74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea
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SAR TEST REPORT

Applicant Name: **SAMSUNG Electronics Co., Ltd.** 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677 Rep. of Korea	**Date of Issue:** 12. 26, 2018 **Test Report No.:** HCT-SR-1812-FC002 **Test Site: HCT CO., LTD.**

FCC ID: A3LSMM105F

Equipment Type:	**Mobile Phone**
Application Type	**Certification**
FCC Rule Part(s):	**CFR §2.1093**
Model Name:	**SM-M105F/DS**
Date of Test:	**12/17/2018 ~ 12/22/2018**

This device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in FCC KDB procedures and had been tested in accordance with the measurement procedures specified in FCC KDB procedures.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested By	**Reviewed By**
In-ho, Park **Test Engineer** **SAR Team** **Certification Division**	**Yun-jeang, Heo** **Technical Manager** **SAR Team** **Certification Division**

DOCUMENT HISTORY

Rev.	DATE	DESCRIPTION
HCT-SR-1812-FC002	12. 26, 2018	First Approval Report

Table of Contents

1. ATTESTATION OF TEST RESULT OF DEVICE UNDER TEST

Test Laboratory	
Company Name:	HCT Co., LTD
Address:	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of Korea
Telephone:	+82 31 645 6300
Fax.:	+82 31 645 6401

Attestation of SAR test result	
Applicant Name:	SAMSUNG Electronics Co., Ltd.
FCC ID:	A3LSMM105F
Model:	SM-M105F/DS
EUT Type:	Mobile Phone
Application Type:	Certification

The Highest Reported SAR

Band	Tx. Frequency (MHz)	Equipment Class	SAR (W/kg) 1g Head (W/Kg)	1g Body-Worn (W/Kg)	1g Hotspot (W/Kg)
GSM/GPRS/EDGE 850	824.2 ~ 848.8	TNE	0.13	0.17	0.35
UMTS 850	826.4 ~ 846.6	TNE	<0.10	<0.10	<0.10
LTE Band 5 (Cell)	824.7 ~ 848.3	TNE	0.17	0.19	0.46
LTE TDD Band 41	2 498.5 ~ 2 687.5	TNE	0.11	<0.10	0.21
802.11b	2 412 ~ 2 472	DTS	0.18	0.14	0.29
Bluetooth	2 402 ~ 2 480	DSS	<0.10	<0.10	<0.10
Simultaneous SAR per KDB 690783 D01v01r03			0.35	0.34	0.74
Date(s) of Tests:	12/17/2018 ~ 12/22/2018				

2. DEVICE UNDER TEST DESCRIPTION

2.1 DUT specification

Device Wireless specification overview		
Band & Mode	**Operating Mode**	**Tx Frequency**
GSM850	Voice / Data	824.2 ~ 848.8 MHz
UMTS 850	Voice / Data	826.4 ~ 846.6 MHz
LTE Band 5 (Cell)	Voice / Data	824.7 ~ 848.3 MHz
LTE TDD Band 41	Voice / Data	2 498.5 ~ 2 687.5 MHz
2.4 GHz WLAN	Voice / Data	2 412 ~ 2 472 MHz
Bluetooth / LE 4.2	Data	2 402 ~ 2 480 MHz

Device Description		
Device Dimension	Overall (Length x Width): 155.7 mm x 75.8 mm Overall Diagonal: 165.5 mm Display Diagonal: 153.2 mm	
Battery Options:	Standard (Li-ion Polymer Battery)	
	Battery Model Name: EB-BA750ABN	
Device Serial Numbers	Mode	Serial Number
	GSM 850, UMTS 850, LTE Band 5/ 41	R38KB0M5H4M
	2.4 GHz WLAN/ Bluetooth	R38KB0M5HHL
	The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics are within operational tolerances expected for production units.	

2.2 Power Reduction for SAR

This device uses an independent fixed level power reduction mechanism for WLAN modes during held-to-ear scenarios. Per FCC Guidance, the held-to-ear exposure conditions were evaluated at reduced power according to the head SAR Positions described in IEEE1528-2013. Detailed descriptions of the power reduction mechanism are include in the operational description.

The reduced powers for the power reduction mechanisms were conformed via conducted power measurements at the RF Port .

2.3 Nominal and Maximum Output Power Specifications

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB publication 447498 D01v06.

2.3.1 Maximum PCE Output Power

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 Tx Slot	1 Tx Slot	2 Tx Slot	3 Tx Slot	4 Tx Slot	1 Tx Slot	2 Tx Slot	3 Tx Slot	4 Tx Slot
GSM/GPRS/ EDGE 850	Maximum	33.5	33.5	31.5	30.5	29.5	29.0	26.5	25.0	23.5
	Nominal	32.5	32.5	30.5	29.5	28.5	28.0	25.5	24.0	22.5

Mode/Band		Modulated Average (dBm)		
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA
UMTS Band 5 (850 MHz)	Maximum	24.0	24.0	21.0
	Nominal	23.0	23.0	20.0

Mode / Band		Modulated Average (dBm)
LTE Band 5 (Cell)	Maximum	25.0
	Nominal	24.0
LTE TDD Band 41	Maximum	23.5
	Nominal	22.5

2.3.2 Maximum WLAN/ Bluetooth Power

Mode / Band			Modulated Average (dBm)		
Mode	Channel		802.11b	802.11g	802.11n
2.4 GHz WIFI (Inactive)	Ch.1	Maximum	19.0	16.0	16.0
		Nominal	18.0	15.0	15.0
	Ch.2 ~ 10	Maximum	19.0	18.0	18.0
		Nominal	18.0	17.0	17.0
	Ch.11	Maximum	19.0	15.0	15.0
		Nominal	18.0	14.0	14.0
	Ch.12	Maximum	6.0	6.0	6.0
		Nominal	5.0	5.0	5.0
	Ch.13	Maximum	-5	-5	-5
		Nominal	-6	-6	-6

2.3.3 Reduced WLAN Power (Held to ear)

Mode / Band			Modulated Average (dBm)		
Mode	Channel		802.11b	802.11g	802.11n
2.4 GHz WIFI (Active)	Ch.1 ~11	Maximum	13.0	13.0	13.0
		Nominal	12.0	12.0	12.0
	Ch.12	Maximum	6.0	6.0	6.0
		Nominal	5.0	5.0	5.0
	Ch.13	Maximum	-5	-5	-5
		Nominal	-6	-6	-6

2.3.4 Maximum Bluetooth Power

Mode / Band			Modulated Average (dBm)
Bluetooth	DH5	Maximum	10.5
		Nominal	9.5
	2-DH5	Maximum	6.5
		Nominal	5.5
	3-DH5	Maximum	6.5
		Nominal	5.5
Bluetooth LE		Maximum	9.0
		Nominal	8.0

2.4 LTE information

<table>
<tr><th colspan="2">Item.</th><th colspan="5">Description</th></tr>
<tr><td rowspan="2">Frequency Range</td><td>LTE Band 5 (Cell)</td><td colspan="5">824.7 ~ 848.3 MHz</td></tr>
<tr><td>LTE TDD Band 41</td><td colspan="5">2 498.5 ~ 2 687.5 MHz</td></tr>
<tr><td rowspan="2">Channel Bandwidths</td><td>LTE Band 5 (Cell)</td><td colspan="5">1.4 MHz, 3 MHz, 5 MHz, 10 MHz</td></tr>
<tr><td>LTE TDD Band 41</td><td colspan="5">5 MHz, 10 MHz, 15 MHz, 20 MHz</td></tr>
<tr><td colspan="2">Channel Numbers & Freq.(MHz)</td><td colspan="2">Low</td><td>Mid</td><td colspan="2">High</td></tr>
<tr><td rowspan="4">LTE Band 5</td><td>1.4 MHz</td><td colspan="2">824.7 (20407)</td><td>836.5 (20525)</td><td colspan="2">848.3 (20643)</td></tr>
<tr><td>3 MHz</td><td colspan="2">825.5 (20415)</td><td>836.5 (20525)</td><td colspan="2">847.5 (20635)</td></tr>
<tr><td>5 MHz</td><td colspan="2">826.5 (20425)</td><td>836.5 (20525)</td><td colspan="2">846.5 (20625)</td></tr>
<tr><td>10 MHz</td><td colspan="2"></td><td>836.5 (20525)</td><td colspan="2"></td></tr>
<tr><td rowspan="4">LTE Band 41</td><td>5 MHz</td><td>2 498.5(39675)</td><td>2 545.8(40148)</td><td>2 593.0(40620)</td><td>2 640.3(41093)</td><td>2 687.5(41565)</td></tr>
<tr><td>10 MHz</td><td>2 501.0(39700)</td><td>2 547.0(40160)</td><td>2 593.0(40620)</td><td>2 639.0(41080)</td><td>2 685.0(41540)</td></tr>
<tr><td>15 MHz</td><td>2 503.5(39725)</td><td>2 548.3(41073)</td><td>2 593.0(40620)</td><td>2 637.8(41068)</td><td>2 682.5(41515)</td></tr>
<tr><td>20 MHz</td><td>2 506.0(39750)</td><td>2 549.5(40185)</td><td>2 593.0(40620)</td><td>2 636.5(41055)</td><td>2 680.0(41490)</td></tr>
<tr><td colspan="2">UE Category</td><td colspan="5">LTE Rel. 8, Category 4</td></tr>
<tr><td colspan="2">Modulations Supported in UL</td><td colspan="5">QPSK, 16 QAM</td></tr>
<tr><td colspan="2">LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3</td><td colspan="5">Yes</td></tr>
<tr><td colspan="2">A-MPR disabled for SAR Testing.</td><td colspan="5">Yes</td></tr>
<tr><td colspan="2">LTE Carrier Aggregation</td><td colspan="5">This device does not support downlink and uplink Carrier Aggregation for US region.</td></tr>
<tr><td colspan="2">LTE Release 10 information</td><td colspan="5">This device does not support full CA features on 3GPP Release 10. The following LTE Release 10 features are not supported. Uplink and Downlink Carrier aggregations, Relay, HetNet, Enhanced MIMO, eICI, WiFi offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.</td></tr>
</table>

2.5 Test Methodology and Procedures

The tests documented in this report were performed in accordance with IEEE Standard 1528-2013 and the following published KDB procedures.

- FCC KDB Publication 941225 D01 3G SAR Procedures v03r01
- FCC KDB Publication 941225 D06 Hot Spot SAR v02r01
- FCC KDB Publication 941225 D05 SAR for LTE Devices v02r05
- FCC KDB Publication 941225 D05A LTE Rel.10 KDB Inquiry sheet v01r02
- FCC KDB Publication 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB Publication 447498 D01 General SAR Guidance v06
- FCC KDB Publication 648474 D04 Handset SAR v01r03
- FCC KDB Publication 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- FCC KDB Publication 865664 D02 SAR Reporting v01r02
- October 2013 TCB Workshop Notes (GPRS testing criteria)
- April 2015 TCB Workshop Notes (Simultaneous transmission summation clarified)

2.6 DUT Antenna Locations

The overall dimensions of this device are > 9 X 5 cm. A diagram showing device antenna can be found in SAR_setup_photos. Since the diagonal dimension of this device is > 160 mm and < 200 mm, it is considered a “phablet”.

This model allows users to exchange data or media files with other Bluetooth enabled devices using Bluetooth, which means they can connect to other Bluetooth enabled devices via Bluetooth tethering. Therefore, SAR test was performed for additional simultaneous transmissions.
Head and Bluetooth Tethering SAR were evaluated for BT BR tethering applications.

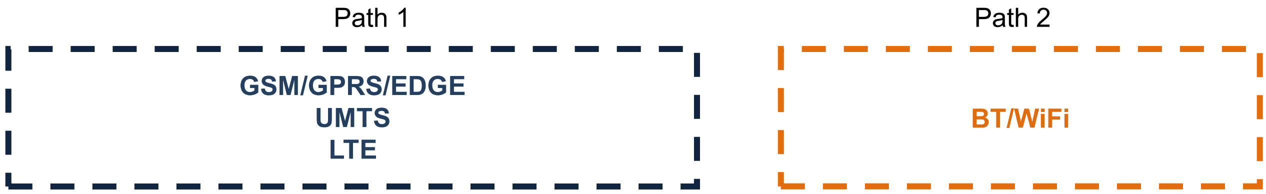
Mode	Rear	Front	Left	Right	Bottom	Top
GSM/GPRS/EDGE 850	Yes	Yes	Yes	Yes	Yes	No
UMTS 850	Yes	Yes	Yes	Yes	Yes	No
LTE Band 5	Yes	Yes	Yes	Yes	Yes	No
LTE Band 41	Yes	Yes	Yes	No	Yes	No
2.4 GHz WLAN	Yes	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	Yes	No	No	Yes

Particular EUT edges were not required to be evaluated for Bluetooth Tethering and Hotspot SAR if the edges were > 25 mm from the transmitting antenna according to FCC KDB 941225 D06v02r01 on page 2. The distance between the transmit antennas and the edges of the device are included in the filing.

* Note: All test configurations are based on front view position.

2.7 SAR Summation Scenario

According to FCC KDB 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the EUT are shown below paths and are mode in same rectangle to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.



Simultaneous transmission paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB 447498 D01v06.

Simultaneous Transmission Scenarios				
Applicable Combination	Head	Body-Worn	Hotspot	Extremity
GSM Voice + 2.4 GHz WiFi	Yes	Yes	N/A	Yes
GSM Voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes
GPRS + 2.4 GHz WiFi	N/A	N/A	Yes	Yes
GPRS + Bluetooth	N/A	N/A	Yes^	Yes
UMTS + 2.4 GHz WiFi	Yes	Yes	Yes	Yes
UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes
LTE + 2.4 GHz WiFi	Yes	Yes	Yes	Yes
LTE+ 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes

1. WLAN 2.4 GHz and Bluetooth share antenna path and cannot transmit simultaneously.
2. All licensed modes share the same antenna path and cannot transmit simultaneously.
3. UMTS +WLAN scenario also represents the UMTS Voice/DATA + WLAN 2.4GHz hotspot scenario.
4. GPRS/EDGE does not support pre-installed VOIP applications.
5. The highest reported SAR for each exposure condition is used for SAR summation purpose.
6. Wi-Fi Hotspot and WiFi Direct are supported for WLAN 2.4GHz.
7. ^ Bluetooth tethering is considered.
8. This device supports VOLTE and VoWIFI.

2.8 SAR Test Considerations

2.8.1 Bluetooth LE

Per FCC KDB 447498 D01v06, The SAR exclusion threshold for distance < 50mm is defined by the following equation:

$$\frac{MaxPowerofChannel(mW)}{TestSeparationDistance(mm)} * \sqrt{Frequency(GHz)} \leq 3.0(1g\ \ SAR), 7.5(10g\ \ SAR)$$

Mode		Frequency	Maximum Allowed Power	Separation Distance	≤ 3.0	≤ 7.5
		[MHz]	[mW]	[mm]	1-g SAR	10-g SAR
Bluetooth LE	Head SAR	2 480	8.0	5	2.5	
	Body Worn SAR		8.0	15	0.8	
	Tethering SAR		8.0	10	1.3	
	Extremity SAR		8.0	5		2.5

Based on the maximum conducted power of Bluetooth LE and antenna to use separation distance, Bluetooth LE SAR was not required [(8/5)*√2.480] = 2.5≤3.0, [(8/15)*√2.480] = 0.8≤3.0 for 1-g SAR, [(8/10)*√2.480] = 1.3≤3.0 for 1-g SAR, [(8/5)*√2.480] = 2.5≤7.5 for 10-g SAR.

The Reported SAR for WLAN and Bluetooth

The Reported SAR = The Measured SAR *- $\frac{Maximum\ \ tune\text{-}up\ \ (mW)}{Measured\ \ Conducted\ \ Power(mW)}$ * Duty factor

2.8.2 Licensed Transmitter(s)

GSM/GPRS/EDGE DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v03r01.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r05.

Per FCC KDB 648474 D04v01r03, this device is considered a “Phablet” since the diagonal dimension is greater than 160 mm and less than 200 mm. Therefore, extremity SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR >1.2 W/kg. When hotspot mode applies, 10g SAR required only for the surfaces and edges with hotspot mode scaled to the maximum output power (including tolerance) is 1g SAR > 1.2 W/kg.

Per FCC KDB 941225 D01v03r01, 12.2 kbps RMC is the primary mode and HSPA (HSUPA/HSDPA with RMC) is the secondary mode.

Per FCC KDB 941225 D01v03r01, The SAR test exclusion is applied to the secondary mode by the following equation.

$$Adjusted\ SAR = Highest\ Reported\ SAR * \frac{Secondary\ Max\ tune-up\ (mW)}{Primary\ Max\ tune\ tune-up(mW)} \leq 1.2\ \text{W/kg}.$$

Based on the highest Reported SAR, the secondary mode is not required.

Per FCC KDB 690783 D01 SAR Listings on Grants v01r03 and KDB 447498 D01 General RF Exposure Guidance v06 The SAR numbers listed must be consistent with the highest reported test results required by the published RF exposure KDB procedures. When the measured SAR is not at the maximum tune-up tolerance limit or maximum output power allowed for production units, the measured results are scaled to the maximum conditions to determine compliance; the scaled results are referred to as the reported SAR.

$$\text{The Reported SAR} = \text{The Measured SAR} * \frac{Maximum\ tune-up\ (mW)}{Measured\ Conducted\ Power(mW)}$$

3. INTRODUCTION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (d*W*) absorbed by (dissipated in) an incremental mass (d*m*) contained in a volume element (d*V*) of a given density (*r*). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right)$$

Figure 1. SAR Mathematical Equation

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

$$SAR = \sigma E^2 / \rho$$

Where:
σ = conductivity of the tissue-simulant material (S/m)
ρ = mass density of the tissue-simulant material (kg/㎥)
E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

4. DESCRIPTION OF TEST EQUIPMENT

4.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.2).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC with Windows XP or Windows 7 is working with SAR Measurement system DASY4 & DASY5, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

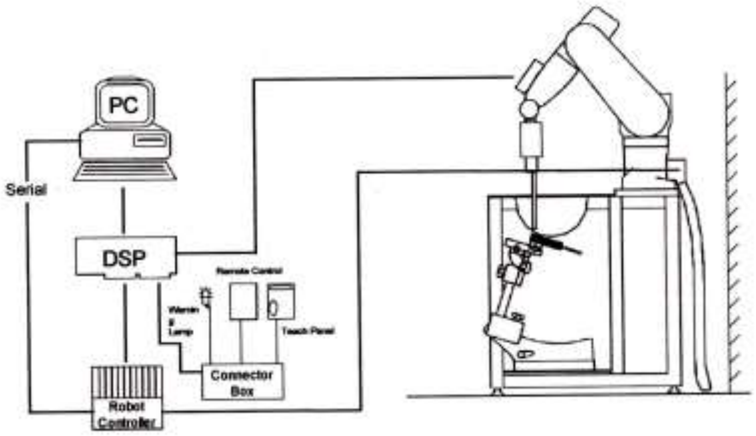


Figure 2. HCT SAR Lab. Test Measurement Set-up

The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in.

5. SAR MEASUREMENT PROCEDURE

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013

1. The SAR distribution at the exposed side of the head or body was measured at a distance no more than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the DUT's head and body area and the horizontal grid resolution was depending on the FCC KDB 865664 D01v01r04 table 4-1 & IEEE 1528-2013.

2. Based on step, the area of the maximum absorption was determined by sophisticated interpolations routines implemented in DASY software. When an Area Scan has measured all reachable point. DASY system computes the field maximal found in the scanned are, within a range of the maximum. SAR at this fixed point was measured and used as a reference value.

3. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB 865664 D01v01r04 table 4-1 and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (reference from the DASY manual.)

   a. The data at the surface were extrapolated, since the center of the dipoles is no more than 2.7 mm away from the tip of the probe (it is different from the probe type) and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

   b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan. If the value changed by more than 5 %, the SAR evaluation and drift measurements were repeated.

Area scan and zoom scan resolution setting follow KDB 865664 D01v01r04 quoted below.

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5±1 mm</td><td>$\frac{1}{2}\cdot\delta\cdot\ln(2)\pm0.5$ mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30°±1°</td><td>20°±1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan Spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤15 mm
2-3 GHz: ≤12 mm</td><td>3-4 GHz: ≤12 mm
4-6 GHz: ≤10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="3">Maximum zoom scan Spatial resolution: Δx_{zoom}, Δy_{zoom}</td><td>≤ 2 GHz: ≤8mm
2-3 GHz: ≤5mm*</td><td>3-4 GHz: ≤5 mm*
4-6 GHz: ≤4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan Spatial resolution normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{zoom}(n)$</td><td>≤ 5 mm</td><td>3-4 GHz: ≤4 mm
4-5 GHz: ≤3 mm
5-6 GHz: ≤2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{zoom}(1)$: between 1 st two Points closest to phantom surface</td><td>≤ 4 mm</td><td>3-4 GHz: ≤3 mm
4-5 GHz: ≤2.5 mm
5-6 GHz: ≤2 mm</td></tr>
<tr><td>$\Delta z_{zoom}(n>1)$: between subsequent Points</td><td colspan="2">$\leq 1.5\cdot\Delta z_{zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3-4 GHz: ≥28 mm
4-5 GHz: ≥25 mm
5-6 GHz: ≥22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

6. DESCRIPTION OF TEST POSITION

6.1 EAR REFERENCE POINT

Figure 6-2 shows the front, back and side views of the SAM phantom. The center-of-mouth reference point is labeled “M”, the left ear reference point (ERP) is marked “LE”, and the right ERP is marked “RE.” Each ERP is on the B-M (back-mouth) line located 15 mm behind the entrance-to-ear-canal (EEC) point, as shown in Figure 6-1. The Reference Plane is defined as passing through the two ear reference point and point M. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (See Figure 5-1), Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning.

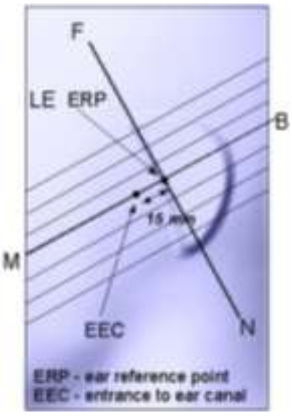


Figure 6-1
Close-up side view of ERP

6.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The device under test was placed in a normal operating position with the acoustic output located along the “vertical centerline” on the front of the device aligned to the “ear reference point”(see Figure 6-3). The acoustic output was than located at the same level as the center of the ear reference point. The device under test was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.

Figure 6-2
Front, back and side views of SAM Twin Phantom

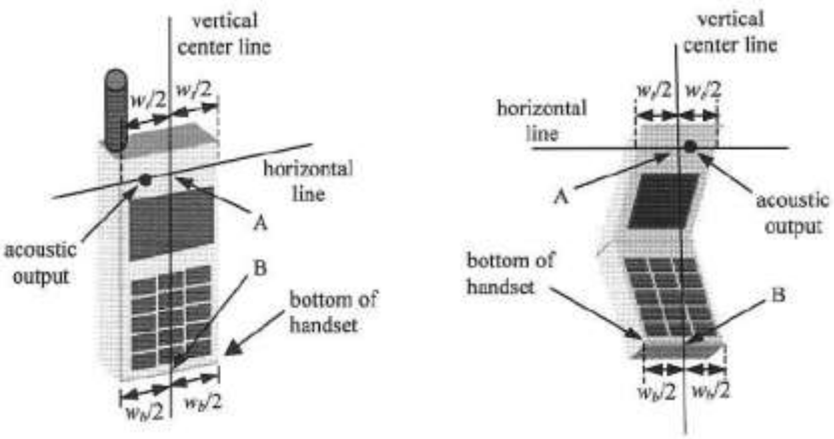


Figure 6-3. Handset vertical and horizontal reference lines

6.3 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameter; relative permittivity ε=3 and loss tangent σ =0.02.

6.4 Position for cheek

Figure 6.4. shows cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

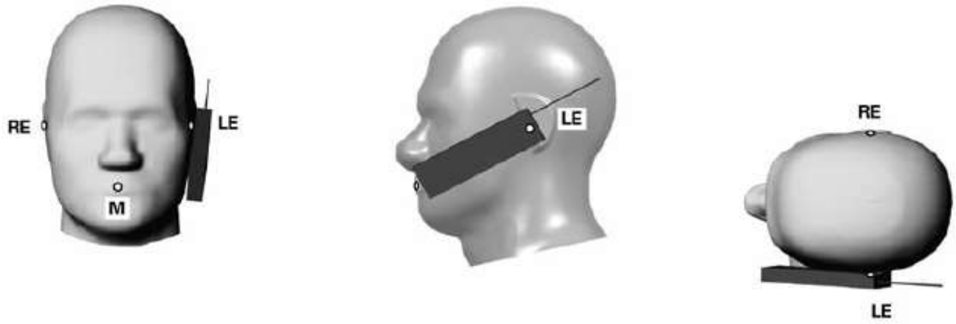


Figure 6.4 Cheek/ Touch position of the wireless device

6.5 Definition of the "tilted" position

Figure 6.5. shows tilted position. Place the device in the cheek position. Then while maintaining the orientation of the device, retract the device parallel to the reference plane far enough away from the phantom to enable a rotation of the device by 15˚

Figure 6.5. Tilt 15˚ position of the wireless device

6.6 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-dips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-6). Per FCC KDB Publication 648474 D04v01r03 Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in Body-worn accessories. The Body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for Body-worn accessory SAR compliance, without a headset connected to it.. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body- worn accessory with a headset attached to the handset.

Figure 6-6
Sample Body-Worn Diagram

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-dip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (L x W ≥ 9cmx5 cm) are based on *a* composite test separation distance of 10 mm from the front back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the Body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some Body-worn accessory SAR tests.

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

6.8 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions: i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear. the phablets procedures outlined in KDB Publication 648474 D04 v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worm accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna ≤25 mm from that surface or edge, in direct contact with the phantom, for 10-g SAR. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g SAR is required only for the surfaces and edges with hotspot mode scaled to the maximum output power (including tolerance) is 1-g SAR > 1.2 W/kg.

6.9 Bluetooth tethering Configurations

Per May 2017 TCBC Workshop documents When Bluetooth tethering applies ,simultaneous transmission SAR needs consideration

This model allows users to exchange data or media files with other Bluetooth enabled devices using Bluetooth, which means they can connect to other Bluetooth enabled devices via Bluetooth tethering.
Therefore, SAR test was performed for additional simultaneous transmissions.
Head and Bluetooth tethering SAR were evaluated for BT BR tethering applications

7. RF EXPOSURE LIMITS

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population	CONTROLLED ENVIRONMENT Occupational
	(W/kg) or (mW/g)	(W/kg) or (mW/g)
SPATIAL PEAK SAR * (Head)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00

NOTES:

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

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

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

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

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

8. FCC SAR GENERAL MEASUREMENT PROCEDURES

Power Measurements for licensed transmitters are performed using a base simulator under digital average power.

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as Reported SAR. The highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

8.2 3G SAR Test Reduction Procedure

8.2.1 GSM, GPRS AND EDGE

The following procedures may be considered for each frequency band to determine SAR test reduction for devices operating in GSM/GPRS/EDGE modes to demonstrate RF exposure compliance. GSM voice mode transmits with 1 time-slot. GPRS and EDGE may transmit up to 4 time slots in the 8 time-slot frame according to the multi-slot class implemented in a device.

8.2.2 SAR Test Reduction

In FCC KDB 941225 D01v03r01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

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

8.3 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB 941225 D01v03r01 - 3G SAR Measurement Procedures
The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluation SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement Software calculates a reference point at the start and end of the test to Cheek for power drifts. If conducted Power deviations of more than 5 % occurred, the tests were repeated.

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in sec. 5.2 of 3GPP TS 34.121, using the appropriate RMC with TPC (transmit power control) set to all “1s” or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

8.4.2 Head SAR Measurements

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

8.4.3 Body SAR measurements

SAR for body exposure configurations is measured using the 12.2kbps RMC with the TPC bits all “1s”. the 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using and applicable RMC configuration with the corresponding spreading code or DPDCHn, for the highest reported SAR configuration in 12.2kbps RMC.

8.4.4 SAR Measurements with Rel. 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using and FRC with H-SET 1 in Sub-test and a 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to release 6 HSPA test procedures. 8.4.5 SAR Measurement with Rel.6 HSUPA The 3G SAR test Reduction Procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, Using H-Set 1 and QPSK for FRC and a 12.2kbps RMC configured in Test Loop Mode 1 and Power Control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

8.4.5 SAR Measurements with Rel. 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

8.5 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r05 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluation SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

8.5.1 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.

8.5.2 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.

8.5.3 A-MPR

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

8.5.4 Required RB Size and RB offsets for SAR testing

According to FCC KDB 941225 D05v02r05

a. Per sec 4.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
    i. The required channel and offset combination with the highest maximum output power is required for SAR.
    ii. When the reported SAR is ≤ 0.8 W/Kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
    iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
b. Per Sec 4.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Sec 4.2.1.

c. Per Sec. 4.2.3, QPSK SAR is not required for the 100% all0cation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
d. Per Sec. 4.2.4 and 4.3, SAR test for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sec. 4.2.1 through 4.2.3 is less than or equal to 1/2 dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/Kg.

8.5.5 LTE(TDD) Considerations

According to KDB 941225 D05v02r05, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33 %) using Uplink-downlink configuration 0 and Special subframe configuration 6.

LTE TDD Band 41 supports 3GPP TS 36.211 section 4.2 for Type 2 Frame and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special sub frame configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

<table>
<tr><th rowspan="3">Special subframe configuration</th><th colspan="3">Normal cyclic prefix in downlink</th><th colspan="3">Extended cyclic prefix in downlink</th></tr>
<tr><th>DwPTS</th><th colspan="2">UpPTS</th><th>DwPTS</th><th colspan="2">UpPTS</th></tr>
<tr><th></th><th>Normal cyclic prefix in uplink</th><th>Extended cyclic prefix in uplink</th><th></th><th>Normal cyclic prefix in uplink</th><th>Extended cyclic prefix in uplink</th></tr>
<tr><td>0</td><td>$6592 \cdot T_s$</td><td rowspan="5">$2192 \cdot T_s$</td><td rowspan="5">$2560 \cdot T_s$</td><td>$7680 \cdot T_s$</td><td rowspan="4">$2192 \cdot T_s$</td><td rowspan="4">$2560 \cdot T_s$</td></tr>
<tr><td>1</td><td>$19760 \cdot T_s$</td><td>$20480 \cdot T_s$</td></tr>
<tr><td>2</td><td>$21952 \cdot T_s$</td><td>$23040 \cdot T_s$</td></tr>
<tr><td>3</td><td>$24144 \cdot T_s$</td><td>$25600 \cdot T_s$</td></tr>
<tr><td>4</td><td>$26336 \cdot T_s$</td><td>$7680 \cdot T_s$</td><td rowspan="4">$4384 \cdot T_s$</td><td rowspan="4">$5120 \cdot T_s$</td></tr>
<tr><td>5</td><td>$6592 \cdot T_s$</td><td rowspan="5">$4384 \cdot T_s$</td><td rowspan="5">$5120 \cdot T_s$</td><td>$20480 \cdot T_s$</td></tr>
<tr><td>6</td><td>$19760 \cdot T_s$</td><td>$23040 \cdot T_s$</td></tr>
<tr><td>7</td><td>$21952 \cdot T_s$</td><td>$12800 \cdot T_s$</td></tr>
<tr><td>8</td><td>$24144 \cdot T_s$</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>9</td><td>$13168 \cdot T_s$</td><td>-</td><td>-</td><td>-</td></tr>
</table>

Table 4.2-2: Uplink-downlink configurations.

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

Calculated Duty Cycle – Extended cyclic prefix in uplink x (T_s) x # of S + # of U
Example for calculated Duty Cycle for Uplink-Downlink Configuration 0:
Calculated Duty Cycle = (5120 x [1/(15000 x 2048)] x 2 + 0.006)/0.01 = 63.33 %
Where
T_s = 1/(15000 x 2048) seconds

8.6 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

8.6.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.
A periodic duty factor is required for current generation SAR system to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92-96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

8.6.2 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating nest to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g SAR and ≤ 1.0 W/kg for 10g SAR, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg for 1g SAR and ≤ 2.0 W/kg for 10g SAR or all test positions are measured.

8.6.3 2.4 GHz SAR test Requirements

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

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

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed.

8.6.4 OFDM Transmission Mode and SAR Test Channel Selection

For the 2.4 GHz, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate and lowest order 802.11 g/n mode. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11g then 802.11n, is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

8.6.5 Initial Test Configuration Procedure

For OFDM, in both 2.4 GHz, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output power is the initial test channel. Otherwise, the channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements.

8.6.6 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position on procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg for 1g SAR and ≤ 3.0 W/kg for 10g SAR, no additional SAR tests for the subsequent test configurations are required.

9. OUTPUT POWER SPECIFICATIONS

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB publication 447498 D01v06.

