TESTING (OR CALIBRATION)
NVLAP LAB CODE 600141-0

Registration
No.788871

TEST REPORT

FOR SAR TESTING

Report No.: SRTC2019-9004(F)-19052402(H)

Product Name: Notification Pager

Product Model: P00000401A01

Applicant: SoftBank Robotics Corp.

Manufacturer: SoftBank Robotics Corp.

Specification: Part 2.1093

IEEE Std 1528

KDB Procedures

FCC ID: 2ATI9-P00000401A01

The State Radio_monitoring_center Testing Center (SRTC)

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1. GENERAL INFORMATION

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).
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)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, Beijing P.R. China
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1.3 Applicant's details

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City:	Tokyo
Country or Region:	Japan
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1.4 Manufacturer's details

Company:	SoftBank Robotics Corp.
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City:	Tokyo
Country or Region:	Japan
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Tel:	+81-3-6889-2450
Fax:	---
Email:	huijun.wang@g.softbank.co.jp

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2019.05.24
Testing Start Date:	2019.06.25
Testing End Date:	2019.09.02

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	21-23	40-45

Normal Supply Voltage (Vdc.):	5.0

2. DESCRIPTION OF THE DEVICE UNDER TEST

2.1 Final Equipment Build Status

Wireless Technology and Frequency Bands	☒Lora: 902-928MHz
Mode	☒Lora: 902-928MHz
Duty Cycle	100% (The test is carried out in the case of continuous waves)

2.2 Support Equipment

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

State of sample	Normal
Headset	N/A
Battery	NSC1450 / Hunan Huahui New Energy Co., Ltd/Li-Lon
H/W Version	V 2.0.1
S/W Version	V1.2.X
Notes	As the information described above, we use test sample offered by the customer. 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 865664 D01	v01r04	SAR Measurement from 100 MHz to 6 GHz
KDB 865664 D02	v01r02	RF Exposure Reporting

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.

4.5.1 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 SUMMAR

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

Exposure Position	Frequency	1g-SAR Reported Result (W/kg)	Highest 1g-SAR Reported Result (W/kg)	1g-Limit (W/kg)	Result
Front	915MHz	0.060	0.060	1.6	pass
Back	915MHz	0.055			
Top	915MHz	0.006			
Bottom	915MHz	0.007			
Left	915MHz	0.053			
Right	915MHz	0.010			

SAR value is less than or equal to the limit.

This Test Report Is Issued by: Mr. Peng Zhen	Checked by: Mr. Li Bin
Tested by: Miss. Wu Han	Issued date: 20190902

6 TEST RESULT

6.1 Manufacturing Tolerance

Frequency	902.5MHz	915.0MHz	927.5MHz
Tolerance (dBm)	10.5~14.5	10.5~14.5	10.5~14.5

6.2 Measurement result

Frequency	902.5MHz	915.0MHz	927.5MHz
Average Power Output (dBm)	14.22	14.23	14.25

6.3 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.

