Add value.
Inspire trust.

# Report On

Specific Absorption Rate Testing of the
Axnes AS, PNG MP30 Transceiver

FCC ID: 2AOHPMP30A

**COMMERCIAL-IN-CONFIDENCE**

**Document 75946122 Report 03 Issue 1** **October 2019**

TÜV SÜD, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuv-sud.co.uk



**REPORT ON**

Specific Absorption Rate Testing of the
Axnes AS, PNG MP30 Transceiver

Document 75946122 Report 03 Issue 1

October 2019

**PREPARED FOR**

Axnes Aviation AS
Terje Lovasvei 1
Grimstad
N-4879
NORWAY

**PREPARED BY**

**Stephen Dodd**
Engineer (SAR)

**APPROVED BY**

**Jonathan Kenny**
Authorised Signatory

**DATED**

14 October 2019

**CONTENTS**


| Section | | Page No |
|---|---|---|
| **1** | **REPORT SUMMARY** | **3** |
| 1.1 | Report Modification Record | 4 |
| 1.2 | Introduction | 4 |
| 1.3 | Brief Summary of Results | 5 |
| 1.4 | Test Results Summary | 5 |
| 1.5 | FCC Power Measurements | 10 |
| **2** | **TEST DETAILS** | **11** |
| 2.1 | DASY5 Measurement System | 12 |
| 2.2 | UHF 16QAM 450 MHz Body SAR Test Results | 16 |
| **3** | **TEST EQUIPMENT USED** | **21** |
| 3.1 | Test Equipment Used | 22 |
| 3.2 | Test Software | 22 |
| 3.3 | Dielectric Properties of Simulant Liquids | 23 |
| 3.4 | Test Conditions | 24 |
| 3.5 | Measurement Uncertainty | 25 |
| **4** | **PHOTOGRAPHS** | **26** |
| 4.1 | Test Positional Photographs | 27 |
| 4.2 | Photographs of Equipment Under Test (EUT) | 29 |
| **5** | **ACCREDITATION, DISCLAIMERS AND COPYRIGHT** | **30** |
| 5.1 | Accreditation, Disclaimers and Copyright | 31 |

**ANNEX A** Probe Calibration Reports ..... A.2
**ANNEX B** Dipole Calibration Reports ..... B.2

# SECTION 1

# REPORT SUMMARY

Specific Absorption Rate Testing of the
Axnes Aviation MP30

## 1.1 REPORT MODIFICATION RECORD

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

| Issue | Description of Change | Date of Issue |
|---|---|---|
| 1 | First Issue | 14 October 2019 |

## 1.2 INTRODUCTION

The information contained in this report is intended to show verification of the Specific Absorption Rate Testing of the Axnes AS, MP30 to the requirements of KDB 447498 D01 v06 General RF Exposure Guidance.

| | |
|---|---|
| Objective | To perform Specific Absorption Rate Testing to determine the Equipment Under Test's (EUT's) compliance with the requirements specified of KDB 447498 D01 v06 General RF Exposure Guidance, for the series of tests carried out. |
| Applicant | Axnes AS |
| Manufacturer | Axnes AS |
| Model Number | MP30 |
| Serial/IMEI Number(s) | 010 300 R10 |
| Number of Samples Tested | 1 |
| Hardware Version | R10 |
| Software Version | AXS-SW-0511 |
| Test Specification/Issue/Date | KDB 447498 D01 v06 General RF Exposure Guidance |
| Order Number | 802298 |
| Date of Receipt of EUT | 30 May 2019 |
| Start of Test | 31 May 2019 |
| Finish of Test | 19 August 2019 |
| Related Document(s) | FCC 47 CFR 2.1093: 2018<br>KDB 865664 – D01 v01r04<br>KDB 865664 – D02 v01r02<br>KDB 648474 – D04 v01r03<br>KDB 447498 – D01 v06<br>IEEE 1528: 2013 |
| Name of Engineer(s) | Aasim Butt<br>Stephen Dodd |

## 1.3 BRIEF SUMMARY OF RESULTS

The measurements shown in this report were made in accordance with the procedures specified KDB 447498 D01 v06 General RF Exposure Guidance.

The maximum 1g volume averaged stand-alone SAR found during this Assessment:

| | | |
|---|---|---|
| Max 1g SAR (W/kg) Body | **0.18** (Measured) | **0.69** (Scaled) |
| The maximum 1g volume averaged SAR level measured for all the tests performed did not exceed the limits for General Population/Uncontrolled Exposure (W/kg) Partial Body of 1.6 W/kg. | | |

## 1.4 TEST RESULTS SUMMARY

### 1.4.1 System Performance / Validation Check Results

Prior to formal testing being performed a System Check was performed in accordance with KDB 865664 and the results were compared against published data in Standard IEEE 1528-2013. The following results were obtained: -

System performance / Validation results

| Date | Frequency (MHz) | Max 1g SAR (W/kg)* | Max 1g SAR (W/kg) Target | Percentage Drift on Reference |
|---|---|---|---|---|
| 31/05/2019 | 450 MHz | 4.54 | 4.69 | -3.20 |
| 20/06/2019 | 450 MHz | 4.54 | 4.69 | -3.20 |
| 21/06/2019 | 450 MHz | 4.70 | 4.69 | 0.21 |
| 19/08/2019 | 450MHz | 4.38 | 4.69 | -6.61 |

*Normalised to a forward power of 1W

### 1.4.2 Results Summary Tables

UHF 16QAM Body (AXS-ANT-0300): 450 MHz Voice Body Specific Absorption Rate (Maximum SAR) 1g Results

| Test Position | Channel Number | Frequency (MHz) | Measured Average Power (dBm) | Tune Up (dBm) | Measured 1g SAR (W/kg) | Scaled 1g SAR (W/kg) | 75 % Duty Factor Scaled 1g SAR (W/kg) | Scan Figure Number |
|---|---|---|---|---|---|---|---|---|
| 5mm Front Facing | Q2 | 418 | 26.81 | 27.00 | 0.08 | 0.08 | 0.31 | Figure 5 |
| 5mm Rear Facing | Q2 | 418 | 26.81 | 27.00 | 0.08 | 0.08 | 0.29 | Figure 6 |
| 5mm Left Edge | Q2 | 418 | 26.81 | 27.00 | 0.08 | 0.08 | 0.30 | Figure 7 |
| Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)<br>KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:<br>≤ 0.8W/kg when the transmission band is ≤ 100MHz<br>≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz<br>≤ 0.4W/kg when the transmission band is ≥ 200MHz<br>KDB 447498 D01 Section 6.1 A duty factor of 75% may be applied for PTT radios with voice activated transmission capabilities to avoid the justification required for using a lower duty factor than what is supported by certain features built-in within the radio. | | | | | | | | |

UHF 16QAM Body (AXS-ANT-0310): 450 MHz Voice Body Specific Absorption Rate (Maximum SAR) 1g Results

| Test Position | Channel Number | Frequency (MHz) | Measured Average Power (dBm) | Tune Up (dBm) | Measured 1g SAR (W/kg) | Scaled 1g SAR (W/kg) | 75 % Duty Factor Scaled 1g SAR (W/kg) | Scan Figure Number |
|---|---|---|---|---|---|---|---|---|
| 5mm Front Facing | Q4 | 450 | 26.97 | 27.00 | 0.09 | 0.09 | 0.34 | Figure 8 |
| 5mm Rear Facing | Q4 | 450 | 26.97 | 27.00 | 0.07 | 0.07 | 0.28 | Figure 9 |
| 5mm Left Edge | Q4 | 450 | 26.97 | 27.00 | 0.08 | 0.08 | 0.31 | Figure 10 |
| Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)<br>KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:<br>≤ 0.8W/kg when the transmission band is ≤ 100MHz<br>≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz<br>≤ 0.4W/kg when the transmission band is ≥ 200MHz<br>KDB 447498 D01 Section 6.1 A duty factor of 75% may be applied for PTT radios with voice activated transmission capabilities to avoid the justification required for using a lower duty factor than what is supported by certain features built-in within the radio. | | | | | | | | |

UHF 16QAM Body (AXS-ANT-0320): 450 MHz Voice Body Specific Absorption Rate (Maximum SAR) 1g Results

| Test Position | Channel Number | Frequency (MHz) | Measured Average Power (dBm) | Tune Up (dBm) | Measured 1g SAR (W/kg) | Scaled 1g SAR (W/kg) | 75 % Duty Factor Scaled 1g SAR (W/kg) | Scan Figure Number |
|---|---|---|---|---|---|---|---|---|
| 5mm Front Facing | Q4 | 450 | 26.97 | 27.00 | 0.18 | 0.18 | **0.69** | Figure 11 |
| 5mm Rear Facing | Q4 | 450 | 26.97 | 27.00 | 0.15 | 0.15 | 0.58 | Figure 12 |
| 5mm Left Edge | Q4 | 450 | 26.97 | 27.00 | 0.17 | 0.17 | 0.65 | Figure 13 |
| 5mm Front Facing* | Q4 | 450 | 26.97 | 27.00 | 0.17 | 0.17 | **0.64** | Figure 11 |
| Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)<br>KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is:<br>≤ 0.8W/kg when the transmission band is ≤ 100MHz<br>≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz<br>≤ 0.4W/kg when the transmission band is ≥ 200MHz<br>KDB 447498 D01 Section 6.1 A duty factor of 75% may be applied for PTT radios with voice activated transmission capabilities to avoid the justification required for using a lower duty factor than what is supported by certain features built-in within the radio.<br>*Repeated test with audio cable, coiled and positioned at a 0mm separation distace to phantom. | | | | | | | | |

### 1.4.3 Standalone SAR Test Exclusion Considerations (KDB 447498 D01)

The 1g SAR Test exclusion thresholds for 100 MHz to 6 GHz *test separation distances* ≤ 50 mm are determined by:

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

- f (GHz) is the RF channel transmit frequency in GHz.
- Power and distance are rounded to the nearest mW and mm before calculation.
- The result is rounded to one decimal place for comparison.
- When the maximum test separation distance is < 5 mm, a distance of 5 mm is applied.

| Band | Frequency (MHz) | Power (dBm) | Power (mW) | Distance (mm) | Threshold | Test Exclusion |
|---|---|---|---|---|---|---|
| UHF 450 MHz | 450 | 27 | 501.19 | 5 | 67.2 | No |

### 1.4.4 Technical Description

The equipment under test (EUT) was an Axnes AS, PNG MP30 Transceiver, a component used in the PNG wireless intercom system. The MP30 Transceiver operates in the UHF frequency band (406.118 - 469.99 MHz). The transceiver supports GPS. The radio is used via a headset or helmet. The radio is also capable of operating as an AIS alerting device. A full technical description can be found in the manufacturer's documentation.

### 1.4.5 Test Configuration and Modes of Operation

The testing was performed with an integral battery supplied and manufactured by Axnes AS. The battery was fully charged before each measurement. A non-terminated cable which would normally be connected to a helmet or headset was connected to the device. For the test configuration which yielded the highest SAR a repeated scan was performed with the cable positioned at a 0mm separation distance from the SAR phantom.

For body SAR assessment of the 406.118 - 469.99 MHz frequency band, which was tested over three different ranges (dictated by the three supplied antennas), as no body worn accessories are supplied with the EUT, testing was performed on the front, rear and left-hand surface of the device, as these surfaces were within 25 mm proximity of the antenna, as per KDB 447498 D01. The device was placed at a distance of 5 mm from the bottom of the Elliptical Flat Phantom for all body testing. The Elliptical Flat Phantom dimensions are 600 mm major axis and 400 mm minor axis with a shell thickness of 2.00 mm. The phantom was filled to a minimum depth of 150 mm with the appropriate body simulant liquid. The dielectric properties were in accordance with the requirements specified in KDB 865665.

The MP30 cannot transmit without the BST50 base station present as timing and timeslot allocations are handled by the BST50 so the CP50 control panel and base station were positioned outside the test chamber with its antenna in the chamber. In order for the handset to transmit at full power a step attenuator was used between the base station main unit and the base station antenna to simulate a virtual distance. The attenuaton level was increased until the MP30 transciever was transmitting at full power with the basestation still receiving a stable signal. The received signal was monitored on the CP50 control panel display. Prior to SAR evaluations the power levels were measured to ensure the EUT was transmitting at the maximum level.

The three antenna variants and corresponding usable frequency ranges are tabulated below.

| Antenna | Frequency Range | Part Number |
|---|---|---|
| Low Range Antenna | 390 - 430 MHz | AXS-ANT-0300 |
| Mid Range Antenna | 410 - 450 MHz | AXS-ANT-0310 |
| High Range Antenna | 430 - 470 MHz | AXS-ANT-0320 |

Testing was performed in each position on the channel that gave the highest output power for each antenna frequency range.

As the EUT has voice activated transmission capabilities a 75 % duty factor scaling was applied as per KDB 447498 D01 section 6.1

Included in this report are descriptions of the test method; the equipment used and an analysis of the test uncertainties applicable and diagrams indicating the locations of maximum SAR for each test position.

## 1.5 FCC POWER MEASUREMENTS

### 1.5.1 Method

Conducted power measurements were made using a Spectrum Analyser

### 1.5.2 Conducted Power Measurements

| Channel | Frequency (MHz) | Modulation | Measured Power (dBm) | Tune Up (dBm) |
|---|---|---|---|---|
| Q1 | 406.118 | 16 QAM | 26.70 | 27.00 |
| Q2 | 418.000 | 16 QAM | 26.81 | 27.00 |
| Q3 | 429.975 | 16 QAM | 26.60 | 27.00 |
| Q4 | 450.000 | 16 QAM | 26.97 | 27.00 |
| Q5 | 460.000 | 16 QAM | 26.90 | 27.00 |
| Q6 | 469.990 | 16 QAM | 26.66 | 27.00 |
| P1 | 406.118 | 8 PSK | 26.35 | 27.00 |
| P2 | 418.000 | 8 PSK | 26.49 | 27.00 |
| P3 | 429.975 | 8 PSK | 26.30 | 27.00 |
| P4 | 450.000 | 8 PSK | 26.68 | 27.00 |
| P5 | 460.000 | 8 PSK | 26.56 | 27.00 |
| P6 | 469.990 | 8 PSK | 26.39 | 27.00 |

# SECTION 2

# TEST DETAILS

Specific Absorption Rate Testing of the
Axnes Aviation MP30

## 2.1 DASY5 MEASUREMENT SYSTEM

### 2.1.1 System Description

The DASY5 system for performing compliance tests consists of the following items:

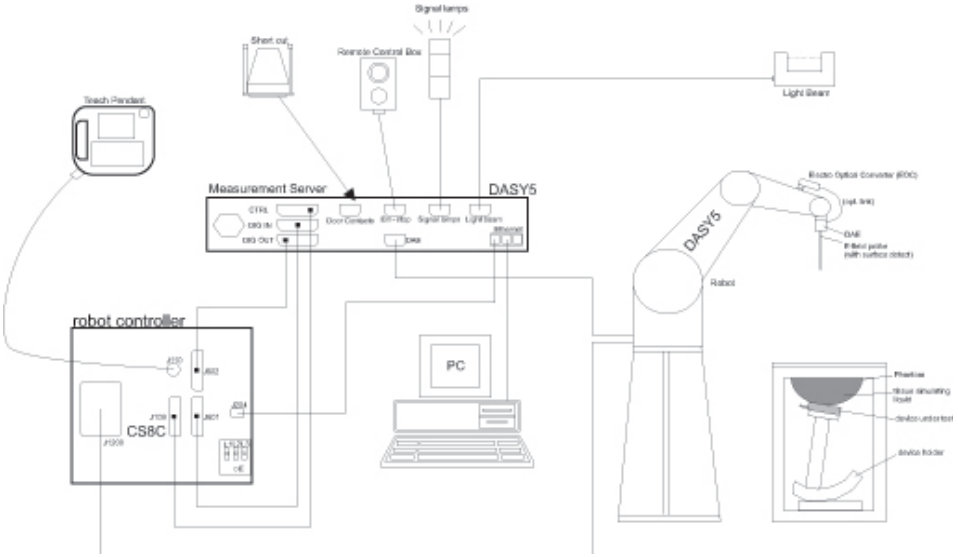



**Figure 1 System Description Diagram**

A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).

An isotropic field probe optimized and calibrated for the targeted measurement.

A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.

The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.

The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.

A computer running Win7 professional operating system and the DASY5 software.

Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.

The phantom, the device holder and other accessories according to the targeted measurement.

### 2.1.2 Probe Specification

The probes used by the DASY system are isotropic E-field probes, constructed with a symmetric design and a triangular core. The probes have built-in shielding against static charges and are contained within a PEEK enclosure material. These probes are specially designed and calibrated for use in liquids with high permittivities. The frequency range of the probes are from 6 MHz to 6 GHz.

### 2.1.3 Data Acquisition Electronics

The data acquisition electronics (DAE4 or DAE3) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of both the DAE4 as well as of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

### 2.1.4 SAR Evaluation Description

The DASY5 software includes all numerical procedures necessary to evaluate the spatial peak SAR values.

Based on the IEEE 1528 standard, a new algorithm has been implemented. The spatial-peak SAR can be computed over any required mass.

The base for the evaluation is a "cube" measurement in a volume of 30mm3 (7x7x7 points). The measured volume must include the 1 g and 10 g cubes with the highest averaged SAR values. For that purpose, the centre of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan. If the 10g cube or both cubes are not entirely inside the measured volumes, the system issues a warning regarding the evaluated spatial peak values within the Post processing engine (SEMCAD X). This means that if the measured volume is shifted, higher values might be possible. To get the correct values you can use a finer measurement grid for the area scan. In complicated field distributions, a large grid spacing for the area scan might miss some details and give an incorrectly interpolated peak location.

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD X). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. extraction of the measured data (grid and values) from the Zoom Scan
2. calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. generation of a high-resolution mesh within the measured volume
4. interpolation of all measured values from the measurement grid to the high-resolution grid
5. extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. calculation of the averaged SAR within masses of 1 g and 10 g

### 2.1.5 Interpolation, Extrapolation and Detection of Maxima

The probe is calibrated at the centre of the dipole sensors which is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated.

In DASY5, the choice of the coordinate system defining the location of the measurement points has no influence on the uncertainty of the interpolation, Maxima Search and extrapolation routines. The interpolation, extrapolation and maximum search routines are all based on the modified Quadratic Shepard's method. Thereby, the interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation. The DASY5 routines construct a once-continuously differentiable function that interpolates the measurement values as follows:

For each measurement point a trivariate (3-D) / bivariate (2-D) quadratic is computed.
It interpolates the measurement values at the data point and forms a least-square fit to neighbouring measurement values. The spatial location of the quadratic with respect to the measurement values is attenuated by an inverse distance weighting. This is performed since the calculated quadratic will fit measurement values at nearby points more accurate than at points located further away.

After the quadratics are calculated for at all measurement points, the interpolating function is calculated as a weighted average of the quadratics.

There are two control parameters that govern the behaviour of the interpolation method. One specifies the number of measurement points to be used in computing the least-square fits for the local quadratics. These measurement points are the ones nearest the input point for which the quadratic is being computed. The second parameter specifies the number of measurement points that will be used in calculating the weights for the quadratics to produce the final function. The input data points used there are the ones nearest the point at which the interpolation is desired. Appropriate defaults are chosen for each of the control parameters

The trivariate quadratics that have been previously computed for the 3-D interpolation and whose input data are at the closest distance from the phantom surface, are used in order to extrapolate the fields to the surface of the phantom.

In order to determine all the field maxima in 2-D (Area Scan) and 3-D (Zoom Scan), the measurement grid is refined by a default factor of 10 and the interpolation function is used to evaluate all field values between corresponding measurement points. Subsequently, a linear search is applied to find all the candidate maxima. In a last step, non-physical maxima are removed and only those maxima which are within 2 dB of the global maximum value are retained.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extrema of the SAR distribution. The uncertainty on the locations of the extrema is less than 1/20 of the grid size. Only local maxima within 2 dB of the global maximum are searched and passed for the Zoom Scan measurement.

In the Zoom Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

### 2.1.6 Averaging and Determination of Spatial Peak SAR

The interpolated data is used to average the SAR over the 1g and 10g cubes by spatially discretising the entire measured volume. The resolution of this spatial grid used to calculate the averaged SAR is 1mm or about 42875 interpolated points. The resulting volumes are defined as cubical volumes containing the appropriate tissue parameters that are cantered at the location. The location is defined as the centre of the incremental volume (voxel).

The spatial-peak SAR must be evaluated in cubical volumes containing a mass that is within 5%of the required mass. The cubical volume centred at each location, as defined above, should be expanded in all directions until the desired value for the mass is reached, with no surface boundaries of the averaging volume extending beyond the outermost surface of the considered region. In addition, the cubical volume should not consist of more than 10% of air. If these conditions are not satisfied, then the centre of the averaging volume is moved to the next location. Otherwise, the exact size of the final sampling cube is found using an inverse polynomial approximation algorithm, leading to results with improved accuracy. If one boundary of the averaging volume reaches the boundary of the measured volume during its expansion, it will not be evaluated at all. Reference is kept of all locations used and those not used for averaging the SAR. All average SAR values are finally assigned to the centred location in each valid averaging volume.

All locations included in an averaging volume are marked to indicate that they have been used at least once. If a location has been marked as used but has never been assigned to the centre of a cube, the highest averaged SAR value of all other cubical volumes which have used this location for averaging is assigned to this location. Only those locations that are not part of any valid averaging volume should be marked as unused. For the case of an unused location, a new averaging volume must be constructed which will have the unused location centred at one surface of the cube. The remaining five surfaces are expanded evenly in all directions until the required mass is enclosed, regardless of the amount of included air. Of the six possible cubes with one surface centred on the unused location, the smallest cube is used, which still contains the required mass.

If the final cube containing the highest averaged SAR touches the surface of the measured volume, an appropriate warning is issued within the Post-processing engine.
The Cheek Position is where the mobile is in the reference plane and the line between the mobile and the line connecting both auditory canal openings is reduced until any part of the mobile touches any part of the generic twin phantom head.

