ACCREDITED
TESTING LABORATORY
CERTIFICATE NUMBER: 3297.02

Bay Area Compliance Labs Corp.

# SAR EVALUATION REPORT

For

# Lectrosonics, Inc.

581 Laser Road NE Rio Rancho, NM 87124, USA

**FCC ID: DBZWM47A**

| **Report Type:** Original Report | **Product Type:** Wireless Microphone Transmitter |
|---|---|
| **Prepared By:** | Vincent Licata<br>Test Engineer |
| **Report Number:** | R1807302-SAR |
| **Report Date:** | 2018-09-14 |
| **Reviewed By:** | Jin Yang<br>RF Lead |
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| Summary of Test Results | | | |
|---|---|---|---|
| **EUT Information** | **EUT Description** | Wireless Microphone Transmitter | |
| | **Tested Model** | WM-470 | |
| | **FCC ID** | DBZWM47A | |
| | **Serial Number** | WM-470: 2369 | |
| | **Test Date** | 2018-08-09 | |
| | **Accessories** | WMBCSL spring loaded belt clip, WMBCWIRE wire belt clip | |
| **Frequency** | **SAR Type** | **Max. SAR Level(s) Reported(W/kg)** | **Limit (W/kg)** |
| 470.1-495.675 MHz | 1g Body SAR | 0.750 | **1.6** |
| **Applicable Standards** | **FCC 47 CFR part 2.1093**<br>Radiofrequency radiation exposure evaluation: portable devices | | |
| | **ANSI / IEEE C95.1: 2005**<br>IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fileds,3 kHz to 300 GHz. | | |
| | **ANSI / IEEE C95.3: 2002**<br>IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to SuchFields,100 kHz-300 GHz. | | |
| | **IEEE 1528: 2013**<br>IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques | | |
| | **IEC 62209-2: 2010**<br>Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices-Human models, instrumentation, and procedures-Part 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) | | |
| | **KDB procedures**<br>KDB 447498 D01 General RF Exposure Guidance v06<br>KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04<br>KDB 865664 D02 RF Exposure Reporting v01r02 | | |
| **Note:** This wireless device has been shown to be capable of compliance for localized specific absorption rate (SAR) for General Population/Uncontrolled Exposure limits specified in **FCC 47 CFR part 2.1093** and has been tested in accordance with the measurement procedures specified in IEEE 1528-2013 and RF exposure KDB procedures.<br>**The results and statements contained in this report pertain only to the device(s) evaluated.** | | | |

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# DOCUMENT REVISION HISTORY

| Revision Number | Report Number | Description of Revision | Date of Revision |
|---|---|---|---|
| 0 | R1807302-SAR | Original Report | 2018-09-14 |

# 1 General Description

## 1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report has been compiled on behalf of *Lectrosonics, Inc.* and their product models: WM-470, *FCC ID: DBZWM47A* which henceforth is referred to as the EUT (Equipment Under Test). The EUT is a Wireless Microphone Transmitter. The EUT operates in the frequency range: 470.1-495.675 MHz.

## 1.2 Test EUT Technical Specification

| Item | Description | |
|---|---|---|
| Modulation Type | FM | |
| Frequency Range | 470.1-495.675 MHz | |
| Maximum Conducted Power Tested WM-470 | 23.75 dBm | 470.1 MHz |
| | 23.76 dBm | 482.9 MHz |
| | 23.73 dBm | 495.675 MHz |
| Power Source | WM-470: 2 DC 1.5V batteries. | |
| Normal Operation | Body-worn | |

The test data gathered are from typical production sample, product WM-470 S/N 2369 provided by the client.

# 2 Test Facility

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3279.02)***, in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report..

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body***

- - For the USA (Federal Communications Commission):
  1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
  2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
  3- All Telephone Terminal Equipment within FCC Scope C.
- For the Canada (Industry Canada):
  1- All Scope 1-Licence-Exempt Radio Frequency Devices;
  2- All Scope 2-Licensed Personal Mobile Radio Services;
  3- All Scope 3-Licensed General Mobile & Fixed Radio Services;
  4- All Scope 4-Licensed Maritime & Aviation Radio Services;
  5- All Scope 5-Licensed Fixed Microwave Radio Services
  6- All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.

For Singapore (Info-Communications Development Authority (IDA)):
  1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2
  2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2

- For the Hong Kong Special Administrative Region:
  1 All Radio Equipment, per KHCA 10XX-series Specifications;
  2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
  3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.
- For Japan:
  1 MIC Telecommunication Business Law (Terminal Equipment):
    - All Scope A1 - Terminal Equipment for the Purpose of Calls;
    - All Scope A2 - Other Terminal Equipment
  2 Radio Law (Radio Equipment):
    - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
    - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
    - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

C- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3279.01)*** to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

1 Electronics and Office Equipment:
- for Telephony (ver. 3.0)
- for Audio/Video (ver. 3.0)
- for Battery Charging Systems (ver. 1.1)
- for Set-top Boxes & Cable Boxes (ver. 4.1)
- for Televisions (ver. 6.1)
- for Computers (ver. 6.0)
- for Displays (ver. 6.0)
- for Imaging Equipment (ver. 2.0)
- for Computer Servers (ver. 2.0)

2 Commercial Food Service Equipment
- for Commercial Dishwashers (ver. 2.0)
- for Commercial Ice Machines (ver. 2.0)
- for Commercial Ovens (ver. 2.1)
- for Commercial Refrigerators and Freezers

3 Lighting Products
- For Decorative Light Strings (ver. 1.5)
- For Luminaires (including sub-components) and Lamps (ver. 1.2)
- For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
- For Integral LED Lamps (ver. 1.4)

4 Heating, Ventilation, and AC Products
- for Residential Ceiling Fans (ver. 3.0)
- for Residential Ventilating Fans (ver. 3.2)

5 Other
- For Water Coolers (ver. 3.0)

***D. A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:***

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;
- Canada: (Industry Canada - IC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
  - BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
  - NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
  - EMC Directive 2014/30/EU US-EU EMC & Telecom MRA CAB (NB)
  - Radio Equipment (RE) Directive 2014/53/EU US-EU EMC & Telecom MRA CAB (NB)
  - Low Voltage Directive (LVD) 2014/35/EU
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA)
  APEC Tel MRA -Phase I & Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA - Phase I
- Singapore: (Infocomm Development Authority - IDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter
- USA:
  - ENERGY STAR Recognized Test Laboratory – US EPA
  - Telecommunications Certification Body (TCB) – US FCC;
  - Nationally Recognized Test Laboratory (NRTL) – US OSHA

Vietnam: APEC Tel MRA -Phase I;

# 3 Reference and Guidelines

**FCC/ISED:**

The Report and Order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1-1992 [6] for an uncontrolled environment (Paragraph 65). According to the FCC KDB 447498 D01 “RF Exposure Procedures and Equipment Authorization Polices for Mobile and Portable Devices”, RF Exposure compliance must be determined at the maximum average power level according to source-based time-averaging requirements to determine compliance for general population exposure conditions.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation, and what is the extent of radiation with respect to safety limits if radiation is found. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

**CE:**

The CE requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 2 mW/g as recommended by the EN50360 for an uncontrolled environment. According to the Standard, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits? SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in Europe is 2 mW/g average over 10 gram of tissue mass.

The test configurations were laid out on a specially designed test fixture to ensure the reproducibility of measurements. Each configuration was scanned for SAR. Analysis of each scan was carried out to characterize the above effects in the device.

## 3.1 SAR Limits

FCC/ISED Limit

| EXPOSURE LIMITS | SAR (W/kg) | |
|---|---|---|
| | (General Population / Uncontrolled Exposure Environment) | (Occupational / Controlled Exposure Environment) |
| Spatial Average (averaged over the whole body) | 0.08 | 0.4 |
| Spatial Peak (averaged over any 1 g of tissue) | 1.60 | 8.0 |
| Spatial Peak (hands/wrists/feet/ankles averaged over 10 g) | 4.0 | 20.0 |

CE Limit

| EXPOSURE LIMITS | SAR (W/kg) | |
|---|---|---|
| | (General Population / Uncontrolled Exposure Environment) | (Occupational / Controlled Exposure Environment) |
| Spatial Average (averaged over the whole body) | 0.08 | 0.4 |
| Spatial Peak (averaged over any 10 g of tissue) | 2.0 | 10 |
| Spatial Peak (hands/wrists/feet/ankles averaged over 10 g) | 4.0 | 20.0 |

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

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

General Population/Uncontrolled environments Spatial Peak limit 1.6 W/kg (FCC/ISED) applied to the EUT.

# 4 Equipment List and Calibration

## 4.1 Equipment List & Calibration Info

| Type/Model | Cal. Due Date | S/N |
|---|---|---|
| DASY6 Professional Dosimetric System | NCR | None |
| Robot TX90XL | NCR | F17/5DBKA1/A/01 |
| Robot Controller CS8Cspeag-TX90 | NCR | F17/5DBKA1/C/01 |
| Pendant Control Box D21142607B | NCR | 013151 |
| Robot Remote Control Box SE UWS032 AA | NCR | None |
| HP Elitedesk 800 G3 TWR | NCR | CZC048171C |
| HP Elitedisplay E271i LED Backlit Monitor | NCR | 3CM7208TJZ |
| SPEAG DAE4 | 2018-09-18 | 530 |
| DASY6 Measurement Server SE UMS 028BB | NCR | 1551 |
| SPEAG E-Field Probe EX3DV4 | 2018-09-25 | 3619 |
| Antenna, Dipole D450V2 | 2020-09-15 | BCL-180 |
| SPEAG Twin SAM Phantom | NCR | TP-1032 |
| SPEAG ELI Phantom V8.0 | NCR | 2074 |
| Body Tissue Simulating Liquid MBBL600-6000V6 | Each Time | 171031-2 |
| Power Sensor Agilent E4419B EPM Series | 2018-09-22 | MY40510985 |
| Power Sensor Agilent 8481A | 2018-09-22 | 3318A94106 |
| Power Sensor ETS-LINDGREN 7002-006 | 2018-12-05 | 160097 |
| Dielectric Probe Kit SPEAG DAK-3.5 Probe | NCR | 1252 |
| HP Network Analyzer 8753D | 2019-03-01 | 3410A04346 |
| HEWLETT PACKARD 779D Directional Coupler | NCR | 1144A05102 |
| Keysight Technologies Vector Signal Generator N5182B | 2019-01-06 | MY51350070 |
| Mini Circuits, AMPLIFIER 2VA-183-S+ | NCR | 576400946 |

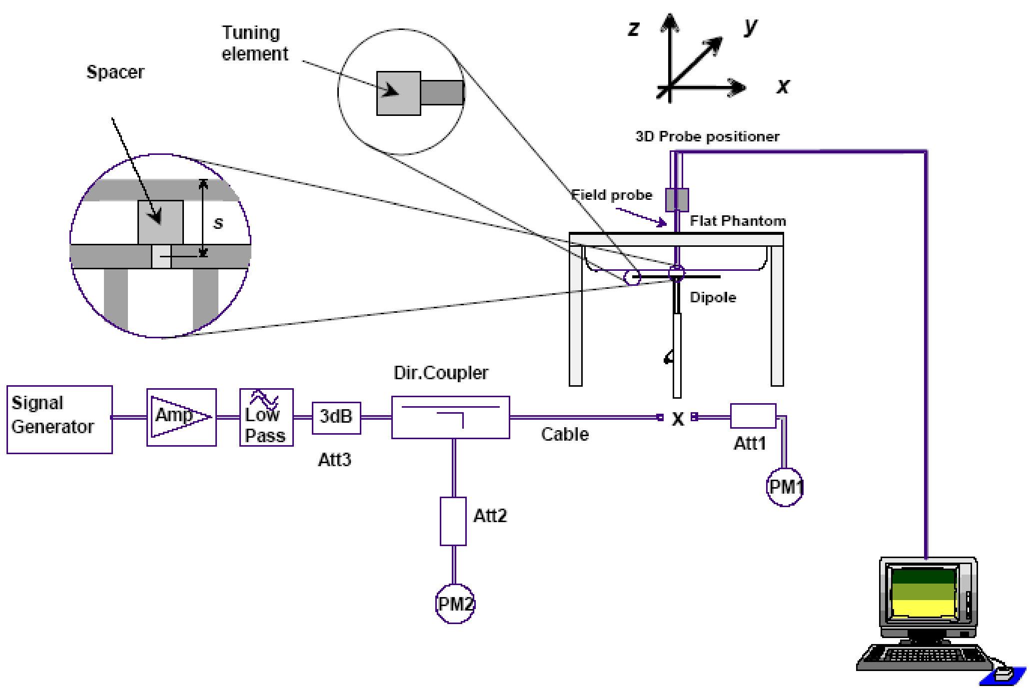
Note: NCR=No Calibration Required
***Statement of Traceability: BACL Corp.*** *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 09 June 2016) "A2LA Policy on Metrological Traceability".*

# 5 SAR Measurement System Verification

## 5.1 System Accuracy Verification

SAR system verification is required to confirm measurement accuracy. The system verification must be performed for each frequency band. System verification must be performed before each series of SAR measurements.