9.1 GSM Maximum Conducted Output Power

GSM Conducted output powers (Burst-Average)

Band	Channel	Voice	GPRS(GMSK) Data – CS1				EDGE Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
Maximum		33.50	33.50	31.50	30.50	29.50	29.00	26.50	25.00	23.50
Nominal		32.50	32.50	30.50	29.50	28.50	28.00	25.50	24.00	22.50
GSM 850	128	32.50	32.53	30.14	29.18	28.34	27.28	25.14	23.35	21.93
	190	32.69	32.71	30.31	29.44	28.65	27.65	25.31	23.85	22.15
	251	32.80	32.78	30.51	29.58	28.81	27.67	25.44	23.97	22.36

GSM Conducted output powers (Frame-Average)

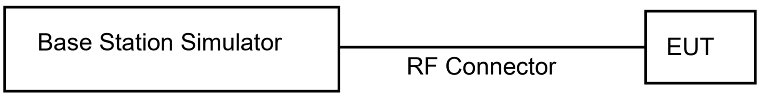
Band	Channel	Voice	GPRS(GMSK) Data – CS1				EDGE Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
Maximum		24.47	24.47	25.48	26.24	26.49	19.97	20.48	20.74	20.49
Nominal		23.47	23.47	24.48	25.24	25.49	18.97	19.48	19.74	19.49
GSM 850	128	23.47	23.50	24.12	24.92	25.33	18.25	19.12	19.09	18.92
	190	23.66	23.68	24.29	25.18	25.64	18.62	19.29	19.59	19.14
	251	23.77	23.75	24.49	25.32	25.80	18.64	19.42	19.71	19.35

Note:

Time slot average factor is as follows:

1 Tx slot = 9.03 dB, Frame-Average output power = Burst-Average output power – 9.03 dB
2 Tx slot = 6.02 dB, Frame-Average output power = Burst-Average output power – 6.02 dB
3 Tx slot = 4.26 dB, Frame-Average output power = Burst-Average output power – 4.26 dB
4 Tx slot = 3.01 dB, Frame-Average output power = Burst-Average output power – 3.01 dB

GSM Class : B
GSM voice: Head SAR , Body worn SAR
GPRS/EDGE Multi-slots 33 : Hotspot SAR with GPRS/EDGE
Multi-slot Class 33 with CS 1 (GMSK)



9.2 UMTS Maximum Conducted Output Power

HSPA+

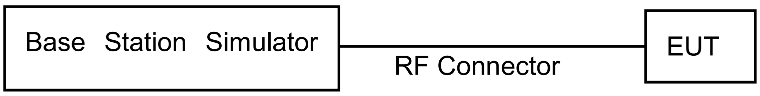
This DUT is only capable of QPSK HSPA+ in uplink. Therefore, the RF conducted power is not measured according to 941225 D01 3G SAR.

WCDMA Band 5

3GPP Release Version	Mode	3GPP 34.121	WCDMA Band 5[dBm]			
		Subtest	UL 4132 DL 4357	UL 4183 DL 4408	UL 4233 DL 4458	3GPP MPR [dB]
99	WCDMA	12.2 kbps RMC	23.02	23.03	23.03	-
99		12.2 kbps AMR	23.01	22.24	23.04	-
5	HSDPA	Subtest 1	22.57	22.58	22.58	0
5		Subtest 2	21.72	21.77	21.78	0
5		Subtest 3	22.28	22.28	22.29	0.5
5		Subtest 4	21.20	21.21	21.24	0.5
6	HSUPA	Subtest 1	19.96	19.95	20.03	0
6		Subtest 2	18.41	18.41	18.45	2
6		Subtest 3	19.40	19.39	19.41	1
6		Subtest 4	18.43	18.58	18.57	2
6		Subtest 5	19.99	19.98	20.05	0

WCDMA Average Conducted output powers

It is expected by the manufacturer that MPR for some HSPA Subtests may be up to 2 dB more than specified by 3GPP, But also as low as 1 dB according to the chipset implementation in this model to match manufacturer.



9.3 LTE Maximum Conducted Output Power

9.3.1 LTE Band 5

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power (dBm)			MPR Allowed Per 3GPP	MPR
				20407 824.7 MHz	20525 836.5 MHz	20643 848.3 MHz	[dB]	[dB]
1.4 MHz	QPSK	1	0	23.76	23.68	23.71	0	0
		1	3	23.76	23.66	23.71	0	0
		1	5	23.75	23.67	23.69	0	0
		3	0	23.83	23.57	23.72	0	0
		3	1	23.82	23.74	23.72	0	0
		3	3	23.75	23.67	23.66	0	0
		6	0	22.71	22.61	22.62	0-1	1
	16QAM	1	0	22.40	22.21	22.30	0-1	1
		1	3	22.41	22.23	22.17	0-1	1
		1	5	22.37	22.31	22.30	0-1	1
		3	0	22.48	22.48	22.43	0-1	1
		3	1	22.51	22.41	22.45	0-1	1
		3	3	22.56	22.45	22.43	0-1	1
		6	0	21.64	21.57	21.47	0-2	2

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power (dBm)			MPR Allowed Per 3GPP	MPR
				20415 825.5 MHz	20525 836.5 MHz	20635 847.5 MHz	[dB]	[dB]
3 MHz	QPSK	1	0	23.79	23.75	23.71	0	0
		1	7	23.71	23.73	23.67	0	0
		1	14	23.62	23.73	23.60	0	0
		8	0	22.72	22.64	22.57	0-1	1
		8	3	22.62	22.57	22.61	0-1	1
		8	7	22.62	22.60	22.59	0-1	1
		15	0	22.67	22.54	22.60	0-1	1
	16QAM	1	0	22.50	22.55	22.50	0-1	1
		1	7	22.50	22.56	22.52	0-1	1
		1	14	22.25	22.42	22.47	0-1	1
		8	0	21.63	21.51	21.50	0-2	2
		8	3	21.64	21.58	21.51	0-2	2
		8	7	21.61	21.56	21.53	0-2	2
		15	0	21.56	21.55	21.56	0-2	2

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power (dBm)			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20425	20525	20625	[dB]	[dB]
				826.5 MHz	836.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	23.67	23.73	23.80	0	0
		1	12	23.68	23.71	23.70	0	0
		1	24	23.62	23.76	23.73	0	0
		12	0	22.65	22.66	22.66	0-1	1
		12	6	22.67	22.61	22.65	0-1	1
		12	11	22.65	22.58	22.63	0-1	1
		25	0	22.67	22.62	22.63	0-1	1
	16QAM	1	0	22.62	22.44	22.40	0-1	1
		1	12	22.39	22.41	22.48	0-1	1
		1	24	22.47	22.48	22.50	0-1	1
		12	0	21.64	21.58	21.63	0-2	2
		12	6	21.54	21.53	21.58	0-2	2
		12	11	21.61	21.48	21.55	0-2	2
		25	0	21.63	21.48	21.56	0-2	2

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power (dBm)	MPR Allowed Per 3GPP	MPR
				20525	[dB]	[dB]
				836.5 MHz		
10 MHz	QPSK	1	0	23.73	0	0
		1	24	23.82	0	0
		1	49	23.73	0	0
		25	0	22.60	0-1	1
		25	12	22.64	0-1	1
		25	24	22.72	0-1	1
		50	0	22.62	0-1	1
	16QAM	1	0	22.60	0-1	1
		1	24	22.45	0-1	1
		1	49	22.49	0-1	1
		25	0	21.53	0-2	2
		25	12	21.54	0-2	2
		25	24	21.50	0-2	2
		50	0	21.54	0-2	2

Note: LTE Band 5 at 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing.

9.3.3 LTE TDD Band 41

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power (dBm)					MPR Allowed Per 3GPP	MPR
				39675 2498.5 MHz	40148 2545.8 MHz	40620 2593.0 MHz	41093 2640.3 MHz	41565 2687.5 MHz	[dB]	[dB]
5 MHz	QPSK	1	0	22.93	21.97	22.65	22.57	22.41	0	0
		1	12	22.88	21.96	22.60	22.51	22.39	0	0
		1	24	22.86	21.91	22.57	22.45	22.36	0	0
		12	0	21.90	20.97	21.29	21.48	21.44	0-1	1
		12	6	21.88	20.99	21.26	21.44	21.44	0-1	1
		12	11	21.82	20.93	21.27	21.38	21.42	0-1	1
		25	0	21.85	21.01	21.30	21.42	21.43	0-1	1
	16QAM	1	0	21.76	21.00	21.27	21.52	21.45	0-1	1
		1	12	21.72	21.00	21.20	21.46	21.39	0-1	1
		1	24	21.78	20.94	21.23	21.48	21.41	0-1	1
		12	0	20.95	19.99	20.26	20.05	20.22	0-2	2
		12	6	20.89	19.98	20.24	20.05	20.19	0-2	2
		12	11	20.89	20.00	20.22	19.99	20.17	0-2	2
		25	0	20.98	20.09	20.33	20.12	20.23	0-2	2

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power (dBm)					MPR Allowed Per 3GPP	MPR
				39700 2501MHz	40160 2547MHz	40620 2593MHz	41080 2639MHz	41540 2685MHz	[dB]	[dB]
10 MHz	QPSK	1	0	23.10	22.02	22.71	22.45	22.52	0	0
		1	24	22.97	21.96	22.61	22.31	22.42	0	0
		1	49	22.85	21.91	22.54	22.17	22.37	0	0
		25	0	21.98	21.00	21.32	21.25	21.52	0-1	1
		25	12	21.91	20.99	21.29	21.19	21.48	0-1	1
		25	24	21.88	20.98	21.25	21.14	21.43	0-1	1
		50	0	21.93	20.97	21.29	21.22	21.51	0-1	1
	16QAM	1	0	22.11	21.06	21.41	21.31	21.59	0-1	1
		1	24	22.00	20.99	21.33	21.17	21.46	0-1	1
		1	49	21.91	20.89	21.26	21.05	21.33	0-1	1
		25	0	21.09	20.09	20.39	20.09	20.30	0-2	2
		25	12	21.05	20.06	20.34	19.98	20.25	0-2	2
		25	24	20.97	20.05	20.32	19.90	20.21	0-2	2
		50	0	21.00	20.10	20.34	19.99	20.25	0-2	2

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power (dBm)					MPR Allowed Per 3GPP	MPR
				39725 2503.5 MHz	40173 2548.3 MHz	40620 2593.0 MHz	41068 2637.8 MHz	41515 2682.5 MHz	[dB]	[dB]
15 MHz	QPSK	1	0	23.08	22.08	22.74	22.57	22.40	0	0
		1	36	22.90	21.96	22.63	22.35	22.25	0	0
		1	74	22.73	21.94	22.50	22.18	22.18	0	0
		36	0	21.91	21.03	21.35	21.36	21.41	0-1	1
		36	18	21.85	20.99	21.27	21.26	21.36	0-1	1
		36	39	21.73	20.90	21.22	21.10	21.29	0-1	1
		75	0	21.83	20.97	21.29	21.22	21.34	0-1	1
	16QAM	1	0	21.87	21.03	21.46	21.37	21.37	0-1	1
		1	36	21.75	20.94	21.37	21.12	21.21	0-1	1
		1	74	21.54	20.87	21.27	20.86	21.11	0-1	1
		36	0	20.95	20.06	20.31	20.04	20.02	0-2	2
		36	18	20.89	20.05	20.25	19.97	19.97	0-2	2
		36	39	20.78	20.01	20.19	19.83	19.90	0-2	2
		75	0	20.95	20.05	20.28	19.99	20.01	0-2	2

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power (dBm)					MPR Allowed Per 3GPP	MPR
				39750 2506.0 MHz	40185 2549.5 MHz	40620 2593.0 MHz	41055 2636.5 MHz	41490 2680.0 MHz	[dB]	[dB]
20 MHz	QPSK	1	0	23.04	22.21	22.78	22.66	22.50	0	0
		1	49	22.81	22.01	22.62	22.37	22.27	0	0
		1	99	22.58	21.91	22.45	22.12	22.15	0	0
		50	0	21.90	21.08	21.36	21.38	21.44	0-1	1
		50	25	21.78	21.00	21.31	21.22	21.36	0-1	1
		50	49	21.68	20.94	21.22	21.10	21.28	0-1	1
		100	0	21.77	21.02	21.30	21.23	21.36	0-1	1
	16QAM	1	0	21.98	21.10	21.44	21.42	21.41	0-1	1
		1	49	21.73	20.87	21.34	21.13	21.23	0-1	1
		1	99	21.55	20.78	21.16	20.84	21.07	0-1	1
		50	0	20.95	20.18	20.44	20.17	20.09	0-2	2
		50	25	20.85	20.12	20.36	20.01	19.99	0-2	2
		50	49	20.74	20.06	20.28	19.90	19.93	0-2	2
		100	0	20.83	20.10	20.36	20.02	20.03	0-2	2

Note;

LTE Band 41 has 5 required test channels per FCC KDB 447498 D01v06.

The EUT enables maximum power reduction in accordance with 3GPP 36.101. The MPR settings are configured during the manufacture process and are not configurable by the network, carrier, or end user.

9.4 WiFi

9.4.1 WiFi Maximum Conducted Power

Mode	Freq. [MHz]	Channel	IEEE 802.11 (2.4 GHz) Conducted Power [dBm]
802.11b	2 412	1	18.19
	2 437	6	17.65
	2 462	11	17.95
	2 467	12	4.62
	2 472	13	-6.91
802.11g	2 412	1	15.08
	2 417	2	16.65
	2 437	6	16.64
	2 457	10	16.76
	2 462	11	14.13
	2 467	12	5.01
	2 472	13	-5.81
802.11n (HT20)	2 412	1	14.82
	2 437	6	16.43
	2 457	10	16.63
	2 462	11	13.94
	2 467	12	4.74
	2 472	13	-6.00

9.4.2 WiFi Reduced Conducted Power (Held to ear VoIP)

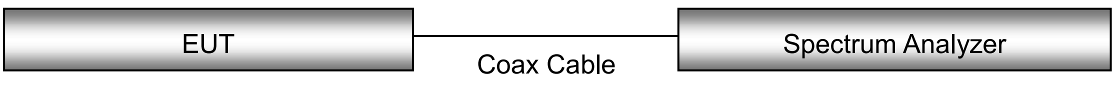
IEEE 802.11 Reduced Average RF Conducted Power

Mode	Freq. [MHz]	Channel	IEEE 802.11 (2.4 GHz) Conducted Power [dBm]
802.11b	2 412	1	12.29
	2 437	6	11.96
	2 462	11	12.20
	2 467	12	4.62
	2 472	13	-6.91
802.11g	2 412	1	12.49
	2 437	6	12.27
	2 462	11	12.24
	2 467	12	5.01
	2 472	13	-5.81
802.11n (HT20)	2 412	1	12.28
	2 437	6	11.99
	2 462	11	12.18
	2 467	12	4.74
	2 472	13	-6.00

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission mode with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.

Test Configuration

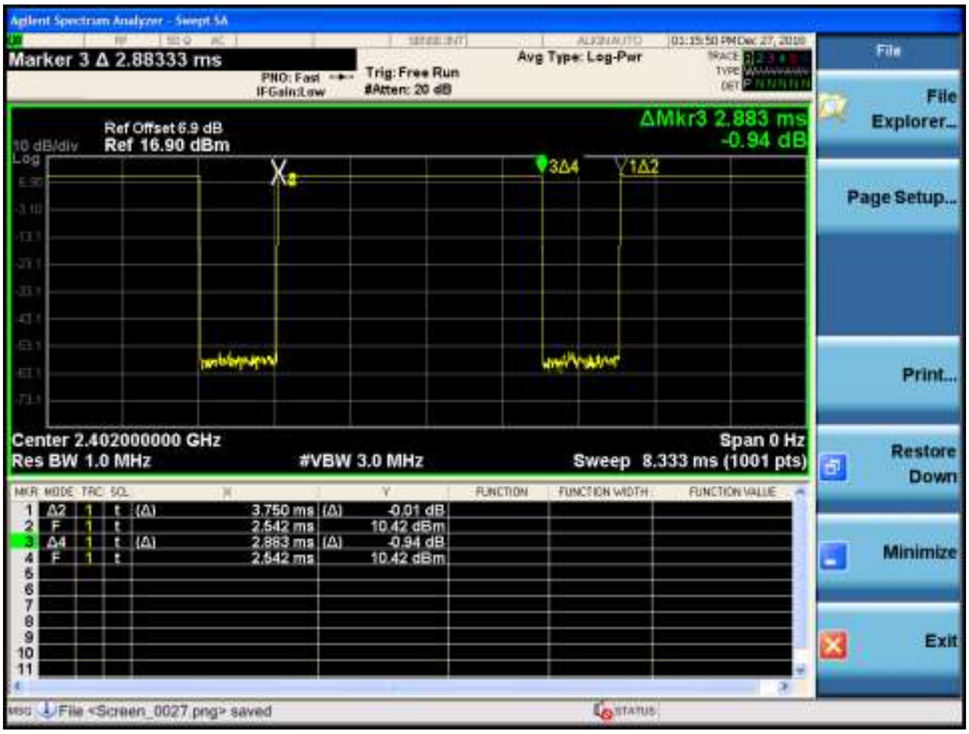


9.4.3 Bluetooth Conducted Power

The Burst averaged-conducted Power

Mode	Channel	Bluetooth Power [dBm]
DH5	0	9.39
	39	9.21
	78	8.34
2-DH5	0	3.93
	39	5.25
	78	5.74
3-DH5	0	3.93
	39	5.22
	78	5.74

Per October 2016 TCB Workshop Notes:
When call box and Bluetooth protocol are used for Bluetooth SAR measurement, time-domain plot is required to identify duty factor for supporting the test setup and result.
Bluetooth duty cycle was measured using Bluetooth tester equipment (CBT / R&S) with Bluetooth protocol. DH5 mode is the highest duty cycle and conducted power. SAR test were performed at DH5 mode.



Duty Cycle

= (BT-On time /BT-Full time) =(2.885/3.750) = 0.769 (DH5)

Duty factor= 1/Duty cycle : 1.300

10. SYSTEM VERIFICATION

10.1 Tissue Verification

The Head /body simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity.

Table for Head Tissue Verification

Date of Tests	Tissue Temp. (°C)	Tissue Type	Freq. (MHz)	Measured Conductivity σ (S/m)	Measured Dielectric Constant, ε	Target Conductivity σ (S/m)	Target Dielectric Constant, ε	% dev σ	% dev ε
12/17/2018	20.3	835H	820	0.906	42.819	0.899	41.577	0.78%	2.99%
			835	0.921	42.661	0.900	41.500	2.33%	2.80%
			850	0.936	42.484	0.916	41.500	2.18%	2.37%
12/17/2018	20.3	835H	820	0.906	42.819	0.899	41.577	0.78%	2.99%
			835	0.921	42.661	0.900	41.500	2.33%	2.80%
			850	0.936	42.484	0.916	41.500	2.18%	2.37%
12/20/2018	19.4	835H	820	0.892	42.136	0.899	41.577	-0.78%	1.34%
			835	0.908	41.852	0.900	41.500	0.89%	0.85%
			850	0.922	41.634	0.916	41.500	0.66%	0.32%
12/21/2018	19.4	2450H	2400	1.745	38.709	1.756	39.290	-0.63%	-1.48%
			2450	1.792	38.680	1.800	39.200	-0.44%	-1.33%
			2500	1.834	38.618	1.855	39.140	-1.13%	-1.33%
12/19/2018	19.7	2600H	2500	1.906	38.442	1.855	39.140	2.75%	-1.78%
			2600	2.006	38.146	1.964	39.010	2.14%	-2.21%
			2700	2.084	37.421	2.073	38.880	0.53%	-3.75%

Table for Body Tissue Verification

Date of Tests	Tissue Temp. (°C)	Tissue Type	Freq. (MHz)	Measured Conductivity σ (S/m)	Measured Dielectric Constant, ε	Target Conductivity σ (S/m)	Target Dielectric Constant, ε	% dev σ	% dev ε
12/18/2018	18.8	835B	820	0.943	53.528	0.969	55.260	-2.68%	-3.13%
			835	0.959	53.402	0.970	55.200	-1.13%	-3.26%
			850	0.973	53.136	0.988	55.150	-1.52%	-3.65%
12/22/2018	20.9	2450B	2400	1.885	51.782	1.902	52.770	-0.89%	-1.87%
			2450	1.930	51.686	1.950	52.700	-1.03%	-1.92%
			2500	2.002	51.628	2.021	52.640	-0.94%	-1.92%
12/21/2018	19.4	2450B	2400	1.916	51.040	1.902	52.770	0.74%	-3.28%
			2450	1.981	50.743	1.950	52.700	1.59%	-3.71%
			2500	2.050	50.528	2.021	52.640	1.43%	-4.01%
12/19/2018	19.0	2600B	2500	2.031	53.288	2.021	52.640	0.49%	1.23%
			2600	2.149	52.984	2.163	52.510	-0.65%	0.90%
			2700	2.272	52.364	2.305	52.380	-1.43%	-0.03%

10.2 System Verification

Prior to assessment, the system is verified to the ± 10 % of the specifications at 835 MHz / 2 450 MHz / 2 600 MHz by using the system Verification kit. (Graphic Plots Attached)

Freq. [MHz]	Date	Probe (S/N)	Dipole (S/N)	Liquid	Amb. Temp. [°C]	Liquid Temp. [°C]	1 W Target SAR_{1g} (SPEAG) [W/kg]	50mW Measured SAR_{1g} [W/kg]	1 W Normalized SAR_{1g} [W/kg]	Deviation [%]	Limit [%]
835	12/17/2018	3863	4d165	Head	20.5	20.3	9.41	0.461	9.22	- 2.02	± 10
835	12/17/2018	3968		Head	20.5	20.3	9.41	0.449	8.98	- 4.57	± 10
835	12/20/2018	3863		Head	19.6	19.4	9.41	0.442	8.84	- 6.06	± 10
835	12/18/2018	3863		Body	19.0	18.8	9.50	0.475	9.50	+ 0.00	± 10
2 450	12/21/2018	3797	965	Head	19.6	19.4	51.1	2.56	51.2	+ 0.20	± 10
2 450	12/22/2018	7370		Body	21.1	20.9	50.2	2.72	54.4	+ 8.37	± 10
2 450	12/21/2018	3797		Body	19.6	19.4	50.2	2.37	47.4	- 5.58	± 10
2 600	12/19/2018	3968	1015	Head	19.9	19.7	58.1	2.7	54.0	- 7.06	± 10
2 600	12/19/2018	3863		Body	19.2	19.0	54.8	2.57	51.4	- 6.20	± 10

10.3 System Verification Procedure

SAR measurement was prior to assessment, the system is verified to the ± 10 % of the specifications at each frequency band by using the system verification kit. (Graphic Plots Attached)

- Cabling the system, using the verification kit equipments.
- Generate about 50 mW Input level from the signal generator to the Dipole Antenna.
- Dipole antenna was placed below the flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.
- The results are normalized to 1 W input power.

NOTE;
SAR Verification was performed according to the FCC KDB 865664 D01v01r04.

11. SAR TEST DATA SUMMARY

11.1 HEAD SAR Measurement Results

GSM 850 Head SAR											
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)			(W/kg)		(W/kg)	
836.6	190	GSM	33.5	32.69	-0.13	Left Cheek	1:8.3	0.101	1.205	0.122	-
836.6	190	GSM	33.5	32.69	0.10	Left Tilt	1:8.3	0.00682	1.205	0.008	-
836.6	190	GSM	33.5	32.69	-0.17	Right Cheek	1:8.3	0.110	1.205	**0.133**	1
836.6	190	GSM	33.5	32.69	-0.13	Right Tilt	1:8.3	0.059	1.205	0.071	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg Averaged over 1 gram					

UMTS 850 Head SAR											
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)			(W/kg)		**(W/kg)**	
836.6	4183	RMC	24.0	23.03	-0.10	Left Cheek	1:1	0.017	1.250	0.021	-
836.6	4183	RMC	24.0	23.03	-0.16	Left Tilt	1:1	0.00912	1.250	0.011	-
836.6	4183	RMC	24.0	23.03	-0.10	Right Cheek	1:1	0.021	1.250	**0.026**	2
836.6	4183	RMC	24.0	23.03	-0.05	Right Tilt	1:1	0.00594	1.250	0.007	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram					

LTE Band 5 (Cell) Head SAR															
Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(dBm)	(dBm)	(dB)		(dB)				(W/kg)		(W/kg)	
836.5	20525	QPSK	10	25.0	23.82	-0.12	Left Cheek	0	1	24	1:1	0.115	1.312	0.151	-
836.5	20525	QPSK	10	24.0	22.72	0.15	Left Cheek	1	25	24	1:1	0.093	1.343	0.125	-
836.5	20525	QPSK	10	25.0	23.82	-0.07	Left Tilt	0	1	24	1:1	0.060	1.312	0.079	-
836.5	20525	QPSK	10	24.0	22.72	0.03	Left Tilt	1	25	24	1:1	0.051	1.343	0.068	-
836.5	20525	QPSK	10	25.0	23.82	-0.19	Right Cheek	0	1	24	1:1	0.126	1.312	**0.165**	3
836.5	20525	QPSK	10	24.0	22.72	0.12	Right Cheek	1	25	24	1:1	0.101	1.343	0.136	-
836.5	20525	QPSK	10	25.0	23.82	0.18	Right Tilt	0	1	24	1:1	0.071	1.312	0.093	-
836.5	20525	QPSK	10	24.0	22.72	0.18	Right Tilt	1	25	24	1:1	0.059	1.343	0.079	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Head 1.6 W/kg Averaged over 1 gram								

LTE TDD Band 41 Head SAR															
Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(dBm)	(dBm)	(dB)		(dB)				(W/kg)		(W/kg)	
2 506	39750	QPSK	20	23.5	23.04	-0.19	Left Cheek	0	1	0	1:1.58	0.102	1.112	**0.113**	4
2 506	39750	QPSK	20	22.5	21.90	0.19	Left Cheek	1	50	0	1:1.58	0.082	1.148	0.094	-
2 506	39750	QPSK	20	23.5	23.04	0.14	Left Tilt	0	1	0	1:1.58	0.044	1.112	0.049	-
2 506	39750	QPSK	20	22.5	21.90	0.18	Left Tilt	1	50	0	1:1.58	0.035	1.148	0.040	-
2 506	39750	QPSK	20	23.5	23.04	-0.13	Right Cheek	0	1	0	1:1.58	0.066	1.112	0.073	-
2 506	39750	QPSK	20	22.5	21.90	0.18	Right Cheek	1	50	0	1:1.58	0.050	1.148	0.057	-
2 506	39750	QPSK	20	23.5	23.04	0.16	Right Tilt	0	1	0	1:1.58	0.070	1.112	0.078	-
2 506	39750	QPSK	20	22.5	21.90	-0.13	Right Tilt	1	50	0	1:1.58	0.054	1.148	0.062	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Head 1.6 W/kg Averaged over 1 gram								

DTS Head SAR															
Frequency		Mode	Band width	Data Rate	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Area Scan Peak SAR	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(Mbps)	(dBm)	(dBm)	(dB)			(W/kg)	(W/kg)		(Duty)	(W/kg)	
2 412	1	802.11b	22	1	13.0	12.29		Left Cheek	99.0	0.0987		1.178	1.010		-
2 412	1	802.11b	22	1	13.0	12.29		Left Tilt	99.0	0.0869		1.178	1.010		-
2 412	1	802.11b	22	1	13.0	12.29	0.19	Right Cheek	99.0	0.257	0.154	1.178	1.010	**0.183**	5
2 412	1	802.11b	22	1	13.0	12.29		Right Tilt	99.0	0.197		1.178	1.010		-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Head 1.6 W/kg Averaged over 1 gram							

DSS Head SAR											
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dBm)	(dBm)	(dB)		(W/kg)		(Duty)	(W/kg)	
2 402	0	Bluetooth DH5	10.5	9.39	0.19	Left Cheek	0.014	1.291	1.300	0.023	-
2 402	0	Bluetooth DH5	10.5	9.39	-0.17	Left Tilt	0.011	1.291	1.300	0.018	-
2 402	0	Bluetooth DH5	10.5	9.39	-0.12	Right Cheek	0.039	1.291	1.300	**0.065**	6
2 402	0	Bluetooth DH5	10.5	9.39	-0.04	Right Tilt	0.027	1.291	1.300	0.045	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram					

11.2 Body-worn SAR Measurement Results

GSM/UMTS Body-Worn SAR

Frequency MHz	Ch.	Mode		Tune-Up Limit (dB)	Meas. Power (dB)	Power Drift (dB)	Test Position	Duty Cycle	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Scaled SAR (W/kg)	Plot No.
836.6	190	GSM 850 Voice		33.5	32.69	0.18	Rear	1:8.3	15	0.144	1.205	**0.174**	7
836.6	190	GSM 850 Voice		33.5	32.69	-0.01	Front	1:8.3	15	0.106	1.205	0.128	-
836.6	4183	UMTS 850	RMC	24.0	23.03	0.01	Rear	1:1	15	0.039	1.250	0.049	-
836.6	4183	UMTS 850	RMC	24.0	23.03	0.03	Front	1:1	15	0.051	1.250	**0.064**	8
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 1 gram						

LTE Body-Worn SAR

Frequency MHz	Ch.	Mode	Band width (MHz)	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	MPR (dB)	RB Size	RB offset	Duty Cycle	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Scaled SAR (W/kg)	Plot No.
836.5	20525	LTE 5 QPSK	10	25.0	23.82	0.10	Rear	0	1	24	1:1	15	0.148	1.312	**0.194**	9
836.5	20525		10	24.0	22.72	0.10	Rear	1	25	24	1:1	15	0.116	1.343	0.156	-
836.5	20525		10	25.0	23.82	0.16	Front	0	1	24	1:1	15	0.107	1.312	0.140	-
836.5	20525		10	24.0	22.72	0.16	Front	1	25	24	1:1	15	0.086	1.343	0.115	-
2 506	39750	LTE 41 QPSK	20	23.5	23.04	-0.19	Rear	0	1	0	1:1.58	15	0.063	1.112	**0.070**	10
2 506	39750		20	22.5	21.90	-0.14	Rear	1	50	0	1:1.58	15	0.050	1.148	0.057	-
2 506	39750		20	23.5	23.04	-0.01	Front	0	1	0	1:1.58	15	0.055	1.112	0.061	-
2 506	39750		20	22.5	21.90	0.05	Front	1	50	0	1:1.58	15	0.042	1.148	0.048	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 1 gram									

DTS Body-Worn SAR															
Frequency		Mode	Band width	Data Rate	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Distance	Area Scan Peak SAR	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(Mbps)	(dBm)	(dBm)	(dB)			(mm)	(W/kg)	(W/kg)		(Duty)	(W/kg)	
2 412	1	802.11b	22	1	19.0	18.19	-0.18	Rear	99.0	15	0.183	0.118	1.205	1.010	**0.144**	11
2 412	1	802.11b	22	1	19.0	18.19	-0.11	Front	99.0	15	0.134	0.088	1.205	1.010	0.107	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg (mW/g) Averaged over 1 gram								

DSS Body-Worn SAR												
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Distance	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dBm)	(dBm)	(dB)		(mm)	(W/kg)		(Duty)	(W/kg)	
2 402	0	Bluetooth DH5	10.5	9.39	0.18	Rear	15	0.00301	1.291	1.300	**0.005**	12
2 402	0	Bluetooth DH5	10.5	9.39	-0.13	Front	15	0.00259	1.291	1.300	0.004	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg (mW/g) Averaged over 1 gram					

11.3 Hotspot SAR Measurement Results

GSM 850 Hotspot SAR												
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)			(mm)	(W/kg)		(W/kg)	
836.6	190	GPRS 4Tx	29.5	28.65	0.14	Rear	1:2.07	10	0.284	1.216	**0.345**	13
836.6	190	GPRS 4Tx	29.5	28.65	0.08	Front	1:2.07	10	0.123	1.216	0.150	-
836.6	190	GPRS 4Tx	29.5	28.65	-0.05	Left	1:2.07	10	0.125	1.216	0.152	-
836.6	190	GPRS 4Tx	29.5	28.65	0.17	Right	1:2.07	10	0.074	1.216	0.090	-
836.6	190	GPRS 4Tx	29.5	28.65	-0.06	Bottom	1:2.07	10	0.075	1.216	0.091	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg Averaged over 1 gram						

UMTS 850 Hotspot SAR												
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)			(mm)	(W/kg)		(W/kg)	
836.6	4183	RMC	24.0	23.03	-0.12	Rear	1:1	10	0.062	1.250	**0.078**	14
836.6	4183	RMC	24.0	23.03	-0.01	Front	1:1	10	0.055	1.250	0.069	-
836.6	4183	RMC	24.0	23.03	0.06	Left	1:1	10	0.018	1.250	0.023	-
836.6	4183	RMC	24.0	23.03	-0.11	Right	1:1	10	0.018	1.250	0.023	-
836.6	4183	RMC	24.0	23.03	0.16	Bottom	1:1	10	0.017	1.250	0.021	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram						