<u>The 15° Position</u>
The 15° Position is where the mobile is in the reference Cheek position and the phone is kept in contact with the auditory canal at the earpiece; the bottom of the phone is then tilted away from the phantom mouth by 15°.

## 2.2 UHF 16QAM 450 MHz BODY SAR TEST RESULTS

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 20.9 °C |
| **DATE:** | 31/05/2019 | **RELATIVE HUMIDITY:** | 43 % |
| **PHANTOM:** | QDOVA003-FB | **CONDUCTIVITY:** | 0.901 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0300) | **RELATIVE PERMITTIVITY** | 55.347 |
| **DUT POSITION:** | 5mm - Front Facing | **LIQUID TEMPERATURE:** | 21.5 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 418 MHz | **DRIFT:** | -0.18 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.121 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.31 W/kg |

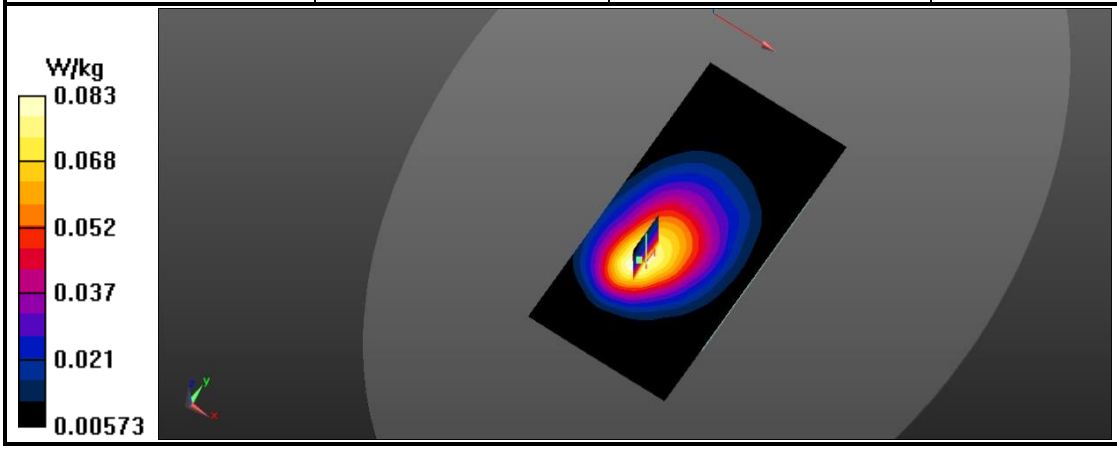



Figure 5: SAR Body Testing Results for the MP30 at 418 MHz.

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 20.9 °C |
| **DATE:** | 31/05/2019 | **RELATIVE HUMIDITY:** | 43.4 % |
| **PHANTOM:** | QDOVA003-FB | **CONDUCTIVITY:** | 0.901 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0300) | **RELATIVE PERMITTIVITY:** | 55.347 |
| **DUT POSITION:** | 5mm - Rear Facing | **LIQUID TEMPERATURE:** | 21.5 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 418 MHz | **DRIFT:** | -0.19 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.105 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.29 W/kg |

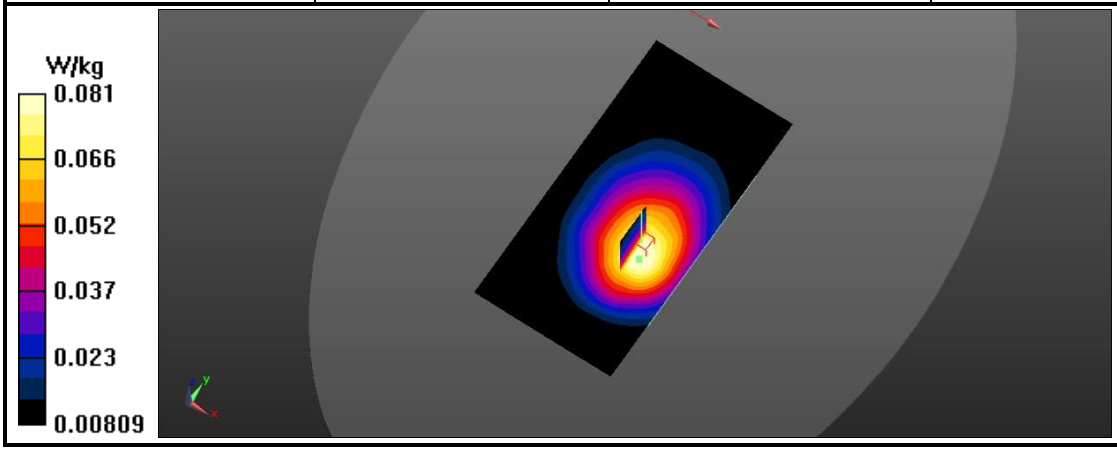



Figure 6: SAR Body Testing Results for the MP30 at 418 MHz.

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 20.9 °C |
| **DATE:** | 21/06/2019 | **RELATIVE HUMIDITY:** | 43.4 % |
| **PHANTOM:** | QDOVA003-FB | **CONDUCTIVITY:** | 0.931 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0300) | **RELATIVE PERMITTIVITY:** | 55.622 |
| **DUT POSITION:** | 5mm - Left Edge | **LIQUID TEMPERATURE:** | 21.5 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 418 MHz | **DRIFT:** | -0.19 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.118 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.30 W/kg |

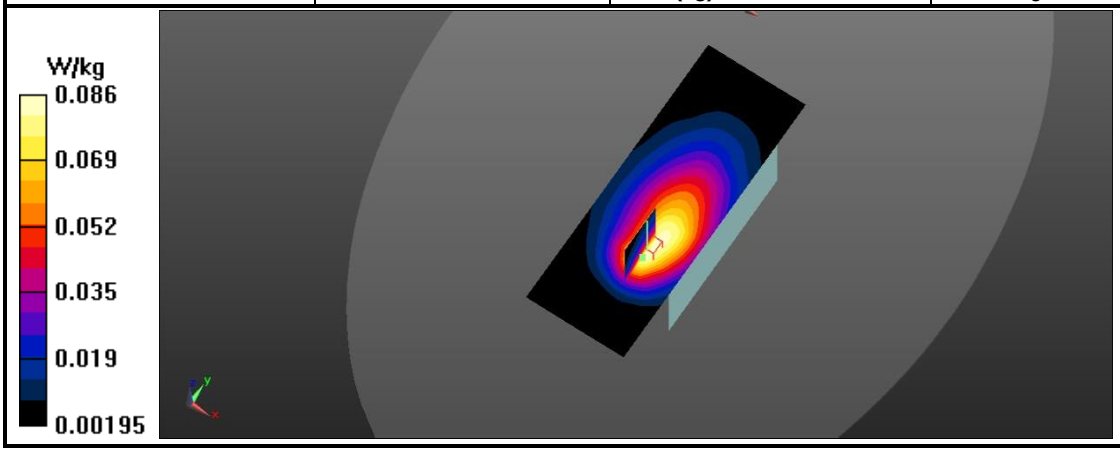



Figure 7: SAR Body Testing Results for the MP30 at 418 MHz.

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 22.4 °C |
| **DATE:** | 20/06/2019 | **RELATIVE HUMIDITY:** | 42.7 % |
| **PHANTOM:** | QDOVA003-FB | **CONDUCTIVITY:** | 0.957 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0310) | **RELATIVE PERMITTIVITY:** | 55.187 |
| **DUT POSITION:** | 5mm - Front Facing | **LIQUID TEMPERATURE:** | 21.5 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 450 MHz | **DRIFT:** | -0.08 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.132 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.34 W/kg |

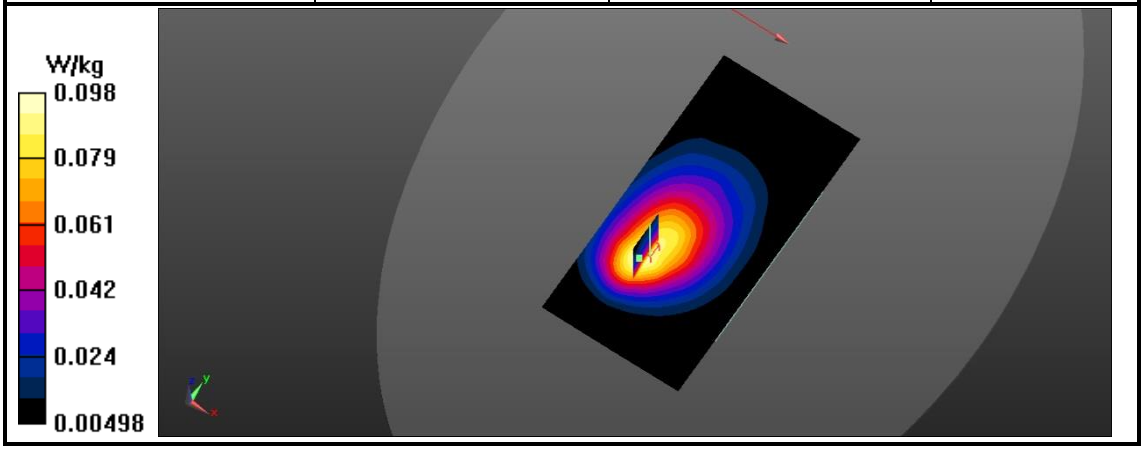



Figure 8: SAR Body Testing Results for the MP30 at 450 MHz

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 22.4 °C |
| **DATE:** | 21/06/2019 | **RELATIVE HUMIDITY:** | 42.7 % |
| **PHANTOM:** | QDOVA003-FB | **: CONDUCTIVITY:** | 0.957 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0310) | **RELATIVE PERMITTIVITY:** | 55.187 |
| **DUT POSITION:** | 5mm - Rear Facing | **LIQUID TEMPERATURE:** | 21.5 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 450 MHz | **DRIFT:** | 0.05 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.104 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.28 W/kg |

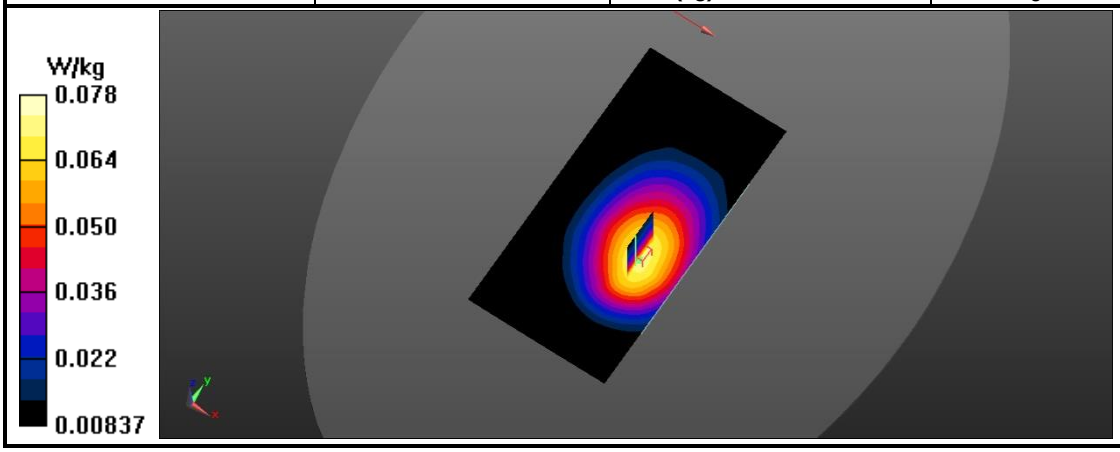



Figure 9: SAR Body Testing Results for the MP30 at 450 MHz.

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 22.4 °C |
| **DATE:** | 21/06/2019 | **RELATIVE HUMIDITY:** | 42.7 % |
| **PHANTOM:** | QDOVA003-FB | **CONDUCTIVITY:** | 0.957 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0310) | **RELATIVE PERMITTIVITY:** | 55.187 |
| **DUT POSITION:** | 5mm - Left Edge | **LIQUID TEMPERATURE:** | 21.5 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 450 MHz | **DRIFT:** | 0.20 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.125 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.31 W/kg |

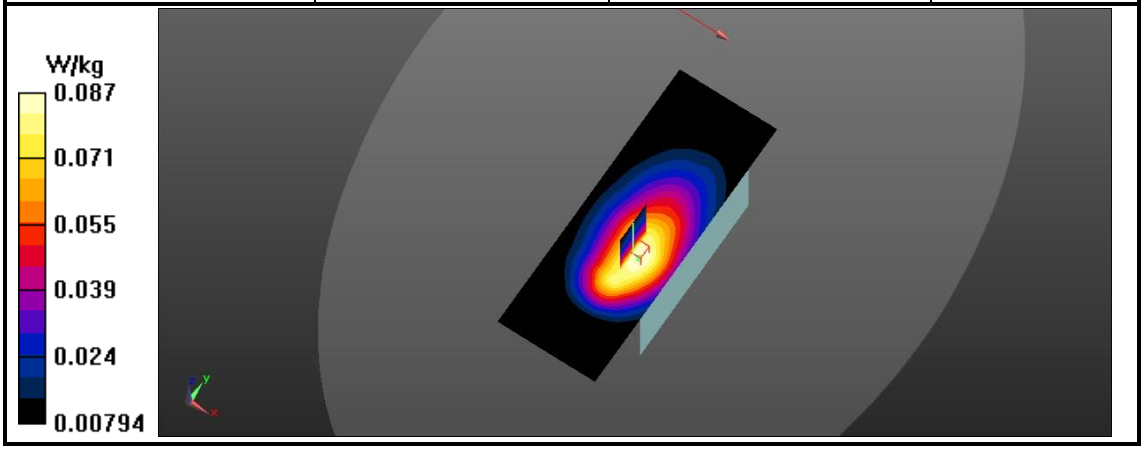



Figure 10: SAR Body Testing Results for the MP30 at 450 MHz.

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 22.4 °C |
| **DATE:** | 21/06/2019 | **RELATIVE HUMIDITY:** | 42.7 % |
| **PHANTOM:** | QDOVA003-FB | **CONDUCTIVITY:** | 0.957 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0320) | **RELATIVE PERMITTIVITY:** | 55.187 |
| **DUT POSITION:** | 5mm - Front Facing | **LIQUID TEMPERATURE:** | 21.5 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 450 MHz | **DRIFT:** | -0.05 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.266 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.69 W/kg |

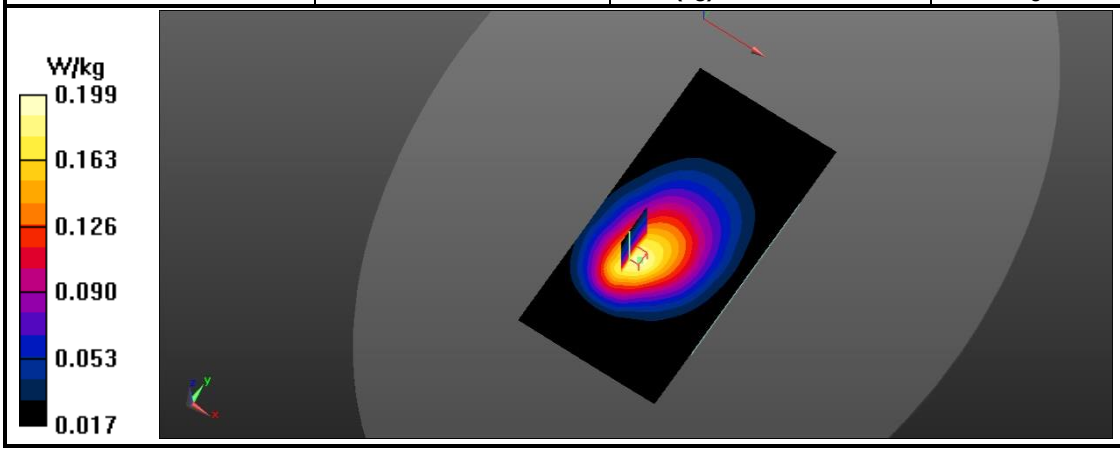



Figure 11: SAR Body Testing Results for the MP30 at 450 MHz.

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 22.4 °C |
| **DATE:** | 21/06/2019 | **RELATIVE HUMIDITY:** | 42.7 % |
| **PHANTOM:** | QDOVA003-FB | **CONDUCTIVITY:** | 0.957 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0320) | **RELATIVE PERMITTIVITY** | 55.187 |
| **DUT POSITION:** | 5mm - Rear Facing | **LIQUID TEMPERATURE:** | 21.5 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 450 MHz | **DRIFT:** | -0.01 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.219 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.58 W/kg |

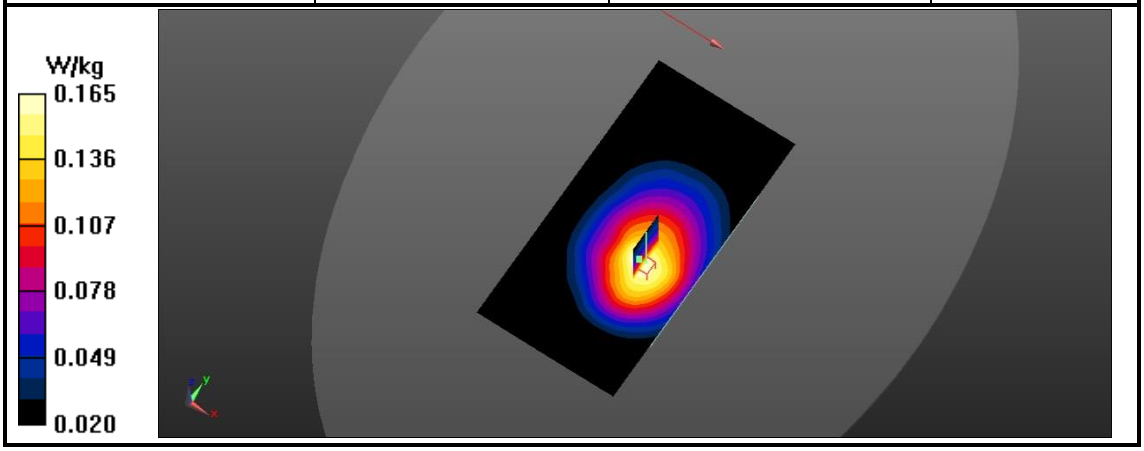



Figure 12: SAR Body Testing Results for the MP30 at 450 MHz.

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 22.4 °C |
| **DATE:** | 21/06/2019 | **RELATIVE HUMIDITY:** | 42.7 % |
| **PHANTOM:** | QDOVA003-FB | **CONDUCTIVITY:** | 0.957 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0320) | **RELATIVE PERMITTIVITY:** | 55.187 |
| **DUT POSITION:** | 5mm - Left Edge | **LIQUID TEMPERATURE:** | 21.5 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 450 MHz | **DRIFT:** | 0.01 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.270 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.65 W/kg |

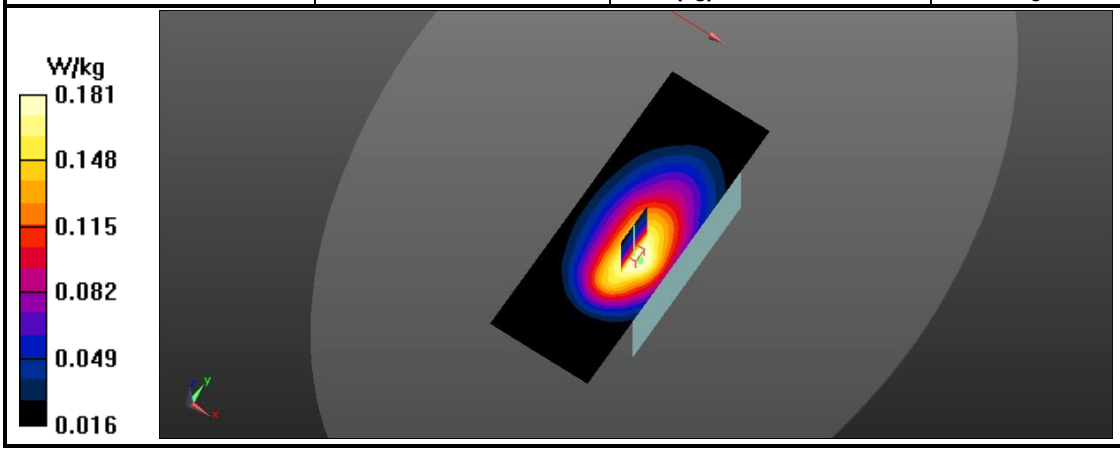



Figure 13: SAR Body Testing Results for the MP30 at 450 MHz.

| | | | |
|---|---|---|---|
| **SOFTWARE VERSION:** | 52.10.2(1495) | **AMBIENT TEMPERATURE:** | 22.8 °C |
| **DATE:** | 19/08/2019 | **RELATIVE HUMIDITY:** | 56.0 % |
| **PHANTOM:** | QDOVA003-FB | **CONDUCTIVITY:** | 0.905 S/m |
| **DUT CONFIGURATION:** | UHF 16QAM Body (AXS-ANT-0320) | **RELATIVE PERMITTIVITY:** | 53.560 |
| **DUT POSITION:** | 5mm - Front Facing. (Audio Cable 0mm) | **LIQUID TEMPERATURE:** | 21.8 °C |
| **RAT:** | N/A | **SCAN TYPE:** | Full |
| **FREQUENCY:** | 450 MHz | **DRIFT:** | 0.01 dB |
| **MODULATION:** | 16 QAM | **PEAK SAR:** | 0.326 W/kg |
| **DUTY CYCLE:** | 20 % | **SAR (1g):** | 0.64 W/kg |

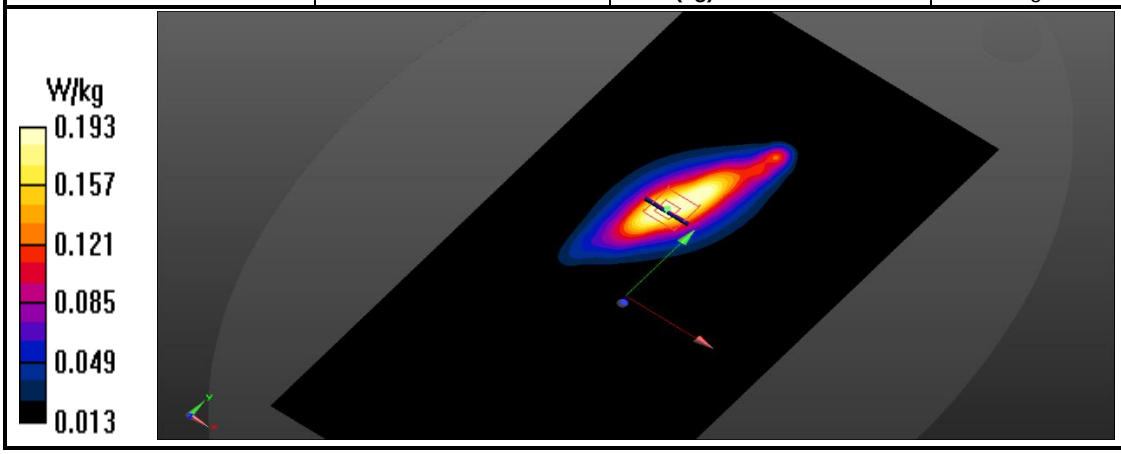



Figure 14: SAR Body Testing Results for the MP30 at 450 MHz.