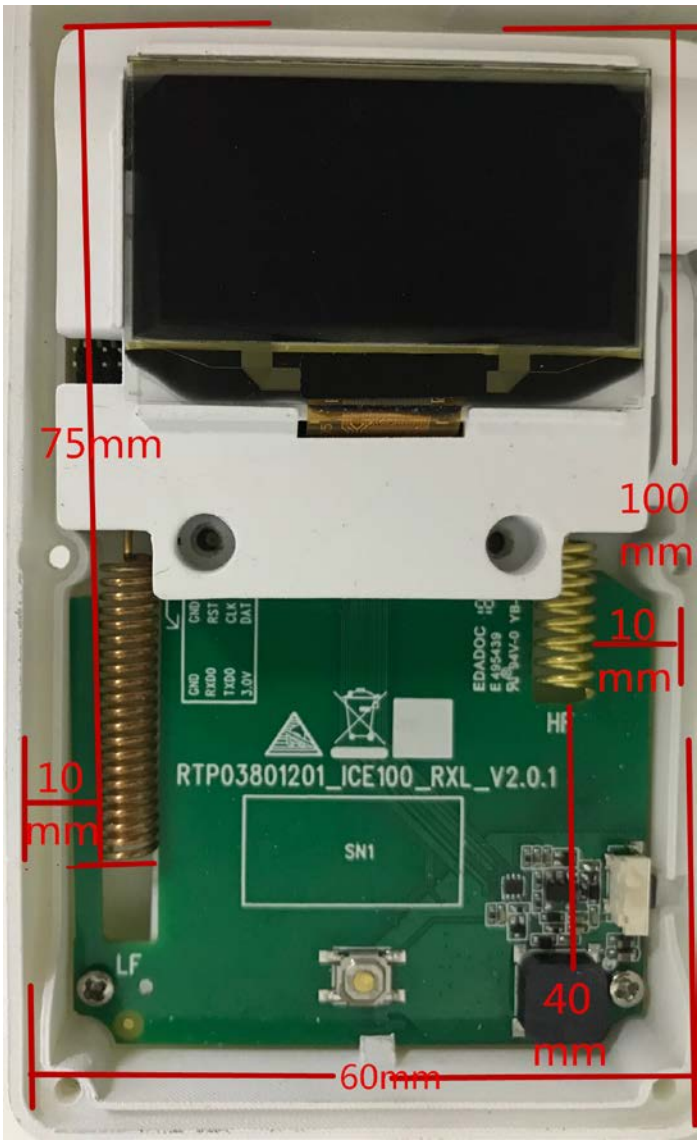
MHz	5	10	15	20	25	mm
150	39	77	116	155	194	*SAR Test Exclusion Threshold* (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25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

Summary of Transmitters

Band/Mode	Position	Max. RF output power (mW)	SAR test exclusion Threshold (mW)	SAR Required
902-928MHz	Body-worn(0mm)	26.61	16	Yes

6.4 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.



6.4.1 Body Exposure Conditions

Test Configurations	Antenna-to-edge/surface	SAR Required
Back	<25 mm	Yes
Front	<25 mm	Yes
Top	<25 mm	Yes
Bottom	<25 mm	Yes
Left	<25 mm	Yes
Right	<25 mm	Yes

6.5 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 (%)
2019/09/02	D835V2	Head	1g	9.16	9.37	-2.2	±10

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 (%)
2019/09/02	Head 835	εr	40.217	41.50	-3.1	±5
		σ[S/m]	0.908	0.90	0.9	±5

6.6 SAR TEST RESULT

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 Body-worn SAR values for the test device are tabulated below:

Mode: Lora
fL(MHz)=902.5MHz fM(MHz)=915.0MHz fH(MHz)= 927.5MHz
SAR Values
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) 1g Average	Reported Results (W/kg) 1g Average
position	mode						
Back	Lora (Body-worn 0mm)	L	14.22	14.50	1.07	---	---
		M	14.23	14.50	1.06	**0.057**	**0.060**
		H	14.25	14.50	1.06	---	---
Front		L	14.22	14.50	1.07	---	---
		M	14.23	14.50	1.06	0.052	0.055
		H	14.25	14.50	1.06	---	---
Top		L	14.22	14.50	1.07	---	---
		M	14.23	14.50	1.06	0.006	0.006
		H	14.25	14.50	1.06	---	---
Bottom		L	14.22	14.50	1.07	---	---
		M	14.23	14.50	1.06	0.006	0.007
		H	14.25	14.50	1.06	---	---
Left		L	14.22	14.50	1.07	---	---
		M	14.23	14.50	1.06	0.050	0.053
		H	14.25	14.50	1.06	---	---
Right		L	14.22	14.50	1.07	---	---
		M	14.23	14.50	1.06	0.009	0.010
		H	14.25	14.50	1.06	---	---

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6.7 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)
850 MHz	Lora	≤0.8

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	720	2018.10.15	2019.10.14
Dosimetric E-field Probe	EX4DV3	3708	2018.10.22	2019.10.21
Dipole Validation Kit	D835V2	4d023	2017.09.13	2020.09.12