LTE Band 5 (Cell) Hotspot SAR																
Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	MPR	RB Size	RB offset	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(dBm)	(dBm)	(dB)		(dB)				(mm)	(W/kg)		(W/kg)	
836.5	20525	QPSK	10	25.0	23.82	0.19	Rear	0	1	24	1:1	10	0.350	1.312	**0.459**	15
836.5	20525	QPSK	10	24.0	22.72	-0.04	Rear	1	25	24	1:1	10	0.267	1.343	0.359	-
836.5	20525	QPSK	10	25.0	23.82	-0.10	Front	0	1	24	1:1	10	0.085	1.312	0.112	-
836.5	20525	QPSK	10	24.0	22.72	-0.09	Front	1	25	24	1:1	10	0.075	1.343	0.101	-
836.5	20525	QPSK	10	25.0	23.82	-0.19	Left	0	1	24	1:1	10	0.129	1.312	0.169	-
836.5	20525	QPSK	10	24.0	22.72	-0.03	Left	1	25	24	1:1	10	0.099	1.343	0.133	-
836.5	20525	QPSK	10	25.0	23.82	0.01	Right	0	1	24	1:1	10	0.120	1.312	0.157	-
836.5	20525	QPSK	10	24.0	22.72	0.08	Right	1	25	24	1:1	10	0.095	1.343	0.128	-
836.5	20525	QPSK	10	25.0	23.82	0.02	Bottom	0	1	24	1:1	10	0.112	1.312	0.147	-
836.5	20525	QPSK	10	24.0	22.72	0.03	Bottom	1	25	24	1:1	10	0.090	1.343	0.121	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg (mW/g) Averaged over 1 gram									

LTE TDD Band 41 Hotspot SAR																
Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	MPR	RB Size	RB offset	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(dBm)	(dBm)	(dB)		(dB)				(mm)	(W/kg)		(W/kg)	
2 506.0	39750	QPSK	20	23.5	23.04	0.12	Rear	0	1	0	1:1.58	10	0.191	1.112	**0.212**	16
2 506.0	39750	QPSK	20	22.5	21.90	-0.18	Rear	1	50	0	1:1.58	10	0.148	1.148	0.170	-
2 506.0	39750	QPSK	20	23.5	23.04	-0.18	Front	0	1	0	1:1.58	10	0.093	1.112	0.103	-
2 506.0	39750	QPSK	20	22.5	21.90	-0.15	Front	1	50	0	1:1.58	10	0.072	1.148	0.083	-
2 506.0	39750	QPSK	20	23.5	23.04	-0.14	Left	0	1	0	1:1.58	10	0.104	1.112	0.116	-
2 506.0	39750	QPSK	20	22.5	21.90	-0.10	Left	1	50	0	1:1.58	10	0.083	1.148	0.095	-
2 506.0	39750	QPSK	20	23.5	23.04	0.18	Bottom	0	1	0	1:1.58	10	0.115	1.112	0.128	-
2 506.0	39750	QPSK	20	22.5	21.90	-0.17	Bottom	1	50	0	1:1.58	10	0.081	1.148	0.093	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 1 gram									

DTS Hotspot SAR

Frequency MHz	Ch.	Mode	Band width (MHz)	Data Rate (Mbps)	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	Duty Cycle	Distance (mm)	Area Scan Peak SAR (W/kg)	Meas. SAR (W/kg)	Scaling Factor	Scaling Factor (Duty)	Scaled SAR (W/kg)	Plot No.
2 412	1	802.11b	22	1	19.0	18.19	0.17	Rear	99.0	10	0.401	0.234	1.205	1.010	**0.285**	17
2 412	1	802.11b	22	1	19.0	18.19		Front	99.0	10	0.196		1.205	1.010		-
2 412	1	802.11b	22	1	19.0	18.19		Left	99.0	10	0.181		1.205	1.010		-
2 412	1	802.11b	22	1	19.0	18.19		Top	99.0	10	0.127		1.205	1.010		-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg Averaged over 1 gram								

DSS Tethering SAR

Frequency MHz	Ch.	Mode	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Scaling Factor (Duty)	Scaled SAR (W/kg)	Plot No.
2 402	0	Bluetooth DH5	10.5	9.39	-0.18	Rear	10	0.017	1.291	1.300	**0.029**	18
2 402	0	Bluetooth DH5	10.5	9.39	-0.16	Front	10	0.010	1.291	1.300	0.017	-
2 402	0	Bluetooth DH5	10.5	9.39	-0.19	Left	10	0.00209	1.291	1.300	0.004	-
2 402	0	Bluetooth DH5	10.5	9.39	0.15	Top	10	0.00318	1.291	1.300	0.005	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg (mW/g) Averaged over 1 gram					

11.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, FCC KDB Procedure.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB 648474 D04v01r03, SAR was evaluated without a headset connected to the device. Since the standalone reported SAR was ≤ 1.2 W/kg, no additional SAR evaluation using a headset cable were required.
8. Per KDB 648474 D04v01r03, this device is considered a “Phablet” since the diagonal dimension is > 160 mm and < 200 mm. When hotspot mode applies, extremity SAR is required only for the surfaces and edges with hotspot mode scaled to the maximum output power (with tolerance) is 1 g SAR > 1.2 W/kg.
9. Per FCC KDB 865664 D01v01r04, variability SAR tests were not performed since the measured SAR results for all frequency bands were less than 0.8 W/kg. Please see Section 13 for variability analysis information.
10. This device utilizes power reduction for some wireless mode and technologies, as outlined in sec. 2.3 The maximum output power allowed for each transmitter and exposure condition was evaluated for SAR compliance based on expected use conditions and simultaneous scenarios.

GSM/GPRS Test Notes:

1. This EUT’S GSM and GPRS device class is B.
2. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
3. Justification for reduced test configurations per KDB 941225 D01v03r01: The source-based time-averaged output power was evaluated for all multi-slot operations. The multi-slot configuration with the highest frame averaged output power including tolerance was evaluated for SAR.
4. Per FCC KDB 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is 1/2 dB, instead of the middle channel, the highest output power channel must be used.
5. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.

UMTS Notes:

1. The 12.2 kbps RMC mode is the primary mode per KDB 941225 D01v03r01.
2. UMTS SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
3. Per FCC KDB 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the channel highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Consideration for LTE Devices in FCC KDB 941225 D05v02r05.
2. According to FCC KDB 941225 D05v02r05:
   When the reported SAR is ≤ 0.8 W/kg, testing of the 100% RB allocation and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the 1RB, 50%RB and 100%RB allocation with highest output power for that channel.
   Only one channel, and as reported SAR values for 1RB allocation and 50%RB allocation were less than 1.45W/Kg only the highest power RB offset for each allocation was required.
3. 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 target MPR is indicated alongside the SAR results.
4. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator.
5. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) LTE TDD Band 41 SAR measured at the highest output power channel for each test configuration is ≤ 0.6 W/kg then testing at the other channels is not required for such test configurations.
6. TDD LTE was tested using UL-DL configuration 0 with 6 UL sub frames and 2S subframes using extended cyclic prefix only and special sub frame configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Sec. 4, the duty factor using extended cyclic prefix is 0.633(cf=1.58).
7. SAR test reduction is applied using the following criteria:
   Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among 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 for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel. Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are >0.8 W/kg, testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation <1.45 W/kg. Testing for 16-QAM modulation is not required because the reported SAR for QPSK is <1.45 W/kg and its output power is not more than 0.5 dB higher than that a QPSK. Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is <1.45 W/kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

WLAN Notes:

1. For held-to-ear and hotspot operations, the initial test position procedures were applied. For initial test position, the highest extrapolated peak SAR will be used. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g SAR and ≤ 1.0 W/kg for 10g SAR, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR results is ≤ 0.8 W/kg for 1g SAR and ≤ 2.0 W/kg for 10g SAR or all test position are measured.
2. Per KDB 248227 D01v02r02 justification for test configurations of 2.4 GHz WiFi transmission operations, the highest measured maximum output power channel for 802.11b(DSSS) was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11 g/n) was not required due to the maximum allowed powers and the highest reported 802.11b SAR.
3. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.
4. The device was configured to transmit continuously at the required data rated, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated WLAN test reports.

Bluetooth Notes:

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests mode type. Per October 2016 TCBC Workshop Notes, the reported SAR was scaled to 100% transmission duty factor to determine compliance. Please see sec.9.4.3 for the time-domain plot and calculation for duty factor of the device.
2. Head and Bluetooth tethering SAR were evaluated for BT BR tethering applications.

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12. SIMULTANEOUS SAR ANALYSIS

12.1 Simultaneous Transmission Summation for Head

Simultaneous Transmission Summation Scenario with 2.4 GHz WLAN				
Exposure condition	Band	WWAN SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	∑ 1-g SAR (W/kg)
Head SAR	GSM 850	0.133	0.183	0.316
	UMTS 850	0.026	0.183	0.209
	LTE Band 5	0.165	0.183	**0.348**
	LTE Band 41	0.113	0.183	0.296

Simultaneous Transmission Summation Scenario with Bluetooth				
Exposure condition	Band	WWAN SAR (W/kg)	Bluetooth (W/kg)	∑ 1-g SAR (W/kg)
Head SAR	GSM 850	0.133	0.065	0.198
	UMTS 850	0.026	0.065	0.091
	LTE Band 5	0.165	0.065	0.230
	LTE Band 41	0.113	0.065	0.178

12.2 Simultaneous Transmission Summation for Body-Worn

Simultaneous Transmission Summation Scenario with 2.4 GHz WLAN					
Exposure condition	Distance (mm)	Band	WWAN SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	∑ 1-g SAR (W/kg)
Body-worn	15	GSM 850	0.174	0.144	0.318
		UMTS 850	0.064	0.144	0.208
		LTE Band 5	0.194	0.144	**0.338**
		LTE Band 41	0.070	0.144	0.214

Simultaneous Transmission Summation Scenario with Bluetooth					
Exposure condition	Distance (mm)	Band	WWAN SAR (W/kg)	Bluetooth SAR (W/kg)	∑ 1-g SAR (W/kg)
Body-worn	15	GSM 850	0.174	0.005	0.179
		UMTS 850	0.064	0.005	0.069
		LTE Band 5	0.194	0.005	0.199
		LTE Band 41	0.070	0.005	0.075

12.3 Simultaneous Transmission Summation for Hotspot

Simultaneous Transmission Summation Scenario with 2.4 GHz WLAN					
Exposure condition	Distance (mm)	Band	WWAN SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	∑ 1-g SAR (W/kg)
Hotspot	10	GSM 850	0.345	0.285	0.630
		UMTS 850	0.078	0.285	0.363
		LTE Band 5	0.459	0.285	**0.744**
		LTE Band 41	0.212	0.285	0.497

Simultaneous Transmission Summation Scenario with Bluetooth					
Exposure condition	Distance (mm)	Band	WWAN SAR (W/kg)	Bluetooth SAR (W/kg)	∑ 1-g SAR (W/kg)
Bluetooth Tethering	10	GSM 850	0.345	0.029	0.374
		UMTS 850	0.078	0.029	0.107
		LTE Band 5	0.459	0.029	0.488
		LTE Band 41	0.212	0.029	0.241

12.4 Simultaneous Transmission Conclusion

The above numerical summed SAR Results are sufficient to determine that simultaneous transmission cases will not exceed the SAR Limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE1528-2013.

13. SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

In accordance with KDB procedure 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz, SAR additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg for 1g SAR or < 2.0 W/kg for 10g SAR; steps 2) through 4) do not apply.

2) When the original highest measured 1g SAR is ≥ 0.80 W/kg or 10g SAR ≥ 2.0W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg for 1g SAR or ≥ 3.625 W/kg for 10g SAR (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg for 1g SAR or ≥3.75 W/kg for 10g SAR and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

14. MEASUREMENT UNCERTAINTY

The measured SAR was <1.5 W/Kg for 1g SAR and <3.75 W/KgFor 10g SAR for all frequency bands. Therefore,per KDB Publication 865664 D01v01r04,the extended measurement uncertainty analysis per IEEE1528-2013 was not required.

15. SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
SPEAG	Triple Modular Phantom	-	N/A	N/A	N/A
HP	SAR System Control PC	-	N/A	N/A	N/A
Staubli	TX90 XLspeag	F17/ 59CHA1/ A/ 01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F17/ 59RAA1/ A/ 01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F13/ 5R4XF1/ A/ 01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F11/5K3RA1/A/01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F17/ 59CHA1/ C/ 01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F17/ 59RAA1/ C/ 01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F13/ 5R4XF1/ C/ 01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F11/5K3RA1/C/01	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	010963	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	011578	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-1338 1332	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-1203 0309	N/A	N/A	N/A
SPEAG	DAE4	652	04/20/2018	Annual	04/20/2019
SPEAG	DAE4	912	11/16/2018	Annual	11/16/2019
SPEAG	DAE4	446	08/10/2018	Annual	08/10/2019
SPEAG	DAE3	466	08/22/2018	Annual	08/22/2019
SPEAG	E-Field Probe EX3DV4	3797	11/22/2018	Annual	11/22/2019
SPEAG	E-Field Probe EX3DV4	3968	09/25/2018	Annual	09/25/2019
SPEAG	E-Field Probe EX3DV4	3863	04/25/2018	Annual	04/25/2019
SPEAG	E-Field Probe EX3DV4	7370	08/30/2018	Annual	08/30/2019
SPEAG	Dipole D835V2	4d165	09/18/2018	Annual	09/18/2019
SPEAG	Dipole D2450V2	965	02/16/2018	Annual	02/16/2019
SPEAG	Dipole D2600V2	1015	11/20/2018	Annual	11/20/2019
Agilent	Power Meter E4419B	MY40511244	04/25/2018	Annual	04/25/2019
Agilent	Power Meter E4419B	MY40511243	03/30/2018	Annual	03/30/2019
Agilent	Power Sensor 8481A	SG1091286	10/11/2018	Annual	10/11/2019
Agilent	Power Sensor 8481A	MY41090873	10/11/2018	Annual	10/11/2019
SPEAG	DAKS 3.5	1038	05/29/2018	Annual	05/29/2019
SPEAG	VNA-R140	0141013	05/29/2018	Annual	05/29/2019
Agilent	Base Station E5515C	GB44400269	02/02/2018	Annual	02/02/2019
HP	Signal Generator E4433B	US40052109	03/06/2018	Annual	03/06/2019
TESTO	175-H1/Thermometer	40331915309	02/06/2018	Annual	02/06/2019
TESTO	175-H1/Thermometer	40331922309	02/06/2018	Annual	02/06/2019
TESTO	175-H1/Thermometer	40332651310	02/06/2018	Annual	02/06/2019
TESTO	175-H1/Thermometer	40331949309	02/06/2018	Annual	02/06/2019
EMPOWER	RF Power Amplifier	1084	06/11/2018	Annual	06/11/2019
MICRO LAB	LP Filter / LA-15N	10453	10/11/2018	Annual	10/11/2019
MICRO LAB	LP Filter / LA-30N	-	10/11/2018	Annual	10/11/2019
Apitech	Attenuator (3dB) 18B-03	1	06/07/2018	Annual	06/07/2019
Agilent	Attenuator (20dB) 33340C	13311	05/10/2018	Annual	05/10/2019
HP	Dielectric Probe Kit 85070C	00721521	N/A	N/A	N/A
Agilent	Directional Bridge	3140A03878	06/11/2018	Annual	06/11/2019
Agilent	MXA Signal Analyzer N9020A	MY50510407	10/31/2018	Annual	10/31/2019
HP	Dual Directional Coupler	16072	10/11/2018	Annual	10/11/2019
Anritsu	Radio Communication Tester MT8820C	6200628628	07/19/2018	Annual	07/19/2019
Anritsu	Radio Communication Tester MT8821C	6201502997	08/13/2018	Annual	08/13/2019
R&S	Bluetooth CBT	100272	03/06/2018	Annual	03/06/2019

1. The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Verification measurement is performed by HCT Lab. before each test. The brain/body simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity (dielectric constant) of the brain/body-equivalent material.

16. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1 - 2005.

These measurements were taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the abortion and distribution of electromagnetic energy in the body are very complex phenomena the depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

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Attachment 1. – SAR Test Plots

Test Laboratory: HCT CO., LTD
EUT Type: Mobile Phone
Liquid Temperature: 20.3 ℃
Ambient Temperature: 20.5 ℃
Test Date: 12/17/2018
Plot No.: 1

DUT: SM-M105F/DS; Type: Bar

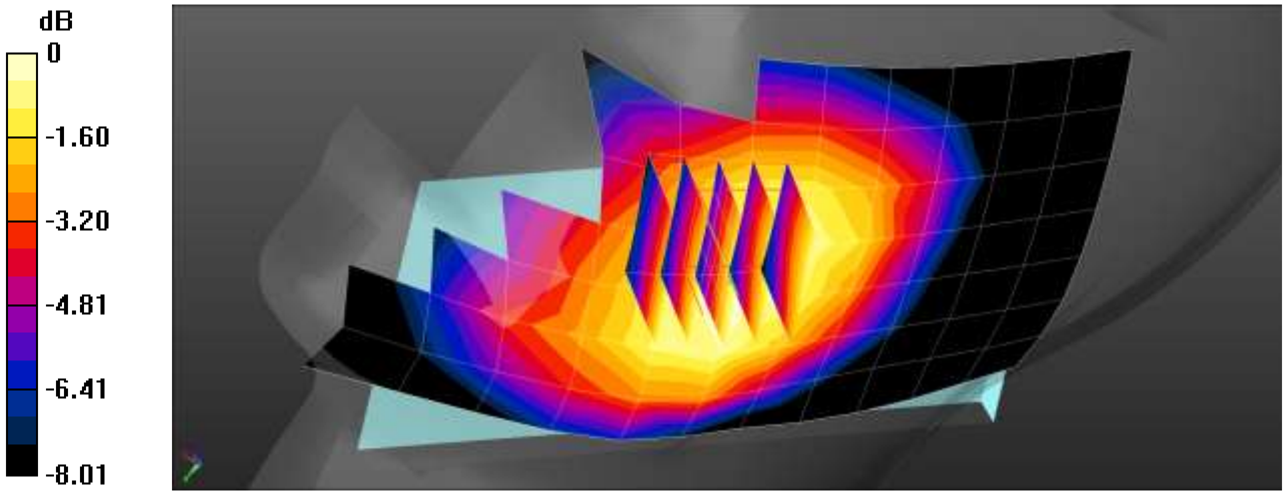
Communication System: UID 0, GSM 850 (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.4
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.923 S/m; ε_r = 42.623; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.95, 9.95, 9.95); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: Twin-SAM V8.0
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/GSM850 Head Right Touch Voice 190h/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.130 W/kg

SM-M105F/DS/GSM850 Head Right Touch Voice 190h/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.593 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.138 W/kg
SAR(1 g) = 0.110 W/kg; SAR(10 g) = 0.085 W/kg
Maximum value of SAR (measured) = 0.129 W/kg



0 dB = 0.129 W/kg = -8.89 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	12/17/2018
Plot No.:	2

DUT: SM-M105F/DS; Type: Bar

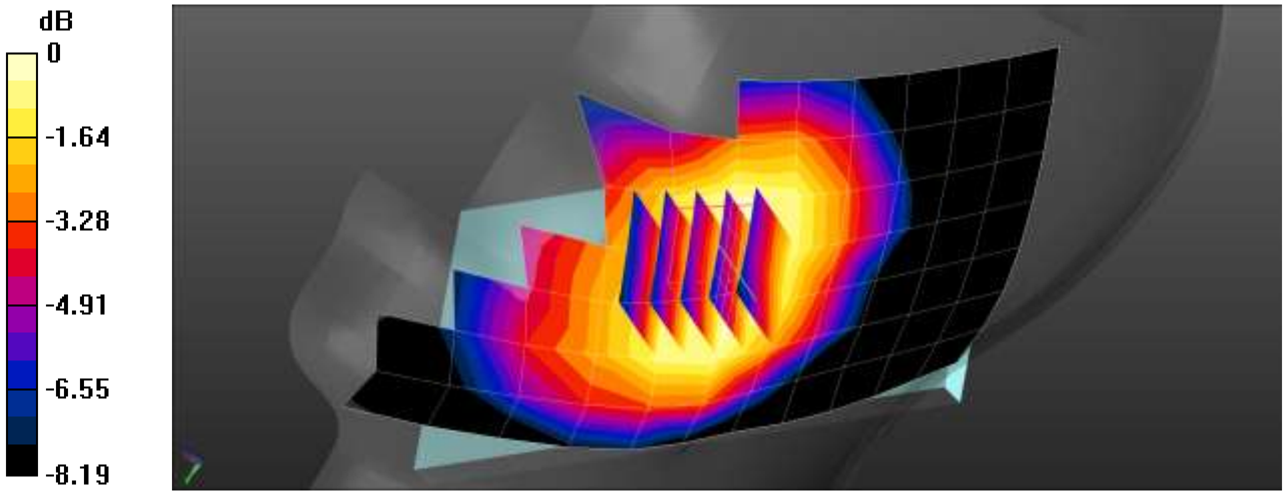
Communication System: UID 0, WCDMA850 (0); Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.923 S/m; ε_r = 42.623; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3968; ConvF(9.86, 9.86, 9.86); Calibrated: 2018-09-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2018-08-10
- Phantom: Twin-SAM V8.0
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/WCDMA850 Head Right Touch 4183h/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0271 W/kg

SM-M105F/DS/WCDMA850 Head Right Touch 4183h/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.797 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.0280 W/kg
SAR(1 g) = 0.021 W/kg; SAR(10 g) = 0.016 W/kg
Maximum value of SAR (measured) = 0.0252 W/kg



0 dB = 0.0252 W/kg = −15.99 dBW/kg

Test Laboratory: HCT CO., LTD
EUT Type: Mobile Phone
Liquid Temperature: 19.4 ℃
Ambient Temperature: 19.6 ℃
Test Date: 12/20/2018
Plot No.: 3

DUT: SM-M105F/DS; Type: Bar

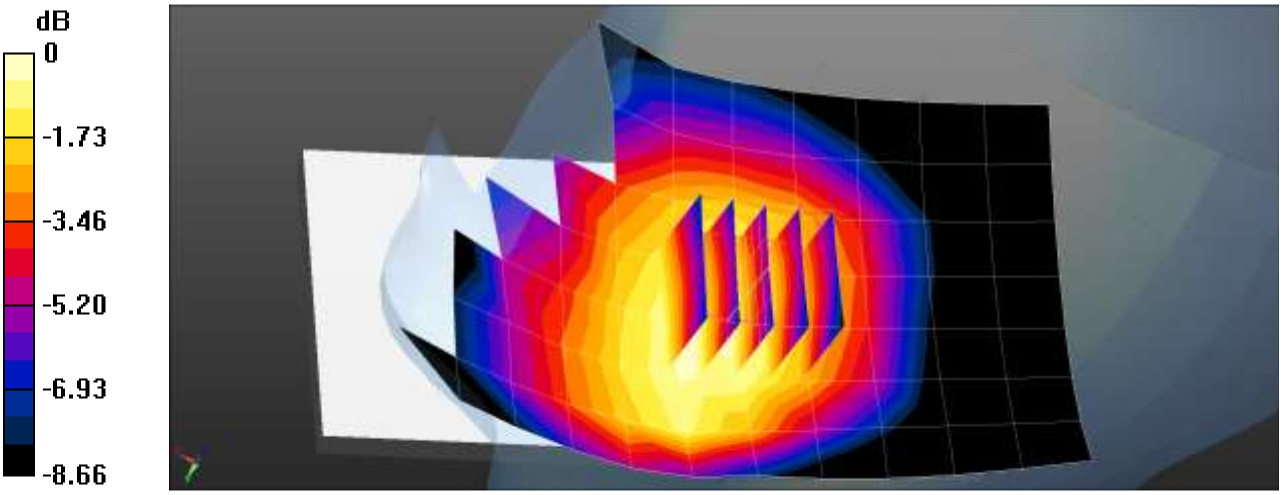
Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.92 S/m; ε_r = 42.679; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.95, 9.95, 9.95); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: SAM
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/LTE band 5 Head Right Touch 1RB 24offset 20525ch/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.150 W/kg

SM-M105F/DS/LTE band 5 Head Right Touch 1RB 24offset 20525ch/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.378 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.158 W/kg
SAR(1 g) = 0.126 W/kg; SAR(10 g) = 0.097 W/kg
Maximum value of SAR (measured) = 0.147 W/kg



0 dB = 0.147 W/kg = -8.33 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.7 ℃
Ambient Temperature:	19.9 ℃
Test Date:	12/19/2018
Plot No.:	4

DUT: SM-M105F/DS; Type: Bar

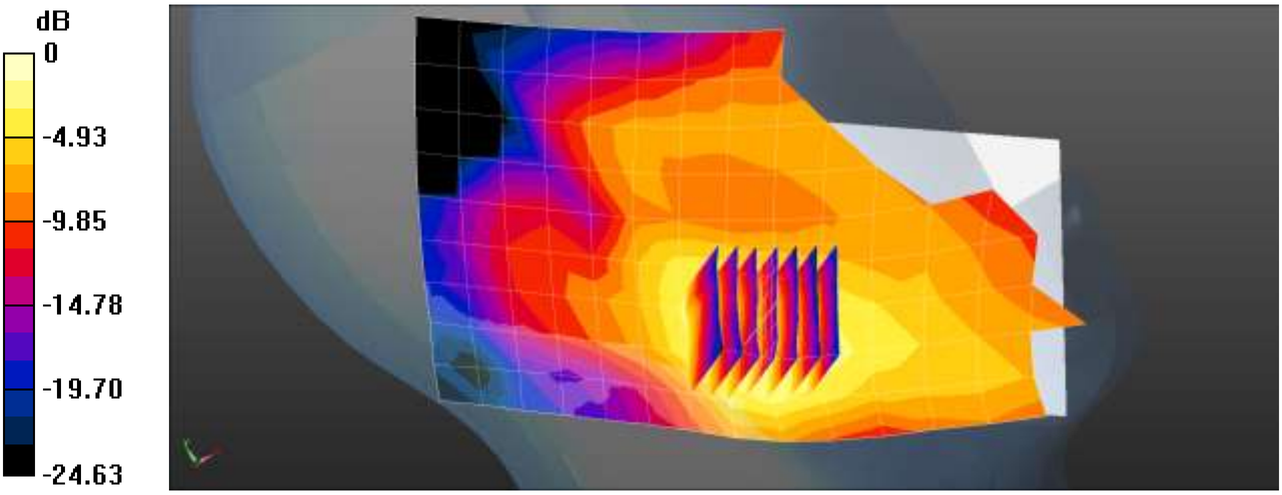
Communication System: UID 0, LTE Band 41 (FCC) (0); Frequency: 2506 MHz;Duty Cycle: 1:1.58052
Medium parameters used (interpolated): f = 2506 MHz; σ = 1.915 S/m; ε_r = 38.44; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3968; ConvF(7.37, 7.37, 7.37); Calibrated: 2018-09-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2018-08-10
- Phantom: SAM with CRP v5.0
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/LTE Band 41 Head Left Touch QPSK 20MHz 1RB 0offset 39750ch/Area Scan (10x16x1):
Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.146 W/kg

SM-M105F/DS/LTE Band 41 Head Left Touch QPSK 20MHz 1RB 0offset 39750ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.837 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.194 W/kg
SAR(1 g) = 0.102 W/kg; SAR(10 g) = 0.053 W/kg
Maximum value of SAR (measured) = 0.157 W/kg



0 dB = 0.157 W/kg = -8.04 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.4 ℃
Ambient Temperature:	19.6 ℃
Test Date:	12/21/2018
Plot No.:	5

DUT: SM-M105F/DS; Type: Bar

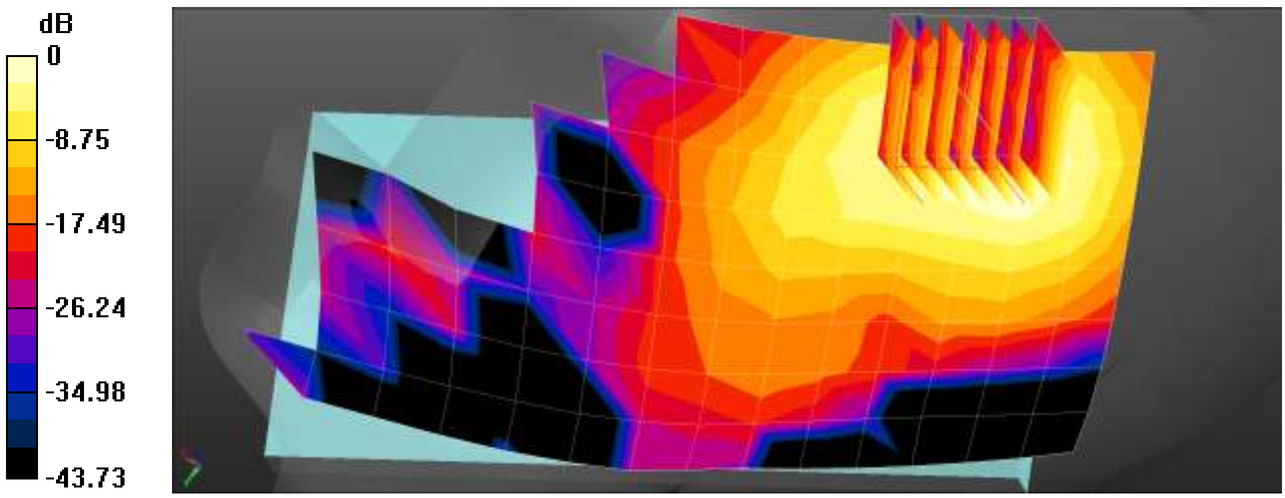
Communication System: UID 0, 2450MHz FCC (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.755 S/m; ε_r = 38.695; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3797; ConvF(7.06, 7.06, 7.06); Calibrated: 2018-11-22;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2018-11-16
- Phantom: Twin-SAM V4.0
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/802.11b Head Right touch 1Mbps 1ch/Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.227 W/kg

SM-M105F/DS/802.11b Head Right touch 1Mbps 1ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.969 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.304 W/kg
SAR(1 g) = 0.154 W/kg; SAR(10 g) = 0.076 W/kg
Maximum value of SAR (measured) = 0.245 W/kg



0 dB = 0.245 W/kg = -6.11 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.4 ℃
Ambient Temperature:	19.6 ℃
Test Date:	12/21/2018
Plot No.:	6

DUT: SM-M105F/DS; Type: Bar

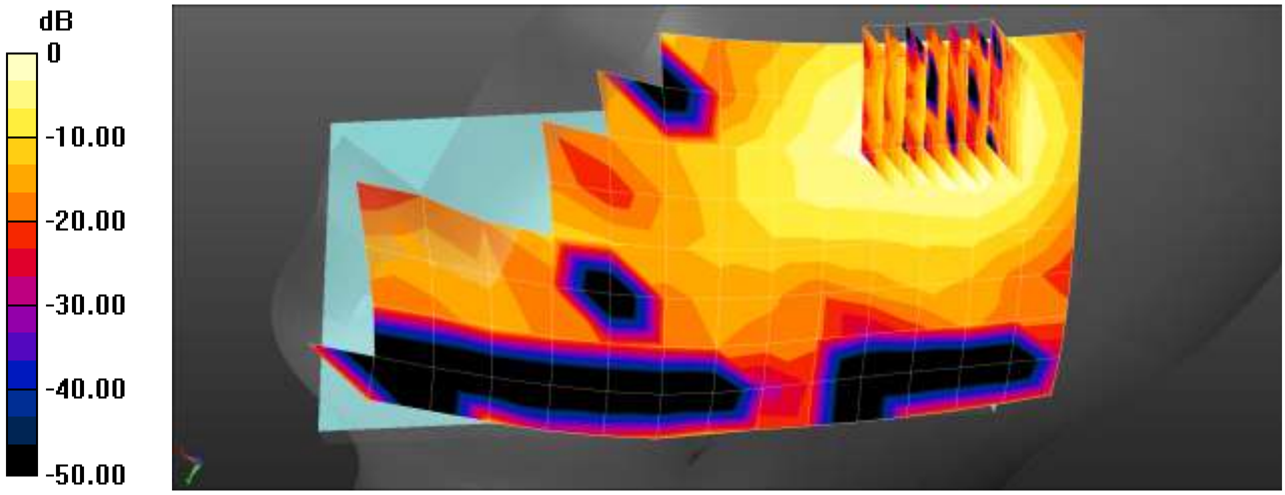
Communication System: UID 0, Bluetooth (0); Frequency: 2402 MHz;Duty Cycle: 1:1.3
Medium parameters used (interpolated): f = 2402 MHz; σ = 1.747 S/m; ε_r = 38.707; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3797; ConvF(7.06, 7.06, 7.06); Calibrated: 2018-11-22;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2018-11-16
- Phantom: Twin-SAM V4.0
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/BT Head Right Touch DH5 0ch/Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.0626 W/kg

SM-M105F/DS/BT Head Right Touch DH5 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.661 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.0820 W/kg
SAR(1 g) = 0.039 W/kg; SAR(10 g) = 0.018 W/kg
Maximum value of SAR (measured) = 0.0647 W/kg



0 dB = 0.0626 W/kg = -12.03 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	18.8 ℃
Ambient Temperature:	19.0 ℃
Test Date:	12/18/2018
Plot No.:	7