## 5.2 System Setup Block Diagram




**Procedure:**

1) The SAR system verification measurements were performed in the flat section of TWIN SAM or flat phantom with shell thickness of 2±0.2mm filled with head or body liquid.

2) The depth of liquid in phantom must be ≥15 cm for SAR measurement less than 3 GHz and ≥10 cm for SAR measurement above 3 GHz.

3) The dipole was mounted below the center of flat phantom, and oriented parallel to the Y-Axis. The standard measurement distance is 15mm (below 1 GHz ) and 10mm (above 1 GHz) from dipole center to the liquid surface.

4) The dipole input power was 25 mW or 100 mW or 250 mW or 500 mW.

5) The SAR results are normalized to 1 Watt input power.

6) compared the normalized the SAR results to the dipole calibration results.

## 5.3 Liquid and System Validation

| Date | Simulant | Freq. [MHz] | Parameters | Liquid Temp [ºC] | Target Value | Measured Value | Deviation [%] | Limits [%] |
|---|---|---|---|---|---|---|---|---|
| 2018-08-09 | Body | 450 | εr | 22 | 56.70 | 55.60 | -1.94 | ± 5 |
| | | | σ | 22 | 0.94 | 0.91 | -3.19 | ± 5 |
| | | | 1g SAR | 22 | 4.79 | 4.80 | -0.21 | ± 10 |

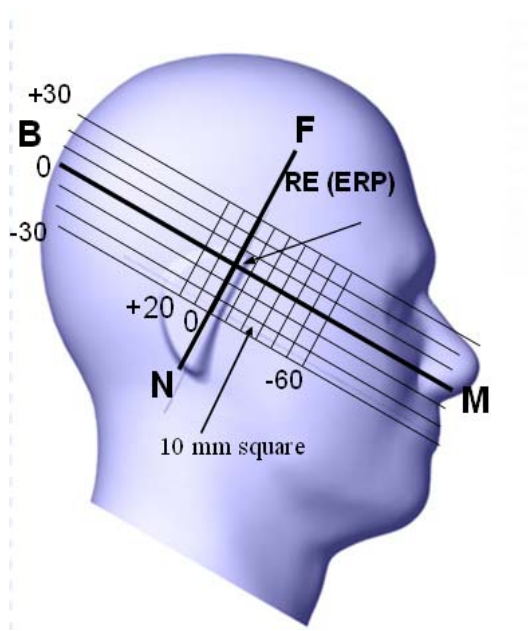
*εr = relative permittivity, σ = conductivity and ρ=1000 kg/m3*

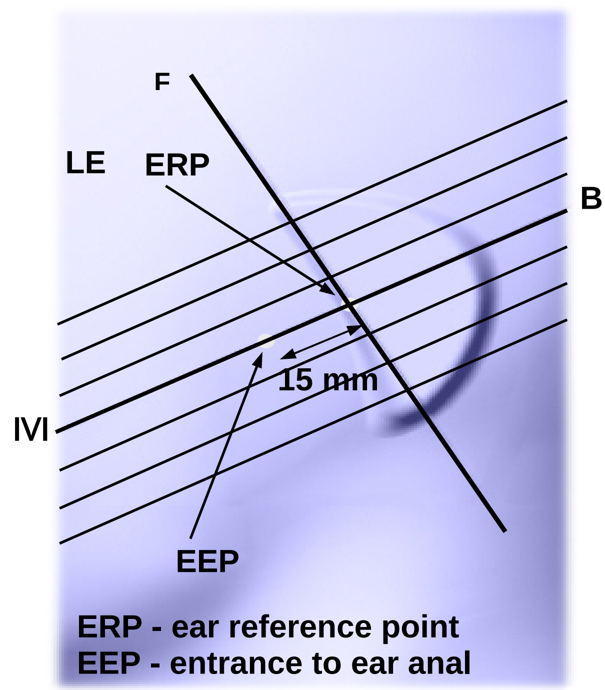
# 6 EUT Test Strategy and Methodology

## 6.1 Test Positions for Device Operating Next to a Person's Ear

This category includes most wireless handsets with fixed, retractable or internal antennas located toward the top half of the device, with or without a foldout, sliding or similar keypad cover. The handset should have its earpiece located within the upper ¼ of the device, either along the centerline or off-centered, as perceived by its users. This type of handset should be positioned in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point". The "test device reference point" should be located at the same level as the center of the earpiece region. The "vertical centerline" should bisect the front surface of the handset at its top and bottom edges. An "ear reference point" is located on the outer surface of the head phantom on each ear spacer. It is located 1.5 cm above the center of the ear canal entrance in the "phantom reference plane" defined by the three lines joining the center of each "ear reference point" (left and right) and the tip of the mouth.

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". For interim head phantoms, the device should be positioned parallel to the cheek for maximum RF energy coupling. The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane". This is called the "initial ear position". While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR:

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## 6.2 Cheek/Touch Position

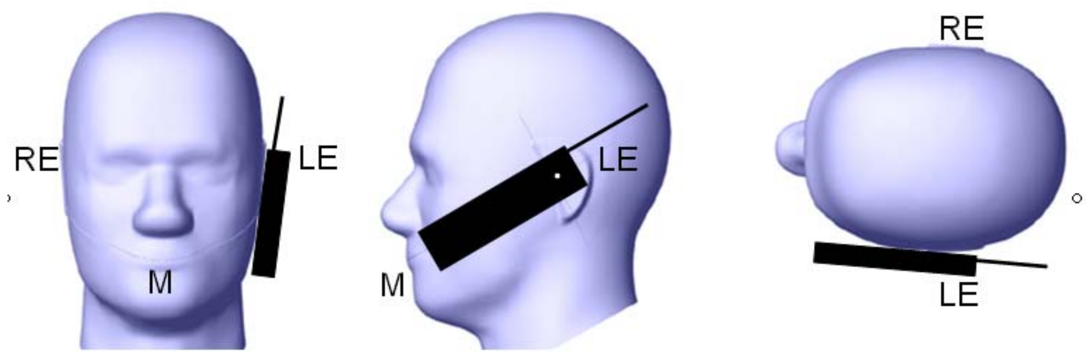
The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line for the SCC-34/SC-2 head phantom.

This test position is established:

- When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
- (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

**Cheek /Touch Position**




## 6.3 Ear/Tilt Position

With the handset aligned in the "Cheek/Touch Position":

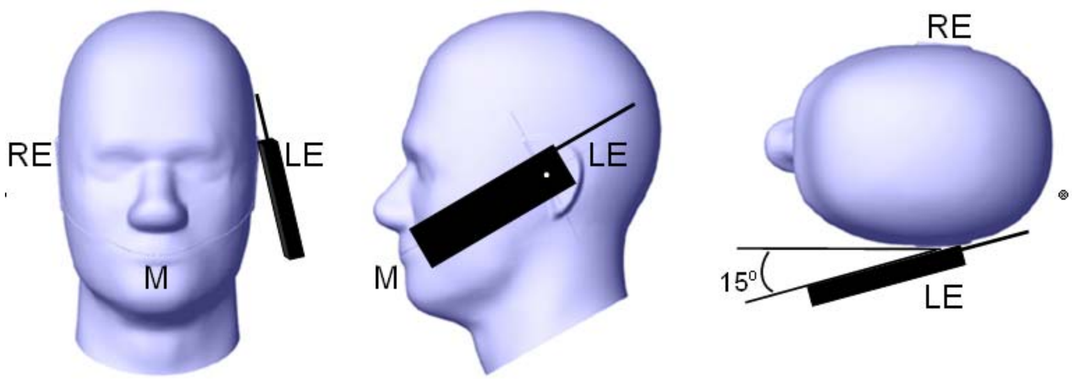
1) If the earpiece of the handset is not in full contact with the phantom's ear spacer (in the "Cheek/Touch position") and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.

2) (otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both "ear reference points" (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the device handset is tilted away from the mouth with respect to the "test device reference point" until the inside angle between the vertical centerline on the front surface of the phone and the horizontal line passing through the ear reference point is by 15 80°. After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15 80° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

If a device is also designed to transmit with its keypad cover closed for operating in the head position, such positions should also be considered in the SAR evaluation. The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tile/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional.

**Ear /Tilt 15° Position**



## 6.4 Test position for body-support device and other configurations

A typical example of a body supported device is a wireless enabled laptop device that among other orientations may be supported on the thighs of a sitting use. To represent this orientation, the device shall be positioned with its base against the flat phantom. Other orientations may be specified by the manufactures in the user instructions. If the intended use is not specified, the device shall be tested directly against the flat phantom in all usable orientations.

The screen portion of the device shall be in an open position at a 90° angle, or at an operating angle specified for intended use by the manufacturer in the operating instructions. Where a body supported device has an integral screen required for normal operation, then the screen-side will not need to be tested if it ordinarily remains 200 mm from the body. Where a screen mounted antenna is present, this position shall be repeated with the screen against the flat phantom, if this is consistent with the intended use.

Other devices that fall into this category include tablet type portable computers and credit card transaction authorization terminals, point-of-sale and/or inventory terminals. Where these devices may be torso or limb-supported, the same principles for body-supported devices are applied.

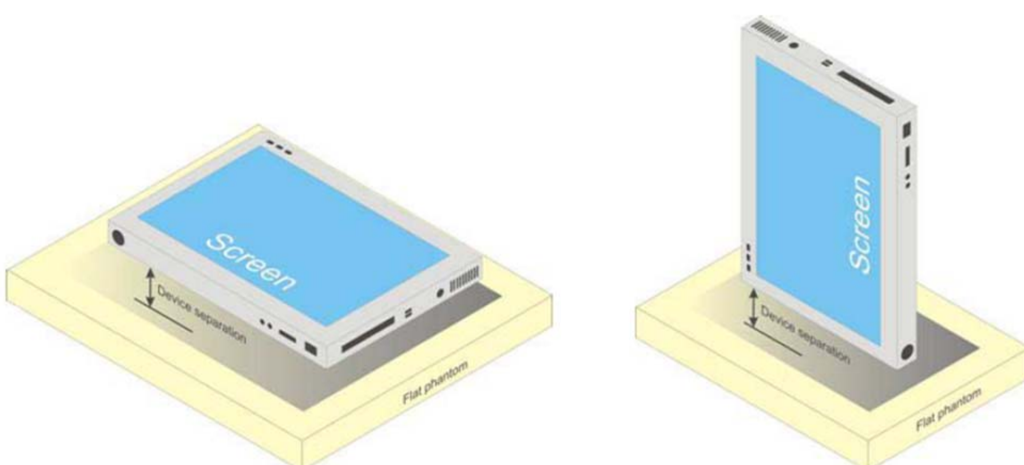
The example in Figure b) shows a tablet from factor portable computer for which SAR should be separately assessed with

a) Each surface and

b) The separation distances

Positioned against the flat phantom that correspond to the intended use as specified by the manufacturer. If the intended use is not specified in the user instructions, the device shall be tested directly against the flat phantom in all usable orientations.

Some body-supported devices may allow testing with an external power supply (e.g. a.c. adapter) supplemental to the battery, but it shall be verified and documented in the measurement report that SAR is still conservative

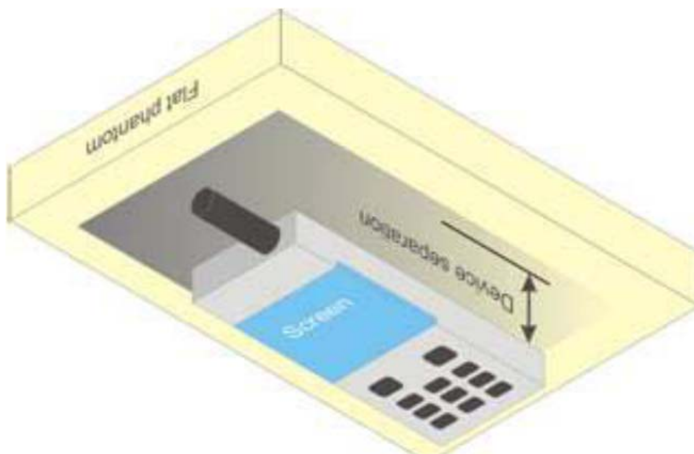



**b) Tablet form factor portable computer**

## 6.5 Test positions for body-worn and other configurations

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.



## 6.6 SAR Evaluation Procedure

The evaluation was performed with the following procedure:

**Step 1:** Measurement of the SAR value at a fixed location above central position was used as a reference value for assessing the power drop. The SAR at this point is measured at the start of the test and then again at the end of the testing.

