



SAR TEST REPORT

Applicant Guangdong OPPO Mobile
Telecommunications Corp., Ltd.

FCC ID R9C-CPH2145

Product Mobile Phone

Brand OPPO

Model CPH2145

Report No. R2009A0668-S1

Issue Date January 11, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **IEEE 1528- 2013, ANSI C95.1: 1992, IEEE C95.1: 1991**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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1.4 Laboratory Environment

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

2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for the EUT are as follows:

Table 1: Highest Reported SAR

Mode		Highest Reported SAR (W/kg)			
		1g SAR Head	1g SAR Body-worn (Separation 15mm)	1g SAR Hotspot (Separation 10mm)	Product Specific 10-g SAR (Separation 0mm)
GSM	850	0.491	0.144	0.383	/
	1900	0.707	0.261	0.732	/
WCDMA	Band II	0.684	0.420	1.139	/
	Band IV	0.964	0.440	1.074	2.434
	Band V	0.757	0.221	0.340	/
LTE	FDD 2	0.793	0.314	0.754	/
	FDD 4	/	/	/	/
	FDD 5	0.766	0.167	0.282	/
	FDD 7	1.094	0.489	0.699	/
	FDD 12	1.146	0.278	0.369	/
	FDD 17	/	/	/	/
	FDD 26	0.908	0.298	0.269	/
	TDD 38	1.067	0.249	0.537	/
	TDD 41	1.194	0.216	0.371	/
	FDD 66	0.908	0.449	0.863	/
LTE (EN-DC)	FDD 7	0.565	0.377	0.547	/
NR (EN-DC)	n5	0.270	0.172	0.293	/
NR (SA)	n7	0.731	0.491	0.792	/
	n41	0.755	0.278	0.638	/
Wi-Fi (2.4G)		0.939	0.223	0.125	/
Wi-Fi (5G)		0.817	0.480	0.381	1.925
BT		0.467	0.089	0.093	/
Date of Testing: October 11, 2020 ~ December 26, 2020 and January 5, 2021 ~ January 6, 2021					
Date of Sample Received: October 3, 2020					
Note: 1. The device is in compliance with SAR for Uncontrolled Environment /General Population exposure					



limits (1.6 W/kg, 4 W/kg) specified in ANSI C95.1: 1992/IEEE C95.1: 1991, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013.

2. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

Table 2: Highest Simultaneous Transmission SAR

Exposure Configuration	1g SAR Head	1g SAR Body-worn (Separation 15mm)	1g SAR Hotspot (Separation 10mm)	Product Specific 10-g SAR (Separation 0mm)
Highest Simultaneous Transmission SAR (W/kg)	1.494	1.029	1.415	2.434
Note: The detail for simultaneous transmission consideration is described in chapter 10.3.				

3 Description of Equipment under Test

Client Information

Applicant	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Applicant address	NO.18 Haibin Road,Wusha Village, Chang'an Town, Dongguan City, Guangdong, China
Manufacturer	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Manufacturer address	NO.18 Haibin Road,Wusha Village, Chang'an Town, Dongguan City, Guangdong, China

General Technologies

Application Purpose	Original Grant	
EUT Stage	Identical Prototype	
Model	CPH2145	
IMEI	Configure 1	IMEI 1: 869771050019591 IMEI 2: 869771050019583
	Configure 2	IMEI 1: 001005433360110 IMEI 2: 001005433360110
Hardware Version	11	
Software Version	ColorOS V11.1	
Antenna Type	Internal Antenna	
Device Class	A	
Wi-Fi Hotspot	Wi-Fi 2.4G Wi-Fi 5G U-NII-1 & U-NII-3	
Power Class	GSM 850: 4 GSM 1900: 1 UMTS Band II/IV/V: 3 LTE FDD 2/4/5/7/12/17/26/66: 3 LTE TDD 38/41: 3 NR FDD n5/n7: 3 NR TDD n41:3	
Power Level	GSM 850: level 5 GSM 1900: level 0 UMTS Band II/IV/V: all up bits LTE FDD 2/4/5/7/12/17/26/66: max power LTE TDD 38/41: max power NR FDD n5/n7: max power NR TDD n41: max power	
EUT Accessory		
Battery 1	Manufacturer: Dongguan NVT Technology Co., Ltd.	



	Model: BLP811
Battery 2	Manufacturer: Sunwoda Electronic CO.,LTD. Model: BLP811
Earphone 1	Manufacturer: OPPO Model: MH156
Earphone 2	Manufacturer: OPPO Model: MH162
Note: 1.The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. 2. LTE Band 66 overlaps the entire frequency range of LTE Band 4. Therefore, the test results of LTE Band 66 provided in this report covers Band 4. LTE Band 12 overlaps the entire frequency range of LTE Band 17. Therefore, the test results of LTE Band 12 provided in this report covers Band 17. 3. There are two forms of this product: it supports dual cards in some regions or operators; while in other regions or operators supports single cards. When supports dual cards, SIM1 and SIM2 are based on the same radio frequency module, and the working mechanism is dual-standby with single-pass, which means SIM1 and SIM2 cannot work at the same time in the communication mode; When only supports a single card, other software and hardware are consistent with the status that supports dual cards; This report focuses on the dual-card status, carries out SAR evaluation, and verifies the compliance of the single-card. The test data in the report is the dual-card status of SIM1 under the worst conditions.	

Item	Configure 1	Configure 2
Shell material	Plastic shell	Glass shell
Others	The same	The same
Note: Customer declaration, two configures is the same, except for shell material. This report focuses on the Configure 1, carries out SAR evaluation, and verifies the compliance of the Configure 2. The test data in the report is the Configure 1 status.		

Wireless Technology and Frequency Range

Wireless Technology		Modulation	Operating mode	Tx (MHz)		
GSM	850	Voice(GMSK) GPRS(GMSK) EGPRS(GMSK,8PSK)	☐ Multi-slot Class:8-1UP ☐ Multi-slot Class:10-2UP ☐ Multi-slot Class:12-4UP ☒ Multi-slot Class:33-4UP	824 ~ 849		
	1900		1850 ~ 1910			
	Does this device support DTM (Dual Transfer Mode)? ☐ Yes ☒ No					
UMTS	Band II	QPSK	HSDPA HSUPA	1850 ~ 1910		
	Band IV			1710 ~ 1755		
	Band V			824 ~ 849		
LTE	FDD 2	QPSK, 16QAM, 64QAM	Rel. 12	1850 ~ 1910		
	FDD 4			1710 ~ 1755		
	FDD 5			824 ~ 849		
	FDD 7			2500 ~ 2570		
	FDD 12			699 ~ 716		
	FDD 17			704 ~ 716		
	FDD 26			814 ~ 849		
	TDD 38			2570 ~ 2620		
	TDD 41			2496 ~ 2690		
	FDD 66			1710 ~ 1780		
	Does this device support Carrier Aggregation (CA). ☒ Yes ☐ No					
	Does this device support SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No					
NR	FDD n5	CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM; DFT-s OFDM: QPSK, 16QAM, 64QAM, 256QAM	/	824 ~ 849		
	FDD n7			2500 ~ 2570		
	TDD n41			2496 ~ 2690		
BT	2.4G	Version 5.0 LE		2402 ~2480		
Wi-Fi	2.4G	DSSS, OFDM	802.11b/g/n HT20	2412 ~ 2462		
		OFDM	802.11ac VHT20	2412 ~ 2472		
	5G	OFDM	802.11a/n HT20/ HT40/ ac VHT20/ VHT40/ VHT80	5150 ~ 5350 5470 ~ 5850		
			Does this device support MIMO ☐ Yes ☒ No			
NFC	13.56MHz					



4 Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE 1528- 2013, ANSI C95.1: 1992, IEEE C95.1: 1991, the following FCC Published RF exposure KDB procedures:

IEC 62209-1

Reference Standards

KDB 447498 D01 General RF Exposure Guidance v06

KDB 648474 D04 Handset SAR v01r03

KDB 690783 D01 SAR Listings on Grants v01r03

KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04

KDB 865664 D02 RF Exposure Reporting v01r02

KDB 941225 D01 3G SAR Procedures v03r01

KDB 941225 D05 SAR for LTE Devices v02r05

KDB 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02

KDB 941225 D06 Hotspot Mode v02r01

5 Operational Conditions during Test

5.1 Test Positions

5.1.1 Against Phantom Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 - 2013 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

5.1.2 Body Worn Configuration

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

Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

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

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

5.1.3 Phablet SAR test considerations

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

- a) The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.
- b) The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for product specific 10-g SAR according to the body-equivalent tissue dielectric parameters in KDB Publication 865664 D01 to address interactive hand use exposure conditions. The 1-g SAR at 5 mm for UMPC mini-tablets is not required. When hotspot mode applies, product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold. The normal tablet procedures in KDB Publication 616217 are required when the overall diagonal dimension of the device is > 20.0 cm. Hotspot mode SAR is not required when normal tablet procedures are applied. Product specific 10-g SAR is also not required for the front (top) surface of larger form factor full size tablets. The more conservative normal tablet SAR results can be used to support phablet mode product specific 10-g SAR.
- c) The simultaneous transmission operating configurations applicable to voice and data transmissions for both phone and mini-tablet modes must be taken into consideration separately for 1-g and 10-g SAR to determine the simultaneous transmission SAR test exclusion and measurement requirements for the relevant wireless modes and exposure conditions.

5.2 Measurement Variability

Per FCC KDB Publication 865664 D01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

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

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.

5.3 Test Configuration

5.3.1 GSM Test Configuration

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot. The allowed power reduction in the multi-slot configuration is as following:

Output power of reductions:

Table 3: The allowed power reduction in the multi-slot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power (dB)
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

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. GSM voice and GPRS data use GMSK, which is a constant amplitude modulation with minimal peak to average power difference within the time-slot burst. For EDGE, GMSK is used for MCS 1 – MCS 4 and 8-PSK is used for MCS 5 – MCS 9; where 8-PSK has an inherently higher peak-to-average power ratio. The GMSK and 8-PSK EDGE configurations are considered separately for SAR compliance. The GMSK EDGE configurations are grouped with GPRS and considered with respect to time-averaged maximum output power to determine compliance. The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode.

5.3.2 UMTS Test Configuration

5.3.2.1 3G SAR Test Reduction Procedure

The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2 kbps RMC (reference measurement channel) configured in Test Loop Mode 1. SAR is selectively confirmed for other physical channel configurations modes according to output power, exposure conditions and device operating capabilities. Maximum output power is verified by applying the applicable versions of 3GPP TS 34.121.

5.3.2.2 Head SAR

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

5.3.2.3 Body-worn accessory SAR

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 EUT with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the EUT, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC

5.3.2.4 Release 5 HSDPA Test Configuration

The 3G SAR test reduction procedure is applied to HSDPA body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures in the “Release 5 HSDPA Data Devices” section of this document, for the highest SAR body-worn accessory exposure configuration in 12.2 kbps RMC. EUT with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

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

Table 4: Subtests for UMTS Release 5 HSDPA

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (note 1, note 2)	CM(dB) (note 3)	MPR(dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (note 4)	15/15 (note 4)	64	12/15 (note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5
Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ Note 2: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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 signaled gain factors for the reference TFC (TFC1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.							

5.3.2.5 Release 6 HSUPA Test Configuration

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures in the “Release 6 HSPA Data Devices” section of this document, for the highest body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When VOIP is applicable for next to the ear head exposure in HSPA, the 3G SAR test reduction procedure is applied to HSPA with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body-worn accessory measurements is tested for next to the ear head exposure.

Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in Table 2 and other applicable procedures described in the ‘WCDMA EUT’ and ‘Release 5 HSDPA Data Devices’ sections of this document

Table 5: Sub-Test 5 Setup for Release 6 HSUPA

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	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 $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.

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 signaled 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 signaled 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 Figure 5.1g.

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

Table 6: HSUPA UE category

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCHTTI (ms)	Minimum Spreading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592



4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	2	2 SF2 & 2	11484	5.76
	4	4	10	SF4	20000	2.00
7 (No DPDCH)	4	8	2	2 SF2 & 2 SF4	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 supports QPSK only. UE Category 7 supports QPSK and 16QAM.
(TS25.306-7.3.0)

5.3.3 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR. The R&S CMW500 was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

A) Spectrum Plots for RB Configurations

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

B) MPR

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

C) A-MPR

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

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

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

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

4) Higher order modulations

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

E) Other channel bandwidth standalone SAR test requirements

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

5.3.4 Additional requirements for TDD LTE specification

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

TDD LTE Band supports 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table: Uplink-downlink configurations for uplink-downlink configurations and Table: Configuration of special subframe (lengths of DwPTS/GP/UpPTS) for Special subframe configurations.

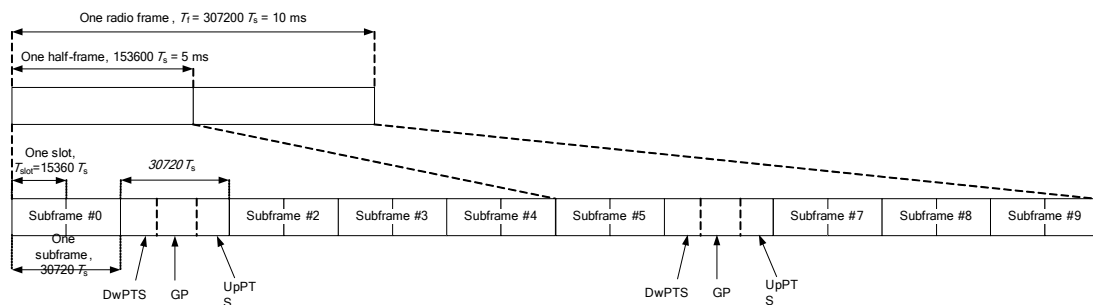


Figure 1: Frame structure type 2

Table 7: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

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

Table 8: Uplink-downlink configurations

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

According to Figure 1, one radio frame is configured by 10 subframes, which consist of Uplink-subframe, Downlink-subframe and Special subframe. For TDD-LTE, the Duty Cycle should be calculated on Uplink-subframes and Special subframes, due to Special subframe containing both Uplink transmissions. So for one radio frame, Duty Cycle can be calculated with formula as below. The count of Uplink subframes are according to Table: Uplink-downlink configurations:

$$\text{Duty cycle} = (30720T_s \cdot \text{Ups} + \text{Uplink Component} \cdot \text{Specials}) / (307200T_s)$$

About the uplink component of Special subframes, we can figure out by Table: Configuration of special subframe (lengths of DwPTS/GP/UpPTS):

$$\text{Uplink Component} = \text{UpPTS}$$

In conclusion, for the TDD LTE Band, Duty Cycle can be calculated with formula as below. All these sets are ok when we test, or we can set as below.

$$\text{Duty cycle} = [(30720T_s \cdot \text{Ups}) + \text{UpPTS} \cdot \text{Specials}] / (307200T_s)$$

And we can get different Duty cycles under different configurations:

Uplink-downlink configuration	Subframe number			Configuration of special subframe							
				Normal cyclic prefix in downlink				Extended cyclic prefix in downlink			
				Normal cyclic prefix in uplink		Extended cyclic prefix in uplink		Normal cyclic prefix in uplink		Extended cyclic prefix in uplink	
	D	S	U	configuration 0~4	configuration 5~9	configuration 0~4	configuration 5~9	configuration 0~3	configuration 4~7	configuration 0~3	configuration 4~7
0	2	2	6	61.43%	62.85%	61.67%	63.33%	61.43%	62.85%	61.67%	63.33%
1	4	2	4	41.43%	42.85%	41.67%	43.33%	41.43%	42.85%	41.67%	43.33%
2	6	2	2	21.43%	22.85%	21.67%	23.33%	21.43%	22.85%	21.67%	23.33%
3	6	1	3	30.71%	31.43%	30.83%	31.67%	30.71%	31.43%	30.83%	31.67%
4	7	1	2	20.71%	21.43%	20.83%	21.67%	20.71%	21.43%	20.83%	21.67%
5	8	1	1	10.71%	11.43%	10.83%	11.67%	10.71%	11.43%	10.83%	11.67%
6	3	2	5	51.43%	52.85%	51.67%	53.33%	51.43%	52.85%	51.67%	53.33%

SAR test Plan: For TDD LTE, SAR should be tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7 for Frame structure type

The screenshot shows the 'LTE Signaling - Configuration' window. The 'Physical Cell Setup' section is highlighted with a red box. The 'TDD' section is also highlighted with a red box, showing 'Uplink Downlink Configuration' set to 0 and 'Special Subframe' set to 7. The 'LTE Signaling' button on the right is highlighted with a red box and labeled 'ON'.

5.3.5 LTE CA specification

The device supports LTE advanced Rel. 12, Carrier Aggregation (CA) on downlink for Intra band and inter-band. Uplink CA is supported for Intra band only, more details information is provided in tables below:

1) DL CA Intra band contiguous

E-UTRA CA configuration / Bandwidth combination set								
E-UTRA CA configuration	Uplink CA configurations (NOTE 3)	Component carriers in order of increasing carrier frequency					Maximum aggregated bandwidth [MHz]	Bandwidth combination set
		Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]		
CA_7C	CA_7C	15	15	-	-	-	40	0
		20	20	-	-	-		
		10	20	-	-	-	40	1
		15	15, 20	-	-	-		
		20	10, 15, 20	-	-	-	40	2
		15	10, 15	-	-	-		
CA_38C	CA_38C	20	15, 20	-	-	-	40	0
		15	15	-	-	-		
CA_41C	CA_41C	10	20	-	-	-	40	0
		15	15, 20	-	-	-		
		20	10, 15, 20	-	-	-		
		5, 10	20	-	-	-	40	1
		15	15, 20	-	-	-		
		20	5, 10, 15, 20	-	-	-		
		10	15, 20	-	-	-	40	2
		15	10, 15, 20	-	-	-		
		20	10, 15, 20	-	-	-		
		10	20	-	-	-	40	3
		20	20	-	-	-		

NOTE 1: The CA configuration refers to an operating band and a CA bandwidth class specified in Table 5.6A-1 (the indexing letter). Absence of a CA bandwidth class for an operating band implies support of all classes.

NOTE 2: For the supported CC bandwidth combinations, the CC downlink and uplink bandwidths are equal.

NOTE 3: Uplink CA configurations are the configurations supported by the present release of specifications.

NOTE 4: Restricted to E-UTRA operation when inter-band carrier aggregation is configured. The downlink operating band is paired with the uplink operating band (external) of the carrier aggregation configuration that is supporting the configured Pcell.



5.3.6 5G NR Test Configuration

For 5G NR SAR testing, due to test setup limitations, SAR testing for NR was performed using factory test mode software to establish the connection and perform SAR with 100% transmission.

The DFT-s-OFDM and CP-OFDM waveforms were investigated, and DFT-s-OFDM was found to be the worst case.

The worst-case scenario for all measurements is based on an engineering evaluation and QPSK was observed as the worst one and set for all conducted and radiated. Output power measurements were measured on QPSK, 16QAM, 64QAM, 256QAM modulations.

5.3.7 Wi-Fi Test Configuration

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; These are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the *initial test position(s)* by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The *initial test position(s)* is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the *reported SAR* for the *initial test position* is:

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the *initial test position* to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the *reported SAR* is ≤ 0.8 W/kg or all required test positions are tested.
 - ✧ For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
 - ✧ When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the *initial test position* and subsequent test positions, when the *reported SAR* is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the *reported SAR* is ≤ 1.2 W/kg or all required test channels are considered.
 - ✧ The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.

To determine the initial test position, Area Scans were performed to determine the position with the Maximum Value of SAR (measured). The position that produced the highest Maximum Value of SAR is considered the worst case position; thus used as the initial test position.

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

5.3.8 BT Test Configuration

For BT SAR testing, BT engineering testing software installed on the EUT can provide continuous transmitting RF signal with maximum output power. And the CBT control the EUT operating with hopping off and data rate set for DH5.

5.3.9 Power Reduction Configuration

Overview of power reduction scenarios

The mobile phone device meets SAR requirements by accurately reducing the power of various scenes. Mainly the following scenarios:

- 1) Head SAR is mainly determined by whether the receiver is working.
- 2) Body SAR is judged by WIFI state working + the receiver not working

Description of power reduction scenarios

- 1) The mobile phone device supports the receiver detection mechanism. This device uses the receiver to indicate whether the user is making a call in head or body.
- 2) When there is a voice call (including VOIP) and the audio is actively routed through the earpiece receiver, which indicating the head exposure condition it will trigger the head exposure reduced the power.
- 3) When there is a voice call (including VOIP), and the audio is actively routed through the headset or speaker, which indicating the body exposure conditions will trigger the body exposure reduced the power.

When this device used data mode only, and the receiver will not work too, the reduced the power are same as body exposure.

WWAN & WLAN Reduced power level table

Reduced level	Receiver state	Transmitting conditions	Antenna	Power reduced bands
Level 1	On (head scenario)	WWAN Use Only	ANT 1	PCS 1900;WCDMA B2/B4; LTE B2/B4/B7/B38/B41/B66
			ANT 4	ENDC_LTE B7;5G NR :n7
Level 2	On (head scenario)	WWAN + WLAN 2.4G	ANT 1	PCS 1900;WCDMA B2/B4; LTE B2/B4/B7/B12/B17/B38/B41/B66
			ANT 4	ENDC_LTE B7;5G NR :n7
Level 3	On (head scenario)	WWAN + WLAN 5G	ANT 1	PCS 1900;WCDMA B2/B4; LTE B2/B4/B7/B12/B17/B38/B41/B66
			ANT 4	ENDC_LTE B7;5G NR :n7
Level 4	Off (Body-worn&Specific scenario)	WWAN Use Only	ANT 0	WCDMA B4;LTE B4/B7/B66;CA_B7
			ANT 1	WCDMA B4;LTE B4/B7/B66
			ANT 4	ENDC_LTE B7
Level 5	Off (Body-worn&Hotspot&Specific scenario)	WWAN + WLAN 2.4G	ANT 0	WCDMA B2/B4;LTE B2/B4/B7/B66; 5G NR :n7;CA_B7
			ANT 1	WCDMA B2/B4;LTE B2/B4/B7/B66
			ANT 4	ENDC_LTE B7



Level 6	Off (Body-worn & Hotspot & Specific scenario)	WWAN + WLAN 5G	ANT 0	WCDMA B2/B4;LTE B2/B4/B7/B66; 5G NR :n7;CA_B7
			ANT 1	WCDMA B2/B4;LTE B2/B4/B7/B66
			ANT 4	ENDC_LTE B7

Reduced level	Receiver state	Transmitting conditions	Antenna	Power reduced bands
Level 1	On (Head scenario)	WLAN Use Only	ANT 7	WIFI 2.4G;WIFI 5G
Level 2	On (Head scenario)	WWAN + WLAN 2.4G	ANT 7	WIFI 2.4G;WIFI 5G
Level 4	Off (Body-worn&Hotspot&Specific scenario)	WWAN + WLAN 2.4G	ANT 7	WIFI 2.4G;WIFI 5G

WWAN Reduced power level table

Mode	Band	Full power (dBm)	Antenna	Head(Receiver on)			Body-worn /Product Specific 10-g SAR (Receiver off)	Hotspot SAR (Receiver off)	Body-worn /Hotspot SAR /Product Specific 10-g SAR (Receiver off)	
				MAX Standalone	MAX Simultaneous transmission		MAX Standalone	MAX Standalone	MAX Simultaneous transmission	
					WWAN+ 2.4G WLAN	WWAN+ 5G WLAN			WWAN+ 2.4G WLAN	WWAN+ 5G WLAN
GSM (CS)	GSM 850	33.5	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GSM (CS)	GSM 1900	30.5	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.2kbps RMC	WCDMA Band2	24.0	Ant.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0
12.2kbps RMC	WCDMA Band4	24.5	Ant.0	0.0	0.0	0.0	2.5	3.0	3.0	3.0
12.2kbps RMC	WCDMA Band5	25.0	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTE Bands	LTE2	24.0	Ant.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0
	LTE4	24.5	Ant.0	0.0	0.0	0.0	2.5	3.0	3.0	3.0



	LTE5	24.8	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE7	24.3	Ant.0	0.0	0.0	0.0	1.5	2.5	2.5	2.5
	LTE12	24.8	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE17	24.8	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE26	24.8	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE38	24.5	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE41	24.5	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE66	24.5	Ant.0	0.0	0.0	0.0	2.5	3.0	3.0	3.0
DC_7A_n5A	n5	24.8	Ant.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE7	24.3	Ant.0	0.0	0.0	0.0	1.5	2.5	2.5	2.5
SA Bands	n7	24.0	Ant.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
	n41	24.5	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Mode	Band	Full power (dBm)	Antenna	Head(Receiver on)			Body-worn /Product Specific 10-g SAR (Receiver off)	Hotspot SAR (Receiver off)	Body-worn /Hotspot SAR /Product Specific 10-g SAR (Receiver off)	
				MAX Standalone	MAX Simultaneous transmission		MAX Standalone	MAX Standalone	MAX Simultaneous transmission	
					WWAN+ 2.4G WLAN	WWAN+ 5G WLAN			WWAN+ 2.4G WLAN	WWAN+ 5G WLAN
GSM (CS)	GSM 850	33.5	Ant.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GSM (CS)	GSM 1900	30.5	Ant.1	2.5	4.0	4.0	0.0	0.0	0.0	0.0
12.2kbps RMC	WCDMA Band2	24.0	Ant.1	5.0	6.0	6.0	0.0	2.0	2.0	2.0
12.2kbps RMC	WCDMA Band4	24.5	Ant.1	6.0	7.5	7.5	2.5	3.0	3.0	3.0
12.2kbps RMC	WCDMA Band5	25.0	Ant.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTE Bands	LTE2	24.0	Ant.1	5.0	6.0	6.0	0.0	2.0	2.0	2.0
	LTE4	24.5	Ant.1	6.5	8.0	8.0	2.5	3.0	3.0	3.0
	LTE5	24.8	Ant.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE7	24.3	Ant.1	6.5	7.5	7.5	4.0	4.5	4.5	4.5
	LTE12	24.8	Ant.1	0.0	2.5	2.5	0.0	0.0	0.0	0.0
	LTE17	24.8	Ant.1	0.0	2.5	2.5	0.0	0.0	0.0	0.0
	LTE26	24.8	Ant.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE38	24.5	Ant.1	2.5	2.5	2.5	0.0	0.0	0.0	0.0
	LTE41	24.5	Ant.1	3.0	4.5	4.5	0.0	0.0	0.0	0.0
DC_7A_n5A	LTE66	24.5	Ant.1	6.5	8.0	8.0	2.5	3.0	3.0	3.0
	n5	24.8	Ant.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE7	24.3	ANT4	2.0	2.0	2.0	1.0	2.0	2.0	2.0