DUT: SM-M105F/DS; Type: Bar

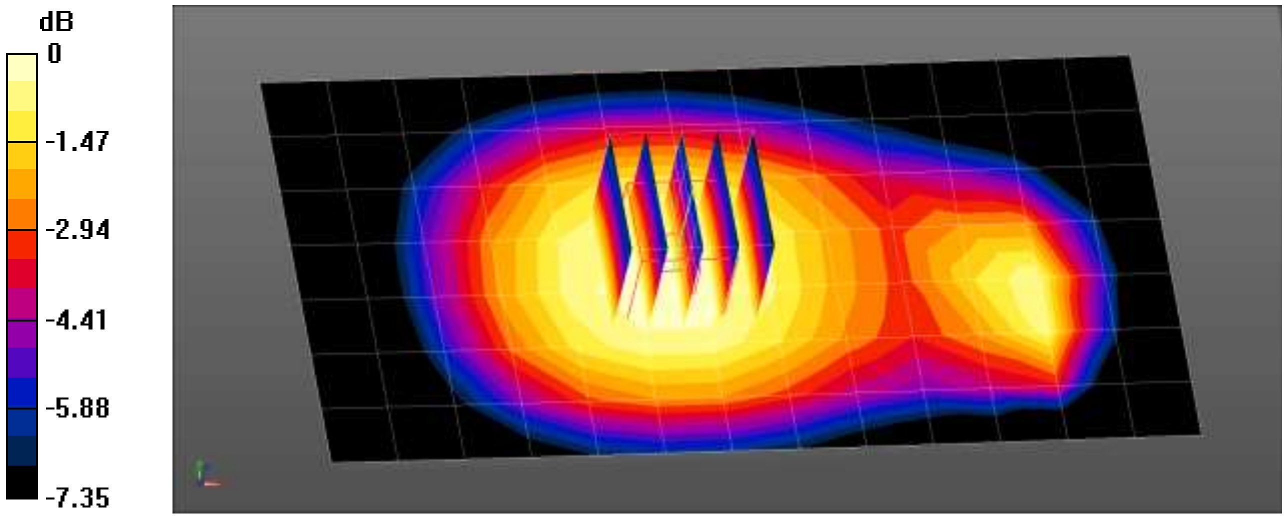
Communication System: UID 0, GSM 850 (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.96 S/m; ε_r = 53.378; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.66, 9.66, 9.66); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/GSM850 Body Worn Rear 190ch/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.167 W/kg

SM-M105F/DS/GSM850 Body Worn Rear 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.48 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.185 W/kg
SAR(1 g) = 0.144 W/kg; SAR(10 g) = 0.110 W/kg
Maximum value of SAR (measured) = 0.172 W/kg



0 dB = 0.172 W/kg = -7.64 dBW/kg

Test Laboratory: HCT CO., LTD
EUT Type: Mobile Phone
Liquid Temperature: 18.8 ℃
Ambient Temperature: 19.0 ℃
Test Date: 12/18/2018
Plot No.: 8

DUT: SM-M105F/DS; Type: Bar

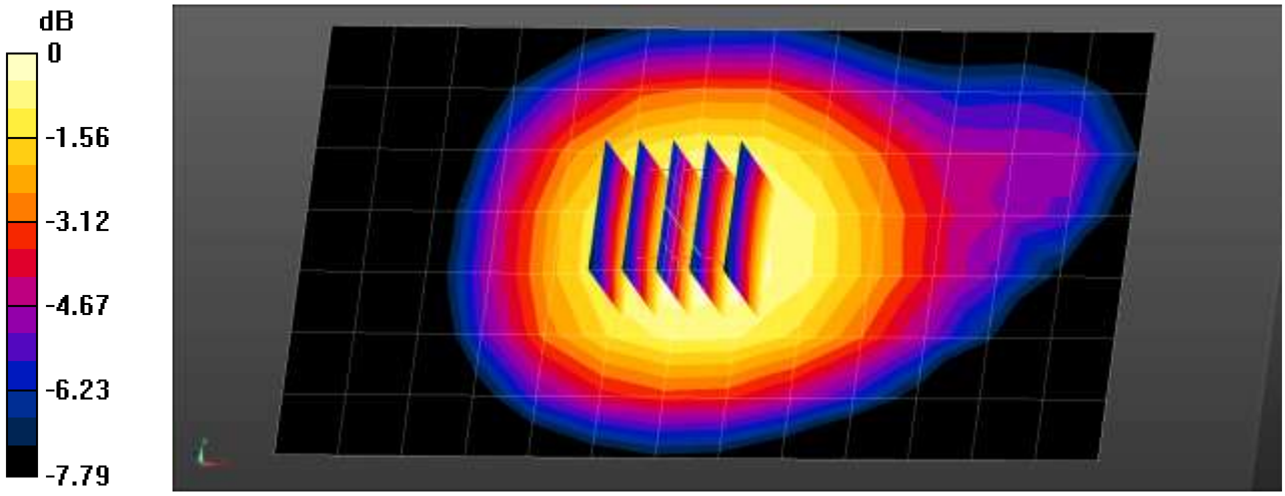
Communication System: UID 0, WCDMA850 (0); Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.96 S/m; ε_r = 53.378; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.66, 9.66, 9.66); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/WCDMA850 Body Worn Front 4183ch/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0598 W/kg

SM-M105F/DS/WCDMA850 Body Worn Front 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.476 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.0660 W/kg
SAR(1 g) = 0.051 W/kg; SAR(10 g) = 0.039 W/kg
Maximum value of SAR (measured) = 0.0614 W/kg



0 dB = 0.0614 W/kg = -12.12 dBW/kg

Test Laboratory: HCT CO., LTD
EUT Type: Mobile Phone
Liquid Temperature: 18.8 ℃
Ambient Temperature: 19.0 ℃
Test Date: 12/18/2018
Plot No.: 9

DUT: SM-M105F/DS; Type: Bar

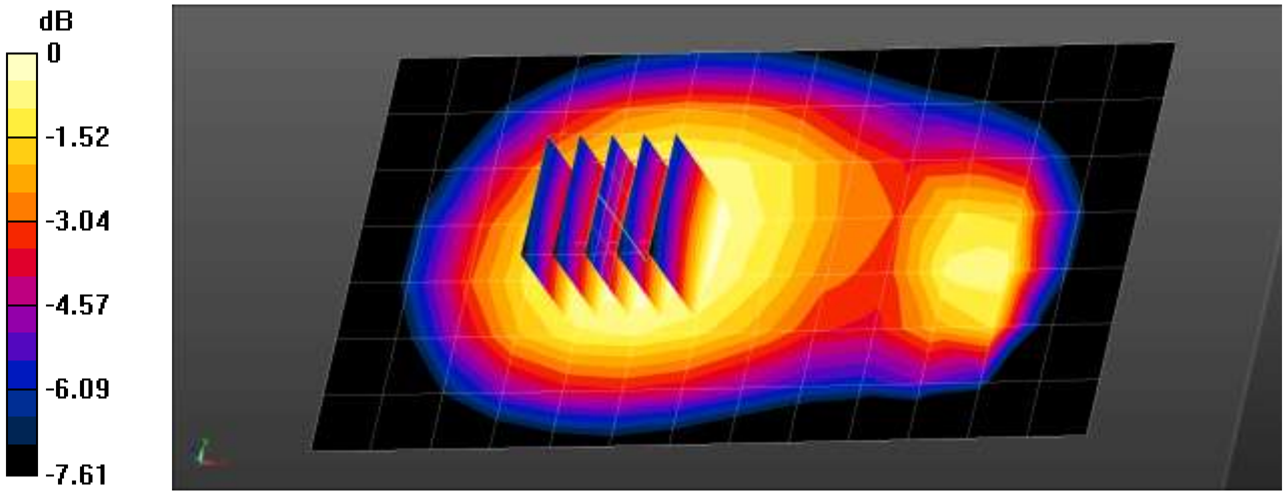
Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.96 S/m; ε_r = 53.379; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.66, 9.66, 9.66); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/LTE Band 5 Body Worn Rear QPSK 10MHz 1RB 24offset 20525ch/Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.177 W/kg

SM-M105F/DS/LTE Band 5 Body Worn Rear QPSK 10MHz 1RB 24offset 20525ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.37 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.191 W/kg
SAR(1 g) = 0.148 W/kg; SAR(10 g) = 0.114 W/kg
Maximum value of SAR (measured) = 0.176 W/kg



0 dB = 0.176 W/kg = -7.54 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.0 ℃
Ambient Temperature:	19.2 ℃
Test Date:	12/19/2018
Plot No.:	10

DUT: SM-M105F/DS; Type: Bar

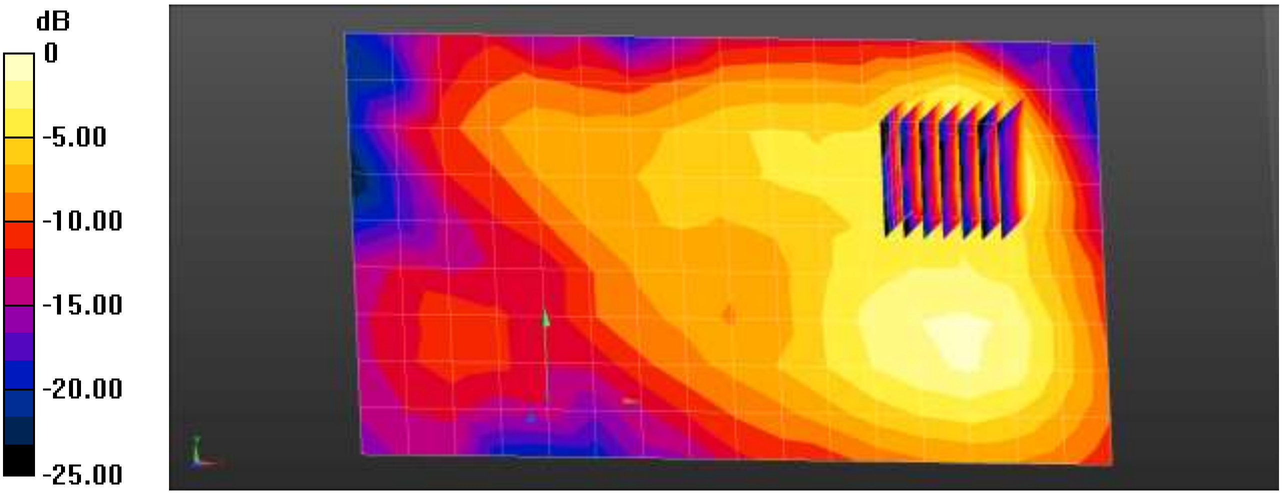
Communication System: UID 0, LTE Band 41 (FCC) (0); Frequency: 2506 MHz;Duty Cycle: 1:1.58052
Medium parameters used (interpolated): f = 2506 MHz; σ = 2.04 S/m; ε_r = 53.271; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(7.27, 7.27, 7.27); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/LTEband 41 Body Worn Rear QPSK 20MHz 1RB 0offset 39750ch/Area Scan (10x17x1):
Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.0973 W/kg

SM-M105F/DS/LTEband 41 Body Worn Rear QPSK 20MHz 1RB 0offset 39750ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.092 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.139 W/kg
SAR(1 g) = 0.063 W/kg; SAR(10 g) = 0.031 W/kg
Maximum value of SAR (measured) = 0.108 W/kg



0 dB = 0.108 W/kg = -9.67 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.9 ℃
Ambient Temperature:	21.1 ℃
Test Date:	12/22/2018
Plot No.:	11

DUT: SM-M105F/DS; Type: Bar

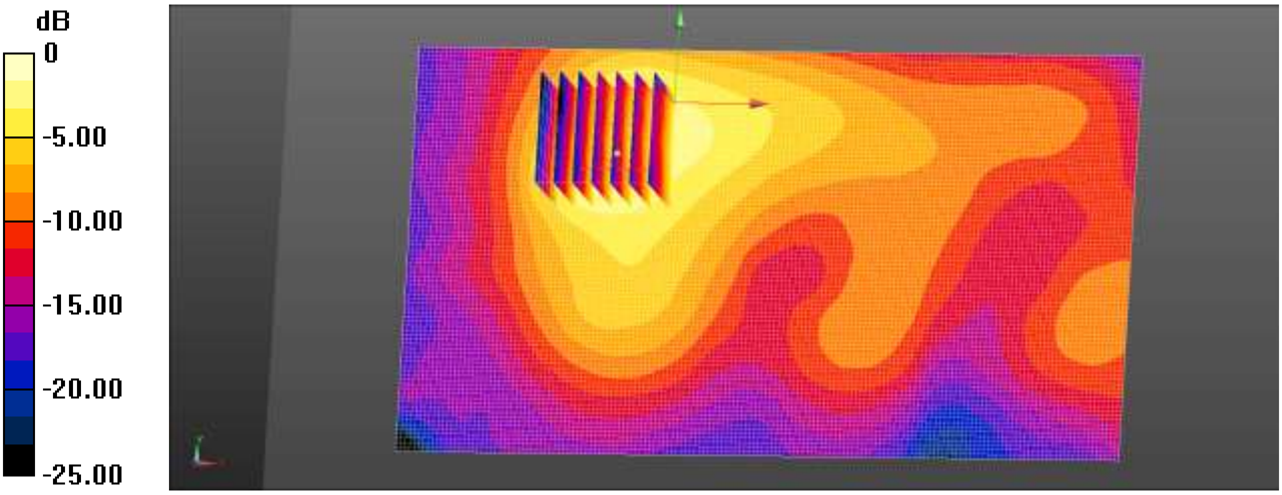
Communication System: UID 0, 2450MHz FCC (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.878 S/m; ε_r = 51.675; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN7370; ConvF(7.45, 7.45, 7.45); Calibrated: 2018-08-30;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn652; Calibrated: 2018-04-20
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/802.11b Body Worn Rear 1Mbps 1ch/Area Scan (91x161x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.183 W/kg

SM-M105F/DS/802.11b Body Worn Rear 1Mbps 1ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.362 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.246 W/kg
SAR(1 g) = 0.118 W/kg; SAR(10 g) = 0.060 W/kg
Maximum value of SAR (measured) = 0.194 W/kg



0 dB = 0.194 W/kg = −7.12 dBW/kg

Test Laboratory: HCT CO., LTD
EUT Type: Mobile Phone
Liquid Temperature: 19.4 ℃
Ambient Temperature: 19.6 ℃
Test Date: 12/21/2018
Plot No.: 12

DUT: SM-M105F/DS; Type: Bar

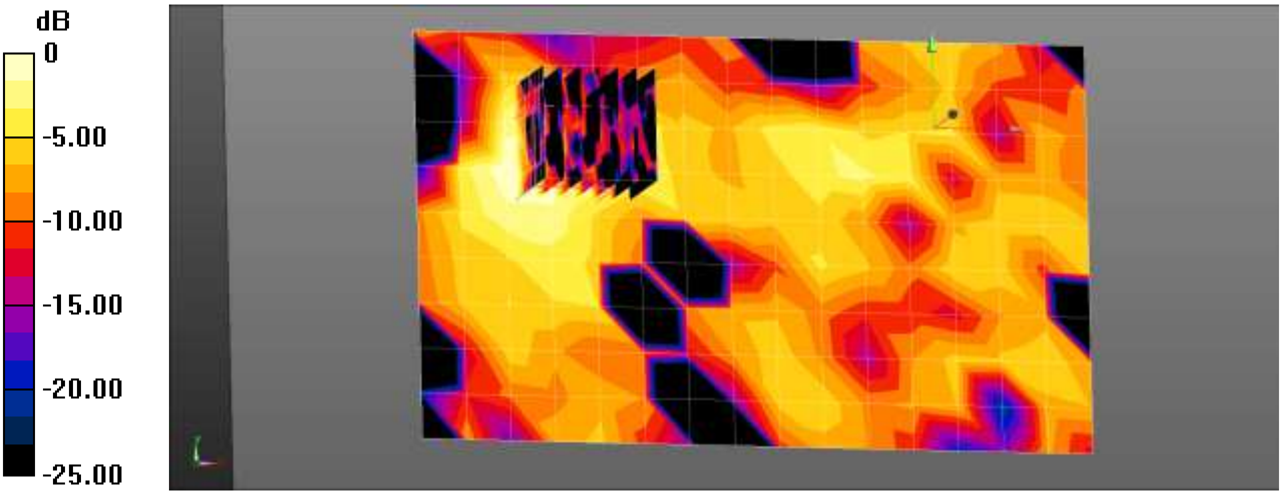
Communication System: UID 0, Bluetooth (0); Frequency: 2402 MHz;Duty Cycle: 1:1.3
Medium parameters used (interpolated): f = 2402 MHz; σ = 1.918 S/m; ε_r = 51.027; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3797; ConvF(7.13, 7.13, 7.13); Calibrated: 2018-11-22;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2018-11-16
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/BT Body Rear DH5 0ch body worn 15mm/Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.00938 W/kg

SM-M105F/DS/BT Body Rear DH5 0ch body worn 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.2610 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.0160 W/kg
SAR(1 g) = 0.00301 W/kg; SAR(10 g) = 0.00104 W/kg
Maximum value of SAR (measured) = 0.00818 W/kg



0 dB = 0.00818 W/kg = −20.87 dBW/kg

Test Laboratory: HCT CO., LTD
EUT Type: Mobile Phone
Liquid Temperature: 18.8 ℃
Ambient Temperature: 19.0℃
Test Date: 12/18/2018
Plot No.: 13

DUT: SM-M105F/DS; Type: Bar

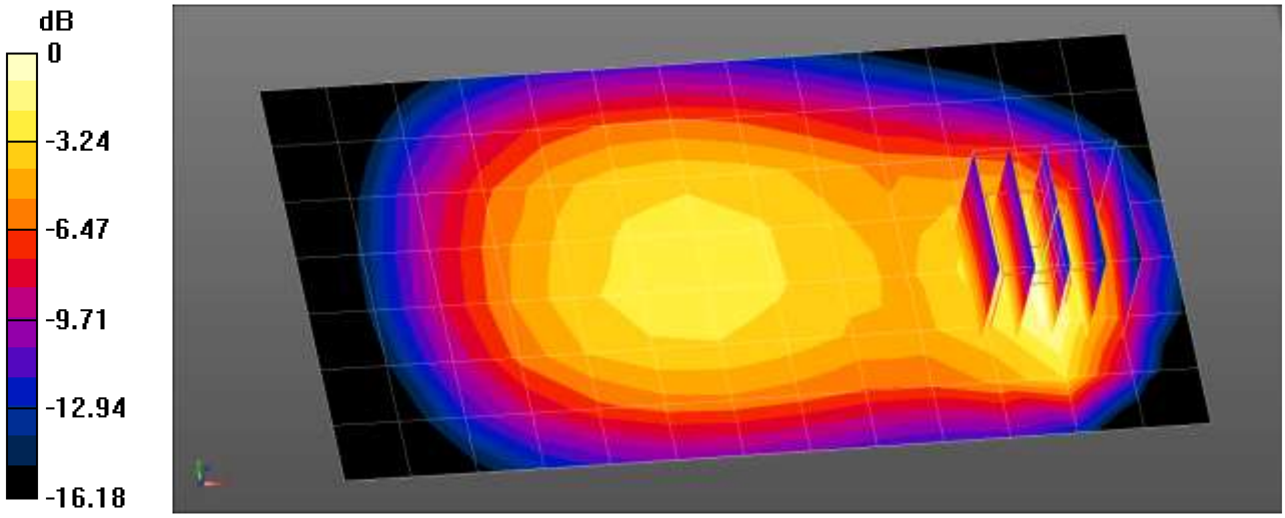
Communication System: UID 0, GSM850 GPRS 4TX (0); Frequency: 836.6 MHz;Duty Cycle: 1:2.07491
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.96 S/m; ε_r = 53.378; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.66, 9.66, 9.66); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/GSM850 Body Rear 4Tx 190ch/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.405 W/kg

SM-M105F/DS/GSM850 Body Rear 4Tx 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.88 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.534 W/kg
SAR(1 g) = 0.284 W/kg; SAR(10 g) = 0.166 W/kg
Maximum value of SAR (measured) = 0.441 W/kg



0 dB = 0.441 W/kg = -3.56 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	18.8 ℃
Ambient Temperature:	19.0℃
Test Date:	12/18/2018
Plot No.:	14

DUT: SM-M105F/DS; Type: Bar

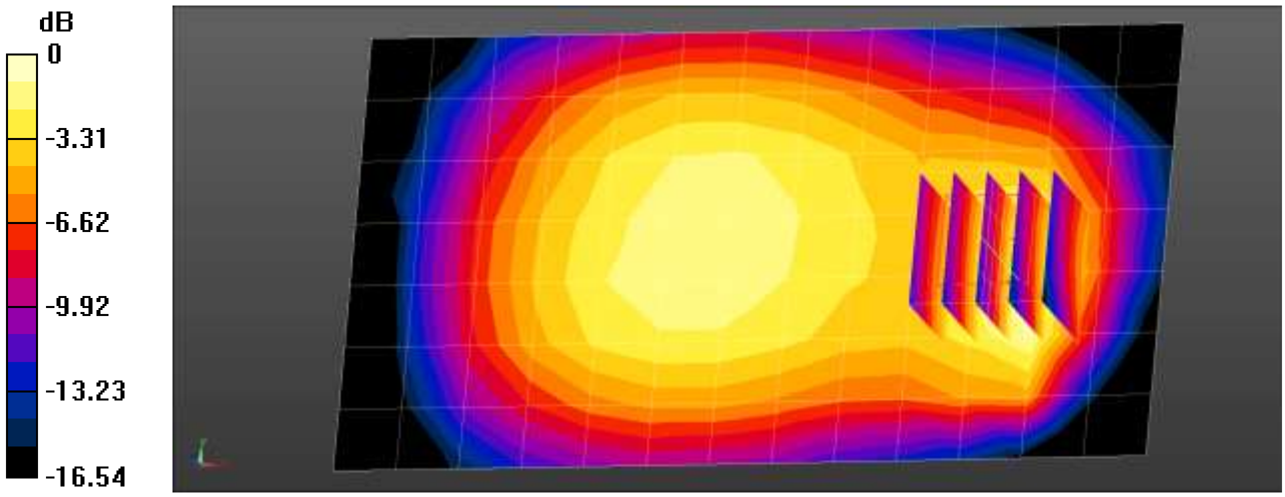
Communication System: UID 0, WCDMA850 (0); Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.96 S/m; ε_r = 53.378; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.66, 9.66, 9.66); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/WCDMA850 Body Rear 4183ch/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0861 W/kg

SM-M105F/DS/WCDMA850 Body Rear 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.310 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.111 W/kg
SAR(1 g) = 0.062 W/kg; SAR(10 g) = 0.038 W/kg
Maximum value of SAR (measured) = 0.0934 W/kg



0 dB = 0.0934 W/kg = -10.30 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	18.8 ℃
Ambient Temperature:	19.0℃
Test Date:	12/18/2018
Plot No.:	15

DUT: SM-M105F/DS; Type: Bar

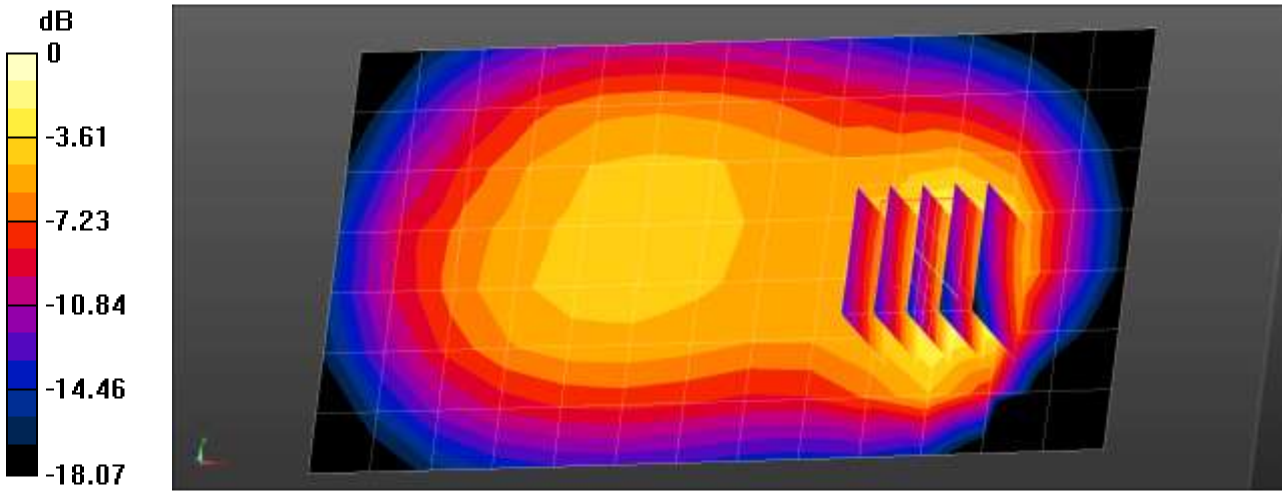
Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.96 S/m; ε_r = 53.379; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.66, 9.66, 9.66); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/LTE Band 5 Body Rear QPSK 10MHz 1RB 24offset 20525ch/Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.449 W/kg

SM-M105F/DS/LTE Band 5 Body Rear QPSK 10MHz 1RB 24offset 20525ch/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.50 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.635 W/kg
SAR(1 g) = 0.350 W/kg; SAR(10 g) = 0.208 W/kg
Maximum value of SAR (measured) = 0.526 W/kg



0 dB = 0.526 W/kg = −2.79 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.0 ℃
Ambient Temperature:	19.2 ℃
Test Date:	12/19/2018
Plot No.:	16

DUT: SM-M105F/DS; Type: Bar

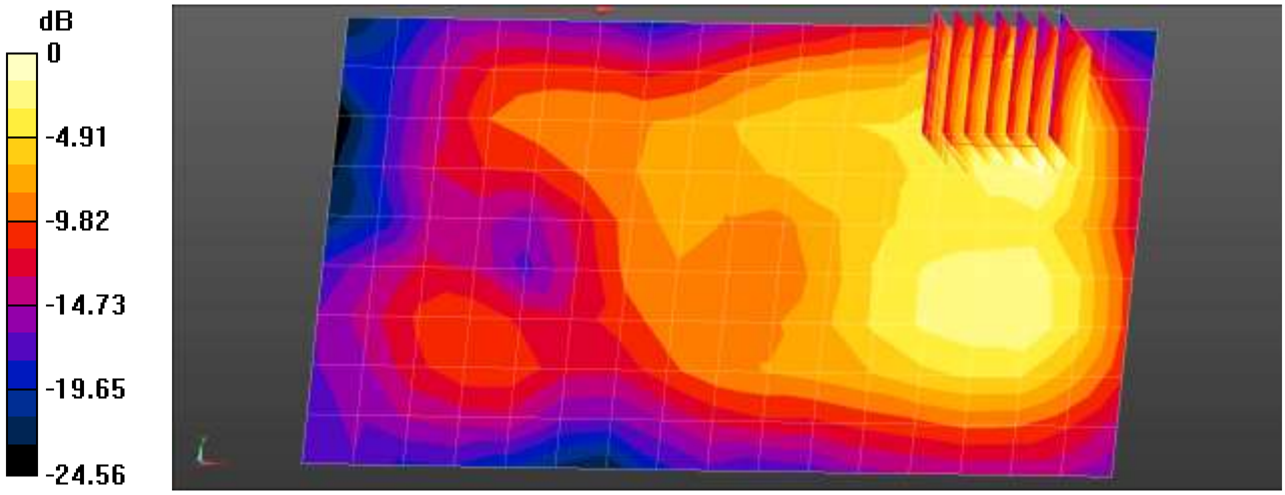
Communication System: UID 0, LTE Band 41 (FCC) (0); Frequency: 2506 MHz;Duty Cycle: 1:1.58052
Medium parameters used (interpolated): f = 2506 MHz; σ = 2.04 S/m; ε_r = 53.271; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(7.27, 7.27, 7.27); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/LTEband 41 Body Rear QPSK 20MHz 1RB 0offset 39750ch/Area Scan (10x17x1):
Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.265 W/kg

SM-M105F/DS/LTEband 41 Body Rear QPSK 20MHz 1RB 0offset 39750ch/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.212 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.435 W/kg
SAR(1 g) = 0.191 W/kg; SAR(10 g) = 0.089 W/kg
Maximum value of SAR (measured) = 0.329 W/kg



0 dB = 0.265 W/kg = −5.76 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.9 ℃
Ambient Temperature:	21.1 ℃
Test Date:	12/22/2018
Plot No.:	17

DUT: SM-M105F/DS; Type: Bar

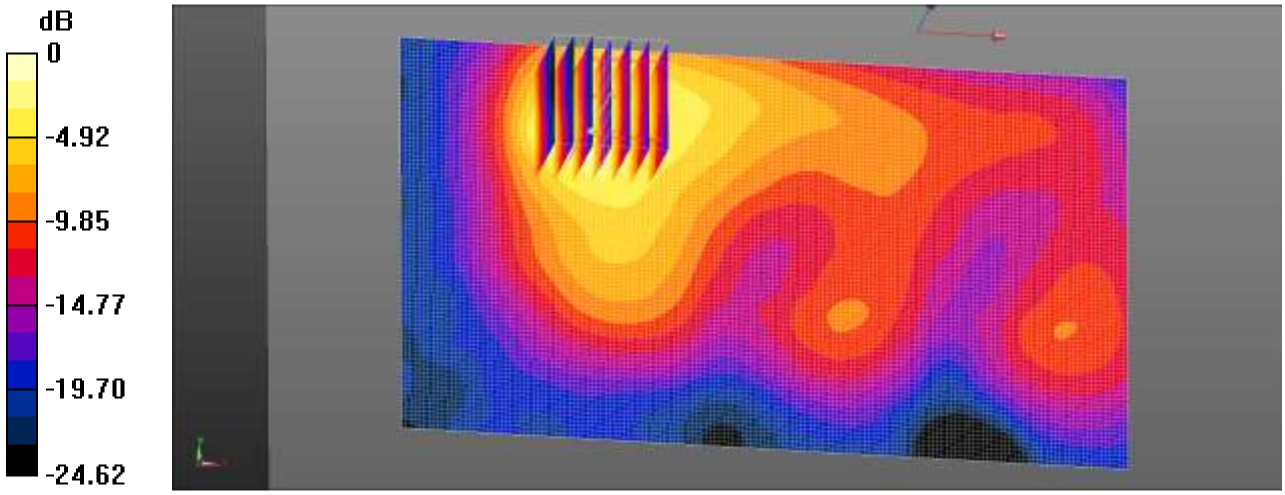
Communication System: UID 0, 2450MHz FCC (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.878 S/m; ε_r = 51.675; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN7370; ConvF(7.45, 7.45, 7.45); Calibrated: 2018-08-30;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn652; Calibrated: 2018-04-20
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/802.11b Body Rear 1Mbps 1ch/Area Scan (91x161x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.401 W/kg

SM-M105F/DS/802.11b Body Rear 1Mbps 1ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.183 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.518 W/kg
SAR(1 g) = 0.234 W/kg; SAR(10 g) = 0.113 W/kg
Maximum value of SAR (measured) = 0.403 W/kg



0 dB = 0.403 W/kg = -3.95 dBW/kg

Test Laboratory: HCT CO., LTD
EUT Type: Mobile Phone
Liquid Temperature: 19.4 ℃
Ambient Temperature: 19.6 ℃
Test Date: 12/21/2018
Plot No.: 18

DUT: SM-M105F/DS; Type: Bar

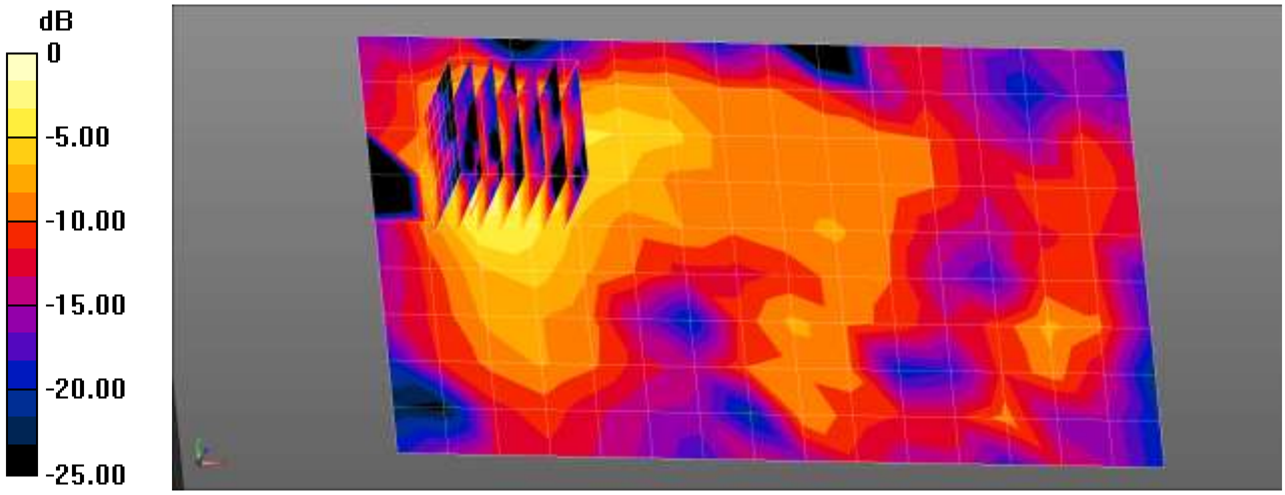
Communication System: UID 0, Bluetooth (0); Frequency: 2402 MHz;Duty Cycle: 1:1.3
Medium parameters used (interpolated): f = 2402 MHz; σ = 1.918 S/m; ε_r = 51.027; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3797; ConvF(7.13, 7.13, 7.13); Calibrated: 2018-11-22;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2018-11-16
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