**Step 2:** The SAR distribution at the exposed side of body was measured at a distance of 4 mm from the inner surface of the shell. The area covered the entire dimension of the body or EUT and the horizontal grid spacing was 50 mm x 110 mm. Based on these data, the area of the maximum absorption was determined by line interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

**Step 3**: Around this point, a volume of 30 mm x 30 mm x 21 mm was assessed by measuring 5 x 5 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

1. The data at the surface were extrapolated, since the center of the dipoles is 1.2 mm away from the tip of the probe. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

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

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

**Step 4**: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

## 6.7 Test Methodology

IEEE 1528: 2013
IEC 62209-2: 2010

# 7 DASY52 SAR Evaluation Procedure

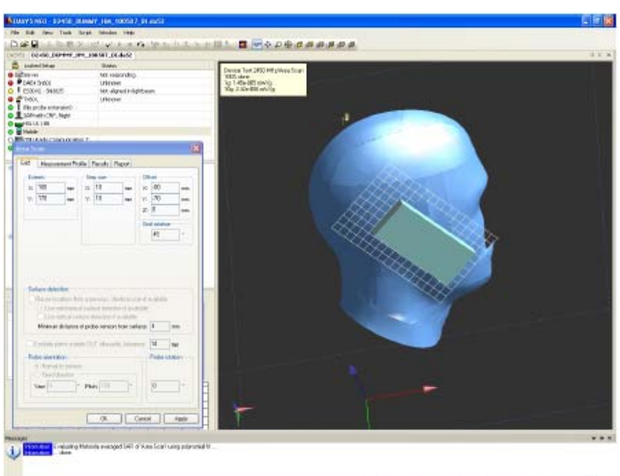
## 7.1 Power Reference Measurement

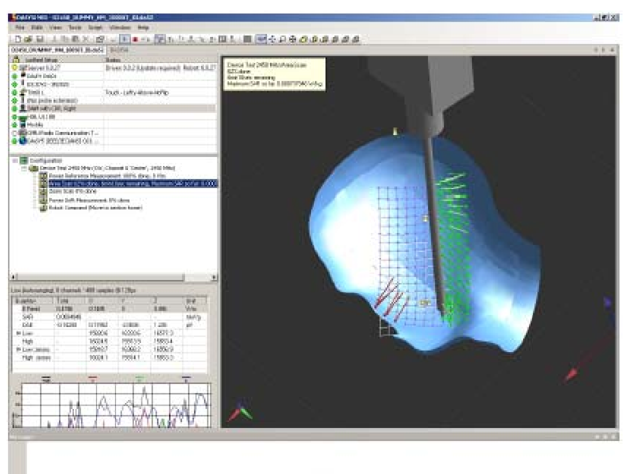
The Power Reference Measurement and Power Drift Measurement jobs are useful jobs for monitoring the power drift of the device under test in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. By default, the Minimum distance of probe sensors to surface is 4mm. This distance can be modified by the user, but cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

## 7.2 Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines implemented in DASY52 software can find the maximum locations even in relatively coarse grids.

The scanning area is defined by an editable grid. This grid is anchored at the grid reference point of the selected section in the phantom. When the Area Scan's property sheet is brought-up, grid settings can be edited by a user.
When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE 1528, EN 50361 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly (see Section 3.3.2.14 Zoom Scan for details). After measurement is completed, all maxima and their coordinates are listed in the Results property page. The maximum selected in the list is highlighted in the 3-D view. For the secondary maxima returned from an Area Scan, the user can specify a lower limit (peak SAR value), in addition to the Find secondary maxima within x dB condition. After measurement is completed, all maxima and their coordinates are listed in the Results property page. The maximum selected in the list is highlighted in the 3-D view. For the secondary maxima returned from an Area Scan, the user can specify a lower limit (peak SAR value), in addition to the Find secondary maxima within x dB condition. Only the primary maximum and any secondary maxima within x dB from the primary maximum and above this limit will be measured.





## 7.3 Zoom Scan

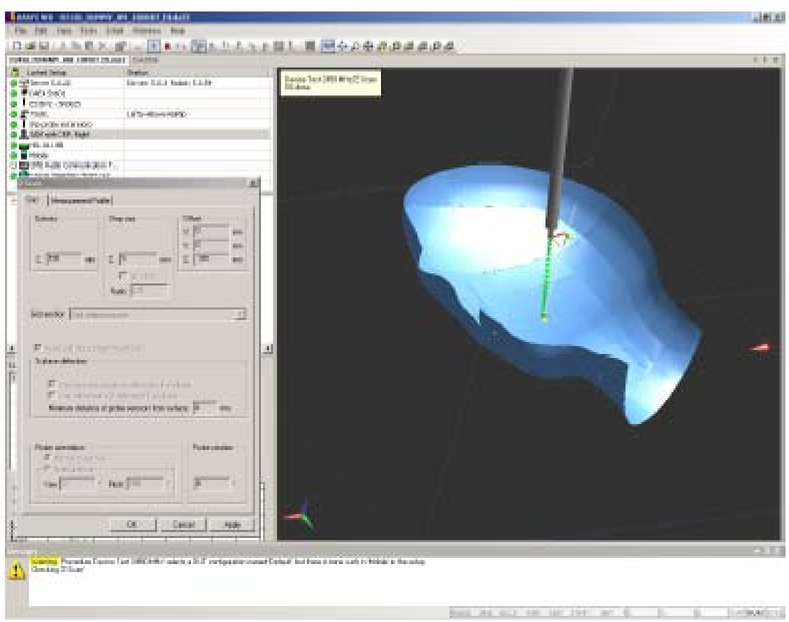
Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan measures 5 x 5 x 7 points within a cube whose base faces are centered around the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

## 7.4 Power drift measurement

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

## 7.5 Z-Scan

The Z Scan job measures points along a vertical straight line. The line runs along the Z axis of a one-dimensional grid. A user can anchor the grid to the section reference point, to any defined user point or to the current probe location. As with any other grids, the local Z axis of the anchor location establishes the Z axis of the grid.



# 8 Description of Test System

These measurements were performed with the automated near-field scanning system DASY6 from Schmid & Partner Engineering AG (SPEAG) which is the sixth generation of the system shown in the figure hereinafter:

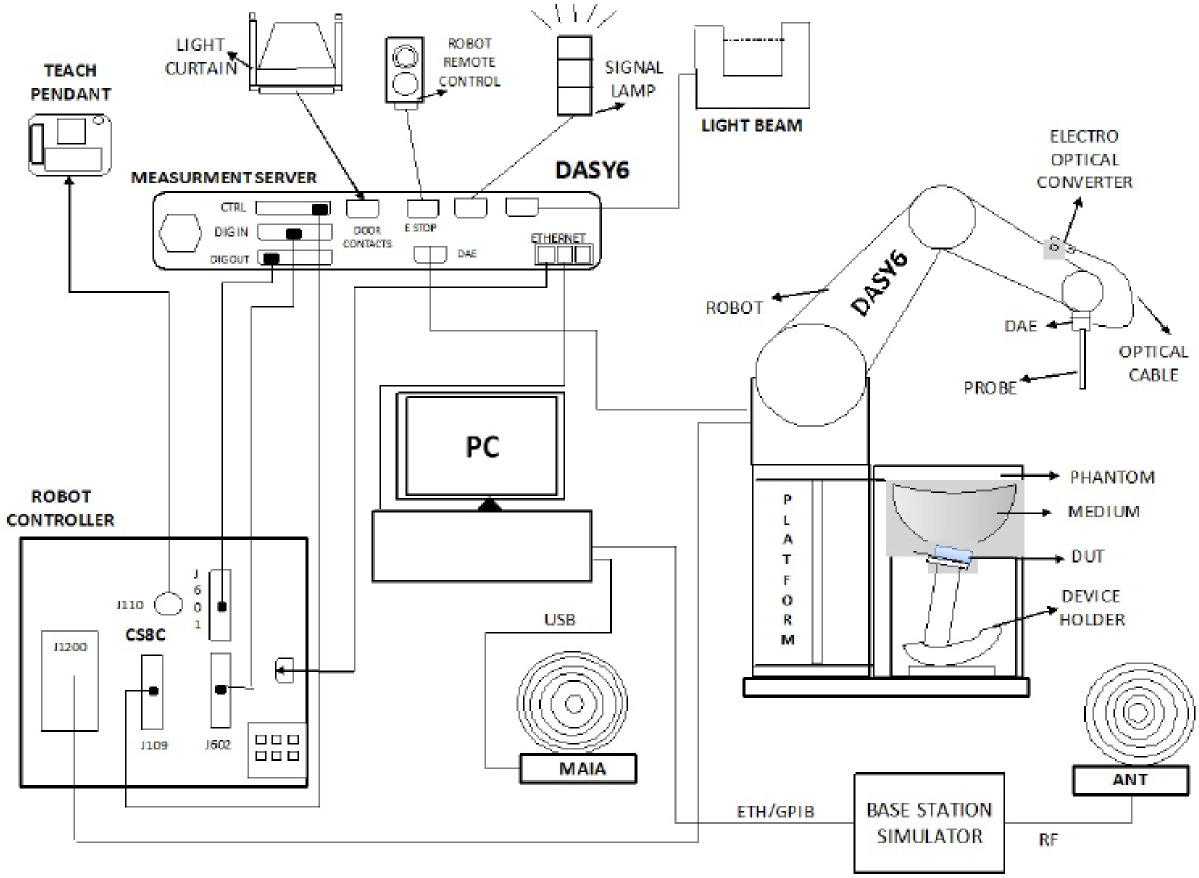
The system is based on a high precision robot (working range greater than 1.45m), which positions the probes with a positional repeatability of better than ±0.02mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit.

The SAR measurements were conducted with the dosimetric probe EX3DV4 SN: 3619 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure with accuracy of better than ±10%. The spherical isotropy was evaluated with the procedure and found to be better than ±0.25dB.

## 8.1 IEEE 1528-2013 Recommended Tissue Dielectric Parameters

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

## 8.2 Measurement System Diagram




The DASY6 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot arm (Stäubli TX90XL) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).

- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

- A data acquisition electronics (DAE4) 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 between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.

- 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.

- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.

- A computer operating Windows 2000 or Windows XP.

• DASY52 software.

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

• The Twin SAM phantom enabling testing left-hand and right-hand usage.

• The ELI V8.0 phantom.

• The device holder for handheld mobile phones.

• Tissue simulating liquid mixed according to the given recipes.

• Validation dipole kits allowing system validation.

## 8.3 System Components

• DASY6 Measurement Server
• Data Acquisition Electronics
• Probes
• Light Beam Unit
• Medium
• SAM Twin Phantom
• ELI V8.0 Phantom
• Device Holder for SAM Twin Phantom
• System Validation Kits
• Robot

## 8.4 DASY6 Measurement Server


The DASY6 measurement server is based on a PC/104 CPU board with a 400MHz intel ULV Celeron, 128MB chip-disk and 128MB RAM. The necessary circuits for communication with the DAE4 (or DAE3) electronics box, as well as the 16-bit AD converter system for optical detection and digital I/O interface are contained on the DASY6 I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all real-time data evaluations of field measurements and surface detection, controls robot movements, and handles safety operations. The PC operating system cannot interfere with these time-critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program controlled robot movements. Furthermore, the measurement server is equipped with an expansion port, which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Connection of devices from any other supplier could seriously damage the measurement server.

## 8.5 Data Acquisition Electronics

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

## 8.6 Probes

The DASY system can support many different probe types.

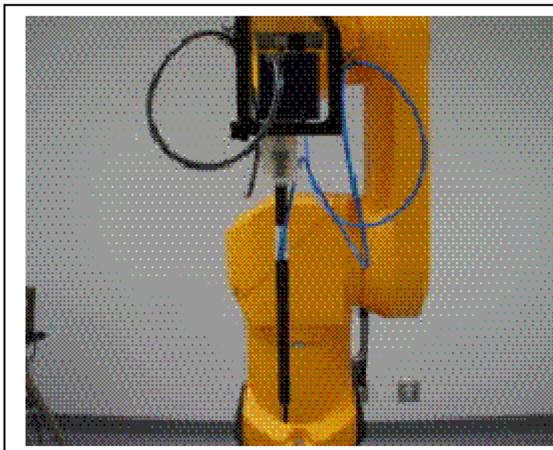
**Dosimetric Probes:** These probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor (±2 dB). The dosimetric probes have special calibrations in various liquids at different frequencies.

**Free Space Probes:** These are electric and magnetic field probes specially designed for measurements in free space. The z-sensor is aligned to the probe axis and the rotation angle of the x-sensor is specified. This allows the DASY system to automatically align the probe to the measurement grid for field component measurement. The free space probes are generally not calibrated in liquid. (The H-field probes can be used in liquids without any change of parameters.)

**Temperature Probes:** Small and sensitive temperature probes for general use. They use a completely different parameter set and different evaluation procedures. Temperature rise features allow direct SAR evaluations with these probes.

## 8.7 ET3DV6 Probe Specification

Construction Symmetrical design with triangular core
Built-in shielding against static charges
Calibration In air from 4 MHz to 10 GHz
In brain and muscle simulating tissue at
frequencies of 450 MHz, 600 MHz, 750 MHz, 835 MHz, 1750 MHz, 1900 MHz, 2450 MHz, 2600 MHz, 5250 MHz, 5600 MHz, and 5800 MHz (accuracy ± 13.3%).
Frequency 4 MHz to 10 GHz; Linearity: ± 0.2 dB
(30 MHz to 10 GHz)
Directivity ± 0.1 dB in TSL (rotation around probe axis)
± 0.3 dB in TSL (rotation normal probe axis)
Dynamic Range: 10 µW/g to > 100 mW/g;
Dynamic Range Linearity: ± 0.2 dB



**Photograph of the probe**

Dimensions Overall length: 337 mm; Tip length: 20 mm; Body diameter: 12 mm; Tip diameter: 2.5 mm
Typical distance from probe tip to dipole centers: 1 mm

Application: High precision dosimetric measurements in ant exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better than 30%.