SA Bands	n7	24.0	ANT4	1.0	1.0	1.0	0.0	0.0	0.0	0.0
	n41	24.5	ANT4	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Mode	Band	Full power (dBm)	Antenna	Head(Receiver on)			Body-worn /Product Specific 10-g SAR (Receiver off)	Hotspot SAR (Receiver off)	Body-worn /Hotspot SAR /Product Specific 10-g SAR (Receiver off)	
				MAX Standalone	MAX Simultaneous transmission		MAX Standalone	MAX Standalone	MAX Simultaneous transmission	
					WWAN+ 2.4G WLAN	WWAN+ 5G WLAN			WWAN+ 2.4G WLAN	WWAN+ 5G WLAN
DC_7A_n5A	n5	24.8	Ant.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LTE7	24.3	ANT4	2.0	2.0	2.0	1.0	2.0	2.0	2.0

**WLAN Reduced power level table**

Mode	Band	Full power (dBm)	Head(Receiver on)		Body-worn /Product Specific 10-g SAR (Receiver off)	Hotspot SAR (Receiver off)	Body-worn /Hotspot SAR /Product Specific 10-g SAR (Receiver off)
			MAX Standalone	MAX Simultaneous transmission	MAX Standalone	MAX Standalone	MAX Simultaneous transmission
				WWAN+ 2.4/5G WLAN			WWAN+ 2.4/5G WLAN
2.4G	802.11b CH1-11	20.0	4.0	10.0	0.0	5.0	5.0
	802.11g CH1-11	18.5	4.0	9.5	0.0	5.0	5.0
	802.11nHT20 CH1-11	18.5	4.0	9.5	0.0	5.0	5.0
	802.11acVHT20 CH1-11	18.5	4.0	9.5	0.0	5.0	5.0
5G U-NII-1	802.11a CH36-48	19.5	5.0	9.0	0.0	7.0	7.0
	802.11nHT20 CH36-48	19.0	5.0	9.0	0.0	7.0	7.0
	802.11nHT40 CH38-46	19.0	5.0	9.0	0.0	7.5	7.5
	802.11acVHT20 CH36-48	18.5	5.0	9.0	0.0	7.0	7.0
	802.11acVHT40 CH38-46	18.5	5.0	9.0	0.0	7.0	7.0
	802.11acVHT80 CH42	18.5	5.0	9.0	0.0	7.0	7.0
5G U-NII-2A	802.11a CH52-64	19.5	5.0	9.0	0.0	7.0	7.0
	802.11nHT20 CH52-64	19.0	5.0	9.0	0.0	7.0	7.0
	802.11nHT40 CH54-62	19.0	5.0	9.0	0.0	7.5	7.5
	802.11acVHT20 CH52-64	18.5	5.0	9.0	0.0	7.0	7.0
	802.11acVHT40 CH54-62	18.5	5.0	9.0	0.0	7.0	7.0
	802.11acVHT80 CH58	18.5	5.0	9.0	0.0	7.0	7.0
5G U-NII-2C	802.11a CH100-140	19.5	5.0	9.0	0.0	7.0	7.0
	802.11nHT20 CH100-140	19.0	5.0	9.0	0.0	7.0	7.0
	802.11nHT40 CH102-134	19.0	5.0	9.0	0.0	7.5	7.5
	802.11acVHT20 CH100-140	18.5	5.0	9.0	0.0	7.0	7.0
	802.11acVHT40 CH102-134	18.5	5.0	9.0	0.0	7.0	7.0
	802.11acVHT80 CH106-122	18.5	5.0	9.0	0.0	7.0	7.0
5G U-NII-3	802.11a CH149-165	19.5	5.0	9.0	0.0	7.0	7.0
	802.11nHT20 CH149-165	19.0	5.0	9.0	0.0	7.0	7.0
	802.11nHT40 CH151-159	19.0	5.0	9.0	0.0	7.5	7.5
	802.11acVHT20 CH149-165	18.5	5.0	9.0	0.0	7.0	7.0
	802.11acVHT40 CH151-159	18.5	5.0	9.0	0.0	7.0	7.0
	802.11acVHT80 CH155	18.5	5.0	9.0	0.0	7.0	7.0

6.1 SAR Measurement Set-up

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

6.2 DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

EX3DV4 Probe Specification

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 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure Scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.



E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy was evaluated and found to be better than ± 0.25 dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.



$$\text{SAR} = C \Delta T / \Delta t$$

Where: Δt = Exposure time (30 seconds),
 C = Heat capacity of tissue (brain or muscle),
 ΔT = Temperature increase due to RF exposure.

Or

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

Where: σ = Simulated tissue conductivity,
 ρ = Tissue density (kg/m^3).

6.3 SAR Measurement Procedure

Power Reference Measurement

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

Area Scan

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

Area scan parameters extracted from FCC KDB 865664 D01 SAR measurement 100 MHz to 6 GHz.

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

Zoom Scan

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

Zoom scan parameters extracted from FCC KDB 865664 D01 SAR measurement 100 MHz to 6 GHz.

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

Volume Scan Procedures

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

Power Drift Monitoring

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

7 Main Test Equipment

Name of Equipment	Manufacturer	Type/Model	Serial Number	Last Cal.	Cal. Due Date
Network analyzer	Agilent	E5071B	MY42404014	2020-05-17	2021-05-16
Dielectric Probe Kit	HP	85070E	US44020115	2020-05-17	2021-05-16
Power meter	Agilent	E4417A	GB41291714	2020-05-17	2021-05-16
Power sensor	Agilent	N8481H	MY50350004	2020-05-17	2021-05-16
Power sensor	Agilent	E9327A	US40441622	2020-05-17	2021-05-16
Dual directional coupler	Agilent	778D-012	50519	/	/
Dual directional coupler	Agilent	777D	50146	/	/
Dual directional coupler	UCL	UCL-DDC0 56G-S	20010600118	/	/
Amplifier	INDEXSAR	IXA-020	0401	2020-05-17	2021-05-16
Wireless communication tester	Anritsu	MT8820C	6201342015	2020-05-17	2021-05-16
Wireless communication tester	Key sight	E5515C	MY48360988	2019-12-15	2020-12-14
				2020-12-13	2021-12-12
Wideband radio communication tester	R&S	CMW 500	113645	2020-05-17	2021-05-16
Base Station Simulator	R&S	CMW270	100673	2020-05-17	2021-05-16
E-field Probe	SPEAG	EX3DV4	3677	2020-07-06	2021-07-05
DAE	SPEAG	DAE4	1291	2020-02-24	2021-02-23
Validation Kit 750MHz	SPEAG	D750V3	1045	2020-08-28	2023-08-27
Validation Kit 835MHz	SPEAG	D835V2	4d020	2020-08-28	2023-08-27
Validation Kit 1750MHz	SPEAG	D1750V2	1033	2020-02-25	2023-02-24
Validation Kit 1900MHz	SPEAG	D1900V2	5d060	2020-08-27	2023-08-26
Validation Kit 2450MHz	SPEAG	D2450V2	786	2020-08-27	2023-08-26
Validation Kit 2600MHz	SPEAG	D2600V2	1025	2018-05-02	2021-05-01
Validation Kit 5GHz	SPEAG	D5GHzV2	1151	2020-02-27	2023-02-26
Temperature Probe	Tianjin jinming	JM222	381	2020-05-25	2021-05-24
Hygrothermograph	Anymetr	HTC-1	TY2020A043	2020-05-19	2021-05-18



Twin SAM Phantom	Speag	SAM1	1534	/	/
Software for Test	Speag	DASY52	/	/	/
Softwarefor Tissue	Agilent	85070	/	/	/

8 Tissue Dielectric Parameter Measurements & System Verification

8.1 Tissue Verification

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within $\pm 2^\circ\text{C}$ of the temperature when the tissue parameters are characterized. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 24 hours of use; or earlier if the dielectric parameters can become out of tolerance.

Target values

Frequency (MHz)	Water (%)	Salt (%)	Sugar (%)	Glycol (%)	Preventol (%)	Cellulose (%)	ϵ_r	$\sigma(\text{s/m})$
750	41.448	1.452	56	0	0.1	1.0	41.9	0.89
835	41.45	1.45	56	0	0.1	1.0	41.5	0.90
1750	55.24	0.31	0	44.45	0	0	40.1	1.37
1900	55.242	0.306	0	44.452	0	0	40.0	1.40
2450	62.7	0.5	0	36.8	0	0	39.2	1.80
2600	55.242	0.306	0	44.452	0	0	39.0	1.96
Frequency (MHz)	Water (%)	Diethylenglycol monohexylether			Triton X-100		ϵ_r	$\sigma(\text{s/m})$
5250	65.53	17.24			17.23		35.9	4.71
5600	65.53	17.24			17.23		35.5	5.07
5750	65.53	17.24			17.23		35.4	5.22

Measurements results

Frequency (MHz)	Test Date	Temp °C	Measured Dielectric Parameters		Target Dielectric Parameters		Limit (Within ±5%)	
			ϵ_r	σ (s/m)	ϵ_r	σ (s/m)	Dev ϵ_r (%)	Dev σ (%)
750	10/17/2020	21.5	42.0	0.87	41.9	0.89	0.24	-2.25
835	10/12/2020	21.5	41.4	0.88	41.5	0.90	-0.24	-2.22
	10/15/2020	21.5	41.3	0.87	41.5	0.90	-0.48	-3.33
	10/23/2020	21.5	41.4	0.92	41.5	0.90	-0.24	2.22
1750	12/08/2020	21.5	40.2	1.36	40.1	1.37	0.25	-0.73
	12/09/2020	21.5	40.1	1.34	40.1	1.37	0.00	-2.19
1900	10/11/2020	21.5	40.1	1.41	40.0	1.40	0.25	0.71
	10/16/2020	21.5	40.2	1.43	40.0	1.40	0.50	2.14
2450	11/13/2020	21.5	38.6	1.81	39.2	1.80	-1.53	0.56
	1/6/2021	21.5	38.7	1.81	39.2	1.80	-1.28	0.56
2600	11/5/2020	21.5	38.2	2.01	39.0	1.96	-2.05	2.55
	12/11/2020	21.5	38.4	1.94	39.0	1.96	-1.54	-1.02
	12/13/2020	21.5	38.3	1.99	39.0	1.96	-1.79	1.53
	12/14/2020	21.5	38.5	1.95	39.0	1.96	-1.28	-0.51
	12/18/2020	21.5	38.2	1.96	39.0	1.96	-2.05	0.00
	12/25/2020	21.5	39.0	1.90	39.0	1.96	0.00	-3.06
	12/26/2020	21.5	39.9	1.97	39.0	1.96	2.31	0.51
5250	11/20/2020	21.5	35.5	4.80	35.9	4.71	-1.11	1.91
	1/5/2021	21.5	35.5	4.77	35.9	4.71	-1.11	1.27
5600	11/23/2020	21.5	34.2	5.21	35.5	5.07	-3.66	2.76
	1/5/2021	21.5	35.1	5.11	35.5	5.07	-1.13	0.79
5750	11/23/2020	21.5	34.9	5.21	35.4	5.22	-1.41	-0.19
	1/5/2021	21.5	35.9	5.19	35.4	5.22	1.41	-0.57

Note: The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulates were measured using the dielectric probe kit and the network analyzer. A system check measurement for every day was made following the determination of the dielectric parameters of the Tissue simulates, using the dipole validation kit. The dipole antenna was placed under the flat section of the twin SAM phantom.

The diagram illustrates the experimental setup for measuring the radiation pattern of a dipole antenna. The setup includes a Signal Generator, an Amplifier (Amp), a Low Pass Filter, a 3dB coupler, and Attenuators (Att1, Att2). The antenna is a dipole mounted on a Flat Phantom, with a Field probe and a 3D Probe positioner. A computer is connected to the system. Two circular insets provide detailed views of the 'Spacer' and 'Tuning element' components.

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**Justification for Extended SAR Dipole Calibrations**

Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss (< -20 dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB 865664 D01:

Dipole		Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
Dipole D750V3 SN: 1045	Head Liquid	8/27/2017	-28.5	/	52.5	/
		8/26/2018	-27.6	3.3	53.2	-0.7
		8/25/2019	-27.5	0.4	54.1	-0.9
Dipole D835V2 SN: 4d020	Head Liquid	8/28/2017	-31.9	/	50.3	/
		8/27/2018	-29.0	10.0	46.6	3.7
		8/26/2019	-29.4	-1.4	45.9	0.7
Dipole D1900V2 SN: 5d060	Head Liquid	8/26/2017	-23.4	/	52.0	/
		8/25/2018	-24.7	-5.3	54.4	-2.4
		8/24/2019	-24.9	-0.8	56.2	-1.8
Dipole D2450V2 SN: 786	Head Liquid	8/29/2017	-25.5	/	53.4	/
		8/28/2018	-23.0	10.9	57.2	-3.8
		8/27/2019	-22.2	3.6	56.4	0.8
Dipole D2600V2 SN: 1025	Head Liquid	5/2/2018	-22.0	/	48.1	/
		5/1/2019	-22.5	-2.2	48.7	-0.6

System Check results

Frequency (MHz)	Test Date	Temp $^{\circ}\text{C}$	250mW /100mW Measured SAR _{1g} (W/kg)	1W Normalized SAR _{1g} (W/kg)	1W Target SAR _{1g} (W/kg)	Δ % (Limit $\pm 10\%$)	Plot No.
750	10/17/2020	21.5	2.10	8.40	8.37	0.36	1
835	10/12/2020	21.5	2.44	9.76	9.65	1.14	2
	10/15/2020	21.5	2.46	9.84	9.65	1.97	3
	10/23/2020	21.5	2.43	9.72	9.65	0.73	4
1750	12/08/2020	21.5	8.96	35.84	35.90	-0.17	5
	12/09/2020	21.5	9.11	36.44	35.90	1.50	6
1900	10/11/2020	21.5	9.88	39.52	39.50	0.05	7
	10/16/2020	21.5	9.85	39.40	39.50	-0.25	8
2450	11/13/2020	21.5	13.70	54.80	52.30	4.78	9
	1/6/2021	21.5	13.20	52.80	52.30	0.96	10
2600	11/5/2020	21.5	13.90	55.60	54.10	2.77	11
	12/11/2020	21.5	13.88	55.52	54.10	2.62	12
	12/13/2020	21.5	13.94	55.76	54.10	3.07	13
	12/14/2020	21.5	13.90	55.60	54.10	2.77	14
	12/18/2020	21.5	13.90	55.60	54.10	2.77	15



	12/25/2020	21.5	13.76	55.04	54.10	1.74	16
	12/26/2020	21.5	13.89	55.56	54.10	2.70	17
5250	11/20/2020	21.5	7.87	78.70	78.00	0.90	18
	1/5/2021	21.5	7.46	74.60	78.00	-4.36	19
5600	11/23/2020	21.5	7.67	76.70	80.50	-4.72	20
	1/5/2021	21.5	7.98	79.80	80.50	-0.87	21
5750	11/23/2020	21.5	7.66	76.60	77.40	-1.03	22
	1/5/2021	21.5	7.65	76.50	77.40	-1.16	23
Note: Target Values used derive from the calibration certificate Data Storage and Evaluation.							

8.3 SAR System Validation

Per FCC KDB 865664 D02v01, SAR system verification is required to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles are used with the required tissue-equivalent media for system validation, according to the procedures outlined in FCC KDB 865664 D01 and IEEE 1528-2013. Since SAR probe calibrations are frequency dependent, each probe calibration point must be validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status, measurement frequencies, SAR probes, calibrated signal type(s) and tissue dielectric parameters has been included.

Frequency [MHz]	Date	Probe SN	Probe Type	Probe Cal Point		PERM (Er)	COND (Σ)	CW Validation			Mod. Validation		
								Sensitivity	Probe Linearity	Probe Isotropy	Mod. Type	Duty Factor	PAR
750	7/6/2020	3677	EX3DV4	750	Head	42.81	0.85	PASS	PASS	PASS	FDD	PASS	N/A
835	7/6/2020	3677	EX3DV4	835	Head	42.22	0.90	PASS	PASS	PASS	GMSK	PASS	N/A
1750	7/6/2020	3677	EX3DV4	1750	Head	39.91	1.32	PASS	PASS	PASS	NA	N/A	N/A
1900	7/6/2020	3677	EX3DV4	1900	Head	39.43	1.42	PASS	PASS	PASS	GMSK	PASS	N/A
2450	7/6/2020	3677	EX3DV4	2450	Head	38.19	1.83	PASS	PASS	PASS	OFDM	PASS	PASS
2600	7/6/2020	3677	EX3DV4	2600	Head	37.60	1.99	PASS	PASS	PASS	TDD	PASS	N/A
5250	7/6/2020	3677	EX3DV4	5250	Head	35.36	4.83	PASS	PASS	PASS	OFDM	N/A	PASS
5600	7/6/2020	3677	EX3DV4	5600	Head	34.43	5.29	PASS	PASS	PASS	OFDM	N/A	PASS
5750	7/6/2020	3677	EX3DV4	5750	Head	34.07	5.47	PASS	PASS	PASS	OFDM	N/A	PASS

NOTE: While the probes have been calibrated for both CW and modulated signals, all measurements were performed using communication systems calibrated for CW signals only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664D01v01 for scenarios when CW probe calibrations are used with other signal types. SAR systems were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5dB), such as OFDM according to KDB 865664.

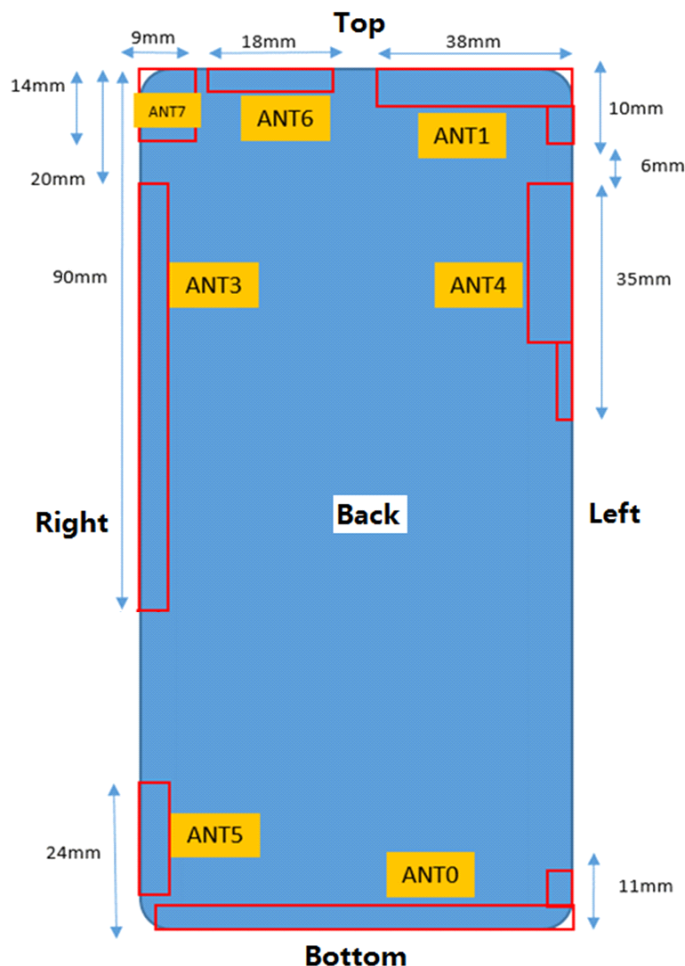


9 Normal and Maximum Output Power

Please see the *R2009A0668 SAR Normal and Maximum Output Power*.

10 Measured and Reported (Scaled) SAR Results

10.1 EUT Antenna Locations



Ant 0	GSM 850/1900; WCDMA B2/B4/B5; LTE B2/B4/B5/B7/B12/B17/B26/B38/B41/B66; NR (EN-DC) n5; NR (SA) n7/n41;
Ant 1	GSM 850/1900; WCDMA B2/B4/B5; LTE B2/B4/B5/B7/B12/B17/B26/B38/B41/B66; NR (EN-DC) n5;
Ant 4	LTE (EN-DC) B7; NR (SA) n7/n41;
Ant 7	WIFI 2.4G/5G/Bluetooth

Overall (Length x Width): 159 mm x 74 mm

Overall Diagonal: 167 mm

Distance of the Antenna to the EUT surface/edge

Antenna	Back Side	Front side	Left Edge	Right Edge	Top Edge	Bottom Edge
Ant 0	<25mm	<25mm	<25mm	<25mm	>25mm	<25mm
Ant 1	<25mm	<25mm	<25mm	>25mm	<25mm	>25mm
Ant 4	<25mm	<25mm	<25mm	>25mm	<25mm	>25mm
Ant 7	<25mm	<25mm	>25mm	<25mm	<25mm	>25mm

Hotspot mode, Positions for SAR tests

Mode	Back Side	Front side	Left Edge	Right Edge	Top Edge	Bottom Edge
Ant 0	Yes	Yes	Yes	Yes	N/A	Yes
Ant 1	Yes	Yes	Yes	N/A	Yes	N/A
Ant 4	Yes	Yes	Yes	N/A	Yes	N/A



Ant 7	Yes	Yes	N/A	Yes	Yes	N/A
Note: 1. Per KDB 941225 D06, when the overall device length and width are $\geq 9\text{cm} \times 5\text{cm}$, the test distance is 10mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge. 2. For smart phones with an overall diagonal dimension is 167mm. Per KDB 648474 D04, for smart phones with a display diagonal dimension $> 15.0\text{ cm}$ or an overall diagonal dimension $> 16.0\text{ cm}$, product specific 10-g SAR must be tested as a phablet to determine SAR compliance. For Phablet, Since hotspot mode 1-g reported SAR $< 1.2\text{ W/kg}$, product specific 10-g SAR is no required. 3. Per FCC KDB 447498 D01, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: a) $\leq 0.8\text{ W/kg}$ or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is $\leq 100\text{MHz}$ b) $\leq 0.6\text{ W/kg}$ or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz. c) $\leq 0.4\text{ W/kg}$ or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$. 4. When the original highest measured SAR is $\geq 0.80\text{ W/kg}$, the measurement was repeated once. 5. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was $\leq 1.2\text{ W/kg}$, no additional SAR evaluations using a headset cable were required.						



10.2 Measured SAR Results

Table 9: GSM 850 (Ant 0)

Test Position	Power Reduction	Time slot	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.114	0.098	1.17	0.133	24
Left Tilt	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.041	-0.040	1.17	0.048	/
Right Cheek	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.105	0.024	1.17	0.123	/
Right Tilt	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.036	0.021	1.17	0.042	/
Body-worn SAR (Distance 15mm)											
Back Side	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.105	0.140	1.17	0.123	25
Front Side	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.087	-0.049	1.17	0.102	/
Hotspot SAR(Distance 10mm)											
Back Side	Normal	3Txslots	1:2.77	190/836.6	29.50	28.37	0.269	-0.022	1.30	0.349	/
Front Side	Normal	3Txslots	1:2.77	190/836.6	29.50	28.37	0.171	0.090	1.30	0.222	/
Left Edge	Normal	3Txslots	1:2.77	190/836.6	29.50	28.37	0.106	0.190	1.30	0.137	/
Right Edge	Normal	3Txslots	1:2.77	190/836.6	29.50	28.37	0.074	0.090	1.30	0.096	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	3Txslots	1:2.77	190/836.6	29.50	28.37	0.295	-0.050	1.30	0.383	26
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.											



Table 10: GSM 1900 (Ant 0)

Test Position	Power Reduction	Time slot	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Normal	GSM	1:8.3	661/1880	30.50	29.50	0.051	0.038	1.26	0.065	27
Left Tilt	Normal	GSM	1:8.3	661/1880	30.50	29.50	0.035	0.023	1.26	0.044	/
Right Cheek	Normal	GSM	1:8.3	661/1880	30.50	29.50	0.033	0.093	1.26	0.041	/
Right Tilt	Normal	GSM	1:8.3	661/1880	30.50	29.50	0.037	0.150	1.26	0.046	/
Body-worn SAR (Distance 15mm)											
Back Side	Normal	GSM	1:8.3	661/1880	30.50	29.50	0.207	0.077	1.26	0.261	28
Front Side	Normal	GSM	1:8.3	661/1880	30.50	29.50	0.130	0.010	1.26	0.164	/
Hotspot SARSAR (Distance 10mm)											
Back Side	Normal	3Txslots	1:2.77	661/1880	26.50	25.59	0.414	0.040	1.23	0.510	/
Front Side	Normal	3Txslots	1:2.77	661/1880	26.50	25.59	0.238	0.028	1.23	0.293	/
Left Edge	Normal	3Txslots	1:2.77	661/1880	26.50	25.59	0.098	-0.035	1.23	0.121	/
Right Edge	Normal	3Txslots	1:2.77	661/1880	26.50	25.59	0.080	0.010	1.23	0.099	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	3Txslots	1:2.77	661/1880	26.50	25.59	0.594	0.170	1.23	0.732	29
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.											