SM-M105F/DS/BT Body Rear DH5 0ch/Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.0221 W/kg

SM-M105F/DS/BT Body Rear DH5 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.224 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.0380 W/kg
SAR(1 g) = 0.017 W/kg; SAR(10 g) = 0.00663 W/kg
Maximum value of SAR (measured) = 0.0291 W/kg



0 dB = 0.0291 W/kg = -15.36 dBW/kg

Attachment 2. – Dipole Verification Plots

■ Verification Data (835 MHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	20.3 ℃
Test Date:	12/17/2018

DUT: Dipole 835 MHz ; Type: D835V2

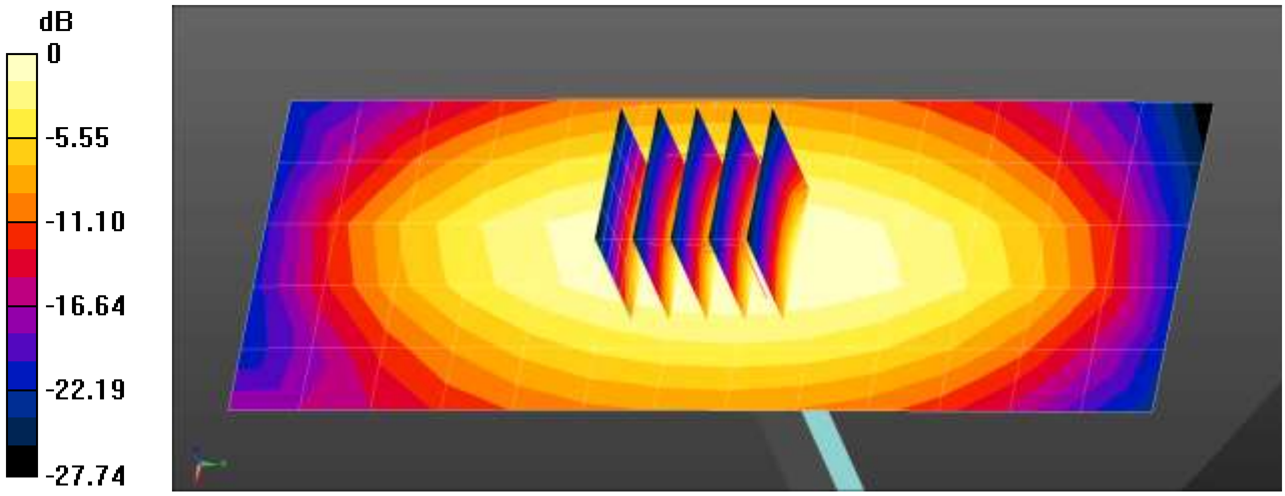
Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 835 MHz; σ = 0.921 S/m; ε_r = 42.661; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.95, 9.95, 9.95); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: Twin-SAM V8.0Measurement SW: DASY52, Version 52.8 (8);

Dipole/835MHz Head Verification/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.523 W/kg

Dipole/835MHz Head Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.11 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.680 W/kg
SAR(1 g) = 0.461 W/kg; SAR(10 g) = 0.302 W/kg
Maximum value of SAR (measured) = 0.612 W/kg



0 dB = 0.523 W/kg = −2.81 dBW/kg

■ Verification Data (835 MHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	20.3 ℃
Test Date:	12/17/2018

DUT: Dipole 835 MHz ; Type: D835V2

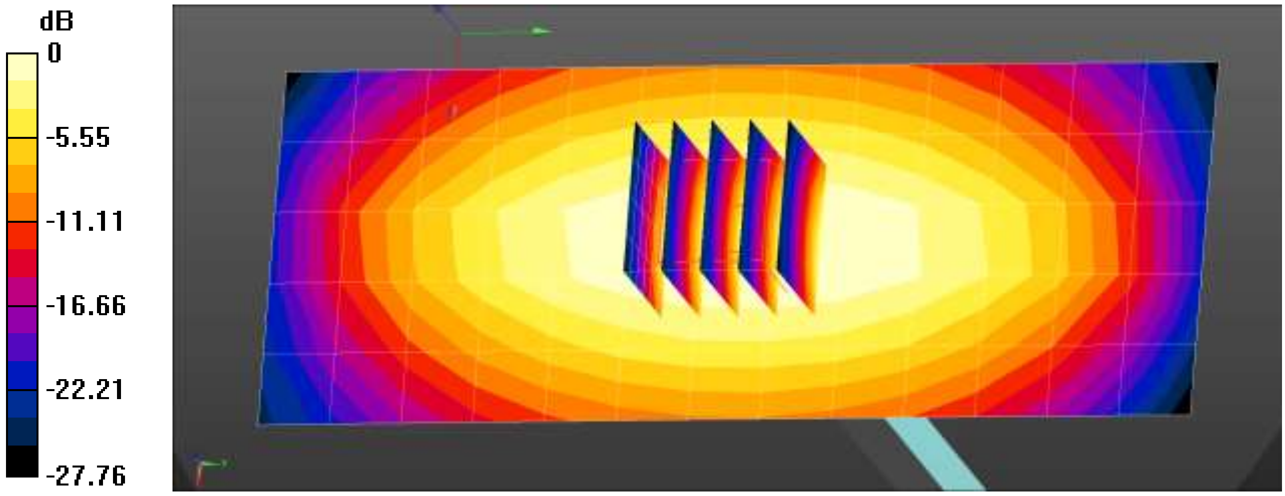
Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 835 MHz; σ = 0.921 S/m; ε_r = 42.661; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3968; ConvF(9.86, 9.86, 9.86); Calibrated: 2018-09-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2018-08-10
- Phantom: Twin-SAM V8.0
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/835MHz Head Verification/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.511 W/kg

Dipole/835MHz Head Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.26 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.682 W/kg
SAR(1 g) = 0.449 W/kg; SAR(10 g) = 0.294 W/kg
Maximum value of SAR (measured) = 0.605 W/kg



0 dB = 0.511 W/kg = −2.92 dBW/kg

■ Verification Data (835 MHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	19.4 ℃
Test Date:	12/20/2018

DUT: Dipole 835 MHz ; Type: D835V2

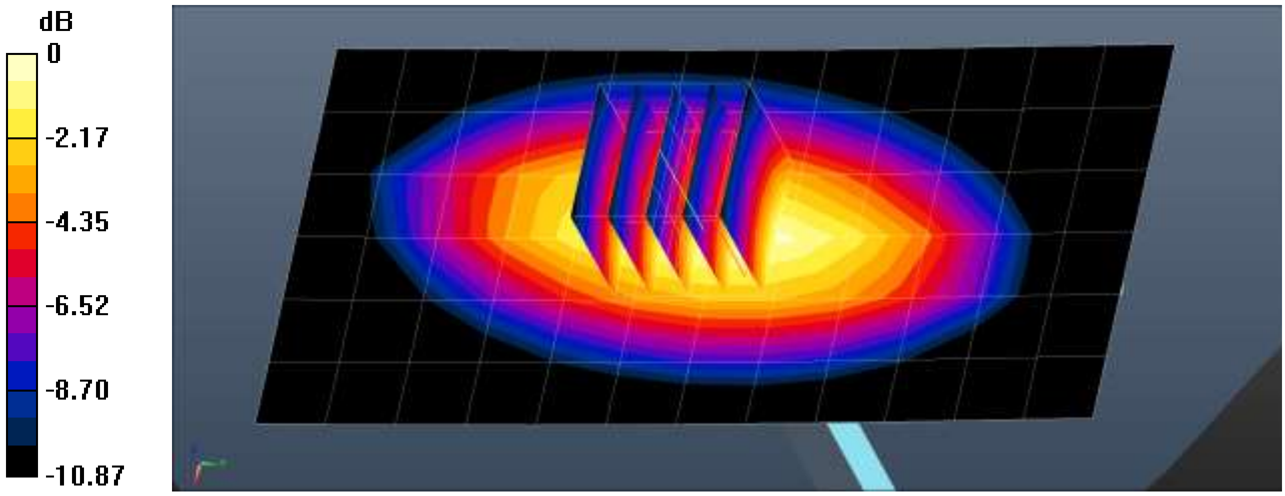
Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 835 MHz; σ = 0.908 S/m; ε_r = 41.852; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.95, 9.95, 9.95); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: SAM
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/835MHz Head Verification/Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.584 W/kg

Dipole/835MHz Head Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.69 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.668 W/kg
SAR(1 g) = 0.442 W/kg; SAR(10 g) = 0.289 W/kg
Maximum value of SAR (measured) = 0.594 W/kg



0 dB = 0.594 W/kg = −2.26 dBW/kg

■ Verification Data (835 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	18.8 ℃
Test Date:	12/18/2018

DUT: Dipole 835 MHz ; Type: D835V2

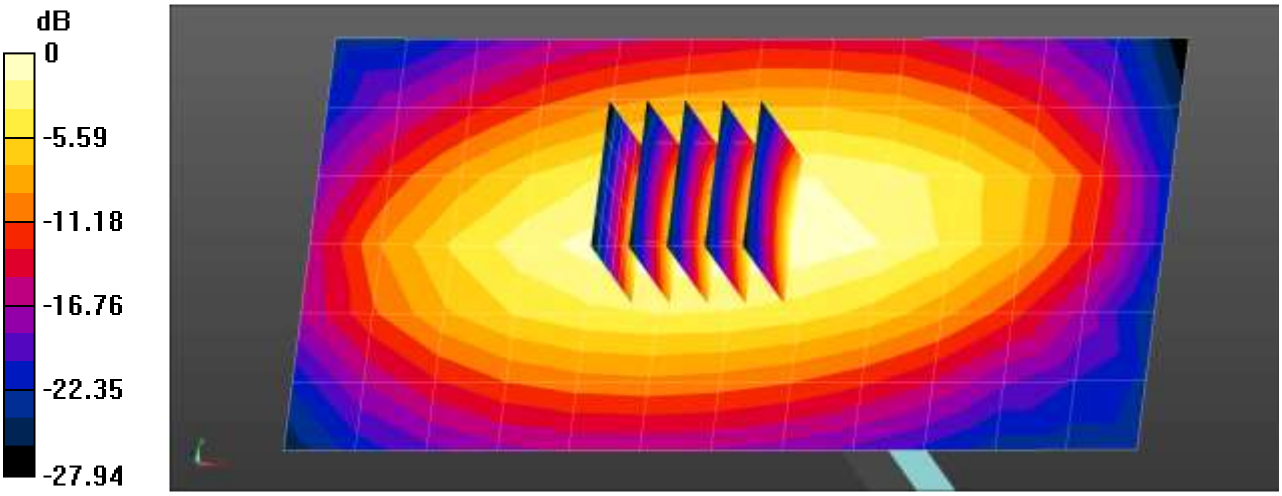
Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 835 MHz; σ = 0.959 S/m; ε_r = 53.402; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(9.66, 9.66, 9.66); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/835MHz Body Verification/Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm.
Maximum value of SAR (measured) = 0.611 W/kg

Dipole/835MHz Body Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.44 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.727 W/kg
SAR(1 g) = 0.475 W/kg; SAR(10 g) = 0.310 W/kg
Maximum value of SAR (measured) = 0.640 W/kg



0 dB = 0.611 W/kg = -2.14 dBW/kg

■ Verification Data (2 450 MHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	19.4 ℃
Test Date:	12/21/2018

DUT: Dipole 2450 MHz ; Type: D2450V2

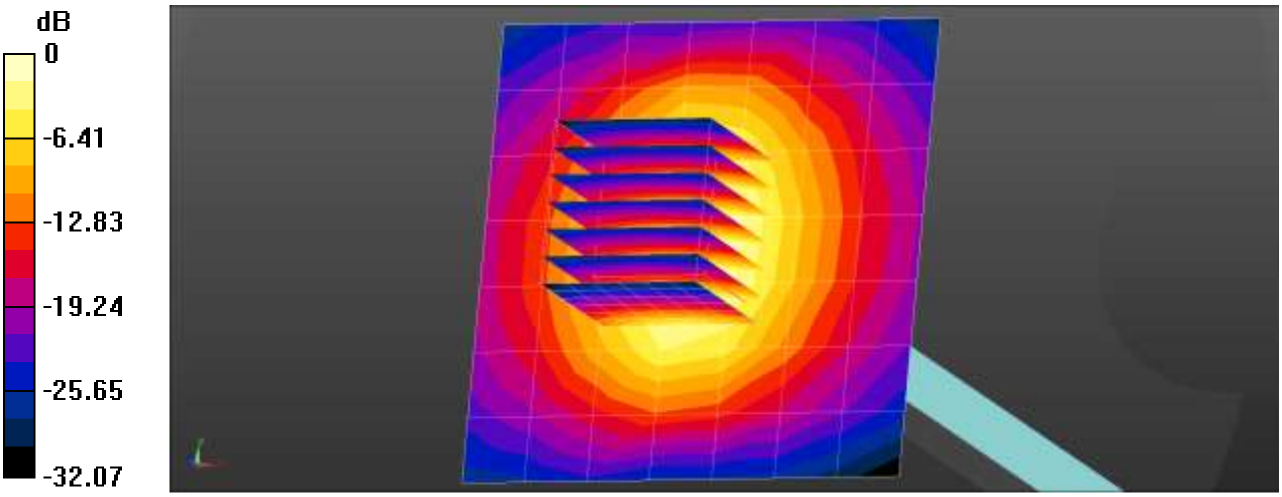
Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.792 S/m; ε_r = 38.68; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3797; ConvF(7.06, 7.06, 7.06); Calibrated: 2018-11-22;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2018-11-16
- Phantom: Twin-SAM V4.0
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/2 450 MHz Head Verification/Area Scan (8x8x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 2.89 W/kg

Dipole/2 450 MHz Head Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 42.89 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 5.75 W/kg
SAR(1 g) = 2.56 W/kg; SAR(10 g) = 1.16 W/kg
Maximum value of SAR (measured) = 3.41 W/kg



0 dB = 2.89 W/kg = 4.61 dBW/kg

■ Verification Data (2 450 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	20.9 ℃
Test Date:	12/22/2018

DUT: Dipole 2450 MHz ; Type: D2450V2

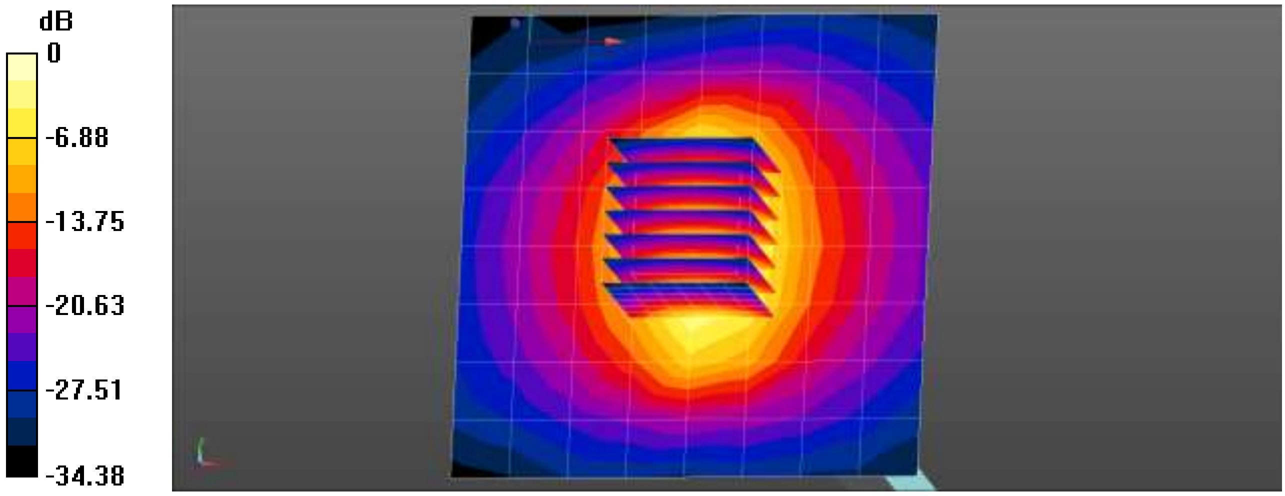
Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.93 S/m; ε_r = 51.686; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN7370; ConvF(7.45, 7.45, 7.45); Calibrated: 2018-08-30;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn652; Calibrated: 2018-04-20
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/2450MHz Body Verification/Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 4.27 W/kg

Dipole/2450MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 49.04 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 5.79 W/kg
SAR(1 g) = 2.72 W/kg; SAR(10 g) = 1.24 W/kg
Maximum value of SAR (measured) = 4.63 W/kg



0 dB = 4.27 W/kg = 6.30 dBW/kg

■ Verification Data (2 450 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	19.4 ℃
Test Date:	12/21/2018

DUT: Dipole 2450 MHz ; Type: D2450V2

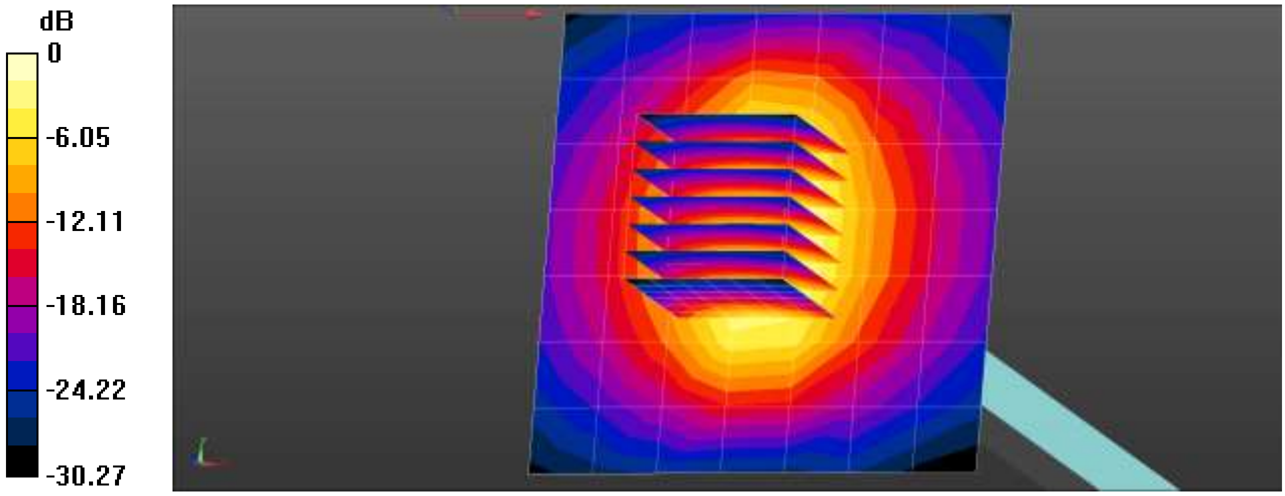
Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.981 S/m; ε_r = 50.743; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3797; ConvF(7.13, 7.13, 7.13); Calibrated: 2018-11-22;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2018-11-16
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/2450MHz Body Verification/Area Scan (8x8x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 2.99 W/kg

Dipole/2450MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 45.84 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 4.84 W/kg
SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.1 W/kg
Maximum value of SAR (measured) = 3.90 W/kg



0 dB = 2.99 W/kg = 4.76 dBW/kg

■ Verification Data (2 600 MHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	19.7 ℃
Test Date:	12/19/2018

DUT: Dipole 2600 MHz; Type: D2600V2

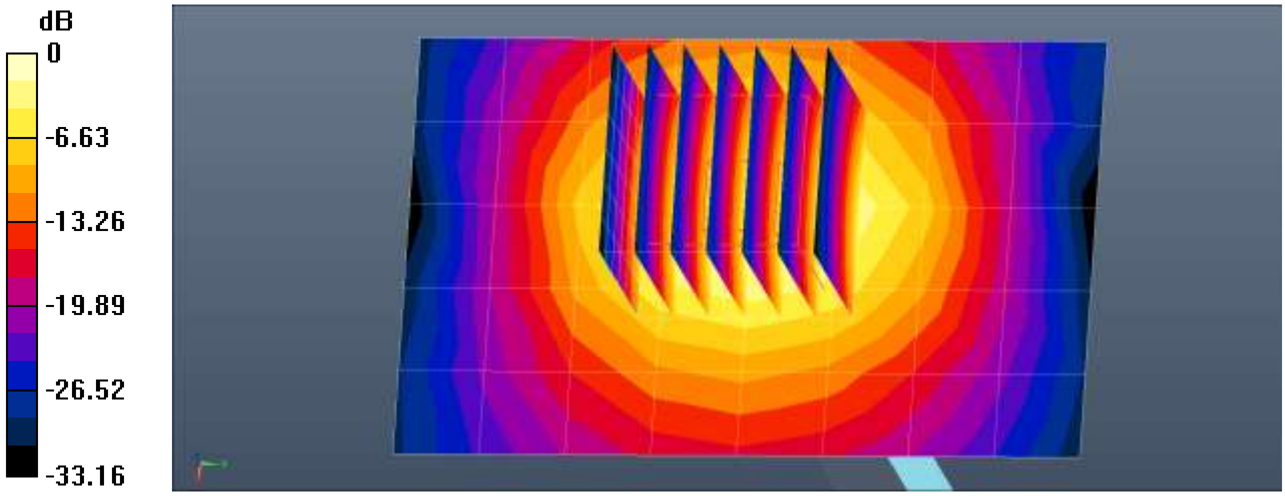
Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.006 S/m; ε_r = 38.146; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3968; ConvF(7.37, 7.37, 7.37); Calibrated: 2018-09-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2018-08-10
- Phantom: SAM with CRP v5.0
- Measurement SW: DASY52, Version 52.8 (8);

2600MHz Head Verification/Area Scan (6x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 4.78 W/kg

2600MHz Head Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 47.05 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 6.22 W/kg
SAR(1 g) = 2.7 W/kg; SAR(10 g) = 1.2 W/kg
Maximum value of SAR (measured) = 4.80 W/kg



0 dB = 4.78 W/kg = 6.79 dBW/kg

■ Verification Data (2 600 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	19.7 ℃
Test Date:	12/19/2018

DUT: Dipole 2600 MHz; Type: D2600V2

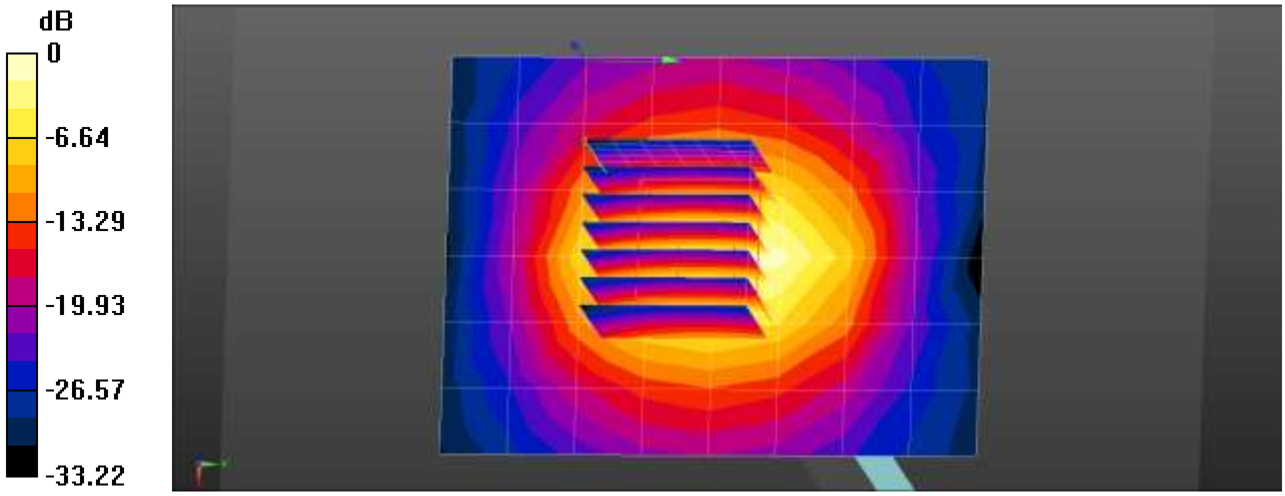
Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.149 S/m; ε_r = 52.984; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3863; ConvF(7.27, 7.27, 7.27); Calibrated: 2018-04-25;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

2600MHz Body Verification/Area Scan (9x7x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 4.44 W/kg

2600MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 46.41 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 5.71 W/kg
SAR(1 g) = 2.57 W/kg; SAR(10 g) = 1.16 W/kg
Maximum value of SAR (measured) = 4.47 W/kg



0 dB = 4.44 W/kg = 6.47 dBW/kg

Attachment 3. – SAR Tissue Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethyl cellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Harts grove.

Ingredients (% by weight)	Frequency (MHz)			
	835		2 450 – 2 700	
Tissue Type	Head	Body	Head	Body
Water	40.45	53.06	71.88	73.2
Salt (NaCl)	1.45	0.94	0.16	0.1
Sugar	57.0	44.9	0.0	0.0
HEC	1.0	1.0	0.0	0.0
Bactericide	0.1	0.1	0.0	0.0
Triton X-100	0.0	0.0	19.97	0.0
DGBE	0.0	0.0	7.99	26.7
Diethylene glycol hexyl ether	-	-	-	-

Salt: 99 % Pure Sodium Chloride Sugar: 98 % Pure Sucrose

Water: De-ionized, 16M resistivity HEC: Hydroxyethyl Cellulose

DGBE: 99 % Di(ethylene glycol) butyl ether,[2-(2-butoxyethoxy) ethanol]

Triton X-100(ultra-pure): Polyethylene glycol mono[4-(1,1,3,3-tetramethylbutyl)phenyl] ether

Composition of the Tissue Equivalent Matter

Attachment 4. – SAR SYSTEM VALIDATION

Per FCC KCB 865664 D02v01r02, SAR system validation status should be document 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 were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2013 and FCC KDB 865664 D01v01r04. Since SAR probe calibrations are frequency dependent, each probe calibration point was 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 including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

SAR System No.	Probe	Probe Type	Probe Calibration Point		Dipole	Date	Dielectric Parameters		CW Validation			Modulation Validation		
							Measured Permittivity	Measured Conductivity	Sensitivity	Probe Linearity	Probe Isotropy	MOD. Type	Duty Factor	PAR
1	3863	EX3DV4	Head	835	4d165	2018-09-28	41.7	0.91	PASS	PASS	PASS	GMSK	PASS	N/A
9	3968	EX3DV4	Head	835	4d165	2018-10-02	41.6	0.92	PASS	PASS	PASS	GMSK	PASS	N/A
1	3863	EX3DV4	Head	835	4d165	2018-09-28	41.7	0.91	PASS	PASS	PASS	N/A	N/A	N/A
1	3863	EX3DV4	Body	835	4d165	2018-09-28	55.4	0.97	PASS	PASS	PASS	N/A	N/A	N/A
1	3863	EX3DV4	Body	835	4d165	2018-09-28	55.4	0.97	PASS	PASS	PASS	GMSK	PASS	N/A
3	3797	EX3DV4	Head	2450	965	2018-02-26	39.2	1.83	PASS	PASS	PASS	OFDM	N/A	PASS
12	7370	EX3DV4	Body	2450	965	2018-09-10	52.8	1.94	PASS	PASS	PASS	OFDM	N/A	PASS
3	3797	EX3DV4	Body	2450	965	2018-02-26	52.8	1.94	PASS	PASS	PASS	OFDM	N/A	PASS
9	3968	EX3DV4	Head	2600	1015	2018-11-26	39.2	1.96	PASS	PASS	PASS	TDD	PASS	N/A
1	3863	EX3DV4	Body	2600	1015	2018-11-26	52.5	2.18	PASS	PASS	PASS	TDD	PASS	N/A

SAR System Validation Summary 1g

Note;

All measurement were performed using probes calibrated for CW signal only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04. SAR system were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to KDB 865664 D01v01r04.

Attachment 5. – The Verification of WLAN Held to ear Power reduction

Per the May 2017 TCBC Workshop notes, demonstration of proper functioning of the power reduction mechanism is required to support the corresponding SAR Configurations.

This device uses a power reduction mechanism for SAR compliance for WLAN operations during voice or VoIP held to ear scenarios.
When a user makes or receives a WLAN voice or WLAN VOIP call, the audio of the call is sent through the earpiece at the top of the device so that the device can be used next to the ear. The IR Sensor located at the top of the device is used to detect when the device is in proximity of the user's head in order to optimize the user's device experience, for example, to dim or turn off the screen to save battery life. For this model, an auxiliary function of the IR sensor is for the purpose of RF Safety
(i.e. reducing output power for Head SAR compliance)

1.1. Power verification for WLAN

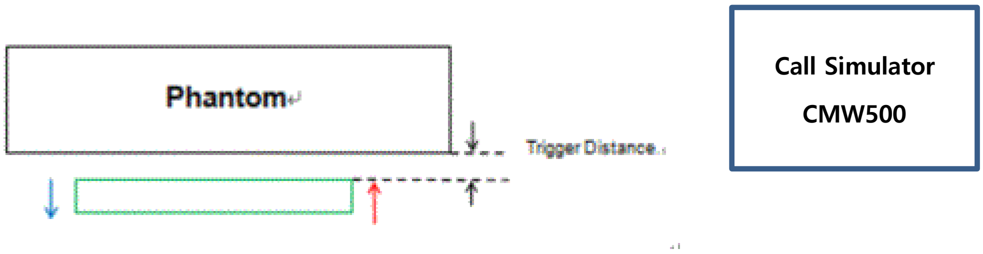
Configurations	Distance	DUT Output power (dBm)	
		Un-Triggered (max)	Triggered (Reduced)
Held to Ear	2.4GHz 802.11b(1~11ch)	17.65	12.20
	2.4GHz 802.11g(1~11ch)	16.65	12.08
	2.4GHz 802.11n(1~11ch)	16.65	11.99

1.2 Procedures for determining proximity sensor triggering distances

(KDB 616217 D04v01r02 §6.2)

We verified the power reduction function with the following procedures.
The DUT was moved toward the phantom in accordance with the steps outlined in KDB 616217 D04 §6.2 to determine the trigger distance for enabling power reduction. The DUT was moved away from the phantom to determine the trigger distance for resuming full power

1) Make a Voice call (VoIP) through a pre-installed VoIP application to call simulator
2) Per KDB616217 D04 §6.2, Measure the power while maintaining the voice call..
. For detailed measurement conducted power results, please refer to the Section .9



Proximity Sensor Trigger Distance Assessment KDB 616217 D04 §6.2, front side

LEGEND
→ Direction of DUT travel for determination of power reduction triggering point
→ Direction of DUT travel for determination of full power resumption triggering point

Tissue simulating liquid	Trigger distance – Front (mm)	
	Moving toward phantom	Moving away phantom
2450 Head	73	79

Front side – EUT Moving toward (trigger) to the Phantom

Distance	Distance to DUT Output power (dBm)									
	78	77	76	75	74	73	72	71	70	69
2.4GHz 802.11b(1~11ch)	17.58	17.31	17.58	17.58	17.68	12.12	12.18	12.15	12.01	12.04
2.4GHz 802.11g(1~11ch)	16.62	16.63	16.64	16.64	16.50	12.05	12.08	11.99	11.97	12.07
2.4GHz 802.11n(1~11ch)	16.63	16.69	16.59	16.68	16.60	11.90	11.99	11.85	11.84	11.85

Front side – EUT Moving away (Release) from the Phantom

Distance	Distance to DUT Output power (dBm)									
	75	76	77	78	79	80	81	82	83	84
2.4GHz 802.11b(1~11ch)	12.11	12.12	12.05	12.08	12.22	17.64	17.29	17.52	17.63	17.63
2.4GHz 802.11g(1~11ch)	12.08	11.93	12.07	12.09	11.94	16.58	16.73	16.66	16.52	16.58
2.4GHz 802.11n(1~11ch)	11.94	12.06	11.97	12.04	11.93	16.61	16.68	16.70	16.65	16.71

1.3 Procedures for determining antenna and proximity sensor coverage

KDB 616217 D04 §6.3

As there is no spatial offset between the antenna and the IR sensor element, IR sensor coverage did not need to be assessed

1.4 Procedures for determining tablet tilt angle influences to proximity sensor triggering

KDB 616217 D04 §6.4

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

The IR sensor is activated while in a held-to-ear voice or VOIP call with the active audio receiver.

Therefore, tilt angle 15 degree position of Head exposure was additional verified.

