TESTING (OR CALIBRATION)
NVLAP LAB CODE 600141-0

Registration
No.788871

TEST REPORT
FOR SAR TESTING

Report No.: SRTC2019-9004(F)-19010203(H)

Product Name: LTE Ufi

Product Model: 802ZT

Applicant: ZTE Corporation

Manufacturer: ZTE Corporation

Specification: Part 2.1093

IEEE Std 1528

KDB Procedures

FCC ID: SRQ-MF993

The State Radio_monitoring_center Testing Center (SRTC)

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1 GENERAL INFORMATION

1.1 Notes of the test report

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The test results relate only to individual items of the samples which have been tested. The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
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1.4 Manufacturer's details

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City:	Shenzhen
Country or Region:	P.R. China
Contacted person:	Yang Zhao
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1.5 Test Environment

Date of Receipt of test sample at SRTC:	2019.01.31
Testing Start Date:	2019.02.12
Testing End Date:	2019.02.19

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	22	35

Normal Supply Voltage (V d.c.):	3.73

2 DESCRIPTION OF THE EQUIPMENT UNDER TEST

2.1 Final equipment build status

Wireless Technology and Frequency Bands	☒WCDMA Band: II/IV ☒LTE Band: 2/3/12/17/41 ☒Wi-Fi Band: 2.4GHz~2.4835GHz/5.15GHz~5.25GHz
Mode	WCDMA ☒UMTS Rel. 99 ☒HSDPA (Rel. 5) ☒HSUPA (Rel. 6) ☐HSPA+ (Rel.7) ☐DC-HSDPA (Rel.8) Wi-Fi 2.4GHz ☒802.11b ☒802.11g ☒802.11n (20MHz) Wi-Fi 5GHz ☒802.11a ☒802.11ac(20MHz) ☒802.11ac(40MHz) ☒802.11ac(80MHz) ☒802.11n (20MHz) ☒802.11n (40MHz) LTE ☒QPSK ☒16QAM ☒64QAM
Duty Cycle	WCDMA: 100% Wi-Fi 2.4GHz: 11b：98.9%; 11g:93.4%; 11n HT20: 93.0% Wi-Fi 5GHz: 11a：96.12%; 11ac HT20:97.34%; 11ac HT40: 96.27%;11ac HT80: 95.37% 11n HT20:98.92%; 11n HT40: 98.94%
GPRS Multi-Slot Class	☐Class 8 - One Up ☐Class 10 - Two Up ☐Class 12 - Four Up
Mobile Phone Capability	☐Class A - Mobile phones can be connected to both GPRS and GSM services simultaneously. ☐Class B - Mobile phones can be attached to both GPRS and GSM services, using one service at a time. ☐Class C - Mobile phones are attached to either GPRS or GSM voice service. You need to switch manually between services
DTM (Dual Transfer Mode)	Not Supported

2.2 Support equipment

The following support equipment was used to exercise the EUT during testing:

Batteries	Li3730T43P4h794667/Li-Lon
H/W Version	MF993H01
S/W Version	MF993S01
IMEI	863942040003484
Notes	The relevant tests have been performed in order to verify in which combination case the EUT would have the worst features.

3 REFERENCE SPECIFICATION

Specification	Version	Title
Part 2.1093	2018	Radiofrequency radiation exposure evaluation: portable devices.
IEEE Std 1528	2013	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
IEEE Std 1528a	2005	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques Amendment 1: CAD File for Human Head Model (SAM Phantom)
KDB 447498 D01	v06	General RF Exposure Guidance
KDB 648474 D04	v01r03	Handset SAR
KDB 941225 D01	v03r01	3G SAR Procedures
KDB 941225 D06	v02r01	Hotspot Mode
KDB 248227 D01	v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 865664 D01	v01r04	SAR Measurement from 100 MHz to 6 GHz
KDB 865664 D02	v01r02	RF Exposure Reporting
KDB 941225 D05	v02r05	SAR for LTE Devices

4. TEST CONDITIONS

4.1 Picture to demonstrate the required liquid depth

The liquid depth in the used SAM phantoms

Liquid depth for SAR Measurement

4.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester. Communication between the device and the call tester was established by air link.
The device output power was set to maximum power level for all tests; a fully charged battery was used for every test sequence.
In all operating bands the measurements were performed on middle channel, and few of them were also performed on lowest and highest channels.

4.3 SAR Measurement Set-up

The system is based on a high precision robot (working range greater than 0.9m), which positions the probes with a positional repeatability of better than ± 0.02mm. Special E-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit. A cell controller system contains the power supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors.
The PC consists of the Micron Pentium IV computer with Win7 system and SAR Measurement Software DASY5 Professional, A/D interface card, monitor, mouse, and keyboard. The Stäubli 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. The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16bit 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.

4.4 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin headed "SAM Phantom", manufactured by SPEAG. The phantom conforms to the requirements of IEEE 1528 - 2013.
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.
The SPEAG device holder (see Section 5.1) was used to position the device in all tests whilst a tripod was used to position the validation dipoles against the flat section of phantom.

4.5 Tissue Simulants

Recommended values for the dielectric parameters of the tissue simulants are given in IEEE 1528 - 2013 and FCC Supplement C to OET Bulletin 65. All tests were carried out using simulants whose dielectric parameters were within ± 5% of the recommended values. All tests were carried out within 24 hours of measuring the dielectric parameters.
The depth of the tissue simulant was 15.0 ± 0.5 cm measured from the ear reference point during system checking and device measurements.

Tissue Stimulant Recipes

The following tissue stimulants were used for Head and Body test:

Name	BroadBand tissue-equivalent liquid
Type for Head	HBBL600-6000V6 Head Simulating Liquid
Type for Body	MBBL600-6000V6 Body Simulating Liquid

4.6 DESCRIPTION OF THE TEST PROCEDURE

4.6.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy5 system.

Device holder supplied by SPEAG

4.6.2 Test positions

4.6.2.1 Against Phantom Head

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

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

4.6.2.2 Body Worn Configuration

The device was placed in the SPEAG holder below the flat section of the phantom. The distance between the device and the phantom was kept at the separation distance using a separate flat spacer that was removed before the start of the measurements. And the distance is 10mm.The device was oriented with its antenna facing the phantom since this orientation gives higher results.

4.6.3 Scan Procedure

First, area scans were used for determination of the field distribution and the approximate location of the local peak SAR values. The SAR distribution is scanned along the inside surface, at least for an area larger than the projection of the handset and antenna. The angle between the probe axis and the surface normal line is recommended but not required to be less than 30°. The SAR distribution is first measured on a 2-D coarse grid. The scan region should cover all areas that are exposed and encompassed by the projection of the handset. There are 15 mm × 15 mm (equal or less than 2GHz), 12 mm × 12 mm (from 2GHz~3GHz) and 10mm x 10mm (above 5GHz) measurement grid used when two staggered one-dimensional cubic splines are used to estimate the maximum SAR location. Next, a zoom scan, a minimum of 7 x 7x7 points covering a volume of at least 30x30x30mm, was

performed around the highest E-field value to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

4.6.4 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within DASY5 are all based on the modified Quadratic Shepard's method (Robert J. Renka, Multivariate Interpolation of Large Sets of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A triradiate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighboring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

5 RESULT SUMMARY

The maximum reported SAR values for Head configuration and Body Worn configuration are given as follows. The device conforms to the requirements of the standard(s) when the maximum reported SAR value is less than or equal to the limit.

Exposure Position	Frequency Band	1g-SAR Reported Results (W/kg)	Highest 1g-SAR Reported Results (W/kg)		1g-SAR Limit (W/kg)	Result
Body Worn (10mm Gap)	WCDMA Band II	1.09	1.09	1.12	1.6	Pass
	WCDMA Band IV	1.08				
	LTE Band 2	0.77				
	LTE Band 4	0.78				
	LTE Band 12	0.58				
	LTE Band 17	0.63				
	LTE Band 41	0.74				
	WLAN 2.4GHz Band	0.29				
	WLAN 5GHz Band	0.30				
Hotspot (10mm Gap)	WCDMA Band II	1.12	1.12			
	WCDMA Band IV	0.98				
	LTE Band 2	0.78				
	LTE Band 4	0.78				
	LTE Band 12	0.61				
	LTE Band 17	0.67				
	LTE Band 41	0.72				

Simultaneous Transmission Summary

Exposure Position	Frequency Band	1g-SAR Reported Results (W/kg)	Highest 1g-SAR Reported Results (W/kg)		1g-SAR Limit (W/kg)	Result
Body Worn (10mm Gap)	WCDMA & Wi-Fi	1.39	1.39	1.42	1.6	Pass
	LTE & Wi-Fi	1.08				
Hotspot (10mm Gap)	WCDMA & Wi-Fi	1.42	1.42			
	LTE & Wi-Fi	1.08				

This Test Report Is Issued by: Mr. Peng Zhen	Checked by: Mr. Li Bin
Tested by: Mr. Chang Tianyu	Issued date: 20190224

6 TEST RESULT

6.1 Manufacturing Tolerance

WCDMA

WCDMA Band2			
Channel	9262	9400	9538
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
WCDMA Band4			
Channel	1312	1412	1513
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0

HSDPA Band2				
Channel		9262	9400	9538
Sub test 1	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 2	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 3	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 4	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
HSDPA Band4				
Channel		1312	1412	1513
Sub test 1	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 2	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 3	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 4	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0

HSUPA Band2				
Channel		9262	9400	9538
Sub test 1	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 2	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 3	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 4	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 5	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
HSUPA Band4				
Channel		1312	1412	1513
Sub test 1	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 2	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 3	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 4	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
Sub test 5	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0

LTE

LTE Band 2

QPSK

20BW 100%RB			
Channel	Channel 18700	Channel 18900	Channel 19100
Tolerance (dBm)	17.5~21.5	17.5~21.5	17.5~21.5
20BW 50%RB			
Channel	Channel 18700	Channel 18900	Channel 19100
Tolerance (dBm)	18.0~22.0	18.0~22.0	18.0~22.0
20BW 1RB			
Channel	Channel 18700	Channel 18900	Channel 19100
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0

16QAM

20BW 100%RB			
Channel	Channel 18700	Channel 18900	Channel 19100
Tolerance (dBm)	17.5~21.5	17.5~21.5	17.5~21.5
20BW 50%RB			
Channel	Channel 18700	Channel 18900	Channel 19100
Tolerance (dBm)	18.0~22.0	18.0~22.0	18.0~22.0
20BW 1RB			
Channel	Channel 18700	Channel 18900	Channel 19100
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0

64QAM

20BW 100%RB			
Channel	Channel 18700	Channel 18900	Channel 19100
Tolerance (dBm)	17.5~21.5	17.5~21.5	17.5~21.5
20BW 50%RB			
Channel	Channel 18700	Channel 18900	Channel 19100
Tolerance (dBm)	18.0~22.0	18.0~22.0	18.0~22.0
20BW 1RB			
Channel	Channel 18700	Channel 18900	Channel 19100
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0

LTE Band 4

QPSK

20BW 100%RB			
Channel	Channel 20050	Channel 20175	Channel 20300
Tolerance (dBm)	18.0~22.0	18.0~22.0	18.0~22.0
20BW 50%RB			
Channel	Channel 20050	Channel 20175	Channel 20300
Tolerance (dBm)	18.0~22.0	18.0~22.0	18.0~22.0
20BW 1RB			
Channel	Channel 20050	Channel 20175	Channel 20300
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0

16QAM

20BW 100%RB			
Channel	Channel 20050	Channel 20175	Channel 20300
Tolerance (dBm)	18.0~22.0	18.0~22.0	18.0~22.0
20BW 50%RB			
Channel	Channel 20050	Channel 20175	Channel 20300
Tolerance (dBm)	18.0~22.0	18.0~22.0	18.0~22.0
20BW 1RB			
Channel	Channel 20050	Channel 20175	Channel 20300
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0

64QAM

20BW 100%RB			
Channel	Channel 20050	Channel 20175	Channel 20300
Tolerance (dBm)	18.0~22.0	18.0~22.0	18.0~22.0
20BW 50%RB			
Channel	Channel 20050	Channel 20175	Channel 20300
Tolerance (dBm)	18.0~22.0	18.0~22.0	18.0~22.0
20BW 1RB			
Channel	Channel 20050	Channel 20175	Channel 20300
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0

LTE Band 12

QPSK

10BW 100%RB			
Channel	Channel 23060	Channel 23095	Channel 23130
Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
10BW 50%RB			
Channel	Channel 23060	Channel 23095	Channel 23130
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
10BW 1RB			
Channel	Channel 23060	Channel 23095	Channel 23130
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

16QAM

10BW 100%RB			
Channel	Channel 23060	Channel 23095	Channel 23130
Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
10BW 50%RB			
Channel	Channel 23060	Channel 23095	Channel 23130
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
10BW 1RB			
Channel	Channel 23060	Channel 23095	Channel 23130
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

64QAM

10BW 100%RB			
Channel	Channel 23060	Channel 23095	Channel 23130
Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
10BW 50%RB			
Channel	Channel 23060	Channel 23095	Channel 23130
Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
10BW 1RB			
Channel	Channel 23060	Channel 23095	Channel 23130
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

LTE Band 17

QPSK

10BW 100%RB			
Channel	Channel 23780	Channel 23790	Channel 23800
Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
10BW 50%RB			
Channel	Channel 23780	Channel 23790	Channel 23800
Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
10BW 1RB			
Channel	Channel 23780	Channel 23790	Channel 23800
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

16QAM

10BW 100%RB			
Channel	Channel 23780	Channel 23790	Channel 23800
Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
10BW 50%RB			
Channel	Channel 23780	Channel 23790	Channel 23800
Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
10BW 1RB			
Channel	Channel 23780	Channel 23790	Channel 23800
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

64QAM

10BW 100%RB			
Channel	Channel 23780	Channel 23790	Channel 23800
Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
10BW 50%RB			
Channel	Channel 23780	Channel 23790	Channel 23800
Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
10BW 1RB			
Channel	Channel 23780	Channel 23790	Channel 23800
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

LTE Band41

QPSK

20BW 100%RB					
Channel	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490
Tolerance (dBm)	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0
20BW 50%RB					
Channel	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490
Tolerance (dBm)	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0
20BW 1RB					
Channel	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490
Tolerance (dBm)	22.0~26.0	22.0~26.0	22.0~26.0	22.0~26.0	22.0~26.0

16QAM

20BW 100%RB					
Channel	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490
Tolerance (dBm)	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0
20BW 50%RB					
Channel	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490
Tolerance (dBm)	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0
20BW 1RB					
Channel	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490
Tolerance (dBm)	22.0~26.0	22.0~26.0	22.0~26.0	22.0~26.0	22.0~26.0

64QAM

20BW 100%RB					
Channel	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490
Tolerance (dBm)	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0
20BW 50%RB					
Channel	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490
Tolerance (dBm)	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0	21.0~25.0
20BW 1RB					
Channel	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490
Tolerance (dBm)	22.0~26.0	22.0~26.0	22.0~26.0	22.0~26.0	22.0~26.0

Note： SRTC check the power for QPSK, 16QAM and 64 QAM，although the power for 16QAM and 64 QAM are smaller than QPSK, they all in the tune-up tolerance so that they can use the same tune up power tolerance.

Wi-Fi (2.4GHz)

802.11b Ant1			
Channel	1	6	11
Tolerance (dBm)	14.0~18.0	14.0~18.0	14.0~18.0
802.11b Ant2			
Channel	1	6	11
Tolerance (dBm)	13.0~17.0	13.0~17.0	13.0~17.0
802.11g Ant1			
Channel	1	6	11
Tolerance (dBm)	13.0~17.0	13.0~17.0	13.0~17.0
802.11g Ant2			
Channel	1	6	11
Tolerance (dBm)	12.0~16.0	12.0~16.0	12.0~16.0
802.11n HT20 Ant1			
Channel	1	6	11
Tolerance (dBm)	11.5~15.5	11.5~15.5	11.5~15.5
802.11n HT20 Ant2			
Channel	1	6	11
Tolerance (dBm)	10.5~14.5	10.5~14.5	10.5~14.5

MIMO

802.11n HT20			
Channel	1	6	11
Tolerance (dBm)	14.0~18.0	14.0~18.0	14.0~18.0

Wi-Fi (5GHz)

802.11a Ant1			
Frequency	5180 MHz	5200 MHz	5240MHz
Tolerance (dBm)	11.0~15.0	11.0~15.0	11.0~15.0
802.11a Ant2			
Frequency	5180 MHz	5200 MHz	5240MHz
Tolerance (dBm)	11.0~15.0	11.0~15.0	11.0~15.0

802.11n HT20 ANT1			
Frequency	5180 MHz	5200 MHz	5240MHz
Tolerance (dBm)	10.0~14.0	10.0~14.0	10.0~14.0
802.11n HT20 ANT2			
Frequency	5180 MHz	5200 MHz	5240MHz
Tolerance (dBm)	10.5~14.5	10.5~14.5	10.5~14.5

802.11ac VHT20 ANT1			
Frequency	5180 MHz	5200 MHz	5240MHz
Tolerance (dBm)	8.0~12.0	8.0~12.0	8.0~12.0
802.11ac VHT20 ANT2			
Frequency	5180 MHz	5200 MHz	5240MHz
Tolerance (dBm)	8.5~12.5	8.5~12.5	8.5~12.5

802.11n HT40 ANT1		
Frequency	5190 MHz	5230 MHz
Tolerance (dBm)	10.0~14.0	10.0~14.0
802.11n HT40 ANT2		
Frequency	5190 MHz	5230 MHz
Tolerance (dBm)	10.5~14.5	10.5~14.5

802.11ac VHT40 ANT1		
Frequency	5190 MHz	5230 MHz
Tolerance (dBm)	8.5~12.5	8.5~12.5
802.11ac VHT40 ANT2		
Frequency	5190 MHz	5230 MHz
Tolerance (dBm)	8.5~12.5	8.5~12.5

802.11ac VHT80 ANT1	
Frequency	5210 MHz
Tolerance (dBm)	8.0~12.0
802.11ac VHT80 ANT2	
Frequency	5210 MHz
Tolerance (dBm)	8.0~12.0

MIMO

802.11n HT20			
Frequency	5180 MHz	5200 MHz	5240MHz
Tolerance (dBm)	13.0~17.0	13.0~17.0	13.0~17.0
802.11ac VHT20			
Frequency	5180 MHz	5200 MHz	5240MHz
Tolerance (dBm)	11.0~15.0	11.0~15.0	11.0~15.0
802.11n HT40			
Frequency	5190 MHz	5230 MHz	
Tolerance (dBm)	13.5~17.5	13.5~17.5	
802.11ac VHT40			
Frequency	5190 MHz	5230 MHz	
Tolerance (dBm)	11.5~15.5	11.5~15.5	
802.11ac VHT80			
Frequency	5210 MHz		
Tolerance (dBm)	11.0~15.0		

6.2 WCDMA Measurement result

The following procedures are according to FCC KDB Publication 941225 D01.
Release 99
The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

Measured Results

Mode	Band II			Band IV		
Channel	9262	9400	9538	1312	1412	1513
Frequency (MHz)	1852.4	1880	1907.6	1712.4	1732.4	1752.6
RB test mode1+64kRMC(dBm)	22.47	22.30	22.41	22.33	22.31	22.17
RB test mode1+12.2kRMC(dBm)	**22.59**	**22.57**	**22.63**	**22.71**	**22.66**	**22.67**
RB test mode1+144kRMC(dBm)	22.20	22.56	22.46	22.50	22.63	22.22
RB test mode1+384kRMC(dBm)	22.44	22.23	22.44	22.50	22.65	22.60

HSDPA
The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	CM(dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0
3	15/15	8/15	64	15/18	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} =8⇔ $A_{hs}=\beta_{hs}/\beta_c=30/15 \Leftrightarrow \beta_{hs}=30/15*\beta_c$.
Note2:CM=1 for $\beta_c/\beta_d=12/15$, $\beta_{hs}/\beta_c=24/15$.
Note3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to $\beta_c=11/15$ and $\beta_d=15/15$.

Measured Results

Mode	HSDPA Band II			HSDPA Band IV		
Channel	9262	9400	9538	1312	1412	1513
Frequency (MHz)	1852.4	1880	1907.6	1712.6	1740.0	1752.4
sub-test1(dBm)	22.58	22.57	22.61	22.70	22.65	22.68
sub-test2(dBm)	22.57	22.56	22.58	22.68	22.64	22.65
sub-test3(dBm)	22.56	22.54	22.53	22.69	22.64	22.62
sub-test4(dBm)	22.58	22.52	22.53	22.68	22.64	22.63

HSUPA

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15 (3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	2.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	2.0	2.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (4)	15/15 (4)	64	15/15 (4)	30/15	24/15	134/15	4	1	1.0	2.0	21	81

Note1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} =8⇔$A_{hs}=\beta_{hs}/\beta_c$=30/15⇔$\beta_{hs}$=30/15*$\beta_c$.
Note2: CM=1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH,DPCCH,HS-DPCCH,E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to β_c=10/15 and β_d=15/15.
Note4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to β_c=14/15 and β_d=15/15.
NOTE5: Testing UE using E-DPDCH Physical layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
NOTE6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Measured Results

Mode	HSUPA Band II			HSUPA Band IV		
Channel	9262	9400	9538	1312	1412	1513
Frequency (MHz)	1852.4	1880	1907.6	1712.6	1740.0	1752.4
sub-test1(dBm)	22.56	22.54	22.56	22.69	22.66	22.67
sub-test2(dBm)	22.53	22.52	22.57	22.65	22.62	22.64
sub-test3(dBm)	22.55	22.54	22.57	22.64	22.61	22.62
sub-test4(dBm)	22.52	22.55	22.53	22.68	22.62	22.62
sub-test5(dBm)	22.55	22.54	22.56	22.62	22.61	22.63

Note: UMTS SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01.HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.

6.3 LTE Measurement result

LTE Band 2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1850.7	18607	1.4	1	0	22.2
				1	5	22.2
				3	2	22.2
				6	0	21.2
	1880	18900		1	0	22.3
				1	5	22.3
				3	2	22.3
				6	0	21.3
	1909.3	19193		1	0	22.2
				1	5	22.2
				3	2	22.2
				6	0	21.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1850.7	18607	1.4	1	0	21.8
				1	5	21.9
				3	2	21.4
				6	0	20.5
	1880	18900		1	0	21.8
				1	5	21.9
				3	2	21.4
				6	0	20.5
	1909.3	19193		1	0	21.8
				1	5	21.9
				3	2	21.4
				6	0	20.5

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1850.7	18607	1.4	1	0	21.7
				1	5	21.7
				3	2	21.3
				6	0	20.2
	1880	18900		1	0	21.9
				1	5	21.8
				3	2	21.4
				6	0	20.2
	1909.3	19193		1	0	21.8
				1	5	21.9
				3	2	21.4
				6	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1851.5	18615	3	1	0	22.3
				1	14	22.4
				8	4	21.3
				15	0	21.3
	1880	18900		1	0	22.3
				1	14	22.4
				8	4	21.3
				15	0	21.3
	1908.5	19185		1	0	22.3
				1	14	22.4
				8	4	21.3
				15	0	21.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1851.5	18615	3	1	0	21.8
				1	14	21.9
				8	4	20.4
				15	0	20.3
	1880	18900		1	0	21.8
				1	14	21.9
				8	4	20.4
				15	0	20.3
	1908.5	19185		1	0	21.8
				1	14	21.9
				8	4	20.4
				15	0	20.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1851.5	18615	3	1	0	21.8
				1	14	21.9
				8	4	20.4
				15	0	20.2
	1880	18900		1	0	21.8
				1	14	21.9
				8	4	20.4
				15	0	20.2
	1908.5	19185		1	0	21.8
				1	14	21.9
				8	4	20.4
				15	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1852.5	18625	5	1	0	22.2
				1	24	22.3
				12	6	21.3
				25	0	21.3
	1880	18900		1	0	22.2
				1	24	22.3
				12	6	21.3
				25	0	21.3
	1907.5	19175		1	0	22.2
				1	24	22.3
				12	6	21.3
				25	0	21.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1852.5	18625	5	1	0	21.7
				1	24	21.8
				12	6	20.4
				25	0	20.2
	1880	18900		1	0	21.7
				1	24	21.8
				12	6	20.4
				25	0	20.2
	1907.5	19175		1	0	21.7
				1	24	21.8
				12	6	20.4
				25	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1852.5	18625	5	1	0	21.8
				1	24	21.9
				12	6	20.4
				25	0	20.2
	1880	18900		1	0	21.8
				1	24	21.9
				12	6	20.4
				25	0	20.2
	1907.5	19175		1	0	21.8
				1	24	21.9
				12	6	20.4
				25	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1855	18650	10	1	0	22.3
				1	49	22.2
				24	12	21.2
				50	0	21.2
	1880	18900		1	0	22.3
				1	49	22.2
				24	12	21.2
				50	0	21.2
	1905	19150		1	0	22.3
				1	49	22.2
				24	12	21.2
				50	0	21.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1855	18650	10	1	0	21.7
				1	49	21.8
				24	12	20.2
				50	0	20.2
	1880	18900		1	0	21.7
				1	49	21.8
				24	12	20.2
				50	0	20.2
	1905	19150		1	0	21.7
				1	49	21.8
				24	12	20.2
				50	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1855	18650	10	1	0	21.8
				1	49	21.9
				24	12	20.2
				50	0	20.2
	1880	18900		1	0	21.8
				1	49	21.9
				24	12	20.2
				50	0	20.2
	1905	19150		1	0	21.8
				1	49	21.9
				24	12	20.2
				50	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1857.5	18675	15	1	0	22.3
				1	74	22.4
				40	18	21.4
				75	0	21.4
	1880	18900		1	0	22.3
				1	74	22.4
				40	18	21.4
				75	0	21.4
	1902.5	19125		1	0	22.3
				1	74	22.4
				40	18	21.4
				75	0	21.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1857.5	18675	15	1	0	21.8
				1	74	22.0
				40	18	20.4
				75	0	20.4
	1880	18900		1	0	21.8
				1	74	22.0
				40	18	20.4
				75	0	20.4
	1902.5	19125		1	0	21.8
				1	74	22.0
				40	18	20.4
				75	0	20.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1857.5	18675	15	1	0	21.8
				1	74	22.0
				40	18	20.4
				75	0	20.4
	1880	18900		1	0	21.8
				1	74	22.0
				40	18	20.4
				75	0	20.4
	1902.5	19125		1	0	21.8
				1	74	22.0
				40	18	20.4
				75	0	20.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1860	18700	20	1	0	22.5
				1	99	22.4
				50	25	21.4
				100	0	21.3
	1880	18900		1	0	22.5
				1	99	22.4
				50	25	21.4
				100	0	21.3
	1900	19100		1	0	22.5
				1	99	22.4
				50	25	21.4
				100	0	21.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1860	18700	20	1	0	21.8
				1	99	22.0
				50	25	20.5
				100	0	20.4
	1880	18900		1	0	21.8
				1	99	22.0
				50	25	20.5
				100	0	20.4
	1900	19100		1	0	21.8
				1	99	22.0
				50	25	20.5
				100	0	20.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1860	18700	20	1	0	21.9
				1	99	22.0
				50	25	20.4
				100	0	20.5
	1880	18900		1	0	21.9
				1	99	22.0
				50	25	20.4
				100	0	20.5
	1900	19100		1	0	21.9
				1	99	22.0
				50	25	20.4
				100	0	20.5

LTE Band 4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1710.7	19957	1.4	1	0	21.8
				1	5	21.9
				3	2	20.7
				6	0	20.5
	1732.5	20175		1	0	21.8
				1	5	21.7
				3	2	20.7
				6	0	20.5
	1754.3	20393		1	0	21.8
				1	5	21.7
				3	2	20.7
				6	0	20.5

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1710.7	19957	1.4	1	0	21.7
				1	5	21.8
				3	2	20.4
				6	0	20.2
	1732.5	20175		1	0	21.7
				1	5	21.8
				3	2	20.4
				6	0	20.2
	1754.3	20393		1	0	21.7
				1	5	21.8
				3	2	20.4
				6	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1710.7	19957	1.4	1	0	21.7
				1	5	21.8
				3	2	20.3
				6	0	20.2
	1732.5	20175		1	0	21.7
				1	5	21.8
				3	2	20.3
				6	0	20.2
	1754.3	20393		1	0	21.7
				1	5	21.8
				3	2	20.3
				6	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1711.5	19965	3	1	0	21.8
				1	14	21.9
				8	4	20.7
				15	0	20.5
	1732.5	20175		1	0	21.8
				1	14	21.9
				8	4	20.7
				15	0	20.5
	1753.5	20385		1	0	21.8
				1	14	21.9
				8	4	20.7
				15	0	20.5