Table 11: UMTS Band II (Ant 0)

Test Position	Power Reduction	Mode	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.130	0.126	1.02	0.133	30
Left Tilt	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.072	0.100	1.02	0.073	/
Right Cheek	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.072	0.064	1.02	0.073	/
Right Tilt	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.061	-0.050	1.02	0.062	/
Body-worn SAR (Distance 15mm)											
Back Side	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.410	-0.080	1.02	0.420	31
Front Side	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.286	-0.020	1.02	0.293	/
Hotspot SAR(Distance 10mm)											
Back Side	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.772	-0.040	1.02	0.790	/
Front Side	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.360	0.013	1.02	0.368	/
Left Edge	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.012	0.024	1.02	0.012	/
Right Edge	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.119	-0.010	1.02	0.122	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	RMC 12.2K	1:1	9262/1852.4	24.00	23.81	1.090	0.050	1.04	1.139	32
	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	1.040	-0.072	1.02	1.064	/
	Normal	RMC 12.2K	1:1	9538/1907.6	24.00	23.99	0.616	0.028	1.00	0.617	/
Bottom Edge (Repeated)	Normal	RMC 12.2K	1:1	9262/1852.4	24.00	23.81	1.010	-0.032	1.04	1.055	/
Bottom Edge (SIM2)	Normal	RMC 12.2K	1:1	9262/1852.4	24.00	23.81	0.986	0.010	1.04	1.030	/
Bottom Edge (Configure 2)	Normal	RMC 12.2K	1:1	9262/1852.4	24.00	23.81	0.943	0.030	1.04	0.985	/

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

3. Accessories that do not contain RF transmitters and have been proven to increase the peak SAR by less than 5 %, such as hands-free kits, do not need SAR tests separate from the SAR tests attached to a main EUT configuration.

Measurement Variability

Test Position	Channel/ Frequency(MHz)	MAX Measured SAR _{1g} (W/kg)	1 st Repeated SAR _{1g} (W/kg)	Ratio
Bottom Edge	9262/1852.4	1.090	1.010	1.08

Note: 1) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

2) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .



Table 12: UMTS Band IV (Ant 0)

Test Position	Power Reduction	Mode	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Normal	RMC 12.2K	1:1	1413/1732.6	24.50	24.27	0.152	-0.070	1.05	0.160	33
Left Tilt	Normal	RMC 12.2K	1:1	1413/1732.6	24.50	24.27	0.084	-0.010	1.05	0.089	/
Right Cheek	Normal	RMC 12.2K	1:1	1413/1732.6	24.50	24.27	0.105	0.044	1.05	0.111	/
Right Tilt	Normal	RMC 12.2K	1:1	1413/1732.6	24.50	24.27	0.080	0.160	1.05	0.084	/
Body-worn SAR (Distance 15mm)											
Back Side	Level 4	RMC 12.2K	1:1	1413/1732.6	22.00	21.61	0.402	0.080	1.09	0.440	34
Front Side	Level 4	RMC 12.2K	1:1	1413/1732.6	22.00	21.61	0.282	0.032	1.09	0.308	/
Hotspot SAR(Distance 10mm)											
Back Side	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.655	0.067	1.23	0.804	/
Front Side	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.496	0.019	1.23	0.609	/
Left Edge	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.042	0.021	1.23	0.052	/
Right Edge	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.053	-0.061	1.23	0.065	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Level 5&6	RMC 12.2K	1:1	1312/1712.4	21.50	20.62	0.859	0.015	1.22	1.052	/
	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.873	0.060	1.23	1.072	35
	Level 5&6	RMC 12.2K	1:1	1513/1752.6	21.50	20.56	0.865	-0.040	1.24	1.074	/
Bottom Edge (Repeated)	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.865	0.030	1.23	1.062	/
Test Position	Power Reduction	Mode	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 4 W/kg (mW/g)				Plot No.
							Measured SAR10g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Product Specific 10-g SAR (Distance 0mm)											
Bottom Edge	Level 4	RMC 12.2K	1:1	1312/1712.4	22.00	21.62	2.230	0.12	1.09	2.434	36
	Level 4	RMC 12.2K	1:1	1413/1732.6	22.00	21.61	2.080	0.09	1.09	2.275	/
	Level 4	RMC 12.2K	1:1	1513/1752.6	22.00	21.54	1.880	0.15	1.11	2.090	/

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.



Measurement Variability				
Test Position	Channel/ Frequency(MHz)	MAX Measured SAR _{1g} (W/kg)	1 st Repeated SAR _{1g} (W/kg)	Ratio
Bottom Edge	1413/1732.6	0.873	0.865	1.01

Note: 1) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
 2) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

MAX Adjusted SAR										
Test Position	Power Reduction	Mode	Duty Cycle	Channel /Frequency(MHz)	Tune-up (dBm)	Measured power (dBm)	Measured SAR _{1g}	Scaling Factor	Report SAR _{1g}	0mm SAR
Back Side	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	0.804	1.12	0.902	No
Front Side	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	0.609	1.12	0.683	No
Left Edge	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	0.052	1.12	0.058	No
Right Edge	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	0.065	1.12	0.073	No
Bottom Edge	Level 5&6	RMC 12.2K	1:1	1312/1712.4	22.00	21.50	1.052	1.12	1.180	No
	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	1.072	1.12	1.202	Yes
	Level 5&6	RMC 12.2K	1:1	1513/1752.6	22.00	21.50	1.074	1.12	1.205	Yes



Table 13: UMTS Band V (Ant 0)

Test Position	Power Reduction	Mode	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.055	0.160	1.33	0.073	37
Left Tilt	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.029	0.034	1.33	0.039	/
Right Cheek	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.049	0.032	1.33	0.066	/
Right Tilt	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.027	0.110	1.33	0.036	/
Body-worn SAR (Distance 15mm)											
Back Side	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.166	-0.110	1.33	0.221	38
Front Side	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.121	-0.058	1.33	0.161	/
Hotspot SAR(Distance 10mm)											
Back Side	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.255	-0.160	1.33	0.340	39
Front Side	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.143	-0.035	1.33	0.191	/
Left Edge	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.089	0.027	1.33	0.119	/
Right Edge	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.035	0.062	1.33	0.047	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.204	0.070	1.33	0.272	/
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2. 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.											



Table 14: LTE Band 2 (20MHz, Ant 0)

Test Position	Power Reduction	Duty Cycle	RB alloc ation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1	1	0	19100/1900	24.00	23.39	0.081	0.034	1.15	0.093	40
Left Tilt	Normal	1:1	1	0	19100/1900	24.00	23.39	0.069	0.110	1.15	0.080	/
Right Cheek	Normal	1:1	1	0	19100/1900	24.00	23.39	0.051	0.036	1.15	0.058	/
Right Tilt	Normal	1:1	1	0	19100/1900	24.00	23.39	0.052	-0.150	1.15	0.060	/
Left Cheek	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.071	0.110	1.13	0.080	/
Left Tilt	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.054	0.170	1.13	0.061	/
Right Cheek	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.047	0.107	1.13	0.053	/
Right Tilt	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.046	0.030	1.13	0.052	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1	1	0	19100/1900	24.00	23.39	0.273	-0.070	1.15	0.314	41
Front Side	Normal	1:1	1	0	19100/1900	24.00	23.39	0.145	0.028	1.15	0.167	/
Back Side	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.250	-0.050	1.13	0.282	/
Front Side	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.173	0.110	1.13	0.195	/
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1	1	0	19100/1900	24.00	23.39	0.479	-0.010	1.15	0.551	/
Front Side	Normal	1:1	1	0	19100/1900	24.00	23.39	0.333	0.090	1.15	0.383	/
Left Edge	Normal	1:1	1	0	19100/1900	24.00	23.39	0.074	0.103	1.15	0.085	/
Right Edge	Normal	1:1	1	0	19100/1900	24.00	23.39	0.113	0.038	1.15	0.130	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1	1	0	19100/1900	24.00	23.39	0.640	0.180	1.15	0.737	42
Back Side	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.427	-0.010	1.13	0.481	/
Front Side	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.296	0.120	1.13	0.334	/
Left Edge	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.054	0.087	1.13	0.061	/
Right Edge	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.093	0.029	1.13	0.104	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.449	0.180	1.13	0.506	/
Note: 1.The value with blue color is the maximum SAR Value of each test band.												
2.For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are≥ 50% limit(1g).												



Table 15: LTE Band 5 (10MHz, Ant 0)

Test Position	Power Reduction	Duty Cycle	RB allocation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1	1	49	20450/829	24.80	23.99	0.171	0.051	1.21	0.206	43
Left Tilt	Normal	1:1	1	49	20450/829	24.80	23.99	0.068	0.031	1.21	0.082	/
Right Cheek	Normal	1:1	1	49	20450/829	24.80	23.99	0.139	0.027	1.21	0.167	/
Right Tilt	Normal	1:1	1	49	20450/829	24.80	23.99	0.075	0.023	1.21	0.090	/
Left Cheek	Normal	1:1	50%	0	20450/829	23.80	23.02	0.130	0.110	1.20	0.156	/
Left Tilt	Normal	1:1	50%	0	20450/829	23.80	23.02	0.055	0.040	1.20	0.066	/
Right Cheek	Normal	1:1	50%	0	20450/829	23.80	23.02	0.112	0.025	1.20	0.134	/
Right Tilt	Normal	1:1	50%	0	20450/829	23.80	23.02	0.062	0.031	1.20	0.075	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1	1	49	20450/829	24.80	23.99	0.104	-0.040	1.21	0.125	44
Front Side	Normal	1:1	1	49	20450/829	24.80	23.99	0.052	0.120	1.21	0.063	/
Back Side	Normal	1:1	50%	0	20450/829	23.80	23.02	0.083	-0.140	1.20	0.099	/
Front Side	Normal	1:1	50%	0	20450/829	23.80	23.02	0.039	0.170	1.20	0.046	/
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1	1	49	20450/829	24.80	23.99	0.234	0.040	1.21	0.282	45
Front Side	Normal	1:1	1	49	20450/829	24.80	23.99	0.128	0.060	1.21	0.154	/
Left Edge	Normal	1:1	1	49	20450/829	24.80	23.99	0.111	0.060	1.21	0.134	/
Right Edge	Normal	1:1	1	49	20450/829	24.80	23.99	0.089	0.110	1.21	0.107	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1	1	49	20450/829	24.80	23.99	0.197	0.010	1.21	0.237	/
Back Side	Normal	1:1	50%	0	20450/829	23.80	23.02	0.179	0.120	1.20	0.214	/
Front Side	Normal	1:1	50%	0	20450/829	23.80	23.02	0.096	0.090	1.20	0.115	/
Left Edge	Normal	1:1	50%	0	20450/829	23.80	23.02	0.079	0.080	1.20	0.094	/
Right Edge	Normal	1:1	50%	0	20450/829	23.80	23.02	0.060	0.021	1.20	0.071	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1	50%	0	20450/829	23.80	23.02	0.148	-0.030	1.20	0.177	/

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq$ 50% limit(1g).



Table 16: LTE Band 7 (20MHz, Ant 0)

Test Position	Power Reduction	Duty Cycle	RB allocation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1	1	0	20850/2510	24.00	23.39	0.208	0.067	1.15	0.239	/
Left Tilt	Normal	1:1	1	0	20850/2510	24.00	23.39	0.124	0.028	1.15	0.143	/
Right Cheek	Normal	1:1	1	0	20850/2510	24.00	23.39	0.454	0.066	1.15	0.522	46
Right Tilt	Normal	1:1	1	0	20850/2510	24.00	23.39	0.158	0.170	1.15	0.182	/
Left Cheek	Normal	1:1	50%	50	21100/2535	23.00	22.20	0.166	0.081	1.20	0.200	/
Left Tilt	Normal	1:1	50%	50	21100/2535	23.00	22.20	0.099	0.050	1.20	0.119	/
Right Cheek	Normal	1:1	50%	50	21100/2535	23.00	22.20	0.373	0.060	1.20	0.448	/
Right Tilt	Normal	1:1	50%	50	21100/2535	23.00	22.20	0.126	0.032	1.20	0.151	/
Right Cheek	Normal	1:1	1	0	21350/2560 (PCC)	24.30	23.85	0.428	0.010	1.11	0.475	/
			2	98	21152/2540.2 (SCC)							
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Level 4	1:1	1	0	20850/2510	22.80	21.95	0.386	0.030	1.22	0.469	/
Front Side	Level 4	1:1	1	0	20850/2510	22.80	21.95	0.272	-0.026	1.22	0.331	/
Back Side	Level 4	1:1	50%	25	20850/2510	22.80	22.01	0.401	0.080	1.20	0.481	47
Front Side	Level 4	1:1	50%	25	20850/2510	22.80	22.01	0.283	0.049	1.20	0.339	/
Back Side	Level 4	1:1	2	98	20850/2510 (PCC)	22.80	21.65	0.375	0.020	1.30	0.489	/
			1	0	21048/2529.8 (SCC)							
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Level 5&6	1:1	1	0	21100/2535	21.80	21.47	0.648	0.021	1.08	0.699	/
Front Side	Level 5&6	1:1	1	0	21100/2535	21.80	21.47	0.462	-0.040	1.08	0.498	/
Left Edge	Level 5&6	1:1	1	0	21100/2535	21.80	21.47	0.043	0.038	1.08	0.046	/
Right Edge	Level 5&6	1:1	1	0	21100/2535	21.80	21.47	0.425	0.027	1.08	0.459	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Level 5&6	1:1	1	0	21100/2535	21.80	21.47	0.336	-0.019	1.08	0.363	/
Back Side	Level 5&6	1:1	50%	25	20850/2510	21.80	21.53	0.649	0.010	1.06	0.691	48
Front Side	Level 5&6	1:1	50%	25	20850/2510	21.80	21.53	0.534	0.035	1.06	0.568	/
Left Edge	Level 5&6	1:1	50%	25	20850/2510	21.80	21.53	0.030	0.010	1.06	0.032	/
Right Edge	Level 5&6	1:1	50%	25	20850/2510	21.80	21.53	0.398	0.080	1.06	0.424	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Level 5&6	1:1	50%	25	20850/2510	21.80	21.53	0.516	0.042	1.06	0.549	/
Back Side	Level 5&6	1:1	2	98	20850/2510 (PCC)	21.80	21.22	0.597	-0.048	1.14	0.682	/



			1	0	21048/2529.8 (SCC)							
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Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq$ 50% limit(1g).

MAX Adjusted SAR

Test Position	Power Reduction	Mode	Duty Cycle	RB allocation	offset	Channel Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Measured SAR1g	Scaling Factor	Report SAR1g	0mm SAR
Back Side	Level 5&6	QPSK	1:1	1	0	21100/2535	22.80	21.80	0.699	1.26	0.880	No
Front Side	Level 5&6	QPSK	1:1	1	0	21100/2535	22.80	21.80	0.498	1.26	0.628	No
Left Edge	Level 5&6	QPSK	1:1	1	0	21100/2535	22.80	21.80	0.046	1.26	0.058	No
Right Edge	Level 5&6	QPSK	1:1	1	0	21100/2535	22.80	21.80	0.459	1.26	0.577	No
Bottom Edge	Level 5&6	QPSK	1:1	1	0	21100/2535	22.80	21.80	0.363	1.26	0.456	No
Back Side	Level 5&6	QPSK	1:1	50%	25	20850/2510	22.80	21.80	0.691	1.26	0.869	No
Front Side	Level 5&6	QPSK	1:1	50%	25	20850/2510	22.80	21.80	0.568	1.26	0.715	No
Left Edge	Level 5&6	QPSK	1:1	50%	25	20850/2510	22.80	21.80	0.032	1.26	0.040	No
Right Edge	Level 5&6	QPSK	1:1	50%	25	20850/2510	22.80	21.80	0.424	1.26	0.533	No
Bottom Edge	Level 5&6	QPSK	1:1	50%	25	20850/2510	22.80	21.80	0.549	1.26	0.691	No



Table 17: LTE Band 12 (10MHz, Ant 0)

Test Position	Power Reduction	Duty Cycle	RB allocation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1	1	0	23130/711	24.80	23.86	0.098	0.051	1.24	0.122	49
Left Tilt	Normal	1:1	1	0	23130/711	24.80	23.86	0.044	0.027	1.24	0.055	/
Right Cheek	Normal	1:1	1	0	23130/711	24.80	23.86	0.065	0.053	1.24	0.081	/
Right Tilt	Normal	1:1	1	0	23130/711	24.80	23.86	0.034	0.028	1.24	0.042	/
Left Cheek	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.085	0.022	1.22	0.104	/
Left Tilt	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.033	0.037	1.22	0.040	/
Right Cheek	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.053	0.073	1.22	0.064	/
Right Tilt	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.024	0.026	1.22	0.030	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1	1	0	23130/711	24.80	23.86	0.224	-0.047	1.24	0.278	50
Front Side	Normal	1:1	1	0	23130/711	24.80	23.86	0.182	0.020	1.24	0.226	/
Back Side	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.194	-0.010	1.22	0.236	/
Front Side	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.152	0.029	1.22	0.185	/
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1	1	0	23130/711	24.80	23.86	0.297	-0.030	1.24	0.369	51
Front Side	Normal	1:1	1	0	23130/711	24.80	23.86	0.148	0.018	1.24	0.184	/
Left Edge	Normal	1:1	1	0	23130/711	24.80	23.86	0.071	0.035	1.24	0.088	/
Right Edge	Normal	1:1	1	0	23130/711	24.80	23.86	0.044	0.072	1.24	0.055	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1	1	0	23130/711	24.80	23.86	0.163	-0.010	1.24	0.202	/
Back Side	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.175	0.062	1.22	0.213	/
Front Side	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.116	0.032	1.22	0.141	/
Left Edge	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.066	0.025	1.22	0.080	/
Right Edge	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.056	0.070	1.22	0.068	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.140	0.090	1.22	0.171	/
Note: 1.The value with blue color is the maximum SAR Value of each test band.												
2.For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are ≥ 50% limit(1g).												



Table 18: LTE Band 26(15MHz, Ant 0)

Test Position	Power Reduction	Duty Cycle	RB alloc ation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.143	0.053	1.21	0.173	52
Left Tilt	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.067	0.046	1.21	0.081	/
Right Cheek	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.135	0.075	1.21	0.163	/
Right Tilt	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.071	0.190	1.21	0.086	/
Left Cheek	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.120	0.075	1.19	0.143	/
Left Tilt	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.056	0.055	1.19	0.067	/
Right Cheek	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.106	0.021	1.19	0.127	/
Right Tilt	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.051	0.080	1.19	0.061	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.206	-0.010	1.21	0.249	53
Front Side	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.188	0.010	1.21	0.227	/
Back Side	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.169	-0.050	1.19	0.202	/
Front Side	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.158	0.070	1.19	0.189	/
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.178	-0.010	1.21	0.215	54
Front Side	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.129	0.030	1.21	0.156	/
Left Edge	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.082	0.021	1.21	0.099	/
Right Edge	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.070	-0.054	1.21	0.085	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.138	0.037	1.21	0.167	/
Back Side	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.150	0.020	1.19	0.179	/
Front Side	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.148	0.070	1.19	0.177	/
Left Edge	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.046	0.080	1.19	0.055	/
Right Edge	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.021	-0.092	1.19	0.025	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1	50%	0	26865/831.5	23.80	23.03	0.111	0.046	1.19	0.133	/
Note: 1.The value with blue color is the maximum SAR Value of each test band.												
2.For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are≥ 50% limit(1g).												



Table 19: LTE Band 38 (20MHz, Ant 0)

Test Position	Power Reduction	Duty Cycle	RB allocation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.212	-0.066	1.08	0.229	/
Left Tilt	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.114	-0.130	1.08	0.123	/
Right Cheek	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.450	0.054	1.08	0.486	55
Right Tilt	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.140	0.022	1.08	0.151	/
Left Cheek	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.170	0.080	1.08	0.183	/
Left Tilt	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.095	-0.024	1.08	0.102	/
Right Cheek	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.370	0.039	1.08	0.398	/
Right Tilt	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.112	0.028	1.08	0.121	/
Right Cheek	Normal	1:1.58	1	0	38099/2604.9(PCC)	24.50	24.47	0.386	0.023	1.01	0.389	/
			2	98	37901/2585.1(SCC)							
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.231	-0.050	1.08	0.249	56
Front Side	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.196	0.010	1.08	0.211	/
Back Side	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.182	0.180	1.08	0.196	/
Front Side	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.147	-0.049	1.08	0.158	/
Back Side	Normal	1:1.58	1	0	38099/2604.9(PCC)	24.50	24.47	0.205	0.060	1.01	0.206	/
			2	98	37901/2585.1(SCC)							
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.307	-0.080	1.08	0.331	57
Front Side	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.292	0.041	1.08	0.315	/
Left Edge	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.038	-0.029	1.08	0.041	/
Right Edge	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.224	0.015	1.08	0.242	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.154	-0.097	1.08	0.166	/
Back Side	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.281	0.056	1.08	0.302	/
Front Side	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.225	0.028	1.08	0.242	/
Left Edge	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.025	0.040	1.08	0.027	/
Right Edge	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.150	0.033	1.08	0.161	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.111	-0.021	1.08	0.119	/
Back Side	Normal	1:1.58	1	0	38099/2604.9(PCC)	24.50	24.47	0.264	0.157	1.01	0.266	/



			2	98	37901/2585.1 (SCC)							
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Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq$ 50% limit(1g).

Table 20: LTE Band 41 (20MHz, Ant 0)

Test Position	Power Reduction	Duty Cycle	RB alloc ation	RB offset	Channel/ Frequency (MHz)	Tune-u p (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.187	0.058	1.02	0.190	/
Left Tilt	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.123	-0.150	1.02	0.125	/
Right Cheek	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.311	0.022	1.02	0.316	58
Right Tilt	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.093	0.042	1.02	0.094	/
Left Cheek	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.111	0.045	1.01	0.112	/
Left Tilt	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.095	0.036	1.01	0.096	/
Right Cheek	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.211	0.131	1.01	0.213	/
Right Tilt	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.077	0.180	1.01	0.077	/
Right Cheek	Normal	1:1.58	1	0	38099/2604.9 (PCC)	24.50	24.47	0.203	0.080	1.01	0.204	/
			2	98	37901/2585.1 (SCC)							
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.171	0.140	1.02	0.174	/
Front Side	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.177	-0.030	1.02	0.180	59
Back Side	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.159	0.020	1.01	0.160	/
Front Side	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.148	0.048	1.01	0.149	/
Front Side	Normal	1:1.58	1	0	38099/2604.9 (PCC)	24.50	24.47	0.172	0.023	1.01	0.173	/
			2	98	37901/2585.1 (SCC)							
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.352	0.000	1.02	0.358	60
Front Side	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.196	0.011	1.02	0.199	/
Left Edge	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.001	-0.023	1.02	0.001	/
Right Edge	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.128	0.049	1.02	0.130	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.103	0.037	1.02	0.105	/
Back Side	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.264	0.040	1.01	0.266	/
Front Side	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.164	-0.090	1.01	0.166	/



Left Edge	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.001	0.100	1.01	0.001	/
Right Edge	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.117	0.025	1.01	0.118	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.081	0.060	1.01	0.082	/
Back Side	Normal	1:1.58	1	0	38099/2604.9 (PCC)	24.50	24.47	0.264	0.049	1.01	0.266	/
			2	98	37901/2585.1 (SCC)							

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq$ 50% limit(1g).

Table 21: LTE Band 66 (20MHz, Ant 0)

Test Position	Power Reduction	Duty Cycle	RB allocation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1	1	0	132072/1720	24.50	24.29	0.155	0.060	1.05	0.163	61
Left Tilt	Normal	1:1	1	0	132072/1720	24.50	24.29	0.131	-0.090	1.05	0.137	/
Right Cheek	Normal	1:1	1	0	132072/1720	24.50	24.29	0.123	-0.040	1.05	0.129	/
Right Tilt	Normal	1:1	1	0	132072/1720	24.50	24.29	0.123	0.020	1.05	0.129	/
Left Cheek	Normal	1:1	50%	25	132072/1720	23.50	23.36	0.132	0.000	1.03	0.136	/
Left Tilt	Normal	1:1	50%	25	132072/1720	23.50	23.36	0.102	0.050	1.03	0.105	/
Right Cheek	Normal	1:1	50%	25	132072/1720	23.50	23.36	0.102	0.038	1.03	0.105	/
Right Tilt	Normal	1:1	50%	25	132072/1720	23.50	23.36	0.098	0.100	1.03	0.101	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Level 4	1:1	1	99	132322/1745	22.00	21.25	0.365	-0.031	1.19	0.434	/
Front Side	Level 4	1:1	1	99	132322/1745	22.00	21.25	0.265	0.040	1.19	0.315	/
Back Side	Level 4	1:1	50%	25	132072/1720	22.00	21.30	0.382	0.010	1.17	0.449	62
Front Side	Level 4	1:1	50%	25	132072/1720	22.00	21.30	0.287	0.058	1.17	0.337	/
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Level 5&6	1:1	1	99	132322/1745	21.50	20.67	0.487	0.013	1.21	0.590	/
Front Side	Level 5&6	1:1	1	99	132322/1745	21.50	20.67	0.341	0.028	1.21	0.413	/
Left Edge	Level 5&6	1:1	1	99	132322/1745	21.50	20.67	0.046	0.094	1.21	0.056	/
Right Edge	Level 5&6	1:1	1	99	132322/1745	21.50	20.67	0.094	-0.033	1.21	0.114	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Level 5&6	1:1	1	99	132322/1745	21.50	20.67	0.607	0.010	1.21	0.735	/
Back Side	Level 5&6	1:1	50%	50	132322/1745	21.50	20.69	0.368	0.110	1.21	0.443	/
Front Side	Level 5&6	1:1	50%	50	132322/1745	21.50	20.69	0.359	0.027	1.21	0.433	/
Left Edge	Level 5&6	1:1	50%	50	132322/1745	21.50	20.69	0.038	0.021	1.21	0.046	/
Right Edge	Level 5&6	1:1	50%	50	132322/1745	21.50	20.69	0.094	-0.035	1.21	0.113	/



Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Level 5&6	1:1	50%	25	132072/1720	21.50	20.68	0.662	0.046	1.21	0.800	/
	Level 5&6	1:1	50%	50	132322/1745	21.50	20.69	0.671	-0.028	1.21	0.809	/
	Level 5&6	1:1	50%	50	132572/1770	21.50	20.66	0.681	0.040	1.21	0.826	63
Bottom Edge	Level 5&6	1:1	100%	0	132072/1720	21.50	20.67	0.653	0.139	1.21	0.791	/

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq$ 50% limit(1g).