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 835

SAR target

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

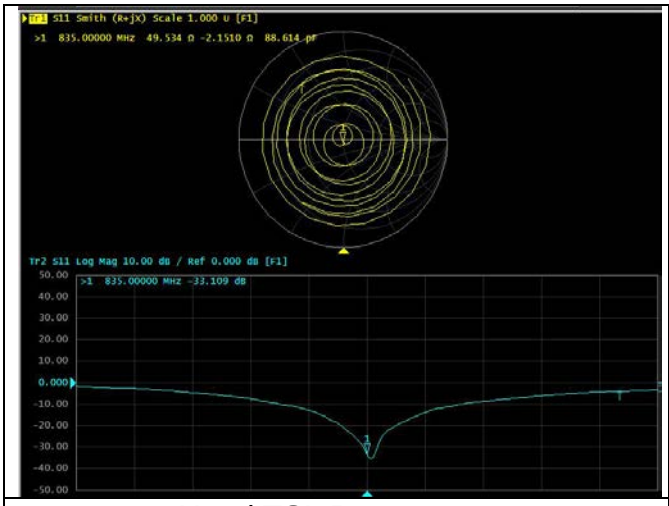
Impedance and Return loss measured by Network analyzer

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)

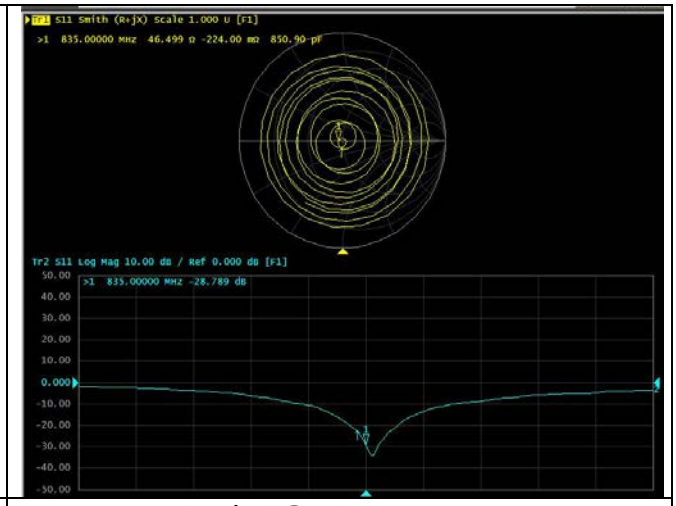
The most recent return-loss result (measured on 2018.8.20) deviates within 20% from the previous measurement. (Data from the last calibration report)

Head TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	51.0Ω-2.79jΩ	49.5Ω-2.15jΩ	<5Ω
Return loss	-30.7 dB	-33.1 dB	<20%

Body TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	46.6Ω-3.61jΩ	49.5Ω-0.22jΩ	<5Ω
Return loss	-25.8dB	-28.8dB	<20%



Head TSL Parameters



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
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
Measurement System	firmware		software	
DASY	DASY5PRO		Dasy52.10.1.1476	

Detailed information of Isotropic E-field Probe Type ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Optical Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Dynamic Range	5 µW/g to > 100 W/kg; Linearity: ± 0.2 dB
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones

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

Please refer to the attachment.

ANNEX B – RELEVANT PAGES FROM CALIBRATION REPORTS

Please refer to the attachment.

