

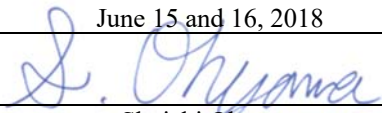
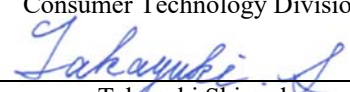


SAR TEST REPORT

Test Report No. : 12244312H-C

Applicant : Sony Corporation
Type of Equipment : UHF Synthesized Transmitter
Model No. : UTX-P03
FCC ID : AK8UTXP03
Test regulation : FCC47CFR 2.1093
Test Result : Complied
Reported SAR(1g) Value : **The highest reported SAR(1g)**
Body : 0.32 W/kg

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report covers SAR technical requirements. It does not cover administrative issues such as Manual or non-SAR test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
7. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test: June 15 and 16, 2018
Representative test engineer: 
Shuichi Ohyama
Engineer
Consumer Technology Division
Approved by : 
Takayuki Shimada
Leader
Consumer Technology Division



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 There is no testing item of "Non-accreditation".

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SECTION1: Customer information

Company Name : Sony Global Manufacturing & Operations Corporation
Address : 8-4 Shiomi Kisarazu-shi, Chiba, 292-0834 Japan
Telephone Number : +81-438-37-4704
Contact Person : Youhei Hisano

***Remarks**

Sony Global Manufacturing & Operations Corporation (Subsidiary Company Name) is on behalf of the applicant: Sony Corporation.

SECTION2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

<Information of the EUT>

Type of Equipment : UHF Synthesized Transmitter
Model No. : UTX-P03
Serial No. : 14UC: Low / Mid Channel
25UC: High Channel
Rating : DC 3 V (Battery)
Receipt Date of Sample : April 24, 2018
Country of Manufacture : Korea
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product description

Model: UTX-P03 (referred to as the EUT in this report) is a UHF Synthesized Transmitter.

Radio Specification (Radio microphone part)

Radio type : Transmitter
Modulation type : Frequency modulation
Emission designator : 116KF3E
Necessary bandwidth : 116 kHz = 2M + 2D
where M: Maximum modulation frequency = 18 kHz
D: Peak deviation = 40 kHz
Channel spacing : 125 kHz
Frequency of operation : 470.125 MHz - 607.875 MHz
(14): 470.125 MHz - 541.875 MHz
(25): 536.125 MHz - 607.875 MHz
Clock frequency(ies) : PLL: 19.2 MHz (TCXO)
RF power : High: 40 mW, Low: 5 mW
Antenna type : 1/4 Lambda Monopole antenna (integral type)
Antenna gain : 4.8 dBi
AF Specification : 40 Hz - 18000 Hz, Maximum input: -24 dBV (MIC level, ATT 0 dB)

SECTION3: Test standard information

3.1 Test Specification

Title : **FCC47CFR 2.1093**
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.

: **Published RF exposure KDB procedures**

- KDB447498D01(v06)** RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices
- KDB447498D02(v02r01)** SAR Measurement Procedures for USB Dongle Transmitters
- KDB648474D04(v01r03)** SAR Evaluation Considerations for Wireless Handsets
- KDB941225D01(v03r01)** 3G SAR Measurement Procedures
- KDB941225D05(v02r05)** SAR Evaluation Considerations for LTE Devices
- KDB941225D06(v02r01)** SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities (Hot Spot SAR)
- KDB941225D07(v01r02)** SAR Evaluation Procedures for UMPC Mini-Tablet Devices
- KDB616217D04(v01r02)** SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers
- KDB865664D01(v01r04)** SAR Measurement Requirements for 100MHz to 6 GHz
- KDB248227D01(v02r02)** SAR Guidance for 802.11(Wi-Fi) Transmitters
- KDB206256D01(v02)** Basic Certification Requirements For Wireless Microphones

Reference

[1]SPEAG uncertainty document (AN 15-7/AN19-17) for DASY 5 System from SPEAG (Schmid & Partner Engineering AG).

3.2 Procedure

| Transmitter | Radio Microphone |
|---|--------------------------------------|
| Test Procedure | Published RF exposure KDB procedures |
| Category | FCC47CFR 2.1093 |
| Note: UL Japan, Inc. 's SAR Work Procedures 13-EM-W0429 and 13-EM-W0430 | |

3.3 Exposure limit

(A) Limits for Occupational/Controlled Exposure (W/kg)

| Spatial Average (averaged over the whole body) | Spatial Peak (averaged over any 1g of tissue) | Spatial Peak (hands/wrists/feet/ankles averaged over 10g) |
|---|--|---|
| 0.4 | 8.0 | 20.0 |

(B) Limits for General population/Uncontrolled Exposure (W/kg)

| Spatial Average (averaged over the whole body) | Spatial Peak (averaged over any 1g of tissue) | Spatial Peak (hands/wrists/feet/ankles averaged over 10g) |
|---|--|---|
| 0.08 | 1.6 | 4.0 |

Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

General Population/Uncontrolled Environments: are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

**NOTE:GENERAL POPULATION/UNCONTROLLED EXPOSURE
SPATIAL PEAK(averaged over any 1g of tissue) LIMIT
1.6 W/kg**

3.4 SAR

Specific Absorption Rate (SAR): The time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ), as shown in the following equation:

$$SAR = \frac{d}{dt} \left(\frac{dW}{dm} \right) = \frac{d}{dt} \left(\frac{dW}{\rho dV} \right)$$

SAR is expressed in units of watts per kilogram (W/kg) or equivalently milliwatts per gram (mW/g).

SAR is related to the E-field at a point by the following equation:

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

where

σ = conductivity of the tissue (S/m)
 ρ = mass density of the tissue (kg/m³)
E = rms E-field strength (V/m)

3.5 Test Location

*Shielded room for SAR testings

UL Japan, Inc. Ise EMC Lab.

NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967 / ISED SAR Lab Company Number: 2973C
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Ise EMC Lab.

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SECTION4: Test result

4.1 Stand-alone SAR result

Reported SAR

Measured SAR is scaled to the maximum tune-up tolerance limit by the following formulas.

Reported SAR= Measured SAR [W/kg] · Scaled factor

Maximum tune-up tolerance limit is by the specification from a customer.

* Scaled factor = Maximum tune-up tolerance limit [mW] / Measured power [mW]

Body SAR

| Mode | Frequency [MHz] | Measured average Power [dBm] | Tune-up upper Power [dBm] | Measured power [mW] | Maximum tune-up tolerance limit [mW] | Measured SAR [W/kg] | Scaled factor | Reported SAR [W/kg] |
|---------------------|-----------------|------------------------------|---------------------------|---------------------|--------------------------------------|---------------------|---------------|---------------------|
| Radio Microphone | 470.125 | 14.61 | 15.20 | 28.91 | 33.11 | 0.275 | 1.146 | 0.315 |

Note(s):

The sample used by the SAR test is not more than 2 dB lower than the maximum tune-up tolerance limit. That is, measured power is included the tune-up tolerance range.

Maximum tune-up tolerance limit is defined as maximum timed-average value. (Considering to maximum duty cycle)

SECTION5: Tune-up tolerance information and software information

Maximum tune-up tolerance limit

| Mode | Band | Maximum tune-up tolerance limit [dBm] | Maximum tune-up tolerance limit [mW] |
|------------------|-----------------------|---------------------------------------|--------------------------------------|
| Radio microphone | 470.125 - 607.875 MHz | 15.20 | 33.11 |

Maximum tune-up tolerance limit is defined as maximum timed-average value. (Considering to maximum duty cycle)

| Software setting |
|---|
| <p>*The power value of the EUT was set for testing as follows (setting value might be different from product specification value); Power settings: High Software / version: 1.008</p> <p>*This setting of software is the worst case. The test was performed with condition that obtained the maximum average power in pre-check. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.</p> |

SECTION6: RF Exposure Conditions (Test Configurations)

6.1 Summary of the distance between antenna and surface of EUT

| Test position | Distance |
|---------------|----------|
| Front | 0.00 mm |
| Rear | 0.00 mm |
| Left | 0.00 mm |
| Right | 0.00 mm |
| Top | 0.00 mm |
| Bottom | 0.00 mm |

* Details are shown in appendix 4

* Microphone was not connected as more conservative

6.2 SAR test exclusion considerations according to KDB447498 D01

The following is based on KDB447498D01.

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$

for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

1. The upper frequency of the frequency band was used in order to calculate standalone SAR test exclusion considerations.
2. Power and distance are rounded to the nearest mW and mm before calculation
3. The result is rounded to one decimal place for comparison
4. 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. When the separation of antenna to EUT's surfaces and edges are ≤ 50 mm, the separation distance used for the SAR exclusion calculations is 5 mm.
5. "N/A" displayed on below exclusion calculation means not applicable this formula since distance between antenna and surface is > 50 mm.

When the calculated threshold value by a numerical formula above-mentioned in the following table is 3.0 or less, SAR test is excluded.

SAR exclusion calculations for antenna < 50 mm from the user

| Antenna | Tx Interface | Frequency (MHz) | Output Power | | Calculated Threshold Value | | | | | |
|---------|------------------|-----------------|--------------|----|----------------------------|-----------|-----------|-----------|-----------|-----------|
| | | | dBm | mW | Front | Rear | Left | Right | Top | Bottom |
| Fixed | Radio microphone | 607.875 | 15.20 | 33 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 |
| | | | | | -MEASURE- | -MEASURE- | -MEASURE- | -MEASURE- | -MEASURE- | -MEASURE- |

2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following.

- a) $[(3 \cdot 50) / (\sqrt{f(\text{GHz})})] + (\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz}) / 150)$ mW at > 100 MHz and ≤ 1500 MHz
b) $[(3 \cdot 50) / (\sqrt{f(\text{GHz})})] + (\text{test separation distance} - 50 \text{ mm}) \cdot 10$ mW at > 1500 MHz and ≤ 6 GHz

1. The upper frequency of the frequency band was used in order to calculate standalone SAR test exclusion considerations.
2. Power and distance are rounded to the nearest mW and mm before calculation
3. "N/A" displayed on below exclusion calculation means not applicable this formula since distance between antenna and surface is < 50 mm.

When output power is less than the calculated threshold value by a numerical formula above-mentioned in the following table, SAR test is excluded.

| Antenna | Tx Interface | Frequency (MHz) | Output Power | | Calculated Threshold Value | | | | | |
|---------|------------------|-----------------|--------------|----|----------------------------|------|------|-------|-----|--------|
| | | | dBm | mW | Front | Rear | Left | Right | Top | Bottom |
| Fixed | Radio microphone | 607.875 | 15.20 | 33 | N/A | N/A | N/A | N/A | N/A | N/A |

SECTION7: Description of the Body setup

7.1 Procedure for SAR test position determination

-The tested procedure was performed according to the KDB 447498 D01 (Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies).

7.2 Test position for Body setup

| No. | Position | Test distance | Radio microphone |
|-----|----------|---------------|-------------------------------------|
| | | | Tested |
| 1 | Front | 0mm | <input checked="" type="checkbox"/> |
| 2 | Rear | 0mm | <input checked="" type="checkbox"/> |
| 3 | Left | 0mm | <input checked="" type="checkbox"/> |
| 4 | Right | 0mm | <input checked="" type="checkbox"/> |
| 5 | Top | 0mm | <input checked="" type="checkbox"/> |
| 6 | Bottom | 0mm | <input checked="" type="checkbox"/> |

SECTION8: Description of the operating mode

8.1 Output Power and SAR test required

Radio microphone

| Mode | Freq. (MHz) | Tune-up upper Power (dBm) | Measured average Power (dBm) | Initial test configuration | Note(s) |
|------------------|-------------|---------------------------|------------------------------|----------------------------|---------|
| Radio microphone | 470.125 | 15.20 | 14.61 | | |
| | 539.000 | 15.20 | 14.78 | Yes | |
| | 607.875 | 15.20 | 14.56 | | |

8.2 Correlation of Output Power

Correlation of Output Power between original test report and this SAR tests

Refer to original report (Report No: 10068338H)

| Mode | Freq. (MHz) | Maximum measured average Power of Original test report (dBm) | Measured average Power in this SAR test (dBm) | Deviation (dB) |
|------------------|-------------|--|---|----------------|
| Radio Microphone | 470.125 | 15.06 | 14.61 | -0.45 |
| | 607.875 | 14.88 | 14.56 | -0.32 |

SECTION9: Test surrounding

9.1 Measurement uncertainty

This measurement uncertainty budget is suggested by IEEE Std 1528(2013) and IEC62209-2:2010, and determined by Schmid & Partner Engineering AG (DASY5 Uncertainty Budget). Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz Section 2.8.1., when the highest measured SAR(1g) within a frequency band is < 1.5W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std.1528 (2013) is not required in SAR reports submitted for equipment approval.

<0.3 – 3GHz range Body>

| Error Description | Uncertai value ± | Probability distribution | divisor | (ci) 1g | Standard (1g) |
|---|---------------------|-----------------------------|---------|------------|------------------|
| Measurement System | | | | | |
| Probe calibration | ± 6.00 | Normal | 1 | 1 | ± 6.00 |
| Axial isotropy of the probe | ± 4.7 | Rectangular | √3 | 0.7 | ± 1.9 |
| Spherical isotropy of the probe | ± 9.6 | Rectangular | √3 | 0.7 | ± 3.9 |
| Boundary effects | ± 1.0 | Rectangular | √3 | 1 | ± 0.6 |
| Probe linearity | ± 4.7 | Rectangular | √3 | 1 | ± 2.7 |
| Detection limit | ± 1.0 | Rectangular | √3 | 1 | ± 0.6 |
| Modulation response | ± 2.4 | Rectangular | √3 | 1 | ± 1.4 |
| Readout electronics | ± 0.3 | Normal | 1 | 1 | ± 0.3 |
| Response time | ± 0.8 | Rectangular | √3 | 1 | ± 0.5 |
| Integration time | ± 2.6 | Rectangular | √3 | 1 | ± 1.5 |
| RF ambient Noise | ± 3.0 | Rectangular | √3 | 1 | ± 1.7 |
| RF ambient Reflections | ± 3.0 | Rectangular | √3 | 1 | ± 1.7 |
| Probe Positioner | ± 0.4 | Rectangular | √3 | 1 | ± 0.2 |
| Probe positioning | ± 2.9 | Rectangular | √3 | 1 | ± 1.7 |
| Max.SAR Eval. | ± 2.0 | Rectangular | √3 | 1 | ± 1.2 |
| Test Sample Related | | | | | |
| Device positioning | ± 2.9 | Normal | 1 | 1 | ± 2.9 |
| Device holder uncertainty | ± 3.6 | Normal | 1 | 1 | ± 3.6 |
| Power drift | ± 5.0 | Rectangular | √3 | 1 | ± 2.9 |
| Power Scaling | + 0.0 | Rectangular | √3 | 1 | ± 0.0 |
| Phantom and Setup | | | | | |
| Phantom uncertainty | ± 6.1 | Rectangular | √3 | 1 | ± 3.5 |
| Algorithm for correcting SAR for deviations in permittivity and conductivity | ± 1.9 | Rectangular | √3 | 1 | ± 1.1 |
| Liquid conductivity (meas.) | + 3.9 | Rectangular | √3 | 0.78 | + 1.8 |
| Liquid permittivity (meas.) | - 3.7 | Rectangular | √3 | 0.26 | - 0.6 |
| Liquid conductivity - temp.unc (below 2deg.C.) | ± 5.2 | Rectangular | √3 | 0.78 | ± 2.3 |
| Liquid permittivity - temp.unc (below 2deg.C.) | ± 0.8 | Rectangular | √3 | 0.23 | ± 0.1 |
| Combined Standard Uncertainty | | | | | ± 11.305 |
| Expanded Uncertainty (k=2) | | | | | ± 22.6 |

*. Table of uncertainties are listed for ISO/IEC 17025.

SECTION10: Parameter Check

The dielectric parameters were checked prior to assessment using the DAK dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

According to KDB865664 D01, +/- 5% tolerances are required for ϵ_r and σ and then below table which is the target value of the simulated tissue liquid is quoted from KDB865664 D01.

| Target Frequency (MHz) | Head | | Body | |
|---------------------------|--------------|----------------|--------------|----------------|
| | ϵ_r | σ (S/m) | ϵ_r | σ (S/m) |
| 150 | 52.3 | 0.76 | 61.9 | 0.80 |
| 300 | 45.3 | 0.87 | 58.2 | 0.92 |
| 450 | 43.5 | 0.87 | 56.7 | 0.94 |
| 835 | 41.5 | 0.90 | 55.2 | 0.97 |
| 900 | 41.5 | 0.97 | 55.0 | 1.05 |
| 915 | 41.5 | 0.98 | 55.0 | 1.06 |
| 1450 | 40.5 | 1.20 | 54.0 | 1.30 |
| 1610 | 40.3 | 1.29 | 53.8 | 1.40 |
| 1800 – 2000 | 40.0 | 1.40 | 53.3 | 1.52 |
| 2450 | 39.2 | 1.80 | 52.7 | 1.95 |
| 3000 | 38.5 | 2.40 | 52.0 | 2.73 |
| 5800 | 35.3 | 5.27 | 48.2 | 6.00 |

(ϵ_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m³)

10.1 For SAR system check

| DIELECTRIC PARAMETERS MEASUREMENT RESULTS | | | | | | | | | | | |
|---|-----------------------|-----------------------|-------------|----------------------|--------------------------|------------------|--------------|----------|---------------|-----------|--------|
| Date | Ambient Temp. [deg.c] | Relative Humidity [%] | Liquid type | Liquid Temp. [deg.c] | Measured Frequency [MHz] | Parameters | Target Value | Measured | Deviation [%] | Limit [%] | Remark |
| 2018/6/15 | 24.0 | 45 | MSL 450 | 23.5 | 450 | σ [mho/m] | 0.94 | 0.90 | -4.7 | +/-5 | *1 |
| | | | | | | ϵ_r | 56.7 | 56.3 | -0.7 | +/-5 | |
| 2018/6/15 | 24.0 | 45 | MSL 650 | 23.5 | 600 | σ [mho/m] | 0.95 | 0.95 | -0.1 | +/-5 | *2 |
| | | | | | | ϵ_r | 56.1 | 54.1 | -3.5 | +/-5 | |
| 2018/6/16 | 24.0 | 45 | MSL 450 | 23.5 | 450 | σ [mho/m] | 0.94 | 0.91 | -3.1 | +/-5 | *2 |
| | | | | | | ϵ_r | 56.7 | 56.7 | 0.0 | +/-5 | |

σ : Conductivity / ϵ_r : Relative Permittivity

*1 The Target value is a parameter defined in KDB 865664D01.

*2 The dielectric parameters should be linearly interpolated between the closest pair of target frequencies to determine the applicable dielectric parameters corresponding to the device test frequency.

Correlation confirmation with measured TSL parameters of the calibration certificate of system check dipoles (Refer to Appendix 3)

+/- 6% limit for deviation provided by manufacture tolerances are required for ϵ_r and σ and then below table which is the target value of the simulated tissue liquid is quoted from data measured TSL parameters of dipole calibration.

| Freq [MHz] | Model,S/N | Body | |
|------------|-----------|----------|--------------|
| | | σ | ϵ_r |
| 450 | D450,1051 | 0.98 | 58.4 |
| 600 | D600,1003 | 0.91 | 55.8 |

| DIELECTRIC PARAMETERS MEASUREMENT RESULTS | | | | | | | | | | | |
|---|-----------------------|-----------------------|-------------|----------------------|--------------------------|------------------|----------------|----------|---------------|-----------|--------|
| Date | Ambient Temp. [deg.c] | Relative Humidity [%] | Liquid type | Liquid Temp. [deg.c] | Measured Frequency [MHz] | Parameters | Target Value*1 | Measured | Deviation [%] | Limit [%] | Remark |
| 2018/6/15 | 24.0 | 45 | MSL 450 | 23.5 | 450 | σ [mho/m] | 0.92 | 0.90 | -2.6 | +/-6 | |
| | | | | | | ϵ_r | 54.4 | 56.3 | 3.5 | +/-6 | |
| 2018/6/15 | 24.0 | 45 | MSL 650 | 23.5 | 600 | σ [mho/m] | 0.91 | 0.95 | 4.5 | +/-6 | |
| | | | | | | ϵ_r | 55.8 | 54.1 | -3.0 | +/-6 | |
| 2018/6/16 | 24.0 | 45 | MSL 450 | 23.5 | 450 | σ [mho/m] | 0.92 | 0.91 | -1.0 | +/-6 | |
| | | | | | | ϵ_r | 54.4 | 56.7 | 4.2 | +/-6 | |

ϵ_r : Relative Permittivity / σ : Conductivity

*1 The Target value is a parameter defined in each Dipole.

10.2 For SAR measurement

| DIELECTRIC PARAMETERS MEASUREMENT RESULTS | | | | | | | | | | | |
|---|-----------------------|-----------------------|-------------|----------------------|--------------------------|------------------|--------------|----------|---------------|-----------|--------|
| Date | Ambient Temp. [deg.c] | Relative Humidity [%] | Liquid type | Liquid Temp. [deg.c] | Measured Frequency [MHz] | Parameters | Target Value | Measured | Deviation [%] | Limit [%] | Remark |
| 2018/6/15 | 24.0 | 45 | MSL 450 | 23.5 | 539 | σ [mho/m] | 0.95 | 0.96 | 1.6 | +/-5 | *1 |
| | | | | | | ϵ_r | 56.4 | 54.8 | -2.8 | +/-5 | |
| 2018/6/15 | 24.0 | 45 | MSL 650 | 23.5 | 607.875 | σ [mho/m] | 0.95 | 0.96 | 0.8 | +/-5 | *1 |
| | | | | | | ϵ_r | 56.1 | 54.0 | -3.7 | +/-5 | |
| 2018/6/16 | 24.0 | 45 | MSL 450 | 23.5 | 539 | σ [mho/m] | 0.95 | 0.98 | 3.9 | +/-5 | *1 |
| | | | | | | ϵ_r | 56.4 | 55.5 | -1.5 | +/-5 | |
| 2018/6/16 | 24.0 | 45 | MSL 450 | 23.5 | 470.125 | σ [mho/m] | 0.94 | 0.93 | -1.5 | +/-5 | *2 |
| | | | | | | ϵ_r | 56.6 | 56.4 | -0.4 | +/-5 | |

σ : Conductivity / ϵ_r : Relative Permittivity

*1 The dielectric parameters should be linearly interpolated between the closest pair of target frequencies to determine the applicable dielectric parameters corresponding to the device test frequency.

SECTION11: System Check confirmation

The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.

The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm ± 0.5 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm ± 0.5 cm for measurements > 3 GHz.

The DASY system with an E-Field Probe was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom).

The standard measuring distance was 10 mm (above 1GHz to 6GHz) and 15 mm (below 1GHz) from dipole center to the simulating liquid surface.

The coarse grid with a grid spacing of 12 mm (1GHz to 3GHz) and 15 mm (below 1GHz) was aligned with the dipole.

For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.

Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.

Distance between probe sensors and phantom surface was set to 3 mm.

For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm

The dipole input power (forward power) was 100 mW(For 5GHz band) or 250 mW(For other band).

The results are normalized to 1 W input power.

Target Value

| Freq [MHz] | Model,S/N | Body | |
|------------|-----------|-------------------|-------------------|
| | | (SPEAG) 1g [W/kg] | (SPEAG) 10g[W/kg] |
| 450 | D450,1051 | 4.56 | 3.00 |
| 600 | D600,1003 | 6.48 | 4.28 |

| Date Tested | Test Freq | Model,S/N | T.S. Liquid | Measured Results | | Target (Ref. Value) | Delta ±10 % | |
|-------------|-----------|-----------|-------------|------------------|------------------|---------------------|-------------|-----|
| | | | | Zoom Scan | Normalize to 1 W | | | |
| 2018/6/15 | 450 | D450,1051 | Body | 1g | 1.16 | 4.64 | 4.56 | 1.8 |
| | | | | 10g | 0.79 | 3.15 | 3.00 | 4.9 |
| 2018/6/15 | 600 | D600,1003 | Body | 1g | 1.72 | 6.88 | 6.48 | 6.2 |
| | | | | 10g | 1.13 | 4.52 | 4.28 | 5.6 |
| 2018/6/16 | 450 | D450,1051 | Body | 1g | 1.18 | 4.72 | 4.56 | 3.5 |
| | | | | 10g | 0.80 | 3.19 | 3.00 | 6.4 |

* The target(reference) SAR values can be obtained from the calibration certificate of system validation dipoles(Refer to Appendix 3). The target SAR values are SAR measured value in the calibration certificate scaled to 1W.

SECTION12: Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows

- **KDB 447498 D01 (General RF Exposure Guidance):**

Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ◇ ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ◇ ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- ◇ ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

- According to Notice 2016-DRS001 based on the IEEE1528 and IEC 62209 requirements, the low, mid and high frequency channels for the configuration with the highest SAR value must be tested regardless of the SAR value measured.
- When reported SAR value is exceed 1.2W/kg(if any), device holder perturbation verification is required; however, since distance between device holder and antenna of EUT is enough, it was not conducted.
- Reported SAR= Measured SAR [W/kg] · Scaled factor
* Scaled factor = Maximum tune-up tolerance limit [mW] / Measured power [mW]
- Maximum tune-up tolerance limit is by the specification from a customer.

12.1 Radio microphone

| Test Position | Dist. (mm) | Freq. (MHz) | Power (dBm) | | Scaled factor | 1-g SAR (W/kg) | |
|---------------|------------|-------------|---------------------|------------------------|---------------|----------------|----------|
| | | | Tune-up upper Power | Measured average Power | | | Reported |
| Front | 0 | 470.125 | 15.20 | 14.61 | 1.146 | | |
| | | 539.000 | 15.20 | 14.78 | 1.102 | 0.074 | 0.082 |
| | | 607.875 | 15.20 | 14.56 | 1.159 | | |
| Rear | 0 | 470.125 | 15.20 | 14.61 | 1.146 | | |
| | | 539.000 | 15.20 | 14.78 | 1.102 | 0.081 | 0.089 |
| | | 607.875 | 15.20 | 14.56 | 1.159 | | |
| Left | 0 | 470.125 | 15.20 | 14.61 | 1.146 | | |
| | | 539.000 | 15.20 | 14.78 | 1.102 | 0.139 | 0.153 |
| | | 607.875 | 15.20 | 14.56 | 1.159 | | |
| Right | 0 | 470.125 | 15.20 | 14.61 | 1.146 | | |
| | | 539.000 | 15.20 | 14.78 | 1.102 | 0.135 | 0.149 |
| | | 607.875 | 15.20 | 14.56 | 1.159 | | |
| Top | 0 | 470.125 | 15.20 | 14.61 | 1.146 | 0.275 | 0.315 |
| | | 539.000 | 15.20 | 14.78 | 1.102 | 0.194 | 0.214 |
| | | 607.875 | 15.20 | 14.56 | 1.159 | 0.093 | 0.108 |
| Bottom | 0 | 470.125 | 15.20 | 14.61 | 1.146 | | |
| | | 539.000 | 15.20 | 14.78 | 1.102 | 0.014 | 0.015 |
| | | 607.875 | 15.20 | 14.56 | 1.159 | | |

SECTION13: Test instruments

| Control No. | Instrument | Manufacturer | Model No | Serial No | Test Item | Calibration Date * Interval(month) |
|--------------|---------------------------------|-------------------------------|---------------------------------|-----------------|----------------------------------|---------------------------------------|
| MNA-03 | Vector Reflectometer | Copper Mountain Technologies | PLANAR R140 | 0030913 | SAR | 2018/04/11 * 12 |
| MDPK-03 | Dielectric assessment kit | Schmid&Partner Engineering AG | DAK-3.5 | 0008 | SAR | 2018/04/10 * 12 |
| MOS-37 | Digital thermometer | LKM electronic | DTM3000 | - | SAR | 2017/07/26 * 12 |
| COTS-MSAR-04 | Dielectric assessment software | Schmid&Partner Engineering AG | DAK | | SAR | - |
| MPM-11 | Dual Power Meter | Agilent | E4419B | MY45102060 | SAR | 2017/08/25 * 12 |
| MPSE-15 | Power sensor | Agilent | E9301A | MY41498311 | SAR | 2017/08/25 * 12 |
| MPSE-16 | Power sensor | Agilent | E9301A | MY41498313 | SAR | 2017/08/25 * 12 |
| MRFA-24 | Pre Amplifier | R&K | R&K CGA020M602-2633R | B30550 | SAR | 2017/06/12 * 12 |
| MSG-10 | Signal Generator | Agilent | N5181A | MY47421098 | SAR | 2017/11/29 * 12 |
| MAT-78 | Attenuator | Telegrartner | J01156A0011 | 0042294119 | SAR | Pre Check |
| MPM-15 | Power Meter | Agilent | N1914A | MY53060017 | SAR | 2017/06/21 * 12 |
| MPSE-21 | Power sensor | Agilent | N8482H | MY52460010 | SAR | 2017/06/21 * 12 |
| MHDC-21 | Dual Directional Coupler | Agilent | 778D | MY52180243 | SAR | Pre Check |
| MDA-09 | Dipole Antenna | Schmid&Partner Engineering AG | D450V3 | 1051 | SAR | 2015/09/21 * 36 |
| MMSL0450 | Tissue simulation liquid (Body) | Schmid&Partner Engineering AG | MSL450V2 | SL AAM 045BC | SAR*Daily Check Target Value ±5% | Pre Check |
| MDA-21 | Dipole Antenna | Schmid&Partner Engineering AG | D600V3 | 1003 | SAR | 2016/09/19 * 24 |
| MMSL0650 | Tissue simulation liquid (Body) | Schmid&Partner Engineering AG | MSL650 | 20090914 | SAR*Daily Check Target Value ±5% | Pre Check |
| MDAE-02 | Data Acquisition Electronics | Schmid&Partner Engineering AG | DAE4 | 1369 | SAR | 2018/05/23 * 12 |
| MPB-08 | Dosimetric E-Field Probe | Schmid&Partner Engineering AG | EX3DV4 | 3917 | SAR | 2018/05/23 * 12 |
| MPF-03 | 2mm Oval Flat Phantom | Schmid&Partner Engineering AG | QDOVA001BB | 1203 | SAR | 2018/05/08 * 12 |
| MDH-04 | Device holder | Schmid&Partner Engineering AG | Mounting device for transmitter | - | SAR | Pre Check |
| MOS-35 | Digital thermometer | HANNA | Checktemp 4 | - | SAR | 2017/07/26 * 12 |
| COTS-MSAR-03 | Dasy5 | Schmid&Partner Engineering AG | DASY5 | - | SAR | - |
| MRBT-03 | SAR robot | Schmid&Partner Engineering AG | TX60 Lspeag | F13/5PPLD1/A/01 | SAR | 2017/06/30 * 12 |