MAX Adjusted SAR

Test Position	Power Reduction	Mode	Duty Cycle	RB allocation	offset	Channel Frequency(MHz)	Tune-up (dBm)	Measured power (dBm)	Measured SAR1g	Scaling Factor	Report SAR1g	0mm SAR
Back Side	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.590	1.12	0.661	No
Front Side	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.413	1.12	0.463	No
Left Edge	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.056	1.12	0.062	No
Right Edge	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.114	1.12	0.128	No
Bottom Edge	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.735	1.12	0.824	No
Back Side	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.443	1.12	0.498	No
Front Side	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.433	1.12	0.485	No
Left Edge	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.046	1.12	0.051	No
Right Edge	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.113	1.12	0.127	No
Bottom Edge	Level 5&6	QPSK	1:1	50%	25	132072/1720	22.00	21.50	0.800	1.12	0.897	No
	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.809	1.12	0.907	No
	Level 5&6	QPSK	1:1	50%	50	132572/1770	22.00	21.50	0.826	1.12	0.927	No
Bottom Edge	Level 5&6	QPSK	1:1	100%	0	132072/1720	22.00	21.50	0.791	1.12	0.887	No

Note: According to 648474 D04 Handset SAR v01r03, For Phablet, Since hotspot mode 1-g reported SAR < 1.2 W/kg, Product Specific 10-g SAR is not required.



Table 22: NR (EN-DC) n5 (10MHz, Ant 0)

Test Position	Power Reduction	RB allocation	offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (DFT-s-OFDM QPSK SCS 15KHz)											
Left cheek	Full Power	1	1	166800/834	24.30	23.64	0.155	0.104	1.16	0.180	64
Left Tilt	Full Power	1	1	166800/834	24.30	23.64	0.061	0.033	1.16	0.071	/
Right cheek	Full Power	1	1	166800/834	24.30	23.64	0.123	0.123	1.16	0.143	/
Right Tilt	Full Power	1	1	166800/834	24.30	23.64	0.053	0.026	1.16	0.061	/
Left cheek	Full Power	50%	0	166800/834	24.30	23.77	0.123	0.022	1.13	0.139	/
Left Tilt	Full Power	50%	0	166800/834	24.30	23.77	0.052	0.074	1.13	0.059	/
Right cheek	Full Power	50%	0	166800/834	24.30	23.77	0.097	-0.080	1.13	0.110	/
Right Tilt	Full Power	50%	0	166800/834	24.30	23.77	0.040	0.000	1.13	0.045	/
Head SAR (CP-OFDM QPSK SCS 15KHz)											
Left cheek	Full Power	1	1	167300/836.5	22.80	22.16	0.114	0.052	1.16	0.132	/
Body-worn SAR (DFT-s-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	166800/834	24.30	23.64	0.148	-0.070	1.16	0.172	65
Front Side	Full Power	1	1	166800/834	24.30	23.64	0.103	0.021	1.16	0.120	/
Back Side	Full Power	50%	0	166800/834	24.30	23.77	0.113	0.030	1.13	0.128	/
Front Side	Full Power	50%	0	166800/834	24.30	23.77	0.086	0.043	1.13	0.097	/
Body-worn SAR (CP-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	167300/836.5	22.80	22.16	0.092	-0.036	1.16	0.106	/
Hotspot SAR(DFT-s-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	1	166800/834	24.30	23.64	0.252	0.150	1.16	0.293	66
Front Side	Full Power	1	1	166800/834	24.30	23.64	0.149	0.026	1.16	0.173	/
Left Edge	Full Power	1	1	166800/834	24.30	23.64	0.001	0.000	1.16	0.001	/
Right Edge	Full Power	1	1	166800/834	24.30	23.64	0.001	0.000	1.16	0.001	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Full Power	1	1	166800/834	24.30	23.64	0.141	0.090	1.16	0.164	/
Back Side	Full Power	50%	0	166800/834	24.30	23.77	0.196	0.040	1.13	0.221	/
Front Side	Full Power	50%	0	166800/834	24.30	23.77	0.127	0.067	1.13	0.143	/
Left Edge	Full Power	50%	0	166800/834	24.30	23.77	0.001	0.000	1.13	0.001	/
Right Edge	Full Power	50%	0	166800/834	24.30	23.77	0.001	0.000	1.13	0.001	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Full Power	50%	0	166800/834	24.30	23.77	0.165	0.023	1.13	0.186	/
Hotspot SAR (CP-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	1	167300/836.5	22.80	22.16	0.183	0.044	1.16	0.212	/
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.											

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.



Table 23: NR (SA) n7 (20MHz, Ant 0)

Test Position	Power Reduction	RB allocation	offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (DFT-s-OFDM QPSK SCS 15KHz)											
Left cheek	Full Power	1	1	512000/2560	24.00	23.04	0.136	0.028	1.25	0.170	/
Left Tilt	Full Power	1	1	512000/2560	24.00	23.04	0.105	0.022	1.25	0.131	/
Right cheek	Full Power	1	1	512000/2560	24.00	23.04	0.536	0.029	1.25	0.669	67
Right Tilt	Full Power	1	1	512000/2560	24.00	23.04	0.080	-0.023	1.25	0.100	/
Left cheek	Full Power	50%	0	512000/2560	24.00	23.12	0.153	0.035	1.22	0.187	/
Left Tilt	Full Power	50%	0	512000/2560	24.00	23.12	0.116	0.072	1.22	0.142	/
Right cheek	Full Power	50%	0	512000/2560	24.00	23.12	0.385	0.182	1.22	0.471	/
Right Tilt	Full Power	50%	0	512000/2560	24.00	23.12	0.103	0.150	1.22	0.126	/
Head SAR (CP-OFDM QPSK SCS 15KHz)											
Right cheek	Full Power	1	1	502000/2510	21.50	20.79	0.427	-0.062	1.18	0.503	/
Body-worn SAR (DFT-s-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	512000/2560	24.00	23.04	0.394	-0.025	1.25	0.491	68
Front Side	Full Power	1	1	512000/2560	24.00	23.04	0.365	0.010	1.25	0.455	/
Back Side	Full Power	50%	0	512000/2560	24.00	23.12	0.285	0.028	1.22	0.349	/
Front Side	Full Power	50%	0	512000/2560	24.00	23.12	0.237	0.067	1.22	0.290	/
Back Side (SIM2)	Full Power	1	1	512000/2560	24.00	23.04	0.369	0.021	1.25	0.460	/
Back Side (Configure 2)	Full Power	1	1	512000/2560	24.00	23.04	0.346	0.032	1.25	0.432	/
Body-worn SAR (CP-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	502000/2510	21.50	20.79	0.315	0.040	1.18	0.371	/
Hotspot SAR(DFT-s-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	1	512000/2560	24.00	23.04	0.615	0.042	1.25	0.767	/
Front Side	Full Power	1	1	512000/2560	24.00	23.04	0.527	0.010	1.25	0.657	/
Left Edge	Full Power	1	1	512000/2560	24.00	23.04	0.001	-0.051	1.25	0.001	/
Right Edge	Full Power	1	1	512000/2560	24.00	23.04	0.094	0.029	1.25	0.117	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Full Power	1	1	512000/2560	24.00	23.04	0.462	0.027	1.25	0.576	/
Back Side	Full Power	50%	0	512000/2560	24.00	23.12	0.647	-0.013	1.22	0.792	69
Front Side	Full Power	50%	0	512000/2560	24.00	23.12	0.414	0.084	1.22	0.507	/
Left Edge	Full Power	50%	0	512000/2560	24.00	23.12	0.001	0.022	1.22	0.001	/
Right Edge	Full Power	50%	0	512000/2560	24.00	23.12	0.178	0.037	1.22	0.218	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Full Power	50%	0	512000/2560	24.00	23.12	0.254	0.010	1.22	0.311	/
Hotspot SAR (CP-OFDM QPSK SCS 15KHz, Distance 10mm)											



Back Side	Full Power	1	1	502000/2510	21.50	20.79	0.498	0.182	1.18	0.586	/
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Note: 1. The value with blue color is the maximum SAR Value of each test band.
2. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.
3. Accessories that do not contain RF transmitters and have been proven to increase the peak SAR by less than 5 %, such as hands-free kits, do not need SAR tests separate from the SAR tests attached to a main EUT configuration.

Table 15: NR (SA) n41 (20MHz, Ant 0)

Test Position	Power Reduction	RB allocation	offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (DFT-s-OFDM QPSK SCS 15KHz)											
Left cheek	Full Power	1	271	518598/2592.99	24.50	23.02	0.094	0.052	1.41	0.132	/
Left Tilt	Full Power	1	271	518598/2592.99	24.50	23.02	0.094	0.068	1.41	0.131	/
Right cheek	Full Power	1	271	518598/2592.99	24.50	23.02	0.138	-0.030	1.41	0.194	/
Right Tilt	Full Power	1	271	518598/2592.99	24.50	23.02	0.050	0.161	1.41	0.070	/
Left cheek	Full Power	50%	69	523302/2616.51	24.50	23.04	0.162	-0.010	1.40	0.227	/
Left Tilt	Full Power	50%	69	523302/2616.51	24.50	23.04	0.184	0.024	1.40	0.258	/
Right cheek	Full Power	50%	69	523302/2616.51	24.50	23.04	0.238	0.044	1.40	0.333	70
Right Tilt	Full Power	50%	69	523302/2616.51	24.50	23.04	0.125	-0.028	1.40	0.175	/
Head SAR (CP-OFDM QPSK SCS 15KHz)											
Right cheek	Full Power	1	1	528000/2640	23.00	21.56	0.223	0.012	1.39	0.311	/
Body-worn SAR (DFT-s-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	271	518598/2592.99	24.50	23.02	0.103	0.026	1.41	0.145	/
Front Side	Full Power	1	271	518598/2592.99	24.50	23.02	0.088	0.043	1.41	0.124	/
Back Side	Full Power	50%	69	523302/2616.51	24.50	23.04	0.158	0.199	1.40	0.221	71
Front Side	Full Power	50%	69	523302/2616.51	24.50	23.04	0.115	0.01	1.40	0.161	/
Body-worn SAR (CP-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	528000/2640	23.00	21.56	0.079	0.038	1.39	0.110	/
Hotspot SAR(DFT-s-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	271	518598/2592.99	24.50	23.02	0.209	0.060	1.41	0.294	/
Front Side	Full Power	1	271	518598/2592.99	24.50	23.02	0.166	-0.052	1.41	0.233	/
Left Edge	Full Power	1	271	518598/2592.99	24.50	23.02	0.024	0.017	1.41	0.034	/
Right Edge	Full Power	1	271	518598/2592.99	24.50	23.02	0.136	0.090	1.41	0.191	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottom Edge	Full Power	1	271	518598/2592.99	24.50	23.02	0.109	0.000	1.41	0.153	/
Back Side	Full Power	50%	69	523302/2616.51	24.50	23.04	0.268	0.053	1.40	0.375	72
Front Side	Full Power	50%	69	523302/2616.51	24.50	23.04	0.249	0.062	1.40	0.348	/
Left Edge	Full Power	50%	69	523302/2616.51	24.50	23.04	0.021	-0.090	1.40	0.029	/
Right Edge	Full Power	50%	69	523302/2616.51	24.50	23.04	0.165	0.024	1.40	0.231	/
Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



Bottom Edge	Full Power	50%	69	523302/2616.51	24.50	23.04	0.169	-0.030	1.40	0.237	/
Hotspot SAR (CP-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	1	528000/2640	23.00	21.56	0.210	0.011	1.39	0.293	/

Note: 1.The value with blue color is the maximum SAR Value of each test band.
2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.

Table 24: GSM 850 (Ant 1)

Test Position	Power Reduction	Time slot	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.178	0.000	1.17	0.208	/
Left Tilt	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.270	-0.080	1.17	0.315	/
Right Cheek	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.359	-0.080	1.17	0.419	/
Right Tilt	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.421	0.020	1.17	0.491	73
Body-worn SAR (Distance 15mm)											
Back Side	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.123	0.090	1.17	0.144	74
Front Side	Normal	GSM	1:8.3	190/836.6	33.50	32.83	0.118	-0.025	1.17	0.138	/
Hotspot SAR(Distance 10mm)											
Back Side	Normal	3Txslots	1:2.77	190/836.6	29.50	28.37	0.125	0.070	1.30	0.162	/
Front Side	Normal	3Txslots	1:2.77	190/836.6	29.50	28.37	0.132	0.028	1.30	0.171	/
Left Edge	Normal	3Txslots	1:2.77	190/836.6	29.50	28.37	0.042	-0.036	1.30	0.055	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	3Txslots	1:2.77	190/836.6	29.50	28.37	0.194	-0.030	1.30	0.252	75
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.											



Table 25: GSM 1900 (Ant 1)

Test Position	Power Reduction	Time slot	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Level 1	GSM	1:8.3	661/1880	28.00	27.23	0.289	0.010	1.19	0.345	/
Left Tilt	Level 1	GSM	1:8.3	661/1880	28.00	27.23	0.362	-0.120	1.19	0.432	/
Right Cheek	Level 1	GSM	1:8.3	661/1880	28.00	27.23	0.474	0.160	1.19	0.566	/
Right Tilt	Level 1	GSM	1:8.3	661/1880	28.00	27.23	0.592	0.023	1.19	0.707	76
Body-worn SAR (Distance 15mm)											
Back Side	Normal	GSM	1:8.3	661/1880	30.50	29.50	0.128	-0.040	1.26	0.161	77
Front Side	Normal	GSM	1:8.3	661/1880	30.50	29.50	0.083	0.057	1.26	0.104	/
Hotspot SARSAR (Distance 10mm)											
Back Side	Normal	3Txslots	1:2.77	661/1880	26.50	25.59	0.203	0.092	1.23	0.250	/
Front Side	Normal	3Txslots	1:2.77	661/1880	26.50	25.59	0.191	-0.035	1.23	0.236	/
Left Edge	Normal	3Txslots	1:2.77	661/1880	26.50	25.59	0.050	0.022	1.23	0.062	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	3Txslots	1:2.77	661/1880	26.50	25.59	0.434	-0.024	1.23	0.535	78
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.											



Table 26: UMTS Band II (Ant 1)

Test Position	Power Reduction	Mode	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Level 1	RMC 12.2K	1:1	9400/1880	19.00	18.67	0.386	-0.090	1.08	0.416	/
Left Tilt	Level 1	RMC 12.2K	1:1	9400/1880	19.00	18.67	0.369	-0.010	1.08	0.398	/
Right Cheek	Level 1	RMC 12.2K	1:1	9400/1880	19.00	18.67	0.485	0.042	1.08	0.523	/
Right Tilt	Level 1	RMC 12.2K	1:1	9400/1880	19.00	18.67	0.634	0.070	1.08	0.684	79
Body-worn SAR (Distance 15mm)											
Back Side	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.365	-0.090	1.02	0.374	80
Front Side	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.232	0.013	1.02	0.237	/
Hotspot SAR(Distance 10mm)											
Back Side	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.461	-0.026	1.02	0.472	/
Front Side	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.479	0.020	1.02	0.490	/
Left Edge	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.100	0.080	1.02	0.102	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	RMC 12.2K	1:1	9262/1852.4	24.00	23.81	0.767	0.010	1.04	0.801	/
	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.886	0.170	1.02	0.907	81
	Normal	RMC 12.2K	1:1	9538/1907.6	24.00	23.99	0.826	0.042	1.00	0.828	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge (Repeated)	Normal	RMC 12.2K	1:1	9400/1880	24.00	23.90	0.882	0.050	1.02	0.903	/

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

Measurement Variability

Test Position	Channel/ Frequency(MHz)	MAX Measured SAR _{1g} (W/kg)	1 st Repeated SAR _{1g} (W/kg)	Ratio
Top Edge	9400/1880	0.886	0.882	1.00

Note: 1) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

2) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .



Table 27: UMTS Band IV (Ant 1)

Test Position	Power Reduction	Mode	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Level 1	RMC 12.2K	1:1	1413/1732.6	18.50	17.57	0.407	0.033	1.24	0.504	/
Left Tilt	Level 1	RMC 12.2K	1:1	1413/1732.6	18.50	17.57	0.459	0.026	1.24	0.569	/
Right Cheek	Level 1	RMC 12.2K	1:1	1413/1732.6	18.50	17.57	0.635	0.040	1.24	0.787	/
Right Tilt	Level 1	RMC 12.2K	1:1	1413/1732.6	18.50	17.57	0.778	0.000	1.24	0.964	82
Right Tilt	Level 2&3	RMC 12.2K	1:1	1413/1732.6	18.50	17.57	0.592	0.138	1.24	0.733	/
Body-worn SAR (Distance 15mm)											
Back Side	Level 4	RMC 12.2K	1:1	1413/1732.6	22.00	21.61	0.244	0.140	1.09	0.267	83
Front Side	Level 4	RMC 12.2K	1:1	1413/1732.6	22.00	21.61	0.187	0.020	1.09	0.205	/
Hotspot SAR(Distance 10mm)											
Back Side	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.585	0.010	1.23	0.718	/
Front Side	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.549	0.034	1.23	0.674	/
Left Edge	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.068	-0.060	1.23	0.083	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Level 5&6	RMC 12.2K	1:1	1413/1732.6	21.50	20.61	0.767	0.050	1.23	0.941	84
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2. 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.											

MAX Adjusted SAR										
Test Position	Power Reduction	Mode	Duty Cycle	Channel /Frequency(MHz)	Tune-up (dBm)	Measured power (dBm)	Measured SAR1g	Scaling Factor	Report SAR1g	0mm SAR
Back Side	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	0.718	1.12	0.806	No
Front Side	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	0.674	1.12	0.756	No
Left Edge	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	0.083	1.12	0.094	No
Right Edge	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	0.045	1.12	0.051	No
Top Edge	Level 5&6	RMC 12.2K	1:1	1413/1732.6	22.00	21.50	0.941	1.12	1.056	No



Table 28: UMTS Band V (Ant 1)

Test Position	Power Reduction	Mode	Duty Cycle	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR											
Left Cheek	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.342	0.010	1.33	0.456	/
Left Tilt	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.295	-0.024	1.33	0.393	/
Right Cheek	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.553	0.070	1.33	0.737	/
Right Tilt	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.568	-0.030	1.33	0.757	85
Body-worn SAR (Distance 15mm)											
Back Side	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.140	-0.050	1.33	0.187	86
Front Side	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.124	0.023	1.33	0.165	/
Hotspot SAR(Distance 10mm)											
Back Side	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.155	0.010	1.33	0.207	/
Front Side	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.172	0.012	1.33	0.229	87
Left Edge	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.078	-0.068	1.33	0.104	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	RMC 12.2K	1:1	4183/836.6	25.00	23.75	0.132	0.011	1.33	0.176	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2. 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.											



Table 29: LTE Band 2 (20MHz, Ant 1)

Test Position	Power Reduction	Duty Cycle	RB alloc ation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Level 1	1:1	1	99	18700/1860	19.00	18.12	0.367	-0.022	1.22	0.449	/
Left Tilt	Level 1	1:1	1	99	18700/1860	19.00	18.12	0.431	-0.020	1.22	0.528	/
Right Cheek	Level 1	1:1	1	99	18700/1860	19.00	18.12	0.524	0.049	1.22	0.642	/
Right Tilt	Level 1	1:1	1	99	18700/1860	19.00	18.12	0.624	0.070	1.22	0.764	/
Left Cheek	Level 1	1:1	50%	50	18700/1860	19.00	18.21	0.378	-0.100	1.20	0.453	/
Left Tilt	Level 1	1:1	50%	50	18700/1860	19.00	18.21	0.505	-0.040	1.20	0.606	/
Right Cheek	Level 1	1:1	50%	50	18700/1860	19.00	18.21	0.538	0.140	1.20	0.645	/
Right Tilt	Level 1	1:1	50%	50	18700/1860	19.00	18.21	0.661	0.070	1.20	0.793	88
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1	1	0	19100/1900	24.00	23.39	0.107	0.025	1.15	0.123	/
Front Side	Normal	1:1	1	0	19100/1900	24.00	23.39	0.129	0.027	1.15	0.148	/
Back Side	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.112	0.023	1.13	0.126	/
Front Side	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.144	0.080	1.13	0.162	89
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1	1	0	19100/1900	24.00	23.39	0.192	0.030	1.15	0.221	/
Front Side	Normal	1:1	1	0	19100/1900	24.00	23.39	0.277	0.010	1.15	0.319	/
Left Edge	Normal	1:1	1	0	19100/1900	24.00	23.39	0.040	0.038	1.15	0.046	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1	1	0	19100/1900	24.00	23.39	0.640	0.030	1.15	0.737	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.199	0.021	1.13	0.224	/
Front Side	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.341	0.090	1.13	0.384	/
Left Edge	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.042	0.150	1.13	0.048	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1	50%	50	19100/1900	23.00	22.48	0.669	0.030	1.13	0.754	90
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1.The value with blue color is the maximum SAR Value of each test band.												
2.For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are≥ 50% limit(1g).												



Table 30: LTE Band 5 (10MHz, Ant 1)

Test Position	Power Reduction	Duty Cycle	RB alloc ation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1	1	49	20450/829	24.80	23.99	0.418	-0.040	1.21	0.504	/
Left Tilt	Normal	1:1	1	49	20450/829	24.80	23.99	0.360	-0.020	1.21	0.434	/
Right Cheek	Normal	1:1	1	49	20450/829	24.80	23.99	0.526	0.010	1.21	0.634	/
Right Tilt	Normal	1:1	1	49	20450/829	24.80	23.99	0.636	0.010	1.21	0.766	91
Left Cheek	Normal	1:1	50%	0	20450/829	23.80	23.02	0.369	0.050	1.20	0.442	/
Left Tilt	Normal	1:1	50%	0	20450/829	23.80	23.02	0.326	0.040	1.20	0.390	/
Right Cheek	Normal	1:1	50%	0	20450/829	23.80	23.02	0.470	0.030	1.20	0.562	/
Right Tilt	Normal	1:1	50%	0	20450/829	23.80	23.02	0.564	0.040	1.20	0.675	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1	1	49	20450/829	24.80	23.99	0.139	0.090	1.21	0.167	92
Front Side	Normal	1:1	1	49	20450/829	24.80	23.99	0.097	0.030	1.21	0.117	/
Back Side	Normal	1:1	50%	0	20450/829	23.80	23.02	0.109	0.060	1.20	0.130	/
Front Side	Normal	1:1	50%	0	20450/829	23.80	23.02	0.077	0.000	1.20	0.092	/
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1	1	49	20450/829	24.80	23.99	0.120	0.070	1.21	0.145	/
Front Side	Normal	1:1	1	49	20450/829	24.80	23.99	0.129	0.170	1.21	0.155	93
Left Edge	Normal	1:1	1	49	20450/829	24.80	23.99	0.080	0.140	1.21	0.097	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1	1	49	20450/829	24.80	23.99	0.102	0.020	1.21	0.123	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Normal	1:1	50%	0	20450/829	23.80	23.02	0.108	0.060	1.20	0.129	/
Front Side	Normal	1:1	50%	0	20450/829	23.80	23.02	0.124	0.090	1.20	0.148	/
Left Edge	Normal	1:1	50%	0	20450/829	23.80	23.02	0.075	0.160	1.20	0.090	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1	50%	0	20450/829	23.80	23.02	0.087	0.070	1.20	0.104	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1.The value with blue color is the maximum SAR Value of each test band.												
2.For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are≥ 50% limit(1g).												



Table 31: LTE Band 7 (20MHz, Ant 1)

Test Position	Power Reduction	Duty Cycle	RB alloc ation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Level 1	1:1	1	99	21100/2535	17.80	16.79	0.435	-0.090	1.26	0.549	/
Left Tilt	Level 1	1:1	1	99	21100/2535	17.80	16.79	0.357	-0.040	1.26	0.450	/
Right Cheek	Level 1	1:1	1	99	20850/2510	17.80	16.78	0.712	0.025	1.26	0.900	/
	Level 1	1:1	1	99	21100/2535	17.80	16.79	0.777	0.110	1.26	0.980	/
	Level 1	1:1	1	99	21350/2560	17.80	16.69	0.569	-0.010	1.29	0.735	/
Right Tilt	Level 1	1:1	1	99	20850/2510	17.80	16.78	0.684	0.021	1.26	0.865	/
	Level 1	1:1	1	99	21100/2535	17.80	16.79	0.685	0.080	1.26	0.864	/
	Level 1	1:1	1	99	21350/2560	17.80	16.69	0.614	0.080	1.29	0.793	/
Left Cheek	Level 1	1:1	50%	25	21350/2560	17.80	16.89	0.362	-0.026	1.23	0.446	/
Left Tilt	Level 1	1:1	50%	25	21350/2560	17.80	16.89	0.383	-0.090	1.23	0.472	/
Right Cheek	Level 1	1:1	50%	25	20850/2510	17.80	16.85	0.683	-0.100	1.24	0.850	/
	Level 1	1:1	50%	25	21100/2535	17.80	16.82	0.739	0.035	1.25	0.926	/
	Level 1	1:1	50%	25	21350/2560	17.80	16.89	0.679	0.090	1.23	0.837	/
Right Tilt	Level 1	1:1	50%	25	20850/2510	17.80	16.85	0.879	0.022	1.24	1.094	94
	Level 1	1:1	50%	25	21100/2535	17.80	16.82	0.678	0.120	1.25	0.850	/
	Level 1	1:1	50%	25	21350/2560	17.80	16.89	0.667	-0.100	1.23	0.822	/
Right Tilt	Level 1	1:1	100%	0	20850/2510	17.80	16.81	0.793	0.080	1.26	0.996	/
	Level 1	1:1	100%	0	21100/2535	17.80	16.77	0.842	0.100	1.27	1.067	/
	Level 1	1:1	100%	0	21350/2560	17.80	16.87	0.737	0.070	1.24	0.913	/
Right Tilt (Repeated)	Level 1	1:1	50%	25	20850/2510	17.80	16.85	0.878	0.016	1.24	1.093	/
Right Tilt	Level 1	1:1	1	0	21350/2560 (PCC)	17.80	16.55	0.729	0.042	1.33	0.972	/
			2	98	21152/2540.2 (SCC)							
Right Tilt	Level 2&3	1:1	50%	50	21350/2560	16.80	15.85	0.693	0.030	1.24	0.862	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Level 4	1:1	1	99	21100/2535	20.30	19.39	0.110	0.040	1.23	0.136	/
Front Side	Level 4	1:1	1	99	21100/2535	20.30	19.39	0.123	-0.062	1.23	0.152	/
Back Side	Level 4	1:1	50%	50	21350/2560	20.30	19.44	0.104	0.080	1.22	0.127	/
Front Side	Level 4	1:1	50%	50	21350/2560	20.30	19.44	0.132	-0.130	1.22	0.161	95
Front Side	Level 4	1:1	1	0	21350/2560 (PCC)	20.30	19.16	0.083	0.050	1.30	0.108	/
			2	98	21152/2540.2 (SCC)							
Hotspot SAR(QPSK, Distance 10mm)												



Back Side	Level 5&6	1:1	1	0	21100/2535	19.80	18.76	0.215	-0.062	1.27	0.273	/
Front Side	Level 5&6	1:1	1	0	21100/2535	19.80	18.76	0.234	0.037	1.27	0.297	/
Left Edge	Level 5&6	1:1	1	0	21100/2535	19.80	18.76	0.168	-0.010	1.27	0.213	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Level 5&6	1:1	1	0	21100/2535	19.80	18.76	0.311	-0.080	1.27	0.395	96
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Level 5&6	1:1	50%	50	21350/2560	19.80	18.84	0.205	0.090	1.25	0.256	/
Front Side	Level 5&6	1:1	50%	50	21350/2560	19.80	18.84	0.237	0.024	1.25	0.296	/
Left Edge	Level 5&6	1:1	50%	50	21350/2560	19.80	18.84	0.189	0.013	1.25	0.236	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Level 5&6	1:1	50%	50	21350/2560	19.80	18.84	0.262	0.050	1.25	0.327	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Level 5&6	1:1	1	0	21350/2560 (PCC)	19.80	18.56	0.278	-0.011	1.33	0.370	/
			2	98	21152/2540.2 (SCC)							

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq$ 50% limit(1g).