# SECTION 3

# TEST EQUIPMENT USED

## 3.1 TEST EQUIPMENT USED

The following test equipment was used at TÜV SÜD:

| Instrument Description | Manufacturer | Model Type | TE Number | Cal Period (months) | Calibration Due Date |
|---|---|---|---|---|---|
| 10MHz - 2.5GHz, 3W, Amplifier | Vectawave Technology | VTL5400 | 51 | - | TU |
| Signal Generator | Hewlett Packard | ESG4000A | 61 | 12 | 17-Jul-2020 |
| Thermometer | Digitron | T208 | 64 | 12 | 12-Jun-2020 |
| Power Sensor | Rohde & Schwarz | NRV-Z1 | 178 | 12 | 07-Jun-2020 |
| Bi-directional Coupler | IndexSar Ltd | 7401 (VDC0830-20) | 2414 | - | TU |
| Attenuator (30dB, 25W) | Weinschel | 46-30-34 | 2776 | 12 | 23-Jul-2020 |
| Hygromer | Rotronic | I-1000 | 2784 | 12 | 13-Jun-2020 |
| Power Meter | Rohde & Schwarz | NRVD | 2979 | 12 | 07-Jun-2020 |
| Power Sensor | Rohde & Schwarz | NRV-Z1 | 3563 | 12 | 07-Jun-2020 |
| SAR phone holder | Speag | n/a | 3870 | - | TU |
| Data Acquisition Electronics | Speag | DAE 4 - SD 000 D04 BM | 4689 | 12 | 25-Mar-2020 |
| Measurement Server | Speag | DASY 5 Measurement Server | 4692 | - | TU |
| Validation Dipole 450MHz | Speag | D450V3 | 4695 | 12 | 07-Dec-2019 |
| Body Phantom | Speag | ELI Phantom | 4699 | - | TU |
| Dosimetric SAR Probe | Speag | EX3DV4 | 4700 | 12 | 13-Dec-2019 |
| Robot | Stäubli | TX90 XL Robot | 4704 | - | TU |
| MSL 450 Fluid | Speag | Batch 1 | N/A | Weekly | 26-Aug-2019 |

TU - Traceability Unscheduled

## 3.2 TEST SOFTWARE

The following software was used to control the TÜV SÜD DASY System.

| Instrument | Version Number |
|---|---|
| DASY system | 52.10.2(1495) |

## 3.3 DIELECTRIC PROPERTIES OF SIMULANT LIQUIDS

The fluid properties of the simulant fluids used during routine SAR evaluation meet the dielectric properties required KDB 865665.

The dielectric properties of the tissue simulant liquids used for the SAR testing at TÜV SÜD are as follows: -

| Fluid Type and Frequency | Relative Permittivity Target | Relative Permittivity Measured | Conductivity Target | Conductivity Measured | Date | Fluid Temperature °C |
|---|---|---|---|---|---|---|
| MSL450 @ 450 MHz | 56.70 | 55.19 | 0.94 | 0.96 | 20/06/2019 | 20.9 |
| MSL450 @ 450 MHz | 56.70 | 53.56 | 0.94 | 0.90 | 19/08/2019 | 21.6 |

## 3.4 TEST CONDITIONS

### 3.4.1 Test Laboratory Conditions

Ambient temperature: Within +15°C to +35°C.
The actual temperature during the testing ranged from 20.9°C to 22.8°C.
The actual humidity during the testing ranged from 42.7% to 56.0% RH.

### 3.4.2 Test Fluid Temperature Range

| Frequency | Body / Head Fluid | Min Temperature °C | Max Temperature °C |
|---|---|---|---|
| 450 MHz | Body | 21.5 | 21.5 |

### 3.4.3 SAR Drift

The SAR Drift was within acceptable limits during scans. The maximum SAR Drift was recorded as 0.200 dB for body. The measurement uncertainty budget for this assessment includes the maximum SAR Drift figures.

## 3.5 MEASUREMENT UNCERTAINTY

Body, Full SAR Measurements, 300 MHz to 3 GHz Using Probe EX3DV4 - SN3759

| Source of Uncertainty | Uncertainty ± % | Probability distribution | Div | $c_i$ (1g) | Standard Uncertainty ± % (1g) | $v_i$ ($v_{eff}$) |
|---|---|---|---|---|---|---|
| **Measurement System** | | | | | | |
| Probe calibration | 6.0 | N | 1.00 | 1.00 | 6.0 | Infinity |
| Axial Isotropy | 4.7 | R | 1.73 | 0.70 | 1.9 | Infinity |
| Hemispherical Isotropy | 9.6 | R | 1.73 | 0.70 | 3.9 | Infinity |
| Boundary effect | 1.0 | R | 1.73 | 1.00 | 0.6 | Infinity |
| Linearity | 4.7 | R | 1.73 | 1.00 | 2.7 | Infinity |
| System Detection limits | 1.0 | R | 1.73 | 1.00 | 0.6 | Infinity |
| Modulation response | 2.4 | R | 1.73 | 1.00 | 1.4 | Infinity |
| Readout electronics | 0.3 | N | 1.00 | 1.00 | 0.3 | Infinity |
| Response time | 0.8 | R | 1.73 | 1.00 | 0.5 | Infinity |
| Integration time | 2.6 | R | 1.73 | 1.00 | 1.5 | Infinity |
| RF ambient noise | 3.0 | R | 1.73 | 1.00 | 1.7 | Infinity |
| RF ambient reflections | 3.0 | R | 1.73 | 1.00 | 1.7 | Infinity |
| Probe positioner | 0.4 | R | 1.73 | 1.00 | 0.2 | Infinity |
| Probe positioning | 2.9 | R | 1.73 | 1.00 | 1.7 | Infinity |
| Max SAR Evaluation | 2.0 | R | 1.73 | 1.00 | 1.2 | Infinity |
| **Test sample related** | | | | | | |
| Device Positioning | 2.9 | N | 1.00 | 1.00 | 2.9 | 145 |
| Device Holder | 3.6 | N | 1.00 | 1.00 | 3.6 | 5 |
| Input Power and SAR Drift | 5.0 | R | 1.73 | 1.00 | 0.1 | Infinity |
| **Phantom and Setup** | | | | | | |
| Phantom uncertainty | 6.1 | R | 1.73 | 1.00 | 3.5 | Infinity |
| SAR Correction | 1.9 | R | 1.73 | 1.00 | 1.1 | Infinity |
| Liquid conductivity Meas. | 2.5 | R | 1.73 | 0.78 | 1.1 | Infinity |
| Liquid Permittivity Meas. | 2.5 | R | 1.73 | 0.23 | 0.3 | Infinity |
| Temp. Unc. Conductivity | 3.4 | R | 1.73 | 0.78 | 1.5 | Infinity |
| Temp. Unc. Permittivity | 0.4 | R | 1.73 | 0.23 | 0.1 | Infinity |
| **Combined Standard Uncertainty** | | **RSS** | | | 10.8 | 361 |
| **Expanded Standard Uncertainty** | | **K=2** | | | 21.5 | |

**SECTION 4**

**PHOTOGRAPHS**

## 4.1 TEST POSITIONAL PHOTOGRAPHS

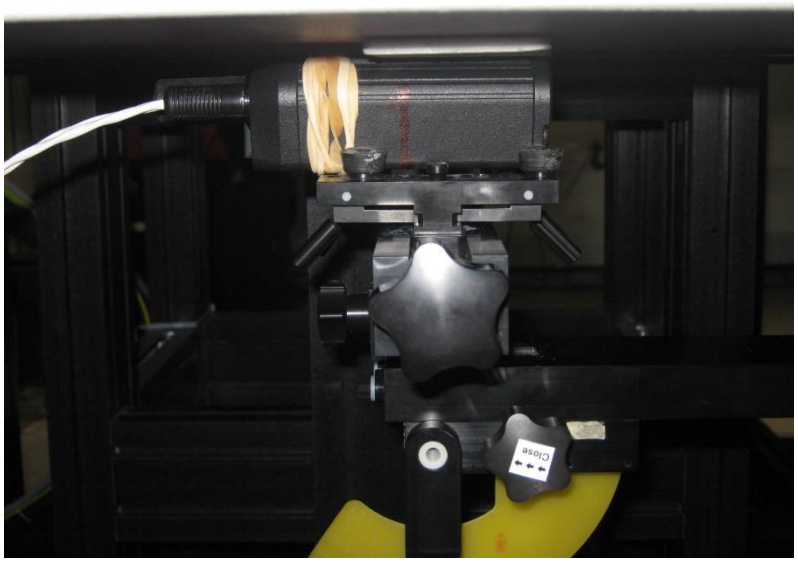



Figure 15 Front Face - 5mm separation distance

Figure 16 Rear Face - 5mm separation distance

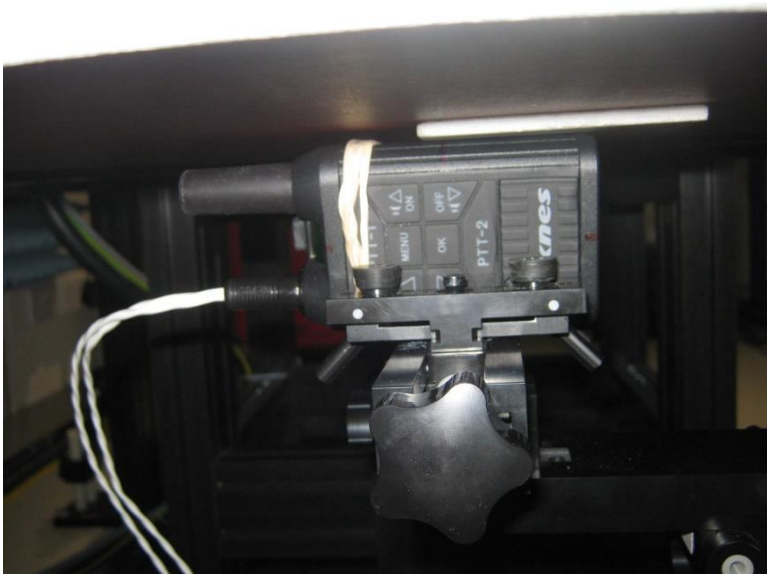



Figure 17 Left edge - 5mm separation distance


Figure 18 Front Face - 5mm separation distance (Audio cable - 0 mm separation distance)

## 4.2 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)


Figure 19 Front


Figure 20 Rear

## SECTION 5

## ACCREDITATION, DISCLAIMERS AND COPYRIGHT

## 5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT


This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

# ANNEX A

# PROBE CALIBRATION REPORT

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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** TüV SÜD UK

Certificate No: **EX3-3759_Dec18**

# CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3759

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: December 13, 2018

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

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

Calibration Equipment used (M&TE critical for calibration)

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

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Michael Weber | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: December 13, 2018

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

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

Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 0108**
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

## Glossary:

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

## Calibration is Performed According to the Following Standards:

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

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z*: *A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

# Probe EX3DV4

## SN:3759

Manufactured: March 16, 2010
Calibrated: December 13, 2018

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3759

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$)[A] | 0.47 | 0.43 | 0.43 | ± 10.1 % |
| DCP (mV)[B] | 98.8 | 100.7 | 99.7 | |

## 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 | 196.6 | ±3.5 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 173.4 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 184.7 | |

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 | 43.15 | 332.9 | 37.58 | 13.15 | 0.734 | 5.080 | 0.000 | 0.592 | 1.010 |
| Y | 49.34 | 366.8 | 35.30 | 18.32 | 0.514 | 5.094 | 0.953 | 0.401 | 1.007 |
| Z | 42.84 | 329.4 | 37.39 | 15.09 | 1.018 | 5.074 | 0.000 | 0.598 | 1.011 |

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

[A] The uncertainties of Norm X,Y,Z do not affect the $E^2$-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3759

## 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 | 11.05 | 11.05 | 11.05 | 0.13 | 1.20 | ± 13.3 % |
| 750 | 41.9 | 0.89 | 10.48 | 10.48 | 10.48 | 0.34 | 0.89 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 10.23 | 10.23 | 10.23 | 0.25 | 1.09 | ± 12.0 % |
| 900 | 41.5 | 0.97 | 9.80 | 9.80 | 9.80 | 0.21 | 1.22 | ± 12.0 % |
| 1640 | 40.2 | 1.31 | 8.57 | 8.57 | 8.57 | 0.20 | 0.93 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 8.48 | 8.48 | 8.48 | 0.22 | 0.98 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 8.14 | 8.14 | 8.14 | 0.30 | 0.85 | ± 12.0 % |
| 2100 | 39.8 | 1.49 | 8.07 | 8.07 | 8.07 | 0.24 | 0.88 | ± 12.0 % |
| 2300 | 39.5 | 1.67 | 7.69 | 7.69 | 7.69 | 0.23 | 0.90 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 7.24 | 7.24 | 7.24 | 0.22 | 0.99 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 6.98 | 6.98 | 6.98 | 0.26 | 0.99 | ± 12.0 % |
| 5200 | 36.0 | 4.66 | 4.60 | 4.60 | 4.60 | 0.40 | 1.80 | ± 13.1 % |
| 5300 | 35.9 | 4.76 | 4.38 | 4.38 | 4.38 | 0.40 | 1.80 | ± 13.1 % |
| 5500 | 35.6 | 4.96 | 3.94 | 3.94 | 3.94 | 0.40 | 1.80 | ± 13.1 % |
| 5600 | 35.5 | 5.07 | 3.91 | 3.91 | 3.91 | 0.40 | 1.80 | ± 13.1 % |
| 5800 | 35.3 | 5.27 | 3.89 | 3.89 | 3.89 | 0.40 | 1.80 | ± 13.1 % |

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

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

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3759

## 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 | 11.27 | 11.27 | 11.27 | 0.07 | 1.20 | ± 13.3 % |
| 750 | 55.5 | 0.96 | 10.34 | 10.34 | 10.34 | 0.28 | 0.95 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 9.98 | 9.98 | 9.98 | 0.36 | 0.80 | ± 12.0 % |
| 900 | 55.0 | 1.05 | 9.87 | 9.87 | 9.87 | 0.23 | 1.03 | ± 12.0 % |
| 1640 | 53.7 | 1.42 | 8.59 | 8.59 | 8.59 | 0.29 | 0.83 | ± 12.0 % |
| 1750 | 53.4 | 1.49 | 8.25 | 8.25 | 8.25 | 0.15 | 1.30 | ± 12.0 % |
| 1900 | 53.3 | 1.52 | 7.93 | 7.93 | 7.93 | 0.19 | 0.99 | ± 12.0 % |
| 2100 | 53.2 | 1.62 | 7.65 | 7.65 | 7.65 | 0.18 | 1.20 | ± 12.0 % |
| 2300 | 52.9 | 1.81 | 7.52 | 7.52 | 7.52 | 0.29 | 0.90 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 7.37 | 7.37 | 7.37 | 0.23 | 0.95 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 7.15 | 7.15 | 7.15 | 0.13 | 1.20 | ± 12.0 % |
| 5200 | 49.0 | 5.30 | 3.99 | 3.99 | 3.99 | 0.50 | 1.90 | ± 13.1 % |
| 5300 | 48.9 | 5.42 | 3.81 | 3.81 | 3.81 | 0.50 | 1.90 | ± 13.1 % |
| 5500 | 48.6 | 5.65 | 3.40 | 3.40 | 3.40 | 0.50 | 1.90 | ± 13.1 % |
| 5600 | 48.5 | 5.77 | 3.26 | 3.26 | 3.26 | 0.50 | 1.90 | ± 13.1 % |
| 5800 | 48.2 | 6.00 | 3.28 | 3.28 | 3.28 | 0.50 | 1.90 | ± 13.1 % |

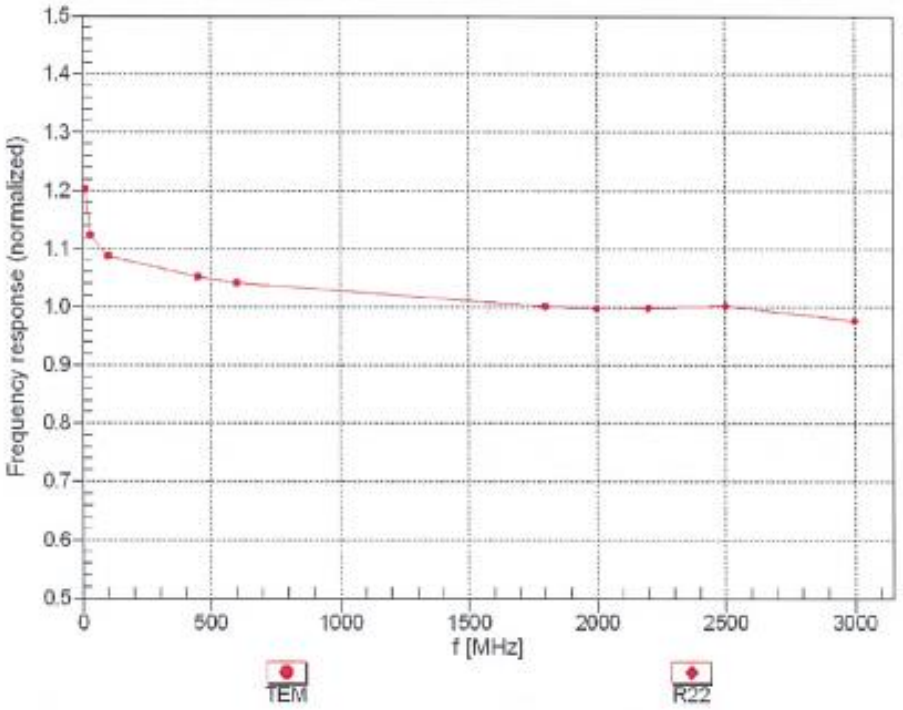
[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz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