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

SAR room is checked before every testing and ambient noise is <0.012W/kg

APPENDIX 1 : System Check

System check result Body 450MHz

20180615 Body 450MHz System Check Power 250mW

Communication System: UID 0, CW (0); Communication System Band: D450 (450.0 MHz); Frequency: 450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 450$ MHz; $\sigma = 0.896$ S/m; $\epsilon_r = 56.296$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(11.28, 11.28, 11.28); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.44 W/kg

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

Reference Value = 40.61 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.77 W/kg

SAR(1 g) = 1.16 W/kg; SAR(10 g) = 0.787 W/kg

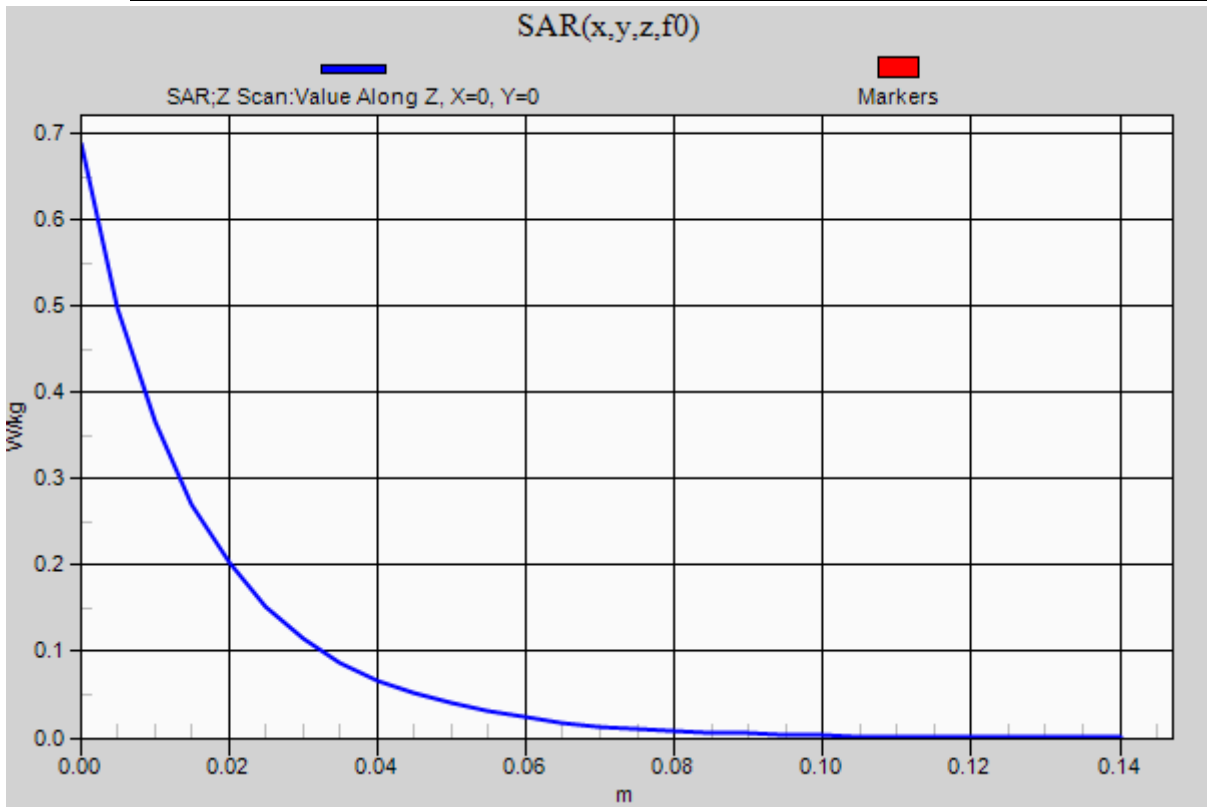
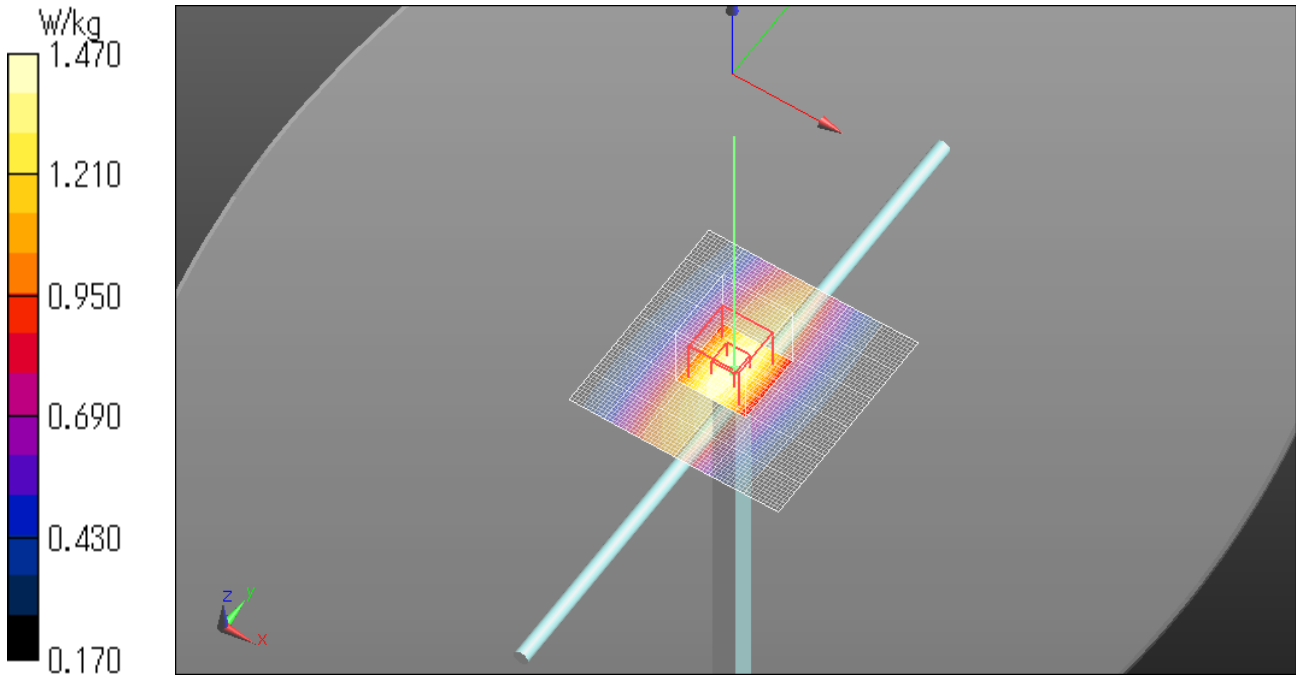
Maximum value of SAR (measured) = 1.47 W/kg

Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.689 W/kg

Date: 2018/06/15

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



20180616 Body 450MHz System Check Power 250mW

Communication System: UID 0, CW (0); Communication System Band: D450 (450.0 MHz); Frequency: 450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 450$ MHz; $\sigma = 0.911$ S/m; $\epsilon_r = 56.708$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(11.28, 11.28, 11.28); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASYS52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.47 W/kg

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

Reference Value = 40.58 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.79 W/kg

SAR(1 g) = 1.18 W/kg; SAR(10 g) = 0.798 W/kg

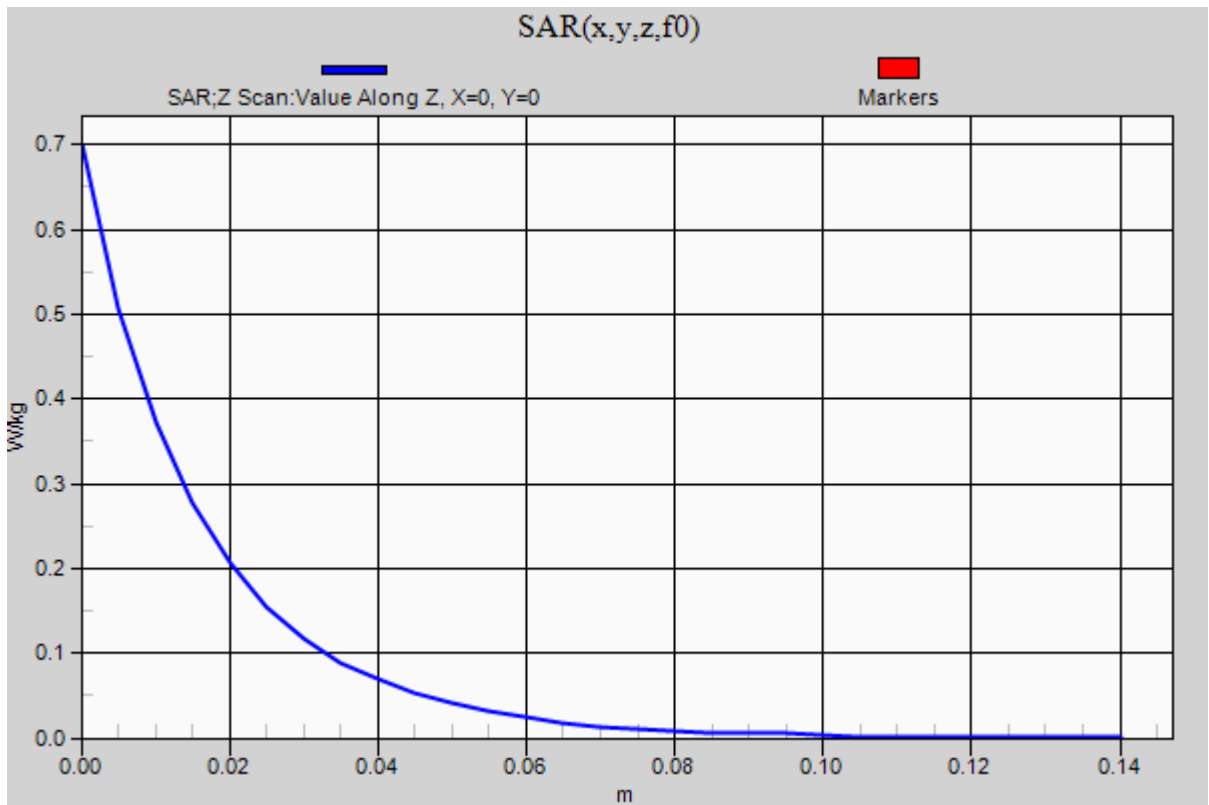
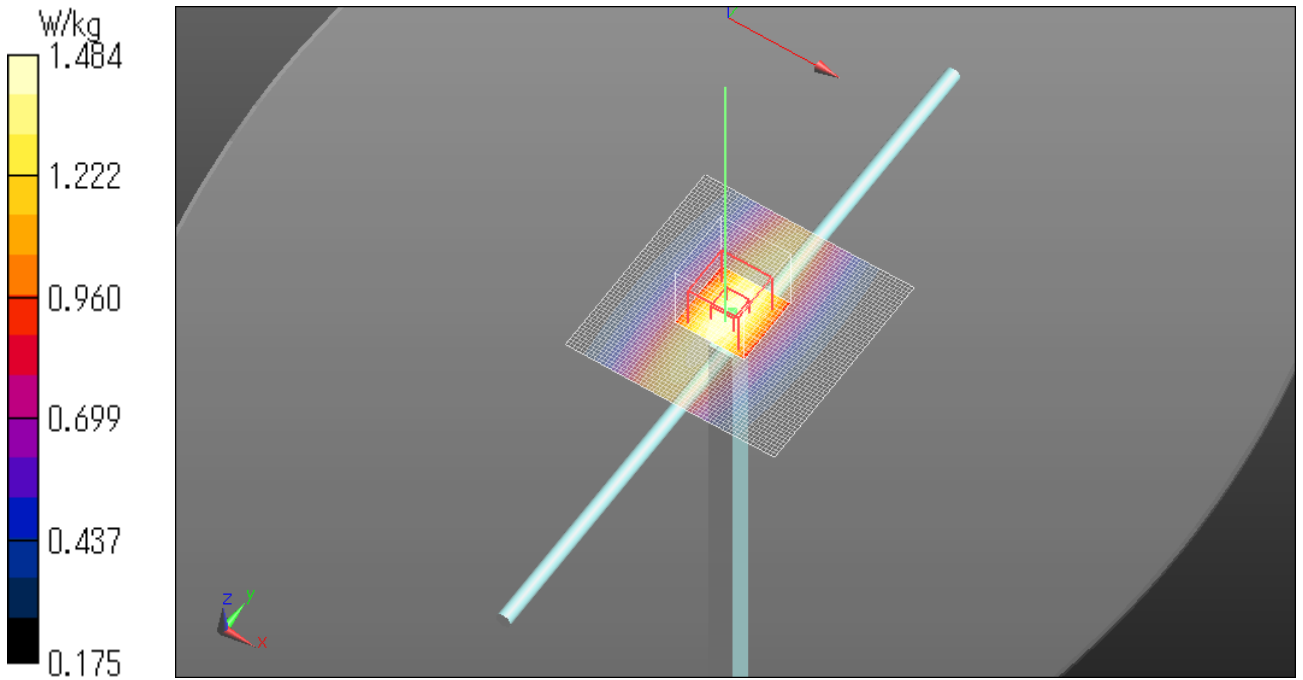
Maximum value of SAR (measured) = 1.48 W/kg

Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.700 W/kg

Date: 2018/06/16

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



System check result Body 600MHz

20180615 Body 600MHz System Check Power 250mW

Communication System: UID 0, CW (0); Communication System Band: D600 (600.0 MHz); Frequency: 600 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 600$ MHz; $\sigma = 0.951$ S/m; $\epsilon_r = 54.127$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(10.51, 10.51, 10.51); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASYS2, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.17 W/kg

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

Reference Value = 48.47 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 2.68 W/kg

SAR(1 g) = 1.72 W/kg; SAR(10 g) = 1.13 W/kg

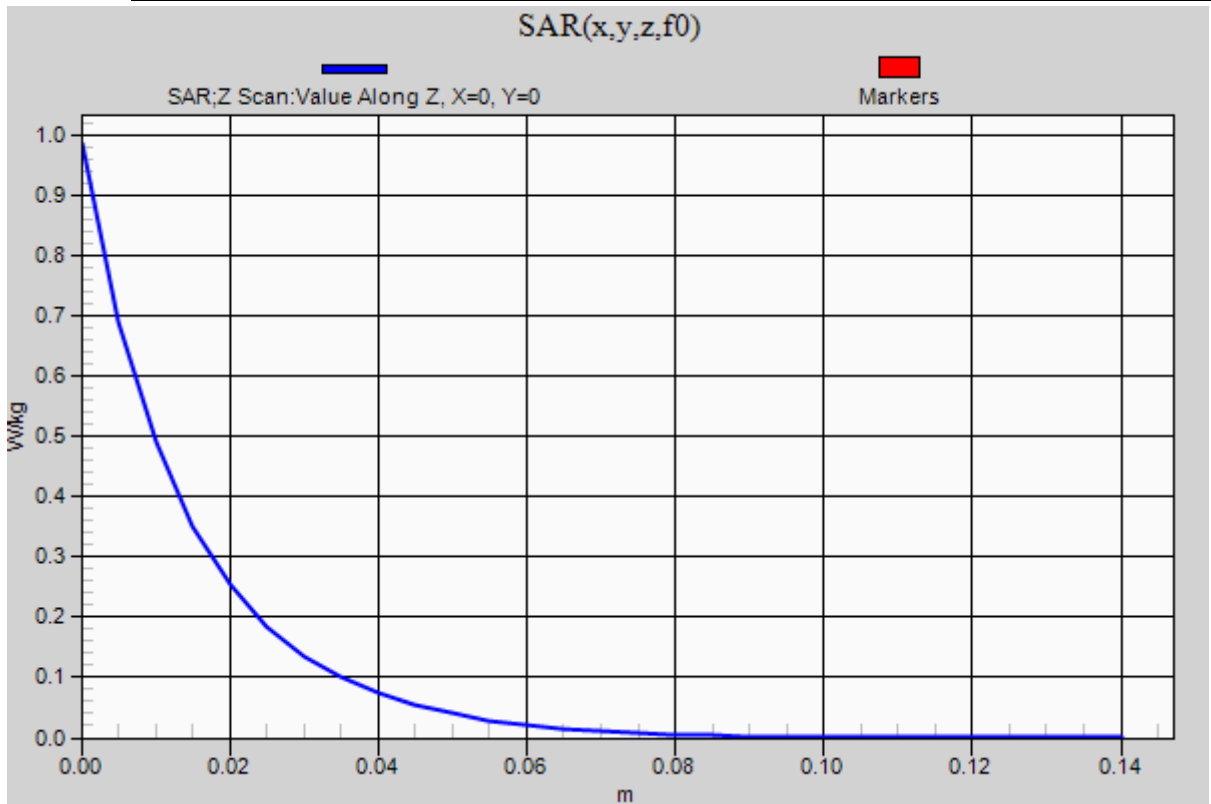
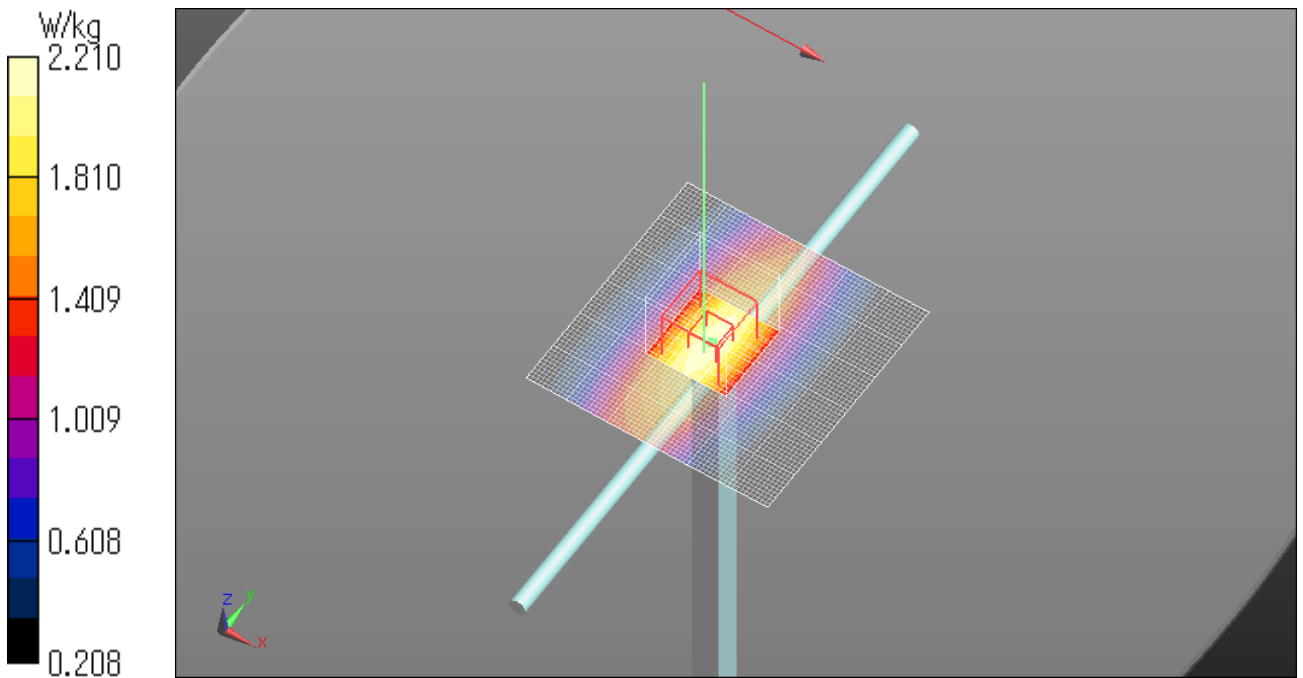
Maximum value of SAR (measured) = 2.21 W/kg

Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.987 W/kg

Date: 2018/06/15

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



APPENDIX 2 : SAR Measurement data

Evaluation procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the E-field at a fixed location above the ear point or central position of flat phantom was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of head or body position was measured at a distance of each device from the inner surface of the shell. The area covered the entire dimension of the antenna of EUT and the horizontal grid spacing was 15 mm x 15 mm, 12 mm x 12 mm or 10mm x 10mm. Based on these data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Around this point found in the Step 2 (area scan), a volume of 30mm x 30mm x 30mm or more was assessed by measuring 7 x 7 x 7 points at least for below 3GHz and a volume of 28 mm x 28mm x 22.5mm or more was assessed by measuring 8 x 8 x 6(ratio step method (*1)) points at least for 5GHz band.

And for any secondary peaks found in the Step2 which are within 2dB of maximum peak and not with this Step3 (Zoom scan) is repeated. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

(1). The data at the surface were extrapolated, since the center of the dipoles is 1mm(EX3DV4) away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm [4]. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

(2). The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x, y and z-directions) [4], [5]. The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

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

***1. Ratio step method parameters used;**

The first measurement point: 2mm from the phantom surface, the initial grid separation: 2mm, subsequent graded grid ratio: 1.5

These parameters comply with the requirement of the KDB 865664D01.

Step 4: Re-measurement of the E-field at the same location as in Step 1.

Confirmation after SAR testing

It was checked that the power drift [W] is within +/-5%. The verification of power drift during the SAR test is that DASY5 system calculates the power drift by measuring the e-field at the same location at beginning and the end of the scan measurement for each test position.

DASY5 system calculation Power drift value[dB] = $20\log(E_a)/(E_b)$

Before SAR testing : E_b [V/m]

After SAR testing : E_a [V/m]

Limit of power drift[W] = +/-5%

$X[\text{dB}] = 10\log[P] = 10\log(1.05/1) = 10\log(1.05) - 10\log(1) = 0.212\text{dB}$

from E-field relations with power.

$p = E^2/\eta = E^2/$

Therefore, The correlation of power and the E-field

$X_{\text{dB}} = 10\log(P) = 10\log(E)^2 = 20\log(E)$

Therefore,

The calculated power drift of DASY5 System must be the less than +/-0.212dB.

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Measurement data

Radio Microphone 539.000MHz Front 0mm

Communication System: UID 0, Radio microphone (0); Communication System Band: UC; Frequency: 539 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 539$ MHz; $\sigma = 0.962$ S/m; $\epsilon_r = 54.789$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(11.28, 11.28, 11.28); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASYS2, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.0988 W/kg

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

Reference Value = 10.19 V/m; Power Drift = 0.04 dB

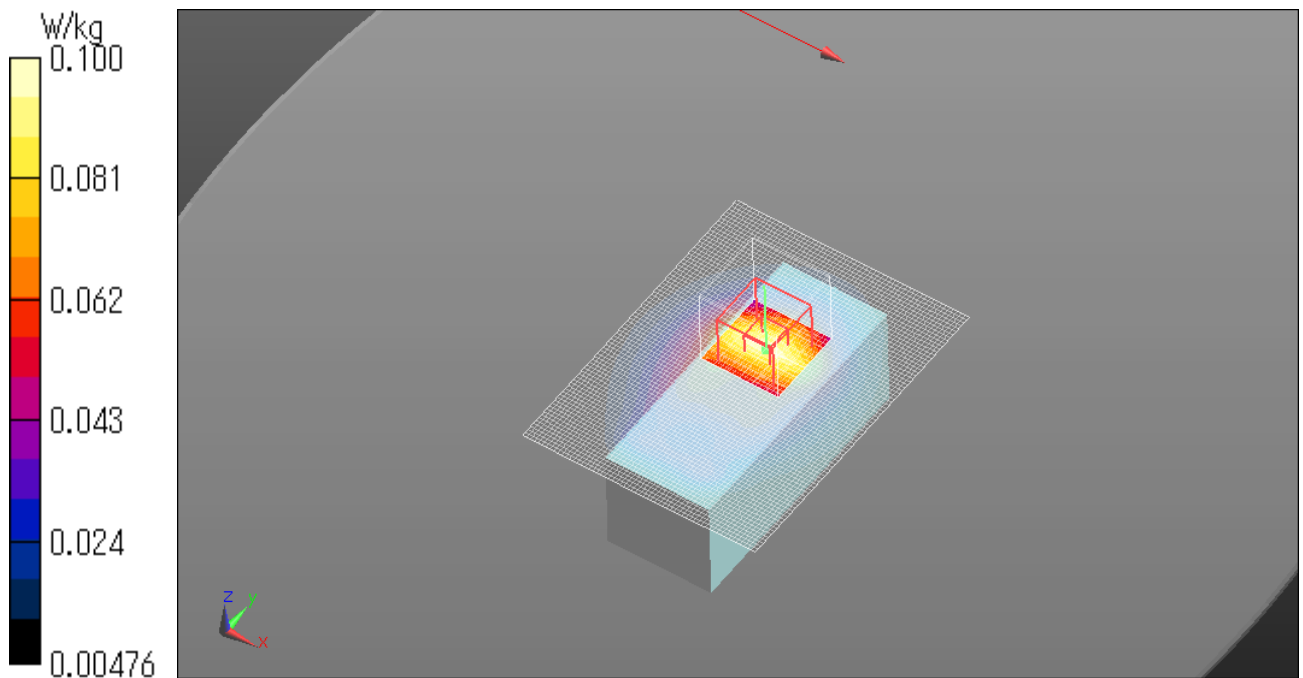
Peak SAR (extrapolated) = 0.126 W/kg

SAR(1 g) = 0.074 W/kg; SAR(10 g) = 0.047 W/kg

Maximum value of SAR (measured) = 0.100 W/kg

Date: 2018/06/15

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Radio Microphone 539.000MHz Rear 0mm

Communication System: UID 0, Radio microphone (0); Communication System Band: UC; Frequency: 539 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 539$ MHz; $\sigma = 0.962$ S/m; $\epsilon_r = 54.789$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(11.28, 11.28, 11.28); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASYS52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0961 W/kg

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

Reference Value = 9.732 V/m; Power Drift = -0.01 dB

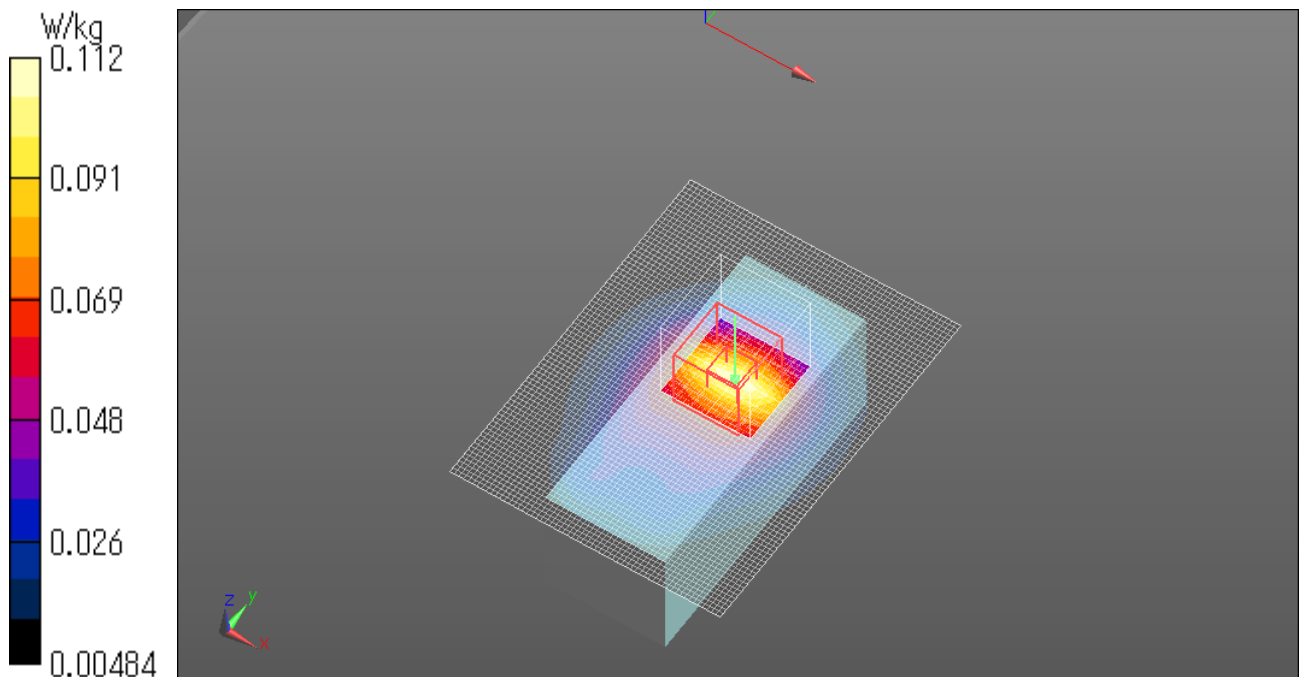
Peak SAR (extrapolated) = 0.144 W/kg

SAR(1 g) = 0.081 W/kg; SAR(10 g) = 0.049 W/kg

Maximum value of SAR (measured) = 0.112 W/kg

Date: 2018/06/15

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Radio Microphone 539.000MHz Left 0mm

Communication System: UID 0, Radio microphone (0); Communication System Band: UC; Frequency: 539 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 539$ MHz; $\sigma = 0.962$ S/m; $\epsilon_r = 54.789$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(11.28, 11.28, 11.28); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASYS52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.170 W/kg