## 8.8 E-Field Probe Calibration Process

Each probe is calibrated according to a dosimetric assessment procedure described in [6] with accuracy better than +/- 10%. The spherical isotropy was evaluated with the procedure described in [7] and found to be better than +/-0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a waveguide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

## 8.9 Data Evaluation

The DASY6 post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

| | | |
|---|---|---|
| Probe parameters: | - Sensitivity | Normi, ai0, ai1, ai2 |
| | - Conversion factor | ConvFi |
| | - Diode compression point | dcpi |
| Device parameters: | - Frequency | f |
| | - Crest factor | cf |
| Media parameters: | - Conductivity | σ |
| | - Density | ρ |

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

With Vi = compensated signal of channel i (i =x, y, z)
Ui = input signal of channel i (i =x, y, z)
cf = crest factor of exciting field (DASY parameter)
$dcp_i$ = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$\text{E}-\text{fieldprobes}: \qquad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$\text{H}-\text{fieldprobes}: \qquad H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

With Vi = compensated signal of channel i (i =x, y, z)
$Norm_i$ = sensor sensitivity of channel i (i =x, y, z)
μV/ $(V/m)^2$ for E-field probes
ConF = sensitivity enhancement in solution
$a_{ij}$ = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strenggy of channel i in V/m
$H_i$ = diode compression point (DASY parameter)

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

With SAR = local specific absorption rate in mW/g
$E_{tot}$ = total field strength in V/m
σ = conductivity in [mho/meter] or [Siemens/meter]
ρ = equivalent tissue density in $g/cm^3$

Note that the density is normally set to 1, to account for actual brain density rather than the density of the simulation liquid.

## 8.10 Light Beam Unit

The light beam switch allows automatic “tooling” of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, so that the robot coordinates are valid for the probe tip. The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position.

## 8.11 Tissue Simulating Liquids

Parameters

The parameters of the tissue simulating liquid strongly influence the SAR in the liquid. The parameters for the different frequencies are defined in the corresponding compliance standards (e.g., EN 50361, IEEE 1528-2003).

Parameter measurements

The following measurement system was applied for measuring the dielectric parameters of liquids:

- The open coax test method (e.g., HP85070 dielectric probe kit) is easy to use, but has only moderate accuracy. It is calibrated with open, short, and deionized water and the calibrations a critical process.

## 8.12 SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

- Left hand
- Right hand
- Flat phantom

The phantom table comes in two sizes: A 100 x 50 x 85 cm (L x W x H) table for use with free standing robots (DASY6 professional system option) or as a second phantom and a 100 x 75 x 85 cm(L x W x H) table with reinforcements for table mounted robots (DASY6 compact system option) . The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. Only one device holder is necessary if two phantoms are used (e.g., for different liquids) A white cover is provided to tap the phantom during o_-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on the cover are possible. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

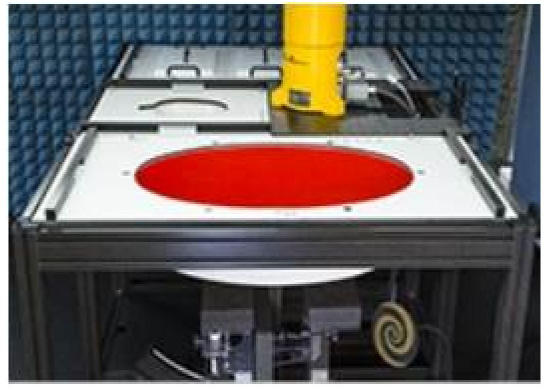
The phantom can be used with the following tissue simulating liquids:

- Water-sugar based liquids can be left permanently in the phantom. Always cover the liquid if the system is not used, otherwise the parameters will change due to water evaporation.

- Glycol based liquids should be used with care. As glycol is a softener for most plastics, the liquid should be taken out of the phantom and the phantom should be dried when the system is not used (desirable at least once a week).

- Do not use other organic solvents without previously testing the phantom’s compatibility.

## 8.13 ELI Phantom



- The ELI phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has one measurement area: Flat Phantom
- Dimensions: Major Axis: 600mm, Minor Axis: 400mm
- Filling Volume: ≈ 30 Liters
- Support: DASY6: standard-size platform slot, DASY52 stand-alone: SPEAG standard phantom table
- The phantom can be used with the following tissue simulating liquids:

  -Water-sugar based liquids can be left permanently in the phantom. Always cover the liquid if the system is not used, otherwise the parameters will change due to water evaporation.

  -Glycol based liquids should be used with care. As glycol is a softener for most plastics, the liquid should be taken out of the phantom and the phantom should be dried when the system is not used (desirable at least once a week).

  -Do not use other organic solvents without previously testing the phantom's compatibility.

## 8.14 System Validation Kits

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performance check and system validation. For that purpose a well-defined SAR distribution in the flat section of the SAM twin phantom or ELI phantom is produced.

System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder. Dipoles are available for the variety of frequencies between 300MHz and 6 GHz (dipoles for other frequencies or media and other calibration conditions are available upon request).

The dipoles are highly symmetric and matched at the center frequency for the specified liquid and distance to the flat phantom (or flat section of the SAM-twin phantom). The accurate distance between the liquid surface and the dipole center is achieved with a distance holder that snaps on the dipole.

## 8.15 Robot

BACL's DASY6 system uses the Stäubli TX90XL high precision industrial robots. This robot has many features:

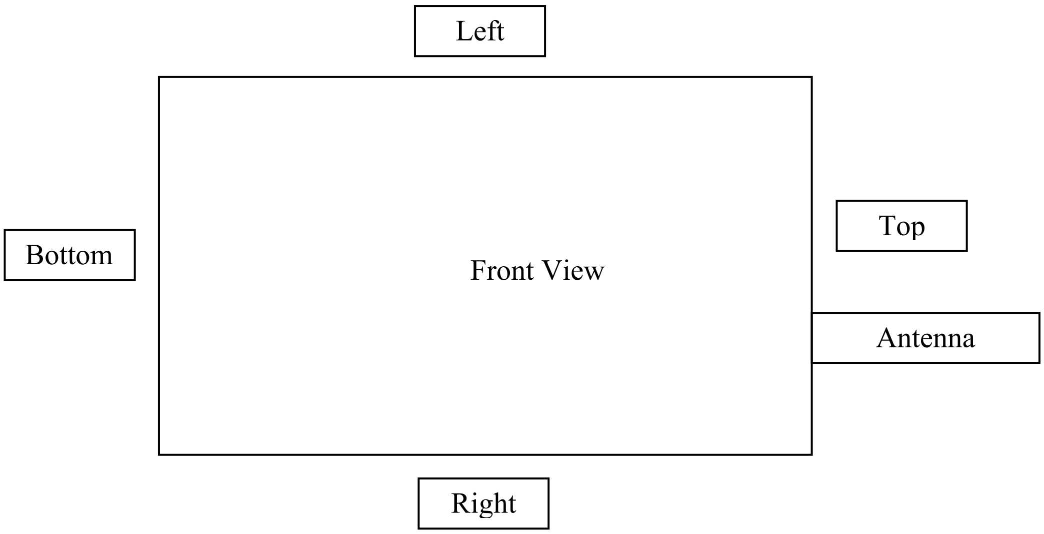
• High precision (repeatability 0.02mm)
• High reliability (industrial design)
• Low maintenance costs (virtually maintenance-free due to direct drive gears; no belt drives)
• Jerk-free straight movements (brushless synchronous motors; no stepper motors)
• Low ELF interference (the closed metallic construction shields against motor control fields)

BACL's DASY6 system uses the SP1 controller with S/N D21142607B.

# 9 SAR Measurement Consideration

## 9.1 SAR Consideration

**EUT Antennas Location**




Note 1: One position was chosen for SAR testing, i.e. rear side touches to human body for normal operation.
Note 2: EUT was tested without any accessories attached (0 mm distance between the phantom & EUT), which represents the worst case separation distance.

# 10 SAR Measurement Results

This page summarizes the results of the performed diametric evaluation. The plots with the corresponding SAR distributions, which reveal information about the location of the maximum SAR with respect to the device, could be found in Appendix E.

## 10.1 Environmental Conditions

| | |
|---|---|
| **Temperature:** | 22° C |
| **Relative Humidity:** | 42 % |
| **ATM Pressure:** | 102 kPa |

*Testing was performed by Vincent Licata in SAR chamber on 2018-08-09.*

## 10.2 Standalone SAR Results

| **470.1-495.675 MHz Band WM-470** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **EUT Position** | **Frequency (MHz)** | **Test Type** | **Phantom** | **Output Power (mW)** | **Rated Power (mW)** | **Scaled** | **Measured SAR (W/kg) 1g Tissue** | **Scaled SAR (W/kg) 1g Tissue** | **Limit (W/kg) 1g Tissue** | **Plot #** |
| Rear Side Touch (Mid CH) | 482.9 | Body | ELI | 237.68 | 250 | 1.05 | 0.712 | 0.749 | 1.6 | 1 |

Note: According to KDB 447498 D01 General RF Exposure Guidance v06 in section 4.4.1 General SAR test reduction considerations: Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz.

# 11 Appendix A – Measurement Uncertainty

The uncertainty budget has been determined for the DASY6 measurement system and is given in the following Table.

| DASY6 Uncertainty Budget 30 MHz – 3 GHz | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Error Description | Uncertainty Value | Prob. Dist. | Div. | (c i) 1g | (c i) 10g | Std. Unc. (1g) | Std. Unc. (10g) | (v i) veff |
| **Measurement System** | | | | | | | | |
| Probe Calibration | ± 6.65 % | N | 1 | 1 | 1 | ± 6.65 % | ± 6.65 % | ∝ |
| Axial Isotropy | ± 0.25 % | R | $\sqrt{3}$ | 0.7 | 0.7 | ± 0.10 % | ± 0.10 % | ∝ |
| Hemispherical Isotropy | ± 1.3 % | R | $\sqrt{3}$ | 0.7 | 0.7 | ± 0.53 % | ± 0.53 % | ∝ |
| Linearity | ± 0.3 % | R | $\sqrt{3}$ | 1 | 1 | ± 0.17 % | ± 0.17 % | ∝ |
| Modulation Response | ± 4.8 % | R | $\sqrt{3}$ | 1 | 1 | ± 2.77 % | ± 2.77 % | ∝ |
| System Detection Limits | ± 1.0 % | R | $\sqrt{3}$ | 1 | 1 | ± 0.6 % | ± 0.6 % | ∝ |
| Boundary Effects | ± 1.0 % | R | $\sqrt{3}$ | 1 | 1 | ± 0.58 % | ± 0.58 % | ∝ |
| Readout Electronics | ± 0.3 % | N | 1 | 1 | 1 | ± 0.3 % | ± 0.3 % | ∝ |
| Response Time | ± 0.8 % | R | $\sqrt{3}$ | 1 | 1 | ± 0.46 % | ± 0.46 % | ∝ |
| Integration Time | ± 2.6 % | R | $\sqrt{3}$ | 1 | 1 | ± 1.5 % | ± 1.5 % | ∝ |
| RF Ambient Noise | ± 3.0 % | R | $\sqrt{3}$ | 1 | 1 | ± 1.7 % | ± 1.7 % | ∝ |
| RF Ambient Reflections | ± 3.0 % | R | $\sqrt{3}$ | 1 | 1 | ± 1.7 % | ± 1.7 % | ∝ |
| Probe Positioner | ± 0.04 % | R | $\sqrt{3}$ | 1 | 1 | ± 0.0 % | ± 0.0 % | ∝ |
| Probe Positioning | ± 0.8 % | R | $\sqrt{3}$ | 1 | 1 | ± 0.5 % | ± 0.5 % | ∝ |
| Post-processing | ± 4.0 % | R | $\sqrt{3}$ | 1 | 1 | ± 2.3 % | ± 2.3 % | ∝ |
| **Test Sample Related** | | | | | | | | |
| Device Holder | ± 3.6 % | N | 1 | 1 | 1 | ± 3.6 % | ± 3.6 % | 5 |
| Device Positioning | ± 2.9 % | N | 1 | 1 | 1 | ± 2.9 % | ± 2.9 % | 145 |
| SAR Scaling | ± 0.0 % | R | $\sqrt{3}$ | 1 | 1 | ± 0.0 % | ± 0.0 % | ∝ |
| Power Drift | ± 5.0 % | R | $\sqrt{3}$ | 1 | 1 | ± 2.9 % | ± 2.9 % | ∝ |
| **Phantom and Setup** | | | | | | | | |
| Phantom Uncertainty | ± 6.6 % | R | $\sqrt{3}$ | 1 | 1 | ± 3.8 % | ± 3.8 % | ∝ |
| SAR Correction | ± 1.9 % | N | 1 | 1 | 0.84 | ± 1.9 % | ± 1.6 % | ∝ |
| Liquid Conductivity (meas.)$^{DAK}$ | ± 2.5 % | N | 1 | 0.78 | 0.71 | ± 2.0 % | ± 1.8 % | ∝ |
| Liquid Permittivity (meas.)$^{DAK}$ | ± 2.5 % | N | 1 | 0.23 | 0.26 | ± 0.6 % | ± 0.7 % | ∝ |
| Temp. unc. - Conductivity (meas.)$^{BB}$ | ± 3.4 % | R | $\sqrt{3}$ | 0.78 | 0.71 | ± 1.5 % | ± 1.4 % | ∝ |
| Temp. unc. - Permittivity (meas.)$^{BB}$ | ± 0.4 % | R | $\sqrt{3}$ | 0.23 | 0.26 | ± 0.1 % | ± 0.1 % | ∝ |
| Combined Std. Uncertainty | - | - | - | - | - | ± 10.9 % | ± 10.7 % | 414 |
| Expanded STD Uncertainty | - | - | - | - | - | ± 21.8 % | ± 21.5 % | - |