ANNEX A – TEST PLOTS

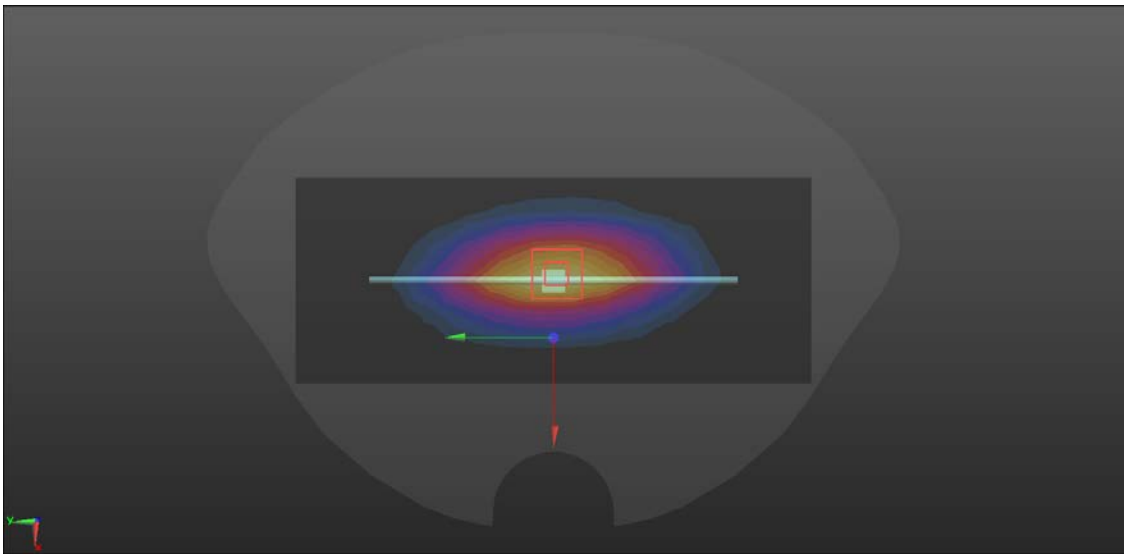
Head liquid

System check	835MHz

Communication System: UID 0, CW (0); Frequency: 835 MHz;
Medium parameters used (interpolated): f = 835 MHz; σ = 0.908 S/m; ε_r = 40.217; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(9.16, 9.16, 9.16) @ 835 MHz; Calibrated: 10/22/2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn720; Calibrated: 10/15/2018
- Phantom: Twin-SAM 1559; Type: QD 000 P40 CD; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7450)
  HEAD/835MHZ/Area Scan (7x16x1): Measurement grid: dx=15mm, dy=15mm
  Maximum value of SAR (measured) = 3.20 W/kg
  HEAD/835MHZ/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
  Reference Value = 64.67 V/m; Power Drift = 0.17 dB
  Peak SAR (extrapolated) = 3.77 W/kg
  SAR(1 g) = 2.29 W/kg; SAR(10 g) = 1.58 W/kg
  Maximum value of SAR (measured) = 3.32 W/kg



Lora

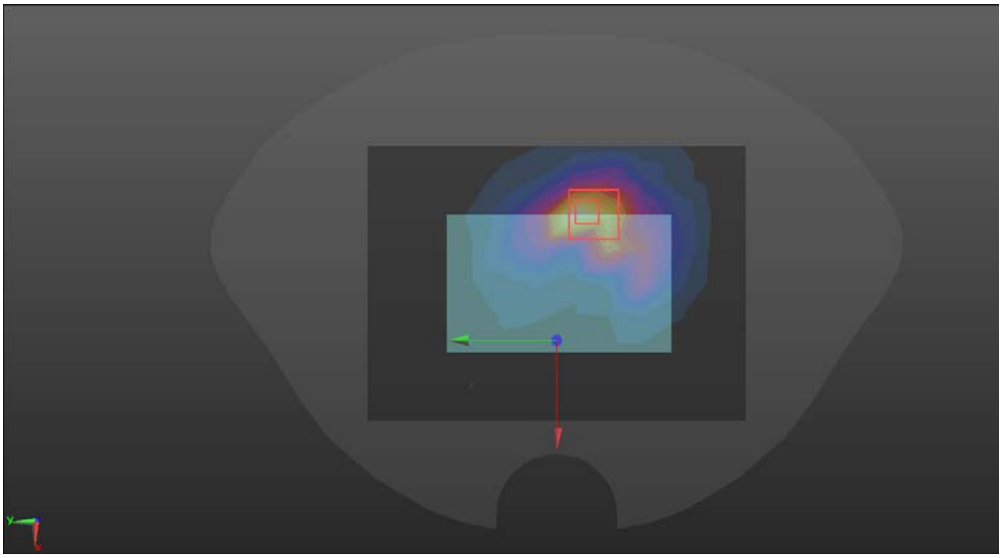
Body-worn	Front

Communication System: UID 0, LORA (0); Frequency: 915 MHz;
Medium parameters used (interpolated): f = 915 MHz; σ = 0.978 S/m; ε_r = 41.497; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3708; ConvF(9.16, 9.16, 9.16) @ 915 MHz; Calibrated: 10/22/2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn720; Calibrated: 10/15/2018
- Phantom: Twin-SAM 1559; Type: QD 000 P40 CD; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