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

Reference Value = 12.73 V/m; Power Drift = 0.01 dB

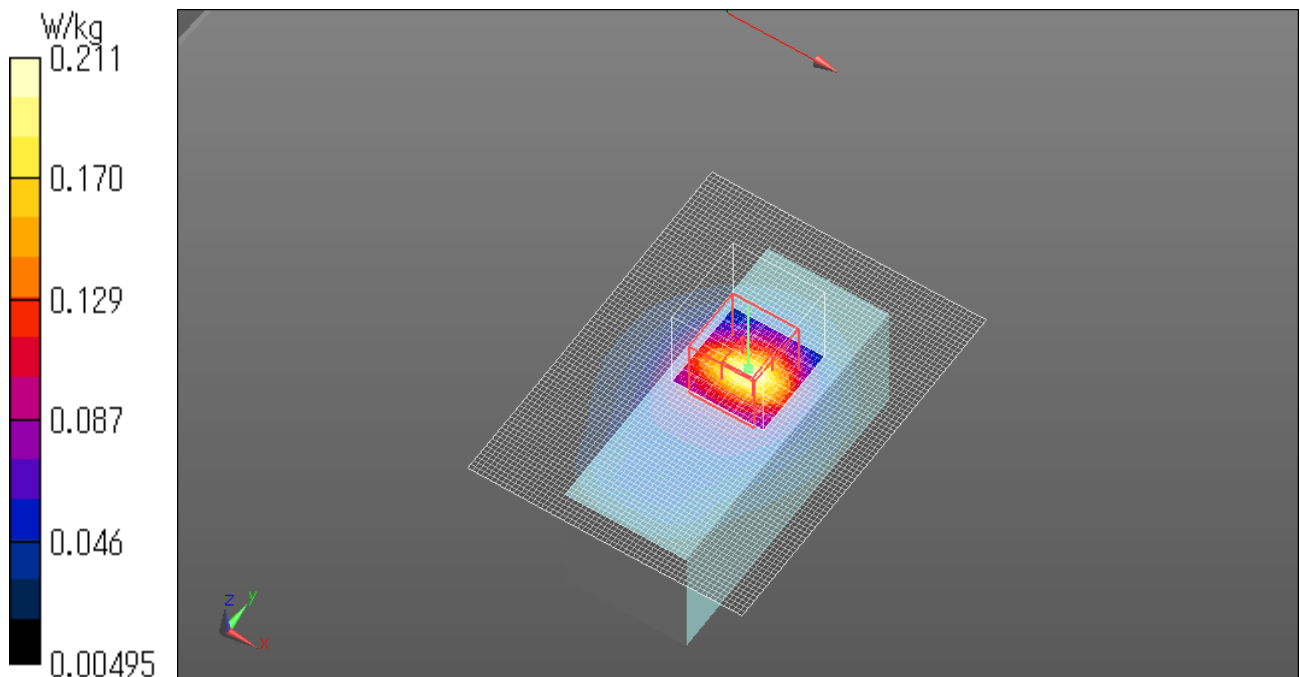
Peak SAR (extrapolated) = 0.319 W/kg

SAR(1 g) = 0.139 W/kg; SAR(10 g) = 0.074 W/kg

Maximum value of SAR (measured) = 0.211 W/kg

Date: 2018/06/15

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Radio Microphone 539.000MHz Right 0mm

Communication System: UID 0, Radio microphone (0); Communication System Band: UC; Frequency: 539 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 539$ MHz; $\sigma = 0.962$ S/m; $\epsilon_r = 54.789$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(11.28, 11.28, 11.28); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASYS52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.165 W/kg

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

Reference Value = 12.63 V/m; Power Drift = 0.03 dB

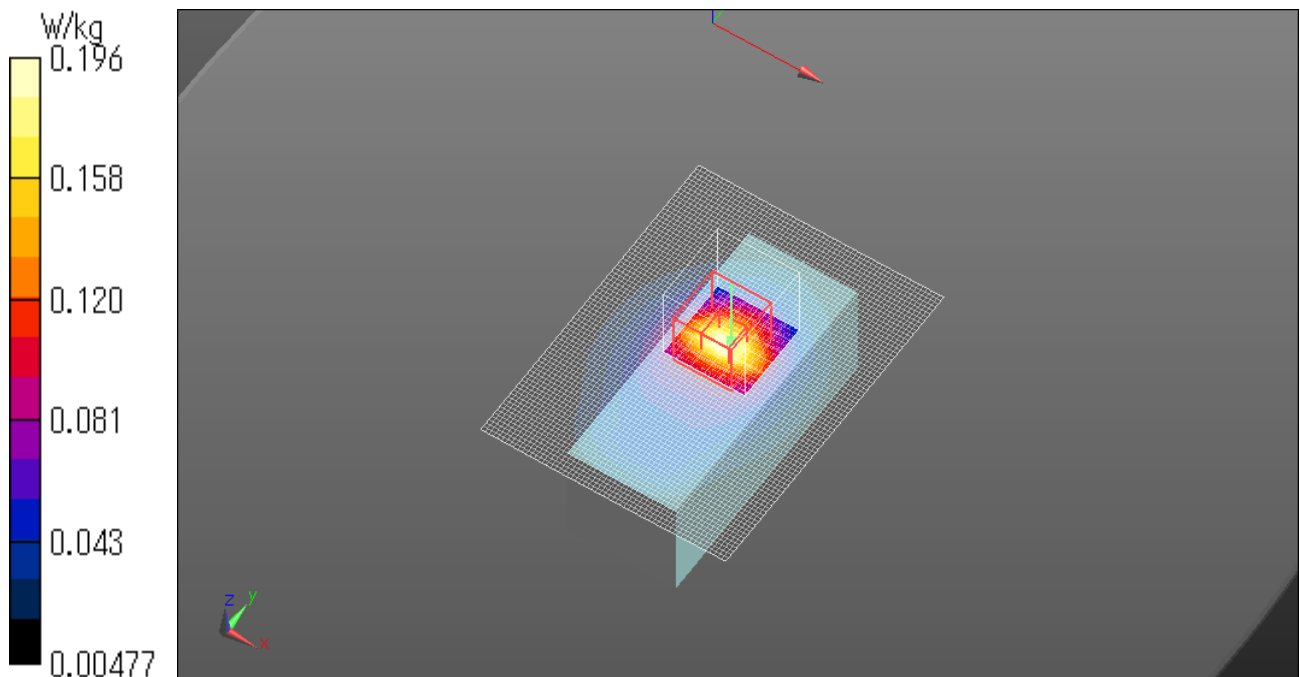
Peak SAR (extrapolated) = 0.292 W/kg

SAR(1 g) = 0.135 W/kg; SAR(10 g) = 0.073 W/kg

Maximum value of SAR (measured) = 0.196 W/kg

Date: 2018/06/15

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Radio Microphone 470.125MHz Top 0mm

Communication System: UID 0, Radio microphone (0); Communication System Band: UC; Frequency: 470.125 MHz;
Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 470.125$ MHz; $\sigma = 0.927$ S/m; $\epsilon_r = 56.405$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(11.28, 11.28, 11.28); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASYS52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.400 W/kg

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

Reference Value = 20.90 V/m; Power Drift = 0.06 dB

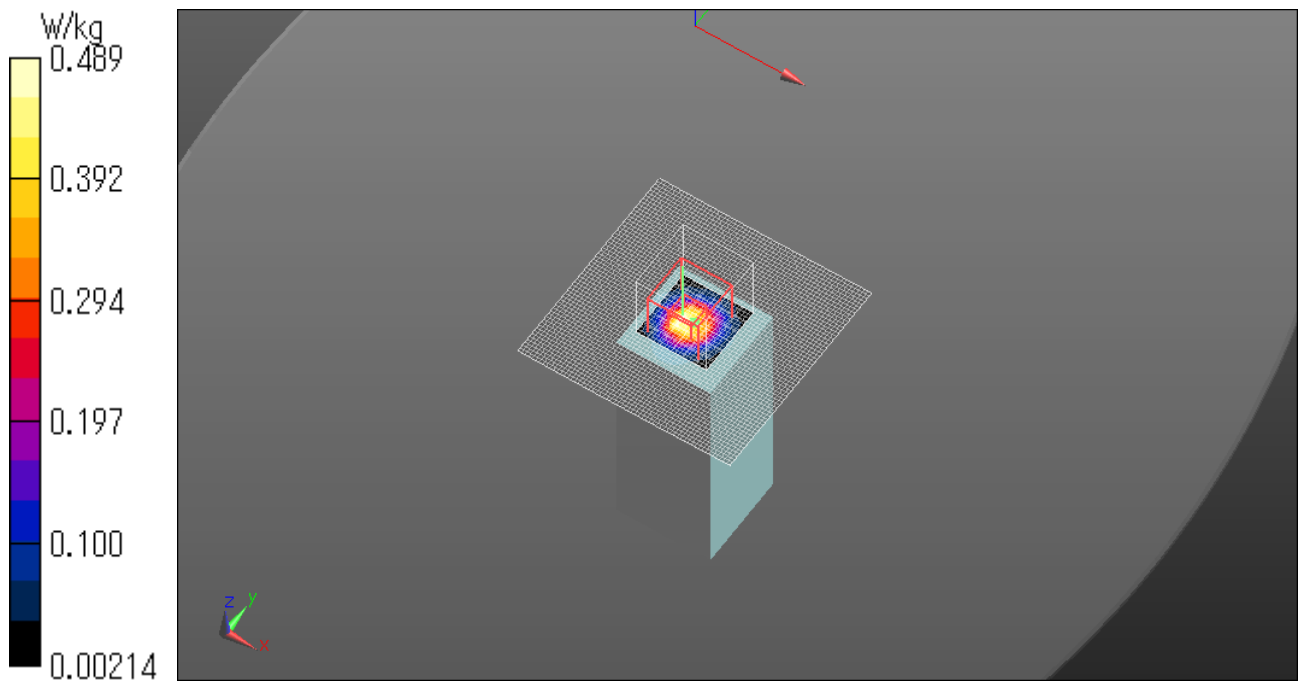
Peak SAR (extrapolated) = 1.22 W/kg

SAR(1 g) = 0.275 W/kg; SAR(10 g) = 0.089 W/kg

Maximum value of SAR (measured) = 0.489 W/kg

Date: 2018/06/16

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Radio Microphone 539.000MHz Top 0mm

Communication System: UID 0, Radio microphone (0); Communication System Band: UC; Frequency: 539 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 539$ MHz; $\sigma = 0.984$ S/m; $\epsilon_r = 55.505$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(11.28, 11.28, 11.28); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.292 W/kg

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

Reference Value = 17.33 V/m; Power Drift = -0.05 dB

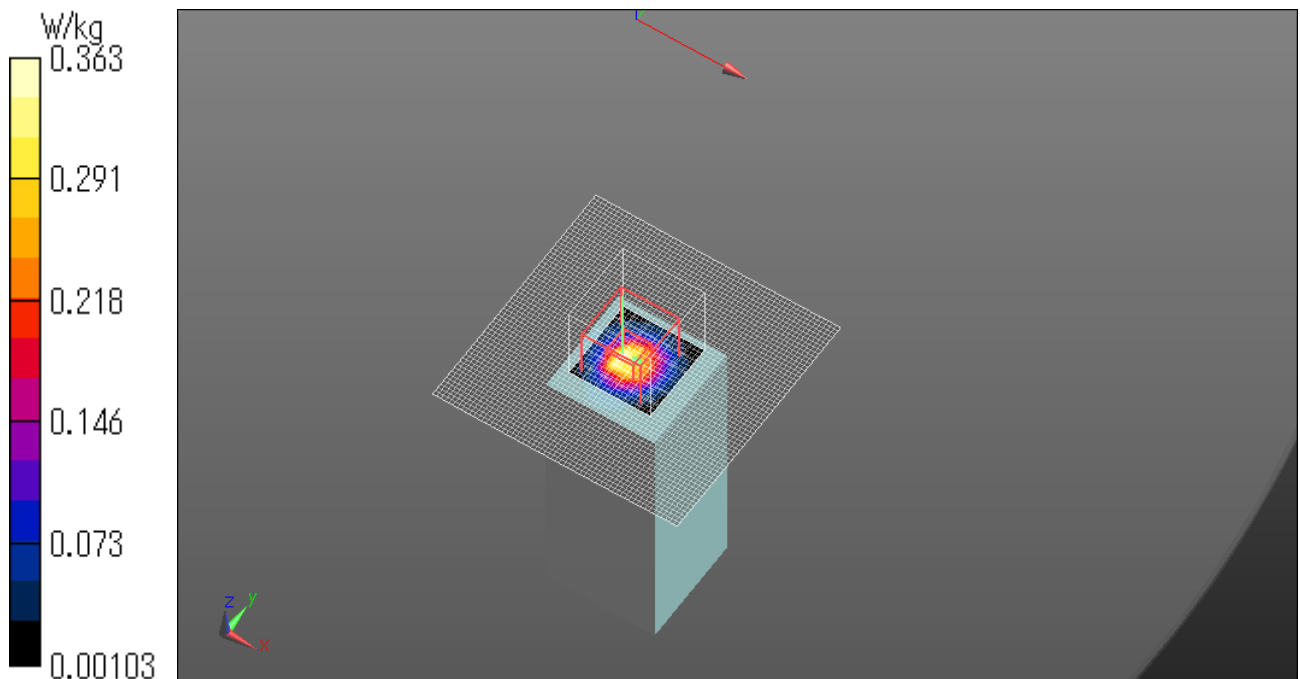
Peak SAR (extrapolated) = 0.852 W/kg

SAR(1 g) = 0.194 W/kg; SAR(10 g) = 0.062 W/kg

Maximum value of SAR (measured) = 0.363 W/kg

Date: 2018/06/16

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Radio Microphone 607.875MHz Top 0mm

Communication System: UID 0, Radio microphone (0); Communication System Band: UC; Frequency: 607.875 MHz;
Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 607.875$ MHz; $\sigma = 0.957$ S/m; $\epsilon_r = 54.021$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(10.51, 10.51, 10.51); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.143 W/kg

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

Reference Value = 12.26 V/m; Power Drift = 0.05 dB

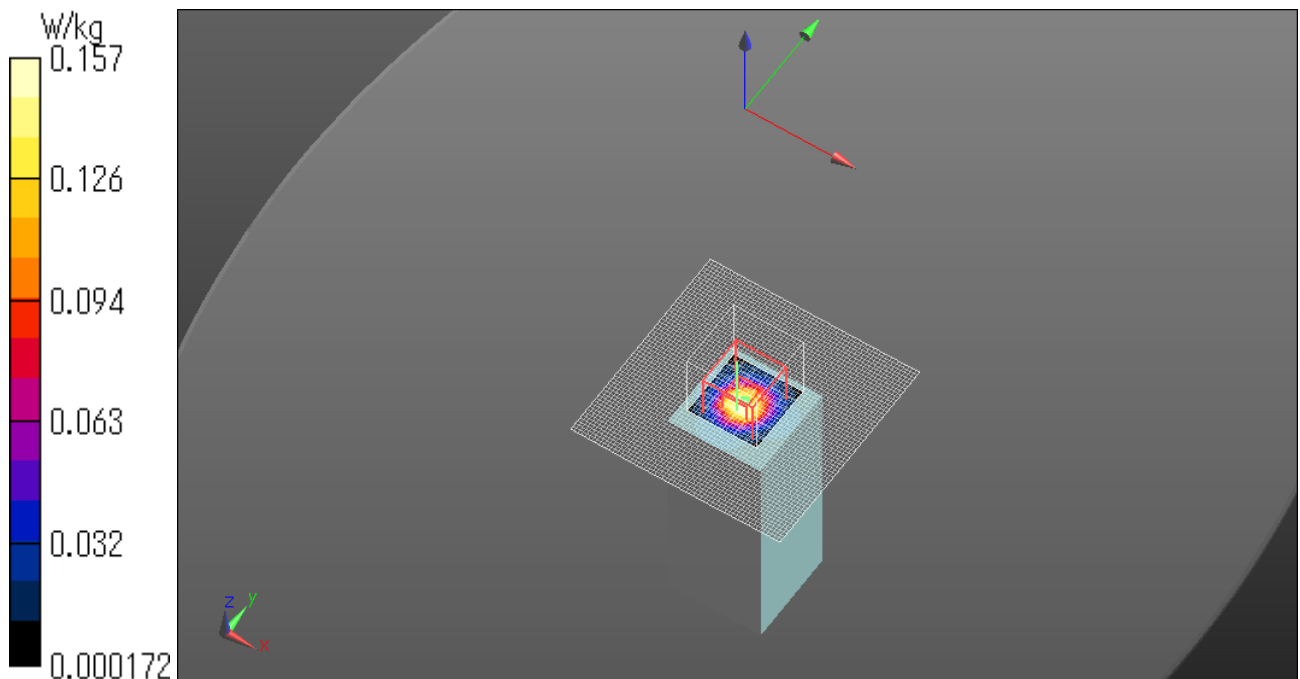
Peak SAR (extrapolated) = 0.344 W/kg

SAR(1 g) = 0.093 W/kg; SAR(10 g) = 0.031 W/kg

Maximum value of SAR (measured) = 0.157 W/kg

Date: 2018/06/15

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Radio Microphone 539.000MHz Bottom 0mm

Communication System: UID 0, Radio microphone (0); Communication System Band: UC; Frequency: 539 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 539$ MHz; $\sigma = 0.962$ S/m; $\epsilon_r = 54.789$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3917; ConvF(11.28, 11.28, 11.28); Calibrated: 2018/05/23;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1369; Calibrated: 2018/05/23

Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1203

Measurement SW: DASYS52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0214 W/kg

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

Reference Value = 4.574 V/m; Power Drift = 0.13 dB

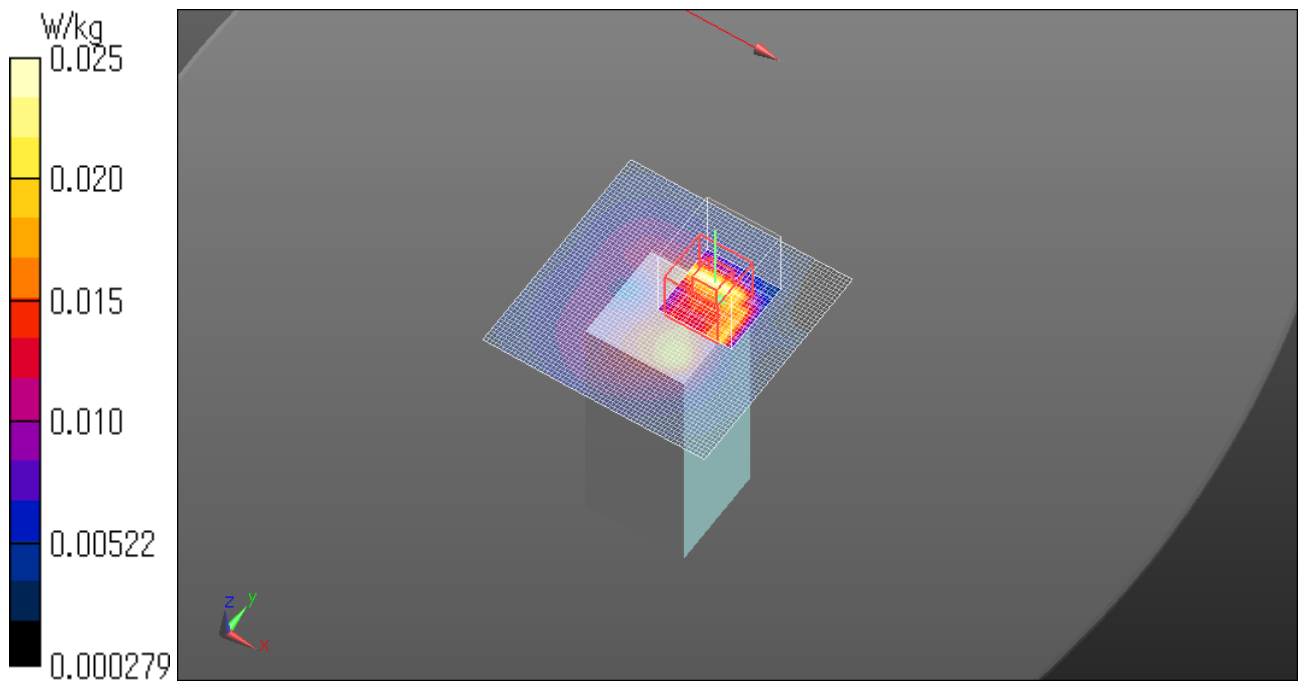
Peak SAR (extrapolated) = 0.0390 W/kg

SAR(1 g) = 0.014 W/kg; SAR(10 g) = 0.00761 W/kg

Maximum value of SAR (measured) = 0.0250 W/kg

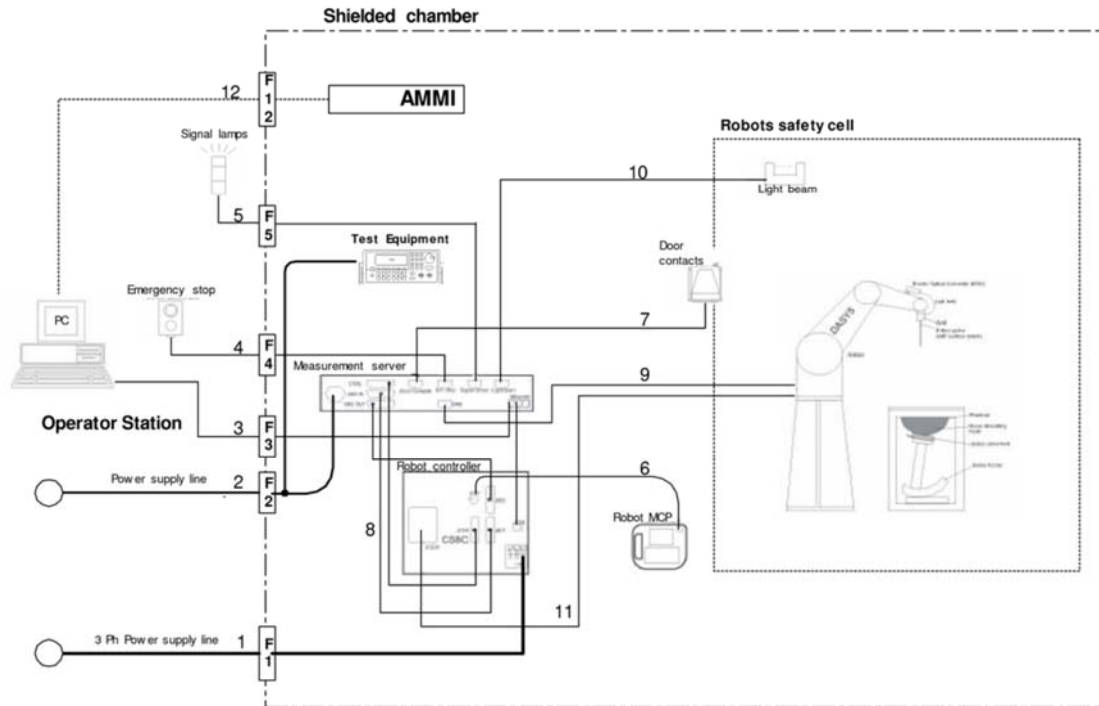
Date: 2018/06/15

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



APPENDIX 3 : System specifications

Configuration and peripherals



The DASYS5 system for performing compliance tests consist of the following items:

- a) A standard high precision 6-axis robot (Stäubli RX family) with controller and software.
An arm extension for accommodating the data acquisition electronics (DAE).
- b) An isotropic field probe optimized and calibrated for the targeted measurement.
- c) A data acquisition electronic (DAE), which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- d) The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection.
The EOC is connected to the measurement server.
- e) The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- f) The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- g) A computer running WinXP and the DASYS5 software.
- h) Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.
- i) The phantom, the device holder and other accessories according to the targeted measurement.

Specifications

a) Robot TX60L

| | | |
|-----------------------------|---|------------------|
| Number of Axes | : | 6 |
| Nominal Load | : | 2 kg |
| Maximum Load | : | 5kg |
| Reach | : | 920mm |
| Repeatability | : | +/-0.03mm |
| Control Unit | : | CS8c |
| Programming Language | : | VAL3 |
| Weight | : | 52.2kg |
| Manufacture | : | Stäubli Robotics |

b) E-Field Probe

| | | |
|----------------------|---|---|
| Model | : | EX3DV4 |
| Construction | : | Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycol ether) |
| Frequency | : | 10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz) |
| Directivity | : | +/-0.3 dB in HSL (rotation around probe axis) +/-0.5 dB in tissue material (rotation normal probe axis) |
| Dynamic Range | : | 10uW/g to > 100 mW/g; Linearity +/-0.2 dB(noise: typically < 1uW/g) |
| Dimensions | : | Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm |
| Application | : | Highprecision dosimetric measurement in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6GHz with precision of better 30%. |
| Manufacture | : | Schmid & Partner Engineering AG |



EX3DV4 E-field Probe

c)Data Acquisition Electronic (DAE4)

| | | |
|-----------------------------|---|---|
| Features | : | Signal amplifier, multiplexer, A/D converter and control logic Serial optical link for communication with DASY5 embedded system (fully remote controlled) Two step probe touch detector for mechanical surface detection and emergency robot stop |
| Measurement Range | : | -100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV) |
| Input Offset voltage | : | < 5 μ V (with auto zero) |
| Input Resistance | : | 200 M Ω |
| Input Bias Current | : | < 50 fA |
| Battery Power | : | > 10 h of operation (with two 9.6 V NiMH accus) |
| Dimension | : | 60 x 60 x 68 mm |
| Manufacture | : | Schmid & Partner Engineering AG |

d)Electro-Optic Converter (EOC)

| | | |
|--------------------|---|--|
| Version | : | EOC 61 |
| Description | : | for TX60 robot arm, including proximity sensor |
| Manufacture | : | Schmid & Partner Engineering AG |

e)DASY5 Measurement server

| | | |
|-------------------------------|---|--|
| Features | : | Intel ULV Celeron 400MHz 128MB chip disk and 128MB RAM 16 Bit A/D converter for surface detection system Vacuum Fluorescent Display Robot Interface Serial link to DAE (with watchdog supervision) Door contact port (Possibility to connect a light curtain) Emergency stop port (to connect the remote control) Signal lamps port Light beam port Three Ethernet connection ports Two USB 2.0 Ports Two serial links Expansion port for future applications |
| Dimensions (L x W x H) | : | 440 x 241 x 89 mm |
| Manufacture | : | Schmid & Partner Engineering AG |

f) Light Beam Switches

| | | |
|---------------------------|---|---------------------------------|
| Version | : | LB5 |
| Dimensions (L x H) | : | 110 x 80 mm |
| Thickness | : | 12 mm |
| Beam-length | : | 80 mm |
| Manufacture | : | Schmid & Partner Engineering AG |

g)Software

| | | |
|-----------------------------|---|------------------------------------|
| Item | : | Dosimetric Assessment System DASY5 |
| Type No. | : | SD 000 401A, SD 000 402A |
| Software version No. | : | DASY52, Version 52.6 (1) |
| Manufacture / Origin | : | Schmid & Partner Engineering AG |

h)Robot Control Unit

| | | |
|-------------------------|---|------------------|
| Weight | : | 70 Kg |
| AC Input Voltage | : | selectable |
| Manufacturer | : | Stäubli Robotics |

i)Phantom and Device Holder

Phantom

| | | |
|----------------|---|---|
| Type | : | SAM Twin Phantom V4.0 |
| Description | : | The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot. |
| Material | : | Vinylester, glass fiber reinforced (VE-GF) |
| Shell Material | : | Fiberglass |
| Thickness | : | 2.0 +/-0.2 mm |
| Dimensions | : | Length: 1000 mm Width: 500 mm Height: adjustable feet |
| Volume | : | Approx. 25 liters |
| Manufacture | : | Schmid & Partner Engineering AG |

| | | |
|-----------------|---|---|
| Type | : | 2mm Flat phantom ERI4.0 |
| Description | : | Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209 Part II and all known tissue simulating liquids. ELI4 has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is supported by software version DASy4.5 and higher and is compatible with all SPEAG dosimetric probes and dipoles. |
| Material | : | Vinylester, glass fiber reinforced (VE-GF) |
| Shell Thickness | : | 2.0 ± 0.2 mm (sagging: <1%) |
| Filling Volume | : | approx. 30 liters |
| Dimensions | : | Major ellipse axis: 600 mm Minor axis: 400 mm |
| Manufacture | : | Schmid & Partner Engineering AG |

Device Holder

In combination with the Twin SAM Phantom V4.0/V4.0c or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).

| | | |
|----------|---|-----|
| Material | : | POM |
|----------|---|-----|

Laptio Extensions kit

Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM, ELI4 Phantoms.

| | | |
|----------|---|--------------------------|
| Material | : | POM, Acrylic glass, Foam |
|----------|---|--------------------------|

Urethane

For this measurement, the urethane foam was used as device holder.

j) Simulated Tissues (Liquid)

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

| Mixture (%) | Frequency (MHz) | | | | | | | | | |
|---------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| | 450 | | 900 | | 1800 | | 1950 | | 2450 | |
| Tissue Type | Head | Body | Head | Body | Head | Body | Head | Body | Head | Body |
| Water | 38.91 | 46.21 | 40.29 | 50.75 | 55.24 | 70.17 | 55.41 | 69.79 | 55.0 | 68.64 |
| Sugar | 56.93 | 51.17 | 57.90 | 48.21 | - | - | - | - | - | - |
| Cellulose | 0.25 | 0.18 | 0.24 | 0.00 | - | - | - | - | - | - |
| Salt (NaCl) | 3.79 | 2.34 | 1.38 | 0.94 | 0.31 | 0.39 | 0.08 | 0.2 | - | - |
| Preventol | 0.12 | 0.08 | 0.18 | 0.10 | - | - | - | - | - | - |
| DGMBE | - | - | - | - | 44.45 | 29.44 | 44.51 | 30.0 | 45.0 | 31.37 |
| Dielectric Constant | 43.42 | 58.0 | 42.54 | 56.1 | 42.0 | 56.8 | 39.9 | 54.0 | 39.8 | 52.5 |
| Conductivity (S/m) | 0.85 | 0.83 | 0.91 | 0.95 | 1.0 | 1.07 | 1.42 | 1.45 | 1.88 | 1.78 |

Note: DGMBE (Diethylenglycol-monobuthyl ether)

The simulated tissue (liquid) of 1800MHz was used for the test frequency of 1700MHz to 1800MHz.

| Mixture (%) | Frequency (MHz) | |
|-------------|-----------------|---------------|
| | 650&750 | 1450 |
| Tissue Type | Head and Body | Head and Body |
| Water | 35-58% | 52-75% |
| Sugar | 40-60% | - |
| Cellulose | <0.3% | - |
| Salt (NaCl) | 0-6% | <1% |
| Preventol | 0.1-0.7% | - |
| DGMBE | - | 25-48% |

| Mixture (%) | Frequency (MHz) | |
|--------------------|-----------------|------|
| | 5800 | |
| Tissue Type | Head | Body |
| Water | 64.0 | 78.0 |
| Mineral Oil | 18.0 | 11.0 |
| Emulsifiers | 15.0 | 9.0 |
| Additives and salt | 3.0 | 2.0 |