# 12 Appendix B – Probe Calibration Certificates

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

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

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

Accreditation No.: **SCS 0108**

Client **BACL**

Certificate No: **EX3-3619_Sep17**

## CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3619

Calibration procedure(s): QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: September 25, 2017

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°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-17 (No. 217-02521/02522) | Apr-18 |
| Power sensor NRP-Z91 | SN: 103244 | 04-Apr-17 (No. 217-02521) | Apr-18 |
| Power sensor NRP-Z91 | SN: 103245 | 04-Apr-17 (No. 217-02525) | Apr-18 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 07-Apr-17 (No. 217-02528) | Apr-18 |
| Reference Probe ES3DV2 | SN: 3013 | 31-Dec-16 (No. ES3-3013_Dec16) | Dec-17 |
| DAE4 | SN: 660 | 7-Dec-16 (No. DAE4-660_Dec16) | Dec-17 |
| | | | |
| Secondary Standards | ID | Check Date (in house) | Scheduled Check |
| Power meter E4419B | SN: GB41293874 | 06-Apr-16 (in house check Jun-16) | In house check: Jun-18 |
| Power sensor E4412A | SN: MY41498087 | 06-Apr-16 (in house check Jun-16) | In house check: Jun-18 |
| Power sensor E4412A | SN: 000110210 | 06-Apr-16 (in house check Jun-16) | In house check: Jun-18 |
| RF generator HP 8648C | SN: US3642U01700 | 04-Aug-99 (in house check Jun-16) | In house check: Jun-18 |
| Network Analyzer HP 8753E | SN: US37390585 | 18-Oct-01 (in house check Oct-16) | In house check: Oct-17 |

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

Issued: September 25, 2017



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

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

## Calibration is Performed According to the Following Standards:

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

## Methods Applied and Interpretation of Parameters:

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

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# Probe EX3DV4

## SN:3619

Manufactured: July 3, 2007
Calibrated: September 25, 2017

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3619

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$)[A] | 0.46 | 0.37 | 0.39 | ± 10.1 % |
| DCP (mV)[B] | 96.6 | 93.8 | 94.9 | |

## 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 | 147.1 | ±3.0 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 147.9 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 137.9 | |

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 | 52.91 | 392.8 | 37.02 | 18.86 | 0.60 | 5.10 | 0.102 | 0.556 | 1.009 |
| Y | 52.72 | 397.3 | 37.78 | 12.52 | 1.50 | 5.03 | 0.000 | 0.617 | 1.009 |
| Z | 56.09 | 413.1 | 36.90 | 20.26 | 0.90 | 5.10 | 0.639 | 0.511 | 1.010 |

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.

**Post Repair/Re-Calibration Verification**

Date Received Back 2017-9-28

Cal Cert/Sticker/Date OK? OK Date 2017-10-2

Functional Verification OK? OK Date 2017-10-2

Verifications By: Simon Ma

EX3DV4– SN:3619 September 25, 2017

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3619

## Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (mm) | Unc (k=2) |
|---|---|---|---|---|---|---|---|---|
| 450 | 43.5 | 0.87 | 9.43 | 9.43 | 9.43 | 0.13 | 1.20 | ± 13.3 % |
| 600 | 42.7 | 0.88 | 9.18 | 9.18 | 9.18 | 0.10 | 1.20 | ± 13.3 % |
| 750 | 41.9 | 0.89 | 9.25 | 9.25 | 9.25 | 0.41 | 0.86 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 8.90 | 8.90 | 8.90 | 0.41 | 0.85 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 7.37 | 7.37 | 7.37 | 0.40 | 0.90 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 6.99 | 6.99 | 6.99 | 0.35 | 0.99 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 6.59 | 6.59 | 6.59 | 0.43 | 0.82 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 6.55 | 6.55 | 6.55 | 0.41 | 0.86 | ± 12.0 % |
| 5250 | 35.9 | 4.71 | 4.60 | 4.60 | 4.60 | 0.35 | 1.80 | ± 13.1 % |
| 5600 | 35.5 | 5.07 | 4.18 | 4.18 | 4.18 | 0.40 | 1.80 | ± 13.1 % |
| 5800 | 35.3 | 5.27 | 4.19 | 4.19 | 4.19 | 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.

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# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3619

## 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 | 9.45 | 9.45 | 9.45 | 0.09 | 1.20 | ± 13.3 % |
| 600 | 56.1 | 0.95 | 8.91 | 8.91 | 8.91 | 0.08 | 1.20 | ± 13.3 % |
| 750 | 55.5 | 0.96 | 8.67 | 8.67 | 8.67 | 0.52 | 0.88 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 8.30 | 8.30 | 8.30 | 0.43 | 0.85 | ± 12.0 % |
| 1750 | 53.4 | 1.49 | 7.28 | 7.28 | 7.28 | 0.36 | 0.85 | ± 12.0 % |
| 1900 | 53.3 | 1.52 | 7.02 | 7.02 | 7.02 | 0.41 | 0.80 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 6.73 | 6.73 | 6.73 | 0.25 | 0.89 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 6.52 | 6.52 | 6.52 | 0.29 | 0.95 | ± 12.0 % |
| 5250 | 48.9 | 5.36 | 4.28 | 4.28 | 4.28 | 0.35 | 1.90 | ± 13.1 % |
| 5600 | 48.5 | 5.77 | 3.61 | 3.61 | 3.61 | 0.40 | 1.90 | ± 13.1 % |
| 5800 | 48.2 | 6.00 | 4.00 | 4.00 | 4.00 | 0.40 | 1.90 | ± 13.1 % |

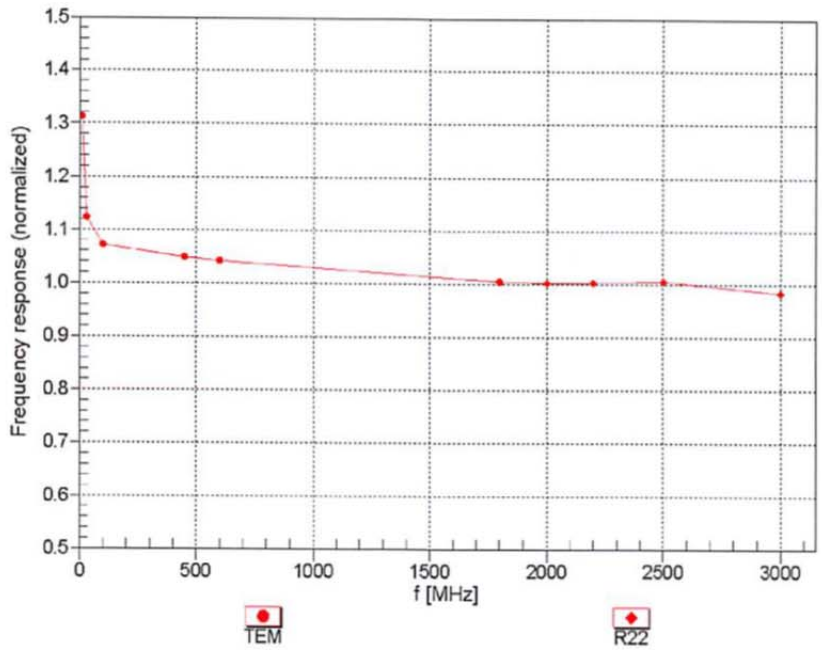
[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz 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 ($\varepsilon$ and $\sigma$) 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 ($\varepsilon$ and $\sigma$) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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

# Frequency Response of E-Field

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




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

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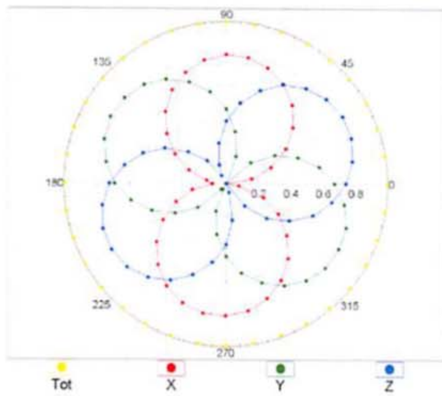
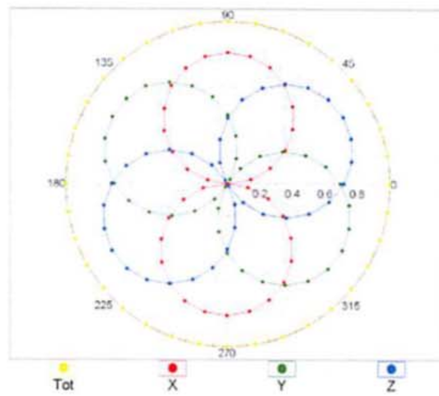
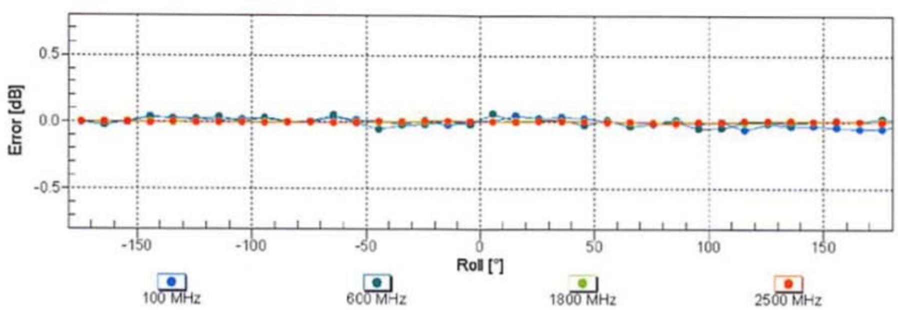
## Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM




f=1800 MHz,R22




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

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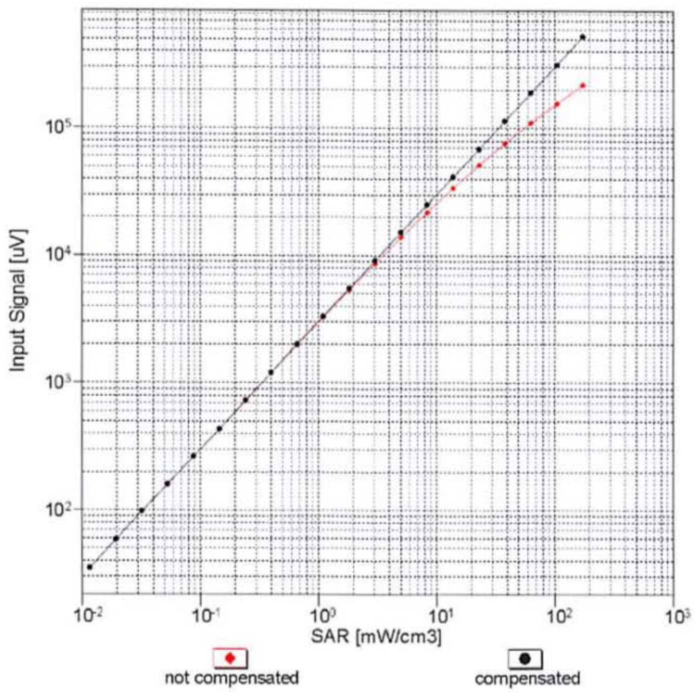
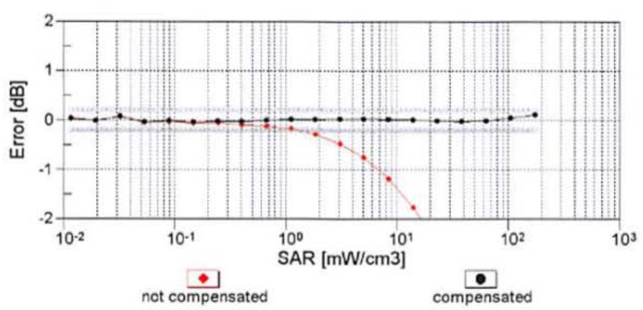
## Dynamic Range f($SAR_{head}$)
**(TEM cell , $f_{eval}$= 1900 MHz)**