MAX Adjusted SAR

Test Position	Power Reduction	Mode	Duty Cycle	RB allocation	offset	Channel Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Measured SAR1g	Scaling Factor	Report SAR1g	0mmSAR
Back Side	Level 5&6	QPSK	1:1	1	0	21100/2535	20.30	19.80	0.273	1.12	0.307	No
Front Side	Level 5&6	QPSK	1:1	1	0	21100/2535	20.30	19.80	0.297	1.12	0.334	No
Left Edge	Level 5&6	QPSK	1:1	1	0	21100/2535	20.30	19.80	0.213	1.12	0.240	No
Right Edge	Level 5&6	QPSK	1:1	1	0	21100/2535	20.30	19.80	0.053	1.12	0.060	No
Top Edge	Level 5&6	QPSK	1:1	1	0	21100/2535	20.30	19.80	0.395	1.12	0.443	No
Back Side	Level 5&6	QPSK	1:1	50%	50	21350/2560	20.30	19.80	0.256	1.12	0.287	No
Front Side	Level 5&6	QPSK	1:1	50%	50	21350/2560	20.30	19.80	0.296	1.12	0.332	No
Left Edge	Level 5&6	QPSK	1:1	50%	50	21350/2560	20.30	19.80	0.236	1.12	0.265	No
Right Edge	Level 5&6	QPSK	1:1	50%	50	21350/2560	20.30	19.80	0.039	1.12	0.043	No
Top Edge	Level 5&6	QPSK	1:1	50%	50	21350/2560	20.30	19.80	0.327	1.12	0.367	No



Measurement Variability

Test Position	Channel/ Frequency(MHz)	MAX Measured SAR _{1g} (W/kg)	1 st Repeated SAR _{1g} (W/kg)	Ratio
Right Tilt	20850/2510	0.879	0.878	1.00

Note: 1) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

2) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Table 32: LTE Band 12 (10MHz, Ant 1)

Test Position	Power Reduction	Duty Cycle	RB alloc ation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1	1	0	23130/711	24.80	23.86	0.373	-0.010	1.24	0.463	/
Left Tilt	Normal	1:1	1	0	23130/711	24.80	23.86	0.438	-0.010	1.24	0.544	/
Right Cheek	Normal	1:1	1	0	23130/711	24.80	23.86	0.619	0.000	1.24	0.769	/
Right Tilt	Normal	1:1	1	0	23060/704	24.80	23.83	0.809	0.030	1.25	1.011	/
	Normal	1:1	1	0	23095/707.5	24.80	23.76	0.902	-0.030	1.27	1.146	97
	Normal	1:1	1	0	23130/711	24.80	23.86	0.843	0.000	1.24	1.047	/
Left Cheek	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.299	0.010	1.22	0.364	/
Left Tilt	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.378	-0.030	1.22	0.461	/
Right Cheek	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.519	0.000	1.22	0.633	/
Right Tilt	Normal	1:1	50%	13	23060/704	23.80	22.93	0.729	-0.024	1.22	0.891	/
	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.741	0.020	1.22	0.903	/
	Normal	1:1	50%	13	23130/711	23.80	22.92	0.775	0.073	1.22	0.949	/
Right Tilt	Level 2&3	1:1	1	0	23060/704	22.30	22.17	0.537	0.052	1.03	0.553	/
Right Tilt (Repeated)	Normal	1:1	1	0	23095/707.5	24.80	23.76	0.896	0.031	1.27	1.138	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1	1	0	23130/711	24.80	23.86	0.210	0.030	1.24	0.261	98
Front Side	Normal	1:1	1	0	23130/711	24.80	23.86	0.187	0.011	1.24	0.232	/
Back Side	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.168	0.050	1.22	0.205	/
Front Side	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.143	-0.120	1.22	0.174	/
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1	1	0	23130/711	24.80	23.86	0.245	0.050	1.24	0.304	99
Front Side	Normal	1:1	1	0	23130/711	24.80	23.86	0.167	0.130	1.24	0.207	/
Left Edge	Normal	1:1	1	0	23130/711	24.80	23.86	0.153	0.000	1.24	0.190	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1	1	0	23130/711	24.80	23.86	0.137	-0.012	1.24	0.170	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



Back Side	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.165	0.038	1.22	0.201	/
Front Side	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.139	-0.046	1.22	0.169	/
Left Edge	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.106	0.020	1.22	0.129	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1	50%	0	23095/707.5	23.80	22.94	0.133	0.067	1.22	0.162	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq$ 50% limit(1g).

Measurement Variability

Test Position	Channel/ Frequency(MHz)	MAX Measured SAR _{1g} (W/kg)	1 st Repeated SAR _{1g} (W/kg)	Ratio
Right Tilt	23095/707.5	0.902	0.896	1.01

Note: 1) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

2) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .



Table 33: LTE Band 26(15MHz, Ant 1)

Test Position	Power Reduction	Duty Cycle	RB alloc ation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.345	0.020	1.21	0.417	/
Left Tilt	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.347	-0.140	1.21	0.419	/
Right Cheek	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.752	-0.050	1.21	0.908	100
	Normal	1:1	1	0	26865/831.5	24.80	23.92	0.632	0.110	1.22	0.774	/
	Normal	1:1	1	0	26965/841.5	24.80	23.86	0.528	-0.029	1.24	0.656	/
Right Tilt	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.672	0.040	1.21	0.812	/
	Normal	1:1	1	0	26865/831.5	24.80	23.92	0.536	0.050	1.22	0.656	/
	Normal	1:1	1	0	26965/841.5	24.80	23.86	0.632	0.050	1.24	0.785	/
Left Cheek	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.412	0.030	1.19	0.492	/
Left Tilt	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.268	0.000	1.19	0.320	/
Right Cheek	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.576	-0.040	1.19	0.688	/
Right Tilt	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.527	0.060	1.19	0.629	/
Right Cheek	Normal	1:1	100%	0	26765/821.5	23.80	23.01	0.264	0.049	1.20	0.317	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.247	0.080	1.21	0.298	101
Front Side	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.212	0.015	1.21	0.256	/
Back Side	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.162	0.037	1.19	0.193	/
Front Side	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.147	-0.010	1.19	0.176	/
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.223	0.020	1.21	0.269	102
Front Side	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.207	0.094	1.21	0.250	/
Left Edge	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.181	-0.071	1.21	0.219	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1	1	0	26765/821.5	24.80	23.98	0.184	0.028	1.21	0.222	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.170	0.050	1.19	0.203	/
Front Side	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.164	-0.069	1.19	0.196	/
Left Edge	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.136	0.043	1.19	0.162	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1	50%	0	26765/821.5	23.80	23.03	0.180	0.039	1.19	0.215	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1.The value with blue color is the maximum SAR Value of each test band.												
2.For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are≥ 50% limit(1g).												



Table 34: LTE Band 38 (20MHz, Ant 1)

Test Position	Power Reduction	Duty Cycle	RB allocation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Level 1&2&3	1:1.58	1	0	38000/2595	22.00	21.20	0.312	0.012	1.20	0.375	/
Left Tilt	Level 1&2&3	1:1.58	1	0	38000/2595	22.00	21.20	0.275	0.030	1.20	0.331	/
Right Cheek	Level 1&2&3	1:1.58	1	50	37850/2580	21.17	20.26	0.774	-0.099	1.23	0.954	/
	Level 1&2&3	1:1.58	1	0	38000/2595	22.00	21.20	0.685	0.110	1.20	0.824	/
	Level 1&2&3	1:1.58	1	0	38150/2610	22.00	21.11	0.761	-0.024	1.23	0.934	/
Right Tilt	Level 1&2&3	1:1.58	1	50	37850/2580	21.17	20.26	0.865	-0.021	1.23	1.067	/
	Level 1&2&3	1:1.58	1	0	38000/2595	22.00	21.20	0.885	0.040	1.20	1.064	103
	Level 1&2&3	1:1.58	1	0	38150/2610	22.00	21.11	0.578	0.170	1.23	0.709	/
Left Cheek	Level 1&2&3	1:1.58	50%	0	38150/2610	22.00	21.16	0.256	-0.025	1.21	0.311	/
Left Tilt	Level 1&2&3	1:1.58	50%	0	38150/2610	22.00	21.16	0.238	0.040	1.21	0.289	/
Right Cheek	Level 1&2&3	1:1.58	50%	0	37850/2580	22.00	21.11	0.803	0.015	1.23	0.986	/
	Level 1&2&3	1:1.58	50%	0	38000/2595	22.00	21.10	0.794	-0.033	1.23	0.977	/
	Level 1&2&3	1:1.58	50%	0	38150/2610	22.00	21.16	0.815	0.027	1.21	0.989	/
Right Tilt	Level 1&2&3	1:1.58	50%	0	37850/2580	22.00	21.11	0.869	0.046	1.23	1.067	/
	Level 1&2&3	1:1.58	50%	0	38000/2595	22.00	21.10	0.842	0.052	1.23	1.036	/
	Level 1&2&3	1:1.58	50%	0	38150/2610	22.00	21.16	0.843	-0.091	1.21	1.023	/
Right Tilt	Level 1&2&3	1:1.58	100%	0	37850/2580	22.00	21.12	0.838	0.010	1.22	1.026	/
	Level 1&2&3	1:1.58	100%	0	38000/2595	22.00	21.20	0.769	0.033	1.20	0.925	/
	Level 1&2&3	1:1.58	100%	0	38150/2610	22.00	21.00	0.774	0.025	1.26	0.974	/
Right Tilt	Level 1&2&3	1:1.58	2	98	37952/2590.2 (PCC)	21.50	20.85	0.812	0.033	1.16	0.943	/ /
			1	0	38150/2610 (SCC)							
Right Tilt (Repeated)	Level 1&2&3	1:1.58	1	0	38000/2595	22.00	21.20	0.869	0.019	1.20	1.045	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.207	-0.040	1.08	0.223	104
Front Side	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.187	0.033	1.08	0.202	/
Back Side	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.163	-0.110	1.08	0.175	/
Front Side	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.158	0.029	1.08	0.170	/
Back Side	Normal	1:1.58	1	0	38099/2604.9 (PCC)	24.50	24.47	0.203	0.080	1.01	0.204	/
			2	98	37901/2585.1 (SCC)							
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.498	-0.045	1.08	0.537	105



Front Side	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.452	0.031	1.08	0.488	/
Left Edge	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.421	0.050	1.08	0.454	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1.58	1	0	37850/2580	24.50	24.17	0.304	0.060	1.08	0.328	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.392	0.010	1.08	0.422	/
Front Side	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.361	-0.090	1.08	0.389	/
Left Edge	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.349	0.028	1.08	0.376	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1.58	50%	25	38000/2595	23.50	23.18	0.256	0.035	1.08	0.276	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Normal	1:1.58	1	0	38099/2604.9 (PCC)	24.50	24.47	0.425	0.076	1.01	0.428	/
			2	98	37901/2585.1 (SCC)							

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq 50\%$ limit(1g).

Measurement Variability

Test Position	Channel/ Frequency(MHz)	MAX Measured SAR _{1g} (W/kg)	1 st Repeated SAR _{1g} (W/kg)	Ratio
Right Tilt	38000/2595	0.885	0.869	1.02

Note: 1) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

2) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .



Table 35: LTE Band 41 (20MHz, Ant 1)

Test Position	Power Reduction	Duty Cycle	RB allocation	RB offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Level 1	1:1.58	1	0	40185/2549.5	21.50	21.01	0.270	-0.150	1.12	0.302	/
Left Tilt	Level 1	1:1.58	1	0	40185/2549.5	21.50	21.01	0.305	-0.080	1.12	0.341	/
Right Cheek	Level 1	1:1.58	1	99	39750/2506	21.50	20.73	0.891	0.029	1.19	1.064	/
	Level 1	1:1.58	1	0	40185/2549.5	21.50	21.01	0.915	0.100	1.12	1.024	/
	Level 1	1:1.58	1	0	40620/2593	21.50	20.99	0.832	0.000	1.12	0.936	/
	Level 1	1:1.58	1	99	41055/2636.5	21.50	20.76	0.764	0.070	1.19	0.906	/
	Level 1	1:1.58	1	99	41490/2680	21.50	20.66	0.787	0.034	1.21	0.955	/
Right Tilt	Level 1	1:1.58	1	0	40185/2549.5	21.50	21.01	0.714	-0.010	1.12	0.799	/
Left Cheek	Level 1	1:1.58	50%	50	41055/2636.5	21.50	21.02	0.353	-0.030	1.12	0.394	/
Left Tilt	Level 1	1:1.58	50%	50	41055/2636.5	21.50	21.02	0.299	-0.050	1.12	0.334	/
Right Cheek	Level 1	1:1.58	50%	0	39750/2506	21.50	20.92	0.737	0.024	1.14	0.842	/
	Level 1	1:1.58	50%	25	40620/2593	21.50	20.99	0.832	-0.040	1.12	0.936	/
	Level 1	1:1.58	50%	25	40185/2549.5	21.50	20.99	0.869	0.130	1.12	0.977	/
	Level 1	1:1.58	50%	0	41490/2680	21.50	20.87	0.825	0.090	1.16	0.954	/
	Level 1	1:1.58	50%	50	41055/2636.5	21.50	21.02	0.740	0.040	1.12	0.826	/
Right Tilt	Level 1	1:1.58	50%	50	41055/2636.5	21.50	21.02	0.556	0.050	1.12	0.621	/
Right Cheek	Level 1	1:1.58	100%	0	39750/2506	21.50	20.86	1.030	0.100	1.16	1.194	106
	Level 1	1:1.58	100%	0	40620/2593	21.50	20.98	0.947	-0.080	1.13	1.067	/
	Level 1	1:1.58	100%	0	40620/2593	21.50	20.98	0.906	-0.010	1.13	1.021	/
	Level 1	1:1.58	100%	0	41490/2680	21.50	20.88	0.932	0.173	1.15	1.075	/
	Level 1	1:1.58	100%	0	41490/2680	21.50	21.00	0.881	0.150	1.12	0.988	/
Right Cheek	Level 1	1:1.58	2	98	40185/2549.5 (PCC)	21.50	20.85	0.891	0.040	1.16	1.035	/
			1	0	40383/2569.3 (SCC)							
Right Cheek (Repeated)	Level 1	1:1.58	100%	0	39750/2506	21.50	20.86	0.983	0.030	1.16	1.139	/
Right Cheek (SIM2)	Level 1	1:1.58	100%	0	39750/2506	21.50	20.86	0.928	-0.012	1.16	1.075	/
Right Cheek (Configure 2)	Level 1	1:1.58	100%	0	39750/2506	21.50	20.86	0.967	0.052	1.16	1.121	/
Right Cheek	Level 2&3	1:1.58	100%	0	41490/2680	20.00	19.43	0.753	0.049	1.14	0.859	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.154	0.024	1.02	0.157	/
Front Side	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.213	-0.150	1.02	0.216	107



Back Side	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.151	0.060	1.01	0.152	/
Front Side	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.198	-0.018	1.01	0.200	/
Front Side	Normal	1:1.58	1	0	38099/2604.9 (PCC)	24.50	24.47	0.208	0.090	1.01	0.209	/
			2	98	37901/2585.1 (SCC)							
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.281	-0.040	1.02	0.286	/
Front Side	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.325	0.090	1.02	0.330	/
Left Edge	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.192	-0.027	1.02	0.195	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1.58	1	50	41055/2636.5	24.50	24.43	0.170	0.021	1.02	0.173	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.286	0.058	1.01	0.289	/
Front Side	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.368	-0.030	1.01	0.371	108
Left Edge	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.200	0.040	1.01	0.202	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Normal	1:1.58	50%	25	41055/2636.5	23.50	23.46	0.140	0.010	1.01	0.141	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Front Side	Normal	1:1.58	1	0	38099/2604.9 (PCC)	24.50	24.47	0.337	0.020	1.01	0.339	/
			2	98	37901/2585.1 (SCC)							

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq$ 50% limit(1g).

3. Accessories that do not contain RF transmitters and have been proven to increase the peak SAR by less than 5 %, such as hands-free kits, do not need SAR tests separate from the SAR tests attached to a main EUT configuration.

Measurement Variability

Test Position	Channel/ Frequency(MHz)	MAX Measured SAR _{1g} (W/kg)	1 st Repeated SAR _{1g} (W/kg)	Ratio
Right Cheek	39750/2506	1.030	0.983	1.05

Note: 1) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

2) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .



Table 36: LTE Band 66 (20MHz, Ant 1)

Test Position	Power Reduction	Duty Cycle	RB alloc ation	RB offset	Channel/ Frequency (MHz)	Tune-u p (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
								Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (QPSK)												
Left Cheek	Level 1	1:1	1	0	132072/1720	18.00	17.30	0.408	-0.040	1.17	0.479	/
Left Tilt	Level 1	1:1	1	0	132072/1720	18.00	17.30	0.521	-0.040	1.17	0.612	/
Right Cheek	Level 1	1:1	1	0	132072/1720	18.00	17.30	0.655	-0.010	1.17	0.770	/
Right Tilt	Level 1	1:1	1	0	132072/1720	18.00	17.30	0.764	0.020	1.17	0.898	/
	Level 1	1:1	1	0	132322/1745	18.00	17.28	0.696	0.029	1.18	0.822	/
	Level 1	1:1	1	0	132572/1770	18.00	17.14	0.666	-0.020	1.22	0.812	/
Left Cheek	Level 1	1:1	50%	25	132072/1720	18.00	17.32	0.391	-0.020	1.17	0.457	/
Left Tilt	Level 1	1:1	50%	25	132072/1720	18.00	17.32	0.504	0.010	1.17	0.589	/
Right Cheek	Level 1	1:1	50%	25	132072/1720	18.00	17.32	0.521	0.060	1.17	0.609	/
Right Tilt	Level 1	1:1	50%	25	132072/1720	18.00	17.32	0.776	0.040	1.17	0.908	109
	Level 1	1:1	50%	25	132322/1745	18.00	17.29	0.647	0.040	1.18	0.762	/
	Level 1	1:1	50%	50	132572/1770	18.00	17.27	0.580	-0.030	1.18	0.686	/
Right Tilt	Level 1	1:1	100%	0	132072/1720	18.00	17.29	0.639	0.017	1.18	0.752	/
Body-worn SAR (QPSK, Distance 15mm)												
Back Side	Level 4	1:1	1	99	132322/1745	22.00	21.25	0.122	0.062	1.19	0.145	/
Front Side	Level 4	1:1	1	99	132322/1745	22.00	21.25	0.141	0.050	1.19	0.168	/
Back Side	Level 4	1:1	50%	25	132072/1720	22.00	21.30	0.143	0.014	1.17	0.168	/
Front Side	Level 4	1:1	50%	25	132072/1720	22.00	21.30	0.189	0.010	1.17	0.222	110
Hotspot SAR(QPSK, Distance 10mm)												
Back Side	Level 5&6	1:1	1	99	132322/1745	21.50	20.67	0.395	0.024	1.21	0.478	/
Front Side	Level 5&6	1:1	1	99	132322/1745	21.50	20.67	0.355	0.130	1.21	0.430	/
Left Edge	Level 5&6	1:1	1	99	132322/1745	21.50	20.67	0.065	0.035	1.21	0.079	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Level 5&6	1:1	1	0	132072/1720	21.50	20.65	0.638	0.035	1.22	0.776	/
	Level 5&6	1:1	1	99	132322/1745	21.50	20.67	0.695	-0.021	1.21	0.841	/
	Level 5&6	1:1	1	0	132572/1770	21.50	20.49	0.684	-0.041	1.26	0.863	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Level 5&6	1:1	50%	50	132322/1745	21.50	20.69	0.421	0.043	1.21	0.507	/
Front Side	Level 5&6	1:1	50%	50	132322/1745	21.50	20.69	0.544	0.057	1.21	0.656	/
Left Edge	Level 5&6	1:1	50%	50	132322/1745	21.50	20.69	0.084	0.010	1.21	0.101	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Level 5&6	1:1	50%	25	132072/1720	21.50	20.68	0.657	0.027	1.21	0.794	/
	Level 5&6	1:1	50%	50	132322/1745	21.50	20.69	0.703	-0.040	1.21	0.847	111
	Level 5&6	1:1	50%	50	132572/1770	21.50	20.66	0.682	0.010	1.21	0.828	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



Top Edge	Level 5&6	1:1	100%	0	132072/1720	21.50	20.67	0.648	-0.030	1.21	0.784	/
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Note: 1. The value with blue color is the maximum SAR Value of each test band.
2. For QPSK with 100% RB allocation, SAR is required when and the highest reported SAR for 1 RB and 50% RB allocation in are $\geq$ 50% limit(1g).

MAX Adjusted SAR													
Test Position	Power Reduction	Mode	Duty Cycle	RB allocation	offset	Channel Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Measured SAR1g	Measured SAR1g	Scaling Factor	Report SAR1g	0mm SAR
Back Side	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.478	0.478	1.12	0.537	No
Front Side	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.430	0.430	1.12	0.482	No
Left Edge	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.079	0.079	1.12	0.088	No
Right Edge	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.029	0.029	1.12	0.033	No
Top Edge	Level 5&6	QPSK	1:1	1	0	132072/1720	22.00	21.50	0.776	0.776	1.12	0.871	No
	Level 5&6	QPSK	1:1	1	99	132322/1745	22.00	21.50	0.841	0.841	1.12	0.944	No
	Level 5&6	QPSK	1:1	1	0	132572/1770	22.00	21.50	0.863	0.863	1.12	0.968	No
Back Side	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.507	0.507	1.12	0.569	No
Front Side	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.656	0.656	1.12	0.736	No
Left Edge	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.101	0.101	1.12	0.114	No
Right Edge	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.046	0.046	1.12	0.051	No
Top Edge	Level 5&6	QPSK	1:1	50%	25	132072/1720	22.00	21.50	0.794	0.794	1.12	0.890	No
	Level 5&6	QPSK	1:1	50%	50	132322/1745	22.00	21.50	0.847	0.847	1.12	0.951	No
	Level 5&6	QPSK	1:1	50%	50	132572/1770	22.00	21.50	0.828	0.828	1.12	0.929	No
Top Edge	Level 5&6	QPSK	1:1	100%	0	132072/1720	22.00	21.50	0.784	0.784	1.12	0.880	No



Table 37: NR (EN-DC) n5 (10MHz, Ant 1)

Test Position	Power Reduction	RB allocation	offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (DFT-s-OFDM QPSK SCS 15KHz)											
Left cheek	Full Power	1	1	166800/834	24.80	23.37	0.141	0.020	1.39	0.196	/
Left Tilt	Full Power	1	1	166800/834	24.80	23.37	0.131	0.120	1.39	0.182	/
Right cheek	Full Power	1	1	166800/834	24.80	23.37	0.194	-0.010	1.39	0.270	112
Right Tilt	Full Power	1	1	166800/834	24.80	23.37	0.159	0.080	1.39	0.221	/
Left cheek	Full Power	50%	0	166800/834	24.80	23.49	0.150	0.060	1.35	0.203	/
Left Tilt	Full Power	50%	0	166800/834	24.80	23.49	0.121	0.000	1.35	0.164	/
Right cheek	Full Power	50%	0	166800/834	24.80	23.49	0.190	0.070	1.35	0.257	/
Right Tilt	Full Power	50%	0	166800/834	24.80	23.49	0.172	0.130	1.35	0.233	/
Head SAR (CP-OFDM QPSK SCS 15KHz)											
Right cheek	Full Power	1	1	167800/839	23.30	22.05	0.153	-0.029	1.33	0.204	/
Body-worn SAR (DFT-s-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	166800/834	24.80	23.37	0.016	0.010	1.39	0.022	/
Front Side	Full Power	1	1	166800/834	24.80	23.37	0.017	0.094	1.39	0.024	/
Back Side	Full Power	50%	0	166800/834	24.80	23.49	0.024	0.050	1.35	0.032	113
Front Side	Full Power	50%	0	166800/834	24.80	23.49	0.020	0.035	1.35	0.028	/
Body-worn SAR (CP-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	167800/839	23.30	22.05	0.020	0.032	1.33	0.027	/
Hotspot SAR(DFT-s-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	1	166800/834	24.80	23.37	0.031	0.061	1.39	0.043	/
Front Side	Full Power	1	1	166800/834	24.80	23.37	0.026	0.040	1.39	0.036	/
Left Edge	Full Power	1	1	166800/834	24.80	23.37	0.010	0.088	1.39	0.014	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Full Power	1	1	166800/834	24.80	23.37	0.028	0.080	1.39	0.039	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Full Power	50%	0	166800/834	24.80	23.49	0.038	0.048	1.35	0.052	/
Front Side	Full Power	50%	0	166800/834	24.80	23.49	0.019	-0.090	1.35	0.026	/
Left Edge	Full Power	50%	0	166800/834	24.80	23.49	0.009	0.139	1.35	0.012	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Full Power	50%	0	166800/834	24.80	23.49	0.052	0.170	1.35	0.071	114
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hotspot SAR (CP-OFDM QPSK SCS 15KHz, Distance 10mm)											
Top Edge	Full Power	1	1	167800/839	23.30	22.05	0.038	0.102	1.33	0.051	/
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.											