Summary of Tablet Tilt Angle influence to Proximity Sensor Triggering (front side)

Band (MHz)	Minimum distance at which power reduction	Power reduction status
		15°
2450HMz Head	73mm	On

Therefore, the IR proximity sensor has no influence of the tilt angle

1.5 Resulting test positions for SAR measurements

Wireless Technologies	DUT Position	§ 6.2 Triggering distance	§ 6.3 Coverage	§ 6.4 Tilt Angle	Worst case Distance fore SAR
WLAN	Front	73mm	N/A	73mm	72mm

Conclusion:

According to FCC KDB 616217 sec.6, we verified the operating distance and Tilt angle of the Proximity sensor for WLAN transmitter with VoIP of this product and confirmed that the Proximity sensor operates correctly in the VoIP (Held to ear) conditions. This IR sensor impacts only WI-FI output Power and has no impact on any other transmitter

Attachment 6. – Probe Calibration Data

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **HCT (Dymstec)**

Certificate No: **EX3-3863_Apr18**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3863
Calibration procedure(s)	QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	April 25, 2018

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 (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
Reference Probe ES3DV2	SN: 3013	30-Dec-17 (No. ES3-3013_Dec17)	Dec-18
DAE4	SN: 660	21-Dec-17 (No. DAE4-660_Dec17)	Dec-18
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 26, 2018

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

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결재	담당자	확인자
	2018.05.11	2018.5.11

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S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,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.e., ϑ = 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:

a) 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
b) 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
c) 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
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,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*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (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
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* 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 ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,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 ± 50 MHz to ± 100 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 *NORMx* (no uncertainty required).

Probe EX3DV4

SN:3863

Manufactured: February 2, 2012
Calibrated: April 25, 2018

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.35	0.34	0.45	± 10.1 %
DCP (mV)[B]	99.7	103.9	103.3	

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	151.1	±3.5 %
		Y	0.0	0.0	1.0		153.4	
		Z	0.0	0.0	1.0		149.6	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 ms.V^{-2}	T2 ms.V^{-1}	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	35.70	266.3	35.57	18.74	0.500	5.000	0.445	0.515	1.000
Y	23.67	174.6	34.99	6.322	0.441	5.000	1.481	0.043	1.003
Z	41.62	317.3	36.81	8.754	0.711	5.047	0.519	0.469	1.008

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 E^2-field uncertainty inside TSL (see Pages 5 and 6).
[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.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

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)	Unc (k=2)
150	52.3	0.76	12.22	12.22	12.22	0.00	1.00	± 13.3 %
450	43.5	0.87	10.92	10.92	10.92	0.14	1.20	± 13.3 %
750	41.9	0.89	10.20	10.20	10.20	0.61	0.80	± 12.0 %
835	41.5	0.90	9.95	9.95	9.95	0.50	0.80	± 12.0 %
900	41.5	0.97	9.67	9.67	9.67	0.32	1.07	± 12.0 %
1450	40.5	1.20	8.78	8.78	8.78	0.34	0.80	± 12.0 %
1750	40.1	1.37	8.45	8.45	8.45	0.42	0.80	± 12.0 %
1900	40.0	1.40	8.19	8.19	8.19	0.36	0.80	± 12.0 %
2300	39.5	1.67	7.77	7.77	7.77	0.34	0.86	± 12.0 %
2450	39.2	1.80	7.62	7.62	7.62	0.36	0.85	± 12.0 %
2600	39.0	1.96	7.19	7.19	7.19	0.36	0.93	± 12.0 %
5250	35.9	4.71	5.04	5.04	5.04	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.68	4.68	4.68	0.40	1.80	± 13.1 %
5750	35.4	5.22	5.08	5.08	5.08	0.40	1.80	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the 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 frequencies 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 frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

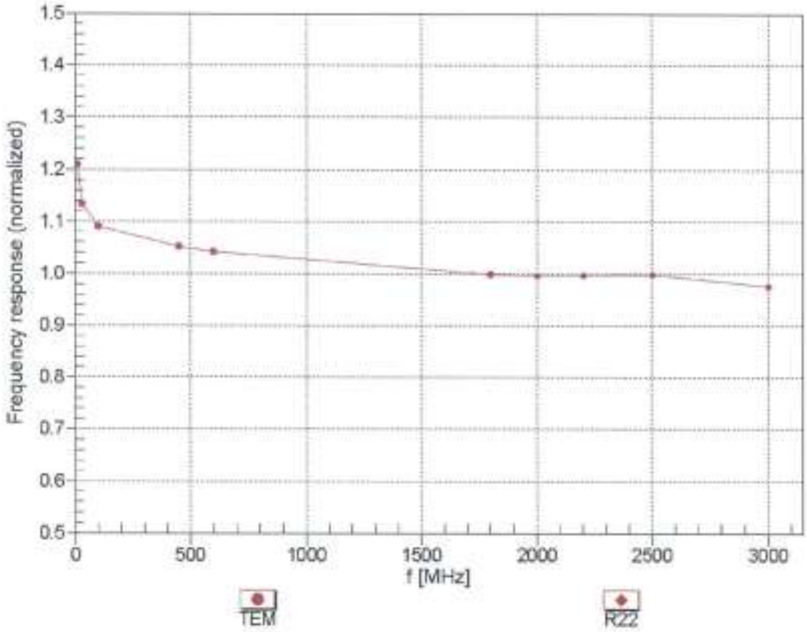
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
150	61.9	0.80	11.86	11.86	11.86	0.00	1.00	± 13.3 %
450	56.7	0.94	10.78	10.78	10.78	0.08	1.20	± 13.3 %
750	55.5	0.96	10.02	10.02	10.02	0.37	0.89	± 12.0 %
835	55.2	0.97	9.66	9.66	9.66	0.42	0.91	± 12.0 %
1750	53.4	1.49	8.18	8.18	8.18	0.40	0.80	± 12.0 %
1900	53.3	1.52	7.84	7.84	7.84	0.34	0.80	± 12.0 %
2300	52.9	1.81	7.68	7.68	7.68	0.29	0.90	± 12.0 %
2450	52.7	1.95	7.48	7.48	7.48	0.27	0.97	± 12.0 %
2600	52.5	2.16	7.27	7.27	7.27	0.17	1.05	± 12.0 %
5250	48.9	5.36	4.41	4.41	4.41	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.88	3.88	3.88	0.50	1.90	± 13.1 %
5750	48.3	5.94	4.21	4.21	4.21	0.50	1.90	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the 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 frequencies 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 frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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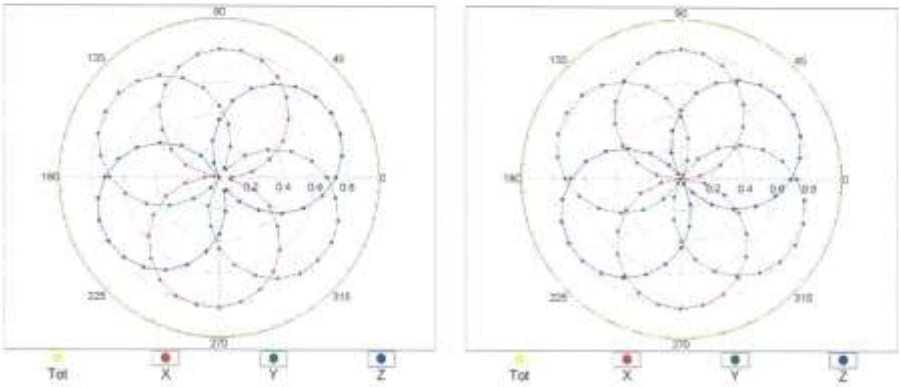
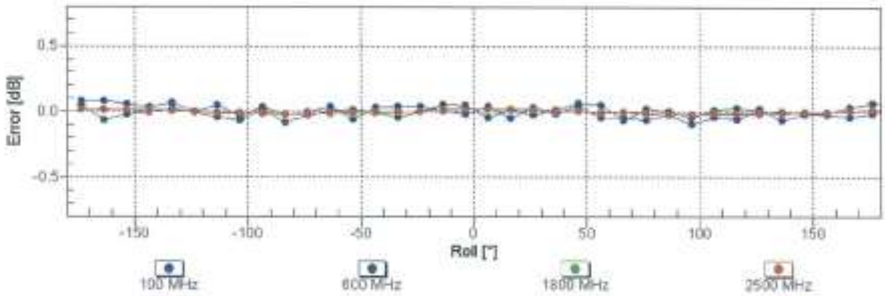
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM f=1800 MHz,R22





Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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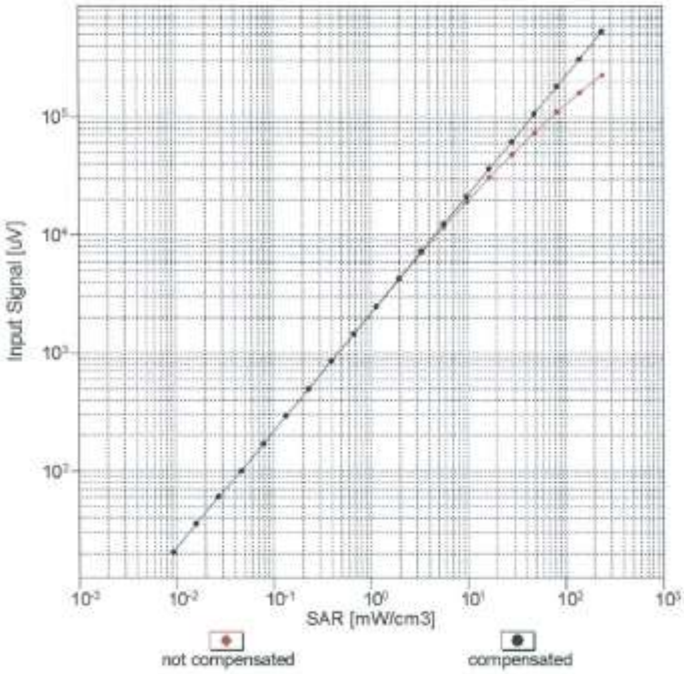
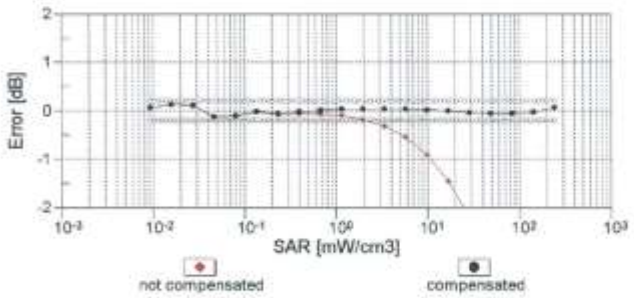
Dynamic Range f(SAR$_{head}$)
(TEM cell , f_{eval}= 1900 MHz)





Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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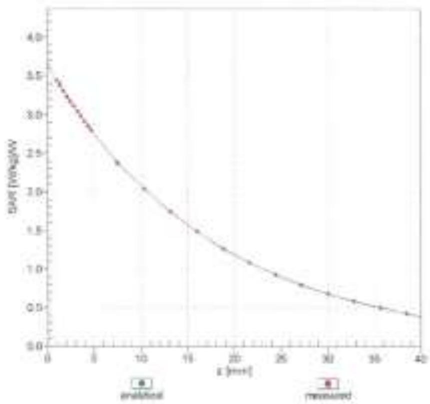
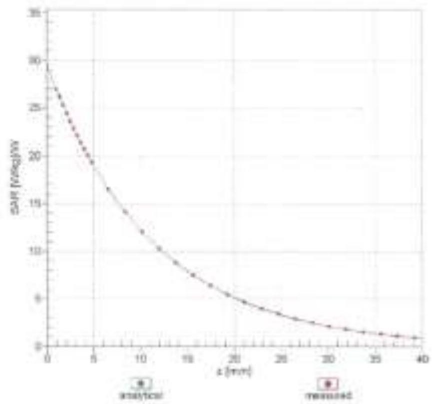
Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

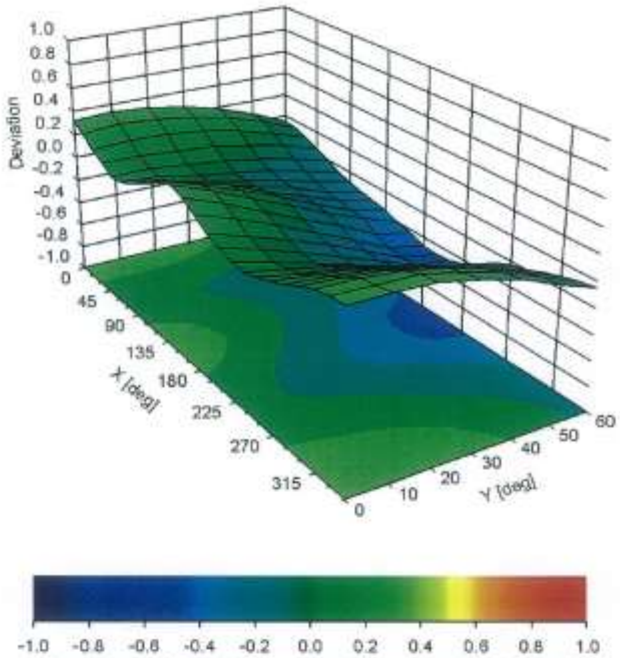


f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	106.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

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Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Unc[E] (k=2)
0	CW	X	0.00	0.00	1.00	0.00	151.1	± 3.5 %
		Y	0.00	0.00	1.00		153.4	
		Z	0.00	0.00	1.00		149.6	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	11.00	70.00	30.00	10.00	20.0	± 9.6 %
		Y	1.74	62.86	8.09		20.0	
		Z	2.07	64.28	9.36		20.0	
10011-CAB	UMTS-FDD (WCDMA)	X	0.92	66.96	14.69	0.00	150.0	± 9.6 %
		Y	1.23	73.72	17.72		150.0	
		Z	0.82	64.81	13.15		150.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.13	63.96	15.00	0.41	150.0	± 9.6 %
		Y	1.12	65.21	15.97		150.0	
		Z	1.04	62.64	14.13		150.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	4.66	66.70	16.87	1.46	150.0	± 9.6 %
		Y	4.41	67.26	17.07		150.0	
		Z	4.70	66.40	16.80		150.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	9.09	79.88	16.40	9.39	50.0	± 9.6 %
		Y	45.23	97.58	21.17		50.0	
		Z	100.00	110.54	25.67		50.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	6.78	76.49	15.24	9.57	50.0	± 9.6 %
		Y	9.44	80.59	16.39		50.0	
		Z	67.36	105.58	24.50		50.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	11.10	81.88	15.87	6.56	60.0	± 9.6 %
		Y	100.00	103.67	20.95		60.0	
		Z	100.00	108.28	23.45		60.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	3.31	63.37	21.37	12.57	50.0	± 9.6 %
		Y	4.23	71.81	26.71		50.0	
		Z	3.77	66.74	23.69		50.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	9.84	92.28	31.76	9.56	60.0	± 9.6 %
		Y	5.95	83.99	29.74		60.0	
		Z	7.19	86.26	30.24		60.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100.00	101.03	19.83	4.80	80.0	± 9.6 %
		Y	100.00	103.59	20.13		80.0	
		Z	100.00	106.91	22.02		80.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	100.43	19.05	3.55	100.0	± 9.6 %
		Y	100.00	104.67	19.92		100.0	
		Z	100.00	105.33	20.65		100.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	6.41	82.79	27.10	7.80	80.0	± 9.6 %
		Y	4.05	75.66	25.13		80.0	
		Z	4.75	77.36	25.50		80.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	5.28	74.89	13.09	5.30	70.0	± 9.6 %
		Y	100.00	100.23	18.93		70.0	
		Z	100.00	105.72	21.80		70.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	4.88	76.31	11.58	1.88	100.0	± 9.6 %
		Y	0.28	61.23	5.16		100.0	
		Z	0.39	62.06	6.02		100.0	

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10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	99.99	93.80	14.65	1.17	100.0	± 9.6 %
		Y	0.14	60.00	3.64		100.0	
		Z	0.18	60.00	3.83		100.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	6.63	80.89	18.62	5.30	70.0	± 9.6 %
		Y	3.59	74.26	15.11		70.0	
		Z	6.50	84.64	21.35		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	2.35	71.30	13.76	1.88	100.0	± 9.6 %
		Y	0.91	63.27	8.38		100.0	
		Z	1.79	70.18	14.28		100.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	1.70	69.13	12.72	1.17	100.0	± 9.6 %
		Y	0.67	61.91	7.34		100.0	
		Z	1.29	67.25	12.66		100.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	8.29	83.97	19.70	5.30	70.0	± 9.6 %
		Y	4.28	76.54	16.01		70.0	
		Z	8.57	88.94	22.82		70.0	
10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	2.17	70.51	13.42	1.88	100.0	± 9.6 %
		Y	0.85	62.76	8.13		100.0	
		Z	1.68	69.54	13.98		100.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	1.73	69.53	13.00	1.17	100.0	± 9.6 %
		Y	0.68	62.14	7.59		100.0	
		Z	1.29	67.51	12.89		100.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	1.20	68.00	12.32	0.00	150.0	± 9.6 %
		Y	0.40	60.00	5.73		150.0	
		Z	1.08	65.78	11.49		150.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	3.96	71.13	12.28	7.78	50.0	± 9.6 %
		Y	4.33	73.40	12.83		50.0	
		Z	20.63	89.92	18.82		50.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.03	118.44	11.49	0.00	150.0	± 9.6 %
		Y	0.03	123.41	0.47		150.0	
		Z	0.10	121.86	6.25		150.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	4.53	70.04	14.07	13.80	25.0	± 9.6 %
		Y	4.85	69.08	13.50		25.0	
		Z	9.31	78.44	18.09		25.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	5.00	72.36	13.87	10.79	40.0	± 9.6 %
		Y	4.95	72.19	13.60		40.0	
		Z	10.49	82.35	18.31		40.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	9.88	83.19	19.98	9.03	50.0	± 9.6 %
		Y	7.80	79.96	18.01		50.0	
		Z	13.55	90.17	23.36		50.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	4.96	77.96	24.46	6.55	100.0	± 9.6 %
		Y	3.33	72.13	22.83		100.0	
		Z	3.78	73.24	22.95		100.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	1.19	65.20	15.58	0.61	110.0	± 9.6 %
		Y	1.14	66.22	16.48		110.0	
		Z	1.06	63.47	14.60		110.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	18.28	106.21	26.40	1.30	110.0	± 9.6 %
		Y	100.00	142.43	36.78		110.0	
		Z	2.88	84.70	20.89		110.0	

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10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	3.45	81.46	21.39	2.04	110.0	± 9.6 %
		Y	2.51	81.17	22.36		110.0	
		Z	1.97	74.69	19.49		110.0	
10062-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	4.45	66.68	16.34	0.49	100.0	± 9.6 %
		Y	4.22	67.27	16.54		100.0	
		Z	4.49	66.34	16.21		100.0	
10063-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	4.47	66.76	16.42	0.72	100.0	± 9.6 %
		Y	4.23	67.37	16.64		100.0	
		Z	4.51	66.43	16.31		100.0	
10064-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	4.71	66.95	16.61	0.86	100.0	± 9.6 %
		Y	4.42	67.49	16.78		100.0	
		Z	4.77	66.69	16.54		100.0	
10065-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	4.59	66.82	16.68	1.21	100.0	± 9.6 %
		Y	4.30	67.26	16.81		100.0	
		Z	4.65	66.56	16.62		100.0	
10066-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	4.60	66.82	16.82	1.46	100.0	± 9.6 %
		Y	4.29	67.17	16.89		100.0	
		Z	4.66	66.58	16.78		100.0	
10067-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	4.89	67.08	17.27	2.04	100.0	± 9.6 %
		Y	4.52	67.29	17.26		100.0	
		Z	4.96	66.83	17.27		100.0	
10068-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	4.93	67.01	17.42	2.55	100.0	± 9.6 %
		Y	4.61	67.41	17.54		100.0	
		Z	5.00	66.81	17.45		100.0	
10069-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	4.99	67.04	17.61	2.67	100.0	± 9.6 %
		Y	4.63	67.31	17.64		100.0	
		Z	5.07	66.84	17.65		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	4.76	66.78	17.15	1.99	100.0	± 9.6 %
		Y	4.51	67.31	17.34		100.0	
		Z	4.79	66.48	17.11		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	4.72	67.04	17.33	2.30	100.0	± 9.6 %
		Y	4.43	67.41	17.46		100.0	
		Z	4.76	66.75	17.30		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	4.80	67.25	17.65	2.83	100.0	± 9.6 %
		Y	4.51	67.66	17.82		100.0	
		Z	4.82	66.92	17.62		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	4.81	67.22	17.80	3.30	100.0	± 9.6 %
		Y	4.56	67.77	18.04		100.0	
		Z	4.81	66.83	17.77		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	4.84	67.27	18.05	3.82	90.0	± 9.6 %
		Y	4.60	67.82	18.29		90.0	
		Z	4.85	66.90	18.05		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	4.88	67.16	18.22	4.15	90.0	± 9.6 %
		Y	4.64	67.67	18.44		90.0	
		Z	4.88	66.75	18.20		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	4.92	67.26	18.33	4.30	90.0	± 9.6 %
		Y	4.68	67.80	18.58		90.0	
		Z	4.90	66.83	18.30		90.0	

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10081-CAB	CDMA2000 (1xRTT, RC3)	X	0.57	63.24	9.45	0.00	150.0	± 9.6 %
		Y	0.29	60.00	5.08		150.0	
		Z	0.55	61.98	8.86		150.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	0.85	60.00	4.39	4.77	80.0	± 9.6 %
		Y	0.61	60.00	3.29		80.0	
		Z	0.85	61.10	4.43		80.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	11.01	81.80	15.86	6.56	60.0	± 9.6 %
		Y	100.00	103.71	20.98		60.0	
		Z	100.00	108.37	23.51		60.0	
10097-CAB	UMTS-FDD (HSDPA)	X	1.75	68.14	15.41	0.00	150.0	± 9.6 %
		Y	2.15	73.36	17.10		150.0	
		Z	1.61	66.21	14.35		150.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	1.71	68.07	15.37	0.00	150.0	± 9.6 %
		Y	2.11	73.35	17.12		150.0	
		Z	1.57	66.13	14.31		150.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	9.91	92.40	31.80	9.56	60.0	± 9.6 %
		Y	6.00	84.12	29.79		60.0	
		Z	7.24	86.38	30.27		60.0	
10100-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	2.91	69.93	16.52	0.00	150.0	± 9.6 %
		Y	2.94	71.66	17.64		150.0	
		Z	2.79	68.74	15.72		150.0	
10101-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.05	67.27	15.75	0.00	150.0	± 9.6 %
		Y	2.96	68.14	16.32		150.0	
		Z	3.02	66.65	15.31		150.0	
10102-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	3.16	67.31	15.88	0.00	150.0	± 9.6 %
		Y	3.06	68.19	16.41		150.0	
		Z	3.13	66.69	15.44		150.0	
10103-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	6.17	75.27	19.83	3.98	65.0	± 9.6 %
		Y	5.02	74.56	20.07		65.0	
		Z	5.58	74.23	19.78		65.0	
10104-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	6.38	74.05	20.09	3.98	65.0	± 9.6 %
		Y	4.96	71.85	19.45		65.0	
		Z	5.51	71.89	19.54		65.0	
10105-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	5.67	71.78	19.42	3.98	65.0	± 9.6 %
		Y	4.68	70.50	19.12		65.0	
		Z	5.40	71.34	19.60		65.0	
10108-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	2.50	69.27	16.35	0.00	150.0	± 9.6 %
		Y	2.53	71.57	17.63		150.0	
		Z	2.41	68.02	15.51		150.0	
10109-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	2.70	67.24	15.61	0.00	150.0	± 9.6 %
		Y	2.63	68.68	16.24		150.0	
		Z	2.66	66.45	15.11		150.0	
10110-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	1.99	68.44	15.79	0.00	150.0	± 9.6 %
		Y	2.06	71.55	17.06		150.0	
		Z	1.92	67.04	14.92		150.0	
10111-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.45	68.57	15.90	0.00	150.0	± 9.6 %
		Y	2.57	71.53	16.67		150.0	
		Z	2.35	67.12	15.16		150.0	

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10112-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	2.83	67.33	15.71	0.00	150.0	± 9.6 %
		Y	2.76	68.82	16.33		150.0	
		Z	2.79	66.53	15.22		150.0	
10113-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.60	68.79	16.07	0.00	150.0	± 9.6 %
		Y	2.70	71.55	16.71		150.0	
		Z	2.50	67.36	15.35		150.0	
10114-CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	4.91	67.08	16.35	0.00	150.0	± 9.6 %
		Y	4.70	67.41	16.61		150.0	
		Z	4.96	66.85	16.19		150.0	
10115-CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.16	67.16	16.39	0.00	150.0	± 9.6 %
		Y	4.93	67.53	16.63		150.0	
		Z	5.21	66.93	16.24		150.0	
10116-CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.00	67.28	16.38	0.00	150.0	± 9.6 %
		Y	4.76	67.61	16.63		150.0	
		Z	5.04	67.03	16.21		150.0	
10117-CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	4.91	67.04	16.35	0.00	150.0	± 9.6 %
		Y	4.68	67.32	16.58		150.0	
		Z	4.93	66.73	16.15		150.0	
10118-CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.23	67.34	16.49	0.00	150.0	± 9.6 %
		Y	4.94	67.52	16.63		150.0	
		Z	5.30	67.14	16.35		150.0	
10119-CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	4.99	67.27	16.39	0.00	150.0	± 9.6 %
		Y	4.77	67.61	16.64		150.0	
		Z	5.03	67.00	16.20		150.0	
10140-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.18	67.31	15.78	0.00	150.0	± 9.6 %
		Y	3.06	68.22	16.30		150.0	
		Z	3.16	66.70	15.36		150.0	
10141-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.31	67.51	16.00	0.00	150.0	± 9.6 %
		Y	3.20	68.53	16.55		150.0	
		Z	3.29	66.86	15.57		150.0	
10142-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	1.75	68.36	15.09	0.00	150.0	± 9.6 %
		Y	1.78	71.06	15.42		150.0	
		Z	1.66	66.67	14.20		150.0	
10143-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	2.25	68.96	15.03	0.00	150.0	± 9.6 %
		Y	1.94	68.81	13.51		150.0	
		Z	2.12	67.21	14.32		150.0	
10144-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	1.90	65.74	12.89	0.00	150.0	± 9.6 %
		Y	1.39	63.90	10.43		150.0	
		Z	1.92	65.05	12.71		150.0	
10145-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	0.74	61.13	7.80	0.00	150.0	± 9.6 %
		Y	0.44	60.00	4.49		150.0	
		Z	0.83	61.47	8.46		150.0	
10146-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	0.98	60.10	6.33	0.00	150.0	± 9.6 %
		Y	0.63	60.00	3.77		150.0	
		Z	1.32	62.30	8.56		150.0	
10147-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	1.02	60.37	6.56	0.00	150.0	± 9.6 %
		Y	0.63	60.00	3.82		150.0	
		Z	1.41	62.99	9.03		150.0	

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10149-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	2.71	67.32	15.67	0.00	150.0	± 9.6 %
		Y	2.64	68.79	16.31		150.0	
		Z	2.67	66.51	15.16		150.0	
10150-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	2.84	67.40	15.76	0.00	150.0	± 9.6 %
		Y	2.77	68.91	16.39		150.0	
		Z	2.80	66.59	15.26		150.0	
10151-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	7.05	79.01	21.24	3.98	65.0	± 9.6 %
		Y	5.45	78.07	21.33		65.0	
		Z	5.61	76.01	20.56		65.0	
10152-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	5.87	73.86	19.52	3.98	65.0	± 9.6 %
		Y	4.45	71.66	18.62		65.0	
		Z	5.02	71.71	19.09		65.0	
10153-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	6.39	75.31	20.54	3.98	65.0	± 9.6 %
		Y	4.89	73.20	19.71		65.0	
		Z	5.39	72.79	19.96		65.0	
10154-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	2.04	68.90	16.07	0.00	150.0	± 9.6 %
		Y	2.13	72.17	17.39		150.0	
		Z	1.95	67.39	15.15		150.0	
10155-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.46	68.61	15.94	0.00	150.0	± 9.6 %
		Y	2.59	71.66	16.74		150.0	
		Z	2.35	67.14	15.18		150.0	
10156-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	1.56	68.06	14.48	0.00	150.0	± 9.6 %
		Y	1.39	68.73	13.43		150.0	
		Z	1.48	66.30	13.62		150.0	
10157-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	1.70	65.86	12.52	0.00	150.0	± 9.6 %
		Y	1.07	62.55	8.97		150.0	
		Z	1.71	65.08	12.35		150.0	
10158-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	2.62	68.90	16.14	0.00	150.0	± 9.6 %
		Y	2.73	71.76	16.82		150.0	
		Z	2.51	67.43	15.40		150.0	
10159-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	1.78	66.23	12.74	0.00	150.0	± 9.6 %
		Y	1.10	62.56	8.97		150.0	
		Z	1.78	65.42	12.58		150.0	
10160-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	2.55	68.64	16.16	0.00	150.0	± 9.6 %
		Y	2.51	70.60	17.09		150.0	
		Z	2.49	67.55	15.47		150.0	
10161-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	2.73	67.38	15.64	0.00	150.0	± 9.6 %
		Y	2.66	68.98	16.16		150.0	
		Z	2.69	66.51	15.14		150.0	
10162-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	2.84	67.62	15.79	0.00	150.0	± 9.6 %
		Y	2.77	69.32	16.34		150.0	
		Z	2.80	66.72	15.29		150.0	
10166-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	3.17	68.43	18.19	3.01	150.0	± 9.6 %
		Y	2.74	68.67	18.97		150.0	
		Z	3.37	69.16	18.82		150.0	
10167-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	3.80	70.92	18.39	3.01	150.0	± 9.6 %
		Y	3.27	72.46	19.76		150.0	
		Z	4.11	71.94	19.16		150.0	

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10168-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	4.33	73.72	20.04	3.01	150.0	± 9.6 %
		Y	3.93	76.52	22.01		150.0	
		Z	4.68	74.75	20.78		150.0	
10169-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	2.69	67.32	17.58	3.01	150.0	± 9.6 %
		Y	2.43	68.05	18.61		150.0	
		Z	2.79	68.16	18.34		150.0	
10170-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	3.59	72.54	19.67	3.01	150.0	± 9.6 %
		Y	3.51	76.45	22.16		150.0	
		Z	3.83	74.10	20.71		150.0	
10171-AAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	2.93	68.40	16.78	3.01	150.0	± 9.6 %
		Y	2.63	70.44	18.33		150.0	
		Z	3.08	69.59	17.69		150.0	
10172-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	4.62	78.65	22.60	6.02	65.0	± 9.6 %
		Y	2.94	76.24	23.12		65.0	
		Z	6.04	85.62	26.43		65.0	
10173-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	7.73	84.08	22.65	6.02	65.0	± 9.6 %
		Y	6.63	89.25	25.64		65.0	
		Z	9.82	91.06	26.34		65.0	
10174-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	3.91	73.33	18.34	6.02	65.0	± 9.6 %
		Y	5.35	84.73	23.41		65.0	
		Z	6.55	83.31	23.20		65.0	
10175-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	2.66	67.02	17.32	3.01	150.0	± 9.6 %
		Y	2.39	67.72	18.33		150.0	
		Z	2.76	67.84	18.07		150.0	
10176-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	3.60	72.56	19.68	3.01	150.0	± 9.6 %
		Y	3.51	76.48	22.17		150.0	
		Z	3.84	74.12	20.72		150.0	
10177-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	2.67	67.15	17.41	3.01	150.0	± 9.6 %
		Y	2.41	67.82	18.40		150.0	
		Z	2.78	67.99	18.17		150.0	
10178-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	3.57	72.39	19.58	3.01	150.0	± 9.6 %
		Y	3.49	76.32	22.09		150.0	
		Z	3.80	73.91	20.61		150.0	
10179-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	3.21	70.22	18.03	3.01	150.0	± 9.6 %
		Y	3.01	73.21	20.07		150.0	
		Z	3.41	71.63	19.02		150.0	
10180-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	2.92	68.36	16.75	3.01	150.0	± 9.6 %
		Y	2.63	70.42	18.31		150.0	
		Z	3.08	69.53	17.64		150.0	
10181-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	2.67	67.13	17.40	3.01	150.0	± 9.6 %
		Y	2.40	67.81	18.39		150.0	
		Z	2.78	67.97	18.16		150.0	
10182-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	3.57	72.37	19.57	3.01	150.0	± 9.6 %
		Y	3.48	76.29	22.07		150.0	
		Z	3.79	73.88	20.60		150.0	
10183-AAC	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	2.92	68.34	16.74	3.01	150.0	± 9.6 %
		Y	2.63	70.39	18.30		150.0	
		Z	3.07	69.51	17.63		150.0	