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

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

# Frequency Response of E-Field

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

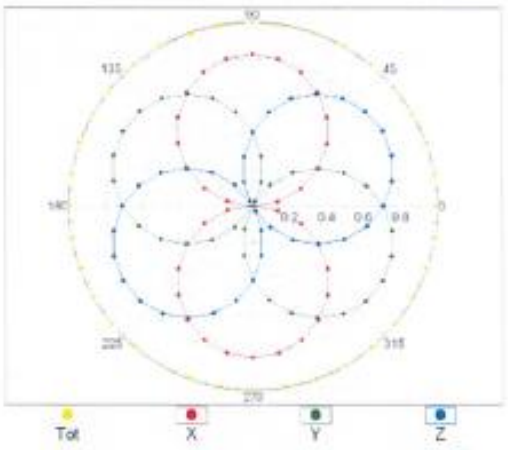


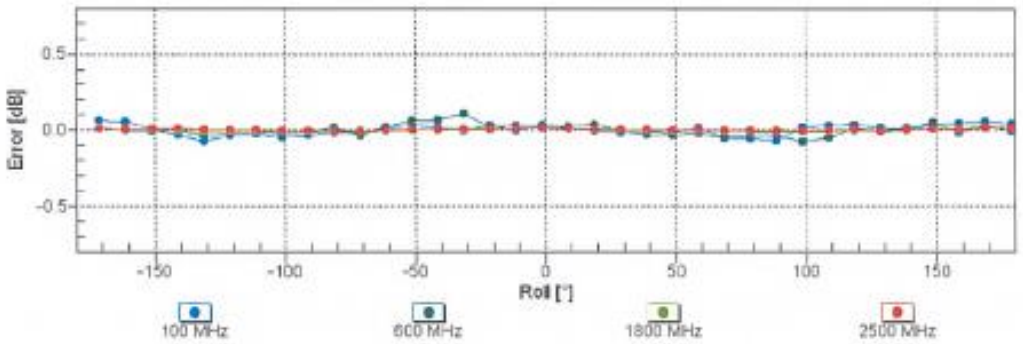

**Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)**

# Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM

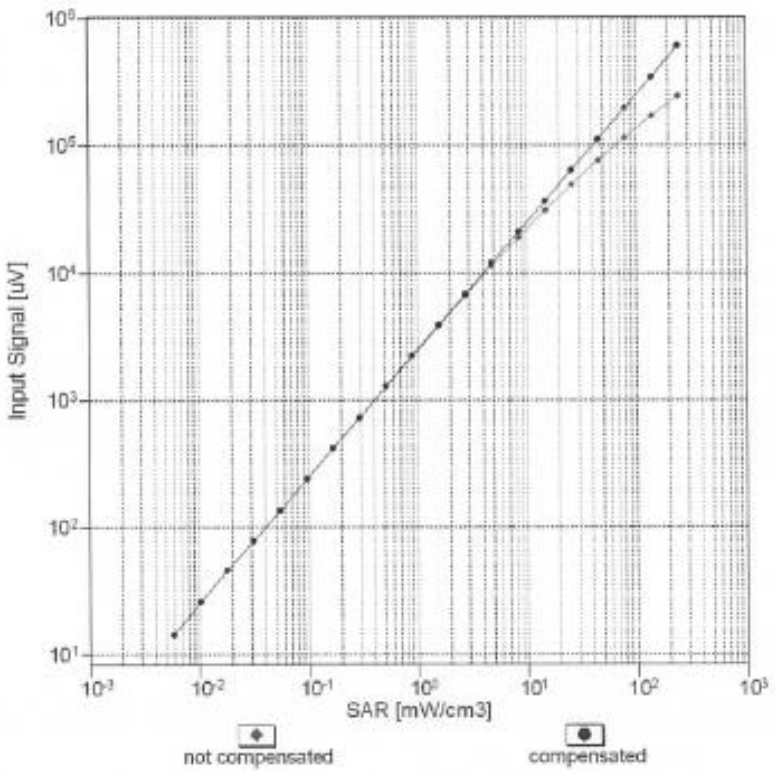

f=1800 MHz,R22

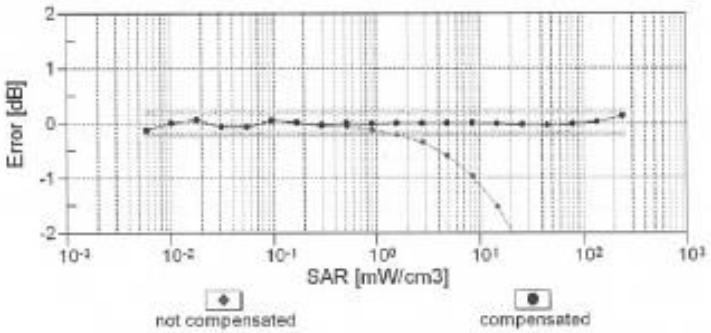



**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

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

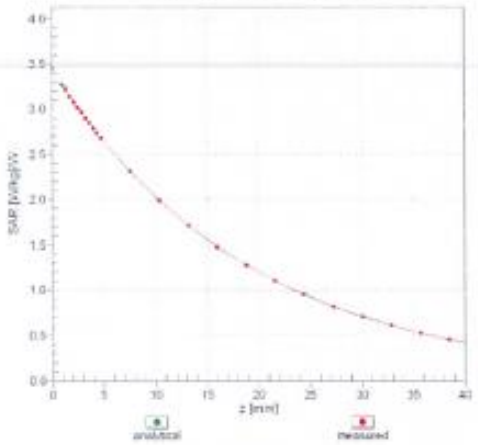


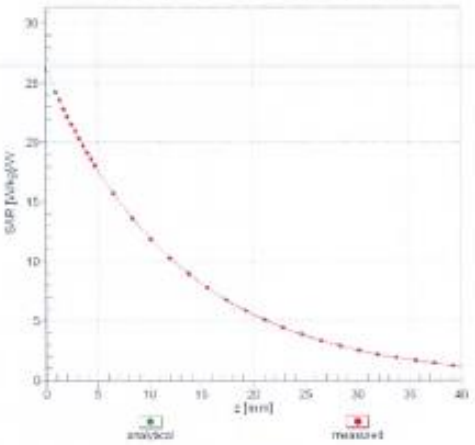

Uncertainty of Linearity Assessment: ± 0.6% (k=2)

## Conversion Factor Assessment

f = 900 MHz,WGLS R9 (H_convF)

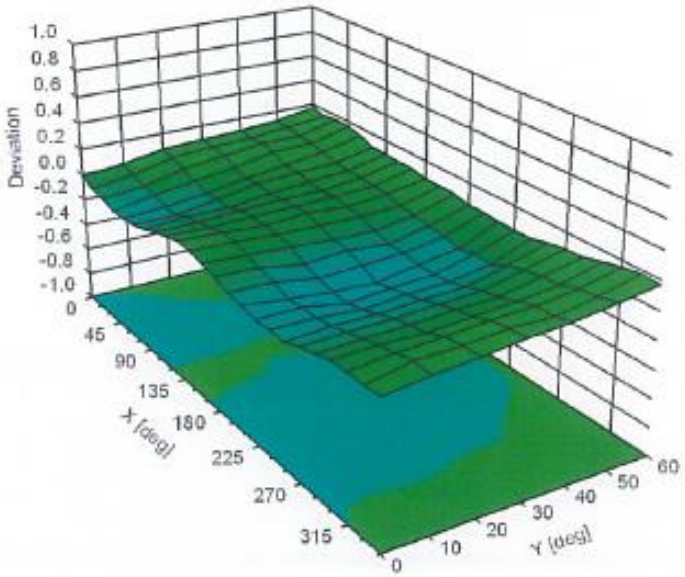



f = 1750 MHz,WGLS R22 (H_convF)




## Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3759

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | -1.3 |
| 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 |

