178
WAS-LX1 Tested at the SAR worst case with battery 1#										
Right Side	6/2437	802.11 b	0.097	0.095	-0.14	17.08	18.00	0.117	98.57%	0.119
WAS-LX1 Tested at the SAR worst case with battery 2#										
Right Side	6/2437	802.11 b	0.090	0.091	0.02	17.08	18.00	0.112	98.57%	0.114
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)										
Right Side	6/2437	802.11 b	0.091	0.091	-0.02	17.08	18.00	0.112	98.57%	0.114

Table 75: Hotspot SAR test results of WiFi 2.4G

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

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

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

7.2.12 SAR measurement Result of WiFi 5G

Test Position of Head	Test channel /Frequency	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled 1-g SAR (W/kg)	Actual duty factor	Reported SAR1-g (W/kg)
			Area Scan	Zoom Scan						
			1-g	1-g						
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)										
Test data of WAS-LX1										
Test data of U-NII-2A										
Left touch	52/5260	802.11a	0.586	0.676	0.15	12.05	13.50	0.944	97.50%	0.968
Left tilt	52/5260	802.11a	0.600	0.644	0.12	12.05	13.50	0.899	97.50%	0.922
Right touch	52/5260	802.11a	0.146	0.177	0.10	12.05	13.50	0.247	97.50%	0.253
Right tilt	52/5260	802.11a	0.151	0.177	0.01	12.05	13.50	0.247	97.50%	0.253
Left touch	56/5280	802.11a	0.777	**0.785**	0.14	12.01	13.50	1.106	97.50%	1.135
Left touch	60/5300	802.11a	0.781	0.784	0.16	11.97	13.50	1.115	97.50%	**1.144**
Left touch	64/5320	802.11a	0.778	0.774	0.19	11.98	13.50	1.098	97.50%	1.127
Test data of U-NII-2C										
Left touch	128/5640	802.11a	0.597	0.717	0.16	12.28	13.50	0.950	97.50%	0.974
Left tilt	128/5640	802.11a	0.546	0.633	0.19	12.28	13.50	0.838	97.50%	0.860
Right touch	128/5640	802.11a	0.217	0.241	0.10	12.28	13.50	0.319	97.50%	0.327
Right tilt	128/5640	802.11a	0.214	0.234	0.00	12.28	13.50	0.310	97.50%	0.318
Tested at the worst position with battery 2#										
Left touch	60/5300	802.11a	0.608	0.678	0.10	12.01	13.50	0.955	97.50%	0.980
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery 3# (Scud)										
Left touch	60/5300	802.11a	0.572	0.657	0.13	12.01	13.50	0.926	97.50%	0.950
Addition SAR test of U-NII-2A (WiFi station simultaneous transmission with 2/3/4G second antenna)										
Left touch	52/5260	802.11a	0.256	0.304	-0.18	7.33	8.00	0.355	97.50%	0.364
Addition SAR test of U-NII-2C (WiFi station simultaneous transmission with 2/3/4G second antenna)										
Left touch	104/5520	802.11a	0.178	0.214	0.16	6.86	8.00	0.278	97.50%	0.285

Table 76: Head SAR test results of WiFi 5G

Note: For Head SAR test of WiFi 5G

1) Per KDB 248227D01, as the same maximum output power is specified for U-NII-1(5.2G) and U-NII-2A(5.3G) 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.

2) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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 of Body-Worn with 15mm	Test channel /Frequency	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Actual duty factor	Reported SAR1-g (W/kg)
			Area Scan	Zoom Scan						
			1-g	1-g						
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)										
Test data of WAS-LX1										
Test data of U-NII-2A										
Front Side	52/5260	802.11a	0.021	/	0.00	12.05	13.50	/	97.50%	/
Back Side	52/5260	802.11a	0.060	0.045	0.00	12.05	13.50	0.062	97.50%	0.064
Test data of U-NII-2C										
Front Side	128/5640	802.11a	0.020	/	0.00	12.28	13.50	/	97.50%	/
Back Side	128/5640	802.11a	0.070	0.045	0.00	12.28	13.50	0.059	97.50%	0.061
WAS-LX1 Tested at the worst position with battery 2#										
Back Side	128/5640	802.11a	0.070	**0.049**	0.00	12.28	13.50	0.065	97.50%	**0.066**
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery3#(Scud)										
Back Side	128/5640	802.11a	0.063	0.045	0.00	12.28	13.50	0.059	97.50%	0.061