System Check Dipole SAR Calibration Certificate -Dipole 450MHz(D450V3,S/N:1051)

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



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

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

Accreditation No.: SCS 0108

Client **UL Japan (Vitec)**

Certificate No: D450V3-1051_Sep15

| CALIBRATION CERTIFICATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|-----------------------------------|----------------------------|-------------------|------|----------------------------|-----------------------|--------------------|------------|---------------------------|--------|---------------------|------------|---------------------------|--------|---------------------------|----------------|---------------------------|--------|----------------------------|-----------------|---------------------------|--------|-----------------------------|--------------------|---------------------------|--------|------------------------|----------|--------------------------------|--------|------|---------|--------------------------------|--------|---------------------|------|-----------------------|-----------------|-----------------------|--------------|-----------------------------------|------------------------|---------------------------|------------------|-----------------------------------|------------------------|
| Object | D450V3 - SN: 1051 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calibration procedure(s) | QA CAL-15.v8 Calibration procedure for dipole validation kits below 700 MHz | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calibration date: | September 21, 2015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>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.</p> <p>All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.</p> <p>Calibration Equipment used (M&TE critical for calibration)</p> <table border="1"> <thead> <tr> <th>Primary Standards</th> <th>ID #</th> <th>Cal Date (Certificate No.)</th> <th>Scheduled Calibration</th> </tr> </thead> <tbody> <tr> <td>Power meter E4419B</td> <td>GB41293874</td> <td>01-Apr-15 (No. 217-02128)</td> <td>Mar-16</td> </tr> <tr> <td>Power sensor E4412A</td> <td>MY41498087</td> <td>01-Apr-15 (No. 217-02128)</td> <td>Mar-16</td> </tr> <tr> <td>Reference 3 dB Attenuator</td> <td>SN: S5054 (3c)</td> <td>01-Apr-15 (No. 217-02129)</td> <td>Mar-16</td> </tr> <tr> <td>Reference 20 dB Attenuator</td> <td>SN: S5058 (20k)</td> <td>01-Apr-15 (No. 217-02131)</td> <td>Mar-16</td> </tr> <tr> <td>Type-N mismatch combination</td> <td>SN: 5047.2 / 06327</td> <td>01-Apr-15 (No. 217-02134)</td> <td>Mar-16</td> </tr> <tr> <td>Reference Probe ET3DV6</td> <td>SN: 1507</td> <td>30-Dec-14 (No. ET3-1507_Dec14)</td> <td>Dec-15</td> </tr> <tr> <td>DAE4</td> <td>SN: 654</td> <td>08-Jul-15 (No. DAE4-654_Jul15)</td> <td>Jul-16</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Secondary Standards</th> <th>ID #</th> <th>Check Date (in house)</th> <th>Scheduled Check</th> </tr> </thead> <tbody> <tr> <td>RF generator HP 8648C</td> <td>US3642U01700</td> <td>04-Aug-99 (in house check Apr-13)</td> <td>In house check: Apr-16</td> </tr> <tr> <td>Network Analyzer HP 8753E</td> <td>US37390585 S4206</td> <td>18-Oct-01 (in house check Oct-14)</td> <td>In house check: Oct-15</td> </tr> </tbody> </table> | | | | Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration | Power meter E4419B | GB41293874 | 01-Apr-15 (No. 217-02128) | Mar-16 | Power sensor E4412A | MY41498087 | 01-Apr-15 (No. 217-02128) | Mar-16 | Reference 3 dB Attenuator | SN: S5054 (3c) | 01-Apr-15 (No. 217-02129) | Mar-16 | Reference 20 dB Attenuator | SN: S5058 (20k) | 01-Apr-15 (No. 217-02131) | Mar-16 | Type-N mismatch combination | SN: 5047.2 / 06327 | 01-Apr-15 (No. 217-02134) | Mar-16 | Reference Probe ET3DV6 | SN: 1507 | 30-Dec-14 (No. ET3-1507_Dec14) | Dec-15 | DAE4 | SN: 654 | 08-Jul-15 (No. DAE4-654_Jul15) | Jul-16 | Secondary Standards | ID # | Check Date (in house) | Scheduled Check | RF generator HP 8648C | US3642U01700 | 04-Aug-99 (in house check Apr-13) | In house check: Apr-16 | Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-14) | In house check: Oct-15 |
| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power meter E4419B | GB41293874 | 01-Apr-15 (No. 217-02128) | Mar-16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power sensor E4412A | MY41498087 | 01-Apr-15 (No. 217-02128) | Mar-16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reference 3 dB Attenuator | SN: S5054 (3c) | 01-Apr-15 (No. 217-02129) | Mar-16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reference 20 dB Attenuator | SN: S5058 (20k) | 01-Apr-15 (No. 217-02131) | Mar-16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 01-Apr-15 (No. 217-02134) | Mar-16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reference Probe ET3DV6 | SN: 1507 | 30-Dec-14 (No. ET3-1507_Dec14) | Dec-15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DAE4 | SN: 654 | 08-Jul-15 (No. DAE4-654_Jul15) | Jul-16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RF generator HP 8648C | US3642U01700 | 04-Aug-99 (in house check Apr-13) | In house check: Apr-16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-14) | In house check: Oct-15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calibrated by: | Name Israe Elnaouq | Function Laboratory Technician | Signature | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Approved by: | Name Kátja Pokovic | Function Technical Manager | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Issued: September 23, 2015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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



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

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

Accreditation No.: **SCS 0108**

Glossary:

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- 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"

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%.

Measurement Conditions

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

| | | |
|------------------------------|------------------------|---------------------------------|
| DASY Version | DASY5 | V52.8.8 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | ELI4 Flat Phantom | Shell thickness: 2 ± 0.2 mm |
| Distance Dipole Center - TSL | 15 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 450 MHz \pm 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 43.5 | 0.87 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 44.3 \pm 6 % | 0.90 mho/m \pm 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 1.15 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 4.50 W/kg \pm 18.1 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 0.768 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 3.01 W/kg \pm 17.6 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Body TSL parameters | 22.0 °C | 56.7 | 0.94 mho/m |
| Measured Body TSL parameters | (22.0 \pm 0.2) °C | 58.4 \pm 6 % | 0.98 mho/m \pm 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 1.14 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 4.44 W/kg \pm 18.1 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 0.750 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 2.93 W/kg \pm 17.6 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with Head TSL**

| | |
|--------------------------------------|---------------------------------|
| Impedance, transformed to feed point | 60.3 Ω - 1.4 $\mu\Omega$ |
| Return Loss | - 20.5 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|---------------------------------|
| Impedance, transformed to feed point | 57.1 Ω - 4.5 $\mu\Omega$ |
| Return Loss | - 22.1 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.150 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 |
| Manufactured on | July 29, 2005 |

DASY5 Validation Report for Head TSL

Date: 21.09.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 450 MHz; Type: D450V3; Serial: D450V3 - SN: 1051

Communication System: UID 0 - CW; Frequency: 450 MHz

Medium parameters used: $f = 450$ MHz; $\sigma = 0.9$ S/m; $\epsilon_r = 44.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.58, 6.58, 6.58); Calibrated: 30.12.2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 08.07.2015
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Head Tissue/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:

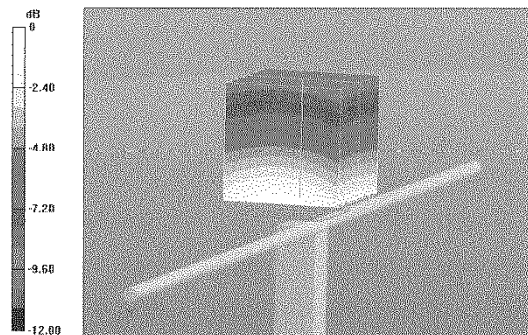
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 38.75 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.66 W/kg

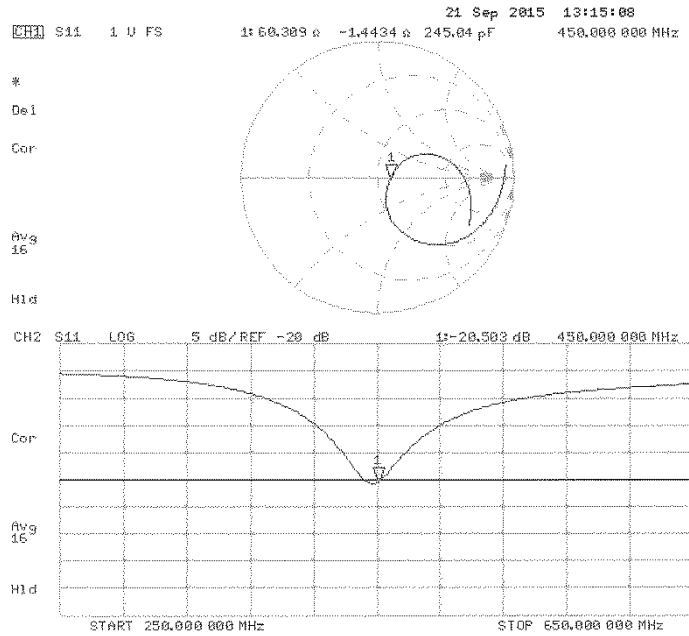
SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.768 W/kg

Maximum value of SAR (measured) = 1.23 W/kg



0 dB = 1.23 W/kg = 0.90 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 21.09.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 450 MHz; Type: D450V3; Serial: D450V3 - SN: 1051

Communication System: UID 0 - CW; Frequency: 450 MHz

Medium parameters used: $f = 450$ MHz; $\sigma = 0.98$ S/m; $\epsilon_r = 58.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(7.05, 7.05, 7.05); Calibrated: 30.12.2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 08.07.2015
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Body Tissue/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:

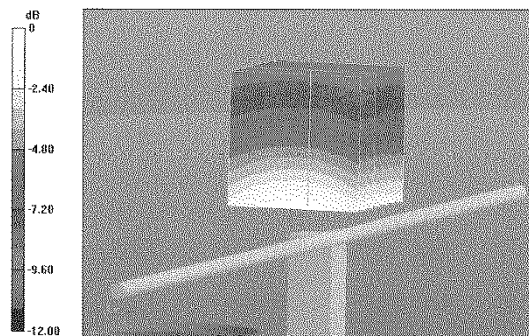
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 36.28 V/m; Power Drift = -0.05 dB

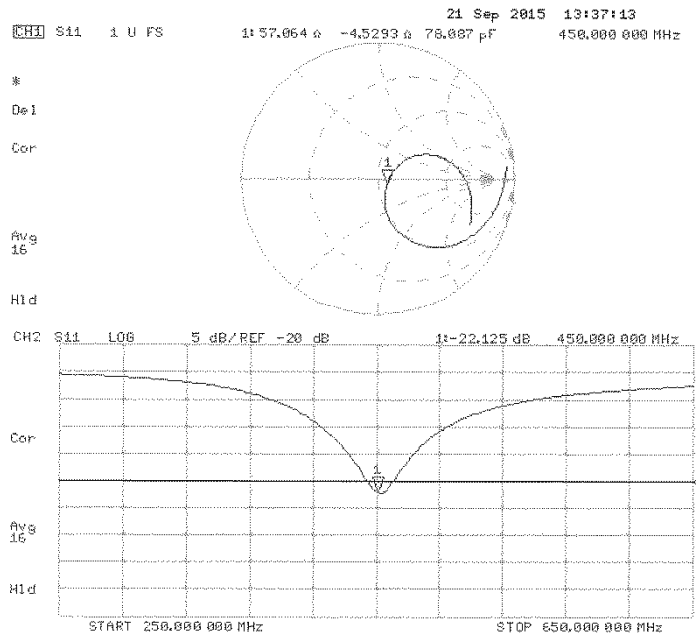
Peak SAR (extrapolated) = 1.83 W/kg

SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.750 W/kg

Maximum value of SAR (measured) = 1.22 W/kg



Impedance Measurement Plot for Body TSL



D450V3 Calibration for Impedance and Return-loss

1. Test environment

| | | | |
|---------------------|--------------------|-------------------|--------|
| Date | September 28, 2017 | | |
| Ambient Temperature | 24.0 deg.C | Relative humidity | 48 %RH |

2. Equipment used

| Control No. | Instrument | Manufacturer | Model No | Serial No | Test Item | Calibration Date * interval(month) |
|-------------|---------------------------------|-------------------------------|-------------|---------------|-----------|------------------------------------|
| EST-30 | Network Analyzer | Agilent | N5230A | MY46400314 | SAR | 2017/08/17 * 12 |
| MOS-30 | Thermo-Hygrometer | Custom | CTH-201 | 3001 | SAR | 2017/07/26 * 12 |
| MHSL0450 | Tissue simulation liquid (Head) | Schmid&Partner Engineering AG | HSL450V2 | SL AAH 045 AA | SAR | Pre Check |
| MMSL0450 | Tissue simulation liquid (Body) | Schmid&Partner Engineering AG | MSL450V2 | SL AAM 045 BC | SAR | Pre Check |
| MOS-35 | Digital thermometer | HANNA | Checktemp 4 | - | SAR | 2017/07/26 * 12 |
| MNA-03 | Vector Reflectometer | Copper Mountain Technologies | PLANAR R140 | 0030913 | SAR | 2017/04/22 * 12 |
| MPF-03 | 2mm Oval Flat Phantom | Schmid&Partner Engineering AG | QDOVA001BB | 1203 | SAR | 2017/05/29 * 12 |

3. Test Result

Head

| Impedance, Transformed to feed point | cal day | Head (real part) [Ω] | Head (img part) [jΩ] | Deviation (real part) [Ω] | Deviation (img part) [jΩ] | Tolerance | Result |
|--------------------------------------|-----------|----------------------|----------------------|---------------------------|---------------------------|-------------|----------|
| Calibration (SPEAG) | 2015/9/21 | 60.30 | -1.40 | - | - | - | - |
| Calibration(ULJ) | 2016/9/30 | 58.72 | -4.34 | -1.58 | -2.94 | +/-5Ω+/-5jΩ | Complied |
| Calibration(ULJ) | 2017/9/28 | 62.71 | -5.53 | 2.41 | -4.13 | +/-5Ω+/-5jΩ | Complied |

| Return loss | cal day | Head [dB] | Deviation [dB] | Tolerance [+-dB] | Result |
|---------------------|-----------|-----------|----------------|------------------|----------|
| Calibration (SPEAG) | 2015/9/21 | -20.50 | - | - | - |
| Calibration(ULJ) | 2016/9/30 | -20.96 | -0.46 | 4.10 | Complied |
| Calibration(ULJ) | 2017/9/28 | -21.17 | -0.67 | 4.10 | Complied |

Body

| Impedance, Transformed to feed point | cal day | Body (real part) [Ω] | Body (img part) [jΩ] | Deviation (real part) [Ω] | Deviation (img part) [jΩ] | Tolerance | Result |
|--------------------------------------|-----------|----------------------|----------------------|---------------------------|---------------------------|-------------|----------|
| Calibration (SPEAG) | 2015/9/21 | 57.10 | -4.50 | - | - | - | - |
| Calibration(ULJ) | 2016/9/30 | 60.36 | -8.26 | 3.26 | -3.76 | +/-5Ω+/-5jΩ | Complied |
| Calibration(ULJ) | 2017/9/28 | 61.42 | -9.22 | 4.32 | -4.72 | +/-5Ω+/-5jΩ | Complied |

| Return loss | cal day | Body [dB] | Deviation [dB] | Tolerance [+-dB] | Result |
|---------------------|-----------|-----------|----------------|------------------|----------|
| Calibration (SPEAG) | 2015/9/21 | -22.10 | - | - | - |
| Calibration(ULJ) | 2016/9/30 | -21.04 | 1.06 | 4.42 | Complied |
| Calibration(ULJ) | 2017/9/28 | -20.04 | 2.07 | 4.42 | Complied |

*Tolerance: According to the KDB865664 D01.

UL Japan, Inc.

Ise EMC Lab.

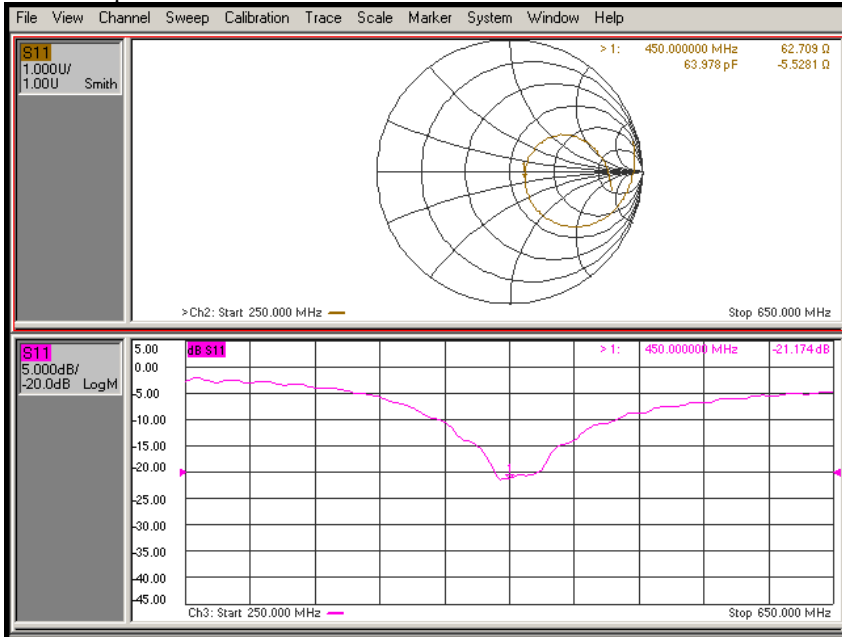
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone: +81 596 24 8999

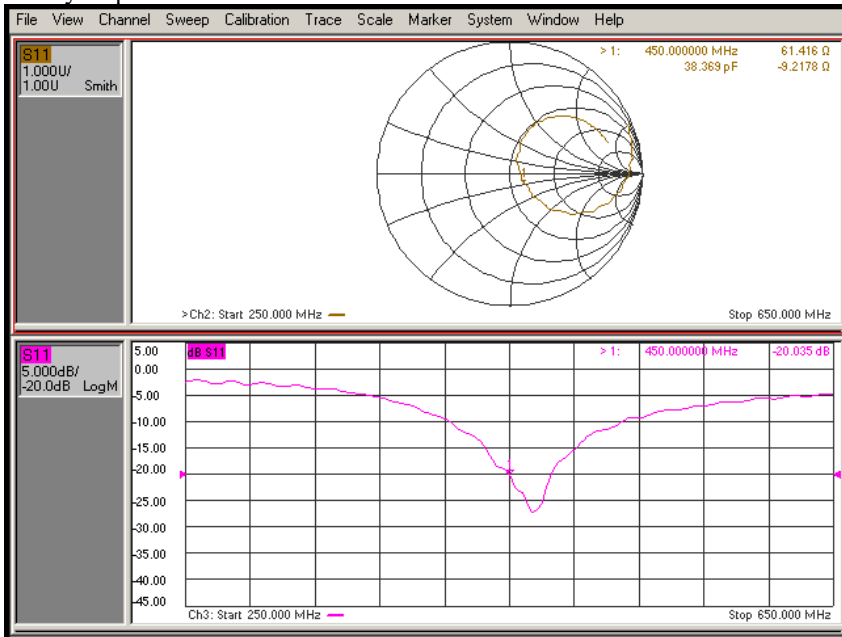
Facsimile: +81 596 24 8124

Measurement Plots

<Head Liquid>



<Body Liquid>



System Check Dipole SAR Calibration Certificate -Dipole 600MHz(D600V3,S/N:1003)

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



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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **UL Japan (Vitec)**

Certificate No: **D600V3-1003_Sep16**

| CALIBRATION CERTIFICATE | | | |
|---|--|-----------------------------------|------------------------------|
| Object | D600V3 - SN: 1003 | | |
| Calibration procedure(s) | QA CAL-15.v8 Calibration procedure for dipole validation kits below 700 MHz | | |
| Calibration date: | September 19, 2016 | | |
| <p>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.</p> <p>All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.</p> <p>Calibration Equipment used (M&TE critical for calibration)</p> | | | |
| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
| Power meter NRP | SN: 104778 | 06-Apr-16 (No. 217-02288/02289) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103244 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103245 | 06-Apr-16 (No. 217-02289) | Apr-17 |
| Reference 20 dB Attenuator | SN: 5277 (20x) | 05-Apr-16 (No. 217-02293) | Apr-17 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 05-Apr-16 (No. 217-02295) | Apr-17 |
| Reference Probe ET3DV6 | SN: 1507 | 31-Dec-15 (No. ET3-1507_Dec15) | Dec-16 |
| DAE4 | SN: 654 | 12-Aug-16 (No. DAE4-654_Aug16) | Aug-17 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power meter E4419B | SN: GB41293874 | 06-Apr-16 (No. 217-02286/02284) | In house check: Jun-18 |
| Power sensor E4412A | SN: MY41498087 | 06-Apr-16 (No. 217-02285) | In house check: Jun-18 |
| Power sensor E4412A | SN: 000110210 | 06-Apr-16 (No. 217-02284) | In house check: Jun-18 |
| RF generator HP 8648C | SN: US3642U01700 | 04-Aug-99 (in house check Jun-16) | In house check: Jun-18 |
| Network Analyzer HP 8753E | SN: US37390585 | 18-Oct-01 (in house check Oct-15) | In house check: Oct-18 |
| Calibrated by: | Name Michael Weber | Function Laboratory Technician | Signature |
| Approved by: | Name Katja Pokovic | Function Technical Manager | Signature |
| | | | Issued: September 19, 2016 |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. | | | |

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- 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"

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%.

Measurement Conditions

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

| | | |
|------------------------------|------------------------|---------------------------------|
| DASY Version | DASY5 | V52.8.8 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | ELI4 Flat Phantom | Shell thickness: 2 ± 0.2 mm |
| Distance Dipole Center - TSL | 15 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 600 MHz \pm 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 42.7 | 0.88 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 41.5 \pm 6 % | 0.87 mho/m \pm 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|--|
| SAR measured | 250 mW input power | 1.61 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 6.46 W/kg \pm 18.1 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|--|
| SAR measured | 250 mW input power | 1.05 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 4.21 W/kg \pm 17.6 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Body TSL parameters | 22.0 °C | 56.1 | 0.95 mho/m |
| Measured Body TSL parameters | (22.0 \pm 0.2) °C | 55.8 \pm 6 % | 0.91 mho/m \pm 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|--|
| SAR measured | 250 mW input power | 1.62 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 6.69 W/kg \pm 18.1 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|--|
| SAR measured | 250 mW input power | 1.07 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 4.40 W/kg \pm 17.6 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 60.2 Ω + 2.3 $j\Omega$ |
| Return Loss | - 20.5 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 53.0 Ω - 4.8 $j\Omega$ |
| Return Loss | - 25.2 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.153 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 |
| Manufactured on | February 08, 2013 |

DASY5 Validation Report for Head TSL

Date: 19.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 600 MHz; Type: D600V3; Serial: D600V3 - SN: 1003

Communication System: UID 0 - CW; Frequency: 600 MHz

Medium parameters used: $f = 600$ MHz; $\sigma = 0.87$ S/m; $\epsilon_r = 41.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.54, 6.54, 6.54); Calibrated: 31.12.2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 12.08.2016
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

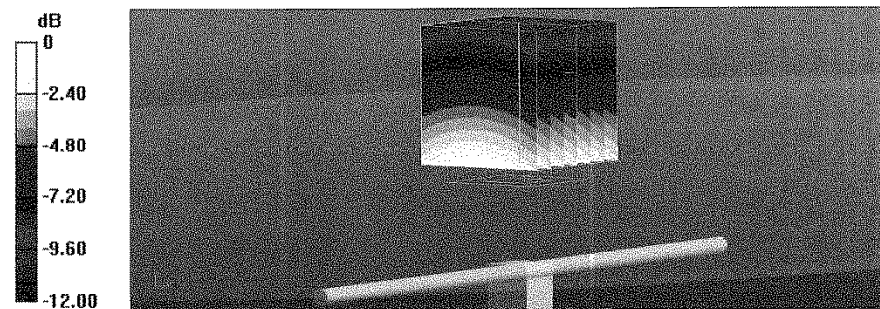
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 45.72 V/m; Power Drift = -0.00 dB

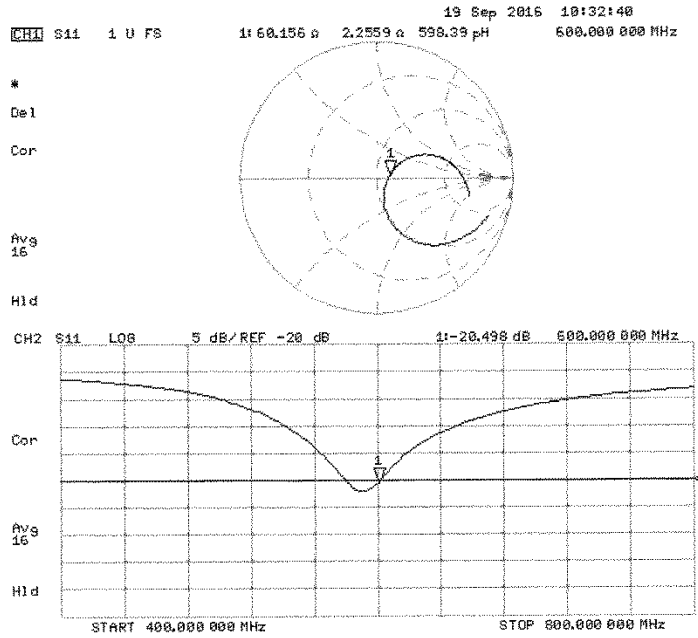
Peak SAR (extrapolated) = 2.57 W/kg

SAR(1 g) = 1.61 W/kg; SAR(10 g) = 1.05 W/kg

Maximum value of SAR (measured) = 1.72 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 19.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 600 MHz; Type: D600V3; Serial: D600V3 - SN: 1003

Communication System: UID 0 - CW; Frequency: 600 MHz

Medium parameters used: $f = 600$ MHz; $\sigma = 0.91$ S/m; $\epsilon_r = 55.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.5, 6.5, 6.5); Calibrated: 31.12.2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 12.08.2016
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

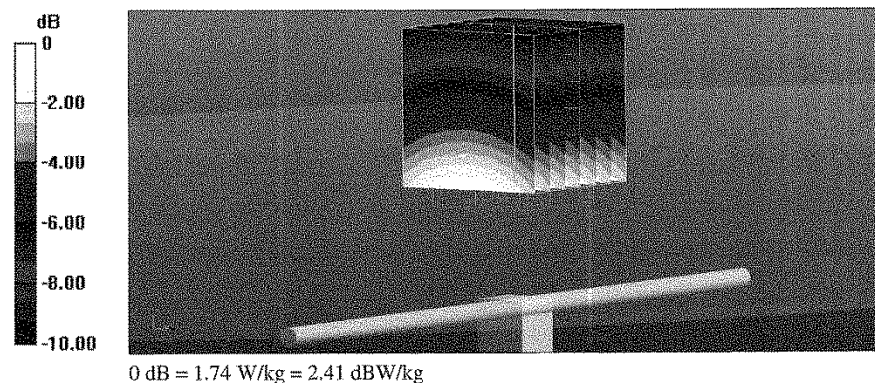
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 44.64 V/m; Power Drift = -0.00 dB

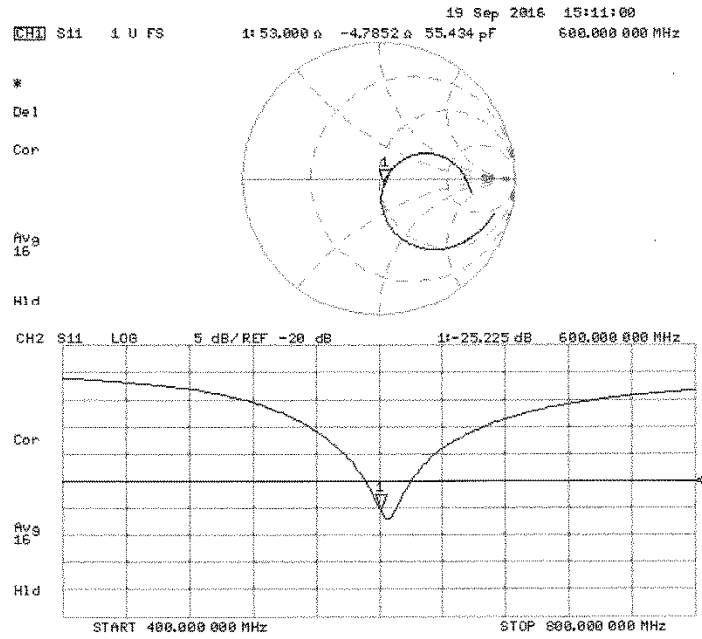
Peak SAR (extrapolated) = 2.58 W/kg

SAR(1 g) = 1.62 W/kg; SAR(10 g) = 1.07 W/kg

Maximum value of SAR (measured) = 1.74 W/kg



Impedance Measurement Plot for Body TSL



D600V3 Calibration for Impedance and Return-loss

1. Test environment

| | | | |
|---------------------|-------------------|-------------------|-------|
| Date | September13, 2017 | | |
| Ambient Temperature | 23.0 deg.C | Relative humidity | 68%RH |

2. Equipment used

| Control No. | Instrument | Manufacturer | Model No | Serial No | Test Item | Calibration Date * Interval(month) |
|-------------|---------------------------------|-------------------------------|------------|------------|-----------|---------------------------------------|
| MOS-37 | Digital thermometer | LKM electronic | DTM3000 | - | SAR | 2017/07/26 * 12 |
| MPF-03 | 2mm Oval Flat Phantom | Schmid&Partner Engineering AG | QDOVA001BB | 1203 | SAR | 2017/05/29 * 12 |
| MMSL0650 | Tissue simulation liquid (Body) | Schmid&Partner Engineering AG | MSL650 | 20090914 | | Pre Check |
| MHSL0650 | Tissue simulation liquid (Head) | Schmid&Partner Engineering AG | HSL650 | 20090911 | | Pre Check |
| EST-63 | Network Analyzer | KEYSIGHT | E5071C | MY46523746 | SAR | 2017/02/03 * 12 |
| EST-64 | Calibration Kit | KEYSIGHT | 85032F | MY53200995 | SAR | 2017/02/02 * 12 |
| MDA-21 | Dipole Antenna | Schmid&Partner Engineering AG | D600V3 | 1003 | SAR | 2016/09/19 * 12 |