## Appendix: Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | C | D dB | VR mV | Max Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.00 | 0.00 | 1.00 | 0.00 | 196.6 | ± 3.5 % |
| | | Y | 0.00 | 0.00 | 1.00 | | 173.4 | |
| | | Z | 0.00 | 0.00 | 1.00 | | 184.7 | |
| 10010-CAA | SAR Validation (Square, 100ms, 10ms) | X | 2.33 | 65.72 | 10.32 | 10.00 | 20.0 | ± 9.6 % |
| | | Y | 4.70 | 74.09 | 14.23 | | 20.0 | |
| | | Z | 2.50 | 65.82 | 10.56 | | 20.0 | |
| 10011-CAB | UMTS-FDD (WCDMA) | X | 0.82 | 64.61 | 13.00 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.96 | 66.19 | 14.43 | | 150.0 | |
| | | Z | 0.81 | 65.02 | 13.15 | | 150.0 | |
| 10012-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) | X | 1.06 | 62.79 | 14.23 | 0.41 | 150.0 | ± 9.6 % |
| | | Y | 1.17 | 63.77 | 15.05 | | 150.0 | |
| | | Z | 1.05 | 63.09 | 14.40 | | 150.0 | |
| 10013-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps) | X | 4.75 | 66.48 | 16.94 | 1.46 | 150.0 | ± 9.6 % |
| | | Y | 4.90 | 66.71 | 17.09 | | 150.0 | |
| | | Z | 4.74 | 66.56 | 16.96 | | 150.0 | |
| 10021-DAC | GSM-FDD (TDMA, GMSK) | X | 100.00 | 113.54 | 27.20 | 9.39 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 117.10 | 28.93 | | 50.0 | |
| | | Z | 100.00 | 113.57 | 27.48 | | 50.0 | |
| 10023-DAC | GPRS-FDD (TDMA, GMSK, TN 0) | X | 100.00 | 113.18 | 27.08 | 9.57 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 116.77 | 28.82 | | 50.0 | |
| | | Z | 100.00 | 113.33 | 27.42 | | 50.0 | |
| 10024-DAC | GPRS-FDD (TDMA, GMSK, TN 0-1) | X | 100.00 | 111.17 | 25.03 | 6.56 | 60.0 | ± 9.6 % |
| | | Y | 100.00 | 115.70 | 27.38 | | 60.0 | |
| | | Z | 100.00 | 110.16 | 24.82 | | 60.0 | |
| 10025-DAC | EDGE-FDD (TDMA, 8PSK, TN 0) | X | 3.96 | 68.09 | 24.76 | 12.57 | 50.0 | ± 9.6 % |
| | | Y | 6.45 | 84.18 | 33.68 | | 50.0 | |
| | | Z | 3.95 | 66.98 | 23.71 | | 50.0 | |
| 10026-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1) | X | 8.81 | 91.01 | 32.27 | 9.56 | 60.0 | ± 9.6 % |
| | | Y | 14.33 | 103.33 | 36.99 | | 60.0 | |
| | | Z | 9.84 | 92.33 | 32.30 | | 60.0 | |
| 10027-DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2) | X | 100.00 | 109.91 | 23.68 | 4.80 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 116.12 | 26.85 | | 80.0 | |
| | | Z | 100.00 | 108.13 | 23.12 | | 80.0 | |
| 10028-DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3) | X | 100.00 | 108.60 | 22.41 | 3.55 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 117.50 | 26.78 | | 100.0 | |
| | | Z | 100.00 | 106.16 | 21.57 | | 100.0 | |
| 10029-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2) | X | 5.69 | 81.09 | 27.21 | 7.80 | 80.0 | ± 9.6 % |
| | | Y | 7.91 | 88.40 | 30.27 | | 80.0 | |
| | | Z | 6.40 | 82.89 | 27.60 | | 80.0 | |
| 10030-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1) | X | 100.00 | 108.69 | 23.44 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 100.00 | 114.15 | 26.27 | | 70.0 | |
| | | Z | 100.00 | 107.47 | 23.12 | | 70.0 | |
| 10031-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3) | X | 100.00 | 96.91 | 16.29 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 115.98 | 24.77 | | 100.0 | |
| | | Z | 1.42 | 68.65 | 9.07 | | 100.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10032-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5) | X | 0.21 | 60.00 | 4.41 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 119.38 | 25.17 | | 100.0 | |
| | | Z | 0.23 | 60.00 | 4.22 | | 100.0 | |
| 10033-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1) | X | 15.56 | 97.63 | 25.77 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 100.00 | 129.32 | 35.00 | | 70.0 | |
| | | Z | 14.06 | 94.36 | 24.43 | | 70.0 | |
| 10034-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3) | X | 2.47 | 73.76 | 15.94 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 5.68 | 85.89 | 21.48 | | 100.0 | |
| | | Z | 2.69 | 74.13 | 15.79 | | 100.0 | |
| 10035-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5) | X | 1.55 | 69.04 | 13.61 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 2.74 | 76.75 | 17.96 | | 100.0 | |
| | | Z | 1.65 | 69.41 | 13.52 | | 100.0 | |
| 10036-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1) | X | 26.25 | 105.76 | 28.09 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 100.00 | 129.75 | 35.21 | | 70.0 | |
| | | Z | 22.10 | 101.22 | 26.45 | | 70.0 | |
| 10037-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3) | X | 2.29 | 72.93 | 15.58 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 5.16 | 84.61 | 21.03 | | 100.0 | |
| | | Z | 2.49 | 73.27 | 15.43 | | 100.0 | |
| 10038-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5) | X | 1.57 | 69.38 | 13.87 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 2.79 | 77.26 | 18.27 | | 100.0 | |
| | | Z | 1.68 | 69.84 | 13.81 | | 100.0 | |
| 10039-CAB | CDMA2000 (1xRTT, RC1) | X | 1.08 | 65.59 | 11.46 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.61 | 70.06 | 14.76 | | 150.0 | |
| | | Z | 1.06 | 65.68 | 11.34 | | 150.0 | |
| 10042-CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | X | 100.00 | 108.33 | 24.00 | 7.78 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 112.59 | 26.15 | | 50.0 | |
| | | Z | 100.00 | 108.01 | 24.09 | | 50.0 | |
| 10044-CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM) | X | 0.13 | 122.60 | 6.71 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.00 | 105.21 | 9.60 | | 150.0 | |
| | | Z | 0.29 | 126.05 | 7.74 | | 150.0 | |
| 10048-CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24) | X | 44.32 | 101.19 | 25.43 | 13.80 | 25.0 | ± 9.6 % |
| | | Y | 100.00 | 117.80 | 30.49 | | 25.0 | |
| | | Z | 16.55 | 88.46 | 22.34 | | 25.0 | |
| 10049-CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12) | X | 96.20 | 112.09 | 27.05 | 10.79 | 40.0 | ± 9.6 % |
| | | Y | 100.00 | 116.04 | 28.74 | | 40.0 | |
| | | Z | 21.78 | 93.24 | 22.57 | | 40.0 | |
| 10056-CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps) | X | 25.89 | 101.25 | 27.24 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 126.03 | 34.65 | | 50.0 | |
| | | Z | 16.13 | 92.71 | 24.56 | | 50.0 | |
| 10058-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3) | X | 4.42 | 76.21 | 24.38 | 6.55 | 100.0 | ± 9.6 % |
| | | Y | 5.72 | 81.33 | 26.62 | | 100.0 | |
| | | Z | 4.91 | 77.90 | 24.83 | | 100.0 | |
| 10059-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps) | X | 1.10 | 63.87 | 14.86 | 0.61 | 110.0 | ± 9.6 % |
| | | Y | 1.23 | 65.18 | 15.84 | | 110.0 | |
| | | Z | 1.11 | 64.36 | 15.09 | | 110.0 | |
| 10060-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps) | X | 7.45 | 96.67 | 24.42 | 1.30 | 110.0 | ± 9.6 % |
| | | Y | 100.00 | 136.09 | 35.03 | | 110.0 | |
| | | Z | 20.40 | 109.23 | 26.87 | | 110.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10061-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps) | X | 2.79 | 79.80 | 21.58 | 2.04 | 110.0 | ± 9.6 % |
| | | Y | 4.85 | 88.66 | 25.17 | | 110.0 | |
| | | Z | 3.59 | 83.15 | 22.48 | | 110.0 | |
| 10062-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps) | X | 4.53 | 66.35 | 16.28 | 0.49 | 100.0 | ± 9.6 % |
| | | Y | 4.68 | 66.62 | 16.44 | | 100.0 | |
| | | Z | 4.51 | 66.42 | 16.30 | | 100.0 | |
| 10063-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps) | X | 4.55 | 66.46 | 16.39 | 0.72 | 100.0 | ± 9.6 % |
| | | Y | 4.70 | 66.73 | 16.56 | | 100.0 | |
| | | Z | 4.53 | 66.53 | 16.41 | | 100.0 | |
| 10064-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps) | X | 4.82 | 66.74 | 16.64 | 0.86 | 100.0 | ± 9.6 % |
| | | Y | 5.00 | 67.02 | 16.81 | | 100.0 | |
| | | Z | 4.81 | 66.80 | 16.66 | | 100.0 | |
| 10065-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps) | X | 4.70 | 66.64 | 16.75 | 1.21 | 100.0 | ± 9.6 % |
| | | Y | 4.87 | 66.96 | 16.94 | | 100.0 | |
| | | Z | 4.69 | 66.72 | 16.77 | | 100.0 | |
| 10066-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps) | X | 4.73 | 66.69 | 16.94 | 1.46 | 100.0 | ± 9.6 % |
| | | Y | 4.90 | 67.01 | 17.13 | | 100.0 | |
| | | Z | 4.72 | 66.78 | 16.96 | | 100.0 | |
| 10067-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps) | X | 5.03 | 66.95 | 17.44 | 2.04 | 100.0 | ± 9.6 % |
| | | Y | 5.19 | 67.17 | 17.59 | | 100.0 | |
| | | Z | 5.03 | 67.06 | 17.46 | | 100.0 | |
| 10068-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps) | X | 5.08 | 66.98 | 17.66 | 2.55 | 100.0 | ± 9.6 % |
| | | Y | 5.26 | 67.30 | 17.86 | | 100.0 | |
| | | Z | 5.08 | 67.09 | 17.68 | | 100.0 | |
| 10069-CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps) | X | 5.16 | 67.01 | 17.86 | 2.67 | 100.0 | ± 9.6 % |
| | | Y | 5.34 | 67.27 | 18.04 | | 100.0 | |
| | | Z | 5.16 | 67.13 | 17.89 | | 100.0 | |
| 10071-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps) | X | 4.86 | 66.60 | 17.27 | 1.99 | 100.0 | ± 9.6 % |
| | | Y | 5.00 | 66.83 | 17.42 | | 100.0 | |
| | | Z | 4.85 | 66.69 | 17.29 | | 100.0 | |
| 10072-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps) | X | 4.84 | 66.92 | 17.49 | 2.30 | 100.0 | ± 9.6 % |
| | | Y | 4.99 | 67.21 | 17.68 | | 100.0 | |
| | | Z | 4.84 | 67.04 | 17.53 | | 100.0 | |
| 10073-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps) | X | 4.91 | 67.13 | 17.85 | 2.83 | 100.0 | ± 9.6 % |
| | | Y | 5.06 | 67.41 | 18.04 | | 100.0 | |
| | | Z | 4.92 | 67.28 | 17.89 | | 100.0 | |
| 10074-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps) | X | 4.91 | 67.06 | 18.02 | 3.30 | 100.0 | ± 9.6 % |
| | | Y | 5.05 | 67.33 | 18.22 | | 100.0 | |
| | | Z | 4.93 | 67.24 | 18.07 | | 100.0 | |
| 10075-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps) | X | 4.95 | 67.18 | 18.34 | 3.82 | 90.0 | ± 9.6 % |
| | | Y | 5.10 | 67.51 | 18.58 | | 90.0 | |
| | | Z | 4.98 | 67.38 | 18.39 | | 90.0 | |
| 10076-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps) | X | 4.97 | 67.01 | 18.48 | 4.15 | 90.0 | ± 9.6 % |
| | | Y | 5.10 | 67.27 | 18.69 | | 90.0 | |
| | | Z | 5.02 | 67.23 | 18.55 | | 90.0 | |
| 10077-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps) | X | 5.00 | 67.09 | 18.59 | 4.30 | 90.0 | ± 9.6 % |
| | | Y | 5.13 | 67.33 | 18.79 | | 90.0 | |
| | | Z | 5.05 | 67.32 | 18.65 | | 90.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10081-CAB | CDMA2000 (1xRTT, RC3) | X | 0.55 | 61.87 | 8.84 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.77 | 64.72 | 11.77 | | 150.0 | |
| | | Z | 0.52 | 61.69 | 8.50 | | 150.0 | |
| 10082-CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | X | 0.74 | 60.00 | 4.43 | 4.77 | 80.0 | ± 9.6 % |
| | | Y | 0.85 | 60.00 | 4.95 | | 80.0 | |
| | | Z | 0.83 | 60.00 | 4.63 | | 80.0 | |
| 10090-DAC | GPRS-FDD (TDMA, GMSK, TN 0-4) | X | 100.00 | 111.28 | 25.10 | 6.56 | 60.0 | ± 9.6 % |
| | | Y | 100.00 | 115.76 | 27.43 | | 60.0 | |
| | | Z | 100.00 | 110.27 | 24.89 | | 60.0 | |
| 10097-CAB | UMTS-FDD (HSDPA) | X | 1.60 | 65.98 | 14.26 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.76 | 66.96 | 15.19 | | 150.0 | |
| | | Z | 1.59 | 66.29 | 14.39 | | 150.0 | |
| 10098-CAB | UMTS-FDD (HSUPA, Subtest 2) | X | 1.56 | 65.91 | 14.21 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.72 | 66.91 | 15.15 | | 150.0 | |
| | | Z | 1.56 | 66.22 | 14.34 | | 150.0 | |
| 10099-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4) | X | 8.87 | 91.15 | 32.31 | 9.56 | 60.0 | ± 9.6 % |
| | | Y | 14.47 | 103.54 | 37.06 | | 60.0 | |
| | | Z | 9.90 | 92.43 | 32.33 | | 60.0 | |
| 10100-CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | X | 2.79 | 68.59 | 15.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.04 | 69.80 | 16.31 | | 150.0 | |
| | | Z | 2.80 | 68.86 | 15.75 | | 150.0 | |
| 10101-CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | X | 3.03 | 66.57 | 15.28 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.20 | 67.25 | 15.69 | | 150.0 | |
| | | Z | 3.01 | 66.69 | 15.34 | | 150.0 | |
| 10102-CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | X | 3.14 | 66.60 | 15.41 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.31 | 67.24 | 15.79 | | 150.0 | |
| | | Z | 3.12 | 66.73 | 15.47 | | 150.0 | |
| 10103-CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | X | 5.97 | 75.10 | 20.26 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.36 | 78.24 | 21.54 | | 65.0 | |
| | | Z | 6.43 | 76.00 | 20.48 | | 65.0 | |
| 10104-CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | X | 6.02 | 73.24 | 20.24 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.93 | 75.40 | 21.20 | | 65.0 | |
| | | Z | 6.28 | 73.73 | 20.33 | | 65.0 | |
| 10105-CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | X | 5.56 | 71.54 | 19.79 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.52 | 74.14 | 20.96 | | 65.0 | |
| | | Z | 5.94 | 72.54 | 20.12 | | 65.0 | |
| 10108-CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | X | 2.42 | 67.88 | 15.43 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.66 | 69.00 | 16.11 | | 150.0 | |
| | | Z | 2.42 | 68.16 | 15.56 | | 150.0 | |
| 10109-CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | X | 2.67 | 66.35 | 15.07 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.86 | 67.05 | 15.56 | | 150.0 | |
| | | Z | 2.66 | 66.50 | 15.15 | | 150.0 | |
| 10110-CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | X | 1.92 | 66.90 | 14.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.15 | 68.03 | 15.68 | | 150.0 | |
| | | Z | 1.92 | 67.19 | 14.98 | | 150.0 | |
| 10111-CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | X | 2.35 | 66.93 | 15.09 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.56 | 67.71 | 15.78 | | 150.0 | |
| | | Z | 2.35 | 67.19 | 15.21 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10112-CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM) | X | 2.80 | 66.42 | 15.18 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.98 | 67.06 | 15.63 | | 150.0 | |
| | | Z | 2.79 | 66.57 | 15.25 | | 150.0 | |
| 10113-CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) | X | 2.50 | 67.16 | 15.29 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.71 | 67.87 | 15.93 | | 150.0 | |
| | | Z | 2.50 | 67.43 | 15.41 | | 150.0 | |
| 10114-CAC | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK) | X | 4.98 | 66.83 | 16.20 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.10 | 67.07 | 16.29 | | 150.0 | |
| | | Z | 4.96 | 66.86 | 16.22 | | 150.0 | |
| 10115-CAC | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM) | X | 5.25 | 66.92 | 16.26 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.40 | 67.23 | 16.38 | | 150.0 | |
| | | Z | 5.22 | 66.94 | 16.27 | | 150.0 | |
| 10116-CAC | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | X | 5.07 | 67.00 | 16.22 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.20 | 67.27 | 16.32 | | 150.0 | |
| | | Z | 5.04 | 67.03 | 16.23 | | 150.0 | |
| 10117-CAC | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK) | X | 4.95 | 66.68 | 16.15 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.07 | 66.96 | 16.25 | | 150.0 | |
| | | Z | 4.92 | 66.71 | 16.16 | | 150.0 | |
| 10118-CAC | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM) | X | 5.33 | 67.14 | 16.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.48 | 67.43 | 16.49 | | 150.0 | |
| | | Z | 5.30 | 67.16 | 16.39 | | 150.0 | |
| 10119-CAC | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM) | X | 5.06 | 66.97 | 16.22 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.17 | 67.21 | 16.30 | | 150.0 | |
| | | Z | 5.03 | 67.00 | 16.23 | | 150.0 | |
| 10140-CAE | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM) | X | 3.16 | 66.61 | 15.33 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.34 | 67.24 | 15.71 | | 150.0 | |
| | | Z | 3.15 | 66.73 | 15.38 | | 150.0 | |
| 10141-CAE | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM) | X | 3.29 | 66.77 | 15.54 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.47 | 67.35 | 15.89 | | 150.0 | |
| | | Z | 3.28 | 66.89 | 15.60 | | 150.0 | |
| 10142-CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK) | X | 1.67 | 66.50 | 14.13 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.92 | 67.89 | 15.30 | | 150.0 | |
| | | Z | 1.66 | 66.82 | 14.25 | | 150.0 | |
| 10143-CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM) | X | 2.12 | 67.00 | 14.26 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.40 | 68.29 | 15.45 | | 150.0 | |
| | | Z | 2.12 | 67.29 | 14.37 | | 150.0 | |
| 10144-CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM) | X | 1.93 | 64.97 | 12.74 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.20 | 66.19 | 13.93 | | 150.0 | |
| | | Z | 1.91 | 65.07 | 12.74 | | 150.0 | |
| 10145-CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK) | X | 0.85 | 61.55 | 8.62 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.18 | 64.59 | 11.53 | | 150.0 | |
| | | Z | 0.81 | 61.36 | 8.35 | | 150.0 | |
| 10146-CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | X | 1.43 | 63.03 | 9.30 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.05 | 66.66 | 11.93 | | 150.0 | |
| | | Z | 1.41 | 63.09 | 9.27 | | 150.0 | |
| 10147-CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | X | 1.55 | 63.93 | 9.89 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.44 | 68.79 | 13.06 | | 150.0 | |
| | | Z | 1.55 | 64.07 | 9.91 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10149-CAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM) | X | 2.68 | 66.41 | 15.12 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.86 | 67.11 | 15.61 | | 150.0 | |
| | | Z | 2.67 | 66.56 | 15.19 | | 150.0 | |
| 10150-CAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM) | X | 2.81 | 66.48 | 15.22 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.99 | 67.11 | 15.67 | | 150.0 | |
| | | Z | 2.79 | 66.63 | 15.30 | | 150.0 | |
| 10151-CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK) | X | 6.48 | 78.18 | 21.55 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.01 | 81.29 | 22.83 | | 65.0 | |
| | | Z | 6.88 | 78.76 | 21.62 | | 65.0 | |
| 10152-CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM) | X | 5.54 | 73.19 | 19.87 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.50 | 75.55 | 21.00 | | 65.0 | |
| | | Z | 5.81 | 73.69 | 19.94 | | 65.0 | |
| 10153-CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM) | X | 5.95 | 74.31 | 20.74 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.90 | 76.53 | 21.77 | | 65.0 | |
| | | Z | 6.25 | 74.69 | 20.85 | | 65.0 | |
| 10154-CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK) | X | 1.96 | 67.24 | 15.08 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.20 | 68.42 | 15.93 | | 150.0 | |
| | | Z | 1.96 | 67.57 | 15.22 | | 150.0 | |
| 10155-CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) | X | 2.35 | 66.95 | 15.11 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.56 | 67.73 | 15.80 | | 150.0 | |
| | | Z | 2.35 | 67.21 | 15.23 | | 150.0 | |
| 10156-CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK) | X | 1.48 | 66.14 | 13.57 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.76 | 67.88 | 15.05 | | 150.0 | |
| | | Z | 1.48 | 66.45 | 13.67 | | 150.0 | |
| 10157-CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM) | X | 1.72 | 65.00 | 12.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.02 | 66.64 | 13.92 | | 150.0 | |
| | | Z | 1.70 | 65.11 | 12.37 | | 150.0 | |
| 10158-CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM) | X | 2.51 | 67.23 | 15.34 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.72 | 67.93 | 15.97 | | 150.0 | |
| | | Z | 2.51 | 67.50 | 15.46 | | 150.0 | |
| 10159-CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM) | X | 1.80 | 65.32 | 12.61 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.13 | 67.09 | 14.20 | | 150.0 | |
| | | Z | 1.78 | 65.46 | 12.61 | | 150.0 | |
| 10160-CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK) | X | 2.50 | 67.45 | 15.43 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.67 | 68.11 | 15.92 | | 150.0 | |
| | | Z | 2.49 | 67.68 | 15.53 | | 150.0 | |
| 10161-CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM) | X | 2.70 | 66.39 | 15.10 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.88 | 67.04 | 15.60 | | 150.0 | |
| | | Z | 2.69 | 66.55 | 15.18 | | 150.0 | |
| 10162-CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM) | X | 2.81 | 66.59 | 15.25 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.99 | 67.18 | 15.71 | | 150.0 | |
| | | Z | 2.80 | 66.76 | 15.32 | | 150.0 | |
| 10166-CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) | X | 3.42 | 69.15 | 18.92 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.64 | 69.65 | 19.05 | | 150.0 | |
| | | Z | 3.44 | 69.55 | 19.16 | | 150.0 | |
| 10167-CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | X | 4.12 | 71.69 | 19.19 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.58 | 72.87 | 19.63 | | 150.0 | |
| | | Z | 4.19 | 72.21 | 19.45 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10168-CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) | X | 4.64 | 74.28 | 20.71 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.12 | 75.26 | 21.00 | | 150.0 | |
| | | Z | 4.78 | 75.11 | 21.12 | | 150.0 | |
| 10169-CAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK) | X | 2.82 | 68.04 | 18.40 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.10 | 69.64 | 19.05 | | 150.0 | |
| | | Z | 2.85 | 68.47 | 18.67 | | 150.0 | |
| 10170-CAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM) | X | 3.75 | 73.33 | 20.53 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.52 | 76.49 | 21.67 | | 150.0 | |
| | | Z | 3.89 | 74.29 | 21.01 | | 150.0 | |
| 10171-AAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM) | X | 3.09 | 69.27 | 17.71 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.61 | 71.81 | 18.72 | | 150.0 | |
| | | Z | 3.14 | 69.73 | 17.95 | | 150.0 | |
| 10172-CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK) | X | 6.61 | 87.05 | 27.32 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 14.89 | 102.54 | 32.37 | | 65.0 | |
| | | Z | 8.81 | 92.01 | 28.81 | | 65.0 | |
| 10173-CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM) | X | 13.85 | 97.13 | 28.75 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 48.27 | 118.57 | 34.60 | | 65.0 | |
| | | Z | 16.93 | 99.90 | 29.38 | | 65.0 | |
| 10174-CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM) | X | 9.88 | 90.07 | 25.94 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 27.82 | 107.05 | 30.90 | | 65.0 | |
| | | Z | 10.47 | 90.42 | 25.88 | | 65.0 | |
| 10175-CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK) | X | 2.79 | 67.73 | 18.15 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.06 | 69.31 | 18.79 | | 150.0 | |
| | | Z | 2.81 | 68.13 | 18.39 | | 150.0 | |
| 10176-CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM) | X | 3.76 | 73.36 | 20.54 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.52 | 76.52 | 21.68 | | 150.0 | |
| | | Z | 3.90 | 74.31 | 21.02 | | 150.0 | |
| 10177-CAI | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK) | X | 2.81 | 67.88 | 18.24 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.09 | 69.47 | 18.89 | | 150.0 | |
| | | Z | 2.83 | 68.28 | 18.49 | | 150.0 | |
| 10178-CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) | X | 3.73 | 73.16 | 20.43 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.47 | 76.26 | 21.55 | | 150.0 | |
| | | Z | 3.86 | 74.09 | 20.89 | | 150.0 | |
| 10179-CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM) | X | 3.38 | 71.14 | 18.97 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.01 | 73.98 | 20.04 | | 150.0 | |
| | | Z | 3.47 | 71.80 | 19.31 | | 150.0 | |
| 10180-CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) | X | 3.09 | 69.21 | 17.67 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.59 | 71.73 | 18.66 | | 150.0 | |
| | | Z | 3.13 | 69.66 | 17.90 | | 150.0 | |
| 10181-CAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK) | X | 2.80 | 67.86 | 18.23 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.08 | 69.45 | 18.88 | | 150.0 | |
| | | Z | 2.83 | 68.27 | 18.48 | | 150.0 | |
| 10182-CAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) | X | 3.72 | 73.14 | 20.42 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.46 | 76.24 | 21.54 | | 150.0 | |
| | | Z | 3.85 | 74.06 | 20.88 | | 150.0 | |
| 10183-AAD | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | X | 3.08 | 69.19 | 17.66 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.59 | 71.70 | 18.65 | | 150.0 | |
| | | Z | 3.13 | 69.64 | 17.89 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10184-CAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK) | X | 2.81 | 67.90 | 18.25 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.09 | 69.50 | 18.90 | | 150.0 | |
| | | Z | 2.84 | 68.31 | 18.51 | | 150.0 | |
| 10185-CAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM) | X | 3.74 | 73.21 | 20.46 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.48 | 76.32 | 21.58 | | 150.0 | |
| | | Z | 3.87 | 74.14 | 20.92 | | 150.0 | |
| 10186-AAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) | X | 3.10 | 69.25 | 17.69 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.61 | 71.77 | 18.69 | | 150.0 | |
| | | Z | 3.14 | 69.70 | 17.92 | | 150.0 | |
| 10187-CAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK) | X | 2.82 | 67.96 | 18.33 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.10 | 69.55 | 18.97 | | 150.0 | |
| | | Z | 2.85 | 68.38 | 18.58 | | 150.0 | |
| 10188-CAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | X | 3.85 | 73.85 | 20.84 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.65 | 77.08 | 21.99 | | 150.0 | |
| | | Z | 4.01 | 74.87 | 21.34 | | 150.0 | |
| 10189-AAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM) | X | 3.16 | 69.64 | 17.96 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.70 | 72.24 | 18.98 | | 150.0 | |
| | | Z | 3.21 | 70.13 | 18.21 | | 150.0 | |
| 10193-CAC | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK) | X | 4.36 | 66.21 | 15.83 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.50 | 66.48 | 16.00 | | 150.0 | |
| | | Z | 4.33 | 66.27 | 15.85 | | 150.0 | |
| 10194-CAC | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM) | X | 4.52 | 66.50 | 15.96 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.67 | 66.80 | 16.12 | | 150.0 | |
| | | Z | 4.49 | 66.55 | 15.98 | | 150.0 | |
| 10195-CAC | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM) | X | 4.56 | 66.54 | 15.98 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.72 | 66.83 | 16.14 | | 150.0 | |
| | | Z | 4.53 | 66.59 | 16.01 | | 150.0 | |
| 10196-CAC | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK) | X | 4.35 | 66.25 | 15.83 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.51 | 66.54 | 16.02 | | 150.0 | |
| | | Z | 4.33 | 66.30 | 15.86 | | 150.0 | |
| 10197-CAC | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM) | X | 4.53 | 66.52 | 15.97 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.69 | 66.82 | 16.13 | | 150.0 | |
| | | Z | 4.50 | 66.57 | 16.00 | | 150.0 | |
| 10198-CAC | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM) | X | 4.55 | 66.55 | 15.99 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.72 | 66.85 | 16.15 | | 150.0 | |
| | | Z | 4.53 | 66.60 | 16.02 | | 150.0 | |
| 10219-CAC | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK) | X | 4.30 | 66.26 | 15.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.46 | 66.55 | 15.98 | | 150.0 | |
| | | Z | 4.28 | 66.31 | 15.81 | | 150.0 | |
| 10220-CAC | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM) | X | 4.52 | 66.49 | 15.96 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.68 | 66.79 | 16.12 | | 150.0 | |
| | | Z | 4.50 | 66.54 | 15.98 | | 150.0 | |
| 10221-CAC | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM) | X | 4.57 | 66.49 | 15.98 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.73 | 66.78 | 16.14 | | 150.0 | |
| | | Z | 4.54 | 66.54 | 16.01 | | 150.0 | |
| 10222-CAC | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK) | X | 4.92 | 66.67 | 16.14 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.05 | 66.97 | 16.25 | | 150.0 | |
| | | Z | 4.90 | 66.71 | 16.15 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10223-CAC | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM) | X | 5.23 | 66.95 | 16.30 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.35 | 67.15 | 16.36 | | 150.0 | |
| | | Z | 5.20 | 66.98 | 16.32 | | 150.0 | |
| 10224-CAC | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM) | X | 4.96 | 66.78 | 16.11 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.09 | 67.08 | 16.23 | | 150.0 | |
| | | Z | 4.94 | 66.81 | 16.13 | | 150.0 | |
| 10225-CAB | UMTS-FDD (HSPA+) | X | 2.59 | 65.32 | 14.53 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.77 | 65.86 | 15.10 | | 150.0 | |
| | | Z | 2.58 | 65.43 | 14.58 | | 150.0 | |
| 10226-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | X | 15.04 | 98.77 | 29.35 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 55.58 | 121.36 | 35.42 | | 65.0 | |
| | | Z | 18.66 | 101.82 | 30.05 | | 65.0 | |
| 10227-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM) | X | 14.65 | 96.82 | 28.11 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 44.89 | 115.25 | 33.13 | | 65.0 | |
| | | Z | 17.65 | 99.26 | 28.64 | | 65.0 | |
| 10228-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK) | X | 8.97 | 93.60 | 29.69 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 20.04 | 108.84 | 34.33 | | 65.0 | |
| | | Z | 11.30 | 97.46 | 30.72 | | 65.0 | |
| 10229-CAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM) | X | 13.95 | 97.24 | 28.79 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 48.69 | 118.71 | 34.65 | | 65.0 | |
| | | Z | 17.07 | 100.03 | 29.42 | | 65.0 | |
| 10230-CAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) | X | 13.52 | 95.32 | 27.57 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 39.77 | 112.98 | 32.45 | | 65.0 | |
| | | Z | 16.11 | 97.57 | 28.06 | | 65.0 | |
| 10231-CAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK) | X | 8.50 | 92.43 | 29.21 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 18.60 | 107.20 | 33.76 | | 65.0 | |
| | | Z | 10.59 | 96.06 | 30.18 | | 65.0 | |
| 10232-CAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) | X | 13.93 | 97.22 | 28.78 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 48.65 | 118.71 | 34.65 | | 65.0 | |
| | | Z | 17.04 | 100.01 | 29.42 | | 65.0 | |
| 10233-CAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) | X | 13.48 | 95.29 | 27.56 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 39.68 | 112.96 | 32.45 | | 65.0 | |
| | | Z | 16.06 | 97.53 | 28.05 | | 65.0 | |
| 10234-CAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK) | X | 8.15 | 91.43 | 28.75 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 17.44 | 105.69 | 33.19 | | 65.0 | |
| | | Z | 10.04 | 94.83 | 29.66 | | 65.0 | |
| 10235-CAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM) | X | 13.95 | 97.27 | 28.80 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 48.87 | 118.81 | 34.67 | | 65.0 | |
| | | Z | 17.08 | 100.06 | 29.44 | | 65.0 | |
| 10236-CAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM) | X | 13.65 | 95.47 | 27.61 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 40.47 | 113.26 | 32.52 | | 65.0 | |
| | | Z | 16.26 | 97.71 | 28.09 | | 65.0 | |
| 10237-CAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK) | X | 8.52 | 92.50 | 29.23 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 18.71 | 107.36 | 33.81 | | 65.0 | |
| | | Z | 10.61 | 96.14 | 30.21 | | 65.0 | |
| 10238-CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) | X | 13.90 | 97.20 | 28.78 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 48.60 | 118.71 | 34.64 | | 65.0 | |
| | | Z | 17.01 | 99.99 | 29.41 | | 65.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10239-CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | X | 13.44 | 95.25 | 27.55 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 39.57 | 112.94 | 32.44 | | 65.0 | |
| | | Z | 16.01 | 97.50 | 28.04 | | 65.0 | |