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

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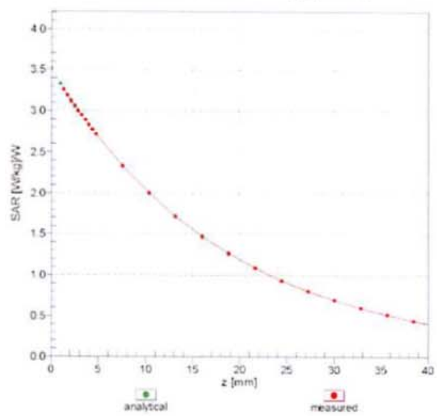
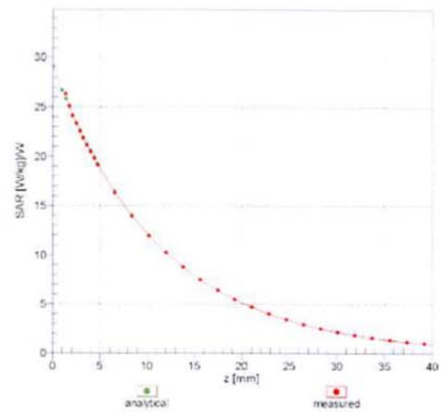
# Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

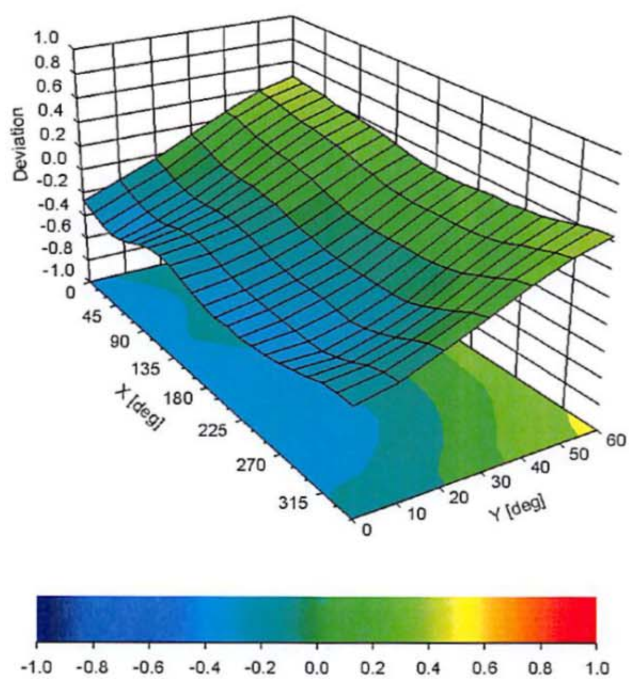



f = 1900 MHz,WGLS R22 (H_convF)




# Deviation from Isotropy in Liquid

**Error (ϕ, ϑ), f = 900 MHz**




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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3619

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 25.7 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disabled |
| Probe Overall Length | 337 mm |
| Probe Body Diameter | 10 mm |
| Tip Length | 9 mm |
| Tip Diameter | 2.5 mm |
| Probe Tip to Sensor X Calibration Point | 1 mm |
| Probe Tip to Sensor Y Calibration Point | 1 mm |
| Probe Tip to Sensor Z Calibration Point | 1 mm |
| Recommended Measurement Distance from Surface | 1.4 mm |