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1711.5	19965	3	1	0	21.7
				1	14	21.8
				8	4	20.3
				15	0	20.3
	1732.5	20175		1	0	21.7
				1	14	21.8
				8	4	20.3
				15	0	20.3
	1753.5	20385		1	0	21.7
				1	14	21.8
				8	4	20.3
				15	0	20.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1711.5	19965	3	1	0	21.7
				1	14	21.8
				8	4	20.3
				15	0	20.2
	1732.5	20175		1	0	21.7
				1	14	21.8
				8	4	20.3
				15	0	20.2
	1753.5	20385		1	0	21.7
				1	14	21.8
				8	4	20.3
				15	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1712.5	19975	5	1	0	22.0
				1	24	22.0
				12	6	20.9
				25	0	20.8
	1732.5	20175		1	0	22.0
				1	24	22.0
				12	6	20.9
				25	0	20.8
	1752.5	20375		1	0	22.0
				1	24	22.0
				12	6	20.9
				25	0	20.8

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1712.5	19975	5	1	0	21.7
				1	24	21.8
				12	6	20.2
				25	0	20.2
	1732.5	20175		1	0	21.7
				1	24	21.8
				12	6	20.2
				25	0	20.2
	1752.5	20375		1	0	21.7
				1	24	21.8
				12	6	20.2
				25	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1712.5	19975	5	1	0	21.7
				1	24	21.8
				12	6	20.2
				25	0	20.2
	1732.5	20175		1	0	21.7
				1	24	21.8
				12	6	20.2
				25	0	20.2
	1752.5	20375		1	0	21.7
				1	24	21.8
				12	6	20.2
				25	0	20.1

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1715	20000	10	1	0	22.2
				1	49	22.2
				24	12	21.1
				50	0	21.2
	1732.5	20175		1	0	22.2
				1	49	22.2
				24	12	21.1
				50	0	21.2
	1750	20350		1	0	22.2
				1	49	22.2
				24	12	21.1
				50	0	21.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1715	20000	10	1	0	21.7
				1	49	21.8
				24	12	20.3
				50	0	20.2
	1732.5	20175		1	0	21.7
				1	49	21.8
				24	12	20.3
				50	0	20.2
	1750	20350		1	0	21.7
				1	49	21.8
				24	12	20.3
				50	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1715	20000	10	1	0	21.7
				1	49	21.8
				24	12	20.2
				50	0	20.2
	1732.5	20175		1	0	21.7
				1	49	21.8
				24	12	20.2
				50	0	20.2
	1750	20350		1	0	21.7
				1	49	21.8
				24	12	20.2
				50	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1717.5	20025	15	1	0	22.3
				1	74	22.3
				40	18	21.3
				75	0	21.2
	1732.5	20175		1	0	22.3
				1	74	22.3
				40	18	21.3
				75	0	21.2
	1747.5	20325		1	0	22.3
				1	74	22.3
				40	18	21.3
				75	0	21.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1717.5	20025	15	1	0	21.8
				1	74	21.8
				40	18	20.3
				75	0	20.4
	1732.5	20175		1	0	21.8
				1	74	21.8
				40	18	20.3
				75	0	20.4
	1747.5	20325		1	0	21.8
				1	74	21.8
				40	18	20.3
				75	0	20.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1717.5	20025	15	1	0	21.8
				1	74	21.8
				40	18	20.3
				75	0	20.4
	1732.5	20175		1	0	21.8
				1	74	21.8
				40	18	20.3
				75	0	20.4
	1747.5	20325		1	0	21.8
				1	74	21.8
				40	18	20.3
				75	0	20.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	1720	20050	20	1	0	22.4
				1	99	22.4
				50	25	21.4
				100	0	21.4
	1732.5	20175		1	0	22.4
				1	99	22.4
				50	25	21.4
				100	0	21.4
	1745	20300		1	0	22.4
				1	99	22.4
				50	25	21.4
				100	0	21.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	1720	20050	20	1	0	22.0
				1	99	22.0
				50	25	20.4
				100	0	20.4
	1732.5	20175		1	0	22.0
				1	99	22.0
				50	25	20.4
				100	0	20.4
	1745	20300		1	0	22.0
				1	99	22.0
				50	25	20.4
				100	0	20.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	1720	20050	20	1	0	22.0
				1	99	22.0
				50	25	20.4
				100	0	20.4
	1732.5	20175		1	0	22.0
				1	99	22.0
				50	25	20.4
				100	0	20.4
	1745	20300		1	0	22.0
				1	99	22.0
				50	25	20.4
				100	0	20.4

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Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	699.7	23017	1.4	1	0	23.1
				1	5	23.2
				3	2	23.1
				6	0	22.2
	707.5	23095		1	0	23.1
				1	5	23.2
				3	2	23.1
				6	0	22.2
	715.3	23173		1	0	23.1
				1	5	23.2
				3	2	23.1
				6	0	22.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	699.7	23017	1.4	1	0	22.7
				1	5	22.7
				3	2	22.3
				6	0	21.4
	707.5	23095		1	0	22.7
				1	5	22.7
				3	2	22.3
				6	0	21.4
	715.3	23173		1	0	22.7
				1	5	22.7
				3	2	22.3
				6	0	21.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	699.7	23017	1.4	1	0	22.7
				1	5	22.8
				3	2	22.3
				6	0	21.2
	707.5	23095		1	0	22.7
				1	5	22.8
				3	2	22.3
				6	0	21.2
	715.3	23173		1	0	22.7
				1	5	22.8
				3	2	22.3
				6	0	21.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	700.5	23025	3	1	0	23.2
				1	14	23.3
				8	4	22.3
				15	0	22.3
	707.5	23095		1	0	23.2
				1	14	23.3
				8	4	22.3
				15	0	22.3
	714.5	23165		1	0	23.2
				1	14	23.3
				8	4	22.3
				15	0	22.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	700.5	23025	3	1	0	22.7
				1	14	22.8
				8	4	21.4
				15	0	21.3
	707.5	23095		1	0	22.7
				1	14	22.8
				8	4	21.4
				15	0	21.3
	714.5	23165		1	0	22.7
				1	14	22.8
				8	4	21.4
				15	0	21.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	700.5	23025	3	1	0	22.8
				1	14	22.9
				8	4	21.4
				15	0	21.3
	707.5	23095		1	0	22.8
				1	14	22.9
				8	4	21.4
				15	0	21.3
	714.5	23165		1	0	22.8
				1	14	22.9
				8	4	21.4
				15	0	21.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	701.5	23035	5	1	0	23.2
				1	24	23.3
				12	6	22.3
				25	0	22.3
	707.5	23095		1	0	23.2
				1	24	23.3
				12	6	22.3
				25	0	22.3
	713.5	23155		1	0	23.2
				1	24	23.3
				12	6	22.3
				25	0	22.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	701.5	23035	5	1	0	22.7
				1	24	22.8
				12	6	21.4
				25	0	21.3
	707.5	23095		1	0	22.7
				1	24	22.8
				12	6	21.4
				25	0	21.3
	713.5	23155		1	0	22.7
				1	24	22.8
				12	6	21.4
				25	0	21.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	701.5	23035	5	1	0	22.8
				1	24	22.9
				12	6	21.3
				25	0	21.2
	707.5	23095		1	0	22.8
				1	24	22.9
				12	6	21.3
				25	0	21.2
	713.5	23155		1	0	22.8
				1	24	22.9
				12	6	21.3
				25	0	21.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	704	23060	10	1	0	23.5
				1	49	23.4
				24	12	22.3
				50	0	22.3
	707.5	23095		1	0	23.5
				1	49	23.4
				24	12	22.3
				50	0	22.3
	711	23130		1	0	23.5
				1	49	23.4
				24	12	22.3
				50	0	22.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	704	23060	10	1	0	22.8
				1	49	22.9
				24	12	21.2
				50	0	21.3
	707.5	23095		1	0	22.8
				1	49	22.9
				24	12	21.2
				50	0	21.3
	711	23130		1	0	22.8
				1	49	22.9
				24	12	21.2
				50	0	21.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	704	23060	10	1	0	22.8
				1	49	23.0
				24	12	21.2
				50	0	21.2
	707.5	23095		1	0	22.8
				1	49	23.0
				24	12	21.2
				50	0	21.2
	711	23130		1	0	22.8
				1	49	23.0
				24	12	21.2
				50	0	21.2

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Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	706.5	23755	5	1	0	23.2
				1	24	23.2
				12	6	22.2
				25	0	22.2
	710	23790		1	0	23.1
				1	24	23.2
				12	6	22.2
				25	0	22.2
	713.5	23825		1	0	23.0
				1	24	23.0
				12	6	22.2
				25	0	22.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	706.5	23755	5	1	0	22.7
				1	24	22.8
				12	6	21.3
				25	0	21.2
	710	23790		1	0	22.7
				1	24	22.8
				12	6	21.3
				25	0	21.2
	713.5	23825		1	0	22.7
				1	24	22.8
				12	6	21.3
				25	0	21.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	706.5	23755	5	1	0	22.7
				1	24	22.9
				12	6	21.3
				25	0	21.2
	710	23790		1	0	22.7
				1	24	22.9
				12	6	21.3
				25	0	21.2
	713.5	23825		1	0	22.7
				1	24	22.9
				12	6	21.3
				25	0	21.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	709	23780	10	1	0	23.3
				1	49	23.2
				24	12	22.2
				50	0	22.2
	710	23790		1	0	23.3
				1	49	23.2
				24	12	22.2
				50	0	22.2
	711	23800		1	0	23.3
				1	49	23.2
				24	12	22.2
				50	0	22.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	709	23780	10	1	0	22.8
				1	49	22.8
				24	12	21.2
				50	0	21.2
	710	23790		1	0	22.8
				1	49	22.8
				24	12	21.2
				50	0	21.2
	711	23800		1	0	22.8
				1	49	22.8
				24	12	21.2
				50	0	21.2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	709	23780	10	1	0	22.8
				1	49	22.9
				24	12	21.1
				50	0	21.2
	710	23790		1	0	22.8
				1	49	22.9
				24	12	21.1
				50	0	21.2
	711	23800		1	0	22.8
				1	49	22.9
				24	12	21.1
				50	0	21.2

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Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	2498.5	39675	5	1	0	25.5
				1	24	25.4
				12	6	24.5
				25	0	24.4
	2545.5	40145		1	0	25.3
				1	24	25.2
				12	6	24.2
				25	0	24.1
	2593	40620		1	0	25.5
				1	24	25.4
				12	6	24.5
				25	0	24.4
	2640.5	41095		1	0	25.2
				1	24	25.0
				12	6	24.5
				25	0	24.2
	2687.5	41565		1	0	25.7
				1	24	25.6
				12	6	24.5
				25	0	24.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	2498.5	39675	5	1	0	25.2
				1	24	25.2
				12	6	23.7
				25	0	23.5
	2545.5	40145		1	0	24.8
				1	24	24.9
				12	6	23.6
				25	0	23.9
	2593	40620		1	0	24.9
				1	24	24.8
				12	6	23.7
				25	0	23.5
	2640.5	41095		1	0	24.7
				1	24	24.5
				12	6	23.7
				25	0	23.3
	2687.5	41565		1	0	24.9
				1	24	24.9
				12	6	23.7
				25	0	23.5

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	2498.5	39675	5	1	0	25.4
				1	24	25.4
				12	6	23.5
				25	0	23.4
	2545.5	40145		1	0	25.3
				1	24	25.1
				12	6	23.7
				25	0	23.4
	2593	40620		1	0	25.4
				1	24	25.4
				12	6	23.5
				25	0	23.4
	2640.5	41095		1	0	25.3
				1	24	25.1
				12	6	24.2
				25	0	24.5
	2687.5	41565		1	0	25.4
				1	24	25.4
				12	6	23.5
				25	0	23.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	2501	39700	10	1	0	25.4
				1	49	25.3
				24	12	24.4
				50	0	24.4
	2547	40160		1	0	25.3
				1	49	25.3
				24	12	24.1
				50	0	24.2
	2593	40620		1	0	25.4
				1	49	25.3
				24	12	24.4
				50	0	24.4
	2639	41080		1	0	25.3
				1	49	25.1
				24	12	24.1
				50	0	24.1
	2685	41540		1	0	25.4
				1	49	25.3
				24	12	24.4
				50	0	24.4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	2501	39700	10	1	0	24.8
				1	49	24.8
				24	12	23.4
				50	0	23.5
	2547	40160		1	0	24.5
				1	49	24.3
				24	12	23.1
				50	0	23.1
	2593	40620		1	0	24.8
				1	49	24.8
				24	12	23.4
				50	0	23.5
	2639	41080		1	0	24.5
				1	49	24.6
				24	12	23.1
				50	0	23.0
	2685	41540		1	0	24.8
				1	49	24.8
				24	12	23.4
				50	0	23.5

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	2501	39700	10	1	0	25.4
				1	49	25.3
				24	12	23.4
				50	0	23.3
	2547	40160		1	0	25.1
				1	49	25.0
				24	12	23.6
				50	0	23.1
	2593	40620		1	0	25.4
				1	49	25.3
				24	12	23.4
				50	0	23.3
	2639	41080		1	0	25.1
				1	49	25.0
				24	12	23.1
				50	0	23.3
	2685	41540		1	0	25.4
				1	49	25.3
				24	12	23.4
				50	0	23.3

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	2503.5	39725	15	1	0	25.7
				1	74	25.5
				40	18	24.6
				75	0	24.6
	2548	40170		1	0	25.4
				1	74	25.1
				40	18	24.4
				75	0	24.3
	2593	40620		1	0	25.7
				1	74	25.5
				40	18	24.6
				75	0	24.6
	2637.5	41065		1	0	25.2
				1	74	25.1
				40	18	24.4
				75	0	24.3
	2682.5	41515		1	0	25.7
				1	74	25.5
				40	18	24.6
				75	0	24.6

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	2503.5	39725	15	1	0	25.1
				1	74	24.9
				40	18	23.6
				75	0	23.7
	2548	40170		1	0	24.8
				1	74	24.7
				40	18	23.4
				75	0	23.3
	2593	40620		1	0	25.1
				1	74	24.9
				40	18	23.6
				75	0	23.7
	2637.5	41065		1	0	24.6
				1	74	24.3
				40	18	23.4
				75	0	23.3
	2682.5	41515		1	0	25.1
				1	74	24.9
				40	18	23.6
				75	0	23.7

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	2503.5	39725	15	1	0	25.6
				1	74	25.5
				40	18	23.6
				75	0	23.7
	2548	40170		1	0	25.5
				1	74	25.3
				40	18	23.4
				75	0	23.3
	2593	40620		1	0	25.6
				1	74	25.5
				40	18	23.6
				75	0	23.7
	2637.5	41065		1	0	25.5
				1	74	25.4
				40	18	23.1
				75	0	23.1
	2682.5	41515		1	0	25.6
				1	74	25.5
				40	18	23.6
				75	0	23.7

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	2506	39750	20	1	0	25.8
				1	99	25.6
				50	25	24.6
				100	0	24.6
	2549.5	40185		1	0	25.6
				1	99	25.5
				50	25	24.3
				100	0	24.4
	2593	40620		1	0	25.8
				1	99	25.6
				50	25	24.6
				100	0	24.6
	2636.5	41055		1	0	25.4
				1	99	25.3
				50	25	24.2
				100	0	24.3
	2680	41490		1	0	25.9
				1	99	25.8
				50	25	24.6
				100	0	24.6

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
16QAM	2506	39750	20	1	0	25.1
				1	99	25.0
				50	25	23.7
				100	0	23.7
	2549.5	40185		1	0	24.8
				1	99	24.7
				50	25	23.4
				100	0	23.3
	2593	40620		1	0	25.1
				1	99	25.0
				50	25	23.7
				100	0	23.7
	2636.5	41055		1	0	24.9
				1	99	24.8
				50	25	23.6
				100	0	23.5
	2680	41490		1	0	25.3
				1	99	25.2
				50	25	23.7
				100	0	23.7

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
64QAM	2506	39750	20	1	0	25.4
				1	99	25.6
				50	25	23.6
				100	0	23.6
	2549.5	40185		1	0	25.3
				1	99	25.3
				50	25	23.4
				100	0	23.3
	2593	40620		1	0	25.4
				1	99	25.6
				50	25	23.6
				100	0	23.6
	2636.5	41055		1	0	25.3
				1	99	25.2
				50	25	23.5
				100	0	23.4
	2680	41490		1	0	25.4
				1	99	25.6
				50	25	23.6
				100	0	23.6

6.4 Wi-Fi Measurement result

Wi-Fi 2.4GHz power
Average power in SISO Mode

Test Mode	Ant	Average power (dBm)		
		2412MHz	2437MHz	2462MHz
802.11b	Ant1	15.83	**17.67**	16.28
802.11b	Ant2	15.79	**15.72**	16.01
802.11g	Ant1	14.82	16.58	15.79
802.11g	Ant2	14.81	15.14	15.77
802.11n HT20	Ant1	14.18	15.42	14.78
802.11n HT20	Ant2	14.01	14.05	14.44

Average power in MIMO Mode

Test Mode	Ant	Average power (dBm)		
		2412MHz	2437MHz	2462MHz
802.11n HT20	Ant1	14.48	14.45	15.18
802.11n HT20	Ant2	14.03	14.07	14.32
802.11n HT20	Ant1+Ant2	17.27	**17.27**	17.78

WiFi 5GHz power
Output Power

Test Mode	Ant	Average Power(dBm)			Limit(dBm)
		5180 MHz	5200 MHz	5240MHz	
802.11a	Ant1	14.46	**14.54**	14.38	24.0
802.11a	Ant2	14.82	**14.86**	14.78	24.0
802.11n HT20	Ant1	13.48	13.63	13.43	24.0
802.11n HT20	Ant2	14.03	13.97	13.85	24.0
802.11n HT20	MIMO	16.77	**16.81**	16.66	24.0
802.11ac VHT20	Ant1	11.75	11.82	11.62	24.0
802.11ac VHT20	Ant2	12.07	12.06	12.03	24.0
802.11ac VHT20	MIMO	14.92	14.95	14.84	24.0
Test Mode	Ant	Average Power(dBm)			Limit(dBm)
		5190 MHz		5230 MHz	
802.11n HT40	Ant1	13.86		13.85	24.0
802.11n HT40	Ant2	14.23		14.18	24.0
802.11n HT40	MIMO	17.06		17.03	24.0
802.11ac VHT40	Ant1	12.10		12.04	24.0
802.11ac VHT40	Ant2	12.29		12.32	24.0
802.11ac VHT40	MIMO	15.21		15.19	24.0
Test Mode	Ant	Average Power(dBm)			Limit(dBm)
		5210 MHz			
802.11ac VHT80	Ant1	11.37			24.0
802.11ac VHT80	Ant2	11.64			24.0
802.11ac VHT80	MIMO	14.52			24.0

6.5 Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

According to the KDB447498 4.3.1 (1)

For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

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

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

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

This is equivalent to [(max. power of channel, including tune-up tolerance, mW)/(60/√f(GHz) mW)] ·[20 mm/(min.test separation distance, mm)] ≤ 1.0 for 1-g SAR; also see Appendix A for approximate exclusion threshold values at selected frequencies and distances.
According to the KDB447498 appendix A

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

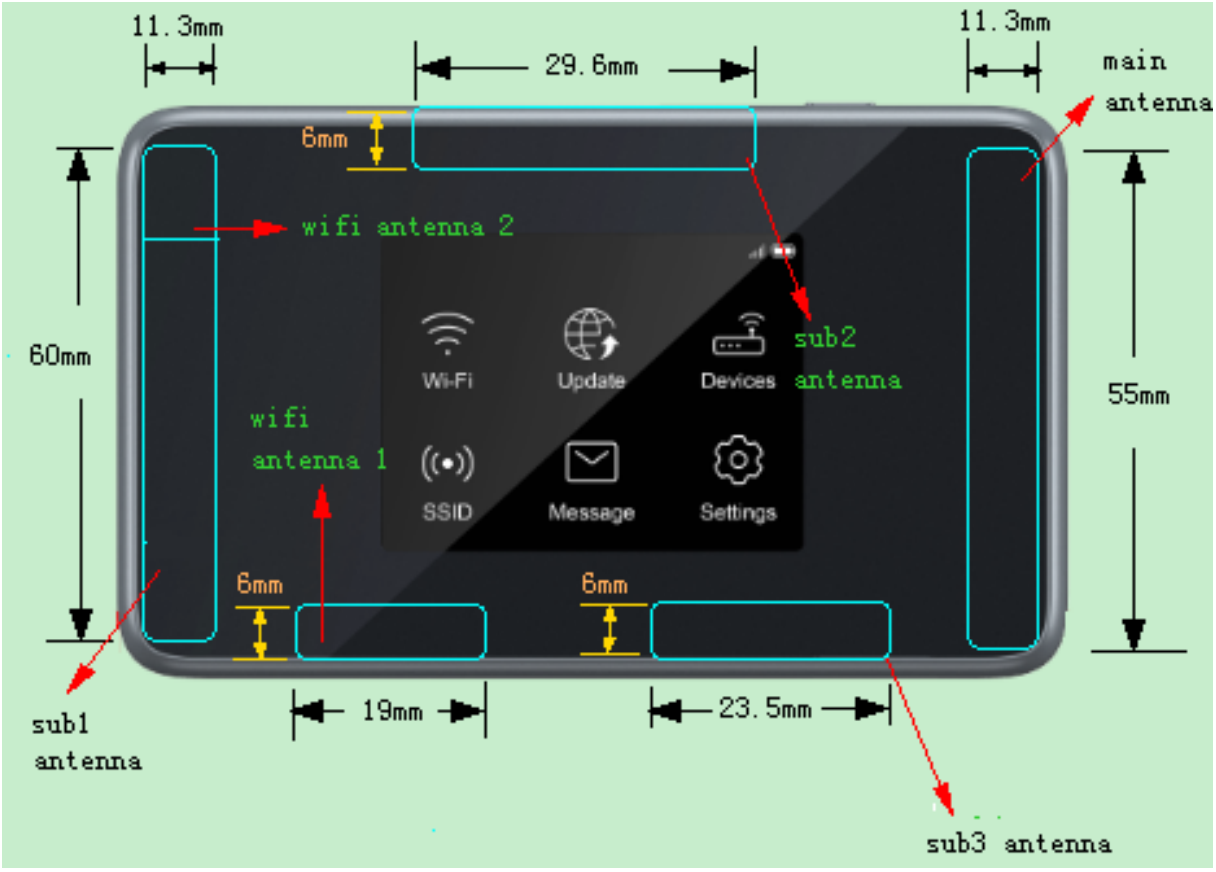
MHz	5	10	15	20	25	mm
150	39	77	116	155	194	*SAR Test Exclusion Threshold* (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

Summary of Transmitters

Band/Mode	Position	Max. RF output power (dBm)	Max. RF output power (mW)	SAR test exclusion Threshold (mW)	SAR Required
2.4GHz Wi-Fi 11b Ant1	Body	17.67	58.48	19	Yes
2.4GHz Wi-Fi 11b Ant2	Body	15.72	37.33	19	Yes
2.4GHz Wi-Fi 11n Ant1+Ant2	Body	17.27	53.33	19	Yes
5.2GHz Wi-Fi 11a Ant1	Body	14.54	28.44	13	Yes
5.2GHz Wi-Fi 11a Ant2	Body	14.86	30.62	13	Yes
5.2GHz Wi-Fi 11n Ant1+Ant2	Body	16.81	47.97	13	Yes

6.6 RF exposure conditions

Refer to the follow picture “Antenna Locations & Separation Distances” for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.



All of Implementation antenna
Main antenna:LTE FDD B2/3/12/17 TDD B41RX&TX
WCDMA B2/4 RX&TX
Sub1 antenna: LTE FDD B2/3/4/12/17 TDD B41RX
WCDMA B2/4 RX
Sub2 antenna: LTE TDD B41 RX
Sub3 antenna: LTE TDD B41 RX
Wi-Fi antenna 1&2: 2412MHz~2462MHz, 5150MHz~5250MHz

6.6.1 Body Exposure conditions

For WWAN

Test Configurations	SAR Required	Note
Back	yes	/
Front	yes	/

For WLAN

Test Configurations	SAR Required	Note
Back	yes	/
Front	yes	/

6.6.2 Hotspot Exposure Conditions

For WWAN

Test Configurations	Antenna-to-edge/surface	SAR Required
Back	<25 mm	Yes
Front	<25 mm	Yes
Top	<25 mm	Yes
Bottom	<25 mm	Yes
Right	<25 mm	Yes
Left	>25 mm	No

For WLAN Ant1

Test Configurations	Antenna-to-edge/surface	SAR Required
Back	<25 mm	Yes
Front	<25 mm	Yes
Top	>25 mm	No
Bottom	<25 mm	Yes
Right	>25 mm	No
Left	<25 mm	Yes

For WLAN Ant2

Test Configurations	Antenna-to-edge/surface	SAR Required
Back	<25 mm	Yes
Front	<25 mm	Yes
Top	<25 mm	Yes
Bottom	>25 mm	No
Right	>25 mm	No
Left	<25 mm	Yes

For WLAN Ant1+Ant2 (MIMO)

Test Configurations	Antenna-to-edge/surface	SAR Required
Back	<25 mm	Yes
Front	<25 mm	Yes
Top	<25 mm	Yes
Bottom	<25 mm	Yes
Right	>25 mm	No
Left	<25 mm	Yes

6.7 System Checking

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyzer. A system check measurement was made following the determination of the dielectric parameters of the simulant, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna **except D5GHzV2 used 10mW**, which was placed under the flat section of the twin SAM phantom. The system checking results (dielectric parameters and SAR values) are given in the table below.

Date Tested	System dipole	T.S. Liquid	SAR measured (normalized to 1W)		Target (Ref. Value)	Delta (%)	Tolerance (%)
2019.02.12	D750V3	Body	1g	8.24	8.26	-0.24	±10
2019.02.14	D1800V2	Body	1g	38.20	39.0	-1.80	±10
2019.02.16	D2000V2	Body	1g	37.96	40.30	-5.8	±10
2019.02.18	D2450V2	Body	1g	52.80	52.30	0.76	±10
2019.02.19	D5GHzV2 (5.2GHz)	Body	1g	73.00	75.40	-5.9	±10

Plots of the system checking scans are given in Appendix A.
Tissue Simulants used in the Measurements
For the measurement of the following parameters the SPEAG DAKS-3.5 dielectric parameter probe is used, representing the open-ended coaxial probe measurement procedure.

Date Tested	Freq. (MHz)	Liquid parameters	measured	Target	Delta (%)	Tolerance (%)
2019.02.12	Body 750	εr	53.279	55.50	-4.00	±5
		σ[S/m]	0.976	0.96	1.67	±5
2019.02.14	Body 1800	εr	52.879	53.30	-0.79	±5
		σ[S/m]	1.523	1.52	0.20	±5
2019.02.16	Body 2000	εr	52.557	53.30	-1.39	±5
		σ[S/m]	1.546	1.52	1.71	±5
2019.02.18	Body 2450	εr	50.795	52.70	-3.61	±5
		σ[S/m]	1.926	1.95	-1.23	±5
2019.02.19	Body 5200	εr	49.035	49.00	0.07	±5
		σ[S/m]	5.355	5.30	1.04	±5

6.8 SAR TEST RESULTS

In order to determine the largest value of the peak spatial-average SAR of a handset, all device positions, configurations, and operational modes should be tested for each frequency band according to Steps 1 to 3 below.

Step 1: The tests should be performed at the channel that is closest to the center of the transmit frequency band.
a) All device positions (cheek and tilt, for both left and right sides of the SAM phantom),
b) All configurations for each device position in a), e.g., antenna extended and retracted, and
c) All operational modes for each device position in item a) and configuration in item b) in each frequency band, e.g., analog and digital, If more than three frequencies need to be tested (i.e., Nc > 3), then all frequencies, configurations and modes shall be tested for all of the above test conditions.
Step 2: For the condition providing the highest peak spatial-average SAR determined in Step 1 for each frequency, perform all tests at all other test frequency channels, e.g., lowest and highest frequencies. In addition, for all other conditions (device position, configuration, and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies should be tested as well.
Step 3: Examine all data to determine the largest value of the peak.
Note:
1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
Scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
Reported SAR (W/kg) = Measured SAR (W/kg) * Scaling Factor
2. Per KDB 447498 D01v06, for each exposure position, if the highest output channel reported SAR ≤0.8W/kg, other channels SAR testing are not necessary.
3. The distance between the EUT and the phantom bottom is 10mm.