Table 77: Body-Worn SAR test results of WiFi 5G

Note: Per KDB248227D01, for Body-Worn SAR test of WiFi 5G:
1) As the same maximum output power is specified for U-NII-1(5.2G) and U-NII-2A(5.3G) 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.
2) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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 of Hotspot with 10mm	Test channel /Frequency	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Reported 1-g SAR (W/kg)	Actual duty factor	Reported SAR1-g (W/kg)
			Area Scan	Zoom Scan						
			1-g	**1-g**						
Test data from the original report(report NO.:SYBH(Z-SAR)029112016-2)										
Test data of WAS-LX1										
WAS-LX1 Test data of U-NII-1 band										
Front Side	36/5180	802.11a	0.028	/	0.00	12.21	13.50	/	97.50%	/
Back Side	36/5180	802.11a	0.092	0.050	0.00	12.21	13.50	0.068	97.50%	0.070
Right Side	36/5180	802.11a	0.001	/	0.00	12.21	13.50	/	97.50%	/
Top Side	36/5180	802.11a	0.017	/	0.17	12.21	13.50	/	97.50%	/
WAS-LX1 Tested at the worst position with battery 2#										
Back Side	36/5180	802.11a	0.098	**0.069**	0.00	12.21	13.50	**0.093**	97.50%	0.095
Tested at the SAR worst case from the report no:SYBH(Z-SAR)029112016-2 with Battery3# (Scud)										
Back Side	36/5180	802.11a	0.060	0.054	0.00	12.21	13.50	0.073	97.50%	0.075

Table 78: Hotspot SAR test results of WiFi 5G

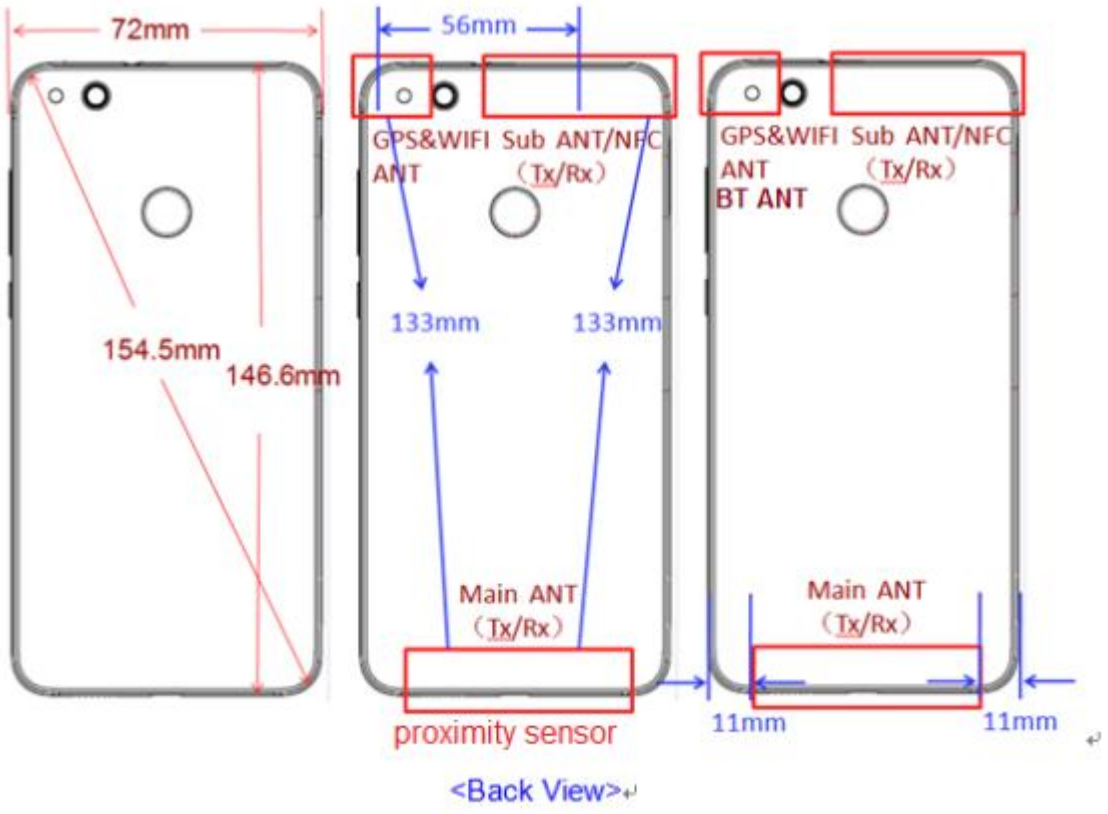
Note : For Hotspot SAR test of WiFi 5G:

1) U-NII-2A band and U-NII-2C band don't support hotspot function, so hotspot SAR test is not required.

2) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

7.3 Multiple Transmitter Evaluation

The following tables list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to FCC KDB 447498D01 General RF Exposure Guidance v05r02.
The location of the antennas inside the device is shown as below picture:



Note:
1) Per KDB 648474 D04, because the diagonal distance of this device is < 160mm, Product Specific 10-g SAR test is not required.
2) The device has two 2G/3G/4G Tx antennas (Main ant and Sub/Second ant). It can transmit from either Main Antenna or Second Antenna, but they can not transmit simultaneously.
3) Per KDB 941225 D06, particular DUT edges were not required to be evaluated for Hotspot SAR if the antenna-to-edge distance is greater than 2.5cm.
.

Mode	Exposure Condition	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
Main ant	Hotspot	Yes	Yes	Yes	Yes	No	Yes
Sub/Second ant	Hotspot	Yes	Yes	Yes	No	Yes	No
WiFi/BT ant	Hotspot	Yes	Yes	No	Yes	Yes	No

Table 79: Sides for Hotspot SAR testing

7.3.1 Stand-alone SAR test exclusion

Per FCC KDB 447498D01, the 1-g SAR 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

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	SAR test exclusion
BT	Body-Worn	11.00	12.59	15	2.480	1.32	3.00	Yes

Table 80: Standalone SAR test exclusion for BT

Note:

1)* - maximum possible output power declared by manufacturer

2) Held to ear configurations are not applicable to Bluetooth for this device.

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

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√f(GHz)/x] W/kg for test separation distances ≤ 50 mm,where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	X	Estimated SAR (W/kg)*
BT	Body-worn	11.00	12.59	15	2.480	7.50	0.176

Table 81: Estimated SAR calculation for BT

Note:

1) * - maximum possible output power declared by manufacturer

2) Held to ear configurations are not applicable to Bluetooth and therefore were not considered for simultaneous transmission.

7.3.2 Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities of this device are as below:

NO.	Simultaneous Tx Combination	Head	Body-worn	Hotspot
1	GSM Voice(Ant 1) + BT	N/A	Yes	N/A
2	GSM DATA(Ant 1) + BT	N/A	Yes	N/A
3	GSM Voice(Ant 2) + BT	N/A	Yes	N/A
4	GSM DATA (Ant 2)+ BT	N/A	Yes	N/A
5	GSM Voice(Ant 1) + WiFi	Yes	Yes	N/A
6	GSM DATA(Ant 1) + WiFi	N/A	Yes	Yes
7	GSM Voice(Ant 2) + WiFi	Yes	Yes	N/A
8	GSM DATA(Ant 2) + WiFi	N/A	Yes	Yes
9	UMTS Voice(Ant 1) + BT	N/A	Yes	N/A
10	UMTS Data(Ant 1) + BT	N/A	Yes	N/A
11	UMTS Voice(Ant 2) + BT	N/A	Yes	N/A
12	UMTS Data(Ant 2) + BT	N/A	Yes	N/A
13	UMTS Voice(Ant 1) + WiFi	Yes	Yes	N/A
14	UMTS Data (Ant 1) + WiFi	N/A	Yes	Yes
15	UMTS Voice (Ant 2) + WiFi	Yes	Yes	N/A
16	UMTS Data (Ant 2)+ WiFi	N/A	Yes	Yes
17	LTE (Ant 1) + WiFi	Yes	Yes	Yes
18	LTE (Ant 1) + BT	N/A	Yes	N/A
19	LTE (Ant 2) + WiFi	Yes	Yes	Yes
20	LTE (Ant 2) + BT	N/A	Yes	N/A

Table 82: Simultaneous Transmission Possibilities

Note:

1) Wi-Fi 2.4G and Bluetooth share the same Tx antenna and can't transmit simultaneously.

2) Held to ear configurations are not applicable to Bluetooth and therefore were not considered for simultaneous transmission.

3) The device does not support DTM function.

4) * VOIP 3rd party applications may possibly be installed and used by the user.

5) The Main Antenna (Ant1) and Second Antenna(Ant 2) can't transmit simultaneously.

6) The device support VoLTE and VoWIFI function.

7.3.3 SAR Summation Scenario

The yellow color SAR test data in the following summed SAR tables represent that the additional SAR test results in simultaneous transmission fixed power reduction scenario are used to ensure simultaneous transmission SAR test exclusion. For the other SAR test data in the summed SAR tables, the more conservative SAR test results at the maximum output power level without any power reduction are used.