| 10240-CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK) | X | 8.49 | 92.45 | 29.22 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 18.64 | 107.29 | 33.79 | | 65.0 | |
| | | Z | 10.58 | 96.09 | 30.20 | | 65.0 | |
| 10241-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | X | 7.99 | 81.31 | 25.53 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 9.43 | 84.22 | 26.74 | | 65.0 | |
| | | Z | 8.52 | 82.35 | 25.81 | | 65.0 | |
| 10242-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) | X | 7.10 | 78.80 | 24.41 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 8.49 | 81.96 | 25.78 | | 65.0 | |
| | | Z | 7.78 | 80.41 | 24.94 | | 65.0 | |
| 10243-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) | X | 5.74 | 75.35 | 23.83 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 6.67 | 78.08 | 25.09 | | 65.0 | |
| | | Z | 6.25 | 76.98 | 24.42 | | 65.0 | |
| 10244-CAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | X | 5.58 | 74.97 | 17.83 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.87 | 80.04 | 20.37 | | 65.0 | |
| | | Z | 5.94 | 75.42 | 17.90 | | 65.0 | |
| 10245-CAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | X | 5.38 | 74.13 | 17.42 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.56 | 79.13 | 19.97 | | 65.0 | |
| | | Z | 5.70 | 74.53 | 17.48 | | 65.0 | |
| 10246-CAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | X | 4.98 | 76.70 | 18.61 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.43 | 84.78 | 22.34 | | 65.0 | |
| | | Z | 5.20 | 76.66 | 18.37 | | 65.0 | |
| 10247-CAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM) | X | 4.65 | 72.79 | 17.74 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.06 | 76.74 | 19.98 | | 65.0 | |
| | | Z | 4.87 | 73.04 | 17.67 | | 65.0 | |
| 10248-CAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM) | X | 4.61 | 72.15 | 17.43 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 5.95 | 75.91 | 19.61 | | 65.0 | |
| | | Z | 4.82 | 72.39 | 17.37 | | 65.0 | |
| 10249-CAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK) | X | 6.54 | 81.39 | 21.52 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 9.88 | 87.89 | 24.33 | | 65.0 | |
| | | Z | 7.04 | 81.83 | 21.45 | | 65.0 | |
| 10250-CAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) | X | 5.68 | 75.92 | 20.95 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.85 | 78.71 | 22.33 | | 65.0 | |
| | | Z | 6.05 | 76.61 | 21.08 | | 65.0 | |
| 10251-CAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM) | X | 5.34 | 73.52 | 19.53 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.39 | 76.13 | 20.91 | | 65.0 | |
| | | Z | 5.61 | 73.99 | 19.58 | | 65.0 | |
| 10252-CAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK) | X | 6.77 | 81.31 | 22.67 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.98 | 85.60 | 24.44 | | 65.0 | |
| | | Z | 7.34 | 82.11 | 22.76 | | 65.0 | |
| 10253-CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM) | X | 5.44 | 72.71 | 19.62 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.32 | 74.91 | 20.72 | | 65.0 | |
| | | Z | 5.70 | 73.20 | 19.69 | | 65.0 | |
| 10254-CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM) | X | 5.80 | 73.72 | 20.38 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.70 | 75.83 | 21.43 | | 65.0 | |
| | | Z | 6.09 | 74.28 | 20.49 | | 65.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10255-CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK) | X | 6.16 | 77.48 | 21.47 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.52 | 80.38 | 22.72 | | 65.0 | |
| | | Z | 6.55 | 78.12 | 21.56 | | 65.0 | |
| 10256-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | X | 3.97 | 69.74 | 14.41 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.06 | 75.59 | 17.59 | | 65.0 | |
| | | Z | 4.16 | 69.90 | 14.37 | | 65.0 | |
| 10257-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | X | 3.82 | 68.88 | 13.90 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 5.74 | 74.42 | 17.02 | | 65.0 | |
| | | Z | 3.99 | 69.02 | 13.87 | | 65.0 | |
| 10258-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK) | X | 3.39 | 70.65 | 15.07 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.10 | 79.09 | 19.42 | | 65.0 | |
| | | Z | 3.50 | 70.44 | 14.78 | | 65.0 | |
| 10259-CAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM) | X | 5.07 | 74.05 | 18.94 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.37 | 77.46 | 20.82 | | 65.0 | |
| | | Z | 5.35 | 74.45 | 18.94 | | 65.0 | |
| 10260-CAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM) | X | 5.09 | 73.73 | 18.81 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.36 | 77.06 | 20.66 | | 65.0 | |
| | | Z | 5.35 | 74.12 | 18.80 | | 65.0 | |
| 10261-CAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK) | X | 6.26 | 80.39 | 21.64 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.74 | 85.57 | 23.93 | | 65.0 | |
| | | Z | 6.76 | 81.00 | 21.65 | | 65.0 | |
| 10262-CAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | X | 5.67 | 75.84 | 20.90 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.84 | 78.65 | 22.29 | | 65.0 | |
| | | Z | 6.03 | 76.53 | 21.02 | | 65.0 | |
| 10263-CAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) | X | 5.33 | 73.49 | 19.52 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.38 | 76.11 | 20.90 | | 65.0 | |
| | | Z | 5.60 | 73.97 | 19.57 | | 65.0 | |
| 10264-CAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | X | 6.69 | 81.07 | 22.55 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.87 | 85.35 | 24.33 | | 65.0 | |
| | | Z | 7.25 | 81.85 | 22.64 | | 65.0 | |
| 10265-CAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | X | 5.54 | 73.19 | 19.88 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.49 | 75.55 | 21.00 | | 65.0 | |
| | | Z | 5.81 | 73.69 | 19.95 | | 65.0 | |
| 10266-CAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM) | X | 5.94 | 74.29 | 20.73 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.90 | 76.51 | 21.76 | | 65.0 | |
| | | Z | 6.24 | 74.87 | 20.84 | | 65.0 | |
| 10267-CAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | X | 6.46 | 78.13 | 21.53 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.99 | 81.24 | 22.81 | | 65.0 | |
| | | Z | 6.86 | 78.71 | 21.60 | | 65.0 | |
| 10268-CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM) | X | 6.17 | 73.14 | 20.30 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.04 | 75.12 | 21.19 | | 65.0 | |
| | | Z | 6.43 | 73.63 | 20.40 | | 65.0 | |
| 10269-CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM) | X | 6.16 | 72.73 | 20.18 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.97 | 74.62 | 21.04 | | 65.0 | |
| | | Z | 6.41 | 73.22 | 20.27 | | 65.0 | |
| 10270-CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | X | 6.28 | 75.29 | 20.55 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.36 | 77.58 | 21.50 | | 65.0 | |
| | | Z | 6.58 | 75.77 | 20.61 | | 65.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10274-CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10) | X | 2.39 | 65.58 | 14.37 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.54 | 66.14 | 14.96 | | 150.0 | |
| | | Z | 2.37 | 65.73 | 14.43 | | 150.0 | |
| 10275-CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4) | X | 1.36 | 65.75 | 13.87 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.54 | 67.06 | 14.96 | | 150.0 | |
| | | Z | 1.35 | 66.07 | 14.00 | | 150.0 | |
| 10277-CAA | PHS (QPSK) | X | 2.12 | 61.32 | 6.97 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 2.40 | 62.62 | 8.13 | | 50.0 | |
| | | Z | 2.36 | 61.74 | 7.42 | | 50.0 | |
| 10278-CAA | PHS (QPSK, BW 884MHz, Rolloff 0.5) | X | 4.20 | 70.41 | 14.35 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 9.00 | 82.55 | 20.06 | | 50.0 | |
| | | Z | 4.22 | 69.72 | 14.05 | | 50.0 | |
| 10279-CAA | PHS (QPSK, BW 884MHz, Rolloff 0.38) | X | 4.32 | 70.71 | 14.54 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 9.21 | 82.81 | 20.21 | | 50.0 | |
| | | Z | 4.33 | 69.98 | 14.22 | | 50.0 | |
| 10290-AAB | CDMA2000, RC1, SO55, Full Rate | X | 0.93 | 63.86 | 10.31 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.32 | 67.34 | 13.23 | | 150.0 | |
| | | Z | 0.90 | 63.80 | 10.11 | | 150.0 | |
| 10291-AAB | CDMA2000, RC3, SO55, Full Rate | X | 0.54 | 61.76 | 8.75 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.76 | 64.54 | 11.66 | | 150.0 | |
| | | Z | 0.51 | 61.58 | 8.42 | | 150.0 | |
| 10292-AAB | CDMA2000, RC3, SO32, Full Rate | X | 0.60 | 63.50 | 10.03 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.91 | 67.80 | 13.68 | | 150.0 | |
| | | Z | 0.57 | 63.42 | 9.74 | | 150.0 | |
| 10293-AAB | CDMA2000, RC3, SO3, Full Rate | X | 0.78 | 66.43 | 11.98 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.31 | 72.81 | 16.39 | | 150.0 | |
| | | Z | 0.78 | 66.82 | 11.92 | | 150.0 | |
| 10295-AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr. | X | 11.88 | 88.43 | 24.43 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 11.50 | 90.15 | 26.20 | | 50.0 | |
| | | Z | 10.98 | 86.07 | 23.41 | | 50.0 | |
| 10297-AAD | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK) | X | 2.43 | 67.97 | 15.50 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.67 | 69.10 | 16.18 | | 150.0 | |
| | | Z | 2.43 | 68.26 | 15.63 | | 150.0 | |
| 10298-AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | X | 1.14 | 64.11 | 11.26 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.48 | 66.77 | 13.58 | | 150.0 | |
| | | Z | 1.12 | 64.18 | 11.18 | | 150.0 | |
| 10299-AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | X | 2.05 | 66.66 | 12.29 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.75 | 69.90 | 14.39 | | 150.0 | |
| | | Z | 2.12 | 67.25 | 12.55 | | 150.0 | |
| 10300-AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | X | 1.61 | 63.18 | 9.81 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.03 | 65.31 | 11.51 | | 150.0 | |
| | | Z | 1.60 | 63.28 | 9.82 | | 150.0 | |
| 10301-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC) | X | 4.73 | 65.80 | 17.42 | 4.17 | 50.0 | ± 9.6 % |
| | | Y | 4.94 | 66.02 | 17.64 | | 50.0 | |
| | | Z | 4.79 | 66.07 | 17.49 | | 50.0 | |
| 10302-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols) | X | 5.13 | 65.96 | 17.87 | 4.96 | 50.0 | ± 9.6 % |
| | | Y | 5.34 | 66.38 | 18.24 | | 50.0 | |
| | | Z | 5.17 | 66.19 | 17.94 | | 50.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10303-AAA | IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC) | X | 4.89 | 65.63 | 17.69 | 4.96 | 50.0 | ± 9.6 % |
| | | Y | 5.10 | 66.07 | 18.10 | | 50.0 | |
| | | Z | 4.94 | 65.90 | 17.78 | | 50.0 | |
| 10304-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC) | X | 4.68 | 65.44 | 17.16 | 4.17 | 50.0 | ± 9.6 % |
| | | Y | 4.89 | 65.86 | 17.54 | | 50.0 | |
| | | Z | 4.72 | 65.67 | 17.23 | | 50.0 | |
| 10305-AAA | IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols) | X | 4.58 | 68.65 | 19.65 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.67 | 68.59 | 20.11 | | 35.0 | |
| | | Z | 4.89 | 70.03 | 20.21 | | 35.0 | |
| 10306-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols) | X | 4.78 | 67.22 | 19.17 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.91 | 67.24 | 19.51 | | 35.0 | |
| | | Z | 4.95 | 68.05 | 19.51 | | 35.0 | |
| 10307-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols) | X | 4.69 | 67.41 | 19.13 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.83 | 67.50 | 19.52 | | 35.0 | |
| | | Z | 4.89 | 68.35 | 19.52 | | 35.0 | |
| 10308-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC) | X | 4.68 | 67.67 | 19.30 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.81 | 67.73 | 19.67 | | 35.0 | |
| | | Z | 4.89 | 68.67 | 19.70 | | 35.0 | |
| 10309-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols) | X | 4.82 | 67.40 | 19.30 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.97 | 67.49 | 19.67 | | 35.0 | |
| | | Z | 5.00 | 68.23 | 19.64 | | 35.0 | |
| 10310-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols) | X | 4.74 | 67.32 | 19.16 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 4.86 | 67.33 | 19.50 | | 35.0 | |
| | | Z | 4.92 | 68.20 | 19.52 | | 35.0 | |
| 10311-AAD | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | X | 2.77 | 67.31 | 15.25 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.02 | 68.45 | 15.87 | | 150.0 | |
| | | Z | 2.78 | 67.57 | 15.37 | | 150.0 | |
| 10313-AAA | iDEN 1:3 | X | 3.38 | 72.32 | 15.61 | 6.99 | 70.0 | ± 9.6 % |
| | | Y | 6.56 | 80.70 | 19.09 | | 70.0 | |
| | | Z | 3.52 | 71.67 | 15.12 | | 70.0 | |
| 10314-AAA | iDEN 1:6 | X | 5.50 | 81.58 | 21.98 | 10.00 | 30.0 | ± 9.6 % |
| | | Y | 11.01 | 93.51 | 26.47 | | 30.0 | |
| | | Z | 5.77 | 80.74 | 21.31 | | 30.0 | |
| 10315-AAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle) | X | 0.96 | 62.54 | 14.02 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 1.06 | 63.49 | 14.83 | | 150.0 | |
| | | Z | 0.95 | 62.82 | 14.19 | | 150.0 | |
| 10316-AAB | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle) | X | 4.42 | 66.30 | 16.01 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 4.57 | 66.59 | 16.18 | | 150.0 | |
| | | Z | 4.40 | 66.35 | 16.03 | | 150.0 | |
| 10317-AAC | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle) | X | 4.42 | 66.30 | 16.01 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 4.57 | 66.59 | 16.18 | | 150.0 | |
| | | Z | 4.40 | 66.35 | 16.03 | | 150.0 | |
| 10400-AAD | IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle) | X | 4.50 | 66.54 | 15.95 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.67 | 66.85 | 16.11 | | 150.0 | |
| | | Z | 4.47 | 66.59 | 15.97 | | 150.0 | |
| 10401-AAD | IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle) | X | 5.27 | 66.91 | 16.25 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.36 | 67.03 | 16.28 | | 150.0 | |
| | | Z | 5.24 | 66.92 | 16.25 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10402-AAD | IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle) | X | 5.48 | 67.05 | 16.19 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.61 | 67.38 | 16.31 | | 150.0 | |
| | | Z | 5.45 | 67.08 | 16.20 | | 150.0 | |
| 10403-AAB | CDMA2000 (1xEV-DO, Rev. 0) | X | 0.93 | 63.86 | 10.31 | 0.00 | 115.0 | ± 9.6 % |
| | | Y | 1.32 | 67.34 | 13.23 | | 115.0 | |
| | | Z | 0.90 | 63.80 | 10.11 | | 115.0 | |
| 10404-AAB | CDMA2000 (1xEV-DO, Rev. A) | X | 0.93 | 63.86 | 10.31 | 0.00 | 115.0 | ± 9.6 % |
| | | Y | 1.32 | 67.34 | 13.23 | | 115.0 | |
| | | Z | 0.90 | 63.80 | 10.11 | | 115.0 | |
| 10406-AAB | CDMA2000, RC3, SO32, SCH0, Full Rate | X | 23.71 | 102.36 | 25.63 | 0.00 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 119.74 | 29.53 | | 100.0 | |
| | | Z | 100.00 | 122.04 | 30.37 | | 100.0 | |
| 10410-AAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4) | X | 100.00 | 124.47 | 31.30 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 122.62 | 30.76 | | 80.0 | |
| | | Z | 100.00 | 123.15 | 30.75 | | 80.0 | |
| 10415-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle) | X | 0.90 | 61.77 | 13.43 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.98 | 62.53 | 14.15 | | 150.0 | |
| | | Z | 0.87 | 61.91 | 13.55 | | 150.0 | |
| 10416-AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle) | X | 4.36 | 66.25 | 15.90 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.50 | 66.52 | 16.06 | | 150.0 | |
| | | Z | 4.33 | 66.30 | 15.93 | | 150.0 | |
| 10417-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle) | X | 4.36 | 66.25 | 15.90 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.50 | 66.52 | 16.06 | | 150.0 | |
| | | Z | 4.33 | 66.30 | 15.93 | | 150.0 | |
| 10418-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule) | X | 4.35 | 66.41 | 15.93 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.49 | 66.67 | 16.08 | | 150.0 | |
| | | Z | 4.33 | 66.46 | 15.95 | | 150.0 | |
| 10419-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule) | X | 4.37 | 66.36 | 15.93 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.51 | 66.62 | 16.08 | | 150.0 | |
| | | Z | 4.34 | 66.41 | 15.95 | | 150.0 | |
| 10422-AAB | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK) | X | 4.48 | 66.36 | 15.95 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.63 | 66.63 | 16.10 | | 150.0 | |
| | | Z | 4.46 | 66.41 | 15.98 | | 150.0 | |
| 10423-AAB | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM) | X | 4.63 | 66.65 | 16.06 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.80 | 66.95 | 16.22 | | 150.0 | |
| | | Z | 4.60 | 66.70 | 16.08 | | 150.0 | |
| 10424-AAB | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM) | X | 4.55 | 66.60 | 16.03 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.72 | 66.90 | 16.19 | | 150.0 | |
| | | Z | 4.53 | 66.65 | 16.05 | | 150.0 | |
| 10425-AAB | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK) | X | 5.18 | 66.94 | 16.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.31 | 67.20 | 16.36 | | 150.0 | |
| | | Z | 5.16 | 66.97 | 16.29 | | 150.0 | |
| 10426-AAB | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM) | X | 5.21 | 67.05 | 16.32 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.31 | 67.21 | 16.37 | | 150.0 | |
| | | Z | 5.18 | 67.08 | 16.34 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10427-AAB | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM) | X | 5.20 | 66.95 | 16.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.33 | 67.21 | 16.36 | | 150.0 | |
| | | Z | 5.17 | 66.98 | 16.28 | | 150.0 | |
| 10430-AAD | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1) | X | 4.03 | 70.50 | 17.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.20 | 70.46 | 17.93 | | 150.0 | |
| | | Z | 4.08 | 70.95 | 17.91 | | 150.0 | |
| 10431-AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1) | X | 3.99 | 66.70 | 15.76 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.18 | 67.03 | 16.04 | | 150.0 | |
| | | Z | 3.97 | 66.77 | 15.79 | | 150.0 | |
| 10432-AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1) | X | 4.31 | 66.62 | 15.93 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.49 | 66.93 | 16.13 | | 150.0 | |
| | | Z | 4.29 | 66.68 | 15.96 | | 150.0 | |
| 10433-AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1) | X | 4.57 | 66.63 | 16.05 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.73 | 66.93 | 16.21 | | 150.0 | |
| | | Z | 4.54 | 66.68 | 16.07 | | 150.0 | |
| 10434-AAA | W-CDMA (BS Test Model 1, 64 DPCH) | X | 4.08 | 71.14 | 17.46 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.29 | 71.27 | 17.88 | | 150.0 | |
| | | Z | 4.15 | 71.66 | 17.70 | | 150.0 | |
| 10435-AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 124.23 | 31.18 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 122.40 | 30.66 | | 80.0 | |
| | | Z | 100.00 | 122.90 | 30.63 | | 80.0 | |
| 10447-AAD | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%) | X | 3.22 | 66.37 | 14.70 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.47 | 66.95 | 15.33 | | 150.0 | |
| | | Z | 3.21 | 66.48 | 14.73 | | 150.0 | |
| 10448-AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%) | X | 3.84 | 66.47 | 15.61 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.02 | 66.80 | 15.90 | | 150.0 | |
| | | Z | 3.82 | 66.55 | 15.65 | | 150.0 | |
| 10449-AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%) | X | 4.13 | 66.43 | 15.81 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.30 | 66.75 | 16.02 | | 150.0 | |
| | | Z | 4.11 | 66.50 | 15.84 | | 150.0 | |
| 10450-AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | X | 4.34 | 66.38 | 15.88 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.49 | 66.69 | 16.06 | | 150.0 | |
| | | Z | 4.32 | 66.44 | 15.91 | | 150.0 | |
| 10451-AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%) | X | 3.06 | 66.27 | 14.09 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.35 | 67.09 | 14.93 | | 150.0 | |
| | | Z | 3.04 | 66.36 | 14.10 | | 150.0 | |
| 10456-AAB | IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle) | X | 6.11 | 67.61 | 16.51 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.17 | 67.77 | 16.53 | | 150.0 | |
| | | Z | 6.08 | 67.64 | 16.52 | | 150.0 | |
| 10457-AAA | UMTS-FDD (DC-HSDPA) | X | 3.66 | 64.92 | 15.60 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.76 | 65.17 | 15.77 | | 150.0 | |
| | | Z | 3.64 | 64.96 | 15.63 | | 150.0 | |
| 10458-AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers) | X | 3.65 | 69.96 | 16.50 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.92 | 70.48 | 17.26 | | 150.0 | |
| | | Z | 3.69 | 70.37 | 16.67 | | 150.0 | |
| 10459-AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers) | X | 4.93 | 68.53 | 17.94 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.04 | 68.13 | 17.95 | | 150.0 | |
| | | Z | 4.94 | 68.79 | 18.08 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10460-AAA | UMTS-FDD (WCDMA, AMR) | X | 0.69 | 64.85 | 13.41 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.82 | 66.61 | 15.04 | | 150.0 | |
| | | Z | 0.68 | 65.44 | 13.67 | | 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 | 128.32 | 33.15 | 3.29 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 127.78 | 33.19 | | 80.0 | |
| | | Z | 100.00 | 127.47 | 32.80 | | 80.0 | |
| 10462-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.83 | 71.29 | 13.71 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 47.63 | 99.29 | 21.71 | | 80.0 | |
| | | Z | 3.49 | 72.89 | 14.14 | | 80.0 | |
| 10463-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.34 | 63.29 | 9.90 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.65 | 72.27 | 13.56 | | 80.0 | |
| | | Z | 1.40 | 63.38 | 9.84 | | 80.0 | |
| 10464-AAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 125.34 | 31.61 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 125.18 | 31.81 | | 80.0 | |
| | | Z | 100.00 | 124.45 | 31.24 | | 80.0 | |
| 10465-AAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.15 | 68.45 | 12.57 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 13.95 | 86.70 | 18.48 | | 80.0 | |
| | | Z | 2.45 | 69.33 | 12.78 | | 80.0 | |
| 10466-AAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.23 | 62.47 | 9.47 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 2.69 | 69.32 | 12.45 | | 80.0 | |
| | | Z | 1.28 | 62.54 | 9.41 | | 80.0 | |
| 10467-AAE | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 125.68 | 31.76 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 125.47 | 31.94 | | 80.0 | |
| | | Z | 100.00 | 124.79 | 31.39 | | 80.0 | |
| 10468-AAE | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.30 | 69.17 | 12.87 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 18.23 | 89.46 | 19.24 | | 80.0 | |
| | | Z | 2.67 | 70.20 | 13.13 | | 80.0 | |
| 10469-AAE | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.23 | 62.50 | 9.48 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 2.71 | 69.39 | 12.47 | | 80.0 | |
| | | Z | 1.28 | 62.56 | 9.42 | | 80.0 | |
| 10470-AAE | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 125.71 | 31.76 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 125.51 | 31.95 | | 80.0 | |
| | | Z | 100.00 | 124.82 | 31.39 | | 80.0 | |
| 10471-AAE | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.28 | 69.06 | 12.82 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 17.83 | 89.19 | 19.15 | | 80.0 | |
| | | Z | 2.63 | 70.06 | 13.07 | | 80.0 | |
| 10472-AAE | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.23 | 62.45 | 9.44 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 2.68 | 69.28 | 12.41 | | 80.0 | |
| | | Z | 1.27 | 62.51 | 9.38 | | 80.0 | |
| 10473-AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 125.67 | 31.74 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 125.47 | 31.93 | | 80.0 | |
| | | Z | 100.00 | 124.78 | 31.37 | | 80.0 | |
| 10474-AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.26 | 68.99 | 12.79 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 17.40 | 88.96 | 19.09 | | 80.0 | |
| | | Z | 2.61 | 69.98 | 13.04 | | 80.0 | |
| 10475-AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.22 | 62.42 | 9.43 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 2.66 | 69.22 | 12.39 | | 80.0 | |
| | | Z | 1.27 | 62.49 | 9.37 | | 80.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10477-AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.14 | 68.42 | 12.54 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 14.17 | 86.82 | 18.49 | | 80.0 | |
| | | Z | 2.44 | 69.28 | 12.75 | | 80.0 | |
| 10478-AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.22 | 62.38 | 9.40 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 2.63 | 69.09 | 12.34 | | 80.0 | |
| | | Z | 1.27 | 62.44 | 9.34 | | 80.0 | |
| 10479-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 15.11 | 97.09 | 26.21 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 12.10 | 93.46 | 25.55 | | 80.0 | |
| | | Z | 38.37 | 110.42 | 29.58 | | 80.0 | |
| 10480-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 9.61 | 84.26 | 20.21 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 14.04 | 89.42 | 22.30 | | 80.0 | |
| | | Z | 15.37 | 89.79 | 21.73 | | 80.0 | |
| 10481-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 6.33 | 78.18 | 17.80 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 10.33 | 84.45 | 20.38 | | 80.0 | |
| | | Z | 8.49 | 81.43 | 18.75 | | 80.0 | |
| 10482-AAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 2.20 | 68.13 | 14.46 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.86 | 75.47 | 18.31 | | 80.0 | |
| | | Z | 2.32 | 68.53 | 14.44 | | 80.0 | |
| 10483-AAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.94 | 72.08 | 15.81 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 6.10 | 77.87 | 18.68 | | 80.0 | |
| | | Z | 4.69 | 74.04 | 16.46 | | 80.0 | |
| 10484-AAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.59 | 70.66 | 15.24 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.50 | 76.23 | 18.09 | | 80.0 | |
| | | Z | 4.13 | 72.24 | 15.78 | | 80.0 | |
| 10485-AAE | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 2.81 | 71.31 | 17.01 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.05 | 76.26 | 19.56 | | 80.0 | |
| | | Z | 3.07 | 72.32 | 17.25 | | 80.0 | |
| 10486-AAE | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.69 | 67.30 | 14.67 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.62 | 71.13 | 17.00 | | 80.0 | |
| | | Z | 2.79 | 67.68 | 14.70 | | 80.0 | |
| 10487-AAE | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.69 | 66.94 | 14.49 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.59 | 70.63 | 16.77 | | 80.0 | |
| | | Z | 2.79 | 67.28 | 14.51 | | 80.0 | |
| 10488-AAE | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.20 | 71.23 | 17.95 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.09 | 74.48 | 19.52 | | 80.0 | |
| | | Z | 3.44 | 72.19 | 18.22 | | 80.0 | |
| 10489-AAE | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.19 | 68.15 | 16.61 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.75 | 70.12 | 17.77 | | 80.0 | |
| | | Z | 3.33 | 68.73 | 16.77 | | 80.0 | |
| 10490-AAE | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.28 | 68.03 | 16.57 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.83 | 69.89 | 17.68 | | 80.0 | |
| | | Z | 3.42 | 68.57 | 16.72 | | 80.0 | |
| 10491-AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.47 | 69.98 | 17.63 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.18 | 72.43 | 18.81 | | 80.0 | |
| | | Z | 3.65 | 70.68 | 17.84 | | 80.0 | |
| 10492-AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.56 | 67.59 | 16.77 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.04 | 69.12 | 17.62 | | 80.0 | |
| | | Z | 3.68 | 68.07 | 16.91 | | 80.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10493-AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.63 | 67.49 | 16.73 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.10 | 68.96 | 17.56 | | 80.0 | |
| | | Z | 3.75 | 67.94 | 16.87 | | 80.0 | |
| 10494-AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.72 | 71.28 | 18.04 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.63 | 74.24 | 19.37 | | 80.0 | |
| | | Z | 3.95 | 72.06 | 18.26 | | 80.0 | |
| 10495-AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.59 | 67.91 | 16.97 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.08 | 69.56 | 17.83 | | 80.0 | |
| | | Z | 3.72 | 68.41 | 17.12 | | 80.0 | |
| 10496-AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.67 | 67.69 | 16.91 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.15 | 69.22 | 17.72 | | 80.0 | |
| | | Z | 3.79 | 68.17 | 17.06 | | 80.0 | |
| 10497-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 1.40 | 62.76 | 10.76 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 2.78 | 70.82 | 15.49 | | 80.0 | |
| | | Z | 1.41 | 62.63 | 10.52 | | 80.0 | |
| 10498-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.30 | 60.00 | 8.24 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 1.93 | 63.62 | 11.21 | | 80.0 | |
| | | Z | 1.31 | 60.00 | 8.10 | | 80.0 | |
| 10499-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.32 | 60.00 | 8.09 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 1.85 | 62.92 | 10.72 | | 80.0 | |
| | | Z | 1.33 | 60.00 | 7.96 | | 80.0 | |
| 10500-AAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 2.94 | 71.14 | 17.35 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.96 | 75.06 | 19.38 | | 80.0 | |
| | | Z | 3.19 | 72.12 | 17.60 | | 80.0 | |
| 10501-AAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.94 | 67.88 | 15.52 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.68 | 70.73 | 17.29 | | 80.0 | |
| | | Z | 3.07 | 68.36 | 15.62 | | 80.0 | |
| 10502-AAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.98 | 67.72 | 15.39 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.73 | 70.54 | 17.15 | | 80.0 | |
| | | Z | 3.11 | 68.17 | 15.47 | | 80.0 | |
| 10503-AAE | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.16 | 71.03 | 17.84 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.04 | 74.26 | 19.42 | | 80.0 | |
| | | Z | 3.39 | 71.96 | 18.11 | | 80.0 | |
| 10504-AAE | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.18 | 68.05 | 16.55 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.73 | 70.03 | 17.71 | | 80.0 | |
| | | Z | 3.31 | 68.62 | 16.70 | | 80.0 | |
| 10505-AAE | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.26 | 67.93 | 16.51 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.81 | 69.79 | 17.62 | | 80.0 | |
| | | Z | 3.40 | 68.47 | 16.66 | | 80.0 | |
| 10506-AAE | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.69 | 71.13 | 17.96 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.59 | 74.08 | 19.29 | | 80.0 | |
| | | Z | 3.91 | 71.90 | 18.18 | | 80.0 | |
| 10507-AAE | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.57 | 67.84 | 16.93 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.07 | 69.50 | 17.79 | | 80.0 | |
| | | Z | 3.70 | 68.34 | 17.08 | | 80.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10508-AAE | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.66 | 67.62 | 16.87 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.13 | 69.15 | 17.68 | | 80.0 | |
| | | Z | 3.78 | 68.09 | 17.01 | | 80.0 | |
| 10509-AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.07 | 70.10 | 17.58 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.81 | 72.40 | 18.61 | | 80.0 | |
| | | Z | 4.24 | 70.66 | 17.74 | | 80.0 | |
| 10510-AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.06 | 67.64 | 16.99 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.53 | 69.10 | 17.70 | | 80.0 | |
| | | Z | 4.18 | 68.05 | 17.12 | | 80.0 | |
| 10511-AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.13 | 67.44 | 16.95 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.57 | 68.80 | 17.62 | | 80.0 | |
| | | Z | 4.24 | 67.84 | 17.07 | | 80.0 | |
| 10512-AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.19 | 71.38 | 17.95 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.15 | 74.31 | 19.22 | | 80.0 | |