3. Test Result

| Impedance,Transformed to feed point | cal day | Head (real part) [Ω] | Head (img part) [jΩ] | Deviation (real part) [Ω] | Deviation (img part) [jΩ] | Tolerance | Result |
|-------------------------------------|-----------|----------------------|----------------------|---------------------------|---------------------------|-------------|----------|
| Calibration (SPEAG) | 2016/9/19 | 60.20 | 2.30 | - | - | - | - |
| Calibration(ULJ) | 2017/9/13 | 61.12 | -1.06 | 0.92 | -3.36 | +/-5Ω+/-5jΩ | Complied |

| Return loss | cal day | Head [dB] | Deviation [dB] | Tolerance [+/-dB] | Result |
|---------------------|-----------|-----------|----------------|-------------------|----------|
| Calibration (SPEAG) | 2016/9/19 | -20.50 | - | - | - |
| Calibration(ULJ) | 2017/9/13 | -22.75 | -2.25 | 4.10 | Complied |

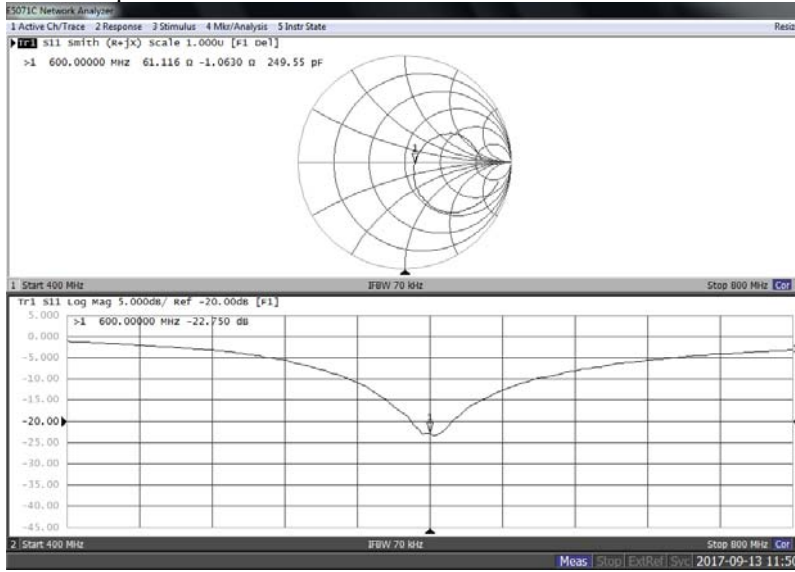
| Impedance,Transformed to feed point | cal day | Body (real part) [Ω] | Body (img part) [jΩ] | Deviation (real part) [Ω] | Deviation (img part) [jΩ] | Tolerance | Result |
|-------------------------------------|-----------|----------------------|----------------------|---------------------------|---------------------------|-------------|----------|
| Calibration (SPEAG) | 2016/9/19 | 53.00 | -4.80 | - | - | - | - |
| Calibration(ULJ) | 2017/9/13 | 56.186 | -5.777 | 3.19 | -0.98 | +/-5Ω+/-5jΩ | Complied |

| Return loss | cal day | Body [dB] | Deviation [dB] | Tolerance [+/-dB] | Result |
|---------------------|-----------|-----------|----------------|-------------------|----------|
| Calibration (SPEAG) | 2016/9/19 | -25.20 | - | - | - |
| Calibration(ULJ) | 2017/9/13 | -22.665 | 2.54 | 5.04 | Complied |

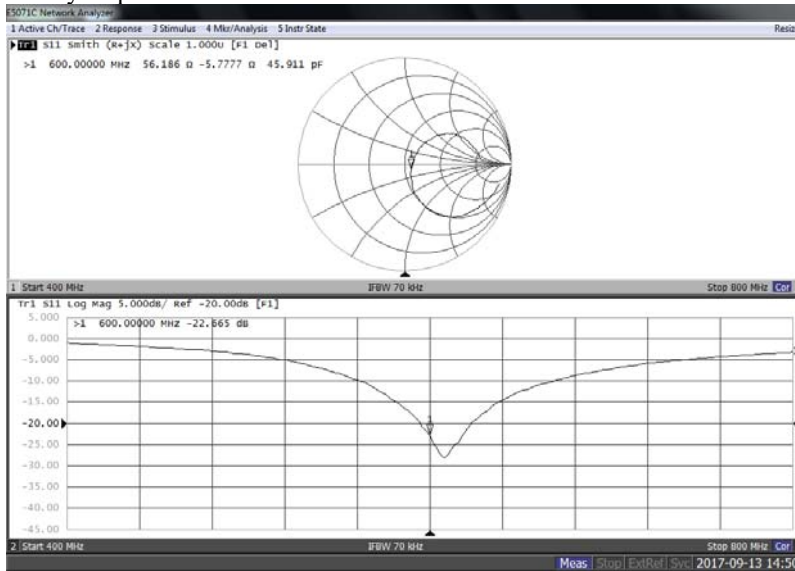
*Tolerance : According to the KDB865664D01

Measurement Plots

<Head Liquid>



<Body Liquid>



Dosimetric E-Field Probe Calibration Certificate (EX3DV4, S/N: 3917)

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **UL Japan (Vitec)**

Certificate No: **EX3-3917_May18**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3917**

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: **May 23, 2018**

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

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

Calibration Equipment used (M&TE critical for calibration)

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

Calibrated by: Name **Michael Weber** Function **Laboratory Technician** Signature *[Signature]*

Approved by: Name **Katja Pokovic** Function **Technical Manager** Signature *[Signature]*

Issued: May 23, 2018

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

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



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The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

| | |
|--------------------------|---|
| TSL | tissue simulating liquid |
| NORM _{x,y,z} | sensitivity in free space |
| ConvF | sensitivity in TSL / NORM _{x,y,z} |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C, D | modulation dependent linearization parameters |
| Polarization ϕ | ϕ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep 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
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,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 $f \leq 800$ 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 NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 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 NORM_x (no uncertainty required).

EX3DV4 – SN:3917

May 23, 2018

Probe EX3DV4

SN:3917

Manufactured: December 18, 2012
Calibrated: May 23, 2018

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

EX3DV4- SN:3917

May 23, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3917

Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|----------|----------|----------|-----------|
| Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A | 0.52 | 0.43 | 0.43 | ± 10.1 % |
| DCP (mV) ^B | 95.9 | 102.7 | 101.7 | |

Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB/μV | C | D dB | VR mV | Unc ^E (k=2) |
|-----|---------------------------|---|---------|------------|-----|---------|----------|---------------------------|
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 143.0 | ±2.2 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 128.6 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 130.6 | |

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 | 46.45 | 353.2 | 36.65 | 19.78 | 1.000 | 5.096 | 0.000 | 0.606 | 1.009 |
| Y | 45.49 | 331.8 | 34.23 | 18.08 | 0.744 | 5.066 | 1.411 | 0.276 | 1.006 |
| Z | 46.64 | 352.6 | 36.35 | 18.28 | 1.078 | 5.077 | 0.000 | 0.630 | 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 E²-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.

EX3DV4- SN:3917

May 23, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3917

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 | 11.27 | 11.27 | 11.27 | 0.13 | 1.20 | ± 13.3 % |
| 600 | 42.7 | 0.88 | 10.34 | 10.34 | 10.34 | 0.10 | 1.20 | ± 13.3 % |
| 750 | 41.9 | 0.89 | 10.51 | 10.51 | 10.51 | 0.47 | 0.84 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 10.00 | 10.00 | 10.00 | 0.44 | 0.85 | ± 12.0 % |
| 1640 | 40.2 | 1.31 | 8.68 | 8.68 | 8.68 | 0.32 | 0.80 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 8.60 | 8.60 | 8.60 | 0.31 | 0.85 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 8.29 | 8.29 | 8.29 | 0.31 | 0.86 | ± 12.0 % |
| 1950 | 40.0 | 1.40 | 8.03 | 8.03 | 8.03 | 0.37 | 0.82 | ± 12.0 % |
| 2300 | 39.5 | 1.67 | 7.86 | 7.86 | 7.86 | 0.35 | 0.80 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 7.44 | 7.44 | 7.44 | 0.30 | 0.85 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 7.25 | 7.25 | 7.25 | 0.44 | 0.84 | ± 12.0 % |
| 3500 | 37.9 | 2.91 | 7.04 | 7.04 | 7.04 | 0.25 | 1.20 | ± 13.1 % |

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

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

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

EX3DV4- SN:3917

May 23, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3917

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 | 11.28 | 11.28 | 11.28 | 0.08 | 1.20 | ± 13.3 % |
| 600 | 56.1 | 0.95 | 10.51 | 10.51 | 10.51 | 0.08 | 1.20 | ± 13.3 % |
| 750 | 55.5 | 0.96 | 10.22 | 10.22 | 10.22 | 0.41 | 0.90 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 9.95 | 9.95 | 9.95 | 0.46 | 0.84 | ± 12.0 % |
| 1640 | 53.7 | 1.42 | 8.67 | 8.67 | 8.67 | 0.31 | 0.97 | ± 12.0 % |
| 1750 | 53.4 | 1.49 | 8.22 | 8.22 | 8.22 | 0.39 | 0.85 | ± 12.0 % |
| 1900 | 53.3 | 1.52 | 7.87 | 7.87 | 7.87 | 0.31 | 0.96 | ± 12.0 % |
| 2300 | 52.9 | 1.81 | 7.61 | 7.61 | 7.61 | 0.36 | 0.88 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 7.48 | 7.48 | 7.48 | 0.35 | 0.88 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 7.42 | 7.42 | 7.42 | 0.28 | 0.95 | ± 12.0 % |
| 3500 | 51.3 | 3.31 | 6.72 | 6.72 | 6.72 | 0.23 | 1.25 | ± 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.

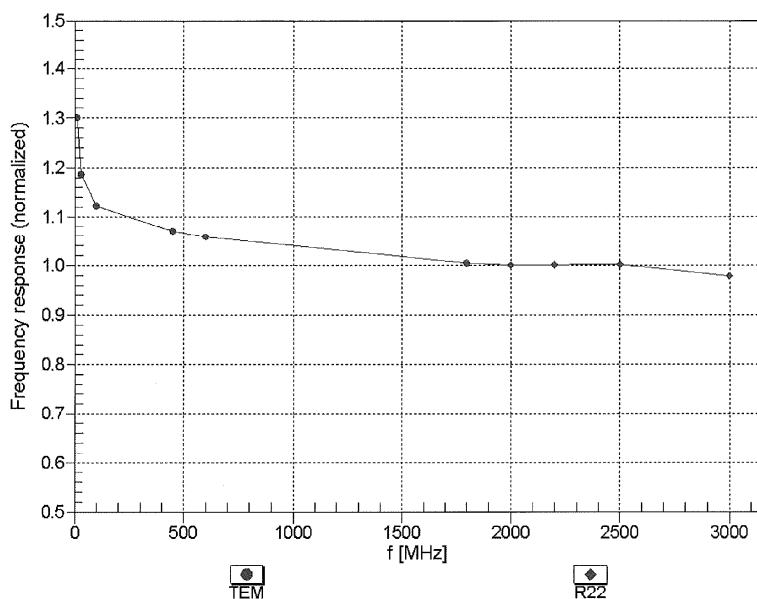
^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty 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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May 23, 2018

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

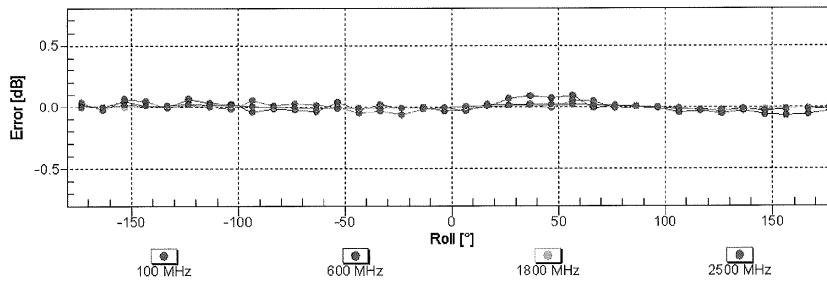
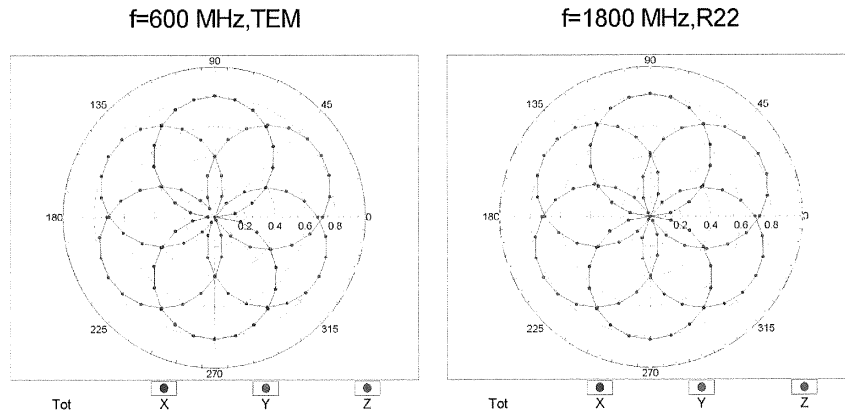


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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May 23, 2018

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

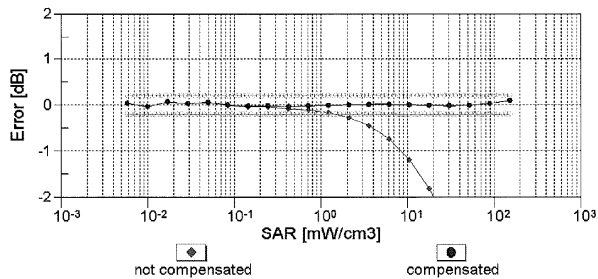
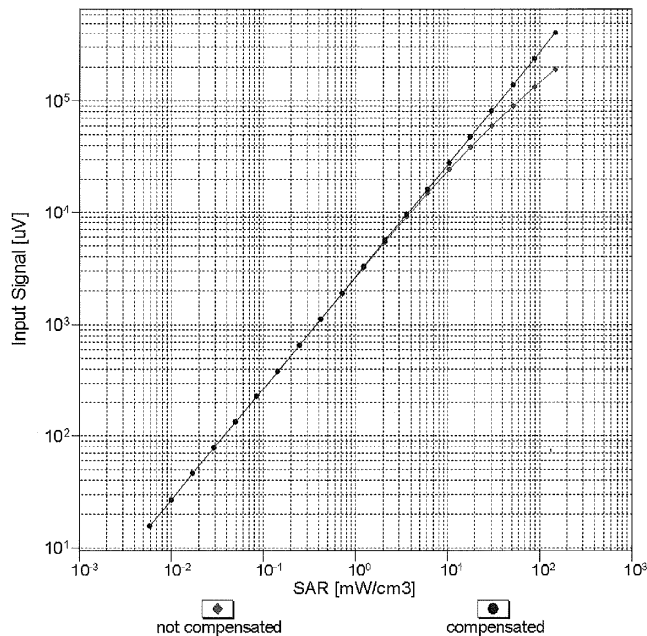


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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May 23, 2018

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

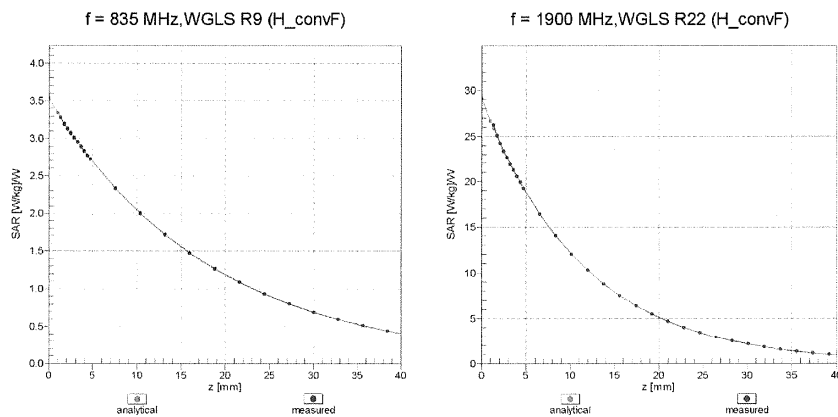


Uncertainty of Linearity Assessment: $\pm 0.6\%$ (k=2)

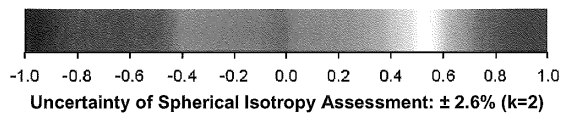
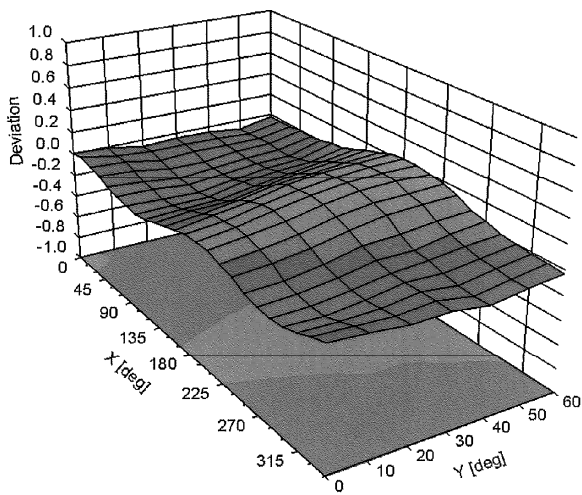
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Conversion Factor Assessment



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



EX3DV4- SN:3917

May 23, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3917

Other Probe Parameters

| | |
|---|------------|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 66.6 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disabled |
| Probe Overall Length | 337 mm |
| Probe Body Diameter | 10 mm |
| Tip Length | 9 mm |
| Tip Diameter | 2.5 mm |
| Probe Tip to Sensor X Calibration Point | 1 mm |
| Probe Tip to Sensor Y Calibration Point | 1 mm |
| Probe Tip to Sensor Z Calibration Point | 1 mm |
| Recommended Measurement Distance from Surface | 1.4 mm |

EX3DV4- SN:3917

May 23, 2018

Appendix: Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB μ V | C | D dB | VR mV | Max Unc ^E (k=2) |
|---------------|---|---|---------|-----------------|-------|---------|----------|----------------------------------|
| 0 | CW | X | 0.00 | 0.00 | 1.00 | 0.00 | 143.0 | $\pm 2.2\%$ |
| | | Y | 0.00 | 0.00 | 1.00 | | 128.6 | |
| | | Z | 0.00 | 0.00 | 1.00 | | 130.6 | |
| 10010- CAA | SAR Validation (Square, 100ms, 10ms) | X | 3.99 | 71.68 | 13.75 | 10.00 | 20.0 | $\pm 9.6\%$ |
| | | Y | 3.86 | 71.24 | 13.19 | | 20.0 | |
| | | Z | 2.95 | 67.52 | 11.59 | | 20.0 | |
| 10011- CAB | UMTS-FDD (WCDMA) | X | 0.85 | 64.80 | 13.27 | 0.00 | 150.0 | $\pm 9.6\%$ |
| | | Y | 1.05 | 68.61 | 15.89 | | 150.0 | |
| | | Z | 0.87 | 65.97 | 13.92 | | 150.0 | |
| 10012- CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) | X | 1.12 | 63.24 | 14.51 | 0.41 | 150.0 | $\pm 9.6\%$ |
| | | Y | 1.19 | 64.70 | 15.71 | | 150.0 | |
| | | Z | 1.10 | 63.68 | 14.86 | | 150.0 | |
| 10013- CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps) | X | 4.85 | 66.63 | 17.02 | 1.46 | 150.0 | $\pm 9.6\%$ |
| | | Y | 4.85 | 66.91 | 17.14 | | 150.0 | |
| | | Z | 4.81 | 66.67 | 17.03 | | 150.0 | |
| 10021- DAC | GSM-FDD (TDMA, GMSK) | X | 100.00 | 117.62 | 29.63 | 9.39 | 50.0 | $\pm 9.6\%$ |
| | | Y | 100.00 | 115.29 | 28.28 | | 50.0 | |
| | | Z | 100.00 | 114.68 | 28.19 | | 50.0 | |
| 10023- DAC | GPRS-FDD (TDMA, GMSK, TN 0) | X | 100.00 | 117.40 | 29.57 | 9.57 | 50.0 | $\pm 9.6\%$ |
| | | Y | 100.00 | 115.03 | 28.20 | | 50.0 | |
| | | Z | 100.00 | 114.52 | 28.16 | | 50.0 | |
| 10024- DAC | GPRS-FDD (TDMA, GMSK, TN 0-1) | X | 100.00 | 114.55 | 27.19 | 6.56 | 60.0 | $\pm 9.6\%$ |
| | | Y | 100.00 | 113.33 | 26.42 | | 60.0 | |
| | | Z | 100.00 | 111.26 | 25.57 | | 60.0 | |
| 10025- DAC | EDGE-FDD (TDMA, 8PSK, TN 0) | X | 4.90 | 73.03 | 27.32 | 12.57 | 50.0 | $\pm 9.6\%$ |
| | | Y | 6.78 | 84.13 | 32.90 | | 50.0 | |
| | | Z | 4.57 | 70.77 | 25.74 | | 50.0 | |
| 10026- DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1) | X | 12.54 | 97.86 | 34.51 | 9.56 | 60.0 | $\pm 9.6\%$ |
| | | Y | 14.75 | 102.82 | 36.31 | | 60.0 | |
| | | Z | 12.42 | 97.14 | 33.89 | | 60.0 | |
| 10027- DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2) | X | 100.00 | 113.39 | 25.90 | 4.80 | 80.0 | $\pm 9.6\%$ |
| | | Y | 100.00 | 113.44 | 25.75 | | 80.0 | |
| | | Z | 100.00 | 109.57 | 24.04 | | 80.0 | |
| 10028- DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3) | X | 100.00 | 112.89 | 24.97 | 3.55 | 100.0 | $\pm 9.6\%$ |
| | | Y | 100.00 | 114.79 | 25.66 | | 100.0 | |
| | | Z | 100.00 | 108.34 | 22.80 | | 100.0 | |
| 10029- DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2) | X | 7.81 | 86.75 | 29.22 | 7.80 | 80.0 | $\pm 9.6\%$ |
| | | Y | 8.25 | 88.78 | 30.06 | | 80.0 | |
| | | Z | 7.80 | 86.64 | 28.93 | | 80.0 | |
| 10030- CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1) | X | 100.00 | 112.32 | 25.71 | 5.30 | 70.0 | $\pm 9.6\%$ |
| | | Y | 100.00 | 111.71 | 25.26 | | 70.0 | |
| | | Z | 100.00 | 108.91 | 24.04 | | 70.0 | |
| 10031- CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3) | X | 100.00 | 107.09 | 21.14 | 1.88 | 100.0 | $\pm 9.6\%$ |
| | | Y | 100.00 | 114.31 | 24.09 | | 100.0 | |
| | | Z | 100.00 | 100.27 | 18.08 | | 100.0 | |

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|-----------|---|---|--------|--------|-------|-------|-------|---------|
| 10032-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5) | X | 100.00 | 103.30 | 18.69 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 120.27 | 25.51 | | 100.0 | |
| | | Z | 1.07 | 68.05 | 8.29 | | 100.0 | |
| 10033-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1) | X | 31.61 | 107.84 | 29.03 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 85.54 | 123.51 | 32.82 | | 70.0 | |
| | | Z | 26.82 | 104.16 | 27.57 | | 70.0 | |
| 10034-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3) | X | 4.00 | 79.31 | 18.47 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 9.41 | 92.02 | 22.90 | | 100.0 | |
| | | Z | 4.34 | 80.40 | 18.60 | | 100.0 | |
| 10035-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5) | X | 2.17 | 72.54 | 15.56 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 4.10 | 82.02 | 19.50 | | 100.0 | |
| | | Z | 2.32 | 73.62 | 15.80 | | 100.0 | |
| 10036-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1) | X | 58.94 | 117.77 | 31.62 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 100.00 | 126.30 | 33.56 | | 70.0 | |
| | | Z | 49.58 | 113.65 | 30.09 | | 70.0 | |
| 10037-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3) | X | 3.68 | 78.31 | 18.08 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 7.99 | 89.89 | 22.23 | | 100.0 | |
| | | Z | 3.94 | 79.23 | 18.16 | | 100.0 | |
| 10038-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5) | X | 2.21 | 72.98 | 15.84 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 4.24 | 82.83 | 19.91 | | 100.0 | |
| | | Z | 2.39 | 74.25 | 16.15 | | 100.0 | |
| 10039-CAB | CDMA2000 (1xRTT, RC1) | X | 1.25 | 66.94 | 12.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.18 | 74.98 | 16.71 | | 150.0 | |
| | | Z | 1.36 | 68.43 | 13.26 | | 150.0 | |
| 10042-CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | X | 100.00 | 112.27 | 26.35 | 7.78 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 110.85 | 25.49 | | 50.0 | |
| | | Z | 100.00 | 109.27 | 24.87 | | 50.0 | |
| 10044-CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM) | X | 0.05 | 120.20 | 8.90 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.01 | 113.11 | 8.14 | | 150.0 | |
| | | Z | 0.18 | 125.95 | 4.94 | | 150.0 | |
| 10048-CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24) | X | 100.00 | 118.95 | 31.67 | 13.80 | 25.0 | ± 9.6 % |
| | | Y | 100.00 | 115.47 | 29.72 | | 25.0 | |
| | | Z | 26.09 | 96.25 | 25.11 | | 25.0 | |
| 10049-CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12) | X | 100.00 | 117.43 | 29.90 | 10.79 | 40.0 | ± 9.6 % |
| | | Y | 100.00 | 114.71 | 28.35 | | 40.0 | |
| | | Z | 41.38 | 102.74 | 25.61 | | 40.0 | |
| 10056-CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps) | X | 31.25 | 105.00 | 29.04 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 55.64 | 113.80 | 31.00 | | 50.0 | |
| | | Z | 20.34 | 96.63 | 26.10 | | 50.0 | |
| 10058-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3) | X | 5.81 | 80.76 | 26.07 | 6.55 | 100.0 | ± 9.6 % |
| | | Y | 5.95 | 81.94 | 26.62 | | 100.0 | |
| | | Z | 5.80 | 80.87 | 25.94 | | 100.0 | |
| 10059-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps) | X | 1.19 | 64.65 | 15.28 | 0.61 | 110.0 | ± 9.6 % |
| | | Y | 1.28 | 66.33 | 16.57 | | 110.0 | |
| | | Z | 1.18 | 65.22 | 15.67 | | 110.0 | |
| 10060-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps) | X | 25.59 | 111.99 | 28.46 | 1.30 | 110.0 | ± 9.6 % |
| | | Y | 100.00 | 136.35 | 35.10 | | 110.0 | |
| | | Z | 100.00 | 129.69 | 32.00 | | 110.0 | |

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|-----------|--|---|------|-------|-------|------|-------|---------|
| 10061-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps) | X | 4.51 | 85.90 | 23.66 | 2.04 | 110.0 | ± 9.6 % |
| | | Y | 6.96 | 94.57 | 26.90 | | 110.0 | |
| | | Z | 5.55 | 89.64 | 24.73 | | 110.0 | |
| 10062-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps) | X | 4.61 | 66.46 | 16.33 | 0.49 | 100.0 | ± 9.6 % |
| | | Y | 4.64 | 66.85 | 16.54 | | 100.0 | |
| | | Z | 4.58 | 66.54 | 16.39 | | 100.0 | |
| 10063-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps) | X | 4.64 | 66.58 | 16.46 | 0.72 | 100.0 | ± 9.6 % |
| | | Y | 4.66 | 66.97 | 16.65 | | 100.0 | |
| | | Z | 4.61 | 66.66 | 16.50 | | 100.0 | |
| 10064-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps) | X | 4.92 | 66.87 | 16.71 | 0.86 | 100.0 | ± 9.6 % |
| | | Y | 4.94 | 67.21 | 16.87 | | 100.0 | |
| | | Z | 4.89 | 66.94 | 16.74 | | 100.0 | |
| 10065-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps) | X | 4.81 | 66.83 | 16.85 | 1.21 | 100.0 | ± 9.6 % |
| | | Y | 4.82 | 67.14 | 16.99 | | 100.0 | |
| | | Z | 4.78 | 66.88 | 16.87 | | 100.0 | |
| 10066-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps) | X | 4.84 | 66.90 | 17.05 | 1.46 | 100.0 | ± 9.6 % |
| | | Y | 4.84 | 67.18 | 17.17 | | 100.0 | |
| | | Z | 4.81 | 66.95 | 17.06 | | 100.0 | |
| 10067-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps) | X | 5.15 | 67.14 | 17.55 | 2.04 | 100.0 | ± 9.6 % |
| | | Y | 5.14 | 67.36 | 17.61 | | 100.0 | |
| | | Z | 5.11 | 67.17 | 17.53 | | 100.0 | |
| 10068-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps) | X | 5.22 | 67.25 | 17.81 | 2.55 | 100.0 | ± 9.6 % |
| | | Y | 5.20 | 67.43 | 17.85 | | 100.0 | |
| | | Z | 5.18 | 67.26 | 17.78 | | 100.0 | |
| 10069-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps) | X | 5.30 | 67.26 | 18.01 | 2.67 | 100.0 | ± 9.6 % |
| | | Y | 5.27 | 67.42 | 18.03 | | 100.0 | |
| | | Z | 5.26 | 67.27 | 17.98 | | 100.0 | |
| 10071-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps) | X | 4.97 | 66.78 | 17.38 | 1.99 | 100.0 | ± 9.6 % |
| | | Y | 4.96 | 67.02 | 17.46 | | 100.0 | |
| | | Z | 4.93 | 66.81 | 17.37 | | 100.0 | |
| 10072-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps) | X | 4.97 | 67.17 | 17.63 | 2.30 | 100.0 | ± 9.6 % |
| | | Y | 4.95 | 67.40 | 17.70 | | 100.0 | |
| | | Z | 4.93 | 67.20 | 17.62 | | 100.0 | |
| 10073-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps) | X | 5.05 | 67.42 | 18.02 | 2.83 | 100.0 | ± 9.6 % |
| | | Y | 5.03 | 67.61 | 18.06 | | 100.0 | |
| | | Z | 5.01 | 67.44 | 17.98 | | 100.0 | |
| 10074-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps) | X | 5.06 | 67.39 | 18.21 | 3.30 | 100.0 | ± 9.6 % |
| | | Y | 5.02 | 67.55 | 18.23 | | 100.0 | |
| | | Z | 5.01 | 67.40 | 18.16 | | 100.0 | |
| 10075-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps) | X | 5.13 | 67.60 | 18.58 | 3.82 | 90.0 | ± 9.6 % |
| | | Y | 5.08 | 67.71 | 18.56 | | 90.0 | |
| | | Z | 5.08 | 67.60 | 18.52 | | 90.0 | |
| 10076-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps) | X | 5.15 | 67.42 | 18.72 | 4.15 | 90.0 | ± 9.6 % |
| | | Y | 5.09 | 67.51 | 18.69 | | 90.0 | |
| | | Z | 5.10 | 67.41 | 18.65 | | 90.0 | |
| 10077-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps) | X | 5.18 | 67.49 | 18.82 | 4.30 | 90.0 | ± 9.6 % |
| | | Y | 5.12 | 67.60 | 18.79 | | 90.0 | |
| | | Z | 5.13 | 67.49 | 18.75 | | 90.0 | |