The measured and reported Head/body SAR values for the test device are tabulated below:

Mode: WCDMA BAND II

fL (MHz)=1852.4MHz fM (MHz)=1880MHz fH (MHz)= 1907.6MHz

SAR Values (WCDMA BAND2)

Limit of SAR (W/kg) :< 1.6W/kg (1g Average)

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	12.2KRMC (body-worn)	L	22.59	23.00	1.10	---	---
		M	22.57	23.00	1.10	0.786	0.865
		H	22.63	23.00	1.09	---	---
Front		L	22.59	23.00	1.10	0.978	1.076
		M	22.57	23.00	1.10	0.993	**1.092**
		H	22.63	23.00	1.09	0.980	1.068
		Lr	22.59	23.00	1.10	0.976	1.074
		Mr	22.57	23.00	1.10	0.990	1.089
		Hr	22.63	23.00	1.09	0.981	1.069
Top		L	22.59	23.00	1.00	---	---
		M	22.57	23.00	1.00	0.086	0.086
		H	22.63	23.00	1.00	---	---
Bottom		L	22.59	23.00	1.10	---	---
		M	22.57	23.00	1.10	0.342	0.376
		H	22.63	23.00	1.09	---	---
Right		L	22.59	23.00	1.10	---	---
		M	22.57	23.00	1.10	0.306	0.337
		H	22.63	23.00	1.09	---	---
Back	12.2KRMC (hotspot)	L	22.59	23.00	1.10	---	---
		M	22.57	23.00	1.10	0.767	0.844
		H	22.63	23.00	1.09	---	---
Front		L	22.59	23.00	1.10	0.997	1.097
		M	22.57	23.00	1.10	1.020	**1.122**
		H	22.63	23.00	1.09	0.989	1.078
		Lr	22.59	23.00	1.10	0.993	1.092
		Mr	22.57	23.00	1.10	1.011	1.112
		Hr	22.63	23.00	1.09	0.992	1.081
Top		L	22.59	23.00	1.00	---	---
		M	22.57	23.00	1.00	0.070	0.070
		H	22.63	23.00	1.00	---	---
Bottom		L	22.59	23.00	1.10	---	---
		M	22.57	23.00	1.10	0.341	0.375
		H	22.63	23.00	1.09	---	---
Right		L	22.59	23.00	1.10	---	---
		M	22.57	23.00	1.10	0.322	0.354
		H	22.63	23.00	1.09	---	---

Mode: WCDMA BAND IV

fL (MHz)= 1712.4MHz fM (MHz)= 1732.4MHz fH (MHz)= 1752.6MHz

SAR Values (WCDMA BAND4)

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	12.2KRMC (body-worn)	L	22.71	23.00	1.07	---	---
		M	22.66	23.00	1.08	0.637	0.688
		H	22.67	23.00	1.08	---	---
Front		L	22.71	23.00	1.07	0.861	0.921
		M	22.66	23.00	1.08	0.998	**1.078**
		H	22.67	23.00	1.08	0.885	0.956
		Lr	22.71	23.00	1.07	0.855	0.915
		Mr	22.66	23.00	1.08	0.991	1.070
		Hr	22.67	23.00	1.08	0.888	0.959
Top		L	22.71	23.00	1.00	---	---
		M	22.66	23.00	1.00	0.104	0.104
		H	22.67	23.00	1.00	---	---
Bottom		L	22.71	23.00	1.07	---	---
		M	22.66	23.00	1.08	0.386	0.417
		H	22.67	23.00	1.08	---	---
Right		L	22.71	23.00	1.07	---	---
		M	22.66	23.00	1.08	0.337	0.364
		H	22.67	23.00	1.08	---	---
Back	12.2KRMC (hotspot)	L	22.71	23.00	1.07	---	---
		M	22.66	23.00	1.08	0.648	0.700
		H	22.67	23.00	1.08	---	---
Front		L	22.71	23.00	1.07	0.843	0.902
		M	22.66	23.00	1.08	0.906	**0.978**
		H	22.67	23.00	1.08	0.862	0.931
		Lr	22.71	23.00	1.07	0.831	0.889
		Mr	22.66	23.00	1.08	0.899	0.971
		Hr	22.67	23.00	1.08	0.822	0.888
Top		L	22.71	23.00	1.00	---	---
		M	22.66	23.00	1.00	0.098	0.098
		H	22.67	23.00	1.00	---	---
Bottom		L	22.71	23.00	1.07	---	---
		M	22.66	23.00	1.08	0.382	0.413
		H	22.67	23.00	1.08	---	---
Right		L	22.71	23.00	1.07	---	---
		M	22.66	23.00	1.08	0.357	0.386
		H	22.67	23.00	1.08	---	---

Mode: LTE BAND 2

fL (MHz)= 1860MHz fM (MHz)= 1880MHz fH (MHz)= 1900MHz

SAR Values (LTE BAND2)

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (body-worn)	L	22.50	23.00	1.12	---	---
		M	22.50	23.00	1.12	0.672	0.753
		H	22.50	23.00	1.12	---	---
Front		L	22.50	23.00	1.12	---	---
		M	22.50	23.00	1.12	0.691	**0.774**
		H	22.50	23.00	1.12	---	---
Top		L	22.50	23.00	1.00	---	---
		M	22.50	23.00	1.00	0.056	0.056
		H	22.50	23.00	1.00	---	---
Bottom		L	22.50	23.00	1.12	---	---
		M	22.50	23.00	1.12	0.271	0.304
		H	22.50	23.00	1.12	---	---
Right		L	22.50	23.00	1.12	---	---
		M	22.50	23.00	1.12	0.343	0.384
		H	22.50	23.00	1.12	---	---
Back	50%RB (body-worn)	L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.543	0.624
		H	21.40	22.00	1.15	---	---
Front		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.642	0.738
		H	21.40	22.00	1.15	---	---
Top		L	21.40	22.00	1.00	---	---
		M	21.40	22.00	1.00	0.045	0.045
		H	21.40	22.00	1.00	---	---
Bottom		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.222	0.255
		H	21.40	22.00	1.15	---	---
Right		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.279	0.321
		H	21.40	22.00	1.15	---	---

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (Hotspot)	L	22.50	23.00	1.12	---	---
		M	22.50	23.00	1.12	0.529	0.592
		H	22.50	23.00	1.12	---	---
Front		L	22.50	23.00	1.12	---	---
		M	22.50	23.00	1.12	0.700	**0.784**
		H	22.50	23.00	1.12	---	---
Top		L	22.50	23.00	1.00	---	---
		M	22.50	23.00	1.00	0.060	0.060
		H	22.50	23.00	1.00	---	---
Bottom		L	22.50	23.00	1.12	---	---
		M	22.50	23.00	1.12	0.278	0.311
		H	22.50	23.00	1.12	---	---
Right		L	22.50	23.00	1.12	---	---
		M	22.50	23.00	1.12	0.341	0.382
		H	22.50	23.00	1.12	---	---
Back	50%RB (Hotspot)	L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.427	0.491
		H	21.40	22.00	1.15	---	---
Front		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.633	0.728
		H	21.40	22.00	1.15	---	---
Top		L	21.40	22.00	1.00	---	---
		M	21.40	22.00	1.00	0.044	0.044
		H	21.40	22.00	1.00	---	---
Bottom		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.227	0.261
		H	21.40	22.00	1.15	---	---
Right		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.279	0.321
		H	21.40	22.00	1.15	---	---

Mode: LTE BAND 4

fL (MHz)= 1720MHz fM (MHz)= 1732.5MHz fH (MHz)= 1745MHz

SAR Values (LTE BAND4)

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (body-worn)	L	22.40	23.00	1.15	---	---
		M	22.40	23.00	1.15	0.461	0.530
		H	22.40	23.00	1.15	---	---
Front		L	22.40	23.00	1.15	---	---
		M	22.40	23.00	1.15	0.677	**0.779**
		H	22.40	23.00	1.15	---	---
Top		L	22.40	23.00	1.00	---	---
		M	22.40	23.00	1.00	0.086	0.086
		H	22.40	23.00	1.00	---	---
Bottom		L	22.40	23.00	1.15	---	---
		M	22.40	23.00	1.15	0.357	0.411
		H	22.40	23.00	1.15	---	---
Right		L	22.40	23.00	1.15	---	---
		M	22.40	23.00	1.15	0.328	0.377
		H	22.40	23.00	1.15	---	---
Back	50%RB (body-worn)	L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.392	0.451
		H	21.40	22.00	1.15	---	---
Front		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.593	0.682
		H	21.40	22.00	1.15	---	---
Top		L	21.40	22.00	1.00	---	---
		M	21.40	22.00	1.00	0.072	0.072
		H	21.40	22.00	1.00	---	---
Bottom		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.291	0.335
		H	21.40	22.00	1.15	---	---
Right		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.276	0.317
		H	21.40	22.00	1.15	---	---

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (Hotspot)	L	22.40	23.00	1.15	---	---
		M	22.40	23.00	1.15	0.475	0.546
		H	22.40	23.00	1.15	---	---
Front		L	22.40	23.00	1.15	---	---
		M	22.40	23.00	1.15	0.682	**0.784**
		H	22.40	23.00	1.15	---	---
Top		L	22.40	23.00	1.00	---	---
		M	22.40	23.00	1.00	0.084	0.084
		H	22.40	23.00	1.00	---	---
Bottom		L	22.40	23.00	1.15	---	---
		M	22.40	23.00	1.15	0.362	0.416
		H	22.40	23.00	1.15	---	---
Right		L	22.40	23.00	1.15	---	---
		M	22.40	23.00	1.15	0.335	0.385
		H	22.40	23.00	1.15	---	---
Back	50%RB (Hotspot)	L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.400	0.460
		H	21.40	22.00	1.15	---	---
Front		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.588	0.676
		H	21.40	22.00	1.15	---	---
Top		L	21.40	22.00	1.00	---	---
		M	21.40	22.00	1.00	0.070	0.070
		H	21.40	22.00	1.00	---	---
Bottom		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.293	0.337
		H	21.40	22.00	1.15	---	---
Right		L	21.40	22.00	1.15	---	---
		M	21.40	22.00	1.15	0.275	0.316
		H	21.40	22.00	1.15	---	---

Mode: LTE BAND 12

fL (MHz)= 704MHz fM (MHz)= 707.5MHz fH (MHz)= 711MHz

SAR Values (LTE BAND12)

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (body-worn)	L	23.50	24.00	1.12	---	---
		M	23.50	24.00	1.12	0.518	**0.580**
		H	23.50	24.00	1.12	---	---
Front		L	23.50	24.00	1.12	---	---
		M	23.50	24.00	1.12	0.507	0.568
		H	23.50	24.00	1.12	---	---
Top		L	23.50	24.00	1.00	---	---
		M	23.50	24.00	1.00	0.023	0.023
		H	23.50	24.00	1.00	---	---
Bottom		L	23.50	24.00	1.12	---	---
		M	23.50	24.00	1.12	0.072	0.081
		H	23.50	24.00	1.12	---	---
Right		L	23.50	24.00	1.12	---	---
		M	23.50	24.00	1.12	0.198	0.222
		H	23.50	24.00	1.12	---	---
Back	50%RB (body-worn)	L	22.30	23.00	1.17	---	---
		M	22.30	23.00	1.17	0.426	0.498
		H	22.30	23.00	1.17	---	---
Front		L	22.30	23.00	1.17	---	---
		M	22.30	23.00	1.17	0.420	0.491
		H	22.30	23.00	1.17	---	---
Top		L	22.30	23.00	1.00	---	---
		M	22.30	23.00	1.00	0.019	0.019
		H	22.30	23.00	1.00	---	---
Bottom		L	22.30	23.00	1.17	---	---
		M	22.30	23.00	1.17	0.058	0.068
		H	22.30	23.00	1.17	---	---
Right		L	22.30	23.00	1.17	---	---
		M	22.30	23.00	1.17	0.162	0.190
		H	22.30	23.00	1.17	---	---

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (Hotspot)	L	23.50	24.00	1.12	---	---
		M	23.50	24.00	1.12	0.541	**0.606**
		H	23.50	24.00	1.12	---	---
Front		L	23.50	24.00	1.12	---	---
		M	23.50	24.00	1.12	0.510	0.571
		H	23.50	24.00	1.12	---	---
Top		L	23.50	24.00	1.00	---	---
		M	23.50	24.00	1.00	0.024	0.024
		H	23.50	24.00	1.00	---	---
Bottom		L	23.50	24.00	1.12	---	---
		M	23.50	24.00	1.12	0.070	0.078
		H	23.50	24.00	1.12	---	---
Right		L	23.50	24.00	1.12	---	---
		M	23.50	24.00	1.12	0.206	0.231
		H	23.50	24.00	1.12	---	---
Back	50%RB (Hotspot)	L	22.30	23.00	1.17	---	---
		M	22.30	23.00	1.17	0.458	0.536
		H	22.30	23.00	1.17	---	---
Front		L	22.30	23.00	1.17	---	---
		M	22.30	23.00	1.17	0.428	0.501
		H	22.30	23.00	1.17	---	---
Top		L	22.30	23.00	1.00	---	---
		M	22.30	23.00	1.00	0.020	0.020
		H	22.30	23.00	1.00	---	---
Bottom		L	22.30	23.00	1.17	---	---
		M	22.30	23.00	1.17	0.056	0.066
		H	22.30	23.00	1.17	---	---
Right		L	22.30	23.00	1.17	---	---
		M	22.30	23.00	1.17	0.167	0.195
		H	22.30	23.00	1.17	---	---

Mode: LTE BAND 17

fL (MHz)= 709MHz fM (MHz)= 710MHz fH (MHz)= 711MHz

SAR Values (LTE BAND17)

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (body-worn)	L	23.30	24.00	1.17	---	---
		M	23.30	24.00	1.17	0.540	**0.632**
		H	23.30	24.00	1.17	---	---
Front		L	23.30	24.00	1.17	---	---
		M	23.30	24.00	1.17	0.518	0.606
		H	23.30	24.00	1.17	---	---
Top		L	23.30	24.00	1.00	---	---
		M	23.30	24.00	1.00	0.024	0.024
		H	23.30	24.00	1.00	---	---
Bottom		L	23.30	24.00	1.17	---	---
		M	23.30	24.00	1.17	0.075	0.087
		H	23.30	24.00	1.17	---	---
Right		L	23.30	24.00	1.17	---	---
		M	23.30	24.00	1.17	0.203	0.238
		H	23.30	24.00	1.17	---	---
Back	50%RB (body-worn)	L	22.20	22.50	1.07	---	---
		M	22.20	22.50	1.07	0.426	0.456
		H	22.20	22.50	1.07	---	---
Front		L	22.20	22.50	1.07	---	---
		M	22.20	22.50	1.07	0.435	0.465
		H	22.20	22.50	1.07	---	---
Top		L	22.20	22.50	1.00	---	---
		M	22.20	22.50	1.00	0.019	0.019
		H	22.20	22.50	1.00	---	---
Bottom		L	22.20	22.50	1.07	---	---
		M	22.20	22.50	1.07	0.059	0.063
		H	22.20	22.50	1.07	---	---
Right		L	22.20	22.50	1.07	---	---
		M	22.20	22.50	1.07	0.164	0.175
		H	22.20	22.50	1.07	---	---

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (Hotspot)	L	23.30	24.00	1.17	---	---
		M	23.30	24.00	1.17	0.537	0.628
		H	23.30	24.00	1.17	---	---
Front		L	23.30	24.00	1.17	---	---
		M	23.30	24.00	1.17	0.570	**0.667**
		H	23.30	24.00	1.17	---	---
Top		L	23.30	24.00	1.00	---	---
		M	23.30	24.00	1.00	0.025	0.025
		H	23.30	24.00	1.00	---	---
Bottom		L	23.30	24.00	1.17	---	---
		M	23.30	24.00	1.17	0.070	0.082
		H	23.30	24.00	1.17	---	---
Right		L	23.30	24.00	1.17	---	---
		M	23.30	24.00	1.17	0.212	0.248
		H	23.30	24.00	1.17	---	---
Back	50%RB (Hotspot)	L	22.20	22.50	1.07	---	---
		M	22.20	22.50	1.07	0.459	0.491
		H	22.20	22.50	1.07	---	---
Front		L	22.20	22.50	1.07	---	---
		M	22.20	22.50	1.07	0.469	0.502
		H	22.20	22.50	1.07	---	---
Top		L	22.20	22.50	1.00	---	---
		M	22.20	22.50	1.00	0.020	0.020
		H	22.20	22.50	1.00	---	---
Bottom		L	22.20	22.50	1.07	---	---
		M	22.20	22.50	1.07	0.056	0.060
		H	22.20	22.50	1.07	---	---
Right		L	22.20	22.50	1.07	---	---
		M	22.20	22.50	1.07	0.170	0.182
		H	22.20	22.50	1.07	---	---

TDD LTE SAR Measurement

LTE TDD configurations for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP。

A) 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and table 4.2-2 for uplink-downlink configurations

B) “special subframe S” contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirrements for UpPTS

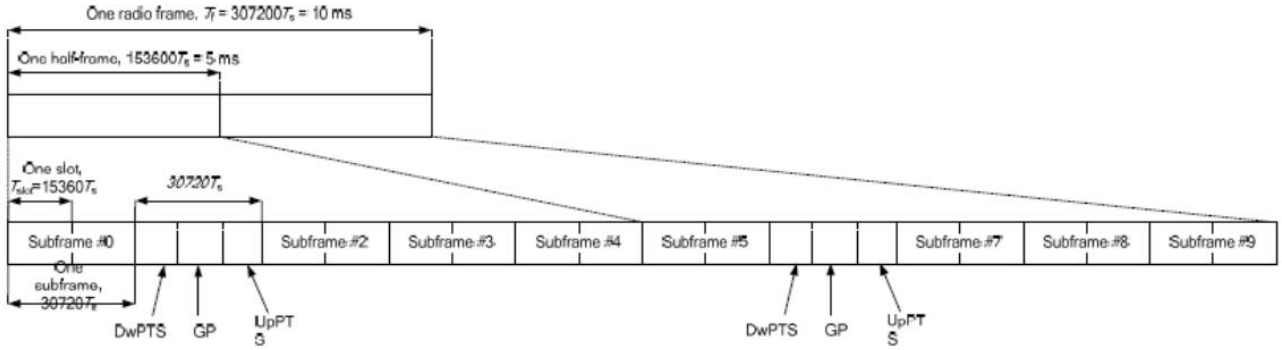


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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

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

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

UL-DL Configuration	0	1	2	3	4	5	6
Highest Duty-Cycle	63.33%	43.33%	23.33%	31.67%	21.67%	11.67%	53.33%

Note: For SAR measurement the duty cycle 1:1.59(62.9%) was used perform testing.

Mode: LTE BAND 41

fL (MHz)= 2506MHz fM (MHz)= 2593MHz fH (MHz)= 2680MHz

SAR Values (LTE BAND41)

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (body-worn)	L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.522	0.548
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---
Front		L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.581	0.610
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---
Top		L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.014	0.014
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---
Bottom		L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.701	**0.736**
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---
Right		L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.356	0.374
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---

Back	50%RB (body-worn)	L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.425	0.468
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---
Front		L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.466	0.513
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---
Top		L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.010	0.010
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---
Bottom		L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.064	0.071
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---
Right		L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.285	0.314
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	1RB (Hotspot)	L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.564	0.592
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---
Front		L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.634	0.666
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---
Top		L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.014	0.014
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---
Bottom		L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.689	**0.723**
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---
Right		L1	25.80	26.00	1.05	---	---
		L2	25.60	26.00	1.10	---	---
		M	25.80	26.00	1.05	0.325	0.341
		H1	25.40	26.00	1.15	---	---
		H2	25.90	26.00	1.02	---	---

Back	50%RB (Hotspot)	L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.458	0.504
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---
Front		L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.512	0.563
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---
Top		L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.010	0.010
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---
Bottom		L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.633	0.696
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---
Right		L1	24.60	25.00	1.10	---	---
		L2	24.30	25.00	1.17	---	---
		M	24.60	25.00	1.10	0.263	0.289
		H1	24.20	25.00	1.20	---	---
		H2	24.60	25.00	1.10	---	---

Mode: Wi-Fi 2.4GHz

fL (MHz)=2412MHz fM (MHz)=2437MHz fH (MHz)= 2462MHz

SAR Values (Wi-Fi 802.11b)

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	802.11b Ant1 (body-worn& hotspot)	L	15.83	18.00	1.65	---	---
		M	17.67	18.00	1.08	0.201	0.217
		H	16.28	18.00	1.49	---	---
Front		L	15.83	18.00	1.65	---	---
		M	17.67	18.00	1.08	0.266	**0.287**
		H	16.28	18.00	1.49	---	---
Bottom		L	15.83	18.00	1.65	---	---
		M	17.67	18.00	1.08	0.083	0.090
		H	16.28	18.00	1.49	---	---
Left		L	15.83	18.00	1.65	---	---
		M	17.67	18.00	1.08	0.108	0.117
		H	16.28	18.00	1.49	---	---
Back	802.11b Ant2 (body-worn& hotspot)	L	15.79	17.00	1.32	---	---
		M	15.72	17.00	1.34	0.167	0.224
		H	16.01	17.00	1.26	---	---
Front		L	15.79	17.00	1.32	---	---
		M	15.72	17.00	1.34	0.199	0.267
		H	16.01	17.00	1.26	---	---
Top		L	15.79	17.00	1.32	---	---
		M	15.72	17.00	1.34	0.011	0.015
		H	16.01	17.00	1.26	---	---
Left		L	15.79	17.00	1.32	---	---
		M	15.72	17.00	1.34	0.050	0.067
		H	16.01	17.00	1.26	---	---
Back	802.11n Ant1+Ant2 (body-worn& hotspot)	L	17.27	18.00	1.18	---	---
		M	17.27	18.00	1.18	0.166	0.196
		H	17.78	18.00	1.05	---	---
Front		L	17.27	18.00	1.18	---	---
		M	17.27	18.00	1.18	0.201	0.237
		H	17.78	18.00	1.05	---	---
Top		L	17.27	18.00	1.18	---	---
		M	17.27	18.00	1.18	0.019	0.022
		H	17.78	18.00	1.05	---	---
Bottom		L	17.27	18.00	1.18	---	---
		M	17.27	18.00	1.18	0.077	0.091
		H	17.78	18.00	1.05	---	---
Left		L	17.27	18.00	1.18	---	---
		M	17.27	18.00	1.18	0.072	0.085
		H	17.78	18.00	1.05	---	---

Note: hotspot mode could not be opened with non-signaling mode, so the data of hotspot and body-worn are same.

Mode: Wi-Fi 5.2GHz

fL (MHz)=5180MHz fM (MHz)=5200MHz fH (MHz)= 5240MHz

SAR Values (Wi-Fi 802.11a)

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Back	802.11a Ant1 (body-worn& hotspot)	L	14.46	15.00	1.13	---	---
		M	14.54	15.00	1.11	0.19	0.211
		H	14.38	15.00	1.15	---	---
Front		L	14.46	15.00	1.13	---	---
		M	14.54	15.00	1.11	0.188	0.209
		H	14.38	15.00	1.15	---	---
Bottom		L	14.46	15.00	1.13	---	---
		M	14.54	15.00	1.11	0.143	0.159
		H	14.38	15.00	1.15	---	---
Left		L	14.46	15.00	1.13	---	---
		M	14.54	15.00	1.11	0.042	0.047
		H	14.38	15.00	1.15	---	---
Back	802.11a Ant2 (body-worn& hotspot)	L	14.82	15.00	1.04	---	---
		M	14.86	15.00	1.03	0.26	0.268
		H	14.78	15.00	1.05	---	---
Front		L	14.82	15.00	1.04	---	---
		M	14.86	15.00	1.03	0.291	**0.300**
		H	14.78	15.00	1.05	---	---
Top		L	14.82	15.00	1.04	---	---
		M	14.86	15.00	1.03	0.013	0.013
		H	14.78	15.00	1.05	---	---
Left		L	14.82	15.00	1.04	---	---
		M	14.86	15.00	1.03	0.083	0.085
		H	14.78	15.00	1.05	---	---
Back	802.11n Ant1+Ant2 (body-worn& hotspot)	L	16.77	17.00	1.05	---	---
		M	16.81	17.00	1.04	0.244	0.254
		H	16.66	17.00	1.08	---	---
Front		L	16.77	17.00	1.05	---	---
		M	16.81	17.00	1.04	0.288	0.300
		H	16.66	17.00	1.08	---	---
Top		L	16.77	17.00	1.05	---	---
		M	16.81	17.00	1.04	0.012	0.012
		H	16.66	17.00	1.08	---	---
Bottom		L	16.77	17.00	1.05	---	---
		M	16.81	17.00	1.04	0.196	0.204
		H	16.66	17.00	1.08	---	---
Left		L	16.77	17.00	1.05	---	---
		M	16.81	17.00	1.04	0.074	0.077
		H	16.66	17.00	1.08	---	---

Note: hotspot mode could not be opened with non-signaling mode, so the data of hotspot and body-worn are same.

6.9 SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.
The following procedures are applied to determine if repeated measurements are required.
1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

The Highest Reported SAR configuration in Each Frequency Band

Frequency band	Air interface	Body worn(W/kg)	Hotspot(W/kg)
750 MHz	LTE Band 12	<0.8	<0.8
	LTE Band 17	<0.8	<0.8
1800/1900 MHz	WCDMA Band II	>0.8	>0.8
	WCDMA Band IV	>0.8	>0.8
	LTE Band 2	<0.8	<0.8
	LTE Band 4	<0.8	<0.8
2.4 GHz	LTE Band 41	<0.8	<0.8
	Wi-Fi 2.4GHz	<0.8	<0.8
5 GHz	Wi-Fi 5GHz	<0.8	<0.8

6.10 Simultaneous Transmission SAR Analysis

The sum of SAR values for WCDMA & Wi-Fi

	MAXIMUM SAR VALUE FOR BODY	MAXIMUM SAR VALUE FOR HOTSPOT
WCDMA	1.092	1.122
Wi-Fi	0.300	0.300
Sum	1.392	1.422
Note	Front: WCDMA Band II + Wi-Fi 5.2GHz	Front: WCDMA Band II+Wi-Fi 5.2GHz

According to the above tables, the sum of SAR values for WCDMA and Wi-Fi < 1.6W/kg.
So simultaneous transmission SAR are not required for Wi-Fi transmitter.

The sum of SAR values for LTE & Wi-Fi

	MAXIMUM SAR VALUE FOR BODY	MAXIMUM SAR VALUE FOR HOTSPOT
LTE	0.779	0.784
Wi-Fi	0.300	0.300
Sum	1.079	1.084
Note	Front: LTE Band II+ Wi-Fi 5.2GHz	Front: LTE Band II+Wi-Fi 5.2GHz

According to the above tables, the sum of SAR values for LTE and Wi-Fi < 1.6W/kg.
So simultaneous transmission SAR are not required for Wi-Fi transmitter.