BODY/F/Area Scan (9x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0930 W/kg
BODY/F/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.953 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.113 W/kg
SAR(1 g) = 0.057 W/kg; SAR(10 g) = 0.033 W/kg
Maximum value of SAR (measured) = 0.0879 W/kg



ANNEX B – RELEVANT PAGES FROM CALIBRATION REPORTS

DAE4 Sn:720

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

中国认可 国际互认 校准 CALIBRATION CNAS L0570

Client : SRTC Certificate No: Z18-60399

CALIBRATION CERTIFICATE

Object	DAE4 - SN: 720
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: Z18-60399 Page 1 of 3

In Collaboration with
s p e a g
CALIBRATION LABORATORY
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E-mail: ctt@chinattl.com Http://www.chinattl.cn

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: Z18-60399 Page 2 of 3

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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	403.343 ± 0.15% (k=2)	404.773 ± 0.15% (k=2)	403.205 ± 0.15% (k=2)
Low Range	3.95574 ± 0.7% (k=2)	3.95569 ± 0.7% (k=2)	3.95585 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	25° ± 1 °

Certificate No: Z18-60399 Page 3 of 3

EX3DV4 Sn:3708 (1/7)

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

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

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.v6
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. 217-02673/02675)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
Reference Probe ES3DV2	SN: 3013	30-Dec-17 (No. ES3-3013_Dec17)	Dec-18
DAE4	SN: 660	21-Dec-17 (No. DAE4-660_Dec17)	Dec-18
Secondary Standards	**ID**	**Check Date (in house)**	**Scheduled Check**
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

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

Issued: October 23, 2018

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Certificate No: EX3-3708_Oct18 Page 1 of 39

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

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

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

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).

Certificate No: EX3-3708_Oct18 Page 2 of 39

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!)

Certificate No: EX3-3708_Oct18 Page 3 of 39

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]	0.28	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√V	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	134.7	±3.5 %
		Y	0.0	0.0	1.0		130.6	
		Z	0.0	0.0	1.0		146.6	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	33.84	270.1	40.07	9.383	1.302	5.022	0.000	0.762	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	11.65	0.830	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.

Certificate No: EX3-3708_Oct18 Page 4 of 39

EX3DV4 Sn:3708 (2/7)

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, 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.

Certificate No: EX3-3708_Oct18 Page 5 of 39

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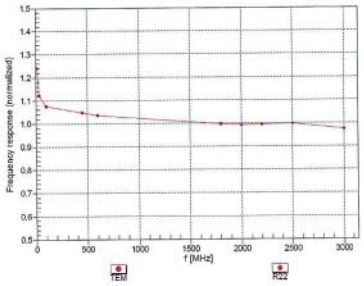
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

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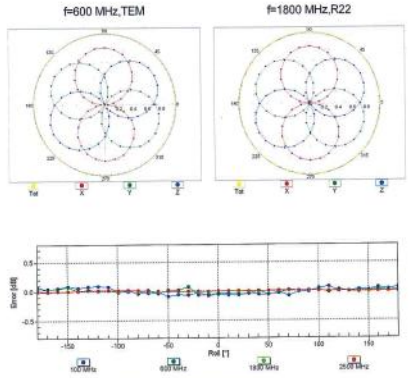
Receiving Pattern (ϕ), ϑ = 0°

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



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

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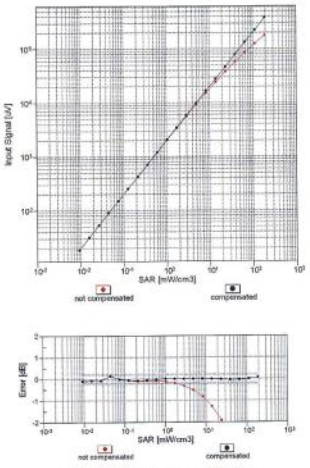
Dynamic Range f(SAR$_{head}$)
(TEM cell , f_{eval}= 1900 MHz)