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|-----------|---|---|--------|--------|-------|------|-------|---------|
| 10081-CAB | CDMA2000 (1xRTT, RC3) | X | 0.63 | 62.79 | 9.94 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.86 | 67.14 | 12.92 | | 150.0 | |
| | | Z | 0.62 | 63.30 | 10.08 | | 150.0 | |
| 10082-CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | X | 0.95 | 60.00 | 5.16 | 4.77 | 80.0 | ± 9.6 % |
| | | Y | 0.89 | 60.00 | 4.99 | | 80.0 | |
| | | Z | 0.92 | 60.00 | 4.92 | | 80.0 | |
| 10090-DAC | GPRS-FDD (TDMA, GMSK, TN 0-4) | X | 100.00 | 114.64 | 27.26 | 6.56 | 60.0 | ± 9.6 % |
| | | Y | 100.00 | 113.38 | 26.46 | | 60.0 | |
| | | Z | 100.00 | 111.36 | 25.63 | | 60.0 | |
| 10097-CAB | UMTS-FDD (HSDPA) | X | 1.64 | 66.07 | 14.45 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.86 | 68.57 | 16.07 | | 150.0 | |
| | | Z | 1.67 | 66.87 | 14.91 | | 150.0 | |
| 10098-CAB | UMTS-FDD (HSUPA, Subtest 2) | X | 1.60 | 66.00 | 14.40 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.82 | 68.53 | 16.05 | | 150.0 | |
| | | Z | 1.63 | 66.81 | 14.87 | | 150.0 | |
| 10099-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4) | X | 12.62 | 97.97 | 34.54 | 9.56 | 60.0 | ± 9.6 % |
| | | Y | 14.86 | 102.96 | 36.35 | | 60.0 | |
| | | Z | 12.49 | 97.23 | 33.92 | | 60.0 | |
| 10100-CAD | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | X | 2.86 | 68.82 | 15.74 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.18 | 71.04 | 17.00 | | 150.0 | |
| | | Z | 2.93 | 69.57 | 16.11 | | 150.0 | |
| 10101-CAD | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | X | 3.09 | 66.72 | 15.35 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.22 | 67.82 | 16.04 | | 150.0 | |
| | | Z | 3.09 | 67.07 | 15.55 | | 150.0 | |
| 10102-CAD | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | X | 3.20 | 66.74 | 15.47 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.32 | 67.79 | 16.13 | | 150.0 | |
| | | Z | 3.20 | 67.08 | 15.68 | | 150.0 | |
| 10103-CAD | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | X | 7.35 | 77.75 | 21.24 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.48 | 78.42 | 21.45 | | 65.0 | |
| | | Z | 7.01 | 77.02 | 20.83 | | 65.0 | |
| 10104-CAD | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | X | 6.91 | 74.96 | 20.90 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.00 | 75.57 | 21.11 | | 65.0 | |
| | | Z | 6.80 | 74.79 | 20.74 | | 65.0 | |
| 10105-CAD | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | X | 6.73 | 74.39 | 20.98 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.52 | 74.11 | 20.79 | | 65.0 | |
| | | Z | 6.30 | 73.25 | 20.38 | | 65.0 | |
| 10108-CAE | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | X | 2.49 | 68.08 | 15.54 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.76 | 70.24 | 16.82 | | 150.0 | |
| | | Z | 2.55 | 68.83 | 15.93 | | 150.0 | |
| 10109-CAE | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | X | 2.74 | 66.49 | 15.17 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.88 | 67.73 | 15.97 | | 150.0 | |
| | | Z | 2.75 | 66.89 | 15.41 | | 150.0 | |
| 10110-CAE | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | X | 2.00 | 67.08 | 15.01 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.23 | 69.37 | 16.44 | | 150.0 | |
| | | Z | 2.04 | 67.87 | 15.44 | | 150.0 | |
| 10111-CAE | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | X | 2.42 | 67.04 | 15.26 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.63 | 68.86 | 16.39 | | 150.0 | |
| | | Z | 2.46 | 67.68 | 15.62 | | 150.0 | |

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| 10112-CAE | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM) | X | 2.86 | 66.54 | 15.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.00 | 67.72 | 16.02 | | 150.0 | |
| | | Z | 2.87 | 66.93 | 15.50 | | 150.0 | |
| 10113-CAE | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) | X | 2.57 | 67.26 | 15.44 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.78 | 68.98 | 16.51 | | 150.0 | |
| | | Z | 2.61 | 67.88 | 15.80 | | 150.0 | |
| 10114-CAC | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK) | X | 5.03 | 66.88 | 16.20 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.07 | 67.30 | 16.42 | | 150.0 | |
| | | Z | 5.01 | 66.99 | 16.27 | | 150.0 | |
| 10115-CAC | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM) | X | 5.31 | 67.01 | 16.28 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.34 | 67.38 | 16.47 | | 150.0 | |
| | | Z | 5.29 | 67.11 | 16.34 | | 150.0 | |
| 10116-CAC | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | X | 5.12 | 67.06 | 16.21 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.15 | 67.47 | 16.44 | | 150.0 | |
| | | Z | 5.10 | 67.17 | 16.29 | | 150.0 | |
| 10117-CAC | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK) | X | 4.99 | 66.73 | 16.14 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.03 | 67.17 | 16.37 | | 150.0 | |
| | | Z | 4.97 | 66.84 | 16.21 | | 150.0 | |
| 10118-CAC | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM) | X | 5.40 | 67.23 | 16.39 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.41 | 67.55 | 16.56 | | 150.0 | |
| | | Z | 5.38 | 67.32 | 16.46 | | 150.0 | |
| 10119-CAC | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM) | X | 5.10 | 67.02 | 16.20 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.13 | 67.42 | 16.42 | | 150.0 | |
| | | Z | 5.08 | 67.12 | 16.27 | | 150.0 | |
| 10140-CAD | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM) | X | 3.23 | 66.75 | 15.39 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.36 | 67.79 | 16.04 | | 150.0 | |
| | | Z | 3.24 | 67.07 | 15.59 | | 150.0 | |
| 10141-CAD | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM) | X | 3.36 | 66.89 | 15.59 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.48 | 67.89 | 16.22 | | 150.0 | |
| | | Z | 3.36 | 67.21 | 15.79 | | 150.0 | |
| 10142-CAD | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK) | X | 1.75 | 66.77 | 14.44 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.02 | 69.55 | 16.16 | | 150.0 | |
| | | Z | 1.80 | 67.67 | 14.92 | | 150.0 | |
| 10143-CAD | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM) | X | 2.22 | 67.30 | 14.65 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.54 | 69.90 | 16.19 | | 150.0 | |
| | | Z | 2.28 | 68.13 | 15.09 | | 150.0 | |
| 10144-CAD | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM) | X | 2.04 | 65.32 | 13.17 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.23 | 67.08 | 14.32 | | 150.0 | |
| | | Z | 2.05 | 65.77 | 13.41 | | 150.0 | |
| 10145-CAE | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK) | X | 0.98 | 62.66 | 9.82 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.20 | 65.49 | 11.77 | | 150.0 | |
| | | Z | 0.97 | 62.93 | 9.89 | | 150.0 | |
| 10146-CAE | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | X | 1.65 | 64.35 | 10.46 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.91 | 66.14 | 11.17 | | 150.0 | |
| | | Z | 1.63 | 64.37 | 10.36 | | 150.0 | |
| 10147-CAE | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | X | 1.85 | 65.65 | 11.25 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.32 | 68.39 | 12.35 | | 150.0 | |
| | | Z | 1.85 | 65.76 | 11.20 | | 150.0 | |

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| 10149-CAD | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM) | X | 2.74 | 66.55 | 15.21 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.89 | 67.80 | 16.02 | | 150.0 | |
| | | Z | 2.76 | 66.96 | 15.46 | | 150.0 | |
| 10150-CAD | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM) | X | 2.87 | 66.60 | 15.31 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.01 | 67.78 | 16.07 | | 150.0 | |
| | | Z | 2.88 | 66.99 | 15.55 | | 150.0 | |
| 10151-CAD | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK) | X | 7.77 | 80.23 | 22.27 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.27 | 81.72 | 22.81 | | 65.0 | |
| | | Z | 7.68 | 80.09 | 22.09 | | 65.0 | |
| 10152-CAD | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM) | X | 6.46 | 75.02 | 20.62 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.58 | 75.72 | 20.87 | | 65.0 | |
| | | Z | 6.35 | 74.83 | 20.43 | | 65.0 | |
| 10153-CAD | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM) | X | 6.90 | 76.12 | 21.45 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.02 | 76.81 | 21.70 | | 65.0 | |
| | | Z | 6.80 | 75.98 | 21.31 | | 65.0 | |
| 10154-CAE | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK) | X | 2.03 | 67.44 | 15.25 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.29 | 69.86 | 16.73 | | 150.0 | |
| | | Z | 2.09 | 68.30 | 15.72 | | 150.0 | |
| 10155-CAE | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) | X | 2.42 | 67.06 | 15.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.63 | 68.87 | 16.41 | | 150.0 | |
| | | Z | 2.46 | 67.70 | 15.64 | | 150.0 | |
| 10156-CAE | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK) | X | 1.58 | 66.55 | 14.02 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.88 | 69.80 | 16.01 | | 150.0 | |
| | | Z | 1.63 | 67.54 | 14.54 | | 150.0 | |
| 10157-CAE | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM) | X | 1.84 | 65.50 | 12.95 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.09 | 67.84 | 14.43 | | 150.0 | |
| | | Z | 1.86 | 66.07 | 13.25 | | 150.0 | |
| 10158-CAE | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM) | X | 2.58 | 67.32 | 15.49 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.79 | 69.06 | 16.56 | | 150.0 | |
| | | Z | 2.62 | 67.95 | 15.85 | | 150.0 | |
| 10159-CAE | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM) | X | 1.93 | 65.89 | 13.21 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.21 | 68.39 | 14.75 | | 150.0 | |
| | | Z | 1.96 | 66.52 | 13.54 | | 150.0 | |
| 10160-CAD | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK) | X | 2.55 | 67.50 | 15.48 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.73 | 69.10 | 16.50 | | 150.0 | |
| | | Z | 2.58 | 68.08 | 15.81 | | 150.0 | |
| 10161-CAD | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM) | X | 2.76 | 66.51 | 15.21 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.91 | 67.76 | 16.01 | | 150.0 | |
| | | Z | 2.78 | 66.92 | 15.46 | | 150.0 | |
| 10162-CAD | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM) | X | 2.87 | 66.69 | 15.34 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.02 | 67.91 | 16.12 | | 150.0 | |
| | | Z | 2.89 | 67.09 | 15.59 | | 150.0 | |
| 10166-CAE | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) | X | 3.48 | 69.02 | 18.77 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.63 | 70.38 | 19.41 | | 150.0 | |
| | | Z | 3.50 | 69.42 | 18.94 | | 150.0 | |
| 10167-CAE | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | X | 4.21 | 71.51 | 19.04 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.72 | 74.23 | 20.18 | | 150.0 | |
| | | Z | 4.29 | 72.00 | 19.22 | | 150.0 | |

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|-----------|--|---|-------|--------|-------|------|-------|---------|
| 10168-CAE | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) | X | 4.69 | 73.84 | 20.43 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.44 | 77.23 | 21.80 | | 150.0 | |
| | | Z | 4.84 | 74.60 | 20.73 | | 150.0 | |
| 10169-CAD | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK) | X | 2.90 | 68.20 | 18.38 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.11 | 70.47 | 19.46 | | 150.0 | |
| | | Z | 2.94 | 68.73 | 18.61 | | 150.0 | |
| 10170-CAD | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM) | X | 3.86 | 73.35 | 20.42 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.00 | 79.28 | 22.80 | | 150.0 | |
| | | Z | 4.05 | 74.41 | 20.83 | | 150.0 | |
| 10171-AAD | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM) | X | 3.20 | 69.46 | 17.72 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.75 | 73.30 | 19.32 | | 150.0 | |
| | | Z | 3.27 | 69.98 | 17.88 | | 150.0 | |
| 10172-CAD | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK) | X | 12.49 | 97.68 | 30.60 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 15.24 | 102.74 | 32.04 | | 65.0 | |
| | | Z | 10.55 | 94.04 | 29.10 | | 65.0 | |
| 10173-CAD | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM) | X | 20.03 | 101.92 | 30.01 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 72.46 | 124.52 | 35.50 | | 65.0 | |
| | | Z | 19.52 | 100.69 | 29.25 | | 65.0 | |
| 10174-CAD | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM) | X | 16.27 | 96.91 | 27.93 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 31.61 | 108.44 | 30.74 | | 65.0 | |
| | | Z | 13.77 | 93.42 | 26.49 | | 65.0 | |
| 10175-CAE | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK) | X | 2.86 | 67.90 | 18.13 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.06 | 70.09 | 19.18 | | 150.0 | |
| | | Z | 2.90 | 68.39 | 18.33 | | 150.0 | |
| 10176-CAE | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM) | X | 3.86 | 73.37 | 20.43 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.01 | 79.31 | 22.82 | | 150.0 | |
| | | Z | 4.05 | 74.44 | 20.85 | | 150.0 | |
| 10177-CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK) | X | 2.89 | 68.05 | 18.22 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.09 | 70.27 | 19.29 | | 150.0 | |
| | | Z | 2.92 | 68.55 | 18.44 | | 150.0 | |
| 10178-CAE | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) | X | 3.83 | 73.17 | 20.31 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.93 | 79.00 | 22.67 | | 150.0 | |
| | | Z | 4.01 | 74.20 | 20.72 | | 150.0 | |
| 10179-CAE | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM) | X | 3.49 | 71.25 | 18.92 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.30 | 76.05 | 20.88 | | 150.0 | |
| | | Z | 3.61 | 71.99 | 19.19 | | 150.0 | |
| 10180-CAE | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) | X | 3.19 | 69.40 | 17.67 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.74 | 73.20 | 19.26 | | 150.0 | |
| | | Z | 3.26 | 69.90 | 17.83 | | 150.0 | |
| 10181-CAD | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK) | X | 2.88 | 68.03 | 18.21 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.09 | 70.24 | 19.28 | | 150.0 | |
| | | Z | 2.92 | 68.53 | 18.43 | | 150.0 | |
| 10182-CAD | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) | X | 3.82 | 73.15 | 20.30 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.92 | 78.96 | 22.65 | | 150.0 | |
| | | Z | 4.00 | 74.17 | 20.71 | | 150.0 | |
| 10183-AAC | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | X | 3.19 | 69.38 | 17.66 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.73 | 73.17 | 19.25 | | 150.0 | |
| | | Z | 3.26 | 69.88 | 17.82 | | 150.0 | |

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|-----------|---|---|------|-------|-------|------|-------|---------|
| 10184-CAD | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK) | X | 2.89 | 68.07 | 18.23 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.10 | 70.29 | 19.30 | | 150.0 | |
| | | Z | 2.93 | 68.57 | 18.45 | | 150.0 | |
| 10185-CAD | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM) | X | 3.84 | 73.22 | 20.34 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.95 | 79.06 | 22.70 | | 150.0 | |
| | | Z | 4.02 | 74.25 | 20.75 | | 150.0 | |
| 10186-AAD | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) | X | 3.20 | 69.44 | 17.69 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.75 | 73.25 | 19.29 | | 150.0 | |
| | | Z | 3.27 | 69.95 | 17.86 | | 150.0 | |
| 10187-CAE | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK) | X | 2.90 | 68.13 | 18.30 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.11 | 70.36 | 19.38 | | 150.0 | |
| | | Z | 2.94 | 68.63 | 18.52 | | 150.0 | |
| 10188-CAE | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | X | 3.95 | 73.84 | 20.71 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.19 | 80.03 | 23.19 | | 150.0 | |
| | | Z | 4.16 | 74.97 | 21.16 | | 150.0 | |
| 10189-AAE | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM) | X | 3.27 | 69.82 | 17.96 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.86 | 73.83 | 19.63 | | 150.0 | |
| | | Z | 3.35 | 70.37 | 18.14 | | 150.0 | |
| 10193-CAC | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK) | X | 4.42 | 66.26 | 15.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.47 | 66.77 | 16.15 | | 150.0 | |
| | | Z | 4.40 | 66.39 | 15.94 | | 150.0 | |
| 10194-CAC | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM) | X | 4.58 | 66.56 | 15.98 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.64 | 67.07 | 16.27 | | 150.0 | |
| | | Z | 4.57 | 66.69 | 16.07 | | 150.0 | |
| 10195-CAC | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM) | X | 4.62 | 66.60 | 16.00 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.68 | 67.10 | 16.29 | | 150.0 | |
| | | Z | 4.61 | 66.73 | 16.09 | | 150.0 | |
| 10196-CAC | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK) | X | 4.42 | 66.31 | 15.86 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.47 | 66.83 | 16.17 | | 150.0 | |
| | | Z | 4.40 | 66.44 | 15.96 | | 150.0 | |
| 10197-CAC | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM) | X | 4.60 | 66.58 | 15.99 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.65 | 67.09 | 16.28 | | 150.0 | |
| | | Z | 4.58 | 66.71 | 16.08 | | 150.0 | |
| 10198-CAC | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM) | X | 4.62 | 66.61 | 16.01 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.68 | 67.12 | 16.30 | | 150.0 | |
| | | Z | 4.61 | 66.74 | 16.10 | | 150.0 | |
| 10219-CAC | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK) | X | 4.37 | 66.31 | 15.82 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.42 | 66.85 | 16.13 | | 150.0 | |
| | | Z | 4.35 | 66.45 | 15.91 | | 150.0 | |
| 10220-CAC | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM) | X | 4.59 | 66.55 | 15.98 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.64 | 67.06 | 16.27 | | 150.0 | |
| | | Z | 4.57 | 66.68 | 16.07 | | 150.0 | |
| 10221-CAC | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM) | X | 4.63 | 66.55 | 16.00 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.69 | 67.04 | 16.28 | | 150.0 | |
| | | Z | 4.62 | 66.67 | 16.09 | | 150.0 | |
| 10222-CAC | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK) | X | 4.97 | 66.74 | 16.13 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.01 | 67.18 | 16.37 | | 150.0 | |
| | | Z | 4.95 | 66.85 | 16.21 | | 150.0 | |

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|-----------|---|---|-------|--------|-------|------|-------|---------|
| 10223-CAC | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM) | X | 5.28 | 66.99 | 16.28 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.30 | 67.34 | 16.47 | | 150.0 | |
| | | Z | 5.25 | 67.07 | 16.34 | | 150.0 | |
| 10224-CAC | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM) | X | 5.01 | 66.84 | 16.11 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.05 | 67.29 | 16.36 | | 150.0 | |
| | | Z | 4.99 | 66.96 | 16.19 | | 150.0 | |
| 10225-CAB | UMTS-FDD (HSPA+) | X | 2.66 | 65.42 | 14.70 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.77 | 66.46 | 15.40 | | 150.0 | |
| | | Z | 2.66 | 65.73 | 14.91 | | 150.0 | |
| 10226-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | X | 21.83 | 103.64 | 30.61 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 88.10 | 128.23 | 36.51 | | 65.0 | |
| | | Z | 21.43 | 102.50 | 29.88 | | 65.0 | |
| 10227-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM) | X | 20.13 | 100.63 | 29.11 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 64.40 | 120.20 | 33.78 | | 65.0 | |
| | | Z | 19.14 | 98.98 | 28.23 | | 65.0 | |
| 10228-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK) | X | 14.12 | 100.60 | 31.63 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 23.80 | 111.72 | 34.72 | | 65.0 | |
| | | Z | 14.86 | 101.16 | 31.46 | | 65.0 | |
| 10229-CAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM) | X | 20.17 | 102.03 | 30.05 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 73.25 | 124.70 | 35.55 | | 65.0 | |
| | | Z | 19.67 | 100.81 | 29.30 | | 65.0 | |
| 10230-CAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) | X | 18.61 | 99.16 | 28.60 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 54.73 | 117.27 | 32.96 | | 65.0 | |
| | | Z | 17.63 | 97.47 | 27.70 | | 65.0 | |
| 10231-CAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK) | X | 13.27 | 99.26 | 31.13 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 21.73 | 109.78 | 34.08 | | 65.0 | |
| | | Z | 13.86 | 99.68 | 30.92 | | 65.0 | |
| 10232-CAD | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) | X | 20.14 | 102.02 | 30.04 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 73.21 | 124.70 | 35.55 | | 65.0 | |
| | | Z | 19.64 | 100.79 | 29.29 | | 65.0 | |
| 10233-CAD | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) | X | 18.57 | 99.13 | 28.59 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 54.59 | 117.24 | 32.96 | | 65.0 | |
| | | Z | 17.59 | 97.44 | 27.70 | | 65.0 | |
| 10234-CAD | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK) | X | 12.60 | 98.04 | 30.63 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 20.09 | 107.98 | 33.44 | | 65.0 | |
| | | Z | 13.06 | 98.32 | 30.37 | | 65.0 | |
| 10235-CAD | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM) | X | 20.19 | 102.07 | 30.06 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 73.67 | 124.83 | 35.59 | | 65.0 | |
| | | Z | 19.69 | 100.85 | 29.31 | | 65.0 | |
| 10236-CAD | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM) | X | 18.79 | 99.31 | 28.64 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 55.78 | 117.56 | 33.03 | | 65.0 | |
| | | Z | 17.79 | 97.60 | 27.74 | | 65.0 | |
| 10237-CAD | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK) | X | 13.32 | 99.36 | 31.16 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 21.88 | 109.95 | 34.13 | | 65.0 | |
| | | Z | 13.92 | 99.79 | 30.95 | | 65.0 | |
| 10238-CAD | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) | X | 20.11 | 102.00 | 30.04 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 73.16 | 124.70 | 35.55 | | 65.0 | |
| | | Z | 19.61 | 100.78 | 29.29 | | 65.0 | |

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| 10239-CAD | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | X | 18.52 | 99.11 | 28.58 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 54.43 | 117.21 | 32.95 | | 65.0 | |
| | | Z | 17.55 | 97.42 | 27.69 | | 65.0 | |
| 10240-CAD | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK) | X | 13.28 | 99.31 | 31.15 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 21.80 | 109.89 | 34.12 | | 65.0 | |
| | | Z | 13.87 | 99.74 | 30.93 | | 65.0 | |
| 10241-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | X | 9.12 | 82.96 | 26.09 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 10.00 | 85.69 | 27.01 | | 65.0 | |
| | | Z | 9.04 | 82.65 | 25.77 | | 65.0 | |
| 10242-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) | X | 8.70 | 81.95 | 25.61 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 8.67 | 82.71 | 25.78 | | 65.0 | |
| | | Z | 8.04 | 80.18 | 24.69 | | 65.0 | |
| 10243-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) | X | 7.00 | 78.72 | 25.20 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 6.71 | 78.49 | 25.00 | | 65.0 | |
| | | Z | 6.48 | 76.99 | 24.26 | | 65.0 | |
| 10244-CAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | X | 7.05 | 77.66 | 19.20 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.43 | 78.54 | 19.22 | | 65.0 | |
| | | Z | 6.68 | 76.74 | 18.64 | | 65.0 | |
| 10245-CAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | X | 6.79 | 76.83 | 18.82 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.09 | 77.57 | 18.79 | | 65.0 | |
| | | Z | 6.45 | 75.94 | 18.27 | | 65.0 | |
| 10246-CAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | X | 7.06 | 80.97 | 20.53 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.30 | 83.87 | 21.55 | | 65.0 | |
| | | Z | 6.80 | 80.34 | 20.09 | | 65.0 | |
| 10247-CAD | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM) | X | 5.79 | 75.33 | 19.04 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.06 | 76.47 | 19.48 | | 65.0 | |
| | | Z | 5.64 | 74.99 | 18.76 | | 65.0 | |
| 10248-CAD | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM) | X | 5.70 | 74.59 | 18.71 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 5.92 | 75.58 | 19.09 | | 65.0 | |
| | | Z | 5.55 | 74.25 | 18.44 | | 65.0 | |
| 10249-CAD | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK) | X | 8.76 | 84.93 | 22.93 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 10.34 | 88.10 | 24.01 | | 65.0 | |
| | | Z | 8.68 | 84.75 | 22.68 | | 65.0 | |
| 10250-CAD | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) | X | 6.81 | 78.07 | 21.84 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.05 | 79.10 | 22.22 | | 65.0 | |
| | | Z | 6.73 | 78.01 | 21.71 | | 65.0 | |
| 10251-CAD | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM) | X | 6.32 | 75.48 | 20.41 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.48 | 76.29 | 20.71 | | 65.0 | |
| | | Z | 6.21 | 75.28 | 20.22 | | 65.0 | |
| 10252-CAD | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK) | X | 8.53 | 84.00 | 23.62 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 9.47 | 86.28 | 24.42 | | 65.0 | |
| | | Z | 8.50 | 83.98 | 23.47 | | 65.0 | |
| 10253-CAD | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM) | X | 6.31 | 74.47 | 20.36 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.42 | 75.13 | 20.60 | | 65.0 | |
| | | Z | 6.20 | 74.27 | 20.18 | | 65.0 | |
| 10254-CAD | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM) | X | 6.72 | 75.47 | 21.11 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.82 | 76.13 | 21.34 | | 65.0 | |
| | | Z | 6.62 | 75.32 | 20.95 | | 65.0 | |

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| 10255-CAD | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK) | X | 7.38 | 79.53 | 22.21 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.78 | 80.88 | 22.71 | | 65.0 | |
| | | Z | 7.29 | 79.40 | 22.04 | | 65.0 | |
| 10256-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | X | 5.30 | 72.99 | 16.24 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 5.30 | 73.08 | 15.94 | | 65.0 | |
| | | Z | 4.92 | 71.84 | 15.54 | | 65.0 | |
| 10257-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | X | 5.07 | 72.00 | 15.72 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 5.03 | 72.02 | 15.39 | | 65.0 | |
| | | Z | 4.73 | 70.95 | 15.06 | | 65.0 | |
| 10258-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK) | X | 4.98 | 75.11 | 17.39 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 5.57 | 77.09 | 18.14 | | 65.0 | |
| | | Z | 4.66 | 74.16 | 16.79 | | 65.0 | |
| 10259-CAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM) | X | 6.20 | 76.38 | 20.06 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.46 | 77.48 | 20.48 | | 65.0 | |
| | | Z | 6.08 | 76.15 | 19.84 | | 65.0 | |
| 10260-CAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM) | X | 6.19 | 76.02 | 19.92 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.42 | 77.04 | 20.30 | | 65.0 | |
| | | Z | 6.07 | 75.78 | 19.70 | | 65.0 | |
| 10261-CAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK) | X | 8.10 | 83.46 | 22.85 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 9.17 | 85.99 | 23.74 | | 65.0 | |
| | | Z | 8.03 | 83.33 | 22.64 | | 65.0 | |
| 10262-CAD | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | X | 6.79 | 78.00 | 21.79 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.03 | 79.02 | 22.17 | | 65.0 | |
| | | Z | 6.72 | 77.93 | 21.66 | | 65.0 | |
| 10263-CAD | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) | X | 6.31 | 75.46 | 20.40 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.46 | 76.27 | 20.70 | | 65.0 | |
| | | Z | 6.20 | 75.25 | 20.21 | | 65.0 | |
| 10264-CAD | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | X | 8.42 | 83.76 | 23.51 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 9.35 | 86.01 | 24.30 | | 65.0 | |
| | | Z | 8.39 | 83.72 | 23.35 | | 65.0 | |
| 10265-CAD | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | X | 6.46 | 75.03 | 20.62 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.57 | 75.72 | 20.88 | | 65.0 | |
| | | Z | 6.35 | 74.83 | 20.44 | | 65.0 | |
| 10266-CAD | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM) | X | 6.89 | 76.10 | 21.44 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.02 | 76.79 | 21.69 | | 65.0 | |
| | | Z | 6.80 | 75.96 | 21.29 | | 65.0 | |
| 10267-CAD | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | X | 7.75 | 80.18 | 22.25 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.25 | 81.67 | 22.78 | | 65.0 | |
| | | Z | 7.66 | 80.04 | 22.07 | | 65.0 | |
| 10268-CAD | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM) | X | 7.04 | 74.77 | 20.94 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.11 | 75.31 | 21.11 | | 65.0 | |
| | | Z | 6.93 | 74.60 | 20.78 | | 65.0 | |
| 10269-CAD | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM) | X | 6.99 | 74.32 | 20.80 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.05 | 74.83 | 20.96 | | 65.0 | |
| | | Z | 6.88 | 74.15 | 20.64 | | 65.0 | |
| 10270-CAD | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | X | 7.27 | 76.96 | 21.15 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.51 | 77.89 | 21.47 | | 65.0 | |
| | | Z | 7.17 | 76.79 | 20.97 | | 65.0 | |