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.



Table 38: LTE(EN-DC) Band 7 (20MHz, Ant 4)

Test Position	Power Reduction	Mode	Duty Cycle	RB allocation	offset	Channel /Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				
									Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	Plot No.
Head SAR													
Left Cheek	Level 1&2&3	QPSK	1:1	1	99	20850/2510	22.30	21.84	0.335	0.033	1.11	0.372	/
Left Tilt	Level 1&2&3	QPSK	1:1	1	99	20850/2510	22.30	21.84	0.214	0.160	1.11	0.238	/
Right Cheek	Level 1&2&3	QPSK	1:1	1	99	20850/2510	22.30	21.84	0.502	0.015	1.11	0.558	/
Right Tilt	Level 1&2&3	QPSK	1:1	1	99	20850/2510	22.30	21.84	0.414	0.022	1.11	0.460	/
Left Cheek	Level 1&2&3	QPSK	1:1	50%	25	21100/2535	22.30	21.89	0.344	0.063	1.10	0.378	/
Left Tilt	Level 1&2&3	QPSK	1:1	50%	25	21100/2535	22.30	21.89	0.206	0.031	1.10	0.226	/
Right Cheek	Level 1&2&3	QPSK	1:1	50%	25	21100/2535	22.30	21.89	0.514	-0.040	1.10	0.565	115
Right Tilt	Level 1&2&3	QPSK	1:1	50%	25	21100/2535	22.30	21.89	0.329	0.038	1.10	0.362	/
Body-worn SAR (Distance 15mm)													
Back Side	Level 4	QPSK	1:1	1	99	20850/2510	23.30	22.75	0.332	0.020	1.14	0.377	116
Front Side	Level 4	QPSK	1:1	1	99	20850/2510	23.30	22.75	0.152	0.032	1.14	0.173	/
Back Side	Level 4	QPSK	1:1	50%	25	21100/2535	23.30	22.39	0.281	-0.026	1.23	0.347	/
Front Side	Level 4	QPSK	1:1	50%	25	21100/2535	23.30	22.39	0.131	0.010	1.23	0.162	/
Hotspot SAR (Distance 10mm)													
Back Side	Level 5&6	QPSK	1:1	1	99	20850/2510	23.30	22.75	0.453	0.011	1.14	0.514	/
Front Side	Level 5&6	QPSK	1:1	1	99	20850/2510	23.30	22.75	0.182	0.025	1.14	0.207	/
Left Edge	Level 5&6	QPSK	1:1	1	99	20850/2510	23.30	22.75	0.243	0.038	1.14	0.276	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Level 5&6	QPSK	1:1	1	50	20850/2510	23.30	22.75	0.089	0.010	1.14	0.101	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Level 5&6	QPSK	1:1	50%	25	21100/2535	23.00	22.39	0.475	-0.030	1.15	0.547	117
Front Side	Level 5&6	QPSK	1:1	50%	25	21100/2535	23.30	22.39	0.211	0.025	1.23	0.260	/
Left Edge	Level 5&6	QPSK	1:1	50%	25	21100/2535	23.30	22.39	0.235	0.033	1.23	0.290	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Level 5&6	QPSK	1:1	50%	25	21100/2535	23.30	22.39	0.057	0.024	1.23	0.070	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.



Table 39: NR (SA) n7 (20MHz, Ant 4)

Test Position	Power Reduction	RB allocation	offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (DFT-s-OFDM QPSK SCS 15KHz)											
Left cheek	Level 1&2&3	1	53	512000/2560	22.00	21.59	0.441	0.140	1.10	0.485	/
Left Tilt	Level 1&2&3	1	53	512000/2560	22.00	21.59	0.237	0.050	1.10	0.260	/
Right cheek	Level 1&2&3	1	53	512000/2560	22.00	21.59	0.665	0.061	1.10	0.731	118
Right Tilt	Level 1&2&3	1	53	512000/2560	22.00	21.59	0.369	0.033	1.10	0.406	/
Left cheek	Level 1&2&3	50%	56	512000/2560	22.00	21.78	0.329	0.043	1.05	0.346	/
Left Tilt	Level 1&2&3	50%	56	512000/2560	22.00	21.78	0.160	0.160	1.05	0.168	/
Right cheek	Level 1&2&3	50%	56	512000/2560	22.00	21.78	0.481	0.025	1.05	0.506	/
Right Tilt	Level 1&2&3	50%	56	512000/2560	22.00	21.78	0.300	0.180	1.05	0.316	/
Head SAR (CP-OFDM QPSK SCS 15KHz)											
Right cheek	Level 1&2&3	1	1	507000/2535	21.50	20.84	0.598	-0.012	1.16	0.696	/
Body-worn SAR (DFT-s-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	507000/2535	23.00	22.61	0.262	-0.071	1.09	0.287	119
Front Side	Full Power	1	1	507000/2535	23.00	22.61	0.131	0.015	1.09	0.143	/
Back Side	Full Power	50%	0	507000/2535	23.00	22.53	0.216	-0.060	1.11	0.241	/
Front Side	Full Power	50%	0	507000/2535	23.00	22.53	0.099	0.032	1.11	0.110	/
Body-worn SAR (CP-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	502000/2510	21.50	20.79	0.128	-0.033	1.18	0.151	/
Hotspot SAR(DFT-s-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	1	507000/2535	23.00	22.61	0.510	-0.064	1.09	0.558	120
Front Side	Full Power	1	1	507000/2535	23.00	22.61	0.221	0.080	1.09	0.242	/
Left Edge	Full Power	1	1	507000/2535	23.00	22.61	0.379	-0.049	1.09	0.415	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Full Power	1	1	507000/2535	23.00	22.61	0.095	0.012	1.09	0.104	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Full Power	50%	0	507000/2535	23.00	22.53	0.459	0.087	1.11	0.511	/
Front Side	Full Power	50%	0	507000/2535	23.00	22.53	0.174	-0.090	1.11	0.194	/
Left Edge	Full Power	50%	0	507000/2535	23.00	22.53	0.299	0.014	1.11	0.333	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Full Power	50%	0	507000/2535	23.00	22.53	0.076	0.013	1.11	0.085	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hotspot SAR (CP-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	1	502000/2510	21.50	20.79	0.462	0.018	1.18	0.544	/
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.											

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.



Table 15: NR (SA) n41 (20MHz, Ant 4)

Test Position	Power Reduction	RB allocation	offset	Channel/ Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR1g	
Head SAR (DFT-s-OFDM QPSK SCS 15KHz)											
Left cheek	Full Power	1	271	518598/2592.99	23.50	23.05	0.190	-0.010	1.11	0.211	/
Left Tilt	Full Power	1	271	518598/2592.99	23.50	23.05	0.204	0.020	1.11	0.226	/
Right cheek	Full Power	1	271	518598/2592.99	23.50	23.05	0.539	-0.120	1.11	0.598	/
Right Tilt	Full Power	1	271	518598/2592.99	23.50	23.05	0.386	0.024	1.11	0.428	/
Left cheek	Full Power	50%	138	518598/2592.99	23.50	23.08	0.242	-0.015	1.10	0.267	/
Left Tilt	Full Power	50%	138	518598/2592.99	23.50	23.08	0.271	0.092	1.10	0.299	/
Right cheek	Full Power	50%	138	518598/2592.99	23.50	23.08	0.685	-0.046	1.10	0.755	121
Right Tilt	Full Power	50%	138	518598/2592.99	23.50	23.08	0.414	0.020	1.10	0.456	/
Head SAR (CP-OFDM QPSK SCS 15KHz)											
Right cheek	Full Power	1	1	513900/2569.5	22.00	20.70	0.516	0.021	1.35	0.696	/
Body-worn SAR (DFT-s-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	271	518598/2592.99	23.50	23.05	0.237	-0.08	1.11	0.263	122
Front Side	Full Power	1	271	518598/2592.99	23.50	23.05	0.109	0.038	1.11	0.121	/
Back Side	Full Power	50%	138	518598/2592.99	23.50	23.08	0.196	0.02	1.10	0.216	/
Front Side	Full Power	50%	138	518598/2592.99	23.50	23.08	0.080	-0.035	1.10	0.088	/
Body-worn SAR (CP-OFDM QPSK SCS 15KHz, Distance 15mm)											
Back Side	Full Power	1	1	513900/2569.5	22.00	20.70	0.206	0.044	1.35	0.278	/
Hotspot SAR(DFT-s-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	271	518598/2592.99	23.50	23.05	0.545	0.020	1.11	0.605	123
Front Side	Full Power	1	271	518598/2592.99	23.50	23.05	0.207	0.035	1.11	0.230	/
Left Edge	Full Power	1	271	518598/2592.99	23.50	23.05	0.322	0.060	1.11	0.357	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Full Power	1	271	518598/2592.99	23.50	23.05	0.079	0.042	1.11	0.088	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Back Side	Full Power	50%	138	518598/2592.99	23.50	23.08	0.400	0.013	1.10	0.441	/
Front Side	Full Power	50%	138	518598/2592.99	23.50	23.08	0.150	0.022	1.10	0.165	/
Left Edge	Full Power	50%	138	518598/2592.99	23.50	23.08	0.257	0.080	1.10	0.283	/
Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Top Edge	Full Power	50	138	518598/2592.99	23.50	23.08	0.050	0.033	1.10	0.055	/
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hotspot SAR (CP-OFDM QPSK SCS 15KHz, Distance 10mm)											
Back Side	Full Power	1	1	513900/2569.5	22.00	20.70	0.473	0.130	1.35	0.638	/
Note: 1.The value with blue color is the maximum SAR Value of each test band.											
2.When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.											

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.



Table 40: Wi-Fi (2.4G) Ant 7

Test Position	Power Reduction	Mode	Duty Cycle	Channel/ Frequency (MHz)	Tune-up dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR 1g	
Head SAR											
Left Cheek	Level 1	802.11b	98.7%	1/2412	16.00	15.33	0.561	-0.090	1.18	0.663	/
	Level 1	802.11b	98.7%	6/2437	16.00	15.62	0.817	-0.070	1.11	0.903	/
	Level 1	802.11b	98.7%	11/2462	16.00	15.58	0.833	0.000	1.12	0.930	/
Left Tilt	Level 1	802.11b	98.7%	6/2437	16.00	15.62	0.677	-0.140	1.11	0.749	/
Right Cheek	Level 1	802.11b	98.7%	6/2437	16.00	15.62	0.272	-0.060	1.11	0.301	/
Right Tilt	Level 1	802.11b	98.7%	6/2437	16.00	15.62	0.357	0.140	1.11	0.395	/
Left Cheek (Repeated)	Level 1	802.11b	98.7%	11/2462	16.00	15.58	0.841	0.040	1.12	0.939	124
Left Cheek	Level 2	802.11b	98.7%	11/2462	10.00	9.59	0.088	0.060	1.11	0.098	/
Right Tilt	Level 2	802.11b	98.7%	11/2462	10.00	9.59	0.131	-0.170	1.11	0.146	/
Body-worn SAR (Distance 15mm)											
Back Side	Full Power	802.11b	98.7%	1/2412	20.00	19.20	0.119	0.076	1.22	0.145	/
Front Side	Full Power	802.11b	98.7%	1/2412	20.00	19.20	0.183	0.040	1.22	0.223	125
Hotspot SAR(Distance 10mm)											
Back Side	Level 4	802.11b	98.7%	1/2412	15.00	14.79	0.098	0.015	1.06	0.104	/
Front Side	Level 4	802.11b	98.7%	1/2412	15.00	14.79	0.106	-0.060	1.06	0.113	/
Left Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Right Edge	Level 4	802.11b	98.7%	1/2412	15.00	14.79	0.053	0.032	1.06	0.056	/
Top Edge	Level 4	802.11b	98.7%	1/2412	15.00	14.79	0.118	-0.044	1.06	0.125	126
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1. The value with blue color is the maximum SAR Value of each test band.											

Note: 1. The value with blue color is the maximum SAR Value of each test band.

MAX Adjusted SAR										
Test Position	Power Reduction	Mode	Duty Cycle	Channel /Frequency(MHz)	Tune-up (dBm)	Measured power (dBm)	Measured SAR1g	Scaling Factor	Report SAR 1g	0mm SAR
Back Side	Level 4	802.11b	98.7%	1/2412	20.00	15.00	0.104	3.20	0.334	No
Front Side	Level 4	802.11b	98.7%	1/2412	20.00	15.00	0.113	3.20	0.361	No
Left Edge	Level 4	802.11b	98.7%	1/2412	20.00	15.00	0.001	3.20	0.003	No
Right Edge	Level 4	802.11b	98.7%	1/2412	20.00	15.00	0.056	3.20	0.181	No
Top Edge	Level 4	802.11b	98.7%	1/2412	20.00	15.00	0.125	3.20	0.402	No

Note:SAR is not required for OFDM 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.



Measurement Variability

Test Position	Channel/ Frequency(MHz)	MAX Measured SAR _{1g} (W/kg)	1 st Repeated SAR _{1g} (W/kg)	Ratio
Left Cheek	11/2462	0.833	0.841	1.01

Note: 1) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

2) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

MAX Adjusted SAR

Mode	Test Position	Power Reduction	Channel/ Frequency (MHz)	MAX Reported SAR _{1g} (W/kg)	802.11b Tune-up limit (dBm)	Tune-up limit (dBm)	Scaling Factor	Adjusted SAR _{1g} (W/kg)
802.11g	Left Cheek	Level 1	11/2462	0.939	16.00	14.50	0.72	0.674
802.11n HT20	Left Cheek	Level 1	11/2462	0.939	16.00	14.50	0.72	0.674
802.11n HT40	Left Cheek	Level 1	11/2462	0.939	16.00	14.50	0.72	0.674

Note: SAR is not required for OFDM 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.

Table 41: Wi-Fi (5G,U-NII-1)

Test Position	Mode	Power Reduction	Duty Cycle	Channel/ Frequency (MHz)	Tune-up dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR 1g	
Head SAR											
Left Cheek	802.11a	Level 1	98.32%	36/5180	14.50	14.20	0.359	0.031	1.09	0.391	/
Left Tilt	802.11a	Level 1	98.32%	36/5180	14.50	14.20	0.646	0.160	1.09	0.704	127
Right Cheek	802.11a	Level 1	98.32%	36/5180	14.50	14.20	0.332	-0.050	1.09	0.362	/
Right Tilt	802.11a	Level 1	98.32%	36/5180	14.50	14.20	0.357	0.021	1.09	0.389	/
Left Tilt	802.11a	Level 2	98.32%	48/5240	10.50	10.15	0.212	-0.040	1.10	0.234	/
Right Cheek	802.11a	Level 2	98.32%	48/5240	10.50	10.15	0.140	0.117	1.10	0.154	/
Right Tilt	802.11a	Level 2	98.32%	48/5240	10.50	10.15	0.148	0.145	1.10	0.163	/
Body-worn SAR (Distance 15mm)											
Back Side	802.11a	Full Power	98.32%	48/5240	19.50	18.50	0.315	0.129	1.28	0.403	128
Front Side	802.11a	Full Power	98.32%	48/5240	19.50	18.50	0.178	0.037	1.28	0.228	/
Hotspot SAR(Distance 10mm)											
Back Side	802.11a	Level 4	98.32%	44/5220	12.50	12.22	0.196	0.040	1.08	0.213	/
Front Side	802.11a	Level 4	98.32%	44/5220	12.50	12.22	0.134	-0.041	1.08	0.145	/
Left Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Right Edge	802.11a	Level 4	98.32%	44/5220	12.50	12.22	0.143	0.035	1.08	0.155	/
Top Edge	802.11a	Level 4	98.32%	44/5220	12.50	12.22	0.351	0.089	1.08	0.381	129
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



Test Position	Mode	Power Reduction	Duty Cycle	Channel/Frequency (MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 4 W/kg (mW/g)				Plot No.
							Measured SAR10g	Power Drift (dB)	Scaling Factor	Report SAR 1g	

Product Specific 10-g SAR (Distance 0mm)

Top Edge	802.11a	Full Power	98.32%	48/5240	19.50	18.50	1.020	0.056	1.28	1.306	130
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Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. The highest reported SAR for a test configuration is > 1.2 W/kg, SAR is required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, each band is tested independently for SAR.

Since the band U-NII-2A does not support hotspot function, hotspot SAR for U-NII-1 is required.

MAX Adjusted SAR										
Test Position	Power Reduction	Mode	Duty Cycle	Channel /Frequency(MHz)	Tune-up (dBm)	Measured power (dBm)	Measured SAR1g	Scaling Factor	Report SAR1g	0mm SAR
Back Side	Level 4	802.11a	98.32%	44/5220	19.50	12.50	0.213	5.10	1.084	No
Front Side	Level 4	802.11a	98.32%	44/5220	19.50	12.50	0.145	5.10	0.741	No
Left Edge	Level 4	802.11a	98.32%	44/5220	19.50	12.50	0.107	5.10	0.547	No
Right Edge	Level 4	802.11a	98.32%	44/5220	19.50	12.50	0.155	5.10	0.791	No
Top Edge	Level 4	802.11a	98.32%	44/5220	19.50	12.50	0.381	5.10	1.941	Yes

Table 42: Wi-Fi (5G,U-NII-2A)

Per 248227, for band U-NII-1 and U-NII-2A, 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, each band is tested independently for SAR.

Test Position	Mode	Power Reduction	Duty Cycle	Channel/ Frequency (MHz)	Tune-up dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR 1g	
Head SAR											
Left Cheek	802.11a	Level 1	98.32%	60/5300	14.50	14.30	0.385	0.116	1.07	0.410	/
Left Tilt	802.11a	Level 1	98.32%	60/5300	14.50	14.30	0.441	0.025	1.07	0.470	131
Right Cheek	802.11a	Level 1	98.32%	60/5300	14.50	14.30	0.323	0.031	1.07	0.344	/
Right Tilt	802.11a	Level 1	98.32%	60/5300	14.50	14.30	0.360	-0.110	1.07	0.383	/
Right Cheek	802.11a	Level 2	98.32%	52/5260	10.50	10.25	0.149	-0.040	1.08	0.161	/
Right Tilt	802.11a	Level 2	98.32%	52/5260	10.50	10.25	0.162	0.029	1.08	0.175	/
Body-worn SAR (Distance 15mm)											
Back Side	802.11a	Full Power	98.32%	64/5320	19.50	19.12	0.402	-0.099	1.11	0.446	132
Front Side	802.11a	Full Power	98.32%	64/5320	19.50	19.12	0.216	0.010	1.11	0.240	/



Test Position	Mode	Power Reduction	Duty Cycle	Channel/ Frequency (MHz)	Tune-up dBm)	Measured power (dBm)	Limit of SAR 4 W/kg (mW/g)				Plot No.
							Measured SAR10g	Power Drift (dB)	Scaling Factor	Report SAR 1g	
Product Specific 10-g SAR (Distance 0mm)											
Back Side	802.11a	Full Power	98.32%	64/5320	19.50	19.12	0.482	0.020	1.11	0.535	/
Front Side	802.11a	Full Power	98.32%	64/5320	19.50	19.12	0.731	-0.035	1.11	0.811	/
Left Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Right Edge	802.11a	Full Power	98.32%	64/5320	19.50	19.12	0.089	-0.017	1.11	0.099	/
Top Edge	802.11a	Full Power	98.32%	64/5320	19.50	19.12	1.210	0.104	1.11	1.343	133
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1. The value with blue color is the maximum SAR Value of each test band.											

Table 43: Wi-Fi (5G, U-NII-2C) Ant 7

Test Position	Mode	Power Reduction	Duty Cycle	Channel/ Frequency (MHz)	Tune-up dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR 1g	
Head SAR											
Left Cheek	802.11a	Level 1	98.32%	140/5700	14.50	14.20	0.545	0.028	1.09	0.594	/
Left Tilt	802.11a	Level 1	98.32%	116/5580	14.50	14.12	0.561	0.036	1.11	0.623	/
	802.11a	Level 1	98.32%	132/5660	14.50	14.11	0.706	0.021	1.11	0.786	/
	802.11a	Level 1	98.32%	140/5700	14.50	14.20	0.750	0.025	1.09	0.817	134
Right Cheek	802.11a	Level 1	98.32%	140/5700	14.50	14.20	0.513	0.150	1.09	0.559	/
Right Tilt	802.11a	Level 1	98.32%	140/5700	14.50	14.20	0.620	0.021	1.09	0.676	/
Left Cheek	802.11a	Level 2	98.32%	140/5700	10.50	10.10	0.243	-0.102	1.12	0.271	/
Left Tilt	802.11a	Level 2	98.32%	140/5700	10.50	10.10	0.293	0.063	1.12	0.327	/
Right Cheek	802.11a	Level 2	98.32%	140/5700	10.50	10.10	0.215	0.034	1.12	0.240	/
Right Tilt	802.11a	Level 2	98.32%	140/5700	10.50	10.10	0.245	0.000	1.12	0.273	/
Body-worn SAR (Distance 15mm)											
Back Side	802.11a	Full Power	98.32%	100/5500	19.50	19.08	0.428	0.063	1.12	0.480	135
Front Side	802.11a	Full Power	98.32%	100/5500	19.50	19.08	0.279	0.014	1.12	0.313	/
Test Position	Mode	Power Reduction	Duty Cycle	Channel/ Frequency (MHz)	Tune-up dBm)	Measured power (dBm)	Limit of SAR 4 W/kg (mW/g)				Plot No.
							Measured SAR10g	Power Drift (dB)	Scaling Factor	Report SAR 1g	
Product Specific 10-g SAR (Distance 0mm)											
Back Side	802.11a	Full Power	98.32%	100/5500	19.50	19.08	0.830	0.021	1.12	0.930	/
Front Side	802.11a	Full Power	98.32%	100/5500	19.50	19.08	1.050	-0.010	1.12	1.176	/
Left Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Right Edge	802.11a	Full Power	98.32%	100/5500	19.50	19.08	0.741	0.024	1.12	0.830	/
Top Edge	802.11a	Full Power	98.32%	100/5500	19.50	19.08	1.680	0.098	1.12	1.882	136



Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
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Note: 1. The value with blue color is the maximum SAR Value of each test band.



Table 44: Wi-Fi (5G,U-NII-3) Ant 7

Test Position	Mode	Power Reduction	Duty Cycle	Channel/ Frequency (MHz)	Tune-up dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				Plot No.
							Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR 1g	
Head SAR											
Left Cheek	802.11a	Level 1	98.32%	149/5745	14.50	14.21	0.577	0.025	1.09	0.627	/
Left Tilt	802.11a	Level 1	98.32%	149/5745	14.50	14.21	0.726	0.090	1.09	0.789	137
Right Cheek	802.11a	Level 1	98.32%	149/5745	14.50	14.21	0.535	0.150	1.09	0.582	/
Right Tilt	802.11a	Level 1	98.32%	149/5745	14.50	14.21	0.598	0.100	1.09	0.650	/
Left Cheek	802.11a	Level 2	98.32%	149/5745	10.50	9.86	0.277	0.079	1.18	0.326	/
Left Tilt	802.11a	Level 2	98.32%	149/5745	10.50	9.86	0.322	0.078	1.18	0.380	/
Right Cheek	802.11a	Level 2	98.32%	149/5745	10.50	9.86	0.259	-0.083	1.18	0.305	/
Right Tilt	802.11a	Level 2	98.32%	149/5745	10.50	9.86	0.297	0.079	1.18	0.350	/
Body-worn SAR (Distance 15mm)											
Back Side	802.11a	Full Power	98.32%	157/5785	19.50	19.11	0.302	-0.020	1.11	0.336	138
Front Side	802.11a	Full Power	98.32%	157/5785	19.50	19.11	0.189	0.024	1.11	0.210	/
Hotspot SAR(Distance 10mm)											
Back Side	802.11a	Level 4	98.32%	157/5785	12.50	12.06	0.144	0.026	1.13	0.162	/
Front Side	802.11a	Level 4	98.32%	157/5785	12.50	12.06	0.123	0.010	1.13	0.138	/
Left Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Right Edge	802.11a	Level 4	98.32%	157/5785	12.50	12.06	0.113	0.035	1.13	0.127	/
Top Edge	802.11a	Level 4	98.32%	157/5785	12.50	12.06	0.241	0.029	1.13	0.271	139
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Test Position	Mode	Power Reduction	Duty Cycle	Channel/ Frequency (MHz)	Tune-up dBm)	Measured power (dBm)	Limit of SAR 4W/kg (mW/g)				Plot No.
							Measured SAR10g	Power Drift (dB)	Scaling Factor	Report SAR 1g	
Product Specific 10-g SAR (Distance 0mm)											
Top Edge	802.11a	Full Power	98.32%	157/5785	19.50	19.11	1.730	0.085	1.11	1.925	140
Note: 1. The value with blue color is the maximum SAR Value of each test band.											

Note: 1. The value with blue color is the maximum SAR Value of each test band.