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

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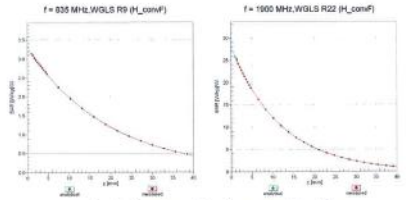
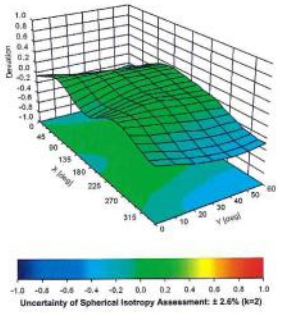
Conversion Factor Assessment



Deviation from Isotropy in Liquid
Error (φ, θ), f = 900 MHz



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

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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

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Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB·µV	C	D dB	VR mV	Max Unc^2 (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	1.46	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	15.85	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	9.57	50.0	± 9.6 %
		Y	48.07	101.86	23.86		50.0	
		Z	21.87	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	2.82	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	11.05	4.80	80.0	± 9.6 %
		Y	100.00	107.96	22.92		80.0	
		Z	100.00	108.88	22.38		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	22.56		100.0	
		Z	100.00	105.65	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	10.16	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	

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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	23.28		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	16.55		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	66.61	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	4.59	66.77	17.34	1.99	100.0	± 9.6 %
		Y	4.83	66.92	17.28		100.0	
		Z	4.79	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	2.83	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	18.46	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	

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10112-CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	2.71	67.16	15.85	0.00	150.0	± 9.6 %
		Y	2.97	68.02	16.17		150.0	
		Z	2.77	66.84	15.23		150.0	
10113-CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.46	68.62	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	16.52	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	66.87	16.48	0.00	100.0	± 9.6 %
		Y	4.98	67.26	16.45		150.0	
		Z	4.90	66.80	16.15		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	67.56	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	16.67	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	67.66	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	1.58	67.83	14.30	0.00	150.0	± 9.6 %
		Y	2.02	70.37	16.43		150.0	
		Z	1.83	66.79	14.16		150.0	
10143-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	1.95	67.47	13.73	0.00	150.0	± 9.6 %
		Y	2.59	70.30	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	11.80	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	8.90	0.00	150.0	± 9.6 %
		Y	1.46	63.50	9.05		150.0	
		Z	1.17	61.60	7.85		150.0	
10147-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	0.94	60.00	8.95	0.00	150.0	± 9.6 %
		Y	1.64	64.86	9.75		150.0	
		Z	1.24	62.17	8.36		150.0	