7 MEASUREMENT UNCERTAINTY

(0.3 - 3 GHz range)								
Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±6.0%	N	1	1	1	±6.0%	±6.0%	∞
Axial Isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Modulation Response^m	±2.4%	R	$\sqrt{3}$	1	1	±1.4%	±1.4%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	$\sqrt{3}$	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±2.0%	R	$\sqrt{3}$	1	1	±1.2%	±1.2%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Power Scaling^p	±0%	R	$\sqrt{3}$	1	1	±0.0%	±0.0%	∞
Phantom and Setup								
Phantom Uncertainty	±6.1%	R	$\sqrt{3}$	1	1	±3.5%	±3.5%	∞
SAR correction	±1.9%	R	$\sqrt{3}$	1	0.84	±1.1%	±0.9%	∞
Liquid Conductivity (mea.)^{DAK}	±2.5%	R	$\sqrt{3}$	0.78	0.71	±1.1%	±1.0%	∞
Liquid Permittivity (mea.) ^{DAK}	±2.5%	R	$\sqrt{3}$	0.26	0.26	±0.3%	±0.4%	∞
Temp. unc. - Conductivity ^{BB}	±3.4%	R	$\sqrt{3}$	0.78	0.71	±1.5%	±1.4%	∞
Temp. unc. - Permittivity ^{BB}	±0.4%	R	$\sqrt{3}$	0.23	0.26	±0.1%	±0.1%	∞
Combined Std. Uncertainty						±11.2%	±11.1%	361
Expanded STD Uncertainty						**±22.3%**	**±22.2%**	

(3 - 6 GHz range)

Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±6.55 %	N	1	1	1	±6.55 %	±6.55 %	∞
Axial Isotropy	±4.7 %	R	$\sqrt{3}$	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	$\sqrt{3}$	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±2.0 %	R	$\sqrt{3}$	1	1	±1.2 %	±1.2 %	∞
Linearity	±4.7 %	R	$\sqrt{3}$	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Modulation Response^m	±2.4 %	R	$\sqrt{3}$	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	$\sqrt{3}$	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.8 %	R	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
Probe Positioning	±6.7 %	R	$\sqrt{3}$	1	1	±3.9 %	±3.9 %	∞
Max. SAR Eval.	±4.0 %	R	$\sqrt{3}$	1	1	±2.3 %	±2.3 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	$\sqrt{3}$	1	1	±2.9 %	±2.9 %	∞
Power Scaling^p	±0 %	R	$\sqrt{3}$	1	1	±0.0 %	±0.0 %	∞
Phantom and Setup								
Phantom Uncertainty	±6.6 %	R	$\sqrt{3}$	1	1	±3.8 %	±3.8 %	∞
SAR correction	±1.9 %	R	$\sqrt{3}$	1	0.84	±1.1 %	±0.9 %	∞
Liquid Conductivity (mea.)^{DAK}	±2.5 %	R	$\sqrt{3}$	0.78	0.71	±1.1 %	±1.0 %	∞
Liquid Permittivity (mea.) ^{DAK}	±2.5 %	R	$\sqrt{3}$	0.26	0.26	±0.3 %	±0.4 %	∞
Temp. unc. - Conductivity ^{BB}	±3.4 %	R	$\sqrt{3}$	0.78	0.71	±1.5 %	±1.4 %	∞
Temp. unc. - Permittivity ^{BB}	±0.4 %	R	$\sqrt{3}$	0.23	0.26	±0.1 %	±0.1 %	∞
Combined Std. Uncertainty						±12.3 %	±12.2 %	748
Expanded STD Uncertainty						**±24.6 %**	**±24.5 %**	

8 TEST EQUIPMENTS

The measurements were performed using an automated near-field scanning system, DASY5, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements was the 'advanced extrapolation' algorithm.

The following table lists calibration dates of SPEAG components:

Test Equipment	Model	Serial Number	Calibration date	Calibration Due data
DAE	DAE4	546	2018.10.15	2019.10.14
Dosimetric E-field Probe	EX4DV3	3708	2018.10.22	2019.10.21
Dipole Validation Kit	D750V3	1101	2017.09.13	2018.09.12
Dipole Validation Kit	D1800V2	2d084	2017.09.15	2020.09.14
Dipole Validation Kit	D2000V2	1009	2018.02.01	2021.01.31
Dipole Validation Kit	D2450V2	738	2017.09.18	2020.09.17
Dipole Validation Kit	D5GHzV2	1079	2017.09.25	2020.09.24

According to KDB 865664 D01 section 3.2.2, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the **SAR target**, **impedance** and **return loss** of a dipole have remain stable according to the following requirements.

1) The test laboratory must ensure that the required supporting information and documentation are included in the SAR report to qualify for the three-year extended calibration interval; otherwise, the IEEE Std 1528-2013 recommended annual calibration applies.
2) Immediate re-calibration is required for the following conditions.
a) After a dipole is damaged and properly repaired to meet required specifications.
b) When the measured SAR deviates from the calibrated SAR value by more than 10% due to changes in physical, mechanical, electrical or other relevant dipole conditions; i.e., the error is not introduced by incorrect measurement procedures or other issues relating to the SAR measurement system.
c) When the most recent return-loss result, measured at least annually, deviates by more than 20% from the previous measurement (i.e. value in dB×0.2) or not meeting the required 20 dB minimum return-loss requirement.
d) When the most recent measurement of the real or imaginary parts of the impedance, measured at least annually, deviates by more than 5 Ω from the previous measurement.

Dipole 750

SAR target

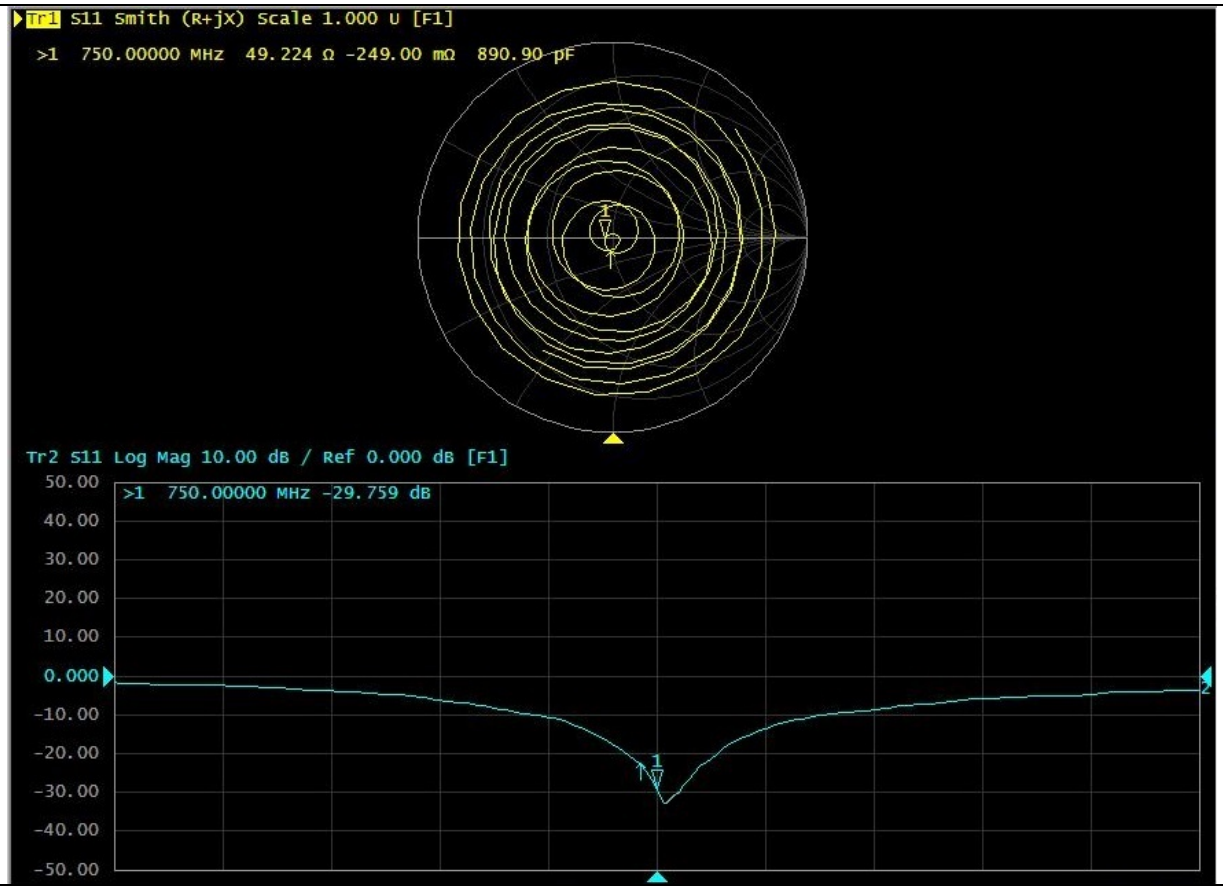
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance (measured on 2018.8.20), deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result (measured on 2018.8.20) deviates within 20% from the previous measurement. (Data from the last calibration report)

Body TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	deviation
Impedance	52.0Ω-2.22jΩ	49.2Ω-0.25jΩ	<5Ω
Return loss	-30.6dB	-29.8dB	<20%



Body TSL Parameters

Dipole1800

SAR target

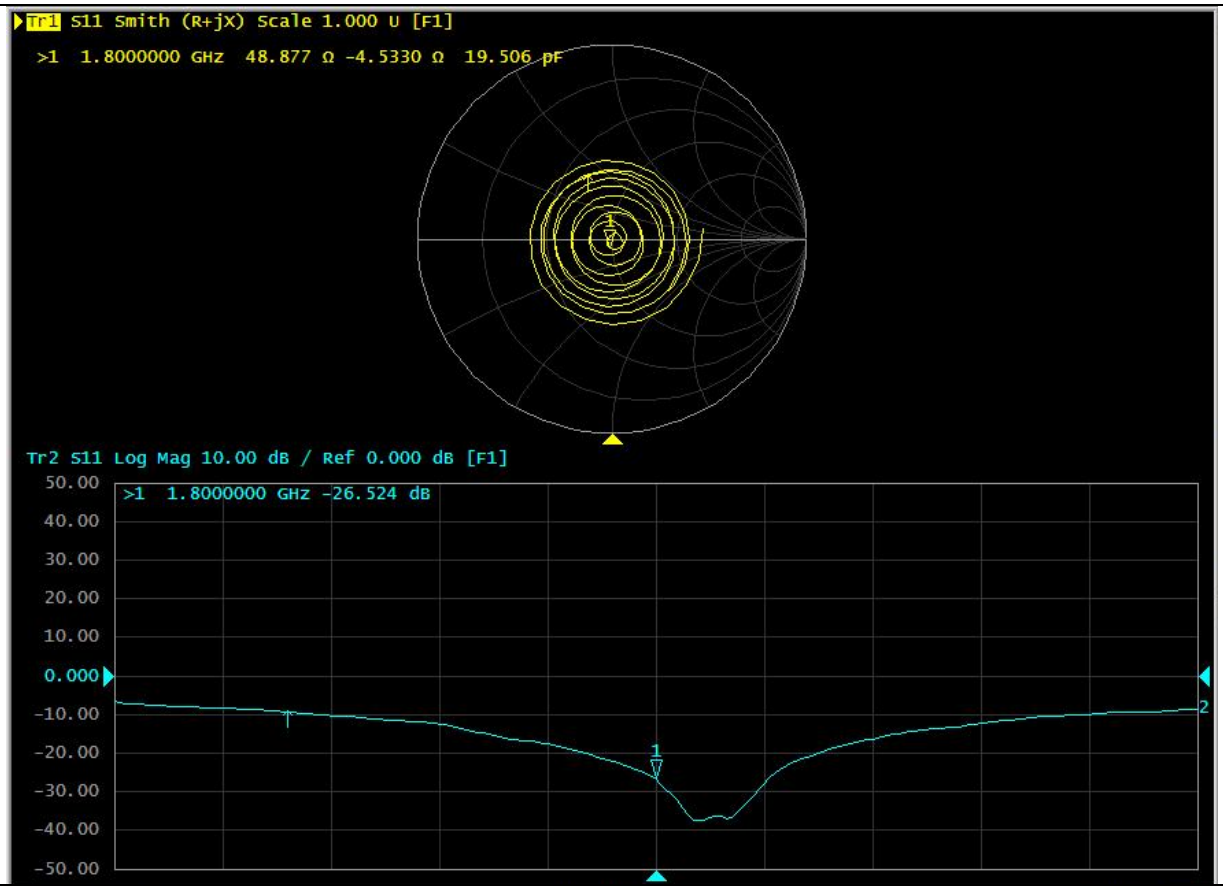
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance (measured on 2018.8.20), deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result (measured on 2018.8.20) deviates within 20% from the previous measurement. (Data from the last calibration report)

Body TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	deviation
Impedance	46.0Ω-1.32jΩ	48.9Ω-4.53jΩ	<5Ω
Return loss	-27.1dB	-26.5dB	<20%



Body TSL Parameters

Dipole2000

SAR target

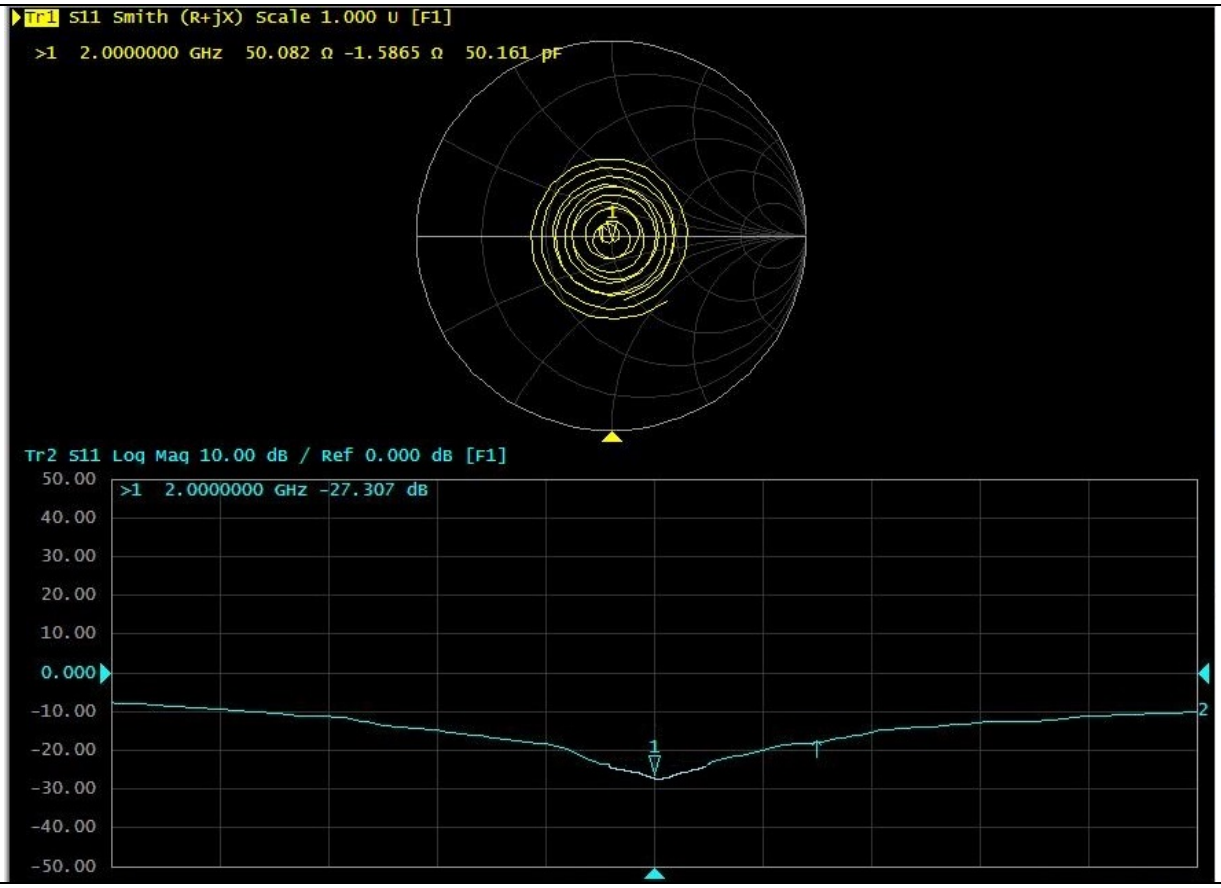
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance (measured on 2018.8.20), deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result (measured on 2018.8.20) deviates within 20% from the previous measurement. (Data from the last calibration report)

Body TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	deviation
Impedance	46.3Ω-1.63jΩ	50.1Ω-1.59jΩ	<5Ω
Return loss	-27.6dB	-27.3dB	<20%



Body TSL Parameters

Dipole2450

SAR target

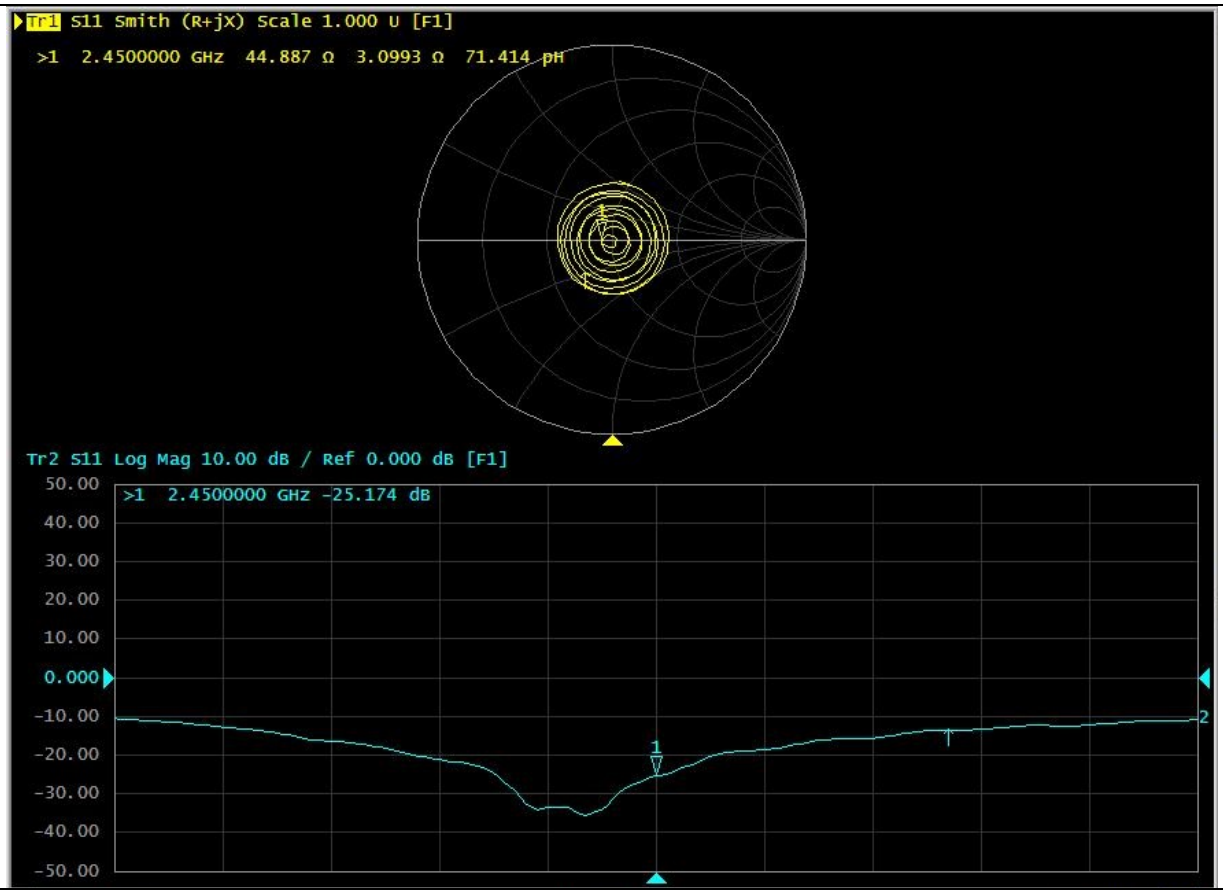
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance (measured on 2018.8.20), deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result (measured on 2018.8.20) deviates within 20% from the previous measurement. (Data from the last calibration report)

Body TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	deviation
Impedance	47.6Ω+6.39jΩ	44.9Ω+3.10jΩ	<5Ω
Return loss	-23.1dB	-25.2dB	<20%



Body TSL Parameters

Dipole5GHz (5.2GHz)

SAR target

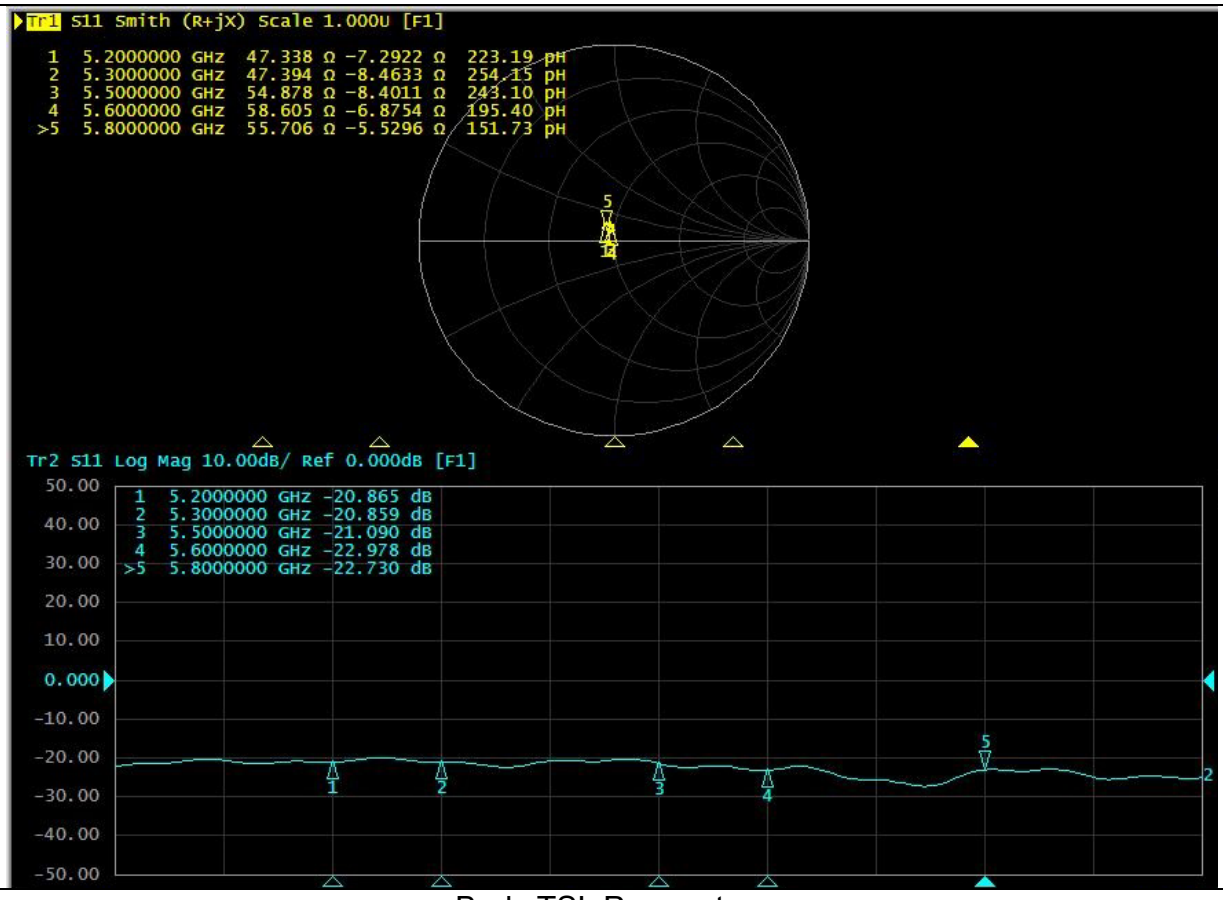
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance (measured on 2018.8.20), deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result (measured on 2018.8.20) deviates within 20% from the previous measurement. (Data from the last calibration report)

Body TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	deviation
Impedance	50.8Ω-10.1jΩ	47.4Ω-7.3jΩ	<5Ω
Return loss	-20.0dB	-20.9dB	<20%



Body TSL Parameters

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration Due data
Signal Generator	E4428C	MY45280865	2018.08.20	2019.08.19
Signal Generator	SML 03	103514	2018.08.20	2019.08.19
Power meter	E4417A	MY45101182	2018.08.20	2019.08.19
Power Sensor	E4412A	MY41502214	2018.08.20	2019.08.19
Power Sensor	E4412A	MY41502130	2018.08.20	2019.08.19
Power meter	E4417A	MY45101004	2018.08.20	2019.08.19
Power Sensor	E9300B	MY41496001	2018.08.20	2019.08.19
Power Sensor	E9300B	MY41496003	2018.08.20	2019.08.19
Communication Tester	8960	MY48367401	2018.08.20	2019.08.19
Communication Tester	MT8820C	6201300660	2018.08.20	2019.08.19
Vector Network Analyzer	VNA R140	0011213	2018.10.17	2019.10.16
Dielectric Parameter Probe	DAKS-3.5	1042	2018.10.17	2019.10.16
Network Analyzer	E5072A	MY51100334	2018.03.01	2019.02.28

Detailed information of Isotropic E-field Probe Type EX3DV4

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Optical Surface Detection	± 0.3 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Dynamic Range	10 μW/g to > 100 W/kg Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

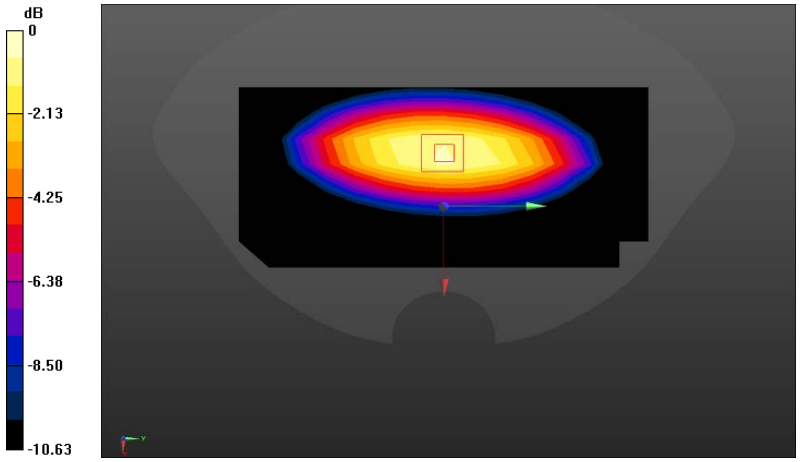
ANNEX A – TEST PLOTS

System check	750MHz

Communication System: UID 0, CW (0); Communication System Band: D750 (750.0 MHz); Frequency: 750 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 750 MHz; σ = 0.976 S/m; ε_r = 53.279; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.7, 7.7, 7.7); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
  System Performance Check at Frequencies 750MHz/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Area Scan (8x15x1): Measurement grid: dx=15mm, dy=15mm
  Maximum value of SAR (measured) = 2.31 W/kg
  System Performance Check at Frequencies 750MHz/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
  Reference Value = 41.26 V/m; Power Drift = 0.13 dB
  Peak SAR (extrapolated) = 3.45 W/kg
  SAR(1 g) = 2.06 W/kg; SAR(10 g) = 1.47 W/kg
  Maximum value of SAR (measured) = 2.66 W/kg



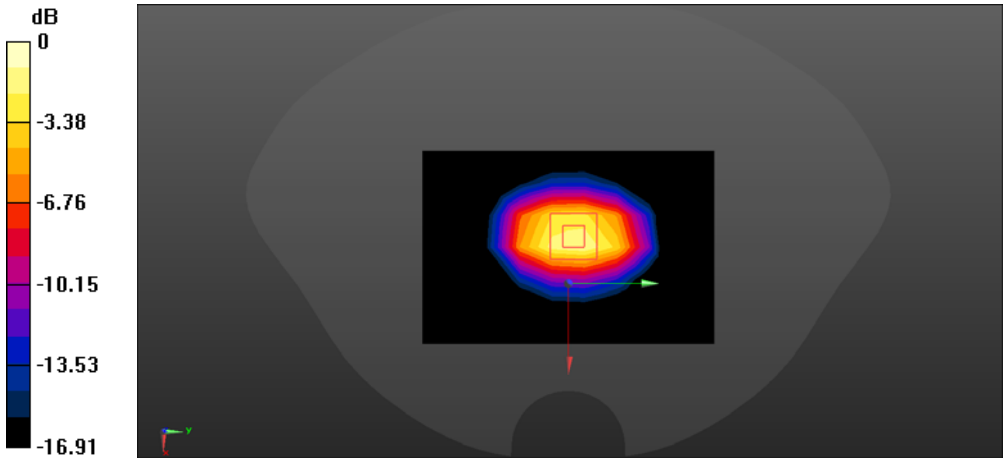
0 dB = 2.66 W/kg = 4.25 dBW/kg

SYSTEM CHECKING SCANS	1800MHz

Communication System: UID 0, CW (0); Frequency: 1800 MHz
Medium parameters used: f = 1800 MHz; σ = 1.523 S/m; ε_r = 52.879; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.7, 7.7, 7.7); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
  Configuration 1800/1800/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
  Maximum value of SAR (measured) = 9.43 W/kg
  Configuration 1800/1800/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
  Reference Value = 80.19 V/m; Power Drift = 0.19 dB
  Peak SAR (extrapolated) = 17.5 W/kg
  SAR(1 g) = 9.55 W/kg; SAR(10 g) = 4.98 W/kg
  Maximum value of SAR (measured) = 12.2 W/kg