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10184-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	2.68	67.17	17.42	3.01	150.0	± 9.6 %
		Y	2.41	67.84	18.41		150.0	
		Z	2.79	68.01	18.18		150.0	
10185-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	3.58	72.44	19.61	3.01	150.0	± 9.6 %
		Y	3.50	76.39	22.12		150.0	
		Z	3.81	73.96	20.64		150.0	
10186-AAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	2.93	68.39	16.77	3.01	150.0	± 9.6 %
		Y	2.64	70.46	18.34		150.0	
		Z	3.09	69.57	17.67		150.0	
10187-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	2.69	67.25	17.51	3.01	150.0	± 9.6 %
		Y	2.43	67.98	18.53		150.0	
		Z	2.80	68.08	18.26		150.0	
10188-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	3.69	73.08	19.99	3.01	150.0	± 9.6 %
		Y	3.64	77.24	22.59		150.0	
		Z	3.94	74.67	21.05		150.0	
10189-AAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	2.99	68.75	17.02	3.01	150.0	± 9.6 %
		Y	2.71	70.95	18.66		150.0	
		Z	3.15	69.99	17.95		150.0	
10193-CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	4.32	66.74	16.06	0.00	150.0	± 9.6 %
		Y	4.14	67.59	16.37		150.0	
		Z	4.34	66.29	15.83		150.0	
10194-CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.46	66.98	16.19	0.00	150.0	± 9.6 %
		Y	4.24	67.67	16.48		150.0	
		Z	4.50	66.57	15.96		150.0	
10195-CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	4.50	66.99	16.21	0.00	150.0	± 9.6 %
		Y	4.25	67.61	16.46		150.0	
		Z	4.54	66.61	15.99		150.0	
10196-CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.31	66.74	16.05	0.00	150.0	± 9.6 %
		Y	4.11	67.51	16.32		150.0	
		Z	4.34	66.32	15.83		150.0	
10197-CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	4.47	66.98	16.20	0.00	150.0	± 9.6 %
		Y	4.24	67.66	16.48		150.0	
		Z	4.51	66.59	15.97		150.0	
10198-CAC	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	4.49	66.99	16.21	0.00	150.0	± 9.6 %
		Y	4.24	67.60	16.45		150.0	
		Z	4.53	66.62	15.99		150.0	
10219-CAC	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	4.26	66.77	16.02	0.00	150.0	± 9.6 %
		Y	4.07	67.62	16.34		150.0	
		Z	4.28	66.34	15.79		150.0	
10220-CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	4.47	66.94	16.18	0.00	150.0	± 9.6 %
		Y	4.23	67.62	16.46		150.0	
		Z	4.50	66.55	15.96		150.0	
10221-CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	4.51	66.94	16.20	0.00	150.0	± 9.6 %
		Y	4.26	67.58	16.45		150.0	
		Z	4.55	66.56	15.98		150.0	
10222-CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	4.88	67.02	16.33	0.00	150.0	± 9.6 %
		Y	4.67	67.32	16.57		150.0	
		Z	4.90	66.72	16.13		150.0	

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10223-CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.15	67.21	16.44	0.00	150.0	± 9.6 %
		Y	4.85	67.37	16.57		150.0	
		Z	5.20	66.97	16.28		150.0	
10224-CAC	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	4.92	67.13	16.32	0.00	150.0	± 9.6 %
		Y	4.70	67.49	16.58		150.0	
		Z	4.94	66.83	16.11		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	2.60	66.16	14.83	0.00	150.0	± 9.6 %
		Y	2.41	67.00	14.35		150.0	
		Z	2.59	65.42	14.54		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	8.23	85.19	23.12	6.02	65.0	± 9.6 %
		Y	7.42	91.37	26.44		65.0	
		Z	10.58	92.51	26.91		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	7.55	82.84	21.72	6.02	65.0	± 9.6 %
		Y	6.51	87.87	24.49		65.0	
		Z	10.25	90.62	25.65		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	6.67	85.48	25.12	6.02	65.0	± 9.6 %
		Y	3.69	80.81	24.99		65.0	
		Z	6.44	87.27	27.13		65.0	
10229-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	7.78	84.18	22.69	6.02	65.0	± 9.6 %
		Y	6.69	89.39	25.70		65.0	
		Z	9.90	91.18	26.39		65.0	
10230-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	7.14	81.92	21.34	6.02	65.0	± 9.6 %
		Y	5.85	86.04	23.80		65.0	
		Z	9.54	89.32	25.15		65.0	
10231-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	6.36	84.50	24.69	6.02	65.0	± 9.6 %
		Y	3.53	79.82	24.51		65.0	
		Z	6.16	86.30	26.70		65.0	
10232-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	7.77	84.16	22.68	6.02	65.0	± 9.6 %
		Y	6.68	89.37	25.69		65.0	
		Z	9.88	91.16	26.38		65.0	
10233-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	7.13	81.90	21.33	6.02	65.0	± 9.6 %
		Y	5.83	85.99	23.79		65.0	
		Z	9.51	89.29	25.14		65.0	
10234-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	6.09	83.61	24.25	6.02	65.0	± 9.6 %
		Y	3.42	79.13	24.11		65.0	
		Z	5.93	85.47	26.28		65.0	
10235-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	7.78	84.19	22.69	6.02	65.0	± 9.6 %
		Y	6.68	89.41	25.71		65.0	
		Z	9.89	91.19	26.39		65.0	
10236-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	7.18	81.98	21.35	6.02	65.0	± 9.6 %
		Y	5.91	86.16	23.84		65.0	
		Z	9.62	89.44	25.18		65.0	
10237-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	6.36	84.53	24.70	6.02	65.0	± 9.6 %
		Y	3.52	79.81	24.52		65.0	
		Z	6.16	86.34	26.72		65.0	
10238-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	7.75	84.14	22.67	6.02	65.0	± 9.6 %
		Y	6.66	89.35	25.68		65.0	
		Z	9.86	91.13	26.37		65.0	

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10239-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	7.11	81.87	21.32	6.02	65.0	± 9.6 %
		Y	5.81	85.95	23.78		65.0	
		Z	9.48	89.25	25.13		65.0	
10240-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	6.34	84.51	24.69	6.02	65.0	± 9.6 %
		Y	3.52	79.81	24.52		65.0	
		Z	6.14	86.30	26.70		65.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	7.98	81.00	24.33	6.98	65.0	± 9.6 %
		Y	6.14	81.54	25.53		65.0	
		Z	7.26	79.71	24.64		65.0	
10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	6.47	76.99	22.66	6.98	65.0	± 9.6 %
		Y	4.99	77.45	23.83		65.0	
		Z	6.91	78.72	24.15		65.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	5.40	74.34	22.44	6.98	65.0	± 9.6 %
		Y	4.21	73.63	23.07		65.0	
		Z	5.61	75.34	23.62		65.0	
10244-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	3.76	67.79	12.85	3.98	65.0	± 9.6 %
		Y	1.87	62.25	8.40		65.0	
		Z	4.41	71.62	16.01		65.0	
10245-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	3.71	67.43	12.64	3.98	65.0	± 9.6 %
		Y	1.87	62.05	8.24		65.0	
		Z	4.30	70.99	15.67		65.0	
10246-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	4.05	72.21	15.44	3.98	65.0	± 9.6 %
		Y	1.80	64.42	10.44		65.0	
		Z	3.80	73.10	16.90		65.0	
10247-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	4.44	71.15	15.84	3.98	65.0	± 9.6 %
		Y	2.54	65.63	11.89		65.0	
		Z	4.00	70.77	16.63		65.0	
10248-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	4.38	70.57	15.58	3.98	65.0	± 9.6 %
		Y	2.50	65.09	11.62		65.0	
		Z	4.00	70.27	16.39		65.0	
10249-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	6.22	78.94	19.39	3.98	65.0	± 9.6 %
		Y	3.43	72.93	16.18		65.0	
		Z	5.02	77.51	19.84		65.0	
10250-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	6.14	76.63	20.38	3.98	65.0	± 9.6 %
		Y	4.51	74.09	18.97		65.0	
		Z	5.00	73.95	19.97		65.0	
10251-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	5.56	73.72	18.77	3.98	65.0	± 9.6 %
		Y	3.95	70.70	16.95		65.0	
		Z	4.76	71.87	18.65		65.0	
10252-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	7.45	81.83	21.98	3.98	65.0	± 9.6 %
		Y	5.54	80.55	21.60		65.0	
		Z	5.55	78.23	21.33		65.0	
10253-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	5.77	73.44	19.25	3.98	65.0	± 9.6 %
		Y	4.37	71.25	18.16		65.0	
		Z	4.94	71.30	18.85		65.0	
10254-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	6.22	74.67	20.11	3.98	65.0	± 9.6 %
		Y	4.73	72.48	19.03		65.0	
		Z	5.27	72.27	19.61		65.0	

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10255-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	6.76	78.48	21.18	3.98	65.0	± 9.6 %
		Y	5.16	77.25	20.99		65.0	
		Z	5.37	75.38	20.49		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	2.78	64.16	9.93	3.98	65.0	± 9.6 %
		Y	1.36	60.00	5.83		65.0	
		Z	3.18	67.02	12.70		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	2.75	63.84	9.69	3.98	65.0	± 9.6 %
		Y	1.38	60.00	5.75		65.0	
		Z	3.11	66.43	12.31		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	2.69	66.45	11.77	3.98	65.0	± 9.6 %
		Y	1.25	60.72	7.00		65.0	
		Z	2.70	67.95	13.57		65.0	
10259-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	5.09	73.24	17.52	3.98	65.0	± 9.6 %
		Y	3.20	68.61	14.39		65.0	
		Z	4.40	72.05	17.89		65.0	
10260-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	5.09	72.94	17.39	3.98	65.0	± 9.6 %
		Y	3.20	68.30	14.22		65.0	
		Z	4.44	71.81	17.78		65.0	
10261-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	6.43	79.43	20.17	3.98	65.0	± 9.6 %
		Y	4.14	75.58	18.12		65.0	
		Z	5.00	77.05	20.16		65.0	
10262-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	6.11	76.51	20.31	3.98	65.0	± 9.6 %
		Y	4.48	73.95	18.88		65.0	
		Z	4.98	73.88	19.92		65.0	
10263-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	5.55	73.70	18.77	3.98	65.0	± 9.6 %
		Y	3.94	70.69	16.95		65.0	
		Z	4.76	71.84	18.64		65.0	
10264-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	7.33	81.55	21.85	3.98	65.0	± 9.6 %
		Y	5.45	80.22	21.44		65.0	
		Z	5.49	78.02	21.23		65.0	
10265-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	5.87	73.86	19.53	3.98	65.0	± 9.6 %
		Y	4.46	71.68	18.63		65.0	
		Z	5.02	71.71	19.09		65.0	
10266-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	6.39	75.29	20.53	3.98	65.0	± 9.6 %
		Y	4.89	73.18	19.70		65.0	
		Z	5.38	72.78	19.96		65.0	
10267-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	7.04	78.96	21.22	3.98	65.0	± 9.6 %
		Y	5.43	77.99	21.30		65.0	
		Z	5.60	75.97	20.54		65.0	
10268-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	6.56	74.07	20.20	3.98	65.0	± 9.6 %
		Y	5.15	72.08	19.58		65.0	
		Z	5.68	71.86	19.63		65.0	
10269-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	6.55	73.70	20.08	3.98	65.0	± 9.6 %
		Y	5.19	71.84	19.47		65.0	
		Z	5.68	71.51	19.52		65.0	
10270-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	6.77	76.24	20.42	3.98	65.0	± 9.6 %
		Y	5.40	75.25	20.50		65.0	
		Z	5.66	73.75	19.79		65.0	

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10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	2.43	66.71	14.85	0.00	150.0	± 9.6 %
		Y	2.33	68.15	14.74		150.0	
		Z	2.38	65.72	14.40		150.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	1.47	67.75	15.10	0.00	150.0	± 9.6 %
		Y	1.72	72.43	16.90		150.0	
		Z	1.36	65.94	13.97		150.0	
10277-CAA	PHS (QPSK)	X	1.92	60.08	5.51	9.03	50.0	± 9.6 %
		Y	1.38	58.77	3.99		50.0	
		Z	1.98	60.78	6.41		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	3.08	65.19	10.55	9.03	50.0	± 9.6 %
		Y	2.17	61.96	7.67		50.0	
		Z	3.52	67.85	12.76		50.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	3.15	65.40	10.71	9.03	50.0	± 9.6 %
		Y	2.20	62.03	7.77		50.0	
		Z	3.61	68.12	12.94		50.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	0.92	64.86	10.52	0.00	150.0	± 9.6 %
		Y	0.39	60.00	5.42		150.0	
		Z	0.92	63.92	10.28		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	0.56	63.07	9.34	0.00	150.0	± 9.6 %
		Y	0.29	60.00	5.06		150.0	
		Z	0.54	61.87	8.78		150.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	0.78	67.26	11.80	0.00	150.0	± 9.6 %
		Y	0.28	60.00	5.38		150.0	
		Z	0.61	63.79	10.15		150.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	2.07	78.82	16.86	0.00	150.0	± 9.6 %
		Y	0.39	62.28	7.09		150.0	
		Z	0.82	67.12	12.27		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	10.77	83.93	21.20	9.03	50.0	± 9.6 %
		Y	21.51	90.17	21.22		50.0	
		Z	9.58	84.17	22.47		50.0	
10297-AAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	2.52	69.39	16.43	0.00	150.0	± 9.6 %
		Y	2.55	71.75	17.73		150.0	
		Z	2.42	68.12	15.58		150.0	
10298-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	1.11	64.88	11.35	0.00	150.0	± 9.6 %
		Y	0.56	60.19	6.52		150.0	
		Z	1.13	64.17	11.22		150.0	
10299-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	1.42	62.80	9.08	0.00	150.0	± 9.6 %
		Y	0.76	60.00	5.28		150.0	
		Z	1.91	65.84	11.56		150.0	
10300-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	1.21	60.93	7.40	0.00	150.0	± 9.6 %
		Y	0.73	60.00	4.72		150.0	
		Z	1.52	62.72	9.26		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	4.38	65.24	17.03	4.17	50.0	± 9.6 %
		Y	4.10	66.08	16.99		50.0	
		Z	4.53	65.17	17.06		50.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	4.87	65.87	17.74	4.96	50.0	± 9.6 %
		Y	4.52	66.36	17.57		50.0	
		Z	5.00	65.70	17.71		50.0	

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10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	4.64	65.56	17.55	4.96	50.0	± 9.6 %
		Y	4.40	66.71	17.70		50.0	
		Z	4.76	65.34	17.52		50.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	4.47	65.53	17.12	4.17	50.0	± 9.6 %
		Y	4.17	66.24	17.01		50.0	
		Z	4.56	65.19	17.01		50.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	4.18	67.59	18.77	6.02	35.0	± 9.6 %
		Y	3.89	67.96	17.61		35.0	
		Z	4.33	67.73	19.13		35.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	4.44	66.50	18.52	6.02	35.0	± 9.6 %
		Y	4.16	67.24	17.98		35.0	
		Z	4.60	66.59	18.78		35.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	4.34	66.59	18.45	6.02	35.0	± 9.6 %
		Y	4.05	67.23	17.84		35.0	
		Z	4.50	66.72	18.72		35.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	4.32	66.82	18.60	6.02	35.0	± 9.6 %
		Y	4.06	67.54	18.06		35.0	
		Z	4.48	66.95	18.87		35.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	4.46	66.56	18.61	6.02	35.0	± 9.6 %
		Y	4.17	67.31	18.10		35.0	
		Z	4.64	66.74	18.90		35.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	4.40	66.58	18.52	6.02	35.0	± 9.6 %
		Y	4.14	67.40	18.05		35.0	
		Z	4.55	66.67	18.76		35.0	
10311-AAC	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	2.88	68.63	16.10	0.00	150.0	± 9.6 %
		Y	2.88	70.38	17.20		150.0	
		Z	2.77	67.46	15.32		150.0	
10313-AAA	iDEN 1:3	X	3.55	71.03	14.37	6.99	70.0	± 9.6 %
		Y	2.76	72.05	15.47		70.0	
		Z	2.49	69.17	14.17		70.0	
10314-AAA	iDEN 1:6	X	6.09	81.23	20.99	10.00	30.0	± 9.6 %
		Y	7.74	88.37	24.07		30.0	
		Z	3.89	76.29	19.81		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.04	63.85	14.96	0.17	150.0	± 9.6 %
		Y	1.05	65.58	16.18		150.0	
		Z	0.96	62.52	14.00		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	4.35	66.66	16.11	0.17	150.0	± 9.6 %
		Y	4.12	67.27	16.33		150.0	
		Z	4.39	66.31	15.96		150.0	
10317-AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	4.35	66.66	16.11	0.17	150.0	± 9.6 %
		Y	4.12	67.27	16.33		150.0	
		Z	4.39	66.31	15.96		150.0	
10400-AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.42	66.96	16.15	0.00	150.0	± 9.6 %
		Y	4.13	67.43	16.34		150.0	
		Z	4.47	66.60	15.95		150.0	
10401-AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	5.08	66.77	16.17	0.00	150.0	± 9.6 %
		Y	5.02	67.75	16.71		150.0	
		Z	5.22	66.85	16.19		150.0	

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10402-AAD	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	5.43	67.35	16.36	0.00	150.0	± 9.6 %
		Y	5.23	67.61	16.59		150.0	
		Z	5.46	67.09	16.19		150.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	0.92	64.86	10.52	0.00	115.0	± 9.6 %
		Y	0.39	60.00	5.42		115.0	
		Z	0.92	63.92	10.28		115.0	
10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	0.92	64.86	10.52	0.00	115.0	± 9.6 %
		Y	0.39	60.00	5.42		115.0	
		Z	0.92	63.92	10.28		115.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	6.61	82.29	18.19	0.00	100.0	± 9.6 %
		Y	100.00	99.95	18.83		100.0	
		Z	45.79	108.43	26.26		100.0	
10410-AAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4)	X	3.30	74.41	15.15	3.23	80.0	± 9.6 %
		Y	16.11	98.20	22.53		80.0	
		Z	23.08	102.83	25.32		80.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	0.96	62.96	14.43	0.00	150.0	± 9.6 %
		Y	0.99	64.96	15.77		150.0	
		Z	0.90	61.91	13.52		150.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	4.32	66.73	16.13	0.00	150.0	± 9.6 %
		Y	4.11	67.43	16.39		150.0	
		Z	4.34	66.32	15.91		150.0	
10417-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.32	66.73	16.13	0.00	150.0	± 9.6 %
		Y	4.11	67.43	16.39		150.0	
		Z	4.34	66.32	15.91		150.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	4.31	66.93	16.18	0.00	150.0	± 9.6 %
		Y	4.10	67.68	16.50		150.0	
		Z	4.33	66.49	15.93		150.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.33	66.86	16.17	0.00	150.0	± 9.6 %
		Y	4.11	67.59	16.46		150.0	
		Z	4.35	66.43	15.93		150.0	
10422-AAB	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.43	66.84	16.18	0.00	150.0	± 9.6 %
		Y	4.21	67.51	16.45		150.0	
		Z	4.46	66.43	15.95		150.0	
10423-AAB	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	4.56	67.09	16.27	0.00	150.0	± 9.6 %
		Y	4.30	67.73	16.52		150.0	
		Z	4.61	66.71	16.06		150.0	
10424-AAB	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	4.49	67.05	16.24	0.00	150.0	± 9.6 %
		Y	4.23	67.65	16.49		150.0	
		Z	4.53	66.66	16.03		150.0	
10425-AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.11	67.24	16.43	0.00	150.0	± 9.6 %
		Y	4.85	67.48	16.62		150.0	
		Z	5.16	66.98	16.26		150.0	
10426-AAB	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.13	67.32	16.47	0.00	150.0	± 9.6 %
		Y	4.90	67.67	16.71		150.0	
		Z	5.18	67.07	16.30		150.0	

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10427-AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.10	67.11	16.36	0.00	150.0	± 9.6 %
		Y	4.87	67.47	16.61		150.0	
		Z	5.17	66.96	16.24		150.0	
10430-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.40	73.18	18.78	0.00	150.0	± 9.6 %
		Y	5.18	77.79	19.68		150.0	
		Z	4.07	70.86	17.81		150.0	
10431-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	3.93	67.31	16.00	0.00	150.0	± 9.6 %
		Y	3.67	68.21	16.08		150.0	
		Z	3.97	66.78	15.76		150.0	
10432-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.25	67.14	16.17	0.00	150.0	± 9.6 %
		Y	4.00	67.91	16.40		150.0	
		Z	4.29	66.70	15.93		150.0	
10433-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.51	67.08	16.27	0.00	150.0	± 9.6 %
		Y	4.26	67.71	16.52		150.0	
		Z	4.55	66.70	16.05		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.57	74.23	18.62	0.00	150.0	± 9.6 %
		Y	4.96	77.01	18.39		150.0	
		Z	4.13	71.55	17.59		150.0	
10435-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.22	74.05	14.97	3.23	80.0	± 9.6 %
		Y	12.58	95.13	21.66		80.0	
		Z	20.50	101.13	24.83		80.0	
10447-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.16	67.07	14.83	0.00	150.0	± 9.6 %
		Y	2.72	66.94	13.70		150.0	
		Z	3.20	66.46	14.68		150.0	
10448-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	3.80	67.10	15.87	0.00	150.0	± 9.6 %
		Y	3.57	68.05	15.99		150.0	
		Z	3.82	66.56	15.62		150.0	
10449-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	X	4.09	66.98	16.07	0.00	150.0	± 9.6 %
		Y	3.88	67.77	16.33		150.0	
		Z	4.12	66.51	15.82		150.0	
10450-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.31	66.86	16.12	0.00	150.0	± 9.6 %
		Y	4.10	67.50	16.40		150.0	
		Z	4.33	66.45	15.89		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	2.96	66.79	14.05	0.00	150.0	± 9.6 %
		Y	2.28	65.25	11.94		150.0	
		Z	3.03	66.33	14.05		150.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.03	67.73	16.57	0.00	150.0	± 9.6 %
		Y	6.14	68.84	17.23		150.0	
		Z	6.09	67.66	16.51		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.67	65.47	15.85	0.00	150.0	± 9.6 %
		Y	3.57	66.44	16.21		150.0	
		Z	3.66	65.00	15.61		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	3.82	71.77	16.94	0.00	150.0	± 9.6 %
		Y	2.33	66.01	12.18		150.0	
		Z	3.66	70.24	16.55		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	5.04	70.06	18.38	0.00	150.0	± 9.6 %
		Y	4.33	69.08	16.37		150.0	
		Z	4.93	68.74	17.97		150.0	

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10460-AAA	UMTS-FDD (WCDMA, AMR)	X	0.82	68.06	15.67	0.00	150.0	± 9.6 %
		Y	1.52	80.43	21.00		150.0	
		Z	0.70	65.12	13.61		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.71	68.46	13.76	3.29	80.0	± 9.6 %
		Y	18.73	104.14	25.37		80.0	
		Z	16.72	101.23	25.84		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.95	60.00	7.25	3.23	80.0	± 9.6 %
		Y	0.26	55.18	3.00		80.0	
		Z	1.02	61.47	8.87		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.96	60.00	6.79	3.23	80.0	± 9.6 %
		Y	3.83	65.07	6.10		80.0	
		Z	0.88	60.00	7.59		80.0	
10464-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.35	65.72	12.06	3.23	80.0	± 9.6 %
		Y	3.75	82.77	18.52		80.0	
		Z	9.51	92.26	22.65		80.0	
10465-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.95	60.00	7.20	3.23	80.0	± 9.6 %
		Y	0.25	55.06	2.87		80.0	
		Z	0.96	60.91	8.53		80.0	
10466-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.97	60.00	6.75	3.23	80.0	± 9.6 %
		Y	3.08	64.36	5.91		80.0	
		Z	0.88	60.00	7.54		80.0	
10467-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.38	66.05	12.23	3.23	80.0	± 9.6 %
		Y	4.97	86.13	19.58		80.0	
		Z	11.48	94.80	23.39		80.0	
10468-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.95	60.00	7.22	3.23	80.0	± 9.6 %
		Y	0.26	55.12	2.95		80.0	
		Z	0.97	61.07	8.63		80.0	
10469-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.96	60.00	6.75	3.23	80.0	± 9.6 %
		Y	3.73	65.04	6.11		80.0	
		Z	0.88	60.00	7.54		80.0	
10470-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.38	66.03	12.21	3.23	80.0	± 9.6 %
		Y	5.04	86.32	19.63		80.0	
		Z	11.56	94.91	23.42		80.0	
10471-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.95	60.00	7.21	3.23	80.0	± 9.6 %
		Y	0.25	55.11	2.92		80.0	
		Z	0.97	61.03	8.59		80.0	
10472-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.96	60.00	6.74	3.23	80.0	± 9.6 %
		Y	8.84	67.69	6.73		80.0	
		Z	0.88	60.00	7.53		80.0	
10473-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.37	66.01	12.20	3.23	80.0	± 9.6 %
		Y	4.94	86.08	19.55		80.0	
		Z	11.45	94.77	23.37		80.0	
10474-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.94	60.00	7.21	3.23	80.0	± 9.6 %
		Y	0.25	55.09	2.91		80.0	
		Z	0.96	61.01	8.58		80.0	
10475-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.96	60.00	6.74	3.23	80.0	± 9.6 %
		Y	5.48	65.71	6.11		80.0	
		Z	0.88	60.00	7.53		80.0	

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10477-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.94	60.00	7.19	3.23	80.0	± 9.6 %
		Y	0.25	55.02	2.82		80.0	
		Z	0.95	60.87	8.49		80.0	
10478-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.96	60.00	6.73	3.23	80.0	± 9.6 %
		Y	0.28	53.97	1.35		80.0	
		Z	0.88	60.00	7.52		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.21	72.74	16.33	3.23	80.0	± 9.6 %
		Y	39.60	110.75	27.52		80.0	
		Z	6.66	84.68	21.96		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.08	64.62	11.24	3.23	80.0	± 9.6 %
		Y	1.03	61.93	8.80		80.0	
		Z	4.36	74.13	16.27		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.78	62.75	10.02	3.23	80.0	± 9.6 %
		Y	0.84	60.00	7.33		80.0	
		Z	3.24	70.04	14.31		80.0	
10482-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.73	64.95	12.00	2.23	80.0	± 9.6 %
		Y	0.84	60.00	7.70		80.0	
		Z	1.75	65.57	13.09		80.0	
10483-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.61	61.02	9.13	2.23	80.0	± 9.6 %
		Y	1.09	60.00	6.49		80.0	
		Z	2.56	66.79	13.19		80.0	
10484-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.61	60.82	9.02	2.23	80.0	± 9.6 %
		Y	1.11	60.00	6.48		80.0	
		Z	2.45	66.04	12.85		80.0	
10485-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.62	70.06	15.66	2.23	80.0	± 9.6 %
		Y	1.92	68.50	13.94		80.0	
		Z	2.29	68.71	15.73		80.0	
10486-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.37	65.68	13.03	2.23	80.0	± 9.6 %
		Y	1.24	60.58	8.96		80.0	
		Z	2.33	65.68	13.73		80.0	
10487-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.37	65.34	12.86	2.23	80.0	± 9.6 %
		Y	1.24	60.28	8.75		80.0	
		Z	2.35	65.41	13.59		80.0	
10488-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.19	71.23	17.45	2.23	80.0	± 9.6 %
		Y	2.91	73.05	18.24		80.0	
		Z	2.77	69.32	17.00		80.0	
10489-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.21	68.38	16.16	2.23	80.0	± 9.6 %
		Y	2.80	68.89	15.94		80.0	
		Z	2.91	66.98	15.94		80.0	
10490-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.28	68.24	16.11	2.23	80.0	± 9.6 %
		Y	2.81	68.47	15.72		80.0	
		Z	3.00	66.92	15.92		80.0	
10491-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.47	70.14	17.34	2.23	80.0	± 9.6 %
		Y	3.03	70.90	17.92		80.0	
		Z	3.12	68.57	16.90		80.0	
10492-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.59	67.96	16.53	2.23	80.0	± 9.6 %
		Y	3.13	68.26	16.56		80.0	
		Z	3.32	66.68	16.23		80.0	

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10493-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.65	67.84	16.48	2.23	80.0	± 9.6 %
		Y	3.17	68.05	16.43		80.0	
		Z	3.39	66.61	16.21		80.0	
10494-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.72	71.32	17.72	2.23	80.0	± 9.6 %
		Y	3.26	72.17	18.50		80.0	
		Z	3.30	69.67	17.25		80.0	
10495-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.62	68.25	16.75	2.23	80.0	± 9.6 %
		Y	3.18	68.50	16.94		80.0	
		Z	3.33	66.95	16.42		80.0	
10496-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.71	68.07	16.72	2.23	80.0	± 9.6 %
		Y	3.25	68.28	16.85		80.0	
		Z	3.43	66.81	16.39		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.07	60.00	8.19	2.23	80.0	± 9.6 %
		Y	0.87	60.00	5.66		80.0	
		Z	1.16	61.09	9.64		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.24	60.00	7.11	2.23	80.0	± 9.6 %
		Y	1.51	60.00	4.12		80.0	
		Z	1.24	60.00	7.97		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.26	60.00	6.97	2.23	80.0	± 9.6 %
		Y	1.84	60.00	3.85		80.0	
		Z	1.26	60.00	7.82		80.0	
10500-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.86	70.59	16.41	2.23	80.0	± 9.6 %
		Y	2.47	71.37	16.06		80.0	
		Z	2.47	68.90	16.23		80.0	
10501-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.77	67.13	14.41	2.23	80.0	± 9.6 %
		Y	1.82	64.08	11.77		80.0	
		Z	2.61	66.45	14.70		80.0	
10502-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.80	66.92	14.24	2.23	80.0	± 9.6 %
		Y	1.80	63.62	11.44		80.0	
		Z	2.65	66.33	14.58		80.0	
10503-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.15	71.01	17.34	2.23	80.0	± 9.6 %
		Y	2.85	72.73	18.09		80.0	
		Z	2.74	69.14	16.90		80.0	
10504-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.18	68.25	16.09	2.23	80.0	± 9.6 %
		Y	2.77	68.71	15.84		80.0	
		Z	2.89	66.89	15.87		80.0	
10505-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.26	68.13	16.04	2.23	80.0	± 9.6 %
		Y	2.78	68.31	15.63		80.0	
		Z	2.99	66.83	15.86		80.0	
10506-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.68	71.16	17.64	2.23	80.0	± 9.6 %
		Y	3.23	71.98	18.40		80.0	
		Z	3.28	69.54	17.18		80.0	
10507-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.60	68.17	16.71	2.23	80.0	± 9.6 %
		Y	3.16	68.41	16.88		80.0	
		Z	3.32	66.89	16.38		80.0	

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10508-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.69	67.98	16.67	2.23	80.0	± 9.6 %
		Y	3.23	68.18	16.79		80.0	
		Z	3.42	66.74	16.35		80.0	
10509-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.09	70.27	17.38	2.23	80.0	± 9.6 %
		Y	3.57	70.54	17.94		80.0	
		Z	3.72	68.92	16.97		80.0	
10510-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.09	67.97	16.86	2.23	80.0	± 9.6 %
		Y	3.56	67.74	16.96		80.0	
		Z	3.82	66.86	16.53		80.0	
10511-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.17	67.81	16.83	2.23	80.0	± 9.6 %
		Y	3.64	67.61	16.92		80.0	
		Z	3.90	66.70	16.51		80.0	
10512-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.18	71.35	17.66	2.23	80.0	± 9.6 %
		Y	3.66	71.62	18.28		80.0	
		Z	3.77	69.95	17.25		80.0	
10513-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.98	68.10	16.91	2.23	80.0	± 9.6 %
		Y	3.47	67.78	17.03		80.0	
		Z	3.70	66.98	16.58		80.0	
10514-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.02	67.80	16.84	2.23	80.0	± 9.6 %
		Y	3.52	67.49	16.93		80.0	
		Z	3.75	66.69	16.51		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.92	63.12	14.48	0.00	150.0	± 9.6 %
		Y	0.96	65.32	15.94		150.0	
		Z	0.86	62.01	13.50		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	0.54	70.00	16.71	0.00	150.0	± 9.6 %
		Y	2.46	99.33	28.61		150.0	
		Z	0.41	65.69	13.40		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.76	64.84	14.98	0.00	150.0	± 9.6 %
		Y	0.86	68.98	17.56		150.0	
		Z	0.68	63.15	13.53		150.0	
10518-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.31	66.83	16.12	0.00	150.0	± 9.6 %
		Y	4.10	67.60	16.42		150.0	
		Z	4.33	66.40	15.88		150.0	
10519-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.45	66.99	16.21	0.00	150.0	± 9.6 %
		Y	4.21	67.71	16.48		150.0	
		Z	4.49	66.60	15.99		150.0	
10520-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.31	66.93	16.12	0.00	150.0	± 9.6 %
		Y	4.08	67.63	16.41		150.0	
		Z	4.35	66.53	15.90		150.0	
10521-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.24	66.89	16.10	0.00	150.0	± 9.6 %
		Y	4.01	67.52	16.35		150.0	
		Z	4.28	66.50	15.87		150.0	
10522-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.29	67.01	16.19	0.00	150.0	± 9.6 %
		Y	4.02	67.52	16.36		150.0	
		Z	4.34	66.64	15.98		150.0	