Test Position		Main antenna SAR_{Max}					WiFi/BT antenna SARMax			Σ1-g SAR (1.6W/kg Limit)	SPLSR	Volume scan
		GSM850	GSM1900	UMTS Band II	UMTS Band V	LTE Band VII	WiFi 2.4G	WiFi 5G	BT			
Head	Left touch	0.337	0.201	0.309	0.322	0.110	1.026	1.144	/	1.481	N/A	N/A
	Left tilt	0.244	0.045	0.074	0.291	0.051	0.934	0.922	/	1.225	N/A	N/A
	Right touch	0.474	0.130	0.222	0.397	0.203	0.222	0.253	/	0.727	N/A	N/A
	Right tilt	0.244	0.042	0.088	0.299	0.095	0.255	0.235	/	0.554	N/A	N/A
Body-worn	Front side	0.464	0.490	0.868	0.382	0.610	0.091	0.066	0.176	1.044	N/A	N/A
	Back side	0.499	0.590	1.024	0.379	0.712	0.091	0.066	0.176	1.200	N/A	N/A
Hotspot	Front side	0.506	0.429	0.506	0.420	1.077	0.183	0.095	/	1.260	N/A	N/A
	Back side	0.528	0.505	0.543	0.442	1.335	0.183	0.095	/	**1.518**	N/A	N/A
	Left side	0.426	0.078	0.057	0.268	0.454	/	/	/	0.454	N/A	N/A
	Right side	0.642	0.099	0.088	0.626	0.356	0.183	0.095	/	0.825	N/A	N/A
	Top side	/	/	/	/	/	0.183	0.095	/	0.183	N/A	N/A
	Bottom side	0.214	0.847	0.814	0.220	1.016	/	/	/	1.016	N/A	N/A

Table 83: SAR Simultaneous Tx Combination of Main antenna and WiFi/BT antenna

Test Position		Second antenna SAR_{Max}					WiFi/BT antenna SARMax			Σ1-g SAR (1.6W/kg Limit)	SPLSR	Volume scan
		GSM 850	GSM 1900	UMTS Band II	UMTS Band V	LTE Band VII	WiFi 2.4G	WiFi 5G	BT			
Head	Left touch	0.608	0.238	0.362	0.683	0.119	0.628	0.364	/	1.311	N/A	N/A
	Left tilt	0.528	0.209	0.298	0.578	0.195	0.934	0.922	/	**1.512**	N/A	N/A
	Right touch	0.917	0.607	0.965	1.133	0.775	0.222	0.253	/	1.386	N/A	N/A
	Right tilt	0.828	0.425	0.640	0.841	0.317	0.255	0.235	/	1.096	N/A	N/A
Body-worn	Front side	0.138	0.068	0.087	0.145	0.070	0.091	0.066	0.176	0.321	N/A	N/A
	Back side	0.130	0.052	0.079	0.132	0.037	0.091	0.066	0.176	0.308	N/A	N/A
Hotspot	Front side	0.301	0.092	0.150	0.311	0.093	0.183	0.095	/	0.494	N/A	N/A
	Back side	0.287	0.107	0.165	0.292	0.079	0.183	0.095	/	0.475	N/A	N/A
	Left side	0.235	0.151	0.234	0.320	0.200	/	/	/	0.320	N/A	N/A
	Right side	/	/	/	/	/	0.183	0.095	/	0.183	N/A	N/A
	Top side	0.224	0.042	0.143	0.238	0.052	0.183	0.095	/	0.421	N/A	N/A
	Bottom side	/	/	/	/	/	/	/	/	0.000	N/A	N/A

Table 84: SAR Simultaneous Tx Combination of Second antenna and WiFi/BT antenna

7.3.4 Simultaneous Transmission Conlcusion

The above numeral summed SAR results and SPLSR analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore simultaneous transmission SAR with Volume Scans is not required per KDB 447498 D01

Appendix A. System Check Plots
(Pls See Appendix No.: SYBH(Z-SAR)029112016-2A, total: 15 pages)

Appendix B. SAR Measurement Plots
(Pls See Appendix No.: SYBH(Z-SAR) 029112016-2B, total: 38 pages)

Appendix C. Calibration Certificate
(Pls See Appendix No.: SYBH(Z-SAR) 029112016-2C, total: 92 pages)

Appendix D. Photo documentation
(Pls See Appendix No.: SYBH(Z-SAR) 029112016-2D, total: 7 pages)

End