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10168-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	79.05	22.54		150.0	
		Z	4.35	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	3.26	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	73.38	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	9.30	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	21.98		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	2.82	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	17.98	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	3.05	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	4.13	75.40	21.42	3.01	150.0	± 9.6 %
		Y	5.26	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	14.46		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	8.96	87.92	24.97	6.02	65.0	± 9.6 %
		Y	31.18	109.98	31.14		65.0	
		Z	8.85	88.69	25.46		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	8.31	85.60	23.69	6.02	65.0	± 9.6 %
		Y	25.63	104.26	28.94		65.0	
		Z	8.57	87.04	24.32		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	8.80	87.47	26.62	6.02	65.0	± 9.6 %
		Y	11.49	97.68	30.08		65.0	
		Z	8.33	86.07	26.42		65.0	
10229-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	8.39	86.61	24.44	6.02	65.0	± 9.6 %
		Y	27.05	106.96	30.33		65.0	
		Z	8.36	87.57	25.02		65.0	
10230-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	7.76	84.41	23.10	6.02	65.0	± 9.6 %
		Y	22.43	101.97	28.22		65.0	
		Z	8.06	85.94	23.87		65.0	
10231-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	8.41	86.23	26.29	6.02	65.0	± 9.6 %
		Y	10.71	96.21	29.53		65.0	
		Z	8.06	85.16	26.01		65.0	
10232-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	8.37	86.60	24.43	6.02	65.0	± 9.6 %
		Y	27.00	106.94	30.32		65.0	
		Z	8.35	87.55	25.01		65.0	
10233-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	7.75	84.38	23.10	6.02	65.0	± 9.6 %
		Y	22.36	101.93	28.21		65.0	
		Z	8.04	85.91	23.86		65.0	
10234-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	8.12	85.18	25.78	6.02	65.0	± 9.6 %
		Y	10.09	94.88	28.97		65.0	
		Z	5.85	84.36	25.60		65.0	
10235-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	8.39	86.63	24.45	6.02	65.0	± 9.6 %
		Y	27.09	107.02	30.34		65.0	
		Z	8.35	87.57	25.02		65.0	
10236-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	7.81	84.48	23.12	6.02	65.0	± 9.6 %
		Y	22.71	102.14	28.26		65.0	
		Z	8.11	86.03	23.90		65.0	
10237-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	8.42	86.27	26.30	6.02	65.0	± 9.6 %
		Y	10.73	96.29	29.56		65.0	
		Z	8.06	85.19	26.02		65.0	
10238-CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	8.36	86.57	24.43	6.02	65.0	± 9.6 %
		Y	26.94	106.92	30.31		65.0	
		Z	8.33	87.52	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	78.25	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	67.57	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	11.63		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	80.85	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	18.48	3.98	65.0	± 9.6 %
		Y	5.98	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	18.54		65.0	
10264-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	5.70	79.84	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	5.73	76.55	20.61	3.98	65.0	± 9.6 %
		Y	6.86	78.96	21.48		65.0	
		Z	6.00	76.98	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	19.86		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	4.80	66.87	17.82	4.17	50.0	± 9.6 %
		Y	4.84	65.92	17.45		50.0	
		Z	4.57	65.46	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	68.82	19.75		35.0	
		Z	4.55	66.96	19.46		35.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 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 (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	4.82	69.04	19.35	6.02	35.0	± 9.6 %
		Y	4.80	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	19.59	6.02	35.0	± 9.6 %
		Y	4.62	67.78	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	19.09		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	4.85	67.42	19.21		35.0	
		Z	4.88	67.43	18.99		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	67.23	12.88	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	6.12	82.13	21.85		30.0	
		Z	4.16	76.04	19.55		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc 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	62.77	14.10		150.0	
10318-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc 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, 99pc 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	
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-AAD	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	72.09	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	92.86	22.58		80.0	
10447-AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	2.98	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	3.66	66.95	15.83	0.00	150.0	± 9.6 %
		Y	3.93	67.43	16.16		150.0	
		Z	3.78	66.56	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	2.98	66.32	13.88		150.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.05	67.79	16.52	0.00	150.0	± 9.6 %
		Y	6.10	68.03	16.69		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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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	18.86	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	72.06	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	92.88	22.56		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	3.13	66.53	14.58		150.0	
10448-AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 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	66.66	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	16.28		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	66.60	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	13.88		150.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.05	67.79	16.82	0.00	150.0	± 9.6 %
		Y	6.10	68.03	16.99		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	18.96		150.0	
		Z	4.91	69.06	17.98		150.0	