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## Appendix: Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | C | D dB | VR mV | Max Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.00 | 0.00 | 1.00 | 0.00 | 147.1 | ± 3.0 % |
| | | Y | 0.00 | 0.00 | 1.00 | | 147.9 | |
| | | Z | 0.00 | 0.00 | 1.00 | | 137.9 | |
| 10010-CAA | SAR Validation (Square, 100ms, 10ms) | X | 100.00 | 146.42 | 42.91 | 10.00 | 20.0 | ± 9.6 % |
| | | Y | 100.00 | 136.02 | 38.82 | | 20.0 | |
| | | Z | 100.00 | 156.09 | 48.32 | | 20.0 | |
| 10011-CAB | UMTS-FDD (WCDMA) | X | 100.00 | 186.20 | 59.83 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 182.43 | 58.08 | | 150.0 | |
| | | Z | 100.00 | 192.66 | 63.54 | | 150.0 | |
| 10012-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) | X | 2.72 | 83.26 | 29.81 | 0.41 | 150.0 | ± 9.6 % |
| | | Y | 3.45 | 89.08 | 31.89 | | 150.0 | |
| | | Z | 3.46 | 89.22 | 33.32 | | 150.0 | |
| 10013-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps) | X | 5.64 | 69.35 | 20.04 | 1.46 | 150.0 | ± 9.6 % |
| | | Y | 5.66 | 69.41 | 19.97 | | 150.0 | |
| | | Z | 5.88 | 69.99 | 20.69 | | 150.0 | |
| 10021-DAC | GSM-FDD (TDMA, GMSK) | X | 100.00 | 154.52 | 47.69 | 9.39 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 142.43 | 42.67 | | 50.0 | |
| | | Z | 100.00 | 160.94 | 51.62 | | 50.0 | |
| 10023-DAC | GPRS-FDD (TDMA, GMSK, TN 0) | X | 100.00 | 153.25 | 47.14 | 9.57 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 141.37 | 42.24 | | 50.0 | |
| | | Z | 100.00 | 159.79 | 51.12 | | 50.0 | |
| 10024-DAC | GPRS-FDD (TDMA, GMSK, TN 0-1) | X | 100.00 | 168.47 | 52.96 | 6.56 | 60.0 | ± 9.6 % |
| | | Y | 100.00 | 155.02 | 47.10 | | 60.0 | |
| | | Z | 100.00 | 174.57 | 56.75 | | 60.0 | |
| 10025-DAC | EDGE-FDD (TDMA, 8PSK, TN 0) | X | 7.44 | 90.92 | 39.98 | 12.57 | 50.0 | ± 9.6 % |
| | | Y | 4.21 | 66.05 | 24.62 | | 50.0 | |
| | | Z | 6.81 | 85.51 | 37.44 | | 50.0 | |
| 10026-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1) | X | 19.44 | 118.66 | 46.05 | 9.56 | 60.0 | ± 9.6 % |
| | | Y | 9.82 | 93.79 | 35.46 | | 60.0 | |
| | | Z | 18.03 | 115.62 | 45.44 | | 60.0 | |
| 10027-DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2) | X | 100.00 | 187.31 | 60.49 | 4.80 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 172.56 | 53.96 | | 80.0 | |
| | | Z | 100.00 | 192.76 | 64.07 | | 80.0 | |
| 10028-DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3) | X | 100.00 | 211.94 | 70.46 | 3.55 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 195.60 | 63.17 | | 100.0 | |
| | | Z | 100.00 | 215.90 | 73.53 | | 100.0 | |
| 10029-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2) | X | 9.88 | 98.25 | 37.53 | 7.80 | 80.0 | ± 9.6 % |
| | | Y | 6.96 | 85.83 | 31.44 | | 80.0 | |
| | | Z | 10.21 | 98.48 | 38.05 | | 80.0 | |
| 10030-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1) | X | 100.00 | 174.93 | 55.31 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 100.00 | 161.43 | 49.33 | | 70.0 | |
| | | Z | 100.00 | 181.11 | 59.15 | | 70.0 | |
| 10031-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3) | X | 100.00 | 275.49 | 95.87 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 251.73 | 85.35 | | 100.0 | |
| | | Z | 100.00 | 272.78 | 96.61 | | 100.0 | |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10032-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5) | X | 100.00 | 345.14 | 124.04 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 308.97 | 108.28 | | 100.0 | |
| | | Z | 100.00 | 328.89 | 119.66 | | 100.0 | |
| 10033-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1) | X | 100.00 | 159.17 | 50.41 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 100.00 | 151.60 | 46.85 | | 70.0 | |
| | | Z | 100.00 | 163.46 | 53.13 | | 70.0 | |
| 10034-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3) | X | 100.00 | 166.80 | 52.19 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 161.96 | 49.86 | | 100.0 | |
| | | Z | 100.00 | 172.84 | 55.71 | | 100.0 | |
| 10035-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5) | X | 100.00 | 170.30 | 53.30 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 166.04 | 51.25 | | 100.0 | |
| | | Z | 100.00 | 176.79 | 57.04 | | 100.0 | |
| 10036-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1) | X | 100.00 | 159.83 | 50.73 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 100.00 | 152.24 | 47.17 | | 70.0 | |
| | | Z | 100.00 | 164.09 | 53.43 | | 70.0 | |
| 10037-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3) | X | 100.00 | 167.32 | 52.38 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 162.33 | 49.98 | | 100.0 | |
| | | Z | 100.00 | 173.39 | 55.91 | | 100.0 | |
| 10038-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5) | X | 100.00 | 171.36 | 53.79 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 167.07 | 51.72 | | 100.0 | |
| | | Z | 100.00 | 177.80 | 57.50 | | 100.0 | |
| 10039-CAB | CDMA2000 (1xRTT, RC1) | X | 100.00 | 167.09 | 51.53 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 165.71 | 50.86 | | 150.0 | |
| | | Z | 100.00 | 173.37 | 55.16 | | 150.0 | |
| 10042-CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | X | 100.00 | 159.05 | 48.89 | 7.78 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 147.06 | 43.80 | | 50.0 | |
| | | Z | 100.00 | 166.23 | 53.15 | | 50.0 | |
| 10044-CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM) | X | 0.27 | 60.00 | 46.16 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.27 | 62.94 | 43.12 | | 150.0 | |
| | | Z | 0.39 | 65.86 | 45.75 | | 150.0 | |
| 10048-CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24) | X | 100.00 | 151.06 | 47.39 | 13.80 | 25.0 | ± 9.6 % |
| | | Y | 100.00 | 134.38 | 40.73 | | 25.0 | |
| | | Z | 100.00 | 157.65 | 51.51 | | 25.0 | |
| 10049-CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12) | X | 100.00 | 148.31 | 45.14 | 10.79 | 40.0 | ± 9.6 % |
| | | Y | 100.00 | 137.38 | 40.80 | | 40.0 | |
| | | Z | 100.00 | 155.34 | 49.36 | | 40.0 | |
| 10056-CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps) | X | 100.00 | 147.90 | 46.36 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 140.04 | 42.87 | | 50.0 | |
| | | Z | 100.00 | 151.85 | 48.94 | | 50.0 | |
| 10058-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3) | X | 7.13 | 89.66 | 33.38 | 6.55 | 100.0 | ± 9.6 % |
| | | Y | 5.69 | 81.90 | 29.26 | | 100.0 | |
| | | Z | 7.61 | 90.75 | 34.28 | | 100.0 | |
| 10059-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps) | X | 3.43 | 90.16 | 32.89 | 0.61 | 110.0 | ± 9.6 % |
| | | Y | 4.46 | 96.33 | 34.75 | | 110.0 | |
| | | Z | 4.58 | 97.88 | 36.95 | | 110.0 | |
| 10060-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps) | X | 100.00 | 203.28 | 67.14 | 1.30 | 110.0 | ± 9.6 % |
| | | Y | 100.00 | 195.01 | 63.30 | | 110.0 | |
| | | Z | 100.00 | 208.93 | 70.67 | | 110.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10061-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps) | X | 100.00 | 179.75 | 58.70 | 2.04 | 110.0 | ± 9.6 % |
| | | Y | 100.00 | 173.12 | 55.52 | | 110.0 | |
| | | Z | 100.00 | 183.86 | 61.31 | | 110.0 | |
| 10062-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps) | X | 5.55 | 69.89 | 19.78 | 0.49 | 100.0 | ± 9.6 % |
| | | Y | 5.60 | 70.07 | 19.83 | | 100.0 | |
| | | Z | 5.83 | 70.69 | 20.54 | | 100.0 | |
| 10063-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps) | X | 5.57 | 70.01 | 19.91 | 0.72 | 100.0 | ± 9.6 % |
| | | Y | 5.61 | 70.17 | 19.93 | | 100.0 | |
| | | Z | 5.85 | 70.82 | 20.67 | | 100.0 | |
| 10064-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps) | X | 5.85 | 70.06 | 19.96 | 0.86 | 100.0 | ± 9.6 % |
| | | Y | 5.89 | 70.17 | 19.94 | | 100.0 | |
| | | Z | 6.13 | 70.81 | 20.66 | | 100.0 | |
| 10065-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps) | X | 5.70 | 69.99 | 20.12 | 1.21 | 100.0 | ± 9.6 % |
| | | Y | 5.74 | 70.07 | 20.07 | | 100.0 | |
| | | Z | 5.98 | 70.75 | 20.84 | | 100.0 | |
| 10066-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps) | X | 5.70 | 69.92 | 20.24 | 1.46 | 100.0 | ± 9.6 % |
| | | Y | 5.73 | 69.98 | 20.16 | | 100.0 | |
| | | Z | 5.98 | 70.65 | 20.94 | | 100.0 | |
| 10067-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps) | X | 5.92 | 69.63 | 20.39 | 2.04 | 100.0 | ± 9.6 % |
| | | Y | 5.94 | 69.61 | 20.23 | | 100.0 | |
| | | Z | 6.17 | 70.21 | 20.99 | | 100.0 | |
| 10068-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps) | X | 5.97 | 69.69 | 20.62 | 2.55 | 100.0 | ± 9.6 % |
| | | Y | 5.99 | 69.65 | 20.43 | | 100.0 | |
| | | Z | 6.23 | 70.30 | 21.23 | | 100.0 | |
| 10069-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps) | X | 6.02 | 69.48 | 20.67 | 2.67 | 100.0 | ± 9.6 % |
| | | Y | 6.03 | 69.43 | 20.47 | | 100.0 | |
| | | Z | 6.26 | 70.01 | 21.24 | | 100.0 | |
| 10071-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps) | X | 5.70 | 69.28 | 20.25 | 1.99 | 100.0 | ± 9.6 % |
| | | Y | 5.73 | 69.30 | 20.13 | | 100.0 | |
| | | Z | 5.94 | 69.87 | 20.87 | | 100.0 | |
| 10072-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps) | X | 5.73 | 69.83 | 20.63 | 2.30 | 100.0 | ± 9.6 % |
| | | Y | 5.75 | 69.82 | 20.47 | | 100.0 | |
| | | Z | 5.98 | 70.48 | 21.28 | | 100.0 | |
| 10073-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps) | X | 5.77 | 69.89 | 20.91 | 2.83 | 100.0 | ± 9.6 % |
| | | Y | 5.79 | 69.84 | 20.70 | | 100.0 | |
| | | Z | 6.02 | 70.50 | 21.54 | | 100.0 | |
| 10074-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps) | X | 5.71 | 69.63 | 21.00 | 3.30 | 100.0 | ± 9.6 % |
| | | Y | 5.73 | 69.59 | 20.77 | | 100.0 | |
| | | Z | 5.95 | 70.22 | 21.62 | | 100.0 | |
| 10075-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps) | X | 5.74 | 69.72 | 21.32 | 3.82 | 90.0 | ± 9.6 % |
| | | Y | 5.77 | 69.66 | 21.03 | | 90.0 | |
| | | Z | 5.99 | 70.33 | 21.95 | | 90.0 | |
| 10076-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps) | X | 5.69 | 69.23 | 21.27 | 4.15 | 90.0 | ± 9.6 % |
| | | Y | 5.73 | 69.18 | 20.99 | | 90.0 | |
| | | Z | 5.92 | 69.76 | 21.86 | | 90.0 | |
| 10077-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps) | X | 5.71 | 69.27 | 21.35 | 4.30 | 90.0 | ± 9.6 % |
| | | Y | 5.75 | 69.22 | 21.06 | | 90.0 | |
| | | Z | 5.94 | 69.79 | 21.93 | | 90.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10081-CAB | CDMA2000 (1xRTT, RC3) | X | 100.00 | 188.12 | 59.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 184.82 | 58.14 | | 150.0 | |
| | | Z | 100.00 | 195.82 | 64.08 | | 150.0 | |
| 10082-CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | X | 100.00 | 129.45 | 32.85 | 4.77 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 121.04 | 29.21 | | 80.0 | |
| | | Z | 100.00 | 145.24 | 40.72 | | 80.0 | |
| 10090-DAC | GPRS-FDD (TDMA, GMSK, TN 0-4) | X | 100.00 | 168.10 | 52.81 | 6.56 | 60.0 | ± 9.6 % |
| | | Y | 100.00 | 154.72 | 46.98 | | 60.0 | |
| | | Z | 100.00 | 174.19 | 56.59 | | 60.0 | |
| 10097-CAB | UMTS-FDD (HSDPA) | X | 27.92 | 129.29 | 42.02 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 156.60 | 48.39 | | 150.0 | |
| | | Z | 99.33 | 162.54 | 51.76 | | 150.0 | |
| 10098-CAB | UMTS-FDD (HSUPA, Subtest 2) | X | 31.92 | 132.96 | 43.08 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 157.25 | 48.62 | | 150.0 | |
| | | Z | 100.00 | 163.48 | 52.09 | | 150.0 | |
| 10099-DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4) | X | 19.72 | 119.04 | 46.16 | 9.56 | 60.0 | ± 9.6 % |
| | | Y | 9.87 | 93.88 | 35.49 | | 60.0 | |
| | | Z | 18.23 | 115.91 | 45.53 | | 60.0 | |
| 10100-CAD | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | X | 20.39 | 109.73 | 34.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 31.33 | 118.04 | 36.60 | | 150.0 | |
| | | Z | 51.38 | 131.16 | 41.28 | | 150.0 | |
| 10101-CAD | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | X | 5.62 | 79.03 | 23.76 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.05 | 80.49 | 24.33 | | 150.0 | |
| | | Z | 6.66 | 82.76 | 25.90 | | 150.0 | |
| 10102-CAD | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | X | 5.47 | 77.76 | 23.25 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.87 | 79.22 | 23.85 | | 150.0 | |
| | | Z | 6.35 | 81.00 | 25.20 | | 150.0 | |
| 10103-CAD | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | X | 16.00 | 96.35 | 30.75 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 12.65 | 90.44 | 28.30 | | 65.0 | |
| | | Z | 20.49 | 101.78 | 33.05 | | 65.0 | |
| 10104-CAD | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | X | 9.77 | 83.89 | 26.84 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.44 | 79.95 | 24.88 | | 65.0 | |
| | | Z | 10.81 | 85.84 | 27.99 | | 65.0 | |
| 10105-CAD | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | X | 8.96 | 81.72 | 26.17 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.66 | 77.58 | 24.09 | | 65.0 | |
| | | Z | 9.58 | 82.82 | 26.96 | | 65.0 | |
| 10108-CAE | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | X | 17.20 | 108.95 | 34.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 28.44 | 118.98 | 37.41 | | 150.0 | |
| | | Z | 40.01 | 129.01 | 41.36 | | 150.0 | |
| 10109-CAE | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | X | 5.68 | 81.51 | 25.04 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.40 | 83.99 | 25.99 | | 150.0 | |
| | | Z | 6.97 | 86.08 | 27.53 | | 150.0 | |
| 10110-CAE | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | X | 22.12 | 118.98 | 38.33 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 50.16 | 135.78 | 42.51 | | 150.0 | |
| | | Z | 64.73 | 145.48 | 46.49 | | 150.0 | |
| 10111-CAE | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | X | 8.02 | 92.35 | 29.54 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 11.80 | 100.51 | 32.25 | | 150.0 | |
| | | Z | 11.21 | 100.38 | 33.19 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10112-CAE | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM) | X | 5.51 | 79.94 | 24.35 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.12 | 82.14 | 25.22 | | 150.0 | |
| | | Z | 6.58 | 83.83 | 26.58 | | 150.0 | |
| 10113-CAE | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) | X | 7.42 | 89.53 | 28.43 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 10.25 | 96.39 | 30.81 | | 150.0 | |
| | | Z | 9.81 | 96.13 | 31.61 | | 150.0 | |
| 10114-CAB | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK) | X | 6.06 | 70.45 | 19.58 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.14 | 70.73 | 19.73 | | 150.0 | |
| | | Z | 6.35 | 71.30 | 20.33 | | 150.0 | |
| 10115-CAB | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM) | X | 6.36 | 70.42 | 19.50 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.43 | 70.64 | 19.62 | | 150.0 | |
| | | Z | 6.69 | 71.32 | 20.25 | | 150.0 | |
| 10116-CAB | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | X | 6.21 | 70.79 | 19.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.30 | 71.07 | 19.81 | | 150.0 | |
| | | Z | 6.53 | 71.70 | 20.44 | | 150.0 | |
| 10117-CAB | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK) | X | 6.01 | 70.27 | 19.51 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.09 | 70.53 | 19.65 | | 150.0 | |
| | | Z | 6.32 | 71.18 | 20.29 | | 150.0 | |
| 10118-CAB | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM) | X | 6.49 | 70.76 | 19.67 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.58 | 71.02 | 19.80 | | 150.0 | |
| | | Z | 6.81 | 71.60 | 20.39 | | 150.0 | |
| 10119-CAB | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM) | X | 6.18 | 70.72 | 19.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.27 | 71.00 | 19.79 | | 150.0 | |
| | | Z | 6.50 | 71.62 | 20.42 | | 150.0 | |
| 10140-CAD | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM) | X | 5.55 | 77.78 | 23.15 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.93 | 79.13 | 23.71 | | 150.0 | |
| | | Z | 6.44 | 81.01 | 25.09 | | 150.0 | |
| 10141-CAD | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM) | X | 5.51 | 77.00 | 22.86 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.86 | 78.31 | 23.42 | | 150.0 | |
| | | Z | 6.29 | 79.85 | 24.64 | | 150.0 | |
| 10142-CAD | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK) | X | 100.00 | 154.67 | 47.53 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 153.27 | 46.84 | | 150.0 | |
| | | Z | 100.00 | 158.83 | 50.01 | | 150.0 | |
| 10143-CAD | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM) | X | 36.85 | 126.19 | 39.50 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 146.43 | 44.33 | | 150.0 | |
| | | Z | 99.99 | 150.96 | 46.99 | | 150.0 | |
| 10144-CAD | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM) | X | 15.31 | 105.50 | 32.82 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 30.00 | 118.49 | 36.37 | | 150.0 | |
| | | Z | 30.28 | 121.64 | 38.65 | | 150.0 | |
| 10145-CAE | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK) | X | 100.00 | 158.80 | 47.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 157.59 | 47.20 | | 150.0 | |
| | | Z | 100.00 | 165.89 | 51.76 | | 150.0 | |
| 10146-CAE | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | X | 100.00 | 140.95 | 40.54 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 140.77 | 40.48 | | 150.0 | |