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|-----------|--|---|-------|-------|-------|------|-------|---------|
| 10274-CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10) | X | 2.44 | 65.65 | 14.52 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.58 | 66.93 | 15.38 | | 150.0 | |
| | | Z | 2.44 | 66.02 | 14.76 | | 150.0 | |
| 10275-CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4) | X | 1.41 | 65.93 | 14.09 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.64 | 68.84 | 15.97 | | 150.0 | |
| | | Z | 1.43 | 66.84 | 14.59 | | 150.0 | |
| 10277-CAA | PHS (QPSK) | X | 2.69 | 63.02 | 8.62 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 2.49 | 62.47 | 7.99 | | 50.0 | |
| | | Z | 2.63 | 62.54 | 8.19 | | 50.0 | |
| 10278-CAA | PHS (QPSK, BW 884MHz, Rolloff 0.5) | X | 6.13 | 75.62 | 17.36 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 6.10 | 75.61 | 17.01 | | 50.0 | |
| | | Z | 5.25 | 72.84 | 15.87 | | 50.0 | |
| 10279-CAA | PHS (QPSK, BW 884MHz, Rolloff 0.38) | X | 6.27 | 75.87 | 17.50 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 6.26 | 75.90 | 17.18 | | 50.0 | |
| | | Z | 5.39 | 73.11 | 16.03 | | 50.0 | |
| 10290-AAB | CDMA2000, RC1, SO55, Full Rate | X | 1.07 | 64.99 | 11.41 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.52 | 70.06 | 14.36 | | 150.0 | |
| | | Z | 1.10 | 65.80 | 11.73 | | 150.0 | |
| 10291-AAB | CDMA2000, RC3, SO55, Full Rate | X | 0.62 | 62.66 | 9.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.84 | 66.84 | 12.75 | | 150.0 | |
| | | Z | 0.61 | 63.14 | 9.97 | | 150.0 | |
| 10292-AAB | CDMA2000, RC3, SO32, Full Rate | X | 0.70 | 64.71 | 11.29 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.35 | 74.03 | 16.36 | | 150.0 | |
| | | Z | 0.73 | 66.02 | 11.81 | | 150.0 | |
| 10293-AAB | CDMA2000, RC3, SO3, Full Rate | X | 0.91 | 67.99 | 13.37 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.72 | 88.47 | 22.02 | | 150.0 | |
| | | Z | 1.14 | 71.50 | 14.79 | | 150.0 | |
| 10295-AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr. | X | 11.25 | 87.71 | 24.83 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 11.23 | 88.06 | 24.81 | | 50.0 | |
| | | Z | 10.25 | 85.38 | 23.63 | | 50.0 | |
| 10297-AAC | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK) | X | 2.50 | 68.17 | 15.60 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.77 | 70.35 | 16.90 | | 150.0 | |
| | | Z | 2.56 | 68.94 | 16.00 | | 150.0 | |
| 10298-AAC | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | X | 1.27 | 64.98 | 12.13 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.59 | 68.58 | 14.37 | | 150.0 | |
| | | Z | 1.30 | 65.74 | 12.50 | | 150.0 | |
| 10299-AAC | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | X | 2.26 | 67.58 | 13.09 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.88 | 70.84 | 14.39 | | 150.0 | |
| | | Z | 2.31 | 68.05 | 13.23 | | 150.0 | |
| 10300-AAC | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | X | 1.77 | 63.93 | 10.56 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.93 | 65.15 | 11.03 | | 150.0 | |
| | | Z | 1.76 | 63.99 | 10.51 | | 150.0 | |
| 10301-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC) | X | 4.92 | 66.12 | 17.59 | 4.17 | 50.0 | ± 9.6 % |
| | | Y | 4.94 | 66.60 | 17.92 | | 50.0 | |
| | | Z | 4.93 | 66.44 | 17.78 | | 50.0 | |
| 10302-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols) | X | 5.35 | 66.47 | 18.15 | 4.96 | 50.0 | ± 9.6 % |
| | | Y | 5.31 | 66.68 | 18.33 | | 50.0 | |
| | | Z | 5.30 | 66.45 | 18.14 | | 50.0 | |

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|-----------|---|---|-------|-------|-------|-------|-------|---------|
| 10303-AAA | IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC) | X | 5.13 | 66.21 | 18.02 | 4.96 | 50.0 | ± 9.6 % |
| | | Y | 5.07 | 66.39 | 18.20 | | 50.0 | |
| | | Z | 5.07 | 66.18 | 18.01 | | 50.0 | |
| 10304-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC) | X | 4.90 | 65.93 | 17.43 | 4.17 | 50.0 | ± 9.6 % |
| | | Y | 4.86 | 66.20 | 17.66 | | 50.0 | |
| | | Z | 4.85 | 65.93 | 17.45 | | 50.0 | |
| 10305-AAA | IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols) | X | 5.09 | 70.41 | 20.66 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.83 | 69.73 | 20.50 | | 35.0 | |
| | | Z | 5.06 | 70.51 | 20.69 | | 35.0 | |
| 10306-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols) | X | 5.13 | 68.33 | 19.84 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.96 | 67.93 | 19.74 | | 35.0 | |
| | | Z | 5.09 | 68.34 | 19.83 | | 35.0 | |
| 10307-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols) | X | 5.08 | 68.69 | 19.88 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.89 | 68.24 | 19.77 | | 35.0 | |
| | | Z | 5.04 | 68.72 | 19.88 | | 35.0 | |
| 10308-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC) | X | 5.08 | 69.01 | 20.07 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.89 | 68.54 | 19.96 | | 35.0 | |
| | | Z | 5.05 | 69.06 | 20.07 | | 35.0 | |
| 10309-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols) | X | 5.19 | 68.55 | 19.99 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.02 | 68.14 | 19.88 | | 35.0 | |
| | | Z | 5.15 | 68.56 | 19.97 | | 35.0 | |
| 10310-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols) | X | 5.10 | 68.49 | 19.85 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.92 | 68.06 | 19.75 | | 35.0 | |
| | | Z | 5.06 | 68.50 | 19.84 | | 35.0 | |
| 10311-AAC | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | X | 2.84 | 67.53 | 15.34 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.14 | 69.61 | 16.53 | | 150.0 | |
| | | Z | 2.91 | 68.24 | 15.71 | | 150.0 | |
| 10313-AAA | iDEN 1:3 | X | 5.13 | 76.18 | 17.28 | 6.99 | 70.0 | ± 9.6 % |
| | | Y | 6.09 | 78.88 | 18.20 | | 70.0 | |
| | | Z | 4.34 | 73.62 | 15.93 | | 70.0 | |
| 10314-AAA | iDEN 1:6 | X | 8.00 | 86.16 | 23.72 | 10.00 | 30.0 | ± 9.6 % |
| | | Y | 11.47 | 92.42 | 25.66 | | 30.0 | |
| | | Z | 7.40 | 83.99 | 22.45 | | 30.0 | |
| 10315-AAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle) | X | 1.01 | 62.88 | 14.24 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 1.09 | 64.49 | 15.59 | | 150.0 | |
| | | Z | 0.99 | 63.37 | 14.65 | | 150.0 | |
| 10316-AAB | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle) | X | 4.49 | 66.39 | 16.05 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 4.53 | 66.84 | 16.30 | | 150.0 | |
| | | Z | 4.47 | 66.49 | 16.12 | | 150.0 | |
| 10317-AAC | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle) | X | 4.49 | 66.39 | 16.05 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 4.53 | 66.84 | 16.30 | | 150.0 | |
| | | Z | 4.47 | 66.49 | 16.12 | | 150.0 | |
| 10400-AAD | IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle) | X | 4.57 | 66.61 | 15.97 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.62 | 67.11 | 16.26 | | 150.0 | |
| | | Z | 4.55 | 66.73 | 16.05 | | 150.0 | |
| 10401-AAD | IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle) | X | 5.30 | 66.90 | 16.22 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.30 | 67.18 | 16.36 | | 150.0 | |
| | | Z | 5.28 | 66.98 | 16.27 | | 150.0 | |

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|-----------|---|---|--------|--------|-------|------|-------|---------|
| 10402-AAD | IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle) | X | 5.54 | 67.14 | 16.20 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.57 | 67.55 | 16.41 | | 150.0 | |
| | | Z | 5.51 | 67.23 | 16.26 | | 150.0 | |
| 10403-AAB | CDMA2000 (1xEV-DO, Rev. 0) | X | 1.07 | 64.99 | 11.41 | 0.00 | 115.0 | ± 9.6 % |
| | | Y | 1.52 | 70.06 | 14.36 | | 115.0 | |
| | | Z | 1.10 | 65.80 | 11.73 | | 115.0 | |
| 10404-AAB | CDMA2000 (1xEV-DO, Rev. A) | X | 1.07 | 64.99 | 11.41 | 0.00 | 115.0 | ± 9.6 % |
| | | Y | 1.52 | 70.06 | 14.36 | | 115.0 | |
| | | Z | 1.10 | 65.80 | 11.73 | | 115.0 | |
| 10406-AAB | CDMA2000, RC3, SO32, SCH0, Full Rate | X | 12.79 | 94.04 | 23.58 | 0.00 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 117.36 | 28.19 | | 100.0 | |
| | | Z | 28.29 | 104.65 | 26.35 | | 100.0 | |
| 10410-AAD | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4) | X | 100.00 | 122.63 | 30.86 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 120.11 | 29.40 | | 80.0 | |
| | | Z | 100.00 | 120.57 | 29.77 | | 80.0 | |
| 10415-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle) | X | 0.92 | 61.88 | 13.54 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.99 | 63.42 | 14.90 | | 150.0 | |
| | | Z | 0.90 | 62.30 | 13.94 | | 150.0 | |
| 10416-AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle) | X | 4.42 | 66.29 | 15.92 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.47 | 66.81 | 16.22 | | 150.0 | |
| | | Z | 4.40 | 66.42 | 16.01 | | 150.0 | |
| 10417-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle) | X | 4.42 | 66.29 | 15.92 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.47 | 66.81 | 16.22 | | 150.0 | |
| | | Z | 4.40 | 66.42 | 16.01 | | 150.0 | |
| 10418-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preamble) | X | 4.41 | 66.45 | 15.93 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.47 | 66.98 | 16.25 | | 150.0 | |
| | | Z | 4.39 | 66.59 | 16.03 | | 150.0 | |
| 10419-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preamble) | X | 4.43 | 66.40 | 15.94 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.48 | 66.92 | 16.25 | | 150.0 | |
| | | Z | 4.41 | 66.53 | 16.03 | | 150.0 | |
| 10422-AAB | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK) | X | 4.55 | 66.41 | 15.96 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.60 | 66.91 | 16.25 | | 150.0 | |
| | | Z | 4.53 | 66.53 | 16.05 | | 150.0 | |
| 10423-AAB | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM) | X | 4.70 | 66.71 | 16.07 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.76 | 67.21 | 16.36 | | 150.0 | |
| | | Z | 4.69 | 66.84 | 16.16 | | 150.0 | |
| 10424-AAB | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM) | X | 4.62 | 66.66 | 16.04 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.68 | 67.17 | 16.34 | | 150.0 | |
| | | Z | 4.61 | 66.79 | 16.14 | | 150.0 | |
| 10425-AAB | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK) | X | 5.24 | 67.01 | 16.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.26 | 67.37 | 16.46 | | 150.0 | |
| | | Z | 5.22 | 67.11 | 16.34 | | 150.0 | |
| 10426-AAB | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM) | X | 5.25 | 67.07 | 16.29 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.27 | 67.41 | 16.48 | | 150.0 | |
| | | Z | 5.23 | 67.16 | 16.36 | | 150.0 | |

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| 10427-AAB | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM) | X | 5.26 | 67.02 | 16.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.28 | 67.38 | 16.46 | | 150.0 | |
| | | Z | 5.24 | 67.12 | 16.34 | | 150.0 | |
| 10430-AAB | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1) | X | 4.09 | 70.32 | 17.72 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.33 | 71.71 | 18.50 | | 150.0 | |
| | | Z | 4.19 | 71.06 | 18.14 | | 150.0 | |
| 10431-AAB | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1) | X | 4.07 | 66.75 | 15.82 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.15 | 67.41 | 16.23 | | 150.0 | |
| | | Z | 4.07 | 66.94 | 15.95 | | 150.0 | |
| 10432-AAB | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1) | X | 4.38 | 66.68 | 15.96 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.45 | 67.24 | 16.29 | | 150.0 | |
| | | Z | 4.37 | 66.83 | 16.06 | | 150.0 | |
| 10433-AAB | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1) | X | 4.64 | 66.69 | 16.06 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.69 | 67.20 | 16.36 | | 150.0 | |
| | | Z | 4.62 | 66.83 | 16.16 | | 150.0 | |
| 10434-AAA | W-CDMA (BS Test Model 1, 64 DPCH) | X | 4.15 | 71.02 | 17.57 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.49 | 72.80 | 18.54 | | 150.0 | |
| | | Z | 4.30 | 71.93 | 18.06 | | 150.0 | |
| 10435-AAC | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 122.42 | 30.76 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 119.87 | 29.28 | | 80.0 | |
| | | Z | 100.00 | 120.35 | 29.67 | | 80.0 | |
| 10447-AAB | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%) | X | 3.32 | 66.52 | 14.92 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.45 | 67.50 | 15.55 | | 150.0 | |
| | | Z | 3.33 | 66.81 | 15.10 | | 150.0 | |
| 10448-AAB | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%) | X | 3.92 | 66.52 | 15.67 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.00 | 67.20 | 16.10 | | 150.0 | |
| | | Z | 3.91 | 66.72 | 15.81 | | 150.0 | |
| 10449-AAB | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%) | X | 4.20 | 66.49 | 15.84 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.27 | 67.09 | 16.20 | | 150.0 | |
| | | Z | 4.19 | 66.65 | 15.96 | | 150.0 | |
| 10450-AAB | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | X | 4.41 | 66.44 | 15.90 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.46 | 66.99 | 16.22 | | 150.0 | |
| | | Z | 4.39 | 66.59 | 16.00 | | 150.0 | |
| 10451-AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%) | X | 3.18 | 66.52 | 14.41 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.34 | 67.66 | 15.13 | | 150.0 | |
| | | Z | 3.20 | 66.84 | 14.60 | | 150.0 | |
| 10456-AAB | IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle) | X | 6.12 | 67.60 | 16.46 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.13 | 67.91 | 16.60 | | 150.0 | |
| | | Z | 6.09 | 67.67 | 16.50 | | 150.0 | |
| 10457-AAA | UMTS-FDD (DC-HSDPA) | X | 3.70 | 64.95 | 15.61 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.75 | 65.46 | 15.93 | | 150.0 | |
| | | Z | 3.68 | 65.07 | 15.72 | | 150.0 | |
| 10458-AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers) | X | 3.76 | 70.07 | 16.80 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.10 | 71.97 | 17.86 | | 150.0 | |
| | | Z | 3.88 | 70.90 | 17.24 | | 150.0 | |
| 10459-AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers) | X | 4.98 | 68.29 | 17.93 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.09 | 68.97 | 18.30 | | 150.0 | |
| | | Z | 5.04 | 68.73 | 18.22 | | 150.0 | |

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|-----------|---|---|--------|--------|-------|------|-------|---------|
| 10460-AAA | UMTS-FDD (WCDMA, AMR) | X | 0.72 | 65.00 | 13.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.94 | 69.89 | 17.00 | | 150.0 | |
| | | Z | 0.74 | 66.60 | 14.60 | | 150.0 | |
| 10461-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 126.33 | 32.63 | 3.29 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 125.96 | 32.10 | | 80.0 | |
| | | Z | 100.00 | 124.33 | 31.57 | | 80.0 | |
| 10462-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 8.86 | 82.47 | 17.67 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 5.35 | 76.08 | 14.61 | | 80.0 | |
| | | Z | 3.57 | 72.37 | 13.98 | | 80.0 | |
| 10463-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.54 | 68.67 | 12.50 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 1.52 | 63.94 | 9.65 | | 80.0 | |
| | | Z | 1.66 | 64.25 | 10.29 | | 80.0 | |
| 10464-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 123.75 | 31.28 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 122.99 | 30.58 | | 80.0 | |
| | | Z | 100.00 | 121.46 | 30.09 | | 80.0 | |
| 10465-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 5.17 | 76.73 | 15.83 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.26 | 71.43 | 13.01 | | 80.0 | |
| | | Z | 2.68 | 69.44 | 12.84 | | 80.0 | |
| 10466-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.13 | 66.86 | 11.72 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 1.36 | 62.95 | 9.17 | | 80.0 | |
| | | Z | 1.51 | 63.34 | 9.83 | | 80.0 | |
| 10467-AAC | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 124.04 | 31.41 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 123.31 | 30.72 | | 80.0 | |
| | | Z | 100.00 | 121.76 | 30.22 | | 80.0 | |
| 10468-AAC | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 5.86 | 78.09 | 16.29 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.65 | 72.52 | 13.41 | | 80.0 | |
| | | Z | 2.86 | 70.15 | 13.13 | | 80.0 | |
| 10469-AAC | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.14 | 66.91 | 11.74 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 1.36 | 62.97 | 9.18 | | 80.0 | |
| | | Z | 1.51 | 63.36 | 9.84 | | 80.0 | |
| 10470-AAC | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 124.06 | 31.41 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 123.34 | 30.72 | | 80.0 | |
| | | Z | 100.00 | 121.78 | 30.22 | | 80.0 | |
| 10471-AAC | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 5.79 | 77.95 | 16.23 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.58 | 72.31 | 13.32 | | 80.0 | |
| | | Z | 2.83 | 70.03 | 13.07 | | 80.0 | |
| 10472-AAC | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.12 | 66.84 | 11.70 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 1.35 | 62.90 | 9.13 | | 80.0 | |
| | | Z | 1.50 | 63.31 | 9.80 | | 80.0 | |
| 10473-AAC | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 124.03 | 31.39 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 123.30 | 30.70 | | 80.0 | |
| | | Z | 100.00 | 121.74 | 30.20 | | 80.0 | |
| 10474-AAC | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 5.72 | 77.83 | 16.19 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.54 | 72.22 | 13.29 | | 80.0 | |
| | | Z | 2.81 | 69.97 | 13.04 | | 80.0 | |
| 10475-AAC | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.11 | 66.79 | 11.69 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 1.34 | 62.88 | 9.12 | | 80.0 | |
| | | Z | 1.50 | 63.28 | 9.79 | | 80.0 | |

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|-----------|---|---|-------|--------|-------|------|------|---------|
| 10477-AAC | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 5.20 | 76.78 | 15.83 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.22 | 71.32 | 12.95 | | 80.0 | |
| | | Z | 2.66 | 69.39 | 12.80 | | 80.0 | |
| | | X | 2.10 | 66.72 | 11.65 | 3.23 | 80.0 | ± 9.6 % |
| 10478-AAC | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | Y | 1.33 | 62.81 | 9.08 | | 80.0 | |
| | | Z | 1.49 | 63.23 | 9.76 | | 80.0 | |
| 10479-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 13.62 | 94.54 | 25.59 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 23.22 | 102.70 | 27.63 | | 80.0 | |
| | | Z | 17.49 | 97.86 | 26.25 | | 80.0 | |
| | | X | 11.04 | 85.67 | 20.97 | 3.23 | 80.0 | ± 9.6 % |
| 10480-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | Y | 20.11 | 93.02 | 22.64 | | 80.0 | |
| | | Z | 10.73 | 84.85 | 20.43 | | 80.0 | |
| 10481-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 8.05 | 80.76 | 19.01 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 11.70 | 85.21 | 19.94 | | 80.0 | |
| | | Z | 7.38 | 79.30 | 18.25 | | 80.0 | |
| | | X | 3.15 | 72.04 | 16.45 | 2.23 | 80.0 | ± 9.6 % |
| 10482-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | Y | 4.55 | 77.65 | 18.74 | | 80.0 | |
| | | Z | 3.27 | 72.71 | 16.57 | | 80.0 | |
| 10483-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 5.31 | 75.46 | 17.46 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 6.12 | 77.50 | 17.98 | | 80.0 | |
| | | Z | 5.21 | 75.16 | 17.17 | | 80.0 | |
| | | X | 4.80 | 73.91 | 16.88 | 2.23 | 80.0 | ± 9.6 % |
| 10484-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | Y | 5.38 | 75.63 | 17.32 | | 80.0 | |
| | | Z | 4.69 | 73.59 | 16.59 | | 80.0 | |
| 10485-AAC | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.67 | 74.28 | 18.39 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.78 | 78.84 | 20.28 | | 80.0 | |
| | | Z | 3.90 | 75.39 | 18.71 | | 80.0 | |
| | | X | 3.33 | 69.57 | 15.95 | 2.23 | 80.0 | ± 9.6 % |
| 10486-AAC | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | Y | 3.87 | 72.23 | 17.17 | | 80.0 | |
| | | Z | 3.36 | 69.91 | 16.01 | | 80.0 | |
| 10487-AAC | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.31 | 69.14 | 15.75 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.80 | 71.59 | 16.89 | | 80.0 | |
| | | Z | 3.33 | 69.43 | 15.79 | | 80.0 | |
| | | X | 3.89 | 73.38 | 18.85 | 2.23 | 80.0 | ± 9.6 % |
| 10488-AAC | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | Y | 4.46 | 76.13 | 20.06 | | 80.0 | |
| | | Z | 4.02 | 74.18 | 19.10 | | 80.0 | |
| 10489-AAC | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.66 | 69.57 | 17.31 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.91 | 71.08 | 18.04 | | 80.0 | |
| | | Z | 3.68 | 69.92 | 17.42 | | 80.0 | |
| | | X | 3.75 | 69.38 | 17.25 | 2.23 | 80.0 | ± 9.6 % |
| 10490-AAC | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | Y | 3.97 | 70.78 | 17.92 | | 80.0 | |
| | | Z | 3.76 | 69.69 | 17.34 | | 80.0 | |
| 10491-AAC | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.04 | 71.64 | 18.32 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.40 | 73.51 | 19.18 | | 80.0 | |
| | | Z | 4.10 | 72.13 | 18.47 | | 80.0 | |
| | | X | 3.98 | 68.76 | 17.31 | 2.23 | 80.0 | ± 9.6 % |
| 10492-AAC | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | Y | 4.14 | 69.80 | 17.82 | | 80.0 | |
| | | Z | 3.98 | 68.97 | 17.38 | | 80.0 | |

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| 10493-AAC | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.05 | 68.62 | 17.27 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.19 | 69.60 | 17.75 | | 80.0 | |
| | | Z | 4.03 | 68.81 | 17.32 | | 80.0 | |
| 10494-AAC | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.40 | 73.17 | 18.78 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.93 | 75.48 | 19.80 | | 80.0 | |
| | | Z | 4.51 | 73.80 | 18.98 | | 80.0 | |
| 10495-AAC | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.02 | 69.14 | 17.51 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.19 | 70.23 | 18.05 | | 80.0 | |
| | | Z | 4.02 | 69.39 | 17.59 | | 80.0 | |
| 10496-AAC | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.09 | 68.86 | 17.43 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.24 | 69.85 | 17.92 | | 80.0 | |
| | | Z | 4.09 | 69.07 | 17.50 | | 80.0 | |
| 10497-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 2.08 | 66.60 | 13.10 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 2.90 | 71.16 | 15.16 | | 80.0 | |
| | | Z | 2.01 | 66.38 | 12.83 | | 80.0 | |
| 10498-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.58 | 61.21 | 9.46 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 1.71 | 62.49 | 10.20 | | 80.0 | |
| | | Z | 1.50 | 60.82 | 9.10 | | 80.0 | |
| 10499-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.54 | 60.72 | 9.06 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 1.63 | 61.76 | 9.69 | | 80.0 | |
| | | Z | 1.45 | 60.34 | 8.71 | | 80.0 | |
| 10500-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.70 | 73.61 | 18.48 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.48 | 77.17 | 20.01 | | 80.0 | |
| | | Z | 3.86 | 74.54 | 18.75 | | 80.0 | |
| 10501-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.50 | 69.69 | 16.52 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.90 | 71.83 | 17.53 | | 80.0 | |
| | | Z | 3.53 | 70.05 | 16.61 | | 80.0 | |
| 10502-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.54 | 69.51 | 16.39 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.94 | 71.56 | 17.35 | | 80.0 | |
| | | Z | 3.57 | 69.83 | 16.46 | | 80.0 | |
| 10503-AAC | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.84 | 73.16 | 18.74 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.39 | 75.87 | 19.95 | | 80.0 | |
| | | Z | 3.96 | 73.93 | 18.98 | | 80.0 | |
| 10504-AAC | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.64 | 69.47 | 17.25 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.88 | 70.97 | 17.98 | | 80.0 | |
| | | Z | 3.66 | 69.80 | 17.35 | | 80.0 | |
| 10505-AAC | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.72 | 69.28 | 17.19 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.95 | 70.67 | 17.86 | | 80.0 | |
| | | Z | 3.73 | 69.58 | 17.27 | | 80.0 | |
| 10506-AAC | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.36 | 73.01 | 18.70 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.88 | 75.30 | 19.71 | | 80.0 | |
| | | Z | 4.47 | 73.63 | 18.89 | | 80.0 | |
| 10507-AAC | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.01 | 69.07 | 17.47 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.17 | 70.16 | 18.00 | | 80.0 | |
| | | Z | 4.00 | 69.32 | 17.55 | | 80.0 | |

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| 10508-AAC | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.08 | 68.78 | 17.39 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.22 | 69.77 | 17.87 | | 80.0 | |
| | | Z | 4.07 | 68.99 | 17.45 | | 80.0 | |
| 10509-AAC | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.64 | 71.58 | 18.16 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.01 | 73.26 | 18.91 | | 80.0 | |
| | | Z | 4.69 | 71.97 | 18.27 | | 80.0 | |
| 10510-AAC | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.48 | 68.73 | 17.45 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.60 | 69.59 | 17.86 | | 80.0 | |
| | | Z | 4.46 | 68.90 | 17.50 | | 80.0 | |
| 10511-AAC | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.53 | 68.48 | 17.39 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.64 | 69.27 | 17.76 | | 80.0 | |
| | | Z | 4.51 | 68.62 | 17.42 | | 80.0 | |
| 10512-AAC | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.88 | 73.16 | 18.64 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.44 | 75.35 | 19.58 | | 80.0 | |
| | | Z | 4.99 | 73.70 | 18.79 | | 80.0 | |
| 10513-AAC | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.37 | 69.01 | 17.56 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.51 | 69.95 | 18.01 | | 80.0 | |
| | | Z | 4.36 | 69.20 | 17.61 | | 80.0 | |
| 10514-AAC | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.39 | 68.58 | 17.44 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.50 | 69.43 | 17.84 | | 80.0 | |
| | | Z | 4.37 | 68.75 | 17.48 | | 80.0 | |
| 10515-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle) | X | 0.88 | 61.98 | 13.53 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.96 | 63.63 | 14.99 | | 150.0 | |
| | | Z | 0.86 | 62.44 | 13.95 | | 150.0 | |
| 10516-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle) | X | 0.42 | 65.30 | 13.37 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.67 | 73.90 | 19.05 | | 150.0 | |
| | | Z | 0.45 | 68.40 | 14.93 | | 150.0 | |
| 10517-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle) | X | 0.71 | 63.11 | 13.56 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.81 | 65.89 | 15.83 | | 150.0 | |
| | | Z | 0.69 | 64.00 | 14.22 | | 150.0 | |
| 10518-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle) | X | 4.41 | 66.37 | 15.89 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.47 | 66.89 | 16.20 | | 150.0 | |
| | | Z | 4.39 | 66.50 | 15.99 | | 150.0 | |
| 10519-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) | X | 4.59 | 66.59 | 16.01 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.64 | 67.10 | 16.31 | | 150.0 | |
| | | Z | 4.57 | 66.72 | 16.11 | | 150.0 | |
| 10520-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) | X | 4.44 | 66.53 | 15.92 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.49 | 67.06 | 16.23 | | 150.0 | |
| | | Z | 4.42 | 66.67 | 16.02 | | 150.0 | |
| 10521-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) | X | 4.37 | 66.51 | 15.90 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.43 | 67.06 | 16.22 | | 150.0 | |
| | | Z | 4.36 | 66.66 | 16.00 | | 150.0 | |
| 10522-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) | X | 4.43 | 66.63 | 16.00 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.49 | 67.17 | 16.32 | | 150.0 | |
| | | Z | 4.42 | 66.77 | 16.10 | | 150.0 | |

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|-----------|--|---|------|-------|-------|------|-------|---------|
| 10523-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) | X | 4.32 | 66.49 | 15.84 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.38 | 67.06 | 16.18 | | 150.0 | |
| | | Z | 4.30 | 66.64 | 15.94 | | 150.0 | |
| 10524-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) | X | 4.37 | 66.54 | 15.96 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.43 | 67.08 | 16.28 | | 150.0 | |
| | | Z | 4.36 | 66.69 | 16.06 | | 150.0 | |
| 10525-AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) | X | 4.37 | 65.59 | 15.56 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.43 | 66.16 | 15.89 | | 150.0 | |
| | | Z | 4.35 | 65.74 | 15.66 | | 150.0 | |
| 10526-AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) | X | 4.52 | 65.94 | 15.70 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.59 | 66.51 | 16.02 | | 150.0 | |
| | | Z | 4.51 | 66.09 | 15.80 | | 150.0 | |
| 10527-AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) | X | 4.44 | 65.89 | 15.63 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.51 | 66.47 | 15.97 | | 150.0 | |
| | | Z | 4.44 | 66.05 | 15.74 | | 150.0 | |
| 10528-AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) | X | 4.46 | 65.91 | 15.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.53 | 66.49 | 16.00 | | 150.0 | |
| | | Z | 4.45 | 66.06 | 15.77 | | 150.0 | |
| 10529-AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) | X | 4.46 | 65.91 | 15.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.53 | 66.49 | 16.00 | | 150.0 | |
| | | Z | 4.45 | 66.06 | 15.77 | | 150.0 | |
| 10531-AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) | X | 4.44 | 65.98 | 15.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.51 | 66.57 | 16.01 | | 150.0 | |
| | | Z | 4.44 | 66.15 | 15.77 | | 150.0 | |
| 10532-AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) | X | 4.31 | 65.83 | 15.59 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.38 | 66.44 | 15.95 | | 150.0 | |
| | | Z | 4.30 | 66.00 | 15.70 | | 150.0 | |
| 10533-AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) | X | 4.47 | 65.96 | 15.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.54 | 66.55 | 16.00 | | 150.0 | |
| | | Z | 4.46 | 66.12 | 15.76 | | 150.0 | |
| 10534-AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle) | X | 5.01 | 66.05 | 15.77 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.06 | 66.53 | 16.03 | | 150.0 | |
| | | Z | 4.99 | 66.17 | 15.85 | | 150.0 | |
| 10535-AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle) | X | 5.07 | 66.24 | 15.86 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.12 | 66.70 | 16.11 | | 150.0 | |
| | | Z | 5.06 | 66.36 | 15.94 | | 150.0 | |
| 10536-AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle) | X | 4.94 | 66.17 | 15.80 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.99 | 66.67 | 16.07 | | 150.0 | |
| | | Z | 4.93 | 66.30 | 15.89 | | 150.0 | |
| 10537-AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle) | X | 5.00 | 66.14 | 15.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.05 | 66.63 | 16.06 | | 150.0 | |
| | | Z | 4.99 | 66.27 | 15.88 | | 150.0 | |
| 10538-AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle) | X | 5.09 | 66.16 | 15.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.13 | 66.62 | 16.09 | | 150.0 | |
| | | Z | 5.07 | 66.28 | 15.93 | | 150.0 | |
| 10540-AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle) | X | 5.02 | 66.18 | 15.87 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.06 | 66.62 | 16.11 | | 150.0 | |
| | | Z | 5.01 | 66.30 | 15.95 | | 150.0 | |