MAX Adjusted SAR										
Test Position	Power Reduction	Mode	Duty Cycle	Channel /Frequency(MHz)	Tune-up (dBm)	Measured power (dBm)	Measured SAR1g	Scaling Factor	Report SAR1g	0mm SAR
Back Side	Level 4	802.11a(6M)	98.32%	157/5785	19.50	12.50	0.162	5.10	0.826	No
Front Side	Level 4	802.11a(6M)	98.32%	157/5785	19.50	12.50	0.138	5.10	0.706	No
Left Edge	Level 4	802.11a(6M)	98.32%	157/5785	19.50	12.50	0.057	5.10	0.293	No
Right Edge	Level 4	802.11a(6M)	98.32%	157/5785	19.50	12.50	0.127	5.10	0.648	No
Top Edge	Level 4	802.11a(6M)	98.32%	157/5785	19.50	12.50	0.271	5.10	1.383	Yes



Table 45: BT

Test Position	Mode	Duty Cycle	Channel /Frequency(MHz)	Tune-up (dBm)	Measured power (dBm)	Limit of SAR 1.6 W/kg (mW/g)				
						Measured SAR1g	Power Drift (dB)	Scaling Factor	Report SAR 1g	Plot No.
Head SAR										
Left Cheek	DH5	77.07%	39/2441	14.00	13.02	0.287	0.064	1.63	0.467	141
Left Tilt	DH5	77.07%	39/2441	14.00	13.02	0.211	0.050	1.63	0.343	/
Right Cheek	DH5	77.07%	39/2441	14.00	13.02	0.123	-0.050	1.63	0.200	/
Right Tilt	DH5	77.07%	39/2441	14.00	13.02	0.131	-0.020	1.63	0.213	/
Body SAR (Distance 10mm)										
Back Side	DH5	77.07%	39/2441	14.00	13.02	0.055	0.100	1.63	0.089	/
Front Side	DH5	77.07%	39/2441	14.00	13.02	0.044	-0.070	1.63	0.072	/
Left Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Right Edge	DH5	77.07%	39/2441	14.00	13.02	0.047	0.041	1.63	0.076	/
Top Edge	DH5	77.07%	39/2441	14.00	13.02	0.057	0.150	1.63	0.093	142
Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Note: 1. The value with blue color is the maximum SAR Value of each test band.										

10.3 Simultaneous Transmission Analysis

Simultaneous Transmission Configurations	Head	Body-worn	Hotspot	Product Specific 10-g SAR
WWAN+WLAN 2.4G	Yes	Yes	Yes	Yes
WWAN+WLAN 5G	Yes	Yes	Yes	Yes
WWAN+BT	Yes	Yes	Yes	Yes
WLAN 5G+BT	Yes	Yes	Yes	Yes
WWAN+WLAN 5G+BT	Yes	Yes	Yes	Yes

General Note:

1. The Scaled SAR summation is calculated based on the same configuration and test position.
2. Per KDB 447498 D01, simultaneous transmission SAR is compliant if,
 - i) Scalar SAR summation $< 1.6\text{W/kg}$, simultaneously transmission SAR measurement is not necessary.
 - ii) $\text{SPLSR} = (\text{SAR1} + \text{SAR2})^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 - iii) If $\text{SPLSR} \leq 0.04$, simultaneously transmission SAR measurement is not necessary.

The maximum SAR_{1g} Value

2G/3G/4G Ant 0

SAR _{1g/10g} (W/kg)		GSM	GSM	WCDMA	WCDMA	WCDMA	LTE	LTE	LTE	LTE	LTE	LTE	LTE	LTE	MAX.
Test Position		850	1900	Band II	Band IV	Band V	FDD 2	FDD 5	FDD 7	FDD 12	FDD 26	TDD 38	TDD 41	FDD 66	SAR _{1g/10g}
Head	Left Cheek	0.133	0.065	0.133	0.160	0.073	0.093	0.206	0.239	0.122	0.173	0.229	0.190	0.163	0.239
	Left Tilt	0.048	0.044	0.073	0.089	0.039	0.080	0.082	0.143	0.055	0.081	0.123	0.125	0.137	0.143
	Right Cheek	0.123	0.041	0.073	0.111	0.066	0.058	0.167	0.522	0.081	0.163	0.486	0.316	0.129	0.522
	Right Tilt	0.042	0.046	0.062	0.084	0.036	0.060	0.090	0.182	0.042	0.086	0.151	0.094	0.129	0.182
Body worn	Back Side	0.123	0.261	0.420	0.440	0.221	0.314	0.125	0.489	0.278	0.249	0.249	0.174	0.449	0.489
	Front Side	0.102	0.164	0.293	0.308	0.161	0.195	0.063	0.339	0.226	0.227	0.211	0.180	0.337	0.339
Hotspot	Back Side	0.314	0.510	0.790	0.804	0.340	0.551	0.282	0.699	0.369	0.215	0.331	0.358	0.590	0.804
	Front Side	0.200	0.293	0.368	0.609	0.191	0.383	0.154	0.568	0.184	0.177	0.315	0.199	0.433	0.609
	Left Edge	0.124	0.121	0.012	0.052	0.119	0.085	0.134	0.046	0.088	0.099	0.041	0.001	0.056	0.134
	Right Edge	0.086	0.099	0.122	0.065	0.047	0.130	0.107	0.459	0.068	0.085	0.242	0.130	0.114	0.459
	Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Bottom Edge	0.383	0.732	1.139	1.074	0.272	0.737	0.237	0.549	0.202	0.167	0.166	0.105	0.826	1.139
Product Specific 10-g SAR	Back Side	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Front Side	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Left Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Top Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Bottom Edge	NA	NA	NA	2.434	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.434

2G/3G/4G Ant 1

SAR _{1g} (W/kg)		GSM	GSM	WCDMA	WCDMA	WCDMA	LTE	LTE	LTE	LTE	LTE	LTE	LTE	LTE	MAX.
Test Position		850	1900	Band II	Band IV	Band V	FDD 2	FDD 5	FDD 7	FDD 12	FDD 26	TDD 38	TDD 41	FDD 66	SAR _{1g}
Head	Left Cheek	0.208	0.345	0.416	0.504	0.456	0.453	0.504	0.549	0.463	0.492	0.375	0.394	0.479	0.549
	Left Tilt	0.315	0.432	0.398	0.569	0.393	0.606	0.434	0.472	0.544	0.419	0.331	0.341	0.612	0.612
	Right Cheek	0.419	0.566	0.523	0.787	0.737	0.645	0.634	0.980	0.769	0.908	0.989	0.859	0.770	0.989
	Right Tilt	0.491	0.707	0.684	0.733	0.757	0.793	0.766	0.862	0.553	0.812	1.067	0.799	0.908	1.067
Body worn	Back Side	0.144	0.161	0.374	0.267	0.187	0.126	0.167	0.136	0.261	0.298	0.223	0.157	0.168	0.374
	Front Side	0.138	0.104	0.237	0.205	0.165	0.162	0.117	0.161	0.232	0.256	0.202	0.216	0.222	0.256
Hotspot	Back Side	0.146	0.250	0.472	0.718	0.207	0.224	0.145	0.273	0.304	0.269	0.537	0.289	0.507	0.718
	Front Side	0.154	0.236	0.490	0.674	0.229	0.384	0.155	0.297	0.207	0.250	0.488	0.371	0.656	0.674
	Left Edge	0.049	0.062	0.102	0.083	0.104	0.048	0.097	0.236	0.190	0.219	0.454	0.202	0.101	0.454
	Right Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Top Edge	0.252	0.535	0.907	0.941	0.176	0.754	0.123	0.395	0.170	0.222	0.328	0.173	0.863	0.941
	Bottom Edge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



SAR _{1g} (W/kg) Test Position		ENDC 7A_n5								MAX. SAR _{1g}
		ANT 0	ANT 4	ANT 4+0	ANT 1	ANT 0	ANT 0+1	ANT 4	ANT 4+1	
		n5	LTE 7	7A+n5	n5	LTE 7	7A+n5	LTE 7	7A+n5	
Head	Left Cheek	0.180	0.378	0.558	0.203	0.239	0.442	0.378	0.581	0.581
	Left Tilt	0.071	0.238	0.309	0.182	0.143	0.325	0.238	0.420	0.420
	Right Cheek	0.143	0.565	0.708	0.270	0.522	0.792	0.565	0.835	0.835
	Right Tilt	0.061	0.460	0.521	0.233	0.182	0.415	0.460	0.693	0.693
Body worn	Back Side	0.172	0.377	0.549	0.032	0.489	0.521	0.377	0.409	0.549
	Front Side	0.120	0.173	0.293	0.028	0.339	0.367	0.173	0.201	0.367
Hotspot	Back Side	0.293	0.547	0.840	0.052	0.699	0.751	0.547	0.599	0.840
	Front Side	0.173	0.260	0.433	0.036	0.568	0.604	0.260	0.296	0.604
	Left Edge	0.001	0.290	0.291	0.014	0.046	0.060	0.290	0.304	0.304
	Right Edge	0.001	NA	0.001	NA	0.459	0.459	NA	NA	0.459
	Top Edge	NA	0.101	0.101	0.071	NA	0.071	0.101	0.172	0.172
	Bottom Edge	0.186	NA	0.186	NA	0.549	0.549	NA	NA	0.549

SAR _{1g/10g} (W/kg) Test Position		EM-DC 7A_n5	NR (SA) n7		NR (SA) n41		2G/3G/4G	2G/3G/4G	MAX. SAR _{1g/10g}
			Ant 0	Ant 4	Ant 0	Ant 4	Ant 0	Ant 1	
Head	Left Cheek	0.581	0.187	0.485	0.227	0.267	0.239	0.549	0.581
	Left Tilt	0.420	0.142	0.260	0.258	0.299	0.143	0.612	0.612
	Right Cheek	0.835	0.669	0.731	0.333	0.755	0.522	0.989	0.989
	Right Tilt	0.693	0.126	0.406	0.175	0.456	0.182	1.067	1.067
Body worn	Back Side	0.549	0.491	0.287	0.221	0.278	0.489	0.374	0.549
	Front Side	0.367	0.455	0.143	0.161	0.121	0.339	0.256	0.455
Hotspot	Back Side	0.840	0.792	0.558	0.375	0.638	0.804	0.718	0.840
	Front Side	0.604	0.657	0.242	0.348	0.230	0.609	0.674	0.674
	Left Edge	0.304	0.001	0.415	0.034	0.357	0.134	0.454	0.454
	Right Edge	0.459	0.218	NA	0.231	NA	0.459	NA	0.459
	Top Edge	0.172	NA	0.104	NA	0.088	NA	0.941	0.941
	Bottom Edge	0.549	0.576	NA	0.237	NA	1.139	NA	1.139
Product Specific 10-g SAR	Back Side	NA	NA	NA	NA	NA	NA	NA	NA
	Front Side	NA	NA	NA	NA	NA	NA	NA	NA
	Left Edge	NA	NA	NA	NA	NA	NA	NA	NA
	Right Edge	NA	NA	NA	NA	NA	NA	NA	NA
	Top Edge	NA	NA	NA	NA	NA	NA	NA	NA
	Bottom Edge	NA	NA	NA	NA	NA	2.434	NA	2.434

Wi-Fi

Test Position		Wi-Fi 5G				
		(U-NII-1)	(U-NII-2A)	(U-NII-2C)	(U-NII-3)	Final Max.
Head	Left Cheek	0.391	0.410	0.271	0.326	0.410
	Left Tilt	0.234	0.470	0.327	0.380	0.470
	Right Cheek	0.154	0.161	0.240	0.305	0.305
	Right Tilt	0.163	0.175	0.273	0.350	0.350
Body worn	Back Side	0.403	0.446	0.480	0.336	0.480
	Front Side	0.228	0.240	0.313	0.210	0.313
Hotspot	Back Side	0.213	NA	NA	0.162	0.213
	Front Side	0.145	NA	NA	0.138	0.145
	Left Edge	NA	NA	NA	NA	NA
	Right Edge	0.155	NA	NA	0.127	0.155
	Top Edge	0.381	NA	NA	0.271	0.381
	Bottom Edge	NA	NA	NA	NA	NA
Product Specific 10-g SAR	Back Side	NA	0.535	0.930	NA	0.930
	Front Side	NA	0.811	1.176	NA	1.176
	Left Edge	NA	NA	NA	NA	NA
	Right Edge	NA	0.099	0.830	NA	0.830
	Top Edge	1.306	1.343	1.882	1.925	1.925
	Bottom Edge	NA	NA	NA	NA	NA

**SAR Simultaneous of GSM/UMTS/LTE/NR antenna with Wi-Fi/BT Scenario**

SAR _{1g/10g} (W/kg)	Test Position	MAX. SAR _{1g/10g}	2.4G	Wi-Fi 5G	BT	MAX. Σ SAR _{1g/10g}			
		1	2	3	4	1+2	1+3	1+4	1+3+4
Head	Left Cheek	0.581	0.098	0.410	0.467	0.679	0.991	1.048	1.458
	Left Tilt	0.612	0.749	0.470	0.343	1.361	1.082	0.955	1.425
	Right Cheek	0.989	0.301	0.305	0.200	1.290	1.294	1.189	1.494
	Right Tilt	1.067	0.146	0.350	0.213	1.213	1.417	1.280	1.630
Body worn	Back Side	0.549	0.145	0.480	0.089	0.694	1.029	0.638	1.118
	Front Side	0.455	0.223	0.313	0.072	0.678	0.768	0.527	0.840
Hotspot	Back Side	0.840	0.104	0.213	0.089	0.944	1.053	0.929	1.142
	Front Side	0.674	0.113	0.145	0.072	0.787	0.819	0.746	0.891
	Left Edge	0.454	NA	NA	NA	0.454	0.454	0.454	0.454
	Right Edge	0.459	0.056	0.155	0.076	0.515	0.614	0.535	0.690
	Top Edge	0.941	0.125	0.381	0.093	1.066	1.322	1.034	1.415
	Bottom Edge	1.139	NA	NA	NA	1.139	1.139	1.139	1.139
Product Specific 10-g SAR	Back Side	NA	NA	0.930	NA	NA	0.930	NA	0.930
	Front Side	NA	NA	1.176	NA	NA	1.176	NA	1.176
	Left Edge	NA	NA	NA	NA	NA	NA	NA	NA
	Right Edge	NA	NA	0.830	NA	NA	0.830	NA	0.830
	Top Edge	NA	NA	1.925	NA	NA	1.925	NA	1.925
	Bottom Edge	2.434	NA	NA	NA	2.434	2.434	2.434	2.434

Note: 1. The value with blue color is the maximum Σ SAR_{1g/10g} Value.

2. MAX. Σ SAR_{1g/10g} = Unlicensed SAR_{MAX} + Licensed SAR_{MAX}

3. SAR_{MAX, total} = SAR_{GSM/UMTS/LTE/NR} + SAR_{Wi-Fi} + SAR_{BT} = 1.494 W/kg (for Head & Body & Hotspot),

SAR_{MAX, total} = SAR_{GSM/UMTS/LTE/NR} + SAR_{Wi-Fi} + SAR_{BT} = 2.434 W/kg (for Product Specific 10-g SAR),

Thus SAR_{MAX, total} / SAR_{limit} < 1, it is compliant with 1999/519/EC, so Simultaneous SAR are not required for GSM/UMTS/LTE/NR and BT and Wi-Fi.

MAX. $\Sigma SAR_{1g} = 1.630W/kg > 1.6W/kg$, so the SAR to peak location separation ratio should be considered

Reported SAR _{1g} (W/kg)	LTE TDD 38	Wi-Fi 5G, U-NII-3	BT	MAX. ΣSAR_{1g}
Test Position				
Right Tilt	1.067	0.350	0.213	1.630
Note: 1. The value with blue color is the SAR _{1g} >1.6W/kg. 2. When the MAX. ΣSAR_{1g} >1.6W/kg in a position, Ratio need consideration in this position.				

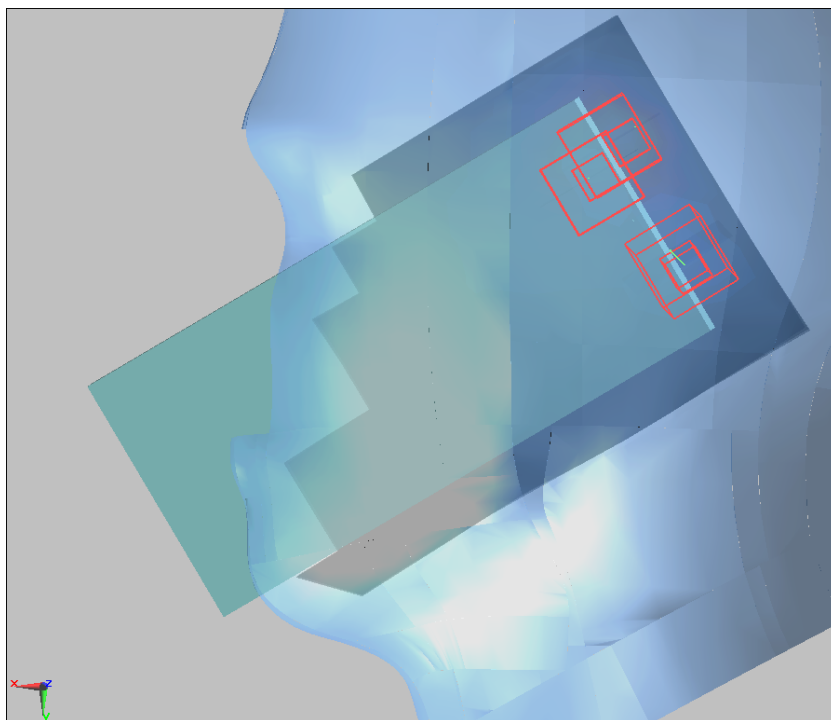
(SAR_{Max}=1.630W/Kg)

The position SAR_{LTE band 38} is (x₁= 6, y₁= -347, z₁= -175),

The position SAR_{Max.U-NII-3} is (x₂= -11.1, y₂= -309, z₂= -167),

The position SAR_{Max.BT} is (x₃= 14.5, y₃= -335, z₃= -171),

so the distance is 42.431mm for GSM/UMTS/LTE/NR antenna and Wi-Fi antenna.



PSLS=Peak SAR Location Separation

Ratio =[(Reported SAR_{Max.GSM/UMTS/LTE/NR}) 1.067W/kg +(Reported SAR_{Max.WiFi}) 0.350W/kg]^{3/2} /PSLS
 =0.0398<0.04 (for 1-g SAR)

So the Simultaneous transimition SAR with volum scan are not required for GSM/UMTS/LTE/NR antenna and Wi-Fi antenna and BT antenna.



11 Measurement Uncertainty

Per KDB 865664 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.

ANNEX A: Test Layout



Tissue Simulating Liquids

For the measurement of the field distribution inside the flat phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For Head and Body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Picture 3 and Picture 4.



Picture 3: liquid depth in the head Phantom



Picture 4: Liquid depth in the flat Phantom



ANNEX B: System Check Results

Please See R2009A0668 ANNEX B System Check Results & ANNEX C Graph Results

ANNEX C: Highest Graph Results

Please See R2009A0668 ANNEX B System Check Results & ANNEX C Graph Results



ANNEX D: Probe Calibration Certificate



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Client **TA(Shanghai)**Certificate No: **Z20-60218****CALIBRATION CERTIFICATE**Object **EX3DV4 - SN : 3677**Calibration Procedure(s)
FF-Z11-004-01
Calibration Procedures for Dosimetric E-field ProbesCalibration date: **July 06, 2020**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	16-Jun-20(CTTL, No.J20X04344)	Jun-21
Power sensor NRP-Z91	101547	16-Jun-20(CTTL, No.J20X04344)	Jun-21
Power sensor NRP-Z91	101548	16-Jun-20(CTTL, No.J20X04344)	Jun-21
Reference 10dBAttenuator	18N50W-10dB	10-Feb-20(CTTL, No.J20X00525)	Feb-22
Reference 20dBAttenuator	18N50W-20dB	10-Feb-20(CTTL, No.J20X00526)	Feb-22
Reference Probe EX3DV4	SN 3617	30-Jan-20(SPEAG, No.EX3-3617_Jan20/2)	Jan-21
DAE4	SN 1556	4-Feb-20(SPEAG, No.DAE4-1556_Feb20)	Feb-21
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGenerator MG3700A	6201052605	23-Jun-20(CTTL, No.J20X04343)	Jun-21
Network Analyzer E5071C	MY46110673	10-Feb-20(CTTL, No.J20X00515)	Feb-21

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: July 08, 2020

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z20-60218

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CALIBRATION LABORATORY

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Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i $\theta=0$ is normal to probe axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

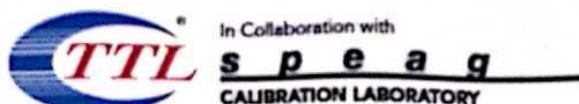
- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}: Assessed for E-field polarization $\theta=0$ ($f \leq 900\text{MHz}$ in TEM-cell; $f > 1800\text{MHz}$: waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,y,z}; A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800\text{MHz}$) and inside waveguide using analytical field distributions based on power measurements for $f > 800\text{MHz}$. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from $\pm 50\text{MHz}$ to $\pm 100\text{MHz}$.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).

Certificate No: Z20-60218

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:3677

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm($\mu V/(V/m)^2$) ^A	0.41	0.46	0.40	±10.0%
DCP(mV) ^B	100.7	102.6	102.1	

Modulation Calibration Parameters

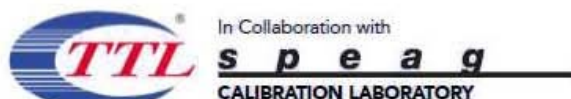
UID	Communication System Name		A dB	B dB· μV	C	D dB	VR mV	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	174.8	±2.0%
		Y	0.0	0.0	1.0		186.9	
		Z	0.0	0.0	1.0		173.5	

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of Norm X, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 4).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



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DASY/EASY – Parameters of Probe: EX3DV4 – SN:3677

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz] ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	41.9	0.89	9.78	9.78	9.78	0.40	0.75	±12.1%
835	41.5	0.90	9.38	9.38	9.38	0.21	1.11	±12.1%
1750	40.1	1.37	8.25	8.25	8.25	0.26	1.05	±12.1%
1900	40.0	1.40	7.90	7.90	7.90	0.28	1.06	±12.1%
2000	40.0	1.40	7.97	7.97	7.97	0.23	1.17	±12.1%
2300	39.5	1.67	7.69	7.69	7.69	0.66	0.68	±12.1%
2450	39.2	1.80	7.54	7.54	7.54	0.66	0.70	±12.1%
2600	39.0	1.96	7.26	7.26	7.26	0.74	0.67	±12.1%
3300	38.2	2.71	7.07	7.07	7.07	0.48	0.97	±13.3%
3500	37.9	2.91	7.03	7.03	7.03	0.49	0.93	±13.3%
3700	37.7	3.12	6.83	6.83	6.83	0.49	0.97	±13.3%
3900	37.5	3.32	6.76	6.76	6.76	0.40	1.20	±13.3%
4100	37.2	3.53	6.78	6.78	6.78	0.40	1.15	±13.3%
4400	36.9	3.84	6.47	6.47	6.47	0.40	1.20	±13.3%
4600	36.7	4.04	6.42	6.42	6.42	0.50	1.13	±13.3%
4800	36.4	4.25	6.35	6.35	6.35	0.45	1.25	±13.3%
4950	36.3	4.40	6.22	6.22	6.22	0.45	1.25	±13.3%
5250	35.9	4.71	5.55	5.55	5.55	0.50	1.15	±13.3%
5600	35.5	5.07	4.97	4.97	4.97	0.55	1.22	±13.3%
5750	35.4	5.22	5.00	5.00	5.00	0.55	1.27	±13.3%

^C Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequency below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

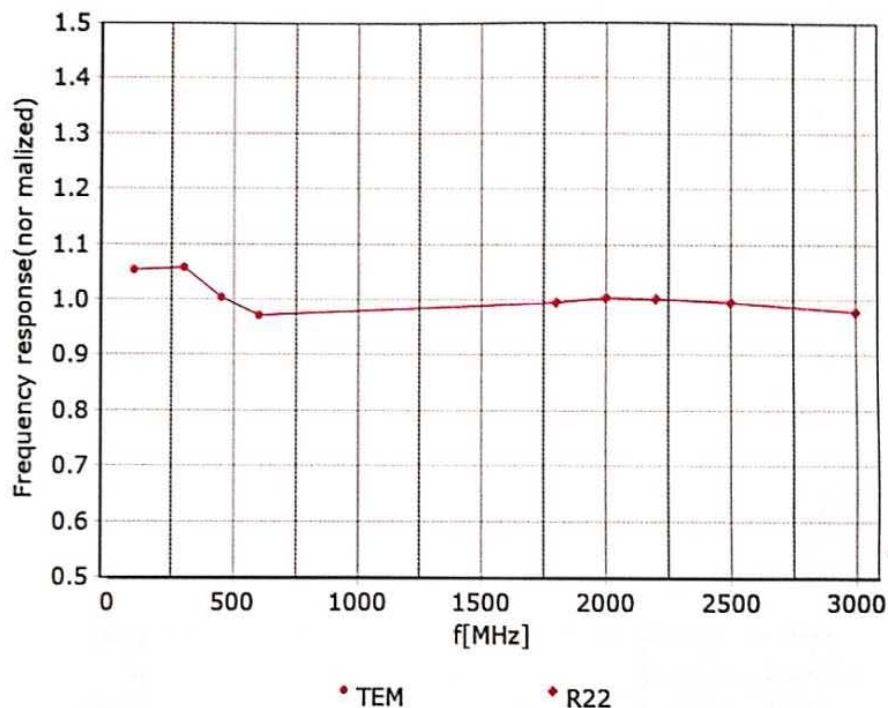
^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



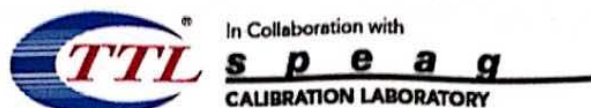
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Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: $\pm 7.4\%$ ($k=2$)