| | | Z | 4.41 | 72.04 | 18.13 | | 80.0 | |
| 10513-AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.95 | 67.83 | 17.07 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.43 | 69.43 | 17.84 | | 80.0 | |
| | | Z | 4.06 | 68.27 | 17.20 | | 80.0 | |
| 10514-AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.98 | 67.48 | 16.97 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.43 | 68.95 | 17.69 | | 80.0 | |
| | | Z | 4.09 | 67.89 | 17.10 | | 80.0 | |
| 10515-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle) | X | 0.85 | 61.86 | 13.41 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.94 | 62.67 | 14.18 | | 150.0 | |
| | | Z | 0.83 | 62.02 | 13.54 | | 150.0 | |
| 10516-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle) | X | 0.40 | 65.39 | 13.06 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.51 | 67.47 | 15.37 | | 150.0 | |
| | | Z | 0.40 | 66.64 | 13.51 | | 150.0 | |
| 10517-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle) | X | 0.68 | 62.98 | 13.39 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.78 | 64.16 | 14.53 | | 150.0 | |
| | | Z | 0.66 | 63.30 | 13.59 | | 150.0 | |
| 10518-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle) | X | 4.35 | 66.32 | 15.88 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.50 | 66.59 | 16.04 | | 150.0 | |
| | | Z | 4.32 | 66.37 | 15.90 | | 150.0 | |
| 10519-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) | X | 4.51 | 66.53 | 15.99 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.68 | 66.83 | 16.16 | | 150.0 | |
| | | Z | 4.49 | 66.58 | 16.02 | | 150.0 | |
| 10520-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) | X | 4.37 | 66.46 | 15.90 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.53 | 66.78 | 16.08 | | 150.0 | |
| | | Z | 4.34 | 66.52 | 15.92 | | 150.0 | |
| 10521-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) | X | 4.30 | 66.44 | 15.87 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.47 | 66.77 | 16.06 | | 150.0 | |
| | | Z | 4.28 | 66.49 | 15.90 | | 150.0 | |
| 10522-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) | X | 4.36 | 66.57 | 15.98 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.53 | 66.86 | 16.15 | | 150.0 | |
| | | Z | 4.34 | 66.63 | 16.01 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10523-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) | X | 4.25 | 66.45 | 15.83 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.41 | 66.73 | 15.99 | | 150.0 | |
| | | Z | 4.23 | 66.51 | 15.86 | | 150.0 | |
| 10524-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) | X | 4.30 | 66.49 | 15.94 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.47 | 66.78 | 16.11 | | 150.0 | |
| | | Z | 4.28 | 66.54 | 15.97 | | 150.0 | |
| 10525-AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) | X | 4.31 | 65.55 | 15.55 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.45 | 65.83 | 15.71 | | 150.0 | |
| | | Z | 4.29 | 65.60 | 15.58 | | 150.0 | |
| 10526-AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) | X | 4.45 | 65.87 | 15.68 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.62 | 66.20 | 15.85 | | 150.0 | |
| | | Z | 4.43 | 65.93 | 15.71 | | 150.0 | |
| 10527-AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) | X | 4.38 | 65.82 | 15.61 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.54 | 66.15 | 15.79 | | 150.0 | |
| | | Z | 4.36 | 65.88 | 15.64 | | 150.0 | |
| 10528-AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) | X | 4.39 | 65.84 | 15.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.56 | 66.17 | 15.82 | | 150.0 | |
| | | Z | 4.37 | 65.90 | 15.67 | | 150.0 | |
| 10529-AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) | X | 4.39 | 65.84 | 15.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.56 | 66.17 | 15.82 | | 150.0 | |
| | | Z | 4.37 | 65.90 | 15.67 | | 150.0 | |
| 10531-AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) | X | 4.37 | 65.90 | 15.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.55 | 66.27 | 15.83 | | 150.0 | |
| | | Z | 4.35 | 65.96 | 15.67 | | 150.0 | |
| 10532-AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) | X | 4.24 | 65.74 | 15.56 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.41 | 66.12 | 15.76 | | 150.0 | |
| | | Z | 4.22 | 65.81 | 15.59 | | 150.0 | |
| 10533-AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) | X | 4.40 | 65.90 | 15.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.57 | 66.22 | 15.81 | | 150.0 | |
| | | Z | 4.38 | 65.96 | 15.67 | | 150.0 | |
| 10534-AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle) | X | 4.95 | 65.98 | 15.77 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.09 | 66.30 | 15.90 | | 150.0 | |
| | | Z | 4.93 | 66.02 | 15.79 | | 150.0 | |
| 10535-AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle) | X | 5.02 | 66.17 | 15.86 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.15 | 66.46 | 15.97 | | 150.0 | |
| | | Z | 4.99 | 66.21 | 15.88 | | 150.0 | |
| 10536-AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle) | X | 4.89 | 66.11 | 15.80 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.02 | 66.41 | 15.93 | | 150.0 | |
| | | Z | 4.87 | 66.16 | 15.83 | | 150.0 | |
| 10537-AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle) | X | 4.95 | 66.07 | 15.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.08 | 66.38 | 15.92 | | 150.0 | |
| | | Z | 4.92 | 66.12 | 15.81 | | 150.0 | |
| 10538-AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle) | X | 5.03 | 66.09 | 15.84 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.17 | 66.41 | 15.97 | | 150.0 | |
| | | Z | 5.00 | 66.13 | 15.86 | | 150.0 | |
| 10540-AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle) | X | 4.96 | 66.07 | 15.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.10 | 66.42 | 15.99 | | 150.0 | |
| | | Z | 4.94 | 66.11 | 15.87 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10541-AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle) | X | 4.94 | 65.96 | 15.78 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.08 | 66.30 | 15.92 | | 150.0 | |
| | | Z | 4.91 | 66.00 | 15.80 | | 150.0 | |
| 10542-AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle) | X | 5.09 | 66.06 | 15.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.23 | 66.37 | 15.97 | | 150.0 | |
| | | Z | 5.07 | 66.10 | 15.87 | | 150.0 | |
| 10543-AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle) | X | 5.16 | 66.09 | 15.89 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.31 | 66.40 | 16.01 | | 150.0 | |
| | | Z | 5.13 | 66.12 | 15.91 | | 150.0 | |
| 10544-AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle) | X | 5.29 | 66.10 | 15.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.40 | 66.43 | 15.90 | | 150.0 | |
| | | Z | 5.26 | 66.14 | 15.80 | | 150.0 | |
| 10545-AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle) | X | 5.48 | 66.56 | 15.97 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.58 | 66.80 | 16.04 | | 150.0 | |
| | | Z | 5.46 | 66.60 | 15.98 | | 150.0 | |
| 10546-AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle) | X | 5.33 | 66.26 | 15.83 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.46 | 66.63 | 15.97 | | 150.0 | |
| | | Z | 5.31 | 66.29 | 15.85 | | 150.0 | |
| 10547-AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle) | X | 5.41 | 66.34 | 15.87 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.53 | 66.66 | 15.98 | | 150.0 | |
| | | Z | 5.38 | 66.37 | 15.88 | | 150.0 | |
| 10548-AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle) | X | 5.63 | 67.21 | 16.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.74 | 67.47 | 16.35 | | 150.0 | |
| | | Z | 5.61 | 67.23 | 16.28 | | 150.0 | |
| 10550-AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle) | X | 5.38 | 66.38 | 15.91 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.49 | 66.64 | 15.98 | | 150.0 | |
| | | Z | 5.36 | 66.42 | 15.92 | | 150.0 | |
| 10551-AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle) | X | 5.36 | 66.32 | 15.84 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.50 | 66.68 | 15.97 | | 150.0 | |
| | | Z | 5.34 | 66.35 | 15.85 | | 150.0 | |
| 10552-AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle) | X | 5.29 | 66.17 | 15.76 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.41 | 66.50 | 15.88 | | 150.0 | |
| | | Z | 5.27 | 66.20 | 15.78 | | 150.0 | |
| 10553-AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle) | X | 5.36 | 66.18 | 15.80 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.50 | 66.54 | 15.93 | | 150.0 | |
| | | Z | 5.34 | 66.21 | 15.81 | | 150.0 | |
| 10554-AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle) | X | 5.71 | 66.48 | 15.89 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.80 | 66.79 | 15.99 | | 150.0 | |
| | | Z | 5.68 | 66.51 | 15.90 | | 150.0 | |
| 10555-AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle) | X | 5.83 | 66.77 | 16.02 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.92 | 67.07 | 16.11 | | 150.0 | |
| | | Z | 5.80 | 66.80 | 16.03 | | 150.0 | |
| 10556-AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle) | X | 5.85 | 66.83 | 16.04 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.94 | 67.11 | 16.13 | | 150.0 | |
| | | Z | 5.83 | 66.86 | 16.05 | | 150.0 | |
| 10557-AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle) | X | 5.80 | 66.70 | 15.99 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.91 | 67.03 | 16.11 | | 150.0 | |
| | | Z | 5.78 | 66.73 | 16.00 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10558-AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle) | X | 5.85 | 66.85 | 16.09 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.96 | 67.18 | 16.20 | | 150.0 | |
| | | Z | 5.82 | 66.88 | 16.09 | | 150.0 | |
| 10560-AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle) | X | 5.84 | 66.71 | 16.05 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.96 | 67.05 | 16.17 | | 150.0 | |
| | | Z | 5.82 | 66.73 | 16.06 | | 150.0 | |
| 10561-AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle) | X | 5.78 | 66.71 | 16.09 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.88 | 67.01 | 16.18 | | 150.0 | |
| | | Z | 5.75 | 66.73 | 16.09 | | 150.0 | |
| 10562-AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle) | X | 5.86 | 66.97 | 16.22 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.99 | 67.36 | 16.36 | | 150.0 | |
| | | Z | 5.84 | 67.00 | 16.23 | | 150.0 | |
| 10563-AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle) | X | 5.96 | 66.92 | 16.16 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.21 | 67.61 | 16.44 | | 150.0 | |
| | | Z | 5.93 | 66.93 | 16.16 | | 150.0 | |
| 10564-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle) | X | 4.68 | 66.42 | 16.06 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.83 | 66.69 | 16.22 | | 150.0 | |
| | | Z | 4.65 | 66.46 | 16.07 | | 150.0 | |
| 10565-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle) | X | 4.89 | 66.85 | 16.39 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.05 | 67.14 | 16.54 | | 150.0 | |
| | | Z | 4.86 | 66.90 | 16.41 | | 150.0 | |
| 10566-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle) | X | 4.72 | 66.67 | 16.19 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.89 | 66.98 | 16.35 | | 150.0 | |
| | | Z | 4.70 | 66.72 | 16.20 | | 150.0 | |
| 10567-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle) | X | 4.75 | 67.07 | 16.56 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.92 | 67.37 | 16.70 | | 150.0 | |
| | | Z | 4.73 | 67.14 | 16.59 | | 150.0 | |
| 10568-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle) | X | 4.63 | 66.44 | 15.94 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.80 | 66.76 | 16.13 | | 150.0 | |
| | | Z | 4.61 | 66.47 | 15.95 | | 150.0 | |
| 10569-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle) | X | 4.72 | 67.22 | 16.65 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.87 | 67.46 | 16.77 | | 150.0 | |
| | | Z | 4.71 | 67.30 | 16.69 | | 150.0 | |
| 10570-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle) | X | 4.74 | 67.05 | 16.56 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.91 | 67.30 | 16.69 | | 150.0 | |
| | | Z | 4.72 | 67.12 | 16.60 | | 150.0 | |
| 10571-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle) | X | 1.04 | 63.16 | 14.41 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.16 | 64.31 | 15.32 | | 130.0 | |
| | | Z | 1.04 | 63.55 | 14.61 | | 130.0 | |
| 10572-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle) | X | 1.05 | 63.64 | 14.72 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.18 | 64.86 | 15.66 | | 130.0 | |
| | | Z | 1.05 | 64.09 | 14.95 | | 130.0 | |
| 10573-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle) | X | 1.03 | 74.44 | 17.59 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.79 | 82.59 | 21.75 | | 130.0 | |
| | | Z | 1.38 | 78.61 | 18.89 | | 130.0 | |
| 10574-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle) | X | 1.07 | 68.05 | 16.92 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.27 | 70.18 | 18.34 | | 130.0 | |
| | | Z | 1.12 | 69.27 | 17.48 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10575-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle) | X | 4.47 | 66.23 | 16.12 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.62 | 66.51 | 16.29 | | 130.0 | |
| | | Z | 4.45 | 66.28 | 16.14 | | 130.0 | |
| 10576-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle) | X | 4.50 | 66.41 | 16.19 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.65 | 66.67 | 16.36 | | 130.0 | |
| | | Z | 4.48 | 66.46 | 16.21 | | 130.0 | |
| 10577-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) | X | 4.68 | 66.68 | 16.36 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.85 | 66.96 | 16.53 | | 130.0 | |
| | | Z | 4.66 | 66.74 | 16.38 | | 130.0 | |
| 10578-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) | X | 4.58 | 66.82 | 16.46 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.75 | 67.12 | 16.62 | | 130.0 | |
| | | Z | 4.56 | 66.89 | 16.49 | | 130.0 | |
| 10579-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) | X | 4.34 | 66.04 | 15.71 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.51 | 66.41 | 15.94 | | 130.0 | |
| | | Z | 4.32 | 66.08 | 15.72 | | 130.0 | |
| 10580-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) | X | 4.38 | 66.11 | 15.75 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.56 | 66.45 | 15.97 | | 130.0 | |
| | | Z | 4.36 | 66.15 | 15.76 | | 130.0 | |
| 10581-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) | X | 4.48 | 66.85 | 16.40 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.64 | 67.15 | 16.57 | | 130.0 | |
| | | Z | 4.46 | 66.93 | 16.43 | | 130.0 | |
| 10582-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) | X | 4.27 | 65.80 | 15.49 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.45 | 66.17 | 15.73 | | 130.0 | |
| | | Z | 4.25 | 65.84 | 15.50 | | 130.0 | |
| 10583-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) | X | 4.47 | 66.23 | 16.12 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.62 | 66.51 | 16.29 | | 130.0 | |
| | | Z | 4.45 | 66.28 | 16.14 | | 130.0 | |
| 10584-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) | X | 4.50 | 66.41 | 16.19 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.65 | 66.67 | 16.36 | | 130.0 | |
| | | Z | 4.48 | 66.46 | 16.21 | | 130.0 | |
| 10585-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) | X | 4.68 | 66.68 | 16.36 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.85 | 66.96 | 16.53 | | 130.0 | |
| | | Z | 4.66 | 66.74 | 16.38 | | 130.0 | |
| 10586-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) | X | 4.58 | 66.82 | 16.46 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.75 | 67.12 | 16.62 | | 130.0 | |
| | | Z | 4.56 | 66.89 | 16.49 | | 130.0 | |
| 10587-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle) | X | 4.34 | 66.04 | 15.71 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.51 | 66.41 | 15.94 | | 130.0 | |
| | | Z | 4.32 | 66.08 | 15.72 | | 130.0 | |
| 10588-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle) | X | 4.38 | 66.11 | 15.75 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.56 | 66.45 | 15.97 | | 130.0 | |
| | | Z | 4.36 | 66.15 | 15.76 | | 130.0 | |
| 10589-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle) | X | 4.48 | 66.85 | 16.40 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.64 | 67.15 | 16.57 | | 130.0 | |
| | | Z | 4.46 | 66.93 | 16.43 | | 130.0 | |
| 10590-AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle) | X | 4.27 | 65.80 | 15.49 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.45 | 66.17 | 15.73 | | 130.0 | |
| | | Z | 4.25 | 65.84 | 15.50 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10591-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle) | X | 4.63 | 66.32 | 16.25 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.77 | 66.58 | 16.40 | | 130.0 | |
| | | Z | 4.60 | 66.37 | 16.26 | | 130.0 | |
| 10592-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle) | X | 4.76 | 66.63 | 16.38 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.92 | 66.91 | 16.53 | | 130.0 | |
| | | Z | 4.74 | 66.69 | 16.39 | | 130.0 | |
| 10593-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle) | X | 4.68 | 66.51 | 16.23 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.85 | 66.82 | 16.41 | | 130.0 | |
| | | Z | 4.66 | 66.56 | 16.25 | | 130.0 | |
| 10594-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle) | X | 4.73 | 66.69 | 16.40 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.90 | 66.98 | 16.56 | | 130.0 | |
| | | Z | 4.71 | 66.75 | 16.42 | | 130.0 | |
| 10595-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle) | X | 4.70 | 66.65 | 16.30 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.87 | 66.93 | 16.46 | | 130.0 | |
| | | Z | 4.68 | 66.71 | 16.32 | | 130.0 | |
| 10596-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle) | X | 4.63 | 66.63 | 16.29 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.80 | 66.93 | 16.46 | | 130.0 | |
| | | Z | 4.61 | 66.68 | 16.31 | | 130.0 | |
| 10597-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle) | X | 4.58 | 66.50 | 16.15 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.75 | 66.83 | 16.34 | | 130.0 | |
| | | Z | 4.56 | 66.55 | 16.17 | | 130.0 | |
| 10598-AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle) | X | 4.57 | 66.73 | 16.42 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.74 | 67.06 | 16.60 | | 130.0 | |
| | | Z | 4.55 | 66.80 | 16.45 | | 130.0 | |
| 10599-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle) | X | 5.31 | 66.88 | 16.52 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.44 | 67.12 | 16.60 | | 130.0 | |
| | | Z | 5.29 | 66.91 | 16.52 | | 130.0 | |
| 10600-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle) | X | 5.45 | 67.34 | 16.72 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.55 | 67.46 | 16.74 | | 130.0 | |
| | | Z | 5.42 | 67.36 | 16.72 | | 130.0 | |
| 10601-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle) | X | 5.33 | 67.05 | 16.59 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.45 | 67.25 | 16.66 | | 130.0 | |
| | | Z | 5.30 | 67.08 | 16.60 | | 130.0 | |
| 10602-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle) | X | 5.46 | 67.20 | 16.58 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.54 | 67.28 | 16.59 | | 130.0 | |
| | | Z | 5.43 | 67.22 | 16.58 | | 130.0 | |
| 10603-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle) | X | 5.52 | 67.46 | 16.85 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.62 | 67.58 | 16.87 | | 130.0 | |
| | | Z | 5.50 | 67.50 | 16.86 | | 130.0 | |
| 10604-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle) | X | 5.39 | 67.12 | 16.66 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.44 | 67.09 | 16.62 | | 130.0 | |
| | | Z | 5.37 | 67.16 | 16.68 | | 130.0 | |
| 10605-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) | X | 5.44 | 67.25 | 16.73 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.54 | 67.37 | 16.75 | | 130.0 | |
| | | Z | 5.42 | 67.27 | 16.73 | | 130.0 | |
| 10606-AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle) | X | 5.17 | 66.49 | 16.20 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.30 | 66.78 | 16.32 | | 130.0 | |
| | | Z | 5.14 | 66.51 | 16.20 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10607-AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle) | X | 4.46 | 65.61 | 15.85 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.61 | 65.89 | 16.02 | | 130.0 | |
| | | Z | 4.44 | 65.67 | 15.88 | | 130.0 | |
| 10608-AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle) | X | 4.62 | 65.98 | 16.01 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.79 | 66.29 | 16.18 | | 130.0 | |
| | | Z | 4.60 | 66.04 | 16.04 | | 130.0 | |
| 10609-AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle) | X | 4.51 | 65.80 | 15.83 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.68 | 66.13 | 16.02 | | 130.0 | |
| | | Z | 4.49 | 65.86 | 15.85 | | 130.0 | |
| 10610-AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle) | X | 4.56 | 65.97 | 16.00 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.73 | 66.29 | 16.18 | | 130.0 | |
| | | Z | 4.55 | 66.03 | 16.03 | | 130.0 | |
| 10611-AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle) | X | 4.48 | 65.77 | 15.84 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.65 | 66.10 | 16.03 | | 130.0 | |
| | | Z | 4.46 | 65.83 | 15.87 | | 130.0 | |
| 10612-AAB | IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle) | X | 4.48 | 65.91 | 15.88 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.66 | 66.25 | 16.07 | | 130.0 | |
| | | Z | 4.46 | 65.96 | 15.90 | | 130.0 | |
| 10613-AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle) | X | 4.48 | 65.76 | 15.74 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.66 | 66.13 | 15.96 | | 130.0 | |
| | | Z | 4.46 | 65.81 | 15.76 | | 130.0 | |
| 10614-AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle) | X | 4.43 | 65.96 | 15.99 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.60 | 66.32 | 16.18 | | 130.0 | |
| | | Z | 4.42 | 66.03 | 16.02 | | 130.0 | |
| 10615-AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle) | X | 4.48 | 65.60 | 15.61 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.65 | 65.94 | 15.81 | | 130.0 | |
| | | Z | 4.45 | 65.64 | 15.62 | | 130.0 | |
| 10616-AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle) | X | 5.12 | 66.07 | 16.09 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.25 | 66.37 | 16.21 | | 130.0 | |
| | | Z | 5.09 | 66.11 | 16.11 | | 130.0 | |
| 10617-AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle) | X | 5.19 | 66.29 | 16.18 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.32 | 66.52 | 16.26 | | 130.0 | |
| | | Z | 5.17 | 66.32 | 16.19 | | 130.0 | |
| 10618-AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle) | X | 5.08 | 66.28 | 16.19 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.20 | 66.54 | 16.29 | | 130.0 | |
| | | Z | 5.06 | 66.33 | 16.20 | | 130.0 | |
| 10619-AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle) | X | 5.09 | 66.06 | 16.01 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.22 | 66.35 | 16.13 | | 130.0 | |
| | | Z | 5.06 | 66.10 | 16.02 | | 130.0 | |
| 10620-AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle) | X | 5.17 | 66.10 | 16.08 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.31 | 66.40 | 16.20 | | 130.0 | |
| | | Z | 5.15 | 66.14 | 16.09 | | 130.0 | |
| 10621-AAB | IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle) | X | 5.18 | 66.25 | 16.28 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.31 | 66.53 | 16.38 | | 130.0 | |
| | | Z | 5.16 | 66.30 | 16.30 | | 130.0 | |
| 10622-AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle) | X | 5.20 | 66.45 | 16.37 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.32 | 66.67 | 16.45 | | 130.0 | |
| | | Z | 5.18 | 66.49 | 16.39 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10623-AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle) | X | 5.06 | 65.90 | 15.96 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.20 | 66.22 | 16.10 | | 130.0 | |
| | | Z | 5.04 | 65.93 | 15.97 | | 130.0 | |
| 10624-AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle) | X | 5.26 | 66.14 | 16.15 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.39 | 66.41 | 16.26 | | 130.0 | |
| | | Z | 5.23 | 66.17 | 16.16 | | 130.0 | |
| 10625-AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle) | X | 5.51 | 66.80 | 16.54 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.73 | 67.31 | 16.76 | | 130.0 | |
| | | Z | 5.48 | 66.81 | 16.54 | | 130.0 | |
| 10626-AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle) | X | 5.44 | 66.14 | 16.07 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.55 | 66.44 | 16.18 | | 130.0 | |
| | | Z | 5.41 | 66.17 | 16.06 | | 130.0 | |
| 10627-AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle) | X | 5.69 | 66.79 | 16.36 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.77 | 66.95 | 16.39 | | 130.0 | |
| | | Z | 5.66 | 66.81 | 16.36 | | 130.0 | |
| 10628-AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle) | X | 5.45 | 66.17 | 15.98 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.58 | 66.53 | 16.12 | | 130.0 | |
| | | Z | 5.42 | 66.19 | 15.98 | | 130.0 | |
| 10629-AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle) | X | 5.54 | 66.28 | 16.03 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.65 | 66.57 | 16.13 | | 130.0 | |
| | | Z | 5.51 | 66.30 | 16.03 | | 130.0 | |
| 10630-AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle) | X | 5.93 | 67.67 | 16.72 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.03 | 67.89 | 16.79 | | 130.0 | |
| | | Z | 5.89 | 67.66 | 16.71 | | 130.0 | |
| 10631-AAB | IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle) | X | 5.82 | 67.45 | 16.81 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.97 | 67.81 | 16.94 | | 130.0 | |
| | | Z | 5.79 | 67.49 | 16.83 | | 130.0 | |
| 10632-AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle) | X | 5.66 | 66.88 | 16.55 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.74 | 67.02 | 16.56 | | 130.0 | |
| | | Z | 5.64 | 66.92 | 16.56 | | 130.0 | |
| 10633-AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle) | X | 5.51 | 66.37 | 16.11 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.64 | 66.70 | 16.23 | | 130.0 | |
| | | Z | 5.49 | 66.40 | 16.12 | | 130.0 | |
| 10634-AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle) | X | 5.49 | 66.38 | 16.18 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.63 | 66.73 | 16.31 | | 130.0 | |
| | | Z | 5.47 | 66.41 | 16.19 | | 130.0 | |
| 10635-AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle) | X | 5.37 | 65.68 | 15.55 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.51 | 66.08 | 15.72 | | 130.0 | |
| | | Z | 5.34 | 65.68 | 15.54 | | 130.0 | |
| 10636-AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle) | X | 5.87 | 66.53 | 16.18 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.96 | 66.80 | 16.26 | | 130.0 | |
| | | Z | 5.84 | 66.55 | 16.18 | | 130.0 | |
| 10637-AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle) | X | 6.02 | 66.93 | 16.36 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.10 | 67.16 | 16.42 | | 130.0 | |
| | | Z | 5.99 | 66.94 | 16.36 | | 130.0 | |
| 10638-AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle) | X | 6.02 | 66.89 | 16.32 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.11 | 67.15 | 16.40 | | 130.0 | |
| | | Z | 5.99 | 66.90 | 16.32 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10639-AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle) | X | 5.98 | 66.80 | 16.32 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.09 | 67.11 | 16.42 | | 130.0 | |
| | | Z | 5.96 | 66.82 | 16.32 | | 130.0 | |
| 10640-AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle) | X | 5.98 | 66.79 | 16.25 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.09 | 67.11 | 16.37 | | 130.0 | |
| | | Z | 5.95 | 66.81 | 16.25 | | 130.0 | |
| 10641-AAC | IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle) | X | 6.05 | 66.80 | 16.28 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.13 | 67.01 | 16.33 | | 130.0 | |
| | | Z | 6.03 | 66.81 | 16.27 | | 130.0 | |
| 10642-AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle) | X | 6.07 | 66.99 | 16.54 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.18 | 67.28 | 16.63 | | 130.0 | |
| | | Z | 6.05 | 67.01 | 16.55 | | 130.0 | |
| 10643-AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle) | X | 5.92 | 66.69 | 16.29 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.01 | 66.95 | 16.37 | | 130.0 | |
| | | Z | 5.89 | 66.71 | 16.29 | | 130.0 | |
| 10644-AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle) | X | 6.02 | 67.01 | 16.47 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.17 | 67.43 | 16.63 | | 130.0 | |
| | | Z | 6.00 | 67.03 | 16.46 | | 130.0 | |
| 10645-AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle) | X | 6.18 | 67.13 | 16.49 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.48 | 67.96 | 16.85 | | 130.0 | |
| | | Z | 6.15 | 67.13 | 16.48 | | 130.0 | |
| 10646-AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7) | X | 14.66 | 105.10 | 36.14 | 9.30 | 60.0 | ± 9.6 % |
| | | Y | 34.83 | 124.98 | 42.17 | | 60.0 | |
| | | Z | 17.09 | 107.30 | 36.45 | | 60.0 | |
| 10647-AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7) | X | 12.88 | 102.80 | 35.56 | 9.30 | 60.0 | ± 9.6 % |
| | | Y | 28.98 | 121.44 | 41.35 | | 60.0 | |
| | | Z | 15.19 | 105.38 | 36.00 | | 60.0 | |
| 10648-AAA | CDMA2000 (1x Advanced) | X | 0.46 | 60.48 | 7.48 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.64 | 62.67 | 10.12 | | 150.0 | |
| | | Z | 0.43 | 60.23 | 7.08 | | 150.0 | |
| 10652-AAD | LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%) | X | 3.39 | 66.19 | 15.99 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.73 | 67.27 | 16.73 | | 80.0 | |
| | | Z | 3.47 | 66.55 | 16.10 | | 80.0 | |
| 10653-AAD | LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%) | X | 3.95 | 65.70 | 16.32 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.24 | 66.55 | 16.83 | | 80.0 | |
| | | Z | 4.01 | 65.99 | 16.41 | | 80.0 | |
| 10654-AAD | LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%) | X | 3.95 | 65.36 | 16.35 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.21 | 66.20 | 16.82 | | 80.0 | |
| | | Z | 4.01 | 65.65 | 16.45 | | 80.0 | |
| 10655-AAE | LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | X | 4.02 | 65.33 | 16.40 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.27 | 66.19 | 16.86 | | 80.0 | |
| | | Z | 4.08 | 65.61 | 16.49 | | 80.0 | |
| 10658-AAA | Pulse Waveform (200Hz, 10%) | X | 22.73 | 92.81 | 21.68 | 10.00 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 114.13 | 27.80 | | 50.0 | |
| | | Z | 11.47 | 84.03 | 19.31 | | 50.0 | |
| 10659-AAA | Pulse Waveform (200Hz, 20%) | X | 100.00 | 107.89 | 23.77 | 6.99 | 60.0 | ± 9.6 % |
| | | Y | 100.00 | 112.00 | 25.89 | | 60.0 | |
| | | Z | 100.00 | 107.59 | 23.87 | | 60.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10660-AAA | Pulse Waveform (200Hz, 40%) | X | 100.00 | 103.98 | 20.71 | 3.98 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 111.62 | 24.50 | | 80.0 | |
| | | Z | 100.00 | 102.80 | 20.39 | | 80.0 | |
| 10661-AAA | Pulse Waveform (200Hz, 60%) | X | 100.00 | 97.71 | 16.95 | 2.22 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 112.86 | 23.84 | | 100.0 | |
| | | Z | 12.87 | 82.54 | 13.42 | | 100.0 | |
| 10662-AAA | Pulse Waveform (200Hz, 80%) | X | 0.20 | 60.00 | 3.58 | 0.97 | 120.0 | ± 9.6 % |
| | | Y | 100.00 | 113.04 | 22.31 | | 120.0 | |
| | | Z | 0.23 | 60.00 | 3.32 | | 120.0 | |
| 10670-AAA | Bluetooth Low Energy | X | 100.00 | 103.45 | 19.60 | 2.19 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 115.24 | 25.21 | | 100.0 | |
| | | Z | 100.00 | 101.01 | 18.73 | | 100.0 | |