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10523-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.22	67.02	16.12	0.00	150.0	± 9.6 %
		Y	4.02	67.85	16.48		150.0	
		Z	4.24	66.53	15.84		150.0	
10524-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.25	66.98	16.19	0.00	150.0	± 9.6 %
		Y	4.00	67.65	16.47		150.0	
		Z	4.28	66.56	15.95		150.0	
10525-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.28	66.09	15.82	0.00	150.0	± 9.6 %
		Y	4.09	66.89	16.17		150.0	
		Z	4.29	65.63	15.56		150.0	
10526-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.40	66.37	15.93	0.00	150.0	± 9.6 %
		Y	4.16	67.06	16.24		150.0	
		Z	4.43	65.94	15.69		150.0	
10527-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.33	66.34	15.87	0.00	150.0	± 9.6 %
		Y	4.12	67.09	16.20		150.0	
		Z	4.36	65.89	15.62		150.0	
10528-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.35	66.35	15.90	0.00	150.0	± 9.6 %
		Y	4.12	67.05	16.21		150.0	
		Z	4.37	65.91	15.65		150.0	
10529-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.35	66.35	15.90	0.00	150.0	± 9.6 %
		Y	4.12	67.05	16.21		150.0	
		Z	4.37	65.91	15.65		150.0	
10531-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.31	66.37	15.88	0.00	150.0	± 9.6 %
		Y	4.07	67.03	16.17		150.0	
		Z	4.35	65.96	15.64		150.0	
10532-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.19	66.23	15.81	0.00	150.0	± 9.6 %
		Y	3.98	66.94	16.12		150.0	
		Z	4.22	65.81	15.56		150.0	
10533-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.35	66.43	15.91	0.00	150.0	± 9.6 %
		Y	4.13	67.21	16.24		150.0	
		Z	4.38	65.98	15.65		150.0	
10534-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	4.91	66.34	15.97	0.00	150.0	± 9.6 %
		Y	4.69	66.74	16.24		150.0	
		Z	4.94	66.04	15.77		150.0	
10535-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	4.95	66.47	16.03	0.00	150.0	± 9.6 %
		Y	4.71	66.81	16.28		150.0	
		Z	4.99	66.21	15.85		150.0	
10536-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	4.84	66.47	16.01	0.00	150.0	± 9.6 %
		Y	4.62	66.84	16.27		150.0	
		Z	4.87	66.16	15.80		150.0	
10537-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	4.90	66.47	16.01	0.00	150.0	± 9.6 %
		Y	4.71	66.93	16.32		150.0	
		Z	4.93	66.13	15.79		150.0	
10538-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	4.97	66.42	16.03	0.00	150.0	± 9.6 %
		Y	4.73	66.75	16.26		150.0	
		Z	5.00	66.13	15.84		150.0	
10540-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	4.90	66.38	16.03	0.00	150.0	± 9.6 %
		Y	4.67	66.70	16.26		150.0	
		Z	4.93	66.11	15.84		150.0	

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10541-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	4.88	66.31	15.97	0.00	150.0	± 9.6 %
		Y	4.67	66.70	16.23		150.0	
		Z	4.91	66.01	15.77		150.0	
10542-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	5.04	66.41	16.04	0.00	150.0	± 9.6 %
		Y	4.80	66.76	16.28		150.0	
		Z	5.07	66.11	15.85		150.0	
10543-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.11	66.49	16.11	0.00	150.0	± 9.6 %
		Y	4.85	66.80	16.33		150.0	
		Z	5.14	66.14	15.89		150.0	
10544-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.25	66.42	15.96	0.00	150.0	± 9.6 %
		Y	5.07	66.65	16.18		150.0	
		Z	5.27	66.15	15.78		150.0	
10545-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.42	66.84	16.13	0.00	150.0	± 9.6 %
		Y	5.21	67.04	16.34		150.0	
		Z	5.45	66.60	15.96		150.0	
10546-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.28	66.54	15.99	0.00	150.0	± 9.6 %
		Y	5.09	66.74	16.19		150.0	
		Z	5.31	66.30	15.82		150.0	
10547-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.36	66.65	16.04	0.00	150.0	± 9.6 %
		Y	5.22	67.07	16.36		150.0	
		Z	5.39	66.38	15.86		150.0	
10548-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	5.50	67.24	16.31	0.00	150.0	± 9.6 %
		Y	5.18	67.11	16.36		150.0	
		Z	5.58	67.16	16.22		150.0	
10550-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.34	66.72	16.10	0.00	150.0	± 9.6 %
		Y	5.22	67.23	16.45		150.0	
		Z	5.36	66.42	15.90		150.0	
10551-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.28	66.50	15.95	0.00	150.0	± 9.6 %
		Y	5.06	66.66	16.14		150.0	
		Z	5.33	66.34	15.82		150.0	
10552-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.26	66.54	15.97	0.00	150.0	± 9.6 %
		Y	5.07	66.82	16.21		150.0	
		Z	5.27	66.23	15.76		150.0	
10553-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.31	66.48	15.97	0.00	150.0	± 9.6 %
		Y	5.11	66.71	16.17		150.0	
		Z	5.34	66.23	15.80		150.0	
10554-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	5.67	66.75	16.04	0.00	150.0	± 9.6 %
		Y	5.52	66.90	16.21		150.0	
		Z	5.69	66.52	15.88		150.0	
10555-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	5.76	66.97	16.13	0.00	150.0	± 9.6 %
		Y	5.58	67.06	16.29		150.0	
		Z	5.80	66.79	16.00		150.0	
10556-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	5.80	67.08	16.18	0.00	150.0	± 9.6 %
		Y	5.63	67.23	16.36		150.0	
		Z	5.83	66.86	16.03		150.0	
10557-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	5.76	66.95	16.13	0.00	150.0	± 9.6 %
		Y	5.57	67.06	16.29		150.0	
		Z	5.78	66.73	15.98		150.0	

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10558-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	5.77	67.00	16.18	0.00	150.0	± 9.6 %
		Y	5.54	66.98	16.27		150.0	
		Z	5.82	66.87	16.07		150.0	
10560-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	5.79	66.93	16.18	0.00	150.0	± 9.6 %
		Y	5.57	66.97	16.30		150.0	
		Z	5.82	66.74	16.04		150.0	
10561-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	5.72	66.92	16.20	0.00	150.0	± 9.6 %
		Y	5.51	66.95	16.32		150.0	
		Z	5.75	66.73	16.07		150.0	
10562-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	5.77	67.08	16.28	0.00	150.0	± 9.6 %
		Y	5.56	67.09	16.39		150.0	
		Z	5.83	66.98	16.19		150.0	
10563-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	5.87	67.06	16.24	0.00	150.0	± 9.6 %
		Y	5.77	67.47	16.55		150.0	
		Z	5.92	66.90	16.12		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	4.62	66.82	16.22	0.46	150.0	± 9.6 %
		Y	4.39	67.43	16.46		150.0	
		Z	4.66	66.47	16.04		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	4.82	67.25	16.56	0.46	150.0	± 9.6 %
		Y	4.56	67.87	16.81		150.0	
		Z	4.86	66.91	16.38		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	4.65	67.05	16.34	0.46	150.0	± 9.6 %
		Y	4.40	67.63	16.58		150.0	
		Z	4.70	66.72	16.17		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	4.70	67.52	16.78	0.46	150.0	± 9.6 %
		Y	4.46	68.13	17.04		150.0	
		Z	4.73	67.13	16.55		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	4.54	66.72	16.04	0.46	150.0	± 9.6 %
		Y	4.23	67.04	16.12		150.0	
		Z	4.60	66.47	15.91		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	4.69	67.76	16.91	0.46	150.0	± 9.6 %
		Y	4.48	68.53	17.28		150.0	
		Z	4.70	67.29	16.65		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	4.68	67.52	16.79	0.46	150.0	± 9.6 %
		Y	4.43	68.13	17.07		150.0	
		Z	4.72	67.10	16.55		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.13	64.43	15.18	0.46	130.0	± 9.6 %
		Y	1.09	65.61	16.13		130.0	
		Z	1.02	62.91	14.24		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.14	65.04	15.56	0.46	130.0	± 9.6 %
		Y	1.11	66.40	16.63		130.0	
		Z	1.02	63.36	14.54		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	2.01	84.38	21.80	0.46	130.0	± 9.6 %
		Y	35.15	138.74	38.20		130.0	
		Z	0.86	72.57	16.97		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.29	71.29	18.68	0.46	130.0	± 9.6 %
		Y	1.41	75.83	21.40		130.0	
		Z	1.02	67.46	16.65		130.0	

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10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.40	66.56	16.20	0.46	130.0	± 9.6 %
		Y	4.16	67.14	16.39		130.0	
		Z	4.44	66.24	16.07		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.43	66.78	16.30	0.46	130.0	± 9.6 %
		Y	4.20	67.45	16.55		130.0	
		Z	4.46	66.42	16.14		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	4.59	67.02	16.46	0.46	130.0	± 9.6 %
		Y	4.33	67.64	16.68		130.0	
		Z	4.64	66.69	16.31		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.50	67.20	16.59	0.46	130.0	± 9.6 %
		Y	4.26	67.87	16.85		130.0	
		Z	4.54	66.83	16.41		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.24	66.27	15.75	0.46	130.0	± 9.6 %
		Y	3.96	66.67	15.85		130.0	
		Z	4.30	66.02	15.65		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.27	66.31	15.76	0.46	130.0	± 9.6 %
		Y	3.95	66.55	15.77		130.0	
		Z	4.34	66.08	15.68		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.41	67.27	16.55	0.46	130.0	± 9.6 %
		Y	4.19	68.04	16.88		130.0	
		Z	4.44	66.86	16.35		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.16	66.00	15.50	0.46	130.0	± 9.6 %
		Y	3.86	66.35	15.58		130.0	
		Z	4.23	65.78	15.42		130.0	
10583-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.40	66.56	16.20	0.46	130.0	± 9.6 %
		Y	4.16	67.14	16.39		130.0	
		Z	4.44	66.24	16.07		130.0	
10584-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.43	66.78	16.30	0.46	130.0	± 9.6 %
		Y	4.20	67.45	16.55		130.0	
		Z	4.46	66.42	16.14		130.0	
10585-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	4.59	67.02	16.46	0.46	130.0	± 9.6 %
		Y	4.33	67.64	16.68		130.0	
		Z	4.64	66.69	16.31		130.0	
10586-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.50	67.20	16.59	0.46	130.0	± 9.6 %
		Y	4.26	67.87	16.85		130.0	
		Z	4.54	66.83	16.41		130.0	
10587-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.24	66.27	15.75	0.46	130.0	± 9.6 %
		Y	3.96	66.67	15.85		130.0	
		Z	4.30	66.02	15.65		130.0	
10588-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.27	66.31	15.76	0.46	130.0	± 9.6 %
		Y	3.95	66.55	15.77		130.0	
		Z	4.34	66.08	15.68		130.0	
10589-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.41	67.27	16.55	0.46	130.0	± 9.6 %
		Y	4.19	68.04	16.88		130.0	
		Z	4.44	66.86	16.35		130.0	
10590-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.16	66.00	15.50	0.46	130.0	± 9.6 %
		Y	3.86	66.35	15.58		130.0	
		Z	4.23	65.78	15.42		130.0	

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10591-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.56	66.67	16.34	0.46	130.0	± 9.6 %
		Y	4.32	67.28	16.57		130.0	
		Z	4.59	66.33	16.20		130.0	
10592-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	4.67	66.95	16.47	0.46	130.0	± 9.6 %
		Y	4.40	67.50	16.68		130.0	
		Z	4.73	66.64	16.33		130.0	
10593-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	4.59	66.81	16.31	0.46	130.0	± 9.6 %
		Y	4.33	67.38	16.52		130.0	
		Z	4.64	66.52	16.18		130.0	
10594-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	4.65	67.01	16.49	0.46	130.0	± 9.6 %
		Y	4.38	67.56	16.71		130.0	
		Z	4.70	66.70	16.35		130.0	
10595-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	4.61	66.98	16.39	0.46	130.0	± 9.6 %
		Y	4.34	67.53	16.61		130.0	
		Z	4.66	66.65	16.24		130.0	
10596-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.54	66.93	16.37	0.46	130.0	± 9.6 %
		Y	4.25	67.39	16.55		130.0	
		Z	4.60	66.62	16.23		130.0	
10597-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.49	66.79	16.22	0.46	130.0	± 9.6 %
		Y	4.22	67.27	16.39		130.0	
		Z	4.55	66.50	16.09		130.0	
10598-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.49	67.08	16.53	0.46	130.0	± 9.6 %
		Y	4.26	67.70	16.78		130.0	
		Z	4.53	66.74	16.37		130.0	
10599-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.23	67.11	16.59	0.46	130.0	± 9.6 %
		Y	5.12	67.88	17.03		130.0	
		Z	5.27	66.86	16.46		130.0	
10600-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	5.32	67.43	16.72	0.46	130.0	± 9.6 %
		Y	5.06	67.70	16.91		130.0	
		Z	5.40	67.28	16.64		130.0	
10601-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.23	67.24	16.64	0.46	130.0	± 9.6 %
		Y	5.01	67.64	16.90		130.0	
		Z	5.29	67.02	16.53		130.0	
10602-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.32	67.24	16.55	0.46	130.0	± 9.6 %
		Y	5.04	67.46	16.72		130.0	
		Z	5.42	67.18	16.53		130.0	
10603-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	5.39	67.57	16.87	0.46	130.0	± 9.6 %
		Y	5.05	67.60	16.95		130.0	
		Z	5.48	67.46	16.80		130.0	
10604-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.28	67.19	16.65	0.46	130.0	± 9.6 %
		Y	5.00	67.36	16.79		130.0	
		Z	5.37	67.14	16.62		130.0	
10605-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.31	67.30	16.70	0.46	130.0	± 9.6 %
		Y	5.01	67.43	16.83		130.0	
		Z	5.39	67.19	16.65		130.0	
10606-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.10	66.73	16.26	0.46	130.0	± 9.6 %
		Y	4.93	67.27	16.59		130.0	
		Z	5.13	66.48	16.14		130.0	

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10607-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.40	66.00	15.99	0.46	130.0	± 9.6 %
		Y	4.19	66.71	16.28		130.0	
		Z	4.43	65.63	15.81		130.0	
10608-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.54	66.32	16.13	0.46	130.0	± 9.6 %
		Y	4.28	66.94	16.39		130.0	
		Z	4.59	65.99	15.97		130.0	
10609-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.43	66.14	15.93	0.46	130.0	± 9.6 %
		Y	4.18	66.77	16.19		130.0	
		Z	4.48	65.81	15.78		130.0	
10610-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.48	66.33	16.12	0.46	130.0	± 9.6 %
		Y	4.24	66.96	16.39		130.0	
		Z	4.53	65.98	15.95		130.0	
10611-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.40	66.11	15.95	0.46	130.0	± 9.6 %
		Y	4.14	66.70	16.20		130.0	
		Z	4.44	65.77	15.79		130.0	
10612-AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.38	66.21	15.97	0.46	130.0	± 9.6 %
		Y	4.09	66.68	16.16		130.0	
		Z	4.44	65.90	15.83		130.0	
10613-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.37	66.02	15.81	0.46	130.0	± 9.6 %
		Y	4.10	66.52	16.00		130.0	
		Z	4.44	65.75	15.68		130.0	
10614-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.36	66.31	16.11	0.46	130.0	± 9.6 %
		Y	4.12	66.94	16.38		130.0	
		Z	4.40	65.96	15.94		130.0	
10615-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.38	65.89	15.68	0.46	130.0	± 9.6 %
		Y	4.11	66.48	15.90		130.0	
		Z	4.44	65.60	15.55		130.0	
10616-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.04	66.30	16.17	0.46	130.0	± 9.6 %
		Y	4.81	66.63	16.40		130.0	
		Z	5.08	66.07	16.04		130.0	
10617-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.07	66.41	16.20	0.46	130.0	± 9.6 %
		Y	4.82	66.67	16.40		130.0	
		Z	5.15	66.26	16.12		130.0	
10618-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	4.99	66.49	16.26	0.46	130.0	± 9.6 %
		Y	4.75	66.78	16.48		130.0	
		Z	5.04	66.28	16.14		130.0	
10619-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.01	66.29	16.09	0.46	130.0	± 9.6 %
		Y	4.79	66.70	16.36		130.0	
		Z	5.05	66.06	15.96		130.0	
10620-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.07	66.29	16.14	0.46	130.0	± 9.6 %
		Y	4.80	66.49	16.29		130.0	
		Z	5.13	66.09	16.03		130.0	
10621-AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.09	66.45	16.35	0.46	130.0	± 9.6 %
		Y	4.85	66.75	16.57		130.0	
		Z	5.15	66.25	16.23		130.0	
10622-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.08	66.53	16.39	0.46	130.0	± 9.6 %
		Y	4.83	66.78	16.59		130.0	
		Z	5.14	66.36	16.28		130.0	

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10623-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	4.96	66.05	15.99	0.46	130.0	± 9.6 %
		Y	4.74	66.39	16.22		130.0	
		Z	5.02	65.88	15.90		130.0	
10624-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.16	66.32	16.20	0.46	130.0	± 9.6 %
		Y	4.91	66.60	16.40		130.0	
		Z	5.22	66.13	16.10		130.0	
10625-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.25	66.46	16.34	0.46	130.0	± 9.6 %
		Y	5.01	66.87	16.61		130.0	
		Z	5.43	66.66	16.42		130.0	
10626-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.37	66.32	16.13	0.46	130.0	± 9.6 %
		Y	5.18	66.52	16.32		130.0	
		Z	5.41	66.14	16.02		130.0	
10627-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	5.59	66.90	16.39	0.46	130.0	± 9.6 %
		Y	5.36	67.08	16.58		130.0	
		Z	5.64	66.75	16.30		130.0	
10628-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.36	66.27	16.00	0.46	130.0	± 9.6 %
		Y	5.15	66.43	16.17		130.0	
		Z	5.41	66.15	15.92		130.0	
10629-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.46	66.45	16.06	0.46	130.0	± 9.6 %
		Y	5.33	66.94	16.43		130.0	
		Z	5.50	66.26	15.98		130.0	
10630-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	5.68	67.33	16.53	0.46	130.0	± 9.6 %
		Y	5.30	67.01	16.48		130.0	
		Z	5.83	67.48	16.58		130.0	
10631-AAB	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	5.68	67.46	16.80	0.46	130.0	± 9.6 %
		Y	5.39	67.46	16.91		130.0	
		Z	5.77	67.39	16.74		130.0	
10632-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	5.60	67.13	16.65	0.46	130.0	± 9.6 %
		Y	5.50	67.73	17.05		130.0	
		Z	5.63	66.87	16.50		130.0	
10633-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.39	66.38	16.10	0.46	130.0	± 9.6 %
		Y	5.16	66.54	16.27		130.0	
		Z	5.48	66.37	16.07		130.0	
10634-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.42	66.59	16.25	0.46	130.0	± 9.6 %
		Y	5.22	66.83	16.48		130.0	
		Z	5.46	66.38	16.13		130.0	
10635-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.26	65.75	15.53	0.46	130.0	± 9.6 %
		Y	5.03	65.88	15.68		130.0	
		Z	5.33	65.66	15.49		130.0	
10636-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	5.80	66.66	16.21	0.46	130.0	± 9.6 %
		Y	5.64	66.80	16.37		130.0	
		Z	5.84	66.53	16.13		130.0	
10637-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	5.91	66.96	16.34	0.46	130.0	± 9.6 %
		Y	5.72	67.05	16.49		130.0	
		Z	5.98	66.89	16.30		130.0	
10638-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	5.94	67.02	16.35	0.46	130.0	± 9.6 %
		Y	5.77	67.21	16.55		130.0	
		Z	5.98	66.86	16.26		130.0	

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10639-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	5.90	66.90	16.34	0.46	130.0	± 9.6 %
		Y	5.70	66.99	16.48		130.0	
		Z	5.95	66.78	16.26		130.0	
10640-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	5.85	66.77	16.21	0.46	130.0	± 9.6 %
		Y	5.60	66.70	16.28		130.0	
		Z	5.94	66.77	16.19		130.0	
10641-AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	5.95	66.85	16.27	0.46	130.0	± 9.6 %
		Y	5.73	66.88	16.38		130.0	
		Z	6.01	66.77	16.22		130.0	
10642-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	5.98	67.10	16.57	0.46	130.0	± 9.6 %
		Y	5.76	67.11	16.68		130.0	
		Z	6.04	66.98	16.50		130.0	
10643-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	5.82	66.74	16.27	0.46	130.0	± 9.6 %
		Y	5.59	66.71	16.35		130.0	
		Z	5.88	66.67	16.23		130.0	
10644-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	5.88	66.93	16.39	0.46	130.0	± 9.6 %
		Y	5.65	66.92	16.48		130.0	
		Z	5.97	66.96	16.39		130.0	
10645-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	6.00	66.98	16.38	0.46	130.0	± 9.6 %
		Y	5.89	67.36	16.67		130.0	
		Z	6.11	67.04	16.40		130.0	
10646-AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	10.64	95.54	31.22	9.30	60.0	± 9.6 %
		Y	4.79	84.10	28.76		60.0	
		Z	10.44	97.20	33.10		60.0	
10647-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	9.38	93.52	30.68	9.30	60.0	± 9.6 %
		Y	4.24	81.79	27.97		60.0	
		Z	9.23	95.05	32.51		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.45	60.96	7.58	0.00	150.0	± 9.6 %
		Y	0.27	60.00	4.46		150.0	
		Z	0.46	60.51	7.45		150.0	
10652-AAB	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.44	66.86	15.90	2.23	80.0	± 9.6 %
		Y	3.11	67.55	15.78		80.0	
		Z	3.23	65.63	15.61		80.0	
10653-AAB	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	4.00	66.30	16.33	2.23	80.0	± 9.6 %
		Y	3.63	66.57	16.36		80.0	
		Z	3.80	65.27	16.02		80.0	
10654-AAB	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	4.02	65.95	16.40	2.23	80.0	± 9.6 %
		Y	3.68	66.02	16.44		80.0	
		Z	3.82	64.96	16.07		80.0	
10655-AAB	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.10	65.87	16.44	2.23	80.0	± 9.6 %
		Y	3.77	65.78	16.47		80.0	
		Z	3.89	64.93	16.12		80.0	
10658-AAA	Pulse Waveform (200Hz, 10%)	X	3.96	69.40	12.41	10.00	50.0	± 9.6 %
		Y	3.54	68.64	11.84		50.0	
		Z	6.60	76.50	15.95		50.0	
10659-AAA	Pulse Waveform (200Hz, 20%)	X	3.35	69.24	11.38	6.99	60.0	± 9.6 %
		Y	2.54	68.41	10.67		60.0	
		Z	15.62	86.85	17.81		60.0	

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10660-AAA	Pulse Waveform (200Hz, 40%)	X	3.13	70.75	10.92	3.98	80.0	± 9.6 %
		Y	2.65	71.33	10.38		80.0	
		Z	100.00	100.70	18.97		80.0	
10661-AAA	Pulse Waveform (200Hz, 60%)	X	3.01	72.21	10.50	2.22	100.0	± 9.6 %
		Y	0.47	62.70	6.02		100.0	
		Z	0.86	65.62	7.78		100.0	
10662-AAA	Pulse Waveform (200Hz, 80%)	X	0.23	60.01	4.55	0.97	120.0	± 9.6 %
		Y	0.53	60.44	2.25		120.0	
		Z	0.27	60.00	2.59		120.0	

[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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Accreditation No.: SCS 0108

Client **HCT (Dymstec)**

Certificate No: **EX3-3968_Sep18**

결재	담당자	확인자
	[signature]	[signature]
직위/성명	GW / [illegible]	GM / [illegible]
일자	2018 / 10.05	2018 / 10.05

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3968
Calibration procedure(s)	QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	September 25, 2018

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 (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
Reference Probe ES3DV2	SN: 3013	30-Dec-17 (No. ES3-3013_Dec17)	Dec-18
DAE4	SN: 660	21-Dec-17 (No. DAE4-660_Dec17)	Dec-18
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	[signature]
Approved by:	Katja Pokovic	Technical Manager	[signature]

Issued: September 27, 2018

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Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,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.e., ϑ = 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:

a) 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
b) 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
c) 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
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,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*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (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
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* 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 ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,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 ± 50 MHz to ± 100 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 *NORMx* (no uncertainty required).

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Probe EX3DV4

SN:3968

Manufactured: September 30, 2013
Repaired: September 13, 2018
Calibrated: September 25, 2018

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3968

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.56	0.57	0.56	± 10.1 %
DCP (mV)[B]	98.0	99.0	97.6	

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	171.6	±2.7 %
		Y	0.0	0.0	1.0		161.8	
		Z	0.0	0.0	1.0		178.8	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	46.84	361.8	37.71	11.82	0.384	5.084	0.048	0.556	1.008
Y	48.24	363.7	36.17	17.75	0.176	5.100	1.558	0.280	1.009
Z	45.97	356.8	37.98	12.75	0.415	5.100	0.000	0.555	1.011

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 E^2-field uncertainty inside TSL (see Pages 5 and 6).
[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.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3968

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)	Unc (k=2)
600	42.7	0.88	10.56	10.56	10.56	0.09	1.20	± 13.3 %
750	41.9	0.89	10.04	10.04	10.04	0.34	1.05	± 12.0 %
835	41.5	0.90	9.86	9.86	9.86	0.47	0.84	± 12.0 %
900	41.5	0.97	9.70	9.70	9.70	0.41	0.89	± 12.0 %
1450	40.5	1.20	8.51	8.51	8.51	0.30	0.88	± 12.0 %
1750	40.1	1.37	8.57	8.57	8.57	0.31	0.90	± 12.0 %
1900	40.0	1.40	8.19	8.19	8.19	0.37	0.90	± 12.0 %
2450	39.2	1.80	7.52	7.52	7.52	0.33	0.97	± 12.0 %
2600	39.0	1.96	7.37	7.37	7.37	0.39	0.93	± 12.0 %
3500	37.9	2.91	7.11	7.11	7.11	0.23	1.20	± 13.1 %
5250	35.9	4.71	5.52	5.52	5.52	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.78	4.78	4.78	0.40	1.80	± 13.1 %
5750	35.4	5.22	4.94	4.94	4.94	0.40	1.80	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the 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 frequencies 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 frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3968

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
600	56.1	0.95	10.50	10.50	10.50	0.10	1.20	± 13.3 %
750	55.5	0.96	10.07	10.07	10.07	0.49	0.80	± 12.0 %
835	55.2	0.97	9.86	9.86	9.86	0.49	0.82	± 12.0 %
1750	53.4	1.49	8.19	8.19	8.19	0.36	0.92	± 12.0 %
1900	53.3	1.52	7.76	7.76	7.76	0.39	0.92	± 12.0 %
2450	52.7	1.95	7.54	7.54	7.54	0.35	0.95	± 12.0 %
2600	52.5	2.16	7.50	7.50	7.50	0.33	1.05	± 12.0 %
3500	51.3	3.31	7.00	7.00	7.00	0.25	1.20	± 13.1 %
5250	48.9	5.36	4.98	4.98	4.98	0.50	1.90	± 13.1 %
5600	48.5	5.77	4.28	4.28	4.28	0.50	1.90	± 13.1 %
5750	48.3	5.94	4.49	4.49	4.49	0.50	1.90	± 13.1 %

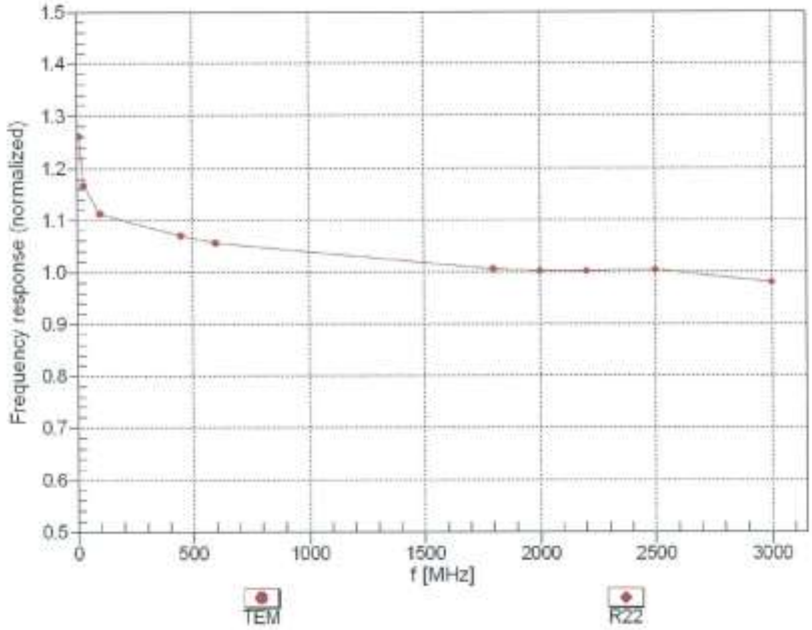
[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz 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 frequencies 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 frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4– SN:3968 September 25, 2018

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



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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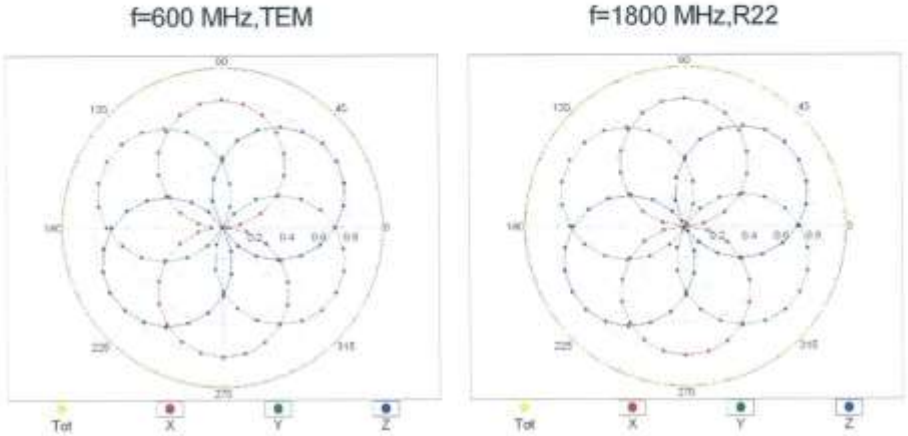
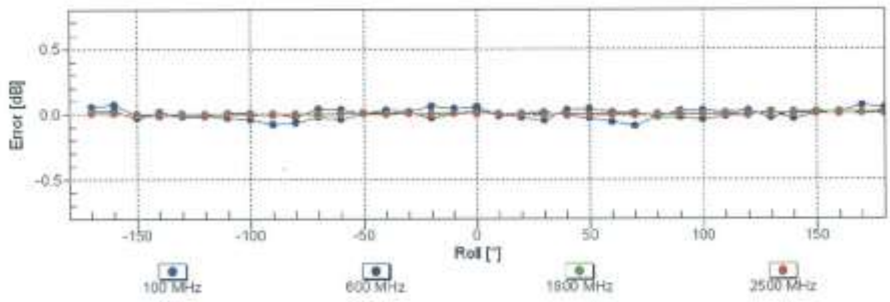
Receiving Pattern (ϕ), ϑ = 0°



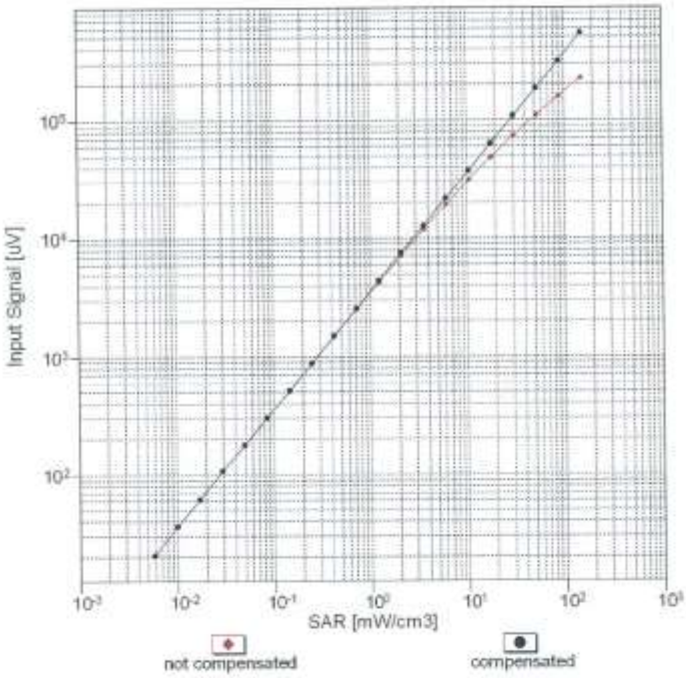


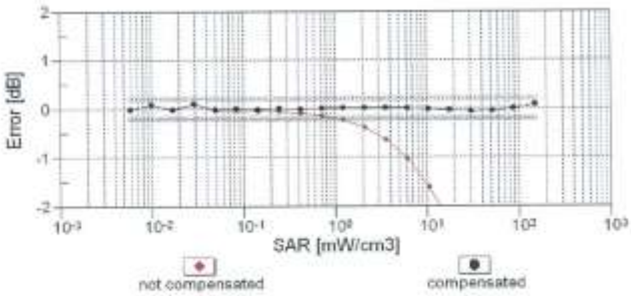
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

EX3DV4– SN:3968 September 25, 2018

Dynamic Range f(SAR_{head})

(TEM cell , f_{eval}= 1900 MHz)





Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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