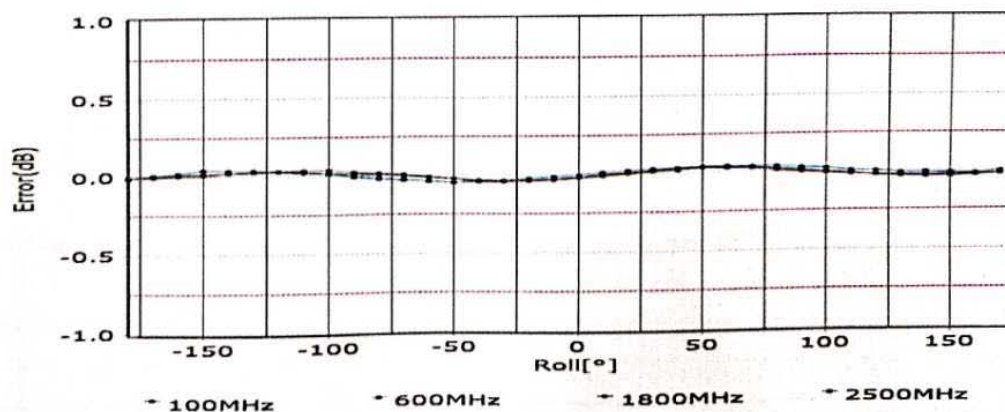
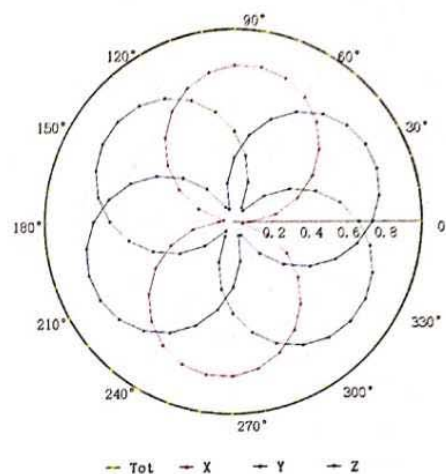
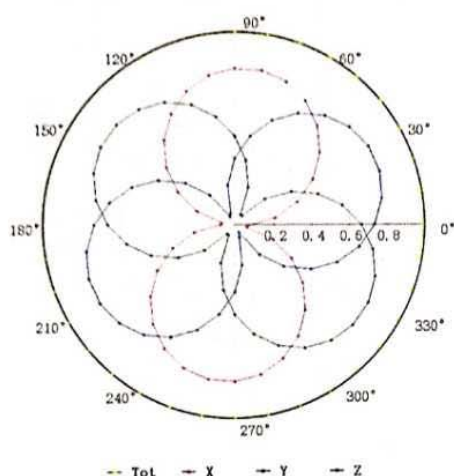


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Receiving Pattern (Φ), $\theta=0^\circ$

f=600 MHz, TEM

f=1800 MHz, R22



Uncertainty of Axial Isotropy Assessment: $\pm 1.2\%$ ($k=2$)

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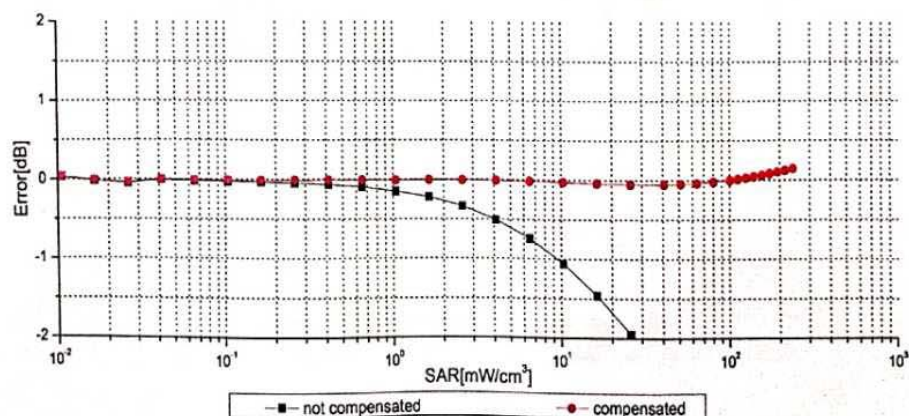
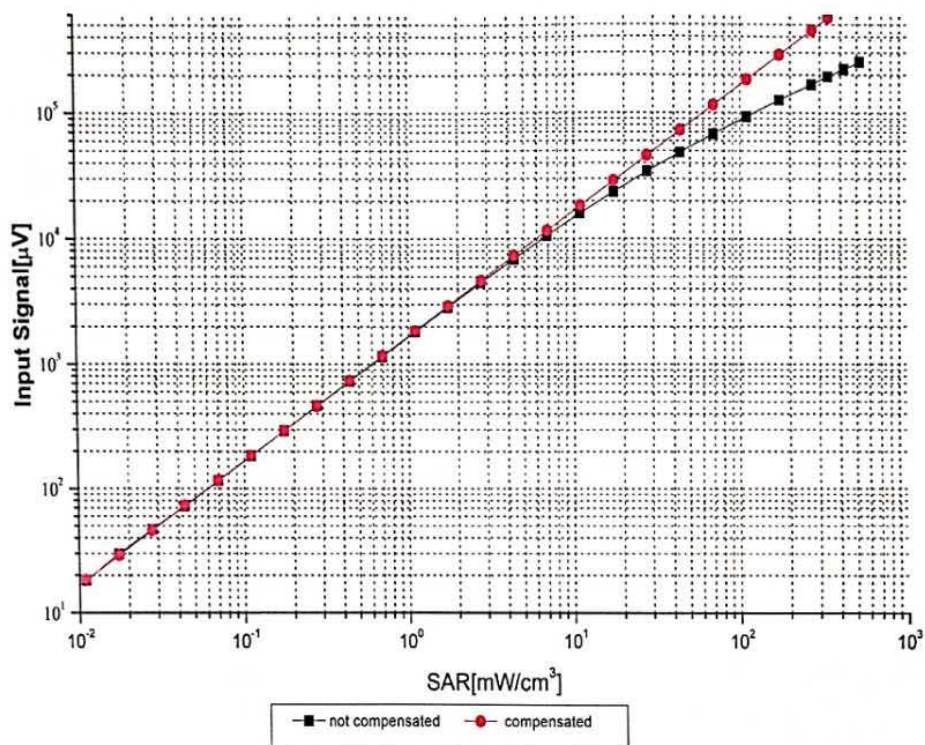
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Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f = 900 \text{ MHz}$)



Uncertainty of Linearity Assessment: $\pm 0.9\%$ ($k=2$)

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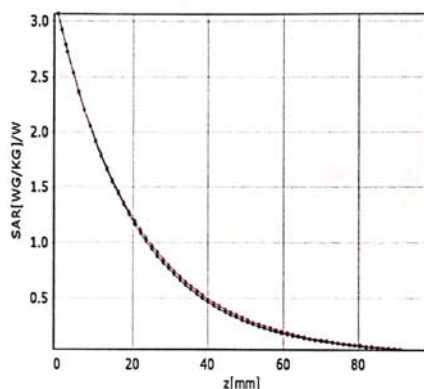
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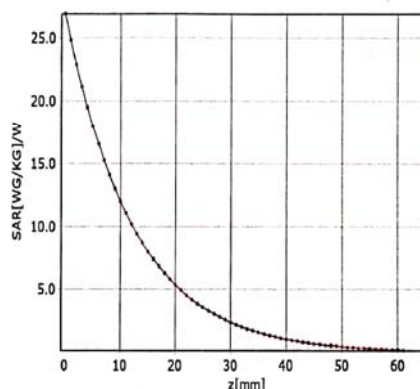
Conversion Factor Assessment

f=750 MHz,WGLS R9(H_convF)

f=1750 MHz,WGLS R22(H_convF)

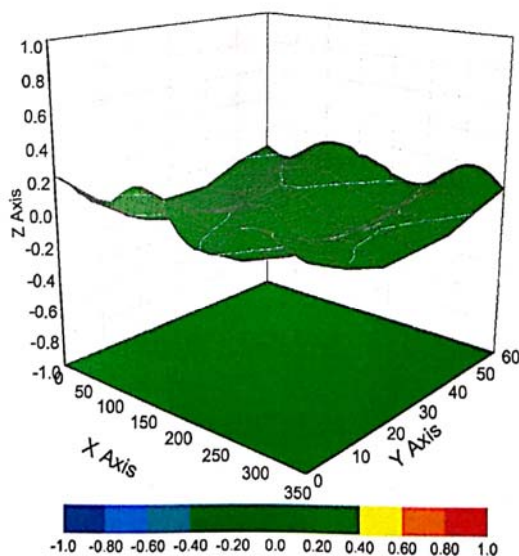


* analytical * measured

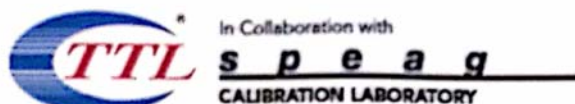


* analytical * measured

Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: $\pm 3.2\%$ ($k=2$)



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DASY/EASY – Parameters of Probe: EX3DV4 – SN:3677

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	115.7
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	10mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm



ANNEX E: D750V3 Dipole Calibration Certificate



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国际互认
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CNAS L0570

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Client **TA(Shanghai)**Certificate No: **Z20-60299****CALIBRATION CERTIFICATE**Object **D750V3 - SN: 1045**

Calibration Procedure(s) **FF-Z11-003-01**
Calibration Procedures for dipole validation kits

Calibration date: **August 28, 2020**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106276	12-May-20 (CTTL, No.J20X02965)	May-21
Power sensor NRP6A	101369	12-May-20 (CTTL, No.J20X02965)	May-21
Reference Probe EX3DV4	SN 3617	30-Jan-20(SPEAG,No.EX3-3617_Jan20)	Jan-21
DAE4	SN 771	10-Feb-20(CTTL-SPEAG,No.Z20-60017)	Feb-21
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	25-Feb-20 (CTTL, No.J20X00516)	Feb-21
NetworkAnalyzer E5071C	MY46110673	10-Feb-20 (CTTL, No.J20X00515)	Feb-21

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: September 3, 2020

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z20-60299

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor $k=2$, which for a normal distribution Corresponds to a coverage probability of approximately 95%.



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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	41.3 $\pm$ 6 %	0.87 mho/m $\pm$ 6 %
Head TSL temperature change during test	<1.0 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.37 W/kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.57 W/kg $\pm$ 18.7 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.4 $\pm$ 6 %	0.94 mho/m $\pm$ 6 %
Body TSL temperature change during test	<1.0 °C	---	---

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.12 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	8.58 W/kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.41 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.70 W/kg $\pm$ 18.7 % (k=2)

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.3Ω- 2.29jΩ
Return Loss	- 26.6dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.7Ω- 4.58jΩ
Return Loss	- 25.6dB

General Antenna Parameters and Design

Electrical Delay (one direction)	0.900 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 08.28.2020

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1045

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.873 \text{ S/m}$; $\epsilon_r = 41.28$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(10.07, 10.07, 10.07) @ 750 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.97 V/m; Power Drift = -0.02 dB

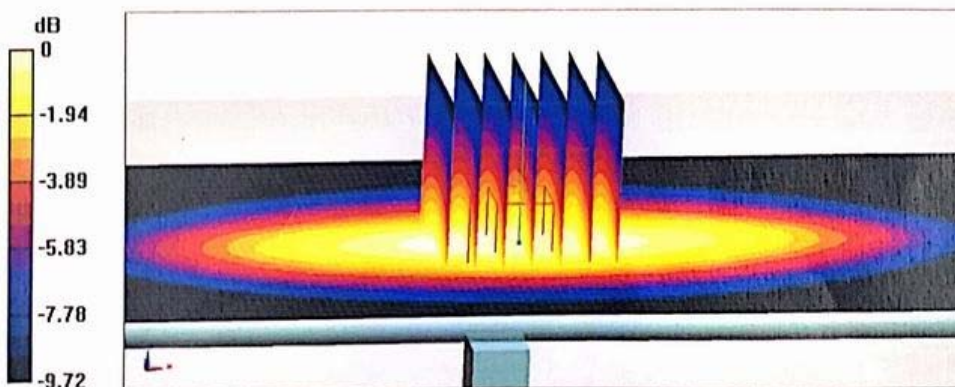
Peak SAR (extrapolated) = 3.00 W/kg

SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.38 W/kg

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 68.7%

Maximum value of SAR (measured) = 2.71 W/kg



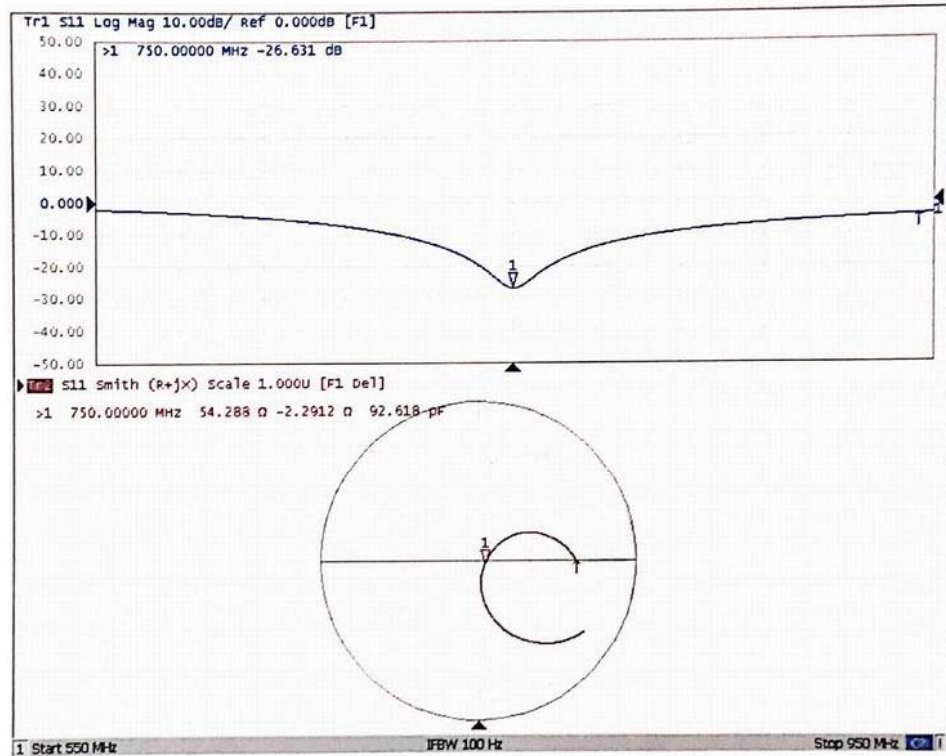
0 dB = 2.71 W/kg = 4.33 dBW/kg



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Impedance Measurement Plot for Head TSL





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DASY5 Validation Report for Body TSL

Date: 08.28.2020

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1045

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.94 \text{ S/m}$; $\epsilon_r = 54.36$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.8, 9.8, 9.8) @ 750 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 53.84 V/m; Power Drift = -0.02 dB

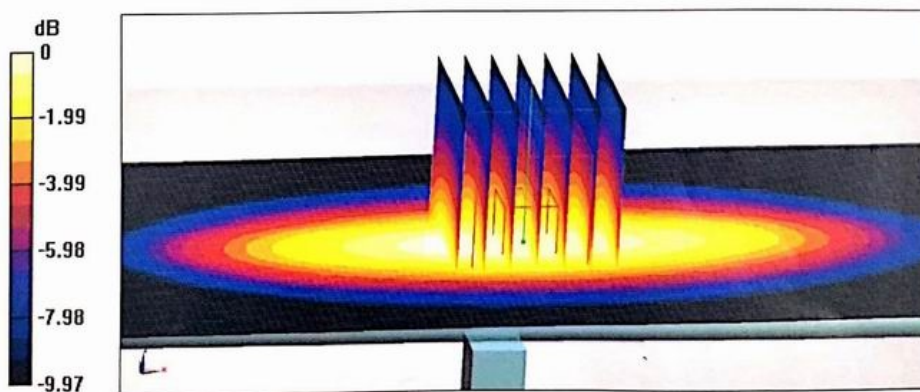
Peak SAR (extrapolated) = 3.14 W/kg

SAR(1 g) = 2.12 W/kg; SAR(10 g) = 1.41 W/kg

Smallest distance from peaks to all points 3 dB below = 18.4 mm

Ratio of SAR at M2 to SAR at M1 = 67.9%

Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 4.47 dBW/kg

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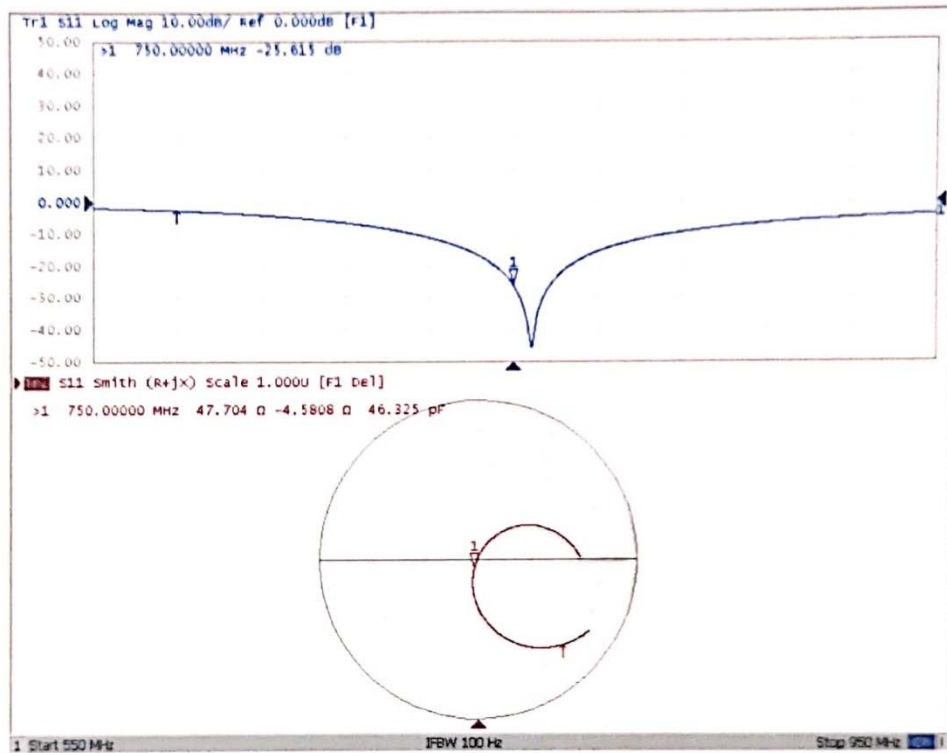
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Impedance Measurement Plot for Body TSL





ANNEX F: D835V2 Dipole Calibration Certificate



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CNAS L0570

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Client **TA(Shanghai)**Certificate No: **Z20-60296****CALIBRATION CERTIFICATE**Object **D835V2 - SN: 4d020**

Calibration Procedure(s) **FF-Z11-003-01**
Calibration Procedures for dipole validation kits

Calibration date: **August 28, 2020**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106276	12-May-20 (CTTL, No.J20X02965)	May-21
Power sensor NRP6A	101369	12-May-20 (CTTL, No.J20X02965)	May-21
Reference Probe EX3DV4	SN 3617	30-Jan-20(SPEAG,No.EX3-3617_Jan20)	Jan-21
DAE4	SN 771	10-Feb-20(CTTL-SPEAG,No.Z20-60017)	Feb-21
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	25-Feb-20 (CTTL, No.J20X00516)	Feb-21
NetworkAnalyzer E5071C	MY46110673	10-Feb-20 (CTTL, No.J20X00515)	Feb-21

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: September 3, 2020

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z20-60296

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM _{x,y,z}
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor $k=2$, which for a normal distribution Corresponds to a coverage probability of approximately 95%.



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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	41.2 $\pm$ 6 %	0.88 mho/m $\pm$ 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.65 W/kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.37 W/kg $\pm$ 18.7 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	55.0 $\pm$ 6 %	0.96 mho/m $\pm$ 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.42 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.76 W/kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.40 W/kg $\pm$ 18.7 % (k=2)

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.8Ω+ 1.73jΩ
Return Loss	- 26.2dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.0Ω- 2.47jΩ
Return Loss	- 26.2dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.258 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 08.28.2020

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835$ MHz; $\sigma = 0.877$ S/m; $\epsilon_r = 41.23$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.66, 9.66, 9.66) @ 835 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.09 V/m; Power Drift = -0.03 dB

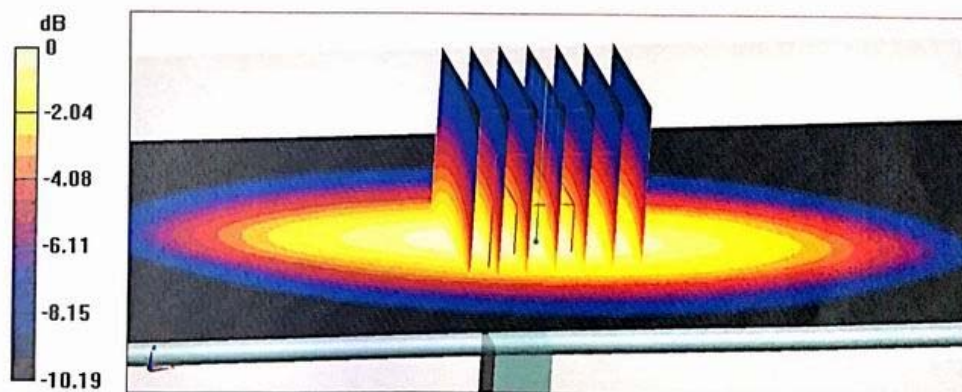
Peak SAR (extrapolated) = 3.46 W/kg

SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.57 W/kg

Smallest distance from peaks to all points 3 dB below = 16.6 mm

Ratio of SAR at M2 to SAR at M1 = 68.1%

Maximum value of SAR (measured) = 3.12 W/kg



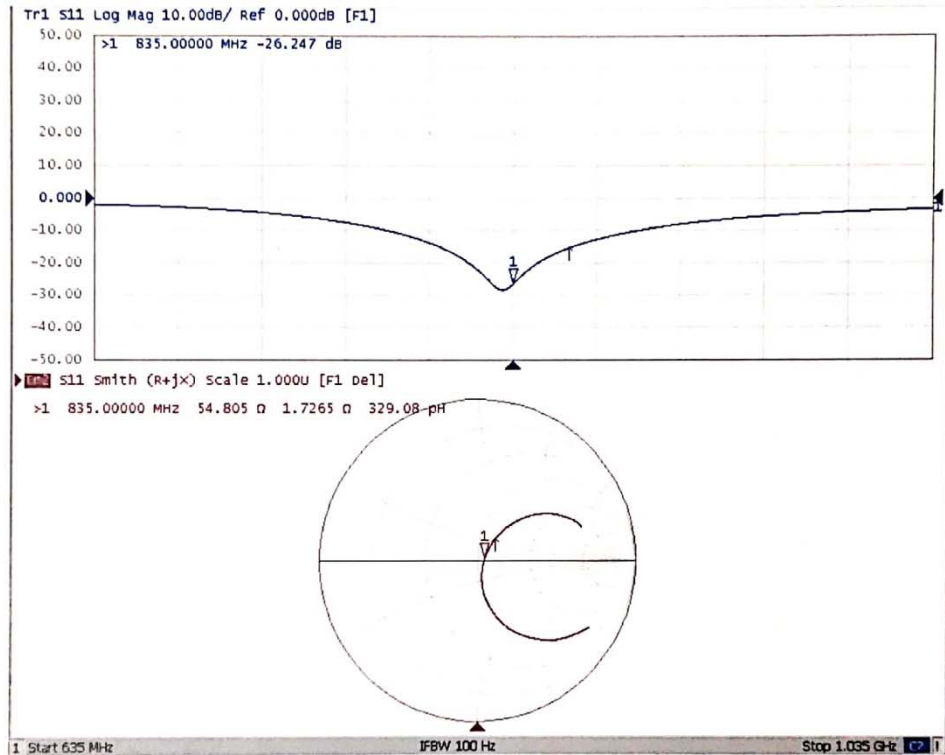
0 dB = 3.12 W/kg = 4.94 dBW/kg



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Impedance Measurement Plot for Head TSL





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DASY5 Validation Report for Body TSL

Date: 08.28.2020

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.958 \text{ S/m}$; $\epsilon_r = 55.02$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.53, 9.53, 9.53) @ 835 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 56.88 V/m; Power Drift = -0.01 dB

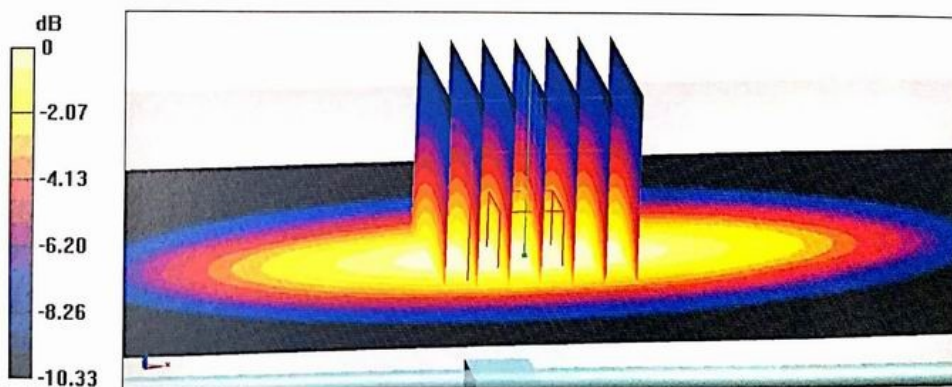
Peak SAR (extrapolated) = 3.65 W/kg

SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.59 W/kg

Smallest distance from peaks to all points 3 dB below = 15.8 mm

Ratio of SAR at M2 to SAR at M1 = 66.5%

Maximum value of SAR (measured) = 3.24 W/kg



0 dB = 3.24 W/kg = 5.11 dBW/kg

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Impedance Measurement Plot for Body TSL