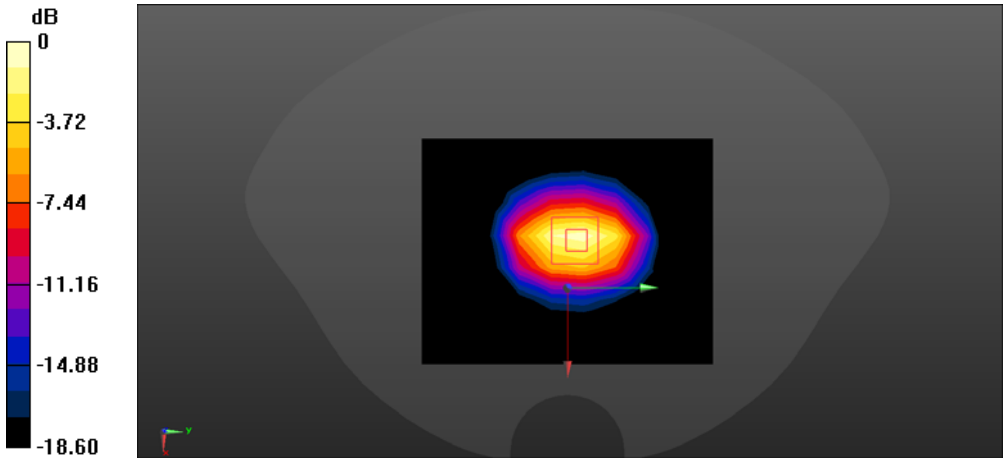
0 dB = 12.2 W/kg = 10.86 dBW/kg

SYSTEM CHECKING SCANS	2000 MHz

Communication System: UID 0, CW (0); Frequency: 2000 MHz
Medium parameters used: f = 2000 MHz; σ = 1.546 S/m; ε_r = 52.557; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.7, 7.7, 7.7); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
  Configuration 2000/2000/Area Scan (8x10x1): Measurement grid: dx=12mm, dy=12mm
  Maximum value of SAR (measured) = 11.1 W/kg
  Configuration 2000/2000/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
  Reference Value = 78.14 V/m; Power Drift = 0.05 dB
  Peak SAR (extrapolated) = 17.8 W/kg
  SAR(1 g) = 9.49 W/kg; SAR(10 g) = 4.78 W/kg
  Maximum value of SAR (measured) = 12.1 W/kg



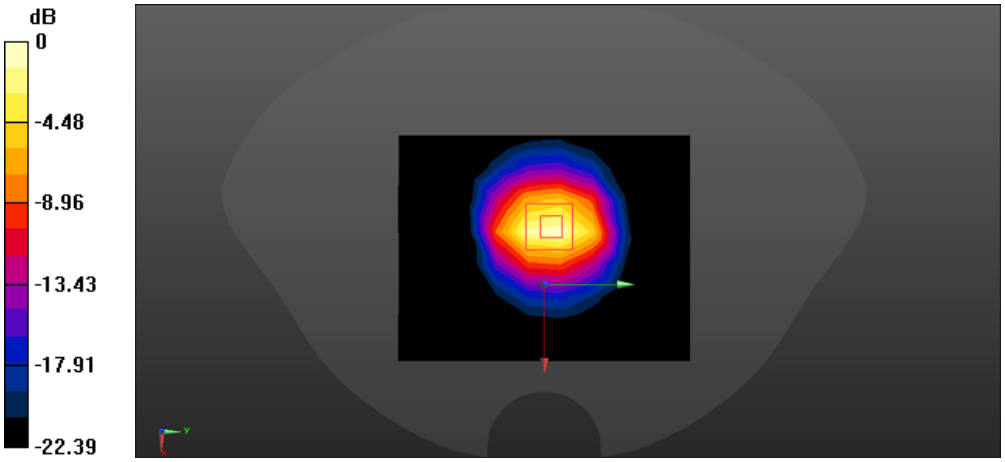
0 dB = 12.1 W/kg = 10.83 dBW/kg

SYSTEM CHECKING SCANS	2450 MHz

Communication System: UID 0, CW (0); Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.926 S/m; ε_r = 50.795; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.7, 7.7, 7.7); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
  System Performance Check at Frequencies 2450 MHz/2450/Area Scan (8x10x1):
  Measurement grid: dx=12mm, dy=12mm
  Maximum value of SAR (measured) = 15.9 W/kg
  System Performance Check at Frequencies 2450 MHz/2450/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
  Reference Value = 62.46 V/m; Power Drift = 0.12 dB
  Peak SAR (extrapolated) = 27.5 W/kg
  SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.09 W/kg
  Maximum value of SAR (measured) = 17.3 W/kg



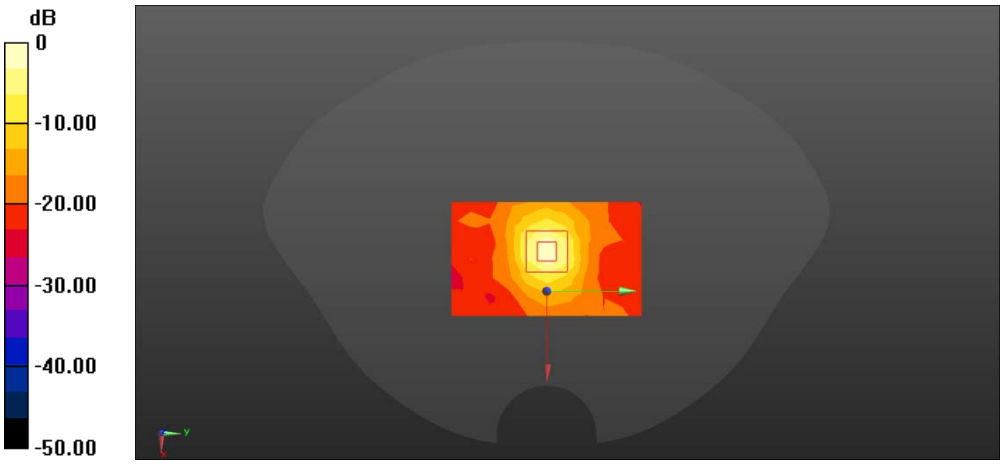
0 dB = 17.3 W/kg = 12.38 dBW/kg

System check	5200MHz

Communication System: UID 10062 - CAB, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5200 MHz
Medium parameters used: f = 5200 MHz; σ = 5.355 S/m; ε_r = 49.035; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.7, 7.7, 7.7); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
  Configuration/5200/Area Scan (7x11x1): Measurement grid: dx=10mm, dy=10mm
  Maximum value of SAR (measured) = 1.47 W/kg
  Configuration/5200/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, d5=5mm
  Reference Value = 11.12 V/m; Power Drift = 0.08 dB
  Peak SAR (extrapolated) = 3.29 W/kg
  SAR(1 g) = 0.73 W/kg; SAR(10 g) = 0.206 W/kg
  Maximum value of SAR (measured) = 2.11 W/kg



0 dB = 2.11 W/kg = 3.24 dBW/kg

The Worst of SAR Value is WCDMA Band II and WCDMA Band IV

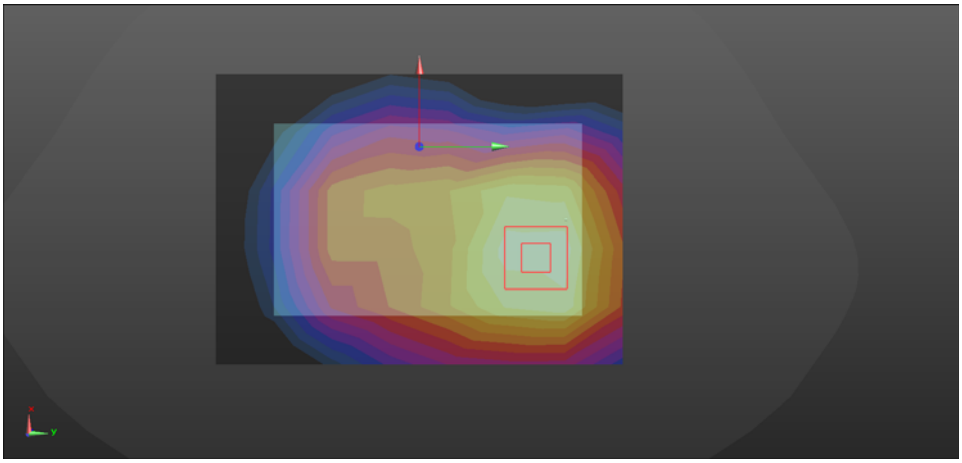
WCDMA BAND II	Hotspot	FRONT

Communication System: UID 0, wcdma II (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.525 S/m; ε_r = 52.883; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.7, 7.7, 7.7); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)

Flat hotspot/Front M/Area Scan (11x13x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 1.08 W/kg
Flat hotspot/Front M/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.38 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.84 W/kg
SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.610 W/kg
Maximum value of SAR (measured) = 1.10 W/kg



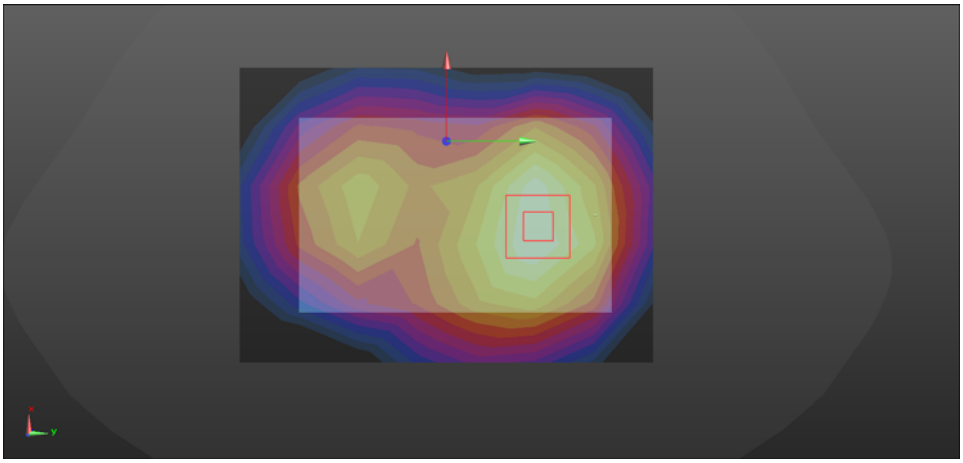
WCDMA BAND IV	Body Worn	FRONT

Communication System: UID 0, wcdma band4 (0); Frequency: 1732.4 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1732.4 MHz; σ = 1.501 S/m; ε_r = 52.856; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.7, 7.7, 7.7); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)

Flat/Front M/Area Scan (11x13x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 1.15 W/kg
Flat/Front M/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.54 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.998 W/kg; SAR(10 g) = 0.601 W/kg
Maximum value of SAR (measured) = 1.08 W/kg



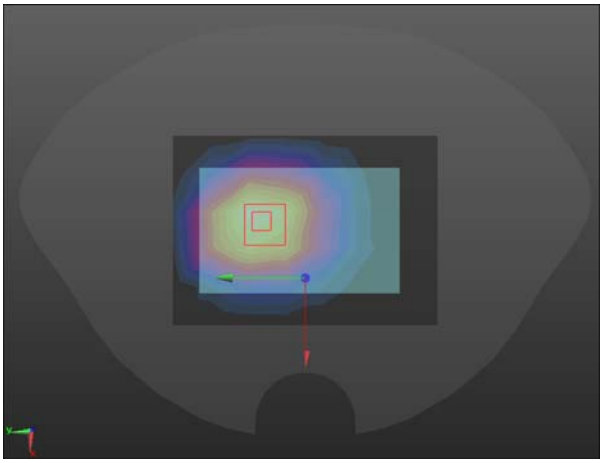
LTE BAND2

HOTSPOT	FRONT

Communication System: UID 0, LTE band 02 (0); Frequency: 1880 MHz
Medium parameters used (interpolated): f = 1880 MHz; σ = 1.4 S/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.56, 7.56, 7.56); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
- **Front/W8/Area Scan (6x8x1):** Measurement grid: dx=15mm, dy=15mm
  Maximum value of SAR (measured) = 0.853 W/kg
  Front/W8/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
  Reference Value = 25.91 V/m; Power Drift = 0.02 dB
  Peak SAR (extrapolated) = 1.10 W/kg
  SAR(1 g) = 0.700 W/kg; SAR(10 g) = 0.546 W/kg
  Maximum value of SAR (measured) = 0.882 W/kg



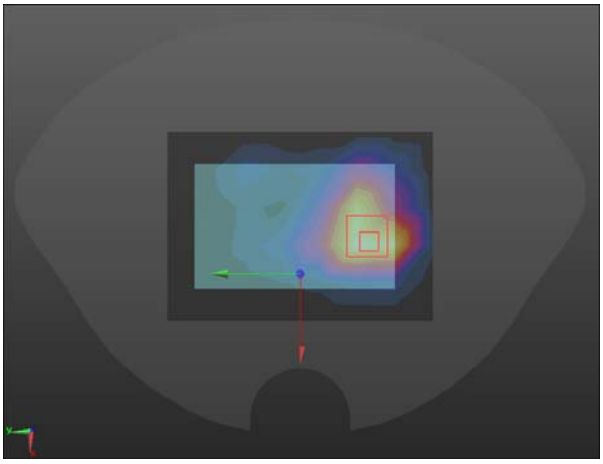
LTE BAND4

HOTSPOT	FRONT

Communication System: UID 0, LTE band 4 (0); Frequency: 1732.5 MHz ;
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.376 S/m; εr = 40.07; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.69, 7.69, 7.69); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
- **Front/L1/Area Scan (6x8x1):** Measurement grid: dx=15mm, dy=15mm
  Maximum value of SAR (measured) = 1.06 W/kg
  Front/L1/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=6mm, dy=6mm, dz=5mm
  Reference Value = 10.78 V/m; Power Drift = -0.01 dB
  Peak SAR (extrapolated) = 1.94 W/kg
  SAR(1 g) = 0.682 W/kg; SAR(10 g) = 0.380 W/kg
  Maximum value of SAR (measured) = 1.11 W/kg



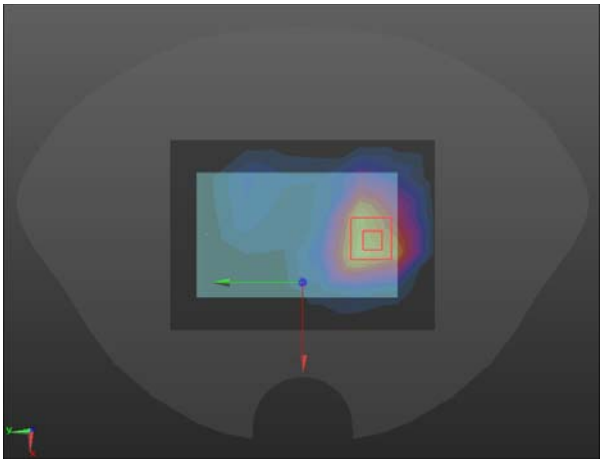
LTE BAND12

HOTSPOT	FRONT

Communication System: UID 0, LTE BAND12 (0); Frequency: 707.5 MHz;
Medium parameters used (interpolated): f = 707.5 MHz; σ = 0.937 S/m; ε_r = 54.016; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(9.51, 9.51, 9.51); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
- **Front/L3/Area Scan (6x8x1):** Measurement grid: dx=15mm, dy=15mm
  Maximum value of SAR (measured) = 1.13 W/kg
  Front/L3/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=6mm, dy=6mm, dz=5mm
  Reference Value = 8.98 V/m; Power Drift = 0.07 dB
  Peak SAR (extrapolated) =1.32 W/kg
  SAR(1 g) = 0.541 W/kg; SAR(10 g) = 0.24 W/kg
  Maximum value of SAR (measured) = 1.07 W/kg



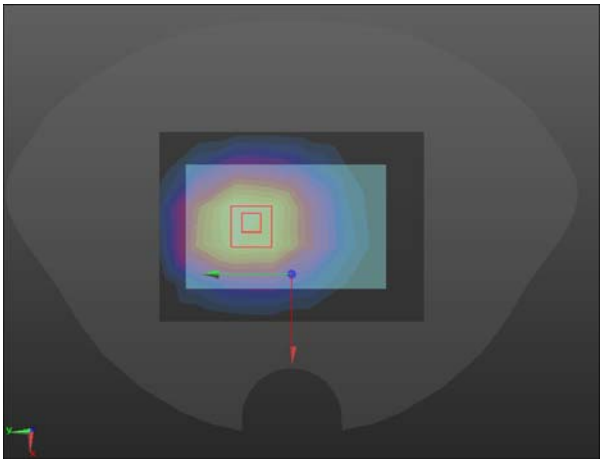
LTE BAND17

HOTSPOT	FRONT

Communication System: UID 0, LTE BAND17 (0); Frequency: 710 MHz;
Medium parameters used (interpolated): f = 710 MHz; σ = 0.938 S/m; ε_r = 54.007; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(9.51, 9.51, 9.51); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
- **Front/L8/Area Scan (6x8x1):** Measurement grid: dx=15mm, dy=15mm
  Maximum value of SAR (measured) = 1.04 W/kg
  Front/L8/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=6mm, dy=6mm, dz=5mm
  Reference Value = 10.94 V/m; Power Drift = -0.02 dB
  Peak SAR (extrapolated) = 1.35 W/kg
  SAR(1 g) = 0.570 W/kg; SAR(10 g) = 0.330 W/kg
  Maximum value of SAR (measured) = 1.12 W/kg



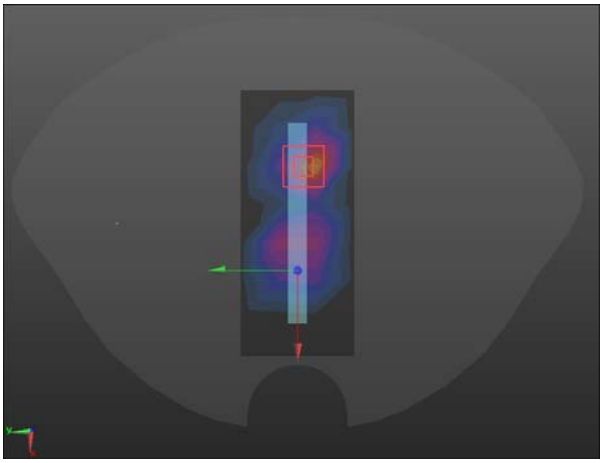
LTE BAND41

BODY-WORN	BOTTOM

Communication System: UID 0, LTE BAND41 (0); Frequency: 2593 MHz;
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 S/m; ε_r = 52.136; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.14, 7.14, 7.14); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
- **Front/L28/Area Scan (6x8x1):** Measurement grid: dx=15mm, dy=15mm
  Maximum value of SAR (measured) = 0.843 W/kg
  Front/L28/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=6mm, dy=6mm, dz=5mm
  Reference Value = 23.78 V/m; Power Drift = 0.00 dB
  Peak SAR (extrapolated) = 1.11 W/kg
  SAR(1 g) = 0.701 W/kg; SAR(10 g) = 0.570 W/kg
  Maximum value of SAR (measured) = 0.894 W/kg



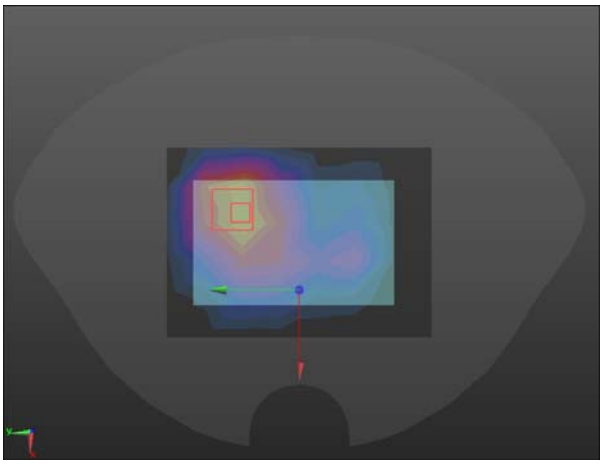
WiFi-2.4GHz

ANT1	FRONT

Communication System: UID 0, WIFI 2.4GHz (0); Frequency: 2442 MHz;
Medium parameters used (interpolated): f = 2442 MHz; σ = 1.793 S/m; ε_r = 39.212; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(7.19, 7.19, 7.19); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
- **Front/BACK WIFI 2.4 MIMO/Area Scan (6x8x1):** Measurement grid: dx=12mm, dy=12mm
  Maximum value of SAR (measured) = 0.275 W/kg
  Front/BACK WIFI 2.4 MIMO/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=6mm, dy=6mm, dz=5mm
  Reference Value = 8.749 V/m; Power Drift = -0.13 dB
  Peak SAR (extrapolated) = 0.557 W/kg
  SAR(1 g) = 0.266 W/kg; SAR(10 g) = 0.167 W/kg
  Maximum value of SAR (measured) = 0.373 W/kg



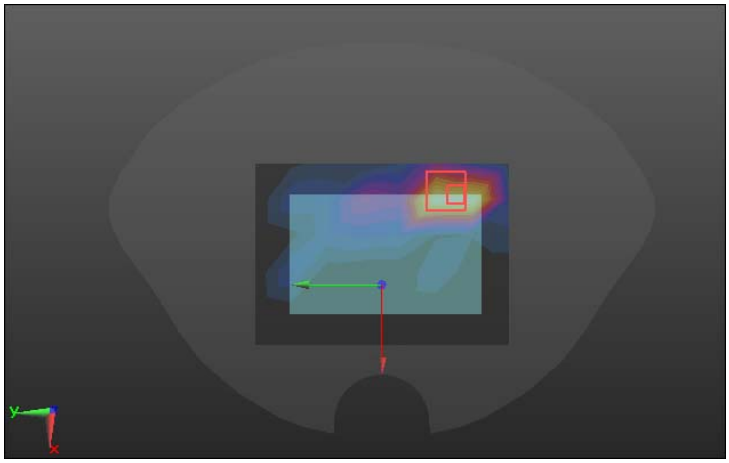
Wi-Fi 5GHz

ANT2	FRONT

Communication System: UID 10317 - AAB, IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle); Frequency: 5200 MHz
Medium parameters used: f = 5200 MHz; σ = 4.66 S/m; ε_r = 36; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5

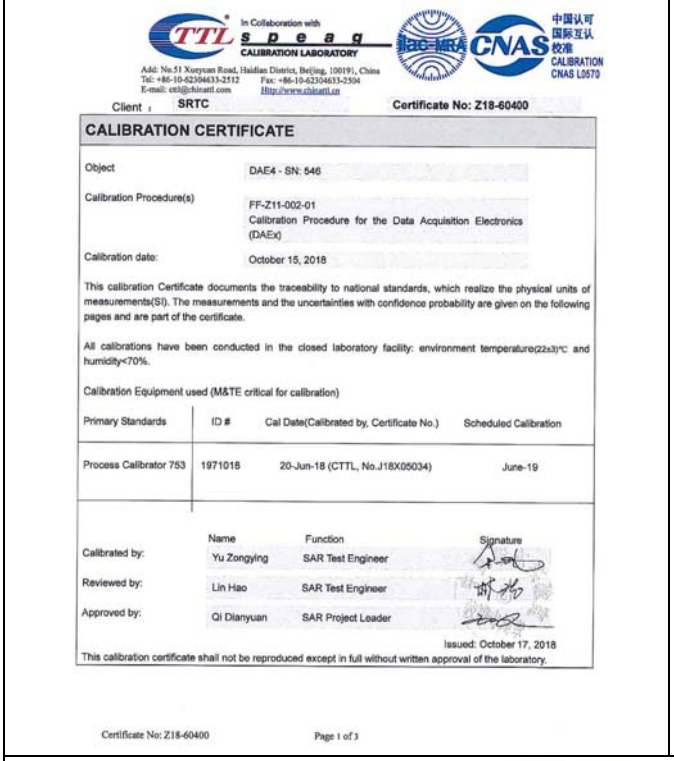
DASY Configuration:

- Probe: EX3DV4 - SN3708; ConvF(4.53,4,53,4.53); Calibrated: 10/22/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn546; Calibrated: 2018/10/15
- Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7437)
- **back/wifi 5g front 2 2/Area Scan (6x8x1):** Measurement grid: dx=10mm, dy=10mm
  Maximum value of SAR (measured) = 0.496 W/kg
  back/wifi 5g front 2 2/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=6mm, dy=6mm, dz=5mm
  Reference Value = 3.100 V/m; Power Drift = -0.40 dB
  Peak SAR (extrapolated) = 1.03 W/kg
  SAR(1 g) = 0.291 W/kg; SAR(10 g) = 0.107 W/kg.
  Maximum value of SAR (measured) = 0.632 W/kg



ANNEX B - RELEVANT PAGES FROM CALIBRATION REPORTS

DAE4 Sn:546



In Collaboration with s p e a g CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: ctt@chinattl.com Http://www.chinattl.cn

Client : SRTC Certificate No: Z18-60400

CALIBRATION CERTIFICATE

Object	DAE4 - SN: 546
Calibration Procedure(s)	FF-Z11-002-01 Calibration Procedure for the Data Acquisition Electronics (DAEx)
Calibration date:	October 15, 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)

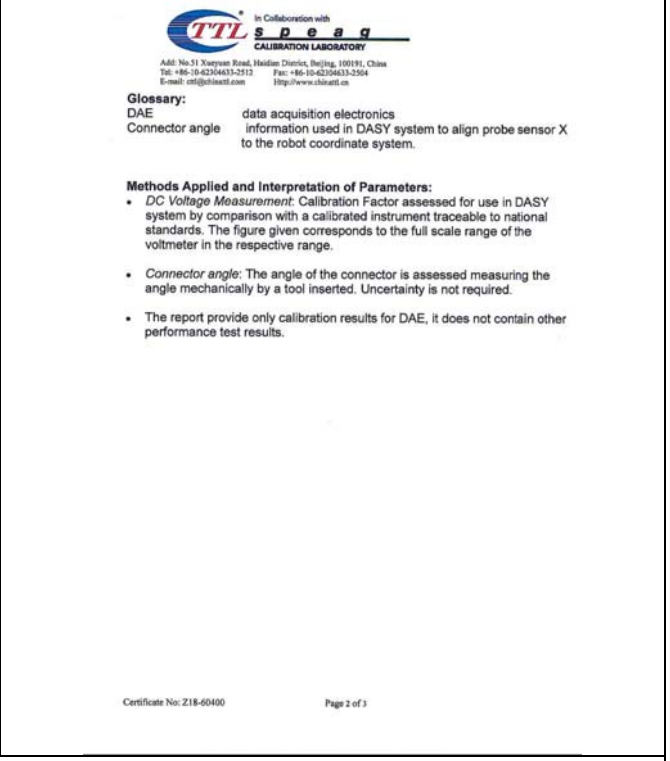
Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Process Calibrator 753	1971018	20-Jun-18 (CTTL, No.J18X05034)	June-19

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

Issued: October 17, 2018

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

Certificate No: Z18-60400 Page 1 of 3



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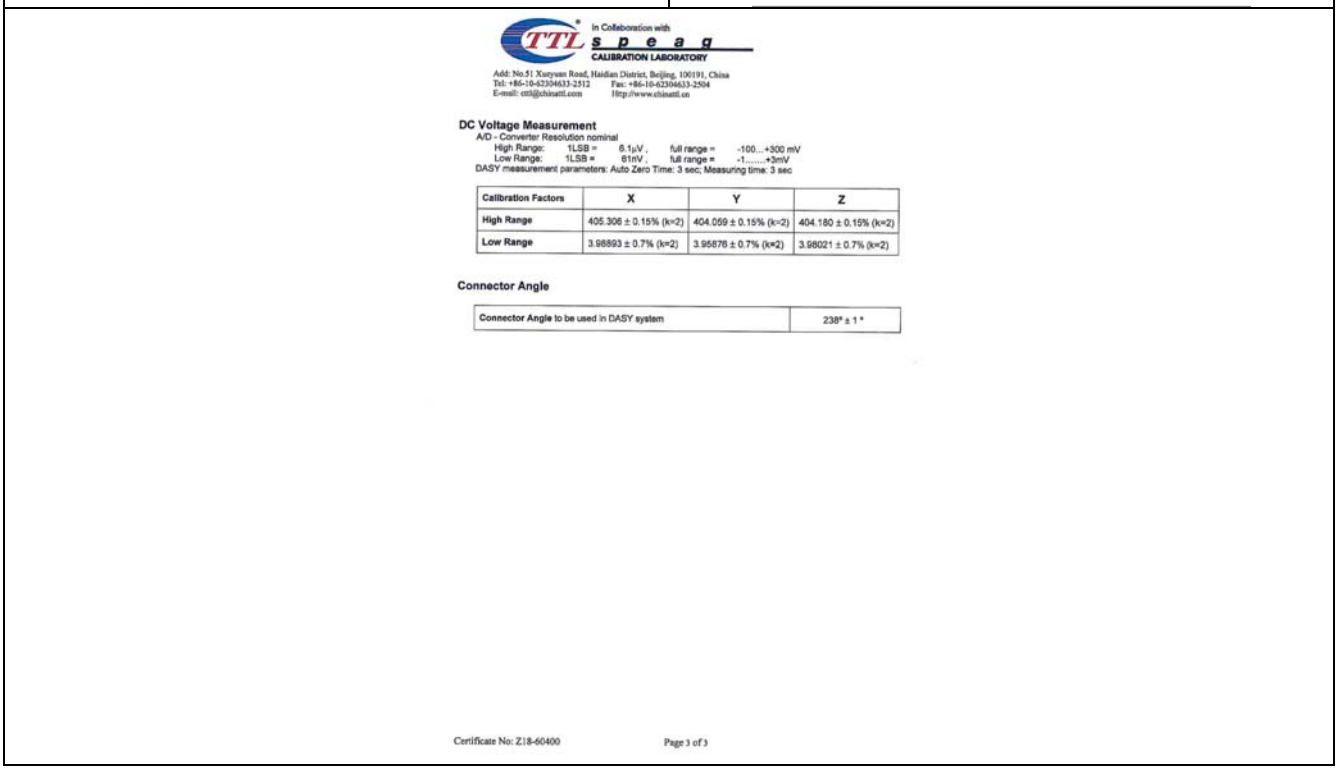
Glossary:

DAE data acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- *DC Voltage Measurement*: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.