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10477-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.95	60.00	7.77	3.23	80.0	± 9.6 %
		Y	0.96	60.00	7.37		80.0	
		Z	0.95	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	0.69	60.00	6.85		80.0	
		Z	0.69	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	45.10	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	69.21	13.43	3.23	80.0	± 9.6 %
		Y	7.14	79.40	17.60		80.0	
		Z	3.96	72.66	15.62		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	2.96	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	70.52	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	8.86	2.23	80.0	± 9.6 %
		Y	3.07	68.75	13.76		80.0	
		Z	2.34	65.52	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	64.67	11.98		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	2.97	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	2.94	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	16.86		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	68.80	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	3.76	69.64	17.37	2.23	80.0	± 9.6 %
		Y	4.36	71.43	18.03		80.0	
		Z	3.81	69.14	16.94		80.0	
10510-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.80	67.28	16.80	2.23	80.0	± 9.6 %
		Y	4.21	68.49	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	68.26	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	16.57		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	0.80	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	13.86		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	15.98		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	66.84	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	66.59	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	66.50	16.32	0.00	150.0	± 9.6 %
		Y	5.49	67.06	16.21		150.0	
		Z	5.41	66.52	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	5.29	66.32	15.78		150.0	
10552-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.18	66.26	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	66.56	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	5.88	67.32	16.27		150.0	
		Z	5.79	66.86	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	15.95		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	66.06	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	65.96	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	16.29		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	4.95	66.33	16.32	0.46	130.0	± 9.6 %
		Y	5.08	66.52	16.20		130.0	
		Z	5.01	66.09	15.93		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	5.08	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	5.18	66.82	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	6.06	67.38	16.68		130.0	
		Z	5.99	66.98	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	92.83	31.00	9.30	60.0	± 9.6 %
		Y	16.22	105.06	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 (Tx Advanced)	X	0.32	60.00	5.00	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	3.35	66.94	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	66.06	16.65		80.0	
		Z	3.96	65.22	16.15		80.0	
10658-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	75.78	16.00		50.0	
10659-AAA	Pulse Waveform (200Hz, 20%)	X	2.90	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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Client SRTC Certificate No: Z17-97135

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d023
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	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 16, 2017

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

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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	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.3 ± 6 %	0.90 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	2.35 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.37 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.52 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.06 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	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.7 ± 6 %	0.96 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	2.34 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.47 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.53 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.17 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	51.0Ω- 2.79jΩ
Return Loss	- 30.7dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.6Ω- 3.61jΩ
Return Loss	- 25.8dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.495 ns

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

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

Additional EUT Data

Manufactured by	SPEAG

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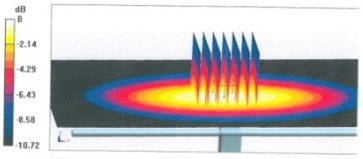
DASY5 Validation Report for Head TSL Date: 09.13.2017
Test Laboratory: CTTL, Beijing, China
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d023
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.903 S/m; ε_r = 41.34; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(9.82, 9.82, 9.82); 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 = 56.28V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.66 W/kg
SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.52 W/kg
Maximum value of SAR (measured) = 3.21 W/kg



0 dB = 3.21 W/kg = 5.07 dBW/kg

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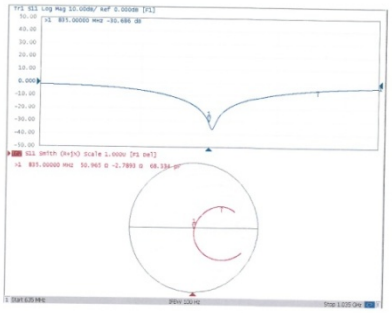
Impedance Measurement Plot for Head TSL



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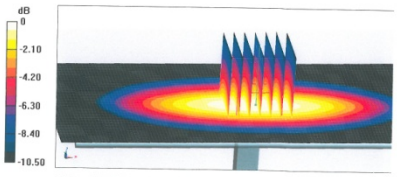
DASY5 Validation Report for Body TSL Date: 09.13.2017
Test Laboratory: CTTL, Beijing, China
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d023
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.958 S/m; ε_r = 55.68; ρ = 1000 kg/m^3
Phantom section: Center Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(9.5,9.5, 9.5); 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 = 56.17 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.57 W/kg
SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (measured) = 3.15 W/kg



0 dB = 3.15 W/kg = 4.98 dBW/kg

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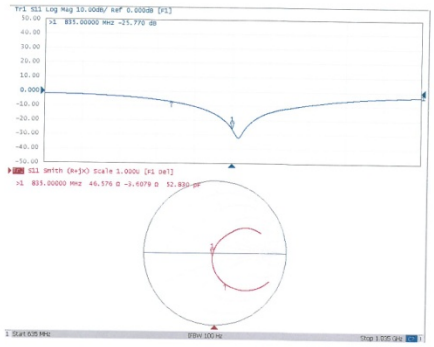
Impedance Measurement Plot for Body TSL



----------End of the test report----------