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

# ANNEX B

# DIPOLE CALIBRATION REPORTS

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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 **TüV SÜD UK**

Certificate No: **D450V3-1094_Dec18**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D450V3 - SN:1094 |
| Calibration procedure(s) | QA CAL-15.v8<br>Calibration procedure for dipole validation kits below 700 MHz |
| Calibration date: | December 07, 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: 5277 (20x) | 04-Apr-18 (No. 217-02682) | Apr-19 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 04-Apr-18 (No. 217-02683) | Apr-19 |
| Reference Probe EX3DV4 | SN: 3877 | 30-Dec-17 (No. EX3-3877_Dec17) | Dec-18 |
| DAE4 | SN: 654 | 05-Jul-18 (No. DAE4-654_Jul18) | Jul-19 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power meter E4419B | SN: GB41293874 | 12-Jun-18 (No. 217-02285/02284) | In house check: Jun-20 |
| Power sensor E4412A | SN: MY41498087 | 12-Jun-18 (No. 217-02285) | In house check: Jun-20 |
| Power sensor E4412A | SN: 000110210 | 12-Jun-18 (No. 217-02284) | In house check: Jun-20 |
| RF generator HP 8648C | SN: US3642U01700 | 04-Aug-99 (in house check Jun-18) | In house check: Jun-20 |
| Network Analyzer Agilent E8358A | SN: US41080477 | 31-Mar-14 (in house check Oct-18) | In house check: Oct-19 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Jeton Kastrati | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: December 10, 2018

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**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 | V52.10.2 |
|---|---|---|
| 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 ± 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 ± 0.2) °C | 44.1 ± 6 % | 0.87 mho/m ± 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 | 1.12 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **4.49 W/kg ± 18.1 % (k=2)** |

| SAR averaged over 10 $cm^3$ (10 g) of Head TSL | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 0.749 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **3.00 W/kg ± 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 ± 0.2) °C | 55.9 ± 6 % | 0.92 mho/m ± 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 | 1.10 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **4.46 W/kg ± 18.1 % (k=2)** |

| SAR averaged over 10 $cm^3$ (10 g) of Body TSL | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 0.738 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **2.99 W/kg ± 17.6 % (k=2)** |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 59.5 Ω - 3.2 jΩ |
| Return Loss | - 20.8 dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 57.3 Ω - 5.4 jΩ |
| Return Loss | - 21.5 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.352 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 | September 15, 2015 |

## DASY5 Validation Report for Head TSL

Date: 07.12.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 450 MHz D450V3; Type: D450V3; Serial: D450V3 - SN:1094**

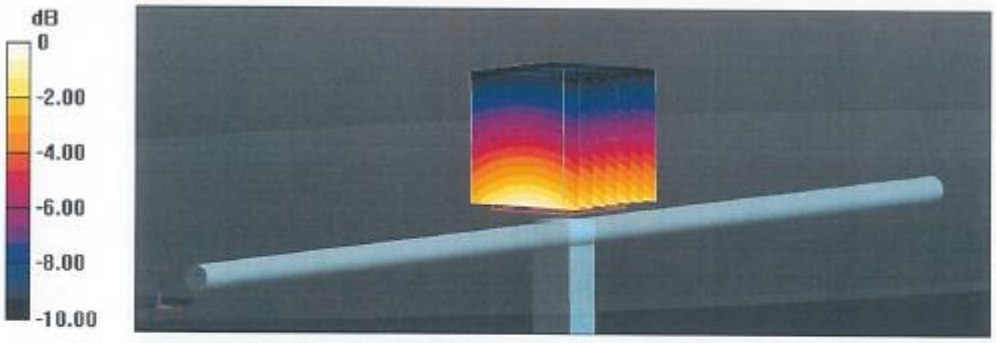
Communication System: UID 0 - CW; Frequency: 450 MHz
Medium parameters used: f = 450 MHz; $\sigma$ = 0.87 S/m; $\varepsilon_r$ = 44.1; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(10.5, 10.5, 10.5) @ 450 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 05.07.2018
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

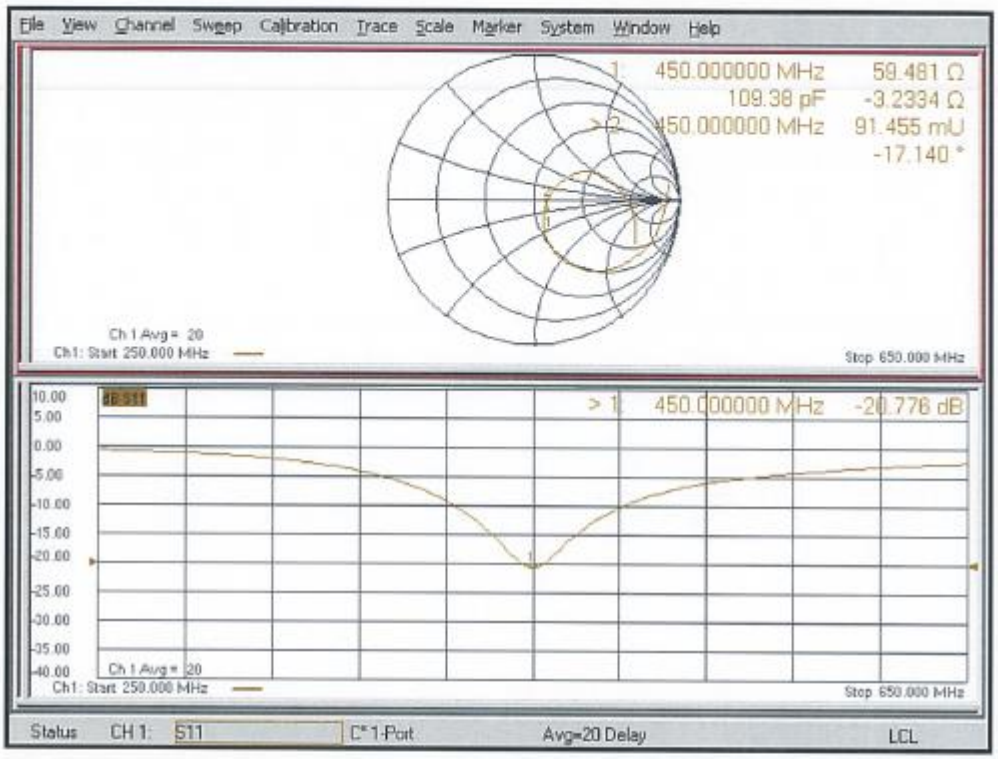
### Dipole Calibration for Head Tissue/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 38.68 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.72 W/kg
**SAR(1 g) = 1.12 W/kg; SAR(10 g) = 0.749 W/kg**
Maximum value of SAR (measured) = 1.50 W/kg




0 dB = 1.50 W/kg = 1.76 dBW/kg

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 07.12.2018

Test Laboratory: The name of your organization

**DUT: Dipole 450 MHz D450V3; Type: D450V3; Serial: D450V3 - SN:1094**

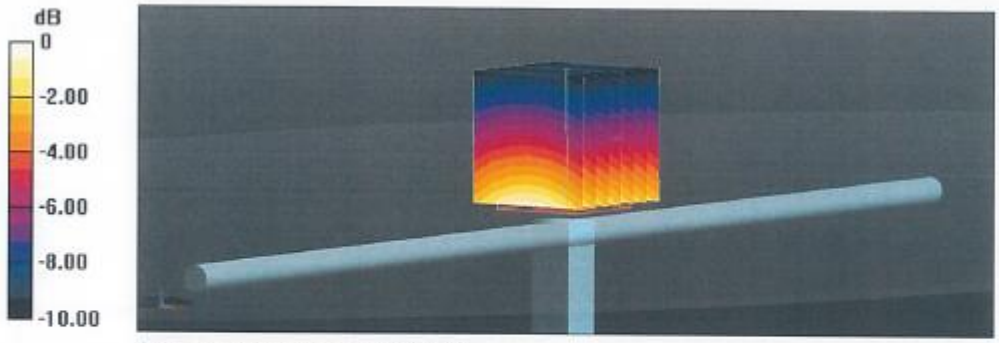
Communication System: UID 0 - CW; Frequency: 450 MHz
Medium parameters used: f = 450 MHz; $\sigma$ = 0.92 S/m; $\varepsilon_r$ = 55.9; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(10.8, 10.8, 10.8) @ 450 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 05.07.2018
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 41.27 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.70 W/kg
**SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.738 W/kg**
Maximum value of SAR (measured) = 1.48 W/kg




0 dB = 1.48 W/kg = 1.70 dBW/kg

## Impedance Measurement Plot for Body TSL