Certificate No: Z18-60400 Page 2 of 3



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Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: ctt@chinattl.com Http://www.chinattl.cn

DC Voltage Measurement

A/D - Converter Resolution nominal
High Range: 1LSB = 6.1μV , full range = -100...+300 mV
Low Range: 1LSB = 61nV , full range = -1.....+3mV
DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	405.306 ± 0.15% (k=2)	404.059 ± 0.15% (k=2)	404.180 ± 0.15% (k=2)
Low Range	3.98893 ± 0.7% (k=2)	3.95876 ± 0.7% (k=2)	3.98021 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	238° ± 1 °

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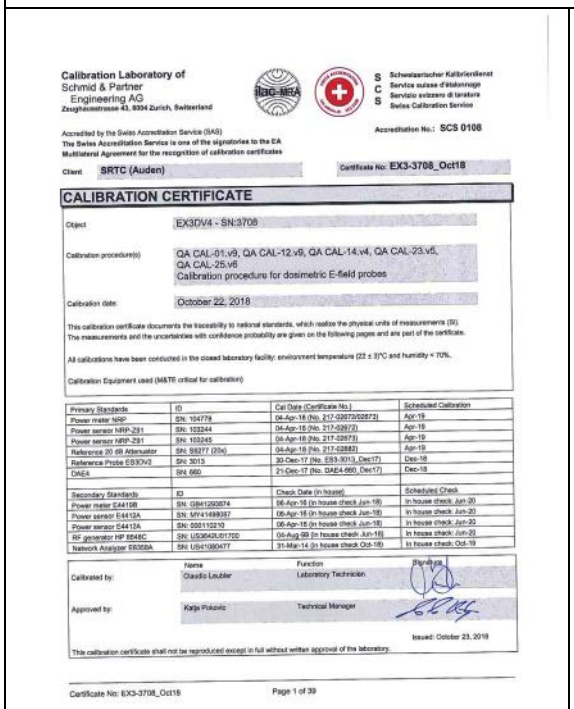
EX3DV4 Sn:3708



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

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

Accreditation No.: SCS 0108

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

Client: SRTC (Auden) Certificate No: EX3-3708_Oct18

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3708

Calibration procedure(s): QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v8
Calibration procedure for dosimetric E-field probes

Calibration date: October 22, 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: 55277 (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-16)	In house check: Jun-20
Network Analyzer 8753ES	SN: US39080477	31-Mar-14 (in house check Oct-16)	In house check: Oct-19

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

Issued: October 23, 2018

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

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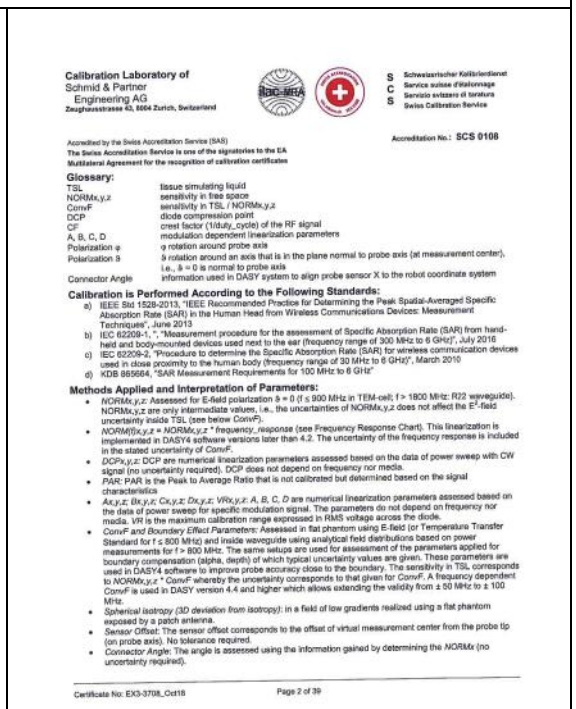

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Glossary:

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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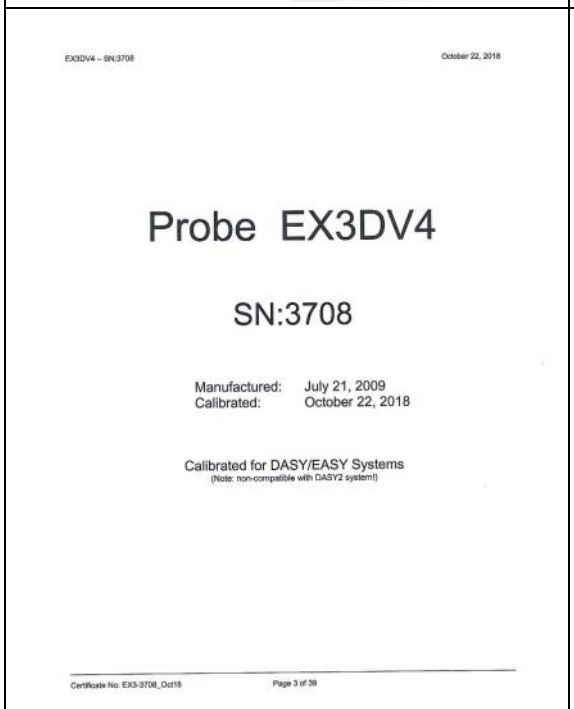

EX3DV4 – SN:3708 October 22, 2018

Probe EX3DV4

SN:3708

Manufactured: July 21, 2009
Calibrated: October 22, 2018

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

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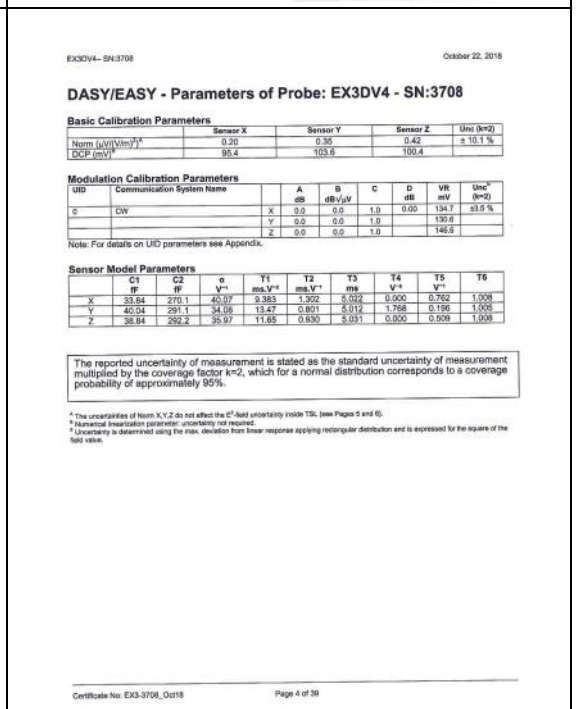

EX3DV4– SN:3708 October 22, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3708

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.20	0.35	0.42	± 10.1 %
DCP (mV)[B]	95.4	103.6	100.4	

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	134.7	±3.0 %
		Y	0.0	0.0	1.0		130.6	
		Z	0.0	0.0	1.0		146.8	

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	33.84	270.1	40.07	9.383	1.302	5.022	0.000	0.782	1.008
Y	40.04	291.1	34.08	13.47	0.801	5.012	1.768	0.196	1.005
Z	38.84	292.2	35.97	11.85	0.630	5.031	0.000	0.509	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.

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EX3DV4 Sn:3708

EX3DV4- SN:3708 October 22, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3708

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)
450	43.5	0.87	9.79	9.79	9.79	0.14	1.20	± 13.3 %
750	41.9	0.89	9.59	9.59	9.59	0.54	0.80	± 12.0 %
835	41.5	0.90	9.16	9.16	9.16	0.51	0.82	± 12.0 %
1450	40.5	1.20	8.50	8.50	8.50	0.33	0.80	± 12.0 %
1750	40.1	1.37	8.20	8.20	8.20	0.28	0.94	± 12.0 %
1900	40.0	1.40	7.89	7.89	7.89	0.35	0.85	± 12.0 %
2000	40.0	1.40	7.86	7.86	7.86	0.34	0.80	± 12.0 %
2300	39.5	1.67	7.51	7.51	7.51	0.29	0.86	± 12.0 %
2450	39.2	1.80	7.13	7.13	7.13	0.38	0.86	± 12.0 %
2600	39.0	1.96	7.01	7.01	7.01	0.36	0.87	± 12.0 %
5200	36.0	4.66	5.46	5.46	5.46	0.40	1.80	± 13.1 %
5300	35.9	4.76	5.25	5.25	5.25	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.84	4.84	4.84	0.40	1.80	± 13.1 %
5800	35.3	5.27	5.04	5.04	5.04	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, 20, 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.

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EX3DV4- SN:3708 October 22, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3708

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)
450	56.7	0.94	10.35	10.35	10.35	0.08	1.20	± 13.3 %
750	55.5	0.96	9.51	9.51	9.51	0.50	0.85	± 12.0 %
835	55.2	0.97	9.33	9.33	9.33	0.47	0.84	± 12.0 %
1450	54.0	1.30	7.84	7.84	7.84	0.38	0.80	± 12.0 %
1750	53.4	1.49	7.69	7.69	7.69	0.37	0.85	± 12.0 %
1900	53.3	1.52	7.56	7.56	7.56	0.42	0.84	± 12.0 %
2000	53.3	1.52	7.53	7.53	7.53	0.41	0.85	± 12.0 %
2300	52.9	1.81	7.34	7.34	7.34	0.39	0.88	± 12.0 %
2450	52.7	1.95	7.19	7.19	7.19	0.32	0.95	± 12.0 %
2600	52.5	2.16	7.14	7.14	7.14	0.32	0.95	± 12.0 %
5200	49.0	5.30	4.53	4.53	4.53	0.50	1.90	± 13.1 %
5300	48.9	5.42	4.41	4.41	4.41	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.99	3.99	3.99	0.50	1.90	± 13.1 %
5800	48.2	6.00	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.

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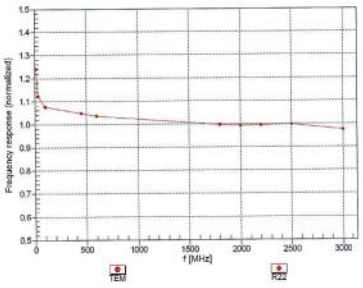
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

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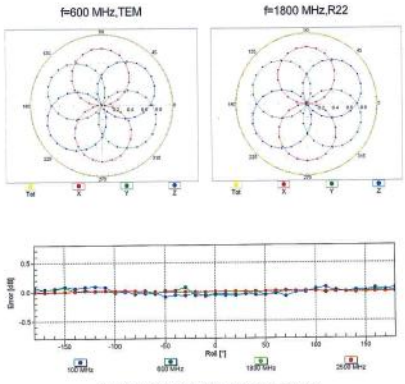
Receiving Pattern (ϕ), ϑ = 0°



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

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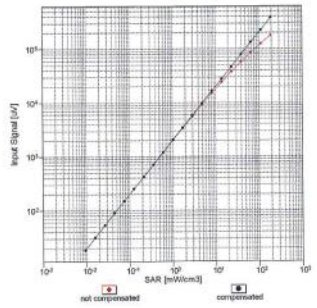
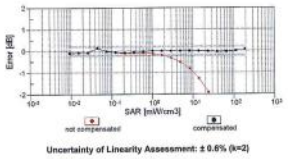
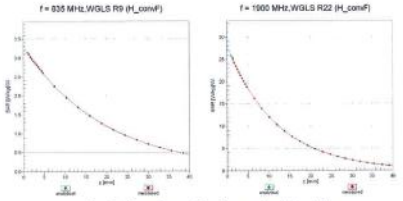
Dynamic Range f(SAR$_{head}$)
(TEM cell , f_{eval}= 1900 MHz)



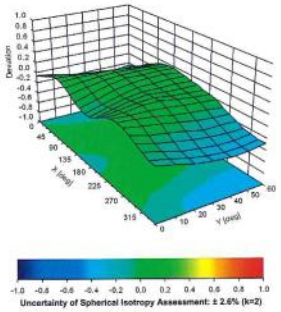


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



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:3708

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	0.5
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

EX3DV4 Sn:3708

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	134.7	± 3.5 %
		Y	0.00	0.00	1.00		130.6	
		Z	0.00	0.00	1.00		146.6	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	2.08	63.10	8.80	10.00	20.0	± 9.6 %
		Y	2.48	65.86	10.39		20.0	
		Z	2.38	65.27	10.16		20.0	
10011-CAB	UMTS-FDD (WCDMA)	X	0.85	67.45	14.21	0.00	150.0	± 9.6 %
		Y	1.09	69.70	16.45		150.0	
		Z	0.82	64.98	13.26		150.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.01	63.64	14.94	0.41	150.0	± 9.6 %
		Y	1.17	64.69	15.71		150.0	
		Z	1.06	62.92	14.22		150.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	4.58	66.67	17.05	1.48	150.0	± 9.6 %
		Y	4.74	66.85	17.01		150.0	
		Z	4.68	66.50	16.77		150.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	6.01	75.63	15.86	9.39	50.0	± 9.6 %
		Y	100.00	110.91	26.03		50.0	
		Z	92.79	103.23	24.40		50.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	5.16	73.68	15.04	8.57	50.0	± 9.6 %
		Y	48.07	101.86	23.86		50.0	
		Z	21.57	92.64	21.60		50.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	3.92	72.91	13.29	6.56	60.0	± 9.6 %
		Y	100.00	108.43	23.86		60.0	
		Z	100.00	108.46	23.85		60.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	2.62	57.94	17.97	12.57	50.0	± 9.6 %
		Y	4.66	73.67	27.15		50.0	
		Z	3.92	68.90	23.39		50.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	7.04	84.41	28.95	9.56	60.0	± 9.6 %
		Y	9.74	92.50	32.22		60.0	
		Z	7.95	87.36	30.23		60.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	2.39	69.69	11.06	4.80	80.0	± 9.6 %
		Y	100.00	107.96	22.92		80.0	
		Z	100.00	108.88	22.36		80.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	0.94	63.73	7.71	3.55	100.0	± 9.6 %
		Y	100.00	108.65	22.58		100.0	
		Z	100.00	108.65	21.15		100.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	4.92	77.66	25.34	7.80	80.0	± 9.6 %
		Y	6.13	82.26	27.21		80.0	
		Z	5.31	78.90	25.80		80.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	1.96	67.01	10.18	5.30	70.0	± 9.6 %
		Y	100.00	106.44	22.52		70.0	
		Z	100.00	105.87	22.20		70.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	0.31	60.00	3.73	1.88	100.0	± 9.6 %
		Y	100.00	105.68	20.10		100.0	
		Z	2.30	72.65	10.49		100.0	

10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	2.80	80.33	21.19	2.04	110.0	± 9.6 %
		Y	3.78	84.62	23.26		110.0	
		Z	2.28	75.84	19.58		110.0	
10062-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	4.35	66.56	16.46	0.49	100.0	± 9.6 %
		Y	4.55	66.88	16.50		100.0	
		Z	4.46	66.43	16.19		100.0	
10063-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	4.38	66.68	16.55	0.72	100.0	± 9.6 %
		Y	4.56	66.96	16.56		100.0	
		Z	4.48	66.52	16.28		100.0	
10064-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	4.61	66.88	16.75	0.86	100.0	± 9.6 %
		Y	4.82	67.17	16.77		100.0	
		Z	4.73	66.75	16.50		100.0	
10065-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	4.49	66.74	16.82	1.21	100.0	± 9.6 %
		Y	4.69	67.04	16.85		100.0	
		Z	4.61	66.63	16.58		100.0	
10066-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	4.51	66.75	16.97	1.46	100.0	± 9.6 %
		Y	4.70	67.04	16.99		100.0	
		Z	4.63	66.65	16.74		100.0	
10067-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	4.81	67.08	17.46	2.04	100.0	± 9.6 %
		Y	4.99	67.24	17.42		100.0	
		Z	4.93	66.92	17.22		100.0	
10068-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	4.85	67.02	17.63	2.55	100.0	± 9.6 %
		Y	5.03	67.20	17.58		100.0	
		Z	4.97	66.90	17.40		100.0	
10069-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	4.92	67.07	17.82	2.67	100.0	± 9.6 %
		Y	5.10	67.21	17.77		100.0	
		Z	5.05	66.94	17.60		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	4.69	66.77	17.34	1.99	100.0	± 9.6 %
		Y	4.83	66.92	17.28		100.0	
		Z	4.78	66.60	17.07		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	4.65	67.04	17.53	2.30	100.0	± 9.6 %
		Y	4.81	67.21	17.47		100.0	
		Z	4.75	66.87	17.26		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	4.74	67.29	17.87	2.63	100.0	± 9.6 %
		Y	4.88	67.39	17.79		100.0	
		Z	4.82	67.08	17.60		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	4.77	67.28	18.03	3.30	100.0	± 9.6 %
		Y	4.88	67.32	17.93		100.0	
		Z	4.83	67.03	17.76		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	4.81	67.33	18.28	3.82	90.0	± 9.6 %
		Y	4.91	67.40	18.20		90.0	
		Z	4.87	67.11	18.03		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	4.86	67.25	18.48	4.15	90.0	± 9.6 %
		Y	4.95	67.25	18.34		90.0	
		Z	4.91	67.00	18.20		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	4.90	67.36	18.58	4.30	90.0	± 9.6 %
		Y	4.98	67.34	18.45		90.0	
		Z	4.95	67.09	18.31		90.0	

10112-CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	2.71	67.16	15.65	0.00	150.0	± 9.6 %
		Y	2.97	68.02	16.17		150.0	
		Z	2.77	66.64	15.23		150.0	
10113-CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.46	66.62	15.79	0.00	150.0	± 9.6 %
		Y	2.80	69.72	16.79		150.0	
		Z	2.49	67.56	15.38		150.0	
10114-CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	4.85	67.01	16.53	0.00	150.0	± 9.6 %
		Y	5.00	67.35	16.48		150.0	
		Z	4.91	66.96	16.16		150.0	
10115-CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.11	67.12	16.58	0.00	150.0	± 9.6 %
		Y	5.25	67.39	16.50		150.0	
		Z	5.16	66.95	16.21		150.0	
10116-CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	4.92	67.15	16.62	0.00	150.0	± 9.6 %
		Y	5.08	67.53	16.49		150.0	
		Z	4.99	67.05	16.18		150.0	
10117-CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	4.82	66.67	16.48	0.00	150.0	± 9.6 %
		Y	4.98	67.26	16.45		150.0	
		Z	4.90	66.90	16.19		150.0	
10118-CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.21	67.43	16.74	0.00	150.0	± 9.6 %
		Y	5.31	67.55	16.58		150.0	
		Z	5.23	67.13	16.31		150.0	
10119-CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	4.94	67.23	16.57	0.00	150.0	± 9.6 %
		Y	5.07	67.50	16.49		150.0	
		Z	4.99	67.03	16.16		150.0	
10140-CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.06	67.10	15.77	0.00	150.0	± 9.6 %
		Y	3.31	67.96	16.16		150.0	
		Z	3.13	66.77	15.37		150.0	
10141-CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.20	67.31	16.00	0.00	150.0	± 9.6 %
		Y	3.44	68.10	16.35		150.0	
		Z	3.26	66.96	15.59		150.0	
10142-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	1.56	67.83	14.30	0.00	150.0	± 9.6 %
		Y	2.02	70.37	16.43		150.0	
		Z	1.63	66.79	14.18		150.0	
10143-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	1.85	67.47	13.73	0.00	150.0	± 9.6 %
		Y	2.59	70.90	16.42		150.0	
		Z	2.09	67.38	14.26		150.0	
10144-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	1.85	64.41	11.60	0.00	150.0	± 9.6 %
		Y	2.15	67.26	14.13		150.0	
		Z	1.87	65.03	12.55		150.0	
10145-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	0.57	60.00	5.77	0.00	150.0	± 9.6 %
		Y	1.02	64.21	10.44		150.0	
		Z	0.77	61.08	7.95		150.0	
10146-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	0.93	60.00	5.90	0.00	150.0	± 9.6 %
		Y	1.46	63.50	9.05		150.0	
		Z	1.17	61.60	7.95		150.0	
10147-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	0.94	60.00	5.95	0.00	150.0	± 9.6 %
		Y	1.64	64.86	9.75		150.0	
		Z	1.24	62.17	8.36		150.0	

10165-CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	5.04	77.28	22.08	3.01	150.0	± 9.6 %
		Y	5.71	78.05	22.54		150.0	
		Z	5.35	73.91	20.51		150.0	
10169-CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	2.91	69.00	18.95	3.01	150.0	± 9.6 %
		Y	3.07	70.75	19.61		150.0	
		Z	2.65	67.34	17.98		150.0	
10170-CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	4.24	75.64	21.55	3.01	150.0	± 9.6 %
		Y	5.36	81.23	23.58		150.0	
		Z	3.43	72.38	20.09		150.0	
10171-AAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	5.26	70.06	18.00	3.01	150.0	± 9.6 %
		Y	3.78	73.94	19.55		150.0	
		Z	2.83	68.37	17.23		150.0	
10172-CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	3.23	73.26	21.43	6.02	65.0	± 9.6 %
		Y	7.67	89.83	27.48		65.0	
		Z	5.63	83.47	25.38		65.0	
10173-CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	8.33	86.51	24.40	6.02	65.0	± 9.6 %
		Y	26.73	106.78	30.27		65.0	
		Z	8.30	87.46	24.97		65.0	
10174-CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	4.01	74.44	19.67	6.02	65.0	± 9.6 %
		Y	13.04	93.73	25.93		65.0	
		Z	5.62	80.26	21.96		65.0	
10175-CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	2.86	68.59	18.83	3.01	150.0	± 9.6 %
		Y	3.02	70.32	19.31		150.0	
		Z	2.62	67.04	17.73		150.0	
10176-CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	4.24	75.67	21.56	3.01	150.0	± 9.6 %
		Y	5.38	81.27	23.59		150.0	
		Z	3.44	72.40	20.10		150.0	
10177-CAI	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	2.89	68.75	18.73	3.01	150.0	± 9.6 %
		Y	3.05	70.51	19.41		150.0	
		Z	2.64	67.17	17.82		150.0	
10178-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	4.20	75.43	21.44	3.01	150.0	± 9.6 %
		Y	5.29	80.92	23.43		150.0	
		Z	3.41	72.22	20.00		150.0	
10179-CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	3.65	72.46	19.52	3.01	150.0	± 9.6 %
		Y	4.45	77.23	21.35		150.0	
		Z	3.09	70.20	18.50		150.0	
10180-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	3.28	70.00	17.96	3.01	150.0	± 9.6 %
		Y	3.76	73.64	19.49		150.0	
		Z	2.82	68.32	17.19		150.0	
10181-CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	2.88	68.73	18.72	3.01	150.0	± 9.6 %
		Y	3.00	70.49	19.41		150.0	
		Z	2.64	67.16	17.81		150.0	
10182-CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	4.19	75.40	21.42	3.01	150.0	± 9.6 %
		Y	5.28	80.88	23.42		150.0	
		Z	3.40	72.20	19.98		150.0	
10183-AAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	3.25	69.98	17.95	3.01	150.0	± 9.6 %
		Y	3.76	73.61	19.47		150.0	
		Z	2.82	68.30	17.18		150.0	

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10223-CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.06	67.07	16.58	0.00	150.0	± 9.6 %
		Y	5.23	67.44	16.54		150.0	
		Z	5.15	67.00	16.26		150.0	
10224-CAC	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	4.84	67.01	16.46	0.00	150.0	± 9.6 %
		Y	4.99	67.37	16.42		150.0	
		Z	4.90	66.88	16.11		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	2.44	65.81	14.46	0.00	150.0	± 9.6 %
		Y	2.73	66.77	15.43		150.0	
		Z	2.56	65.53	14.48		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	8.96	67.92	24.97	6.02	65.0	± 9.6 %
		Y	31.18	109.55	31.14		65.0	
		Z	8.85	68.69	25.46		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	8.31	65.60	23.69	6.02	65.0	± 9.6 %
		Y	25.63	104.26	28.94		65.0	
		Z	8.67	67.04	24.32		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	8.80	67.47	26.82	6.02	65.0	± 9.6 %
		Y	11.49	97.68	30.08		65.0	
		Z	8.33	66.07	26.42		65.0	
10229-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	8.39	66.61	24.44	6.02	65.0	± 9.6 %
		Y	27.05	106.96	30.33		65.0	
		Z	8.36	67.57	25.02		65.0	
10230-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	7.76	64.41	23.10	6.02	65.0	± 9.6 %
		Y	22.43	101.97	28.22		65.0	
		Z	8.06	65.94	23.87		65.0	
10231-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	6.41	66.23	26.29	6.02	65.0	± 9.6 %
		Y	10.71	96.21	29.53		65.0	
		Z	6.06	65.16	26.01		65.0	
10232-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	8.37	66.60	24.43	6.02	65.0	± 9.6 %
		Y	27.00	106.94	30.32		65.0	
		Z	8.35	67.55	25.01		65.0	
10233-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	7.75	64.38	23.10	6.02	65.0	± 9.6 %
		Y	22.36	101.93	28.21		65.0	
		Z	8.04	65.91	23.86		65.0	
10234-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	6.12	65.18	25.78	6.02	65.0	± 9.6 %
		Y	10.09	94.88	28.97		65.0	
		Z	5.85	64.36	25.60		65.0	
10235-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	8.39	66.63	24.45	6.02	65.0	± 9.6 %
		Y	27.06	107.02	30.34		65.0	
		Z	8.35	67.57	25.02		65.0	
10236-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	7.81	64.48	23.12	6.02	65.0	± 9.6 %
		Y	22.71	102.14	28.26		65.0	
		Z	8.11	66.03	23.90		65.0	
10237-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	6.42	66.27	26.30	6.02	65.0	± 9.6 %
		Y	10.73	96.29	29.56		65.0	
		Z	6.06	65.19	26.02		65.0	
10238-CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	8.36	66.57	24.43	6.02	65.0	± 9.6 %
		Y	26.94	106.92	30.31		65.0	
		Z	8.33	67.52	25.00		65.0	