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|-----------|--|---|------|-------|-------|------|-------|---------|
| 10541-AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle) | X | 5.00 | 66.05 | 15.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.04 | 66.53 | 16.05 | | 150.0 | |
| | | Z | 4.98 | 66.17 | 15.87 | | 150.0 | |
| 10542-AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle) | X | 5.15 | 66.14 | 15.86 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.20 | 66.59 | 16.10 | | 150.0 | |
| | | Z | 5.14 | 66.25 | 15.93 | | 150.0 | |
| 10543-AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle) | X | 5.22 | 66.17 | 15.90 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.26 | 66.61 | 16.13 | | 150.0 | |
| | | Z | 5.21 | 66.28 | 15.97 | | 150.0 | |
| 10544-AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle) | X | 5.33 | 66.19 | 15.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.37 | 66.64 | 16.02 | | 150.0 | |
| | | Z | 5.31 | 66.29 | 15.86 | | 150.0 | |
| 10545-AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle) | X | 5.52 | 66.61 | 15.95 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.54 | 66.99 | 16.15 | | 150.0 | |
| | | Z | 5.50 | 66.71 | 16.02 | | 150.0 | |
| 10546-AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle) | X | 5.38 | 66.37 | 15.84 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.43 | 66.82 | 16.08 | | 150.0 | |
| | | Z | 5.37 | 66.48 | 15.92 | | 150.0 | |
| 10547-AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle) | X | 5.46 | 66.42 | 15.86 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.50 | 66.86 | 16.09 | | 150.0 | |
| | | Z | 5.44 | 66.53 | 15.93 | | 150.0 | |
| 10548-AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle) | X | 5.68 | 67.29 | 16.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.67 | 67.56 | 16.41 | | 150.0 | |
| | | Z | 5.67 | 67.40 | 16.34 | | 150.0 | |
| 10550-AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle) | X | 5.42 | 66.42 | 15.88 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.45 | 66.84 | 16.10 | | 150.0 | |
| | | Z | 5.40 | 66.52 | 15.95 | | 150.0 | |
| 10551-AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle) | X | 5.42 | 66.44 | 15.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.46 | 66.88 | 16.08 | | 150.0 | |
| | | Z | 5.40 | 66.55 | 15.92 | | 150.0 | |
| 10552-AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle) | X | 5.34 | 66.25 | 15.76 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.39 | 66.73 | 16.01 | | 150.0 | |
| | | Z | 5.32 | 66.36 | 15.84 | | 150.0 | |
| 10553-AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle) | X | 5.42 | 66.28 | 15.81 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.46 | 66.74 | 16.05 | | 150.0 | |
| | | Z | 5.40 | 66.39 | 15.88 | | 150.0 | |
| 10554-AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle) | X | 5.74 | 66.56 | 15.89 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.78 | 66.98 | 16.10 | | 150.0 | |
| | | Z | 5.72 | 66.66 | 15.95 | | 150.0 | |
| 10555-AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle) | X | 5.86 | 66.85 | 16.02 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.89 | 67.24 | 16.21 | | 150.0 | |
| | | Z | 5.84 | 66.95 | 16.07 | | 150.0 | |
| 10556-AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle) | X | 5.89 | 66.90 | 16.03 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.91 | 67.29 | 16.23 | | 150.0 | |
| | | Z | 5.87 | 67.00 | 16.09 | | 150.0 | |
| 10557-AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle) | X | 5.85 | 66.79 | 16.00 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.88 | 67.21 | 16.20 | | 150.0 | |
| | | Z | 5.83 | 66.89 | 16.06 | | 150.0 | |

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|-----------|---|---|------|--------|-------|------|-------|---------|
| 10558-AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle) | X | 5.89 | 66.95 | 16.09 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.92 | 67.36 | 16.29 | | 150.0 | |
| | | Z | 5.87 | 67.05 | 16.15 | | 150.0 | |
| 10560-AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle) | X | 5.89 | 66.81 | 16.06 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.92 | 67.23 | 16.27 | | 150.0 | |
| | | Z | 5.87 | 66.90 | 16.12 | | 150.0 | |
| 10561-AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle) | X | 5.82 | 66.78 | 16.08 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.84 | 67.18 | 16.28 | | 150.0 | |
| | | Z | 5.80 | 66.88 | 16.14 | | 150.0 | |
| 10562-AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle) | X | 5.92 | 67.11 | 16.25 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.94 | 67.49 | 16.44 | | 150.0 | |
| | | Z | 5.90 | 67.22 | 16.31 | | 150.0 | |
| 10563-AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle) | X | 6.06 | 67.17 | 16.24 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.07 | 67.49 | 16.39 | | 150.0 | |
| | | Z | 6.05 | 67.28 | 16.30 | | 150.0 | |
| 10564-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle) | X | 4.74 | 66.48 | 16.08 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.78 | 66.92 | 16.33 | | 150.0 | |
| | | Z | 4.72 | 66.58 | 16.15 | | 150.0 | |
| 10565-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle) | X | 4.96 | 66.92 | 16.41 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.01 | 67.37 | 16.65 | | 150.0 | |
| | | Z | 4.94 | 67.03 | 16.48 | | 150.0 | |
| 10566-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle) | X | 4.80 | 66.75 | 16.21 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.84 | 67.21 | 16.47 | | 150.0 | |
| | | Z | 4.78 | 66.86 | 16.29 | | 150.0 | |
| 10567-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle) | X | 4.83 | 67.14 | 16.57 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.88 | 67.64 | 16.85 | | 150.0 | |
| | | Z | 4.81 | 67.29 | 16.67 | | 150.0 | |
| 10568-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle) | X | 4.71 | 66.53 | 15.99 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.75 | 66.97 | 16.23 | | 150.0 | |
| | | Z | 4.69 | 66.62 | 16.04 | | 150.0 | |
| 10569-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle) | X | 4.79 | 67.26 | 16.65 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.85 | 67.78 | 16.94 | | 150.0 | |
| | | Z | 4.78 | 67.42 | 16.75 | | 150.0 | |
| 10570-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle) | X | 4.82 | 67.10 | 16.58 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.87 | 67.58 | 16.85 | | 150.0 | |
| | | Z | 4.80 | 67.24 | 16.67 | | 150.0 | |
| 10571-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle) | X | 1.12 | 63.77 | 14.76 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.20 | 65.35 | 16.03 | | 130.0 | |
| | | Z | 1.10 | 64.27 | 15.13 | | 130.0 | |
| 10572-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle) | X | 1.13 | 64.28 | 15.08 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.22 | 66.02 | 16.44 | | 130.0 | |
| | | Z | 1.11 | 64.87 | 15.50 | | 130.0 | |
| 10573-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle) | X | 1.33 | 76.97 | 18.74 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.15 | 103.83 | 28.80 | | 130.0 | |
| | | Z | 2.45 | 86.95 | 22.13 | | 130.0 | |
| 10574-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle) | X | 1.19 | 69.04 | 17.40 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.45 | 73.35 | 20.04 | | 130.0 | |
| | | Z | 1.26 | 71.12 | 18.52 | | 130.0 | |

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| 10575-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle) | X | 4.55 | 66.32 | 16.17 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.58 | 66.74 | 16.40 | | 130.0 | |
| | | Z | 4.52 | 66.41 | 16.23 | | 130.0 | |
| 10576-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle) | X | 4.57 | 66.49 | 16.23 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.61 | 66.93 | 16.47 | | 130.0 | |
| | | Z | 4.55 | 66.59 | 16.30 | | 130.0 | |
| 10577-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) | X | 4.76 | 66.77 | 16.40 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.80 | 67.19 | 16.63 | | 130.0 | |
| | | Z | 4.74 | 66.87 | 16.47 | | 130.0 | |
| 10578-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) | X | 4.66 | 66.92 | 16.50 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.70 | 67.37 | 16.75 | | 130.0 | |
| | | Z | 4.64 | 67.04 | 16.58 | | 130.0 | |
| 10579-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) | X | 4.42 | 66.17 | 15.79 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.46 | 66.60 | 16.02 | | 130.0 | |
| | | Z | 4.40 | 66.25 | 15.83 | | 130.0 | |
| 10580-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) | X | 4.47 | 66.23 | 15.82 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.50 | 66.65 | 16.05 | | 130.0 | |
| | | Z | 4.45 | 66.31 | 15.86 | | 130.0 | |
| 10581-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) | X | 4.56 | 66.95 | 16.44 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.60 | 67.43 | 16.70 | | 130.0 | |
| | | Z | 4.54 | 67.08 | 16.52 | | 130.0 | |
| 10582-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) | X | 4.37 | 65.94 | 15.57 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.39 | 66.34 | 15.80 | | 130.0 | |
| | | Z | 4.34 | 66.00 | 15.61 | | 130.0 | |
| 10583-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) | X | 4.55 | 66.32 | 16.17 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.58 | 66.74 | 16.40 | | 130.0 | |
| | | Z | 4.52 | 66.41 | 16.23 | | 130.0 | |
| 10584-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) | X | 4.57 | 66.49 | 16.23 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.61 | 66.93 | 16.47 | | 130.0 | |
| | | Z | 4.55 | 66.59 | 16.30 | | 130.0 | |
| 10585-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) | X | 4.76 | 66.77 | 16.40 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.80 | 67.19 | 16.63 | | 130.0 | |
| | | Z | 4.74 | 66.87 | 16.47 | | 130.0 | |
| 10586-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) | X | 4.66 | 66.92 | 16.50 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.70 | 67.37 | 16.75 | | 130.0 | |
| | | Z | 4.64 | 67.04 | 16.58 | | 130.0 | |
| 10587-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle) | X | 4.42 | 66.17 | 15.79 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.46 | 66.60 | 16.02 | | 130.0 | |
| | | Z | 4.40 | 66.25 | 15.83 | | 130.0 | |
| 10588-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle) | X | 4.47 | 66.23 | 15.82 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.50 | 66.65 | 16.05 | | 130.0 | |
| | | Z | 4.45 | 66.31 | 15.86 | | 130.0 | |
| 10589-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle) | X | 4.56 | 66.95 | 16.44 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.60 | 67.43 | 16.70 | | 130.0 | |
| | | Z | 4.54 | 67.08 | 16.52 | | 130.0 | |
| 10590-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle) | X | 4.37 | 65.94 | 15.57 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.39 | 66.34 | 15.80 | | 130.0 | |
| | | Z | 4.34 | 66.00 | 15.61 | | 130.0 | |

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|-----------|---|---|------|-------|-------|------|-------|---------|
| 10591-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle) | X | 4.70 | 66.40 | 16.28 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.73 | 66.80 | 16.50 | | 130.0 | |
| | | Z | 4.67 | 66.49 | 16.34 | | 130.0 | |
| 10592-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle) | X | 4.84 | 66.73 | 16.41 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.88 | 67.13 | 16.63 | | 130.0 | |
| | | Z | 4.82 | 66.82 | 16.47 | | 130.0 | |
| 10593-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle) | X | 4.76 | 66.62 | 16.28 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.79 | 67.03 | 16.50 | | 130.0 | |
| | | Z | 4.74 | 66.71 | 16.34 | | 130.0 | |
| 10594-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle) | X | 4.82 | 66.79 | 16.44 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.85 | 67.21 | 16.66 | | 130.0 | |
| | | Z | 4.80 | 66.89 | 16.51 | | 130.0 | |
| 10595-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle) | X | 4.78 | 66.75 | 16.34 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.82 | 67.16 | 16.56 | | 130.0 | |
| | | Z | 4.76 | 66.84 | 16.40 | | 130.0 | |
| 10596-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle) | X | 4.72 | 66.73 | 16.33 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.75 | 67.15 | 16.56 | | 130.0 | |
| | | Z | 4.70 | 66.83 | 16.39 | | 130.0 | |
| 10597-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle) | X | 4.67 | 66.62 | 16.21 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.70 | 67.05 | 16.44 | | 130.0 | |
| | | Z | 4.64 | 66.72 | 16.26 | | 130.0 | |
| 10598-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle) | X | 4.65 | 66.85 | 16.47 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.69 | 67.30 | 16.71 | | 130.0 | |
| | | Z | 4.63 | 66.97 | 16.54 | | 130.0 | |
| 10599-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle) | X | 5.37 | 66.94 | 16.52 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.37 | 67.22 | 16.65 | | 130.0 | |
| | | Z | 5.34 | 67.01 | 16.56 | | 130.0 | |
| 10600-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle) | X | 5.50 | 67.37 | 16.71 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.48 | 67.56 | 16.79 | | 130.0 | |
| | | Z | 5.47 | 67.43 | 16.74 | | 130.0 | |
| 10601-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle) | X | 5.39 | 67.11 | 16.59 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.39 | 67.39 | 16.72 | | 130.0 | |
| | | Z | 5.36 | 67.17 | 16.63 | | 130.0 | |
| 10602-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle) | X | 5.50 | 67.18 | 16.55 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.50 | 67.48 | 16.68 | | 130.0 | |
| | | Z | 5.46 | 67.23 | 16.57 | | 130.0 | |
| 10603-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle) | X | 5.56 | 67.45 | 16.82 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.56 | 67.71 | 16.93 | | 130.0 | |
| | | Z | 5.54 | 67.52 | 16.85 | | 130.0 | |
| 10604-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle) | X | 5.41 | 67.02 | 16.59 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.41 | 67.33 | 16.73 | | 130.0 | |
| | | Z | 5.38 | 67.08 | 16.62 | | 130.0 | |
| 10605-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) | X | 5.49 | 67.27 | 16.71 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.48 | 67.50 | 16.81 | | 130.0 | |
| | | Z | 5.46 | 67.33 | 16.74 | | 130.0 | |
| 10606-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle) | X | 5.22 | 66.55 | 16.20 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.24 | 66.88 | 16.36 | | 130.0 | |
| | | Z | 5.19 | 66.61 | 16.23 | | 130.0 | |

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|-----------|---|---|------|-------|-------|------|-------|---------|
| 10607-AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle) | X | 4.53 | 65.69 | 15.89 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.58 | 66.16 | 16.14 | | 130.0 | |
| | | Z | 4.51 | 65.80 | 15.96 | | 130.0 | |
| 10608-AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle) | X | 4.70 | 66.07 | 16.05 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.75 | 66.54 | 16.31 | | 130.0 | |
| | | Z | 4.69 | 66.19 | 16.12 | | 130.0 | |
| 10609-AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle) | X | 4.59 | 65.91 | 15.88 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.64 | 66.39 | 16.14 | | 130.0 | |
| | | Z | 4.58 | 66.02 | 15.95 | | 130.0 | |
| 10610-AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle) | X | 4.65 | 66.07 | 16.05 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.69 | 66.55 | 16.31 | | 130.0 | |
| | | Z | 4.63 | 66.19 | 16.12 | | 130.0 | |
| 10611-AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle) | X | 4.56 | 65.88 | 15.89 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.61 | 66.35 | 16.15 | | 130.0 | |
| | | Z | 4.54 | 65.99 | 15.96 | | 130.0 | |
| 10612-AAB | IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle) | X | 4.56 | 66.02 | 15.93 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.61 | 66.50 | 16.19 | | 130.0 | |
| | | Z | 4.55 | 66.13 | 16.00 | | 130.0 | |
| 10613-AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle) | X | 4.57 | 65.89 | 15.80 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.61 | 66.36 | 16.06 | | 130.0 | |
| | | Z | 4.55 | 65.99 | 15.87 | | 130.0 | |
| 10614-AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle) | X | 4.51 | 66.08 | 16.04 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.57 | 66.58 | 16.32 | | 130.0 | |
| | | Z | 4.50 | 66.21 | 16.12 | | 130.0 | |
| 10615-AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle) | X | 4.56 | 65.71 | 15.66 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.60 | 66.17 | 15.92 | | 130.0 | |
| | | Z | 4.54 | 65.80 | 15.72 | | 130.0 | |
| 10616-AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle) | X | 5.18 | 66.17 | 16.11 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.21 | 66.55 | 16.30 | | 130.0 | |
| | | Z | 5.16 | 66.25 | 16.17 | | 130.0 | |
| 10617-AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle) | X | 5.25 | 66.36 | 16.18 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.27 | 66.71 | 16.35 | | 130.0 | |
| | | Z | 5.23 | 66.44 | 16.23 | | 130.0 | |
| 10618-AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle) | X | 5.14 | 66.35 | 16.19 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.16 | 66.75 | 16.39 | | 130.0 | |
| | | Z | 5.11 | 66.45 | 16.25 | | 130.0 | |
| 10619-AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle) | X | 5.15 | 66.15 | 16.03 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.17 | 66.52 | 16.21 | | 130.0 | |
| | | Z | 5.12 | 66.23 | 16.07 | | 130.0 | |
| 10620-AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle) | X | 5.24 | 66.20 | 16.10 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.26 | 66.55 | 16.28 | | 130.0 | |
| | | Z | 5.21 | 66.28 | 16.15 | | 130.0 | |
| 10621-AAB | IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle) | X | 5.24 | 66.34 | 16.30 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.27 | 66.72 | 16.48 | | 130.0 | |
| | | Z | 5.22 | 66.43 | 16.35 | | 130.0 | |
| 10622-AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle) | X | 5.25 | 66.49 | 16.36 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.28 | 66.88 | 16.55 | | 130.0 | |
| | | Z | 5.23 | 66.59 | 16.42 | | 130.0 | |

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|-----------|--|---|------|-------|-------|------|-------|---------|
| 10623-AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle) | X | 5.13 | 66.02 | 16.00 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.15 | 66.39 | 16.18 | | 130.0 | |
| | | Z | 5.11 | 66.09 | 16.04 | | 130.0 | |
| 10624-AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle) | X | 5.32 | 66.23 | 16.17 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.34 | 66.58 | 16.33 | | 130.0 | |
| | | Z | 5.30 | 66.30 | 16.21 | | 130.0 | |
| 10625-AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle) | X | 5.64 | 67.08 | 16.64 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.63 | 67.32 | 16.76 | | 130.0 | |
| | | Z | 5.62 | 67.17 | 16.70 | | 130.0 | |
| 10626-AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle) | X | 5.49 | 66.24 | 16.09 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.51 | 66.61 | 16.26 | | 130.0 | |
| | | Z | 5.46 | 66.31 | 16.13 | | 130.0 | |
| 10627-AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle) | X | 5.72 | 66.82 | 16.34 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.72 | 67.10 | 16.46 | | 130.0 | |
| | | Z | 5.70 | 66.88 | 16.37 | | 130.0 | |
| 10628-AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle) | X | 5.51 | 66.30 | 16.01 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.52 | 66.64 | 16.17 | | 130.0 | |
| | | Z | 5.48 | 66.37 | 16.05 | | 130.0 | |
| 10629-AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle) | X | 5.58 | 66.36 | 16.03 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.60 | 66.69 | 16.19 | | 130.0 | |
| | | Z | 5.55 | 66.42 | 16.07 | | 130.0 | |
| 10630-AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle) | X | 5.99 | 67.77 | 16.74 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.90 | 67.81 | 16.75 | | 130.0 | |
| | | Z | 5.96 | 67.83 | 16.77 | | 130.0 | |
| 10631-AAB | IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle) | X | 5.89 | 67.59 | 16.85 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.89 | 67.88 | 16.98 | | 130.0 | |
| | | Z | 5.88 | 67.70 | 16.91 | | 130.0 | |
| 10632-AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle) | X | 5.69 | 66.89 | 16.51 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.70 | 67.20 | 16.65 | | 130.0 | |
| | | Z | 5.67 | 66.97 | 16.56 | | 130.0 | |
| 10633-AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle) | X | 5.57 | 66.47 | 16.13 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.60 | 66.86 | 16.31 | | 130.0 | |
| | | Z | 5.55 | 66.55 | 16.17 | | 130.0 | |
| 10634-AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle) | X | 5.55 | 66.50 | 16.20 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.58 | 66.89 | 16.39 | | 130.0 | |
| | | Z | 5.53 | 66.58 | 16.25 | | 130.0 | |
| 10635-AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle) | X | 5.44 | 65.82 | 15.60 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.45 | 66.17 | 15.76 | | 130.0 | |
| | | Z | 5.40 | 65.87 | 15.62 | | 130.0 | |
| 10636-AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle) | X | 5.90 | 66.61 | 16.18 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.92 | 66.95 | 16.33 | | 130.0 | |
| | | Z | 5.87 | 66.67 | 16.21 | | 130.0 | |
| 10637-AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle) | X | 6.06 | 67.00 | 16.36 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.05 | 67.28 | 16.48 | | 130.0 | |
| | | Z | 6.03 | 67.06 | 16.39 | | 130.0 | |
| 10638-AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle) | X | 6.05 | 66.96 | 16.31 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.06 | 67.29 | 16.46 | | 130.0 | |
| | | Z | 6.02 | 67.02 | 16.35 | | 130.0 | |

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|-----------|--|---|--------|--------|-------|-------|-------|---------|--|
| 10639-AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle) | X | 6.03 | 66.90 | 16.33 | 0.46 | 130.0 | ± 9.6 % | |
| | | Y | 6.04 | 67.23 | 16.47 | | | 130.0 | |
| | | Z | 6.00 | 66.97 | 16.37 | | | 130.0 | |
| 10640-AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle) | X | 6.03 | 66.90 | 16.27 | 0.46 | 130.0 | ± 9.6 % | |
| | | Y | 6.03 | 67.22 | 16.41 | | | 130.0 | |
| | | Z | 6.00 | 66.96 | 16.30 | | | 130.0 | |
| 10641-AAC | IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle) | X | 6.09 | 66.85 | 16.27 | 0.46 | 130.0 | ± 9.6 % | |
| | | Y | 6.08 | 67.13 | 16.38 | | | 130.0 | |
| | | Z | 6.06 | 66.90 | 16.29 | | | 130.0 | |
| 10642-AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle) | X | 6.12 | 67.08 | 16.55 | 0.46 | 130.0 | ± 9.6 % | |
| | | Y | 6.13 | 67.41 | 16.70 | | | 130.0 | |
| | | Z | 6.09 | 67.15 | 16.59 | | | 130.0 | |
| 10643-AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle) | X | 5.96 | 66.77 | 16.29 | 0.46 | 130.0 | ± 9.6 % | |
| | | Y | 5.96 | 67.07 | 16.42 | | | 130.0 | |
| | | Z | 5.93 | 66.82 | 16.32 | | | 130.0 | |
| 10644-AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle) | X | 6.09 | 67.18 | 16.52 | 0.46 | 130.0 | ± 9.6 % | |
| | | Y | 6.09 | 67.48 | 16.64 | | | 130.0 | |
| | | Z | 6.07 | 67.25 | 16.55 | | | 130.0 | |
| 10645-AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle) | X | 6.30 | 67.43 | 16.60 | 0.46 | 130.0 | ± 9.6 % | |
| | | Y | 6.26 | 67.61 | 16.66 | | | 130.0 | |
| | | Z | 6.28 | 67.51 | 16.64 | | | 130.0 | |
| 10646-AAD | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7) | X | 23.53 | 113.77 | 38.49 | 9.30 | 60.0 | ± 9.6 % | |
| | | Y | 36.69 | 124.91 | 41.56 | | | 60.0 | |
| | | Z | 23.00 | 112.27 | 37.54 | | | 60.0 | |
| 10647-AAC | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7) | X | 21.05 | 111.99 | 38.12 | 9.30 | 60.0 | ± 9.6 % | |
| | | Y | 30.62 | 121.62 | 40.82 | | | 60.0 | |
| | | Z | 20.73 | 110.74 | 37.24 | | | 60.0 | |
| 10648-AAA | CDMA2000 (1x Advanced) | X | 0.54 | 61.28 | 8.55 | 0.00 | 150.0 | ± 9.6 % | |
| | | Y | 0.65 | 63.74 | 10.60 | | | 150.0 | |
| | | Z | 0.51 | 61.41 | 8.44 | | | 150.0 | |
| 10652-AAB | LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%) | X | 3.68 | 66.98 | 16.43 | 2.23 | 80.0 | ± 9.6 % | |
| | | Y | 3.81 | 67.96 | 16.95 | | | 80.0 | |
| | | Z | 3.67 | 67.19 | 16.51 | | | 80.0 | |
| 10653-AAB | LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%) | X | 4.21 | 66.37 | 16.65 | 2.23 | 80.0 | ± 9.6 % | |
| | | Y | 4.28 | 67.00 | 16.97 | | | 80.0 | |
| | | Z | 4.18 | 66.48 | 16.69 | | | 80.0 | |
| 10654-AAB | LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%) | X | 4.19 | 66.03 | 16.67 | 2.23 | 80.0 | ± 9.6 % | |
| | | Y | 4.25 | 66.61 | 16.96 | | | 80.0 | |
| | | Z | 4.16 | 66.13 | 16.71 | | | 80.0 | |
| 10655-AAB | LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | X | 4.25 | 66.01 | 16.71 | 2.23 | 80.0 | ± 9.6 % | |
| | | Y | 4.30 | 66.57 | 16.99 | | | 80.0 | |
| | | Z | 4.22 | 66.10 | 16.74 | | | 80.0 | |
| 10658-AAA | Pulse Waveform (200Hz, 10%) | X | 100.00 | 115.26 | 28.77 | 10.00 | 50.0 | ± 9.6 % | |
| | | Y | 100.00 | 112.84 | 27.38 | | | 50.0 | |
| | | Z | 19.40 | 91.33 | 21.93 | | | 50.0 | |
| 10659-AAA | Pulse Waveform (200Hz, 20%) | X | 100.00 | 111.74 | 26.11 | 6.99 | 60.0 | ± 9.6 % | |
| | | Y | 100.00 | 110.19 | 25.18 | | | 60.0 | |
| | | Z | 100.00 | 108.88 | 24.68 | | | 60.0 | |

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|-----------|-----------------------------|---|--------|--------|-------|------|-------|---------|
| 10660-AAA | Pulse Waveform (200Hz, 40%) | X | 100.00 | 108.84 | 23.48 | 3.98 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 109.37 | 23.56 | | 80.0 | |
| | | Z | 100.00 | 104.98 | 21.61 | | 80.0 | |
| 10661-AAA | Pulse Waveform (200Hz, 60%) | X | 100.00 | 106.20 | 21.13 | 2.22 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 111.00 | 23.08 | | 100.0 | |
| | | Z | 100.00 | 100.47 | 18.51 | | 100.0 | |
| 10662-AAA | Pulse Waveform (200Hz, 80%) | X | 100.00 | 95.65 | 15.36 | 0.97 | 120.0 | ± 9.6 % |
| | | Y | 100.00 | 114.70 | 22.93 | | 120.0 | |
| | | Z | 0.24 | 60.00 | 4.24 | | 120.0 | |

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

System check uncertainty

The uncertainty budget has been determined for the DASY5 measurement system according to the SPEAG documents and is given in the following Table.

Repeatability Budget for System Check

<0.3 – 3GHz range Body>

| Error Description | Uncertainty value ± % | Probability distribution | divisor | (ci) lg | Standard (lg) | vi or veff |
|--|-----------------------|--------------------------|---------|---------|---------------|------------|
| Measurement System | | | | | | |
| Probe calibration | ± 1.8 | Normal | 1 | 1 | ± 1.8 | ∞ |
| Axial isotropy of the probe | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Spherical isotropy of the probe | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Boundary effects | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Probe linearity | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Detection limit | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Modulation response | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Readout electronics | ± 0.0 | Normal | 1 | 1 | ± 0.0 | ∞ |
| Response time | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Integration time | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| RF ambient Noise | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| RF ambient Reflections | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Probe Positioner | ± 0.4 | Rectangular | √3 | 1 | ± 0.2 | ∞ |
| Probe positioning | ± 2.9 | Rectangular | √3 | 1 | ± 1.7 | ∞ |
| Max.SAR Eval. | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Test Sample Related | | | | | | |
| Deviation of wxp.dipole | ± 0.0 | Rectangular | √3 | 1 | ± 0.0 | ∞ |
| Dipole Axis to Liquid Distance | ± 2.0 | Rectangular | √3 | 1 | ± 1.2 | ∞ |
| Input power and SAR drift meas. | ± 3.4 | Rectangular | √3 | 1 | ± 2.0 | ∞ |
| Phantom and Setup | | | | | | |
| Phantom uncertainty | ± 4.0 | Rectangular | √3 | 1 | ± 2.3 | ∞ |
| Algorithm for correcting SAR for deviations in permittivity and conductivity | ± 1.9 | Rectangular | √3 | 1 | ± 1.1 | ∞ |
| Liquid conductivity (meas.) | ± 5.0 | Normal | 1 | 0.78 | + 3.9 | ∞ |
| Liquid permittivity (meas.) | ± 5.0 | Normal | 1 | 0.26 | - 1.3 | ∞ |
| Liquid conductivity - temp.unc (below 2deg.C.) | ± 1.7 | Rectangular | √3 | 0.78 | ± 0.8 | ∞ |
| Liquid permittivity - temp.unc (below 2deg.C.) | ± 0.3 | Rectangular | √3 | 0.23 | ± 0.0 | ∞ |
| Combined Standard Uncertainty | | | | | ± 5.945 | |
| Expanded Uncertainty (k=2) | | | | | ± 11.9 | |