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10255-CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	5.52	76.10	20.55	3.98	65.0	± 9.6 %
		Y	5.54	76.25	21.42		65.0	
		Z	5.76	78.07	20.82		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	2.45	63.21	9.47	3.98	65.0	± 9.6 %
		Y	3.51	67.37	12.56		65.0	
		Z	3.12	66.29	12.00		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	2.44	62.90	9.21	3.98	65.0	± 9.6 %
		Y	3.41	66.94	12.16		65.0	
		Z	3.06	65.76	11.83		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	1.95	63.35	9.82	3.98	65.0	± 9.6 %
		Y	3.32	69.86	14.27		65.0	
		Z	2.71	67.24	12.82		65.0	
10259-CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	4.04	70.45	16.24	3.98	65.0	± 9.6 %
		Y	5.26	74.31	18.63		65.0	
		Z	4.62	72.23	17.59		65.0	
10260-CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	4.07	70.21	16.13	3.98	65.0	± 9.6 %
		Y	5.26	73.97	18.48		65.0	
		Z	4.65	71.99	17.49		65.0	
10261-CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	4.80	75.96	18.89	3.98	65.0	± 9.6 %
		Y	6.67	80.86	21.37		65.0	
		Z	5.33	77.24	19.86		65.0	
10262-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	5.01	74.07	19.48	3.98	65.0	± 9.6 %
		Y	5.96	76.46	20.76		65.0	
		Z	5.33	74.50	19.86		65.0	
10263-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	4.61	71.41	17.89	3.98	65.0	± 9.6 %
		Y	5.53	73.93	19.33		65.0	
		Z	5.02	72.30	18.84		65.0	
10264-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	5.70	78.64	21.00	3.98	65.0	± 9.6 %
		Y	7.20	81.83	22.43		65.0	
		Z	5.93	78.58	21.13		65.0	
10265-CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	4.98	71.77	18.88	3.98	65.0	± 9.6 %
		Y	5.76	73.73	19.76		65.0	
		Z	5.31	72.30	19.12		65.0	
10266-CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	5.42	73.17	19.92	3.98	65.0	± 9.6 %
		Y	6.19	74.91	20.65		65.0	
		Z	5.72	73.47	20.01		65.0	
10267-CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	6.73	76.55	20.61	3.98	65.0	± 9.6 %
		Y	6.86	78.96	21.48		65.0	
		Z	6.00	76.58	20.55		65.0	
10268-CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	5.67	72.08	19.66	3.98	65.0	± 9.6 %
		Y	6.39	73.71	20.23		65.0	
		Z	5.98	72.51	19.72		65.0	
10269-CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	5.68	71.75	19.55	3.98	65.0	± 9.6 %
		Y	6.37	73.31	20.11		65.0	
		Z	5.99	72.18	19.61		65.0	
10270-CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	5.72	74.15	19.92	3.98	65.0	± 9.6 %
		Y	6.58	75.97	20.51		65.0	
		Z	6.01	74.38	19.88		65.0	

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10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	4.86	67.09	16.35	4.96	50.0	± 9.6 %
		Y	4.83	66.01	17.92		50.0	
		Z	4.77	65.64	17.56		50.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	4.65	66.57	17.82	4.17	50.0	± 9.6 %
		Y	4.84	65.92	17.45		50.0	
		Z	4.67	65.48	17.05		50.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	4.96	71.08	19.94	6.02	35.0	± 9.6 %
		Y	4.91	66.82	19.75		35.0	
		Z	4.55	66.96	19.46		35.0	
10306-AAA	IEEE 802.16e WiMAX (29:16, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	4.88	68.79	19.42	6.02	35.0	± 9.6 %
		Y	4.69	67.30	19.20		35.0	
		Z	4.71	67.32	18.96		35.0	
10307-AAA	IEEE 802.16e WiMAX (29:16, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	4.82	69.04	19.38	6.02	35.0	± 9.6 %
		Y	4.60	67.51	19.18		35.0	
		Z	4.62	67.50	18.94		35.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	4.84	69.40	19.69	6.02	35.0	± 9.6 %
		Y	4.82	67.75	19.38		35.0	
		Z	4.62	67.77	19.11		35.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	4.90	68.85	19.51	6.02	35.0	± 9.6 %
		Y	4.73	67.44	19.31		35.0	
		Z	4.74	67.44	19.08		35.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	4.87	68.98	19.46	6.02	35.0	± 9.6 %
		Y	4.65	67.42	19.21		35.0	
		Z	4.68	67.43	18.95		35.0	
10311-AAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	2.77	68.48	16.08	0.00	150.0	± 9.6 %
		Y	3.14	70.00	16.79		150.0	
		Z	2.75	67.58	15.39		150.0	
10313-AAA	iDEN 1:3	X	2.37	67.29	12.86	6.99	70.0	± 9.6 %
		Y	3.64	72.55	15.49		70.0	
		Z	2.87	69.60	14.27		70.0	
10314-AAA	iDEN 1:6	X	3.93	74.44	18.42	10.00	30.0	± 9.6 %
		Y	5.12	82.13	21.83		30.0	
		Z	4.16	78.04	19.55		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 98pc duty cycle)	X	0.92	63.83	14.93	0.17	150.0	± 9.6 %
		Y	1.08	64.70	15.74		150.0	
		Z	0.97	63.77	14.10		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 98pc duty cycle)	X	4.25	66.52	16.20	0.17	150.0	± 9.6 %
		Y	4.45	66.89	16.29		150.0	
		Z	4.35	66.39	15.94		150.0	
10317-AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 98pc duty cycle)	X	4.28	66.52	16.20	0.17	150.0	± 9.6 %
		Y	4.45	66.89	16.29		150.0	
		Z	4.35	66.39	15.94		150.0	
10400-AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.30	66.79	16.22	0.00	150.0	± 9.6 %
		Y	4.54	67.23	16.32		150.0	
		Z	4.43	66.67	15.93		150.0	
10401-AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	4.98	66.55	16.27	0.00	150.0	± 9.6 %
		Y	5.19	67.10	16.33		150.0	
		Z	5.12	66.71	16.08		150.0	

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10427-AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.02	67.00	16.51	0.00	150.0	± 9.6 %
		Y	5.19	67.39	16.49		150.0	
		Z	5.11	66.94	16.20		150.0	
10430-AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.38	73.73	18.66	0.00	150.0	± 9.6 %
		Y	4.49	73.15	19.04		150.0	
		Z	4.10	71.38	17.94		150.0	
10431-AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	3.79	67.15	15.96	0.00	150.0	± 9.6 %
		Y	4.07	67.63	16.28		150.0	
		Z	3.92	66.88	15.74		150.0	
10432-AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.13	66.99	16.21	0.00	150.0	± 9.6 %
		Y	4.37	67.41	16.36		150.0	
		Z	4.25	66.79	15.92		150.0	
10433-AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.39	66.91	16.34	0.00	150.0	± 9.6 %
		Y	4.62	67.33	16.42		150.0	
		Z	4.51	66.77	16.04		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.42	74.13	18.26	0.00	150.0	± 9.6 %
		Y	4.75	74.54	19.12		150.0	
		Z	4.17	72.08	17.89		150.0	
10435-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.40	89.31	20.93	3.23	80.0	± 9.6 %
		Y	100.00	117.05	27.59		80.0	
		Z	11.08	92.89	22.58		80.0	
10447-AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	2.96	66.55	14.33	0.00	150.0	± 9.6 %
		Y	3.37	67.75	15.48		150.0	
		Z	3.15	66.53	14.56		150.0	
10448-AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	3.66	66.95	15.83	0.00	150.0	± 9.6 %
		Y	3.93	67.43	16.16		150.0	
		Z	3.78	66.86	15.60		150.0	
10449-AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	3.97	66.81	16.10	0.00	150.0	± 9.6 %
		Y	4.20	67.26	16.26		150.0	
		Z	4.08	66.61	15.81		150.0	
10450-AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.19	66.66	16.18	0.00	150.0	± 9.6 %
		Y	4.40	67.13	16.29		150.0	
		Z	4.29	66.54	15.89		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	2.70	65.89	13.23	0.00	150.0	± 9.6 %
		Y	3.22	67.79	14.95		150.0	
		Z	2.96	66.32	13.68		150.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	5.05	67.79	16.82	0.00	150.0	± 9.6 %
		Y	5.10	68.03	16.89		150.0	
		Z	5.05	67.70	16.49		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.57	65.33	15.93	0.00	150.0	± 9.6 %
		Y	3.72	65.64	16.01		150.0	
		Z	3.64	65.12	15.61		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	3.31	69.86	15.53	0.00	150.0	± 9.6 %
		Y	4.24	73.24	18.12		150.0	
		Z	3.63	70.45	16.45		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	5.26	71.27	18.79	0.00	150.0	± 9.6 %
		Y	5.12	69.87	18.95		150.0	
		Z	4.91	69.06	17.98		150.0	

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10427-AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.02	67.00	16.51	0.00	150.0	± 9.6 %
		Y	5.19	67.39	16.49		150.0	
		Z	5.11	66.94	16.20		150.0	
10430-AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.38	73.73	18.66	0.00	150.0	± 9.6 %
		Y	4.49	73.15	18.04		150.0	
		Z	4.10	71.38	17.94		150.0	
10431-AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	3.79	67.15	15.96	0.00	150.0	± 9.6 %
		Y	4.07	67.63	16.28		150.0	
		Z	3.92	66.88	15.74		150.0	
10432-AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.13	66.99	16.21	0.00	150.0	± 9.6 %
		Y	4.37	67.41	16.36		150.0	
		Z	4.25	66.79	15.92		150.0	
10433-AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.39	66.91	16.34	0.00	150.0	± 9.6 %
		Y	4.62	67.33	16.42		150.0	
		Z	4.51	66.77	16.04		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.42	74.13	18.26	0.00	150.0	± 9.6 %
		Y	4.75	74.54	18.12		150.0	
		Z	4.17	72.09	17.69		150.0	
10435-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.40	89.31	20.93	3.23	80.0	± 9.6 %
		Y	100.00	117.05	27.58		80.0	
		Z	11.08	92.88	22.58		80.0	
10447-AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	2.96	66.55	14.33	0.00	150.0	± 9.6 %
		Y	3.37	67.75	15.49		150.0	
		Z	3.15	66.53	14.56		150.0	
10448-AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	3.06	66.95	15.83	0.00	150.0	± 9.6 %
		Y	3.93	67.43	16.16		150.0	
		Z	3.78	66.66	15.60		150.0	
10449-AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipng 44%)	X	3.07	66.81	16.10	0.00	150.0	± 9.6 %
		Y	4.20	67.26	16.28		150.0	
		Z	4.08	66.61	15.81		150.0	
10450-AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.19	66.68	16.18	0.00	150.0	± 9.6 %
		Y	4.40	67.13	16.29		150.0	
		Z	4.29	66.54	15.89		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	2.70	65.69	13.23	0.00	150.0	± 9.6 %
		Y	3.22	67.79	14.95		150.0	
		Z	2.96	66.32	13.88		150.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.06	67.79	16.82	0.00	150.0	± 9.6 %
		Y	6.10	68.03	16.89		150.0	
		Z	6.05	67.70	16.49		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.57	65.33	15.93	0.00	150.0	± 9.6 %
		Y	3.72	65.64	16.01		150.0	
		Z	3.64	65.12	15.61		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	3.31	69.86	15.53	0.00	150.0	± 9.6 %
		Y	4.24	73.24	18.12		150.0	
		Z	3.83	70.45	16.45		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	5.26	71.27	18.79	0.00	150.0	± 9.6 %
		Y	5.12	69.87	18.56		150.0	
		Z	4.91	69.06	17.98		150.0	

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10477-AAF	LTE-TDD (SC-FDMA, 1 RB, 30 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.86	60.00	7.77	3.23	80.0	± 9.6 %
		Y	0.86	60.00	7.37		80.0	
		Z	0.85	60.75	8.50		80.0	
10478-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.96	60.00	7.29	3.23	80.0	± 9.6 %
		Y	0.89	60.00	6.85		80.0	
		Z	0.89	60.00	7.59		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	49.10	109.19	27.60	3.23	80.0	± 9.6 %
		Y	15.72	96.20	25.05		80.0	
		Z	6.90	84.81	21.76		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.04	68.21	13.43	3.23	80.0	± 9.6 %
		Y	7.14	79.40	17.60		80.0	
		Z	3.95	72.86	15.52		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.13	65.01	11.27	3.23	80.0	± 9.6 %
		Y	4.28	72.85	14.93		80.0	
		Z	2.95	68.94	13.69		80.0	
10482-AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.17	61.31	9.58	2.23	80.0	± 9.6 %
		Y	2.63	70.92	15.29		80.0	
		Z	1.70	64.90	12.42		80.0	
10483-AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.50	60.67	8.88	2.23	80.0	± 9.6 %
		Y	3.07	68.75	13.76		80.0	
		Z	2.34	66.52	12.29		80.0	
10484-AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.49	60.41	8.72	2.23	80.0	± 9.6 %
		Y	2.87	67.74	13.34		80.0	
		Z	2.25	64.87	11.88		80.0	
10485-AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.15	68.29	14.58	2.23	80.0	± 9.6 %
		Y	3.39	74.14	18.00		80.0	
		Z	2.32	68.58	15.36		80.0	
10486-AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.85	63.20	11.43	2.23	80.0	± 9.6 %
		Y	2.87	68.86	15.17		80.0	
		Z	2.31	65.39	13.27		80.0	
10487-AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.86	62.92	11.27	2.23	80.0	± 9.6 %
		Y	2.84	68.37	14.93		80.0	
		Z	2.33	65.12	13.13		80.0	
10488-AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.93	71.00	17.45	2.23	80.0	± 9.6 %
		Y	3.58	73.22	18.66		80.0	
		Z	2.85	69.54	16.89		80.0	
10489-AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.50	67.67	15.87	2.23	80.0	± 9.6 %
		Y	3.42	69.49	17.05		80.0	
		Z	2.98	67.24	15.84		80.0	
10490-AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.97	67.51	15.80	2.23	80.0	± 9.6 %
		Y	3.50	69.29	16.97		80.0	
		Z	3.07	67.17	15.82		80.0	
10491-AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.19	69.71	17.36	2.23	80.0	± 9.6 %
		Y	3.74	71.43	18.14		80.0	
		Z	3.20	68.82	16.88		80.0	
10492-AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.30	67.35	16.40	2.23	80.0	± 9.6 %
		Y	3.73	68.60	17.08		80.0	
		Z	3.40	66.98	16.20		80.0	

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10508-AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.41	67.37	16.58	2.23	80.0	± 9.6 %
		Y	3.82	68.59	17.16		80.0	
		Z	3.50	67.03	16.33		80.0	
10509-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.78	68.64	17.37	2.23	80.0	± 9.6 %
		Y	4.35	71.43	18.03		80.0	
		Z	3.81	69.14	16.84		80.0	
10510-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.60	67.26	16.80	2.23	80.0	± 9.6 %
		Y	4.21	69.49	17.24		80.0	
		Z	3.91	67.13	16.53		80.0	
10511-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.87	67.13	16.77	2.23	80.0	± 9.6 %
		Y	4.26	69.26	17.18		80.0	
		Z	3.98	66.99	16.51		80.0	
10512-AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.83	70.87	17.64	2.23	80.0	± 9.6 %
		Y	4.57	72.96	18.50		80.0	
		Z	3.85	70.11	17.19		80.0	
10513-AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.69	67.39	16.85	2.23	80.0	± 9.6 %
		Y	4.10	68.72	17.33		80.0	
		Z	3.78	67.25	16.67		80.0	
10514-AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.74	67.09	16.78	2.23	80.0	± 9.6 %
		Y	4.12	68.32	17.22		80.0	
		Z	3.84	66.97	16.51		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.81	63.02	14.44	0.00	150.0	± 9.6 %
		Y	0.96	64.09	15.32		150.0	
		Z	0.87	62.17	13.59		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	0.90	79.74	18.57	0.00	150.0	± 9.6 %
		Y	0.90	77.81	20.96		150.0	
		Z	0.42	65.93	13.72		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.66	65.37	15.03	0.00	150.0	± 9.6 %
		Y	0.83	66.70	16.38		150.0	
		Z	0.69	63.32	13.96		150.0	
10518-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.19	66.67	16.18	0.00	150.0	± 9.6 %
		Y	4.40	67.06	16.28		150.0	
		Z	4.30	66.49	15.88		150.0	
10519-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.33	66.84	16.27	0.00	150.0	± 9.6 %
		Y	4.56	67.23	16.37		150.0	
		Z	4.45	66.68	15.98		150.0	
10520-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.19	66.76	16.18	0.00	150.0	± 9.6 %
		Y	4.42	67.19	16.30		150.0	
		Z	4.30	66.60	15.89		150.0	
10521-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.12	66.71	16.15	0.00	150.0	± 9.6 %
		Y	4.36	67.19	16.29		150.0	
		Z	4.24	66.57	15.86		150.0	
10522-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.17	66.64	16.25	0.00	150.0	± 9.6 %
		Y	4.41	67.31	16.38		150.0	
		Z	4.29	66.70	15.97		150.0	

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10541-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	4.79	66.10	16.07	0.00	150.0	± 9.6 %
		Y	4.98	66.99	16.11		150.0	
		Z	4.87	66.06	15.76		150.0	
10542-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	4.95	66.23	16.15	0.00	150.0	± 9.6 %
		Y	5.13	66.67	16.16		150.0	
		Z	5.03	66.16	15.84		150.0	
10543-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.05	66.42	16.28	0.00	150.0	± 9.6 %
		Y	5.19	66.88	16.19		150.0	
		Z	5.10	66.20	15.89		150.0	
10544-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.18	66.17	16.05	0.00	150.0	± 9.6 %
		Y	5.33	66.70	16.06		150.0	
		Z	5.24	66.20	15.77		150.0	
10545-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.40	66.80	16.32	0.00	150.0	± 9.6 %
		Y	5.49	67.06	16.21		150.0	
		Z	5.41	66.62	15.94		150.0	
10546-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.21	66.30	16.09	0.00	150.0	± 9.6 %
		Y	5.36	66.84	16.12		150.0	
		Z	5.27	66.33	15.81		150.0	
10547-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.35	66.64	16.25	0.00	150.0	± 9.6 %
		Y	5.43	66.89	16.14		150.0	
		Z	5.35	66.41	15.85		150.0	
10548-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	5.50	67.27	16.54	0.00	150.0	± 9.6 %
		Y	5.58	67.53	16.43		150.0	
		Z	5.51	67.08	16.15		150.0	
10550-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.35	66.79	16.34	0.00	150.0	± 9.6 %
		Y	5.40	66.91	16.17		150.0	
		Z	5.32	66.47	15.89		150.0	
10551-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.19	66.22	16.03	0.00	150.0	± 9.6 %
		Y	5.38	66.80	16.10		150.0	
		Z	5.28	66.32	15.78		150.0	
10552-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.18	66.28	16.05	0.00	150.0	± 9.6 %
		Y	5.34	66.81	16.08		150.0	
		Z	5.24	66.29	15.77		150.0	
10553-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.23	66.22	16.05	0.00	150.0	± 9.6 %
		Y	5.40	66.78	16.09		150.0	
		Z	5.30	66.27	15.79		150.0	
10554-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	5.63	66.53	16.15	0.00	150.0	± 9.6 %
		Y	5.73	67.01	16.14		150.0	
		Z	5.65	66.55	15.87		150.0	
10555-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	5.73	66.80	16.27	0.00	150.0	± 9.6 %
		Y	5.83	67.25	16.24		150.0	
		Z	5.75	66.79	15.97		150.0	
10556-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	5.79	66.96	16.35	0.00	150.0	± 9.6 %
		Y	5.86	67.32	16.27		150.0	
		Z	5.79	66.88	16.01		150.0	
10557-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	5.70	66.72	16.24	0.00	150.0	± 9.6 %
		Y	5.83	67.23	16.24		150.0	
		Z	5.74	66.76	15.96		150.0	

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10607-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.30	65.88	16.10	0.46	130.0	± 9.6 %
		Y	4.50	66.24	16.15		130.0	
		Z	4.40	65.72	15.80		130.0	
10608-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.43	66.20	16.24	0.46	130.0	± 9.6 %
		Y	4.65	66.59	16.30		130.0	
		Z	4.54	66.06	15.96		130.0	
10609-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.33	66.00	16.03	0.46	130.0	± 9.6 %
		Y	4.54	66.42	16.12		130.0	
		Z	4.44	65.87	15.76		130.0	
10610-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.38	66.21	16.23	0.46	130.0	± 9.6 %
		Y	4.60	66.60	16.30		130.0	
		Z	4.49	66.05	15.93		130.0	
10611-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.29	65.97	16.05	0.46	130.0	± 9.6 %
		Y	4.51	66.39	16.13		130.0	
		Z	4.40	65.84	15.77		130.0	
10612-AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.28	66.08	16.08	0.46	130.0	± 9.6 %
		Y	4.51	66.52	16.17		130.0	
		Z	4.39	65.98	15.80		130.0	
10613-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.27	65.86	15.89	0.46	130.0	± 9.6 %
		Y	4.50	66.34	16.02		130.0	
		Z	4.39	65.79	15.65		130.0	
10614-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.25	66.17	16.21	0.46	130.0	± 9.6 %
		Y	4.47	66.62	16.30		130.0	
		Z	4.36	66.03	15.92		130.0	
10615-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.27	65.75	15.76	0.46	130.0	± 9.6 %
		Y	4.50	66.18	15.88		130.0	
		Z	4.39	65.65	15.52		130.0	
10616-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	4.98	66.20	16.34	0.46	130.0	± 9.6 %
		Y	5.12	66.54	16.39		130.0	
		Z	5.04	66.10	16.02		130.0	
10617-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.02	66.34	16.39	0.46	130.0	± 9.6 %
		Y	5.17	66.69	16.34		130.0	
		Z	5.10	66.26	16.07		130.0	
10618-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	4.91	66.35	16.40	0.46	130.0	± 9.6 %
		Y	5.08	66.77	16.40		130.0	
		Z	5.00	66.31	16.11		130.0	
10619-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	4.98	66.33	16.32	0.46	130.0	± 9.6 %
		Y	5.08	66.52	16.20		130.0	
		Z	5.01	66.09	15.90		130.0	
10620-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.02	66.21	16.31	0.46	130.0	± 9.6 %
		Y	5.16	66.53	16.25		130.0	
		Z	5.09	66.11	15.99		130.0	
10621-AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.01	66.30	16.50	0.46	130.0	± 9.6 %
		Y	5.16	66.72	16.48		130.0	
		Z	5.10	66.27	16.20		130.0	
10622-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.01	66.42	16.55	0.46	130.0	± 9.6 %
		Y	5.16	66.62	16.52		130.0	
		Z	5.09	66.37	16.24		130.0	

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10639-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	5.86	66.76	16.50	0.46	130.0	± 9.6 %
		Y	5.96	67.16	16.45		130.0	
		Z	5.90	66.78	16.22		130.0	
10640-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	5.79	66.55	16.33	0.46	130.0	± 9.6 %
		Y	5.95	67.13	16.36		130.0	
		Z	5.88	66.72	16.13		130.0	
10641-AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	5.97	66.86	16.51	0.46	130.0	± 9.6 %
		Y	6.01	67.08	16.36		130.0	
		Z	5.96	66.74	16.16		130.0	
10642-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	5.94	66.92	16.72	0.46	130.0	± 9.6 %
		Y	6.08	67.36	16.68		130.0	
		Z	5.99	66.96	16.46		130.0	
10643-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	5.78	66.59	16.43	0.46	130.0	± 9.6 %
		Y	5.89	67.02	16.39		130.0	
		Z	5.83	66.65	16.18		130.0	
10644-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	5.83	66.73	16.52	0.46	130.0	± 9.6 %
		Y	5.98	67.32	16.56		130.0	
		Z	5.91	66.89	16.31		130.0	
10645-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	6.16	67.41	16.83	0.46	130.0	± 9.6 %
		Y	6.07	67.25	16.48		130.0	
		Z	6.04	66.95	16.31		130.0	
10646-AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	9.04	92.63	31.00	9.30	60.0	± 9.6 %
		Y	16.22	106.06	35.45		60.0	
		Z	10.43	96.01	32.33		60.0	
10647-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	9.14	91.27	30.60	9.30	60.0	± 9.6 %
		Y	13.94	103.45	34.79		60.0	
		Z	9.34	94.22	31.85		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.32	60.00	5.03	0.00	150.0	± 9.6 %
		Y	0.59	63.51	9.94		150.0	
		Z	0.44	60.36	7.17		150.0	
10652-AAD	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.20	66.29	15.67	2.23	80.0	± 9.6 %
		Y	3.56	67.36	16.44		80.0	
		Z	3.28	65.94	15.59		80.0	
10653-AAD	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	3.78	65.76	16.24	2.23	80.0	± 9.6 %
		Y	4.06	66.53	16.60		80.0	
		Z	3.87	65.57	16.04		80.0	
10654-AAD	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	3.81	65.38	16.33	2.23	80.0	± 9.6 %
		Y	4.06	66.15	16.62		80.0	
		Z	3.89	65.26	16.10		80.0	
10655-AAE	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	3.89	65.27	16.38	2.23	80.0	± 9.6 %
		Y	4.12	66.08	16.65		80.0	
		Z	3.96	65.22	16.15		80.0	
10698-AAA	Pulse Waveform (200Hz, 10%)	X	3.95	69.00	12.97	10.00	50.0	± 9.6 %
		Y	7.30	77.55	16.50		50.0	
		Z	6.32	75.75	16.00		50.0	
10699-AAA	Pulse Waveform (200Hz, 20%)	X	2.50	66.91	10.74	6.99	60.0	± 9.6 %
		Y	30.69	93.57	19.93		60.0	
		Z	9.16	81.25	16.51		60.0	

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D750V3 Sn:1101

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Client SRTC Certificate No: Z17-97134

CALIBRATION CERTIFICATE

Object D750V3 - SN: 1101

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

Calibration date: September 13, 2017

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102196	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
Power sensor NRV-Z5	100596	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
Reference Probe EX3DV4	SN 7433	26-Sep-16(SPEAG,No.EX3-7433_Sep16)	Sep-17
DAE4	SN 1331	19-Jan-17(CTTL-SPEAG,No.Z17-97015)	Jan-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	13-Jan-17 (CTTL, No.J17X00286)	Jan-18
Network Analyzer E5071C	MY46111013	13-Jan-17 (CTTL, No.J17X00285)	Jan-18

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

Issued: September 16, 2017

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

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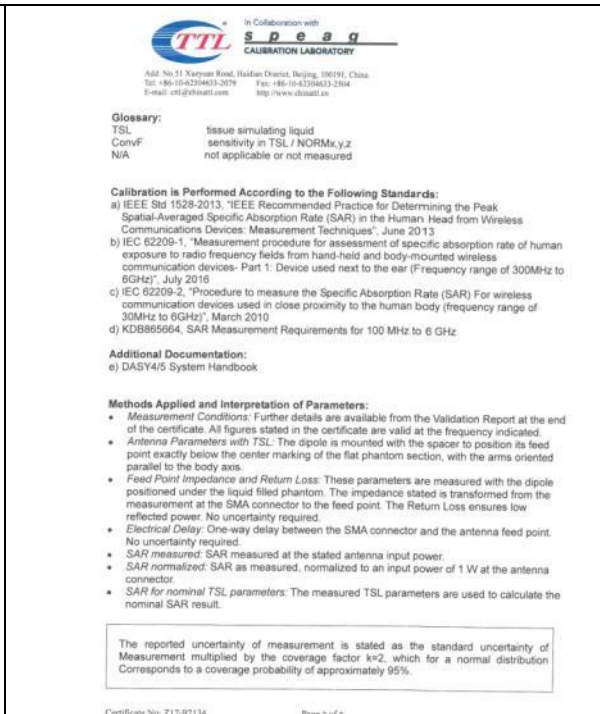

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Glossary:

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

Calibration is Performed According to the Following Standards:

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 assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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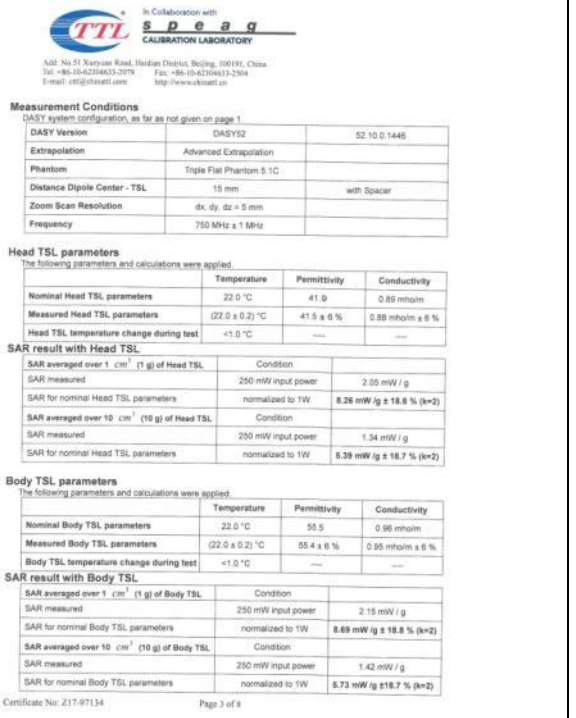

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Measurement Conditions
DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters
The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.5 ± 6 %	0.88 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.05 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**8.26 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.34 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**5.39 mW /g ± 18.7 % (k=2)**

Body TSL parameters
The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.4 ± 6 %	0.95 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	---	---

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.15 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**8.69 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.42 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**5.73 mW /g ±18.7 % (k=2)**

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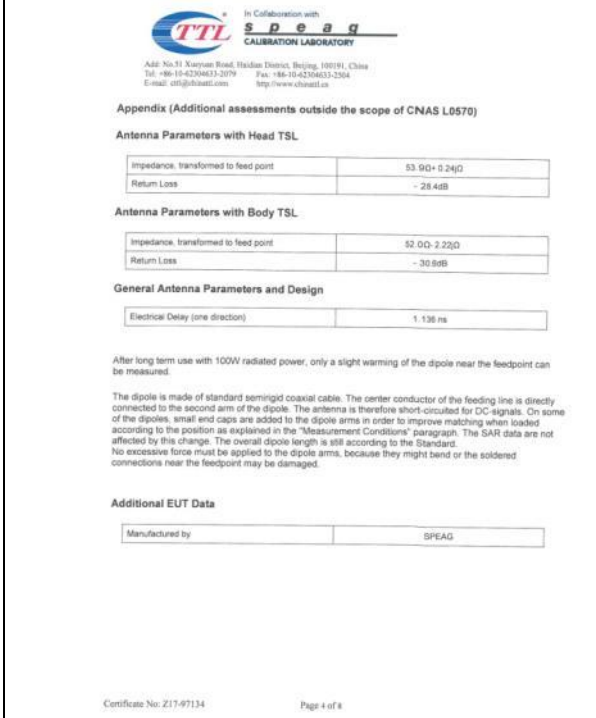

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.9Ω+ 0.24jΩ
Return Loss	- 28.4dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	52.0Ω- 2.22jΩ
Return Loss	- 30.6dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.136 ns

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

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

Additional EUT Data

Manufactured by	SPEAG

Certificate No: Z17-97134 Page 4 of 8

D750V3 Sn:1101

In Collaboration with
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E-mail: ctl@chinattl.com http://www.chinattl.cn

DASY5 Validation Report for Head TSL Date: 09.13.2017

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1101

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

Medium parameters used: f = 750 MHz; σ = 0.879 S/m; ε_r = 41.54; ρ = 1000 kg/m^3

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(10.01, 10.01, 10.01); Calibrated: 9/26/2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 1/19/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

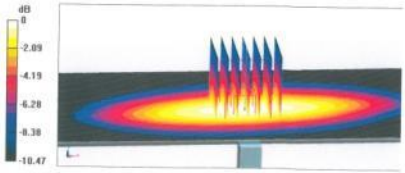
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.10 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 3.17 W/kg

SAR(1 g) = 2.05 W/kg; SAR(10 g) = 1.34 W/kg

Maximum value of SAR (measured) = 2.77 W/kg



0 dB = 2.77 W/kg = 4.42 dBW/kg

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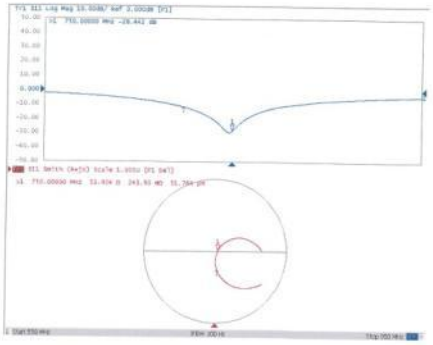
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL Date: 09.13.2017

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1101

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

Medium parameters used: f = 750 MHz; σ = 0.946 S/m; ε_r = 55.41; ρ = 1000 kg/m^3

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(9.83, 9.83, 9.83); Calibrated: 9/26/2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 1/19/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

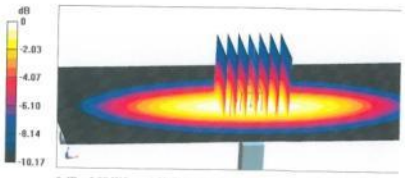
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.35 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.27 W/kg

SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.42 W/kg

Maximum value of SAR (measured) = 2.88 W/kg



0 dB = 2.88 W/kg = 4.59 dBW/kg

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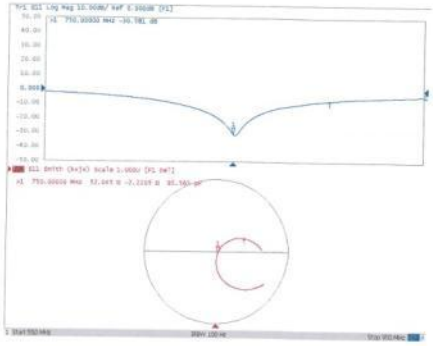
Impedance Measurement Plot for Body TSL



D1800V2 Sn:2d084

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Client SRTC Certificate No: Z17-97138

CALIBRATION CERTIFICATE

Object D1800V2 - SN: 2d084

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

Calibration date: September 15, 2017

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	102196	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
Power sensor NRP-Z91	100596	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
Reference Probe EX3DV4	SN 7433	26-Sep-16(SPEAG,No.EX3-7433_Sep16)	Sep-17
DAE4	SN 1331	19-Jan-17(CTTL-SPEAG,No.Z17-97015)	Jan-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	13-Jan-17 (CTTL, No.J17X00286)	Jan-18
Network Analyzer E5071C	MY46110673	13-Jan-17 (CTTL, No.J17X00285)	Jan-18

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

Issued: September 18, 2017

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Glossary:

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

Calibration is Performed According to the Following Standards:

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, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.4 ± 6 %	1.42 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.79 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**38.9 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.12 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.4 mW /g ± 18.7 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.8 ± 6 %	1.50 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	---	---

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.84 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**39.7 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.18 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**20.8 mW /g ± 18.7 % (k=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.3Ω- 1.55jΩ
Return Loss	- 35.4dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.0Ω- 1.32jΩ
Return Loss	- 27.1dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.316 ns

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

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

Additional EUT Data

Manufactured by	SPEAG

D1800V2 Sn:2d084

In Collaboration with CALIBRATION LABORATORY

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Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
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DASY5 Validation Report for Head TSL Date: 09.15.2017

Test Laboratory: CTTL, Beijing, China

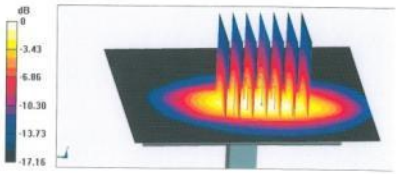
DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d084

Communication System: UID 0, CW; Frequency: 1800 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.423 S/m; ε_r = 40.37; ρ = 1000 kg/m3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(7.97, 7.97, 7.97); Calibrated: 9/26/2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 1/19/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.90 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 18.7 W/kg
SAR(1 g) = 9.79 W/kg; SAR(10 g) = 5.12 W/kg
Maximum value of SAR (measured) = 15.5 W/kg



0 dB = 15.5 W/kg = 11.90 dBW/kg

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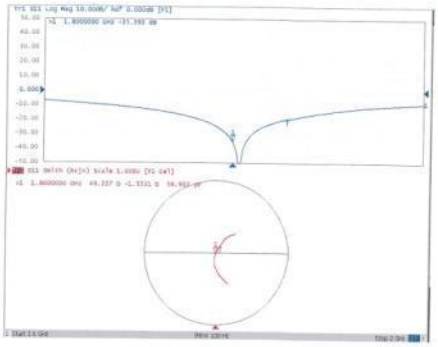
Impedance Measurement Plot for Head TSL



Certificate No: Z17-97138 Page 6 of 8

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E-mail: cttl@chinattl.com http://www.chinattl.cn

DASY5 Validation Report for Body TSL Date: 09.14.2017

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d084

Communication System: UID 0, CW; Frequency: 1800 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.503 S/m; ε_r = 53.79; ρ = 1000 kg/m^3
Phantom section: Center Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(7.75, 7.75, 7.75); Calibrated: 9/26/2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 1/19/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7413)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.57 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 18.0 W/kg
SAR(1 g) = 9.84 W/kg; SAR(10 g) = 5.18 W/kg
Maximum value of SAR (measured) = 15.2 W/kg

0 dB = 15.2 W/kg = 11.82 dBW/kg

Certificate No: Z17-97138 Page 7 of 8

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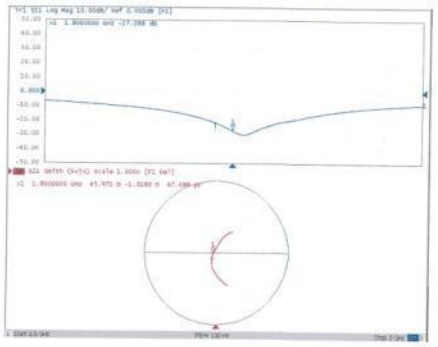
Impedance Measurement Plot for Body TSL



Certificate No: Z17-97138 Page 8 of 8

D2000V2 Sn:1009

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E-mail: ctt@chinattl.com http://www.chinattl.cn

Client SRTC Certificate No: Z18-97021

CALIBRATION CERTIFICATE

Object D2000V2 - SN: 1009

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

Calibration date: February 1, 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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102196	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
Power sensor NRV-Z5	100596	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
Reference Probe EX3DV4	SN 7464	12-Sep-17(SPEAG,No.EX3-7464_Sep17)	Sep-18
DAE4	SN 1525	02-Oct-17(SPEAG,No.DAE4-1525_Oct17)	Oct-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	23-Jan-18 (CTTL, No.J18X00560)	Jan-19
Network Analyzer E5071C	MY46110673	24-Jan-18 (CTTL, No.J18X00561)	Jan-19

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

Issued: February 4, 2018

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

Certificate No: Z18-97021 Page 1 of 8

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Glossary:

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

Calibration is Performed According to the Following Standards:

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 assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

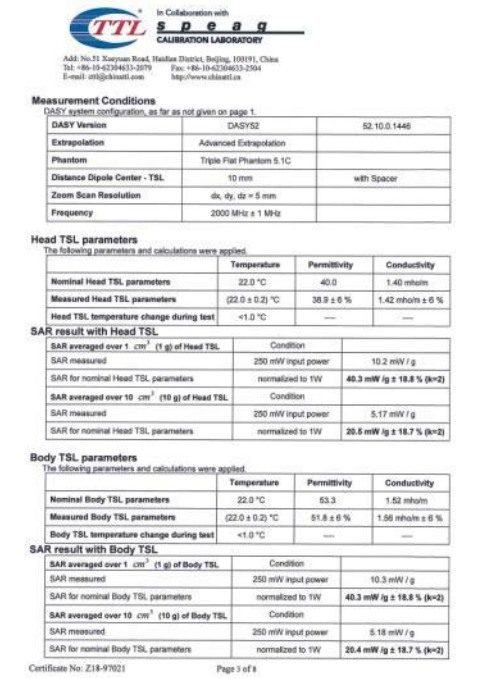
e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Certificate No: Z18-97021 Page 2 of 8



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Measurement Conditions

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

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2000 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	1.42 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**40.3 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.17 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.5 mW /g ± 18.7 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.8 ± 6 %	1.56 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	---	---

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**40.3 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.18 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**20.4 mW /g ± 18.7 % (k=2)**

Certificate No: Z18-97021 Page 3 of 8

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.8Ω- 2.0$\mathrm{j}\Omega$
Return Loss	- 33.6dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.3Ω- 1.6$\mathrm{j}\Omega$
Return Loss	- 27.6dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.047 ns

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

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

Additional EUT Data

Manufactured by	SPEAG

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D2000V2 Sn:1009

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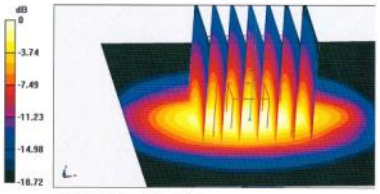
DASY5 Validation Report for Head TSL Date: 02.01.2018
Test Laboratory: CTTL, Beijing, China
DUT: Dipole 2000 MHz; Type: D2000V2; Serial: D2000V2 - SN: 1009
Communication System: UID 0, CW; Frequency: 2000 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2000 MHz; σ = 1.416 S/m; ε_r = 38.89; ρ = 1000 kg/m3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(8.39, 8.39, 8.39); Calibrated: 9/12/2017,
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.98 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 19.7 W/kg
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.17 W/kg
Maximum value of SAR (measured) = 16.2 W/kg



0 dB = 16.2 W/kg = 12.10 dBW/kg

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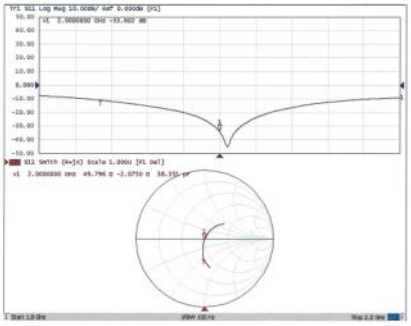
Impedance Measurement Plot for Head TSL



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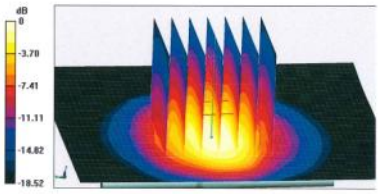
DASY5 Validation Report for Body TSL Date: 02.01.2018
Test Laboratory: CTTL, Beijing, China
DUT: Dipole 2000 MHz; Type: D2000V2; Serial: D2000V2 - SN: 1009
Communication System: UID 0, CW; Frequency: 2000 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2000 MHz; σ = 1.564 S/m; ε_r = 51.83; ρ = 1000 kg/m^3
Phantom section: Center Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(8.24,8.24,8.24); Calibrated: 9/12/2017,
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.84 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 19.7 W/kg
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.18 W/kg
Maximum value of SAR (measured) = 16.3 W/kg



0 dB = 16.3 W/kg = 12.12 dBW/kg

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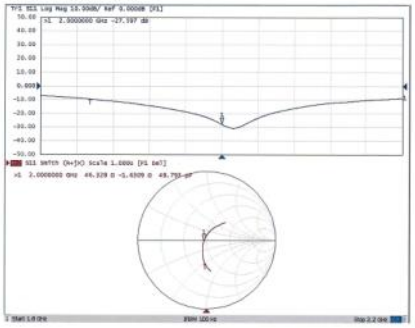
Impedance Measurement Plot for Body TSL



D2450V2 Sn:738

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Client SRTC Certificate No: Z17-97140

CALIBRATION CERTIFICATE

Object D2450V2 - SN: 738

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

Calibration date: September 18, 2017

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102196	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
Power sensor NRV-Z5	100596	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
Reference Probe EX3DV4	SN 7433	26-Sep-16(SPEAG,No.EX3-7433_Sep16)	Sep-17
DAE4	SN 1331	19-Jan-17(CTTL-SPEAG,No.Z17-97015)	Jan-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	13-Jan-17 (CTTL, No.J17X00286)	Jan-18
Network Analyzer E5071C	MY46110673	13-Jan-17 (CTTL, No.J17X00285)	Jan-18

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

Issued: September 21, 2017

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Glossary:

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

Calibration is Performed According to the Following Standards:

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 assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.7 ± 6 %	1.79 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.1 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	52.4 mW /g ± 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.10 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.4 mW /g ± 18.7 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6 %	1.98 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	---	---

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	52.3 mW /g ± 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	6.10 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	24.3 mW /g ± 18.7 % (k=2)

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.3Ω+ 5.9jΩ
Return Loss	- 24.5dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.6Ω+ 6.3jΩ
Return Loss	- 23.1dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.288 ns

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

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

Additional EUT Data

Manufactured by	SPEAG

D2450V2 Sn:738

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DASY5 Validation Report for Head TSL Date: 09.18.2017

Test Laboratory: CTTL, Beijing, China

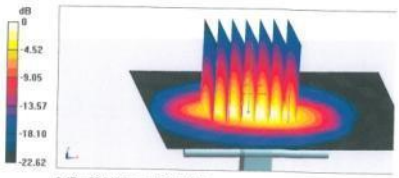
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 738

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.788 S/m; ε_r = 38.67 ; ρ = 1000 kg/m3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(7.45, 7.45, 7.45); Calibrated: 9/26/2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 1/19/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.1 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 27.8 W/kg
SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.1 W/kg
Maximum value of SAR (measured) = 22.0 W/kg



0 dB = 22.0 W/kg = 13.42 dBW/kg

Certificate No: Z17-97140 Page 5 of 8

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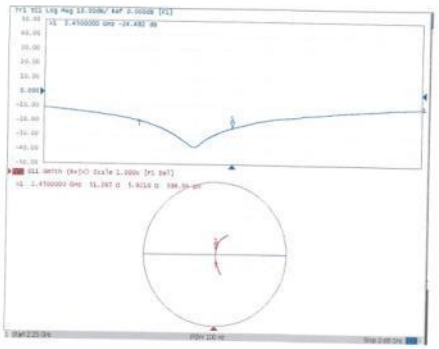
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL Date: 09.18.2017

Test Laboratory: CTTL, Beijing, China

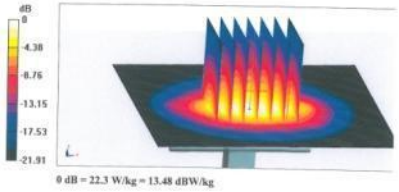
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 738

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.983 S/m; ε_r = 52.51; ρ = 1000 kg/m^3
Phantom section: Center Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(7.46, 7.46, 7.46); Calibrated: 9/26/2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 1/19/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.41 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 27.8 W/kg
SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.1 W/kg
Maximum value of SAR (measured) = 22.3 W/kg



0 dB = 22.3 W/kg = 13.48 dBW/kg

Certificate No: Z17-97140 Page 7 of 8

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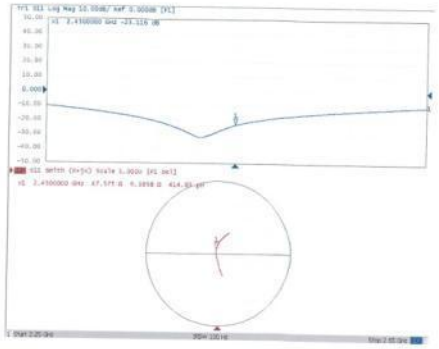
Impedance Measurement Plot for Body TSL



Certificate No: Z17-97140 Page 8 of 8

D5GHzV2 Sn:1079

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Client SRTC Certificate No: Z17-97133

CALIBRATION CERTIFICATE

Object D5GHzV2 - SN: 1079

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

Calibration date: September 25, 2017

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	102196	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
Power sensor NRP-Z91	100596	02-Mar-17 (CTTL, No.J17X01254)	Mar-18
ReferenceProbe EX3DV4	SN 3846	13-Jan-17(CTTL-SPEAG,No.Z16-97251)	Jan-18
DAE4	SN 1331	19-Jan-17(CTTL-SPEAG,No.Z17-97015)	Jan-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	13-Jan-17 (CTTL, No.J17X00286)	Jan-18
NetworkAnalyzer E5071C	MY46110673	13-Jan-17 (CTTL, No.J17X00285)	Jan-18

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

Issued: September 28, 2017

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Glossary:

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

Calibration is Performed According to the Following Standards:

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 assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Certificate No: Z17-97133 Page 2 of 16

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Measurement Conditions

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

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5300 MHz ± 1 MHz 5500 MHz ± 1 MHz 5600 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.7 ± 6 %	4.62 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.77 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**77.6 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.24 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**22.3 mW /g ± 24.2 % (k=2)**

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Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.1 ± 6 %	4.67 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5300 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.13 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**81.3 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.32 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**23.2 mW /g ± 24.2 % (k=2)**

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.9 ± 6 %	4.93 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.24 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**82.5 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.37 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**23.8 mW /g ± 24.2 % (k=2)**

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D5GHzV2 Sn:1079

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Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.7 ± 6 %	4.98 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.16 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**81.6 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.34 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**23.4 mW /g ± 24.2 % (k=2)**

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.8 ± 6 %	5.16 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.85 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**78.7 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.25 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**22.6 mW /g ± 24.2 % (k=2)**

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Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	49.5 ± 6 %	5.38 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.52 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**75.4 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	100 mW input power	2.12 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.3 mW /g ± 24.2 % (k=2)**

Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.42 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	49.2 ± 6 %	5.50 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5300 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.68 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**76.9 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	100 mW input power	2.18 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.9 mW /g ± 24.2 % (k=2)**

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Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	49.0 ± 6 %	5.72 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	8.22 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**82.4 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	100 mW input power	2.35 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**23.6 mW /g ± 24.2 % (k=2)**

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	48.4 ± 6 %	5.73 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	8.08 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**80.7 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	100 mW input power	2.30 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**23.0 mW /g ± 24.2 % (k=2)**

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Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	49.0 ± 6 %	5.94 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.73 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**77.6 mW /g ± 24.4 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	100 mW input power	2.17 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.8 mW /g ± 24.2 % (k=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	47.6Ω - 8.7jΩ
Return Loss	- 20.7dB

Antenna Parameters with Head TSL at 5300 MHz

Impedance, transformed to feed point	48.5Ω - 6.8jΩ
Return Loss	- 21.4dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	50.7Ω - 7.1jΩ
Return Loss	- 23.0dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	55.2Ω - 4.0jΩ
Return Loss	- 24.1dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	52.2Ω - 8.2jΩ
Return Loss	- 21.6dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	50.8Ω - 10.1jΩ
Return Loss	- 20.0dB

Antenna Parameters with Body TSL at 5300 MHz

Impedance, transformed to feed point	48.5Ω - 8.5jΩ
Return Loss	- 21.1dB

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Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	54.9Ω - 6.8jΩ
Return Loss	- 21.9dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	56.6Ω - 2.2jΩ
Return Loss	- 23.7dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	56.7Ω - 8.1jΩ
Return Loss	- 20.2dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.313 ns

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

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

Additional EUT Data

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DASY5 Validation Report for Head TSL Date: 09.21.2017
Test Laboratory: CTTL, Beijing, China
DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1079
Communication System: CW; Frequency: 5200 MHz; Frequency: 5300 MHz; Frequency: 5500 MHz; Frequency: 5600 MHz; Frequency: 5800 MHz;
Medium parameters used: f = 5200 MHz; σ = 4.616 mho/m; ε_r = 35.72; ρ = 1000 kg/m3, Medium parameters used: f = 5300 MHz; σ = 4.668 mho/m; ε_r = 36.09; ρ = 1000 kg/m3, Medium parameters used: f = 5500 MHz; σ = 4.934 mho/m; ε_r = 35.92; ρ = 1000 kg/m3, Medium parameters used: f = 5600 MHz; σ = 4.984 mho/m; ε_r = 35.73; ρ = 1000 kg/m3, Medium parameters used: f = 5800 MHz; σ = 5.159 mho/m; ε_r = 35.83; ρ = 1000 kg/m3,
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(5.37,5.37,5.37); Calibrated: 1/13/2017, ConvF(5.37,5.37,5.37); Calibrated: 1/13/2017, ConvF(4.72,4.72,4.72); Calibrated: 1/13/2017, ConvF(4.72,4.72,4.72); Calibrated: 1/13/2017, ConvF(4.95,4.95,4.95); Calibrated: 1/13/2017,
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2017/1/19
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/3
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Dipole Calibration /Pin=100mW, d=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 58.81 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 30.8 W/kg
SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.24 W/kg
Maximum value of SAR (measured) = 18.2 W/kg

Dipole Calibration /Pin=100mW, d=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.19 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 33.7 W/kg
SAR(1 g) = 8.13 W/kg; SAR(10 g) = 2.32 W/kg
Maximum value of SAR (measured) = 19.3 W/kg

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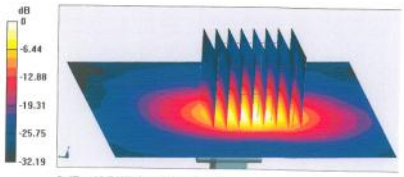
Dipole Calibration /Pin=100mW, d=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 57.80 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 34.3 W/kg
SAR(1 g) = 8.24 W/kg; SAR(10 g) = 2.37 W/kg
Maximum value of SAR (measured) = 19.6 W/kg

Dipole Calibration /Pin=100mW, d=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 57.89 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 35.7 W/kg
SAR(1 g) = 8.16 W/kg; SAR(10 g) = 2.34 W/kg
Maximum value of SAR (measured) = 20.0 W/kg

Dipole Calibration /Pin=100mW, d=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 53.56 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 35.0 W/kg
SAR(1 g) = 7.85 W/kg; SAR(10 g) = 2.25 W/kg
Maximum value of SAR (measured) = 19.7 W/kg



0 dB = 19.7 W/kg = 12.94 dBW/kg

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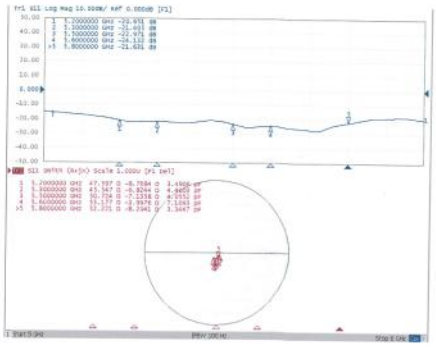
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL Date: 09.25.2017

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1079

Communication System: CW; Frequency: 5200 MHz; Frequency: 5300 MHz; Frequency: 5500 MHz; Frequency: 5600 MHz; Frequency: 5800 MHz;
Medium parameters used: f = 5200 MHz; σ = 5.382 mho/m; ε_r = 49.47; ρ = 1000 kg/m3, Medium parameters used: f = 5300 MHz; σ = 5.498 mho/m; ε_r = 49.21; ρ = 1000 kg/m3, Medium parameters used: f = 5500 MHz; σ = 5.722 mho/m; ε_r = 49.03; ρ = 1000 kg/m3, Medium parameters used: f = 5600 MHz; σ = 5.733 mho/m; ε_r = 48.37; ρ = 1000 kg/m3, Medium parameters used: f = 5800 MHz; σ = 5.935 mho/m; ε_r = 48.99; ρ = 1000 kg/m3,
Phantom section: Center Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(4.95,4.95,4.95); Calibrated: 1/13/2017, ConvF(4.95,4.95,4.95); Calibrated: 1/13/2017,ConvF(4.18,4.18,4.18); Calibrated: 1/13/2017, ConvF(4.18,4.18,4.18); Calibrated: 1/13/2017, ConvF(4.53,4.53,4.53); Calibrated: 1/13/2017,
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2017/1/19
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/3
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Dipole Calibration /Pin=100mW, d=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 55.18 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 30.0 W/kg
SAR(1 g) = 7.52 W/kg; SAR(10 g) = 2.12 W/kg
Maximum value of SAR (measured) = 18.2 W/kg

Dipole Calibration /Pin=100mW, d=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 53.94 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 31.9 W/kg
SAR(1 g) = 7.68 W/kg; SAR(10 g) = 2.18 W/kg
Maximum value of SAR (measured) = 18.3 W/kg

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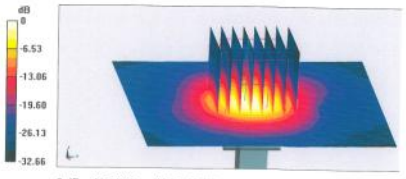
Dipole Calibration /Pin=100mW, d=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.70 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 33.7 W/kg
SAR(1 g) = 8.22 W/kg; SAR(10 g) = 2.35 W/kg
Maximum value of SAR (measured) = 19.8 W/kg

Dipole Calibration /Pin=100mW, d=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.75 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 34.2 W/kg
SAR(1 g) = 8.08 W/kg; SAR(10 g) = 2.3 W/kg
Maximum value of SAR (measured) = 19.3 W/kg

Dipole Calibration /Pin=100mW, d=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.20 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 33.3 W/kg
SAR(1 g) = 7.73 W/kg; SAR(10 g) = 2.17 W/kg
Maximum value of SAR (measured) = 18.3 W/kg



0 dB = 18.3 W/kg = 12.62 dBW/kg

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Impedance Measurement Plot for Body TSL