| | | Z | 100.00 | 146.42 | 43.73 | | 150.0 | |
| 10147-CAE | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | X | 100.00 | 142.11 | 41.17 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 142.29 | 41.27 | | 150.0 | |
| | | Z | 100.00 | 147.45 | 44.30 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10149-CAD | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM) | X | 5.72 | 81.66 | 25.12 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.47 | 84.21 | 26.10 | | 150.0 | |
| | | Z | 7.02 | 86.25 | 27.62 | | 150.0 | |
| 10150-CAD | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM) | X | 5.54 | 80.05 | 24.41 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.17 | 82.33 | 25.32 | | 150.0 | |
| | | Z | 6.61 | 83.97 | 26.65 | | 150.0 | |
| 10151-CAD | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK) | X | 24.59 | 108.08 | 34.95 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 14.56 | 95.63 | 30.48 | | 65.0 | |
| | | Z | 30.62 | 113.32 | 37.13 | | 65.0 | |
| 10152-CAD | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM) | X | 10.13 | 86.36 | 27.72 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.36 | 81.34 | 25.34 | | 65.0 | |
| | | Z | 11.39 | 88.69 | 29.05 | | 65.0 | |
| 10153-CAD | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM) | X | 10.41 | 86.79 | 28.21 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.78 | 82.25 | 26.05 | | 65.0 | |
| | | Z | 11.59 | 88.91 | 29.44 | | 65.0 | |
| 10154-CAE | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK) | X | 26.68 | 123.34 | 39.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 81.73 | 146.71 | 45.30 | | 150.0 | |
| | | Z | 90.92 | 153.69 | 48.58 | | 150.0 | |
| 10155-CAE | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) | X | 8.00 | 92.30 | 29.53 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 11.69 | 100.31 | 32.19 | | 150.0 | |
| | | Z | 11.15 | 100.27 | 33.16 | | 150.0 | |
| 10156-CAE | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK) | X | 100.00 | 157.37 | 48.40 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 155.94 | 47.69 | | 150.0 | |
| | | Z | 100.00 | 161.99 | 51.13 | | 150.0 | |
| 10157-CAE | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM) | X | 100.00 | 146.17 | 43.71 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 145.19 | 43.22 | | 150.0 | |
| | | Z | 100.00 | 150.59 | 46.31 | | 150.0 | |
| 10158-CAE | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM) | X | 7.48 | 89.74 | 28.53 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 10.41 | 96.78 | 30.97 | | 150.0 | |
| | | Z | 9.90 | 96.38 | 31.72 | | 150.0 | |
| 10159-CAE | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM) | X | 100.00 | 145.77 | 43.63 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 144.96 | 43.21 | | 150.0 | |
| | | Z | 100.00 | 150.11 | 46.19 | | 150.0 | |
| 10160-CAD | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK) | X | 8.98 | 94.02 | 29.93 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 11.87 | 99.63 | 31.69 | | 150.0 | |
| | | Z | 13.37 | 103.46 | 33.93 | | 150.0 | |
| 10161-CAD | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM) | X | 5.58 | 80.92 | 24.82 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.34 | 83.62 | 25.88 | | 150.0 | |
| | | Z | 6.73 | 85.08 | 27.17 | | 150.0 | |
| 10162-CAD | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM) | X | 5.59 | 80.29 | 24.52 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.27 | 82.72 | 25.49 | | 150.0 | |
| | | Z | 6.63 | 84.05 | 26.71 | | 150.0 | |
| 10166-CAE | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) | X | 5.01 | 76.82 | 25.04 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.30 | 78.12 | 25.63 | | 150.0 | |
| | | Z | 5.66 | 79.32 | 26.68 | | 150.0 | |
| 10167-CAE | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | X | 7.20 | 83.65 | 27.00 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 7.75 | 85.12 | 27.56 | | 150.0 | |
| | | Z | 9.01 | 88.54 | 29.47 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10168-CAE | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) | X | 8.44 | 87.66 | 28.93 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 9.74 | 90.89 | 30.18 | | 150.0 | |
| | | Z | 10.89 | 93.45 | 31.66 | | 150.0 | |
| 10169-CAD | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK) | X | 4.51 | 78.23 | 26.11 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.88 | 79.86 | 26.78 | | 150.0 | |
| | | Z | 5.61 | 83.18 | 28.83 | | 150.0 | |
| 10170-CAD | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM) | X | 8.64 | 93.21 | 31.75 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 10.74 | 98.02 | 33.43 | | 150.0 | |
| | | Z | 15.34 | 107.12 | 37.17 | | 150.0 | |
| 10171-AAD | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM) | X | 6.66 | 86.27 | 28.20 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 7.15 | 87.35 | 28.50 | | 150.0 | |
| | | Z | 10.53 | 96.72 | 32.68 | | 150.0 | |
| 10172-CAD | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK) | X | 100.00 | 157.06 | 51.92 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 29.58 | 122.92 | 41.84 | | 65.0 | |
| | | Z | 100.00 | 157.86 | 52.85 | | 65.0 | |
| 10173-CAD | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM) | X | 100.00 | 147.04 | 46.72 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 143.66 | 45.07 | | 65.0 | |
| | | Z | 100.00 | 147.61 | 47.52 | | 65.0 | |
| 10174-CAD | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM) | X | 100.00 | 144.70 | 45.45 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 141.89 | 44.08 | | 65.0 | |
| | | Z | 100.00 | 146.18 | 46.69 | | 65.0 | |
| 10175-CAE | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK) | X | 4.45 | 77.77 | 25.80 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.76 | 79.15 | 26.35 | | 150.0 | |
| | | Z | 5.51 | 82.58 | 28.47 | | 150.0 | |
| 10176-CAE | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM) | X | 8.66 | 93.26 | 31.77 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 10.77 | 98.08 | 33.45 | | 150.0 | |
| | | Z | 15.39 | 107.20 | 37.19 | | 150.0 | |
| 10177-CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK) | X | 4.49 | 78.03 | 25.94 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.84 | 79.55 | 26.56 | | 150.0 | |
| | | Z | 5.58 | 82.93 | 28.64 | | 150.0 | |
| 10178-CAE | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) | X | 8.48 | 92.72 | 31.54 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 10.38 | 97.15 | 33.09 | | 150.0 | |
| | | Z | 14.83 | 106.24 | 36.85 | | 150.0 | |
| 10179-CAE | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM) | X | 7.76 | 90.19 | 30.08 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 8.90 | 92.90 | 31.00 | | 150.0 | |
| | | Z | 13.20 | 102.68 | 35.12 | | 150.0 | |
| 10180-CAE | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) | X | 6.62 | 86.10 | 28.11 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 7.07 | 87.03 | 28.35 | | 150.0 | |
| | | Z | 10.41 | 96.42 | 32.55 | | 150.0 | |
| 10181-CAD | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK) | X | 4.49 | 78.00 | 25.93 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.83 | 79.51 | 26.54 | | 150.0 | |
| | | Z | 5.57 | 82.89 | 28.63 | | 150.0 | |
| 10182-CAD | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) | X | 8.46 | 92.68 | 31.53 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 10.35 | 97.10 | 33.07 | | 150.0 | |
| | | Z | 14.79 | 106.17 | 36.83 | | 150.0 | |
| 10183-AAC | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | X | 6.60 | 86.05 | 28.09 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 7.04 | 86.98 | 28.33 | | 150.0 | |
| | | Z | 10.38 | 96.34 | 32.52 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10184-CAD | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK) | X | 4.50 | 78.07 | 25.95 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.85 | 79.60 | 26.58 | | 150.0 | |
| | | Z | 5.60 | 82.97 | 28.66 | | 150.0 | |
| 10185-CAD | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM) | X | 8.51 | 92.81 | 31.58 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 10.44 | 97.27 | 33.14 | | 150.0 | |
| | | Z | 14.92 | 106.36 | 36.89 | | 150.0 | |
| 10186-AAD | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) | X | 6.65 | 86.19 | 28.15 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 7.10 | 87.13 | 28.39 | | 150.0 | |
| | | Z | 10.48 | 96.54 | 32.59 | | 150.0 | |
| 10187-CAE | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK) | X | 4.51 | 78.08 | 25.99 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.85 | 79.59 | 26.61 | | 150.0 | |
| | | Z | 5.59 | 82.96 | 28.69 | | 150.0 | |
| 10188-CAE | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | X | 8.97 | 94.14 | 32.16 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 11.36 | 99.44 | 34.00 | | 150.0 | |
| | | Z | 16.21 | 108.54 | 37.70 | | 150.0 | |
| 10189-AAE | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM) | X | 6.88 | 87.02 | 28.55 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 7.46 | 88.34 | 28.95 | | 150.0 | |
| | | Z | 11.02 | 97.81 | 33.13 | | 150.0 | |
| 10193-CAB | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK) | X | 5.46 | 70.23 | 19.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.55 | 70.58 | 19.82 | | 150.0 | |
| | | Z | 5.77 | 71.17 | 20.48 | | 150.0 | |
| 10194-CAB | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM) | X | 5.67 | 70.58 | 19.73 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.76 | 70.92 | 19.91 | | 150.0 | |
| | | Z | 6.00 | 71.55 | 20.57 | | 150.0 | |
| 10195-CAB | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM) | X | 5.71 | 70.56 | 19.71 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.80 | 70.89 | 19.89 | | 150.0 | |
| | | Z | 6.03 | 71.51 | 20.54 | | 150.0 | |
| 10196-CAB | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK) | X | 5.49 | 70.36 | 19.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.58 | 70.72 | 19.88 | | 150.0 | |
| | | Z | 5.80 | 71.33 | 20.55 | | 150.0 | |
| 10197-CAB | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM) | X | 5.69 | 70.60 | 19.74 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.78 | 70.93 | 19.92 | | 150.0 | |
| | | Z | 6.01 | 71.56 | 20.57 | | 150.0 | |
| 10198-CAB | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM) | X | 5.72 | 70.59 | 19.73 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.80 | 70.91 | 19.90 | | 150.0 | |
| | | Z | 6.04 | 71.53 | 20.55 | | 150.0 | |
| 10219-CAB | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK) | X | 5.46 | 70.52 | 19.75 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.55 | 70.90 | 19.95 | | 150.0 | |
| | | Z | 5.79 | 71.52 | 20.62 | | 150.0 | |
| 10220-CAB | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM) | X | 5.68 | 70.56 | 19.72 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.77 | 70.89 | 19.90 | | 150.0 | |
| | | Z | 6.01 | 71.53 | 20.56 | | 150.0 | |
| 10221-CAB | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM) | X | 5.70 | 70.43 | 19.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.79 | 70.74 | 19.83 | | 150.0 | |
| | | Z | 6.02 | 71.35 | 20.47 | | 150.0 | |
| 10222-CAB | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK) | X | 6.00 | 70.33 | 19.54 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.07 | 70.59 | 19.68 | | 150.0 | |
| | | Z | 6.31 | 71.25 | 20.33 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10223-CAB | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM) | X | 6.28 | 70.29 | 19.46 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.36 | 70.53 | 19.60 | | 150.0 | |
| | | Z | 6.60 | 71.17 | 20.21 | | 150.0 | |
| 10224-CAB | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM) | X | 6.07 | 70.51 | 19.55 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.15 | 70.78 | 19.70 | | 150.0 | |
| | | Z | 6.38 | 71.44 | 20.34 | | 150.0 | |
| 10225-CAB | UMTS-FDD (HSPA+) | X | 4.59 | 76.23 | 22.87 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.00 | 78.11 | 23.67 | | 150.0 | |
| | | Z | 5.23 | 78.95 | 24.70 | | 150.0 | |
| 10226-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | X | 100.00 | 147.19 | 46.83 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 143.86 | 45.20 | | 65.0 | |
| | | Z | 100.00 | 147.74 | 47.62 | | 65.0 | |
| 10227-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM) | X | 100.00 | 144.45 | 45.39 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 141.39 | 43.90 | | 65.0 | |
| | | Z | 100.00 | 145.20 | 46.27 | | 65.0 | |
| 10228-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK) | X | 100.00 | 157.69 | 52.21 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 80.09 | 147.90 | 48.69 | | 65.0 | |
| | | Z | 100.00 | 157.91 | 52.87 | | 65.0 | |
| 10229-CAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM) | X | 100.00 | 146.98 | 46.70 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 143.62 | 45.06 | | 65.0 | |
| | | Z | 100.00 | 147.55 | 47.50 | | 65.0 | |
| 10230-CAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) | X | 100.00 | 144.35 | 45.31 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 141.25 | 43.80 | | 65.0 | |
| | | Z | 100.00 | 145.12 | 46.20 | | 65.0 | |
| 10231-CAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK) | X | 100.00 | 157.58 | 52.11 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 69.62 | 144.30 | 47.71 | | 65.0 | |
| | | Z | 100.00 | 157.82 | 52.79 | | 65.0 | |
| 10232-CAD | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) | X | 100.00 | 147.01 | 46.71 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 143.64 | 45.06 | | 65.0 | |
| | | Z | 100.00 | 147.58 | 47.51 | | 65.0 | |
| 10233-CAD | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) | X | 100.00 | 144.39 | 45.32 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 141.28 | 43.81 | | 65.0 | |
| | | Z | 100.00 | 145.15 | 46.21 | | 65.0 | |
| 10234-CAD | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK) | X | 100.00 | 157.28 | 51.93 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 63.28 | 141.69 | 46.92 | | 65.0 | |
| | | Z | 100.00 | 157.55 | 52.62 | | 65.0 | |
| 10235-CAD | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM) | X | 100.00 | 147.04 | 46.72 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 143.66 | 45.07 | | 65.0 | |
| | | Z | 100.00 | 147.61 | 47.52 | | 65.0 | |
| 10236-CAD | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM) | X | 100.00 | 144.31 | 45.29 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 141.21 | 43.78 | | 65.0 | |
| | | Z | 100.00 | 145.08 | 46.18 | | 65.0 | |
| 10237-CAD | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK) | X | 100.00 | 157.64 | 52.14 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 70.63 | 144.71 | 47.82 | | 65.0 | |
| | | Z | 100.00 | 157.88 | 52.81 | | 65.0 | |
| 10238-CAD | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) | X | 100.00 | 147.05 | 46.72 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 143.67 | 45.07 | | 65.0 | |
| | | Z | 100.00 | 147.61 | 47.52 | | 65.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10239-CAD | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | X | 100.00 | 144.43 | 45.34 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 141.32 | 43.82 | | 65.0 | |
| | | Z | 100.00 | 145.20 | 46.23 | | 65.0 | |
| 10240-CAD | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK) | X | 100.00 | 157.67 | 52.15 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 70.12 | 144.55 | 47.78 | | 65.0 | |
| | | Z | 100.00 | 157.91 | 52.82 | | 65.0 | |
| 10241-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | X | 13.46 | 94.53 | 33.13 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 11.24 | 88.73 | 30.36 | | 65.0 | |
| | | Z | 15.92 | 98.41 | 34.98 | | 65.0 | |
| 10242-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) | X | 12.60 | 92.77 | 32.35 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 9.84 | 85.40 | 28.91 | | 65.0 | |
| | | Z | 13.89 | 94.76 | 33.51 | | 65.0 | |
| 10243-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) | X | 8.84 | 85.65 | 30.56 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 7.32 | 79.57 | 27.33 | | 65.0 | |
| | | Z | 9.32 | 86.30 | 31.18 | | 65.0 | |
| 10244-CAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | X | 100.00 | 133.98 | 40.14 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 72.41 | 126.23 | 37.83 | | 65.0 | |
| | | Z | 100.00 | 136.28 | 41.80 | | 65.0 | |
| 10245-CAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | X | 100.00 | 133.42 | 39.90 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 56.91 | 121.03 | 36.37 | | 65.0 | |
| | | Z | 100.00 | 135.73 | 41.55 | | 65.0 | |
| 10246-CAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | X | 100.00 | 140.57 | 42.61 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 138.09 | 41.35 | | 65.0 | |
| | | Z | 100.00 | 143.02 | 44.35 | | 65.0 | |
| 10247-CAD | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM) | X | 25.24 | 108.57 | 34.21 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 14.35 | 95.74 | 29.69 | | 65.0 | |
| | | Z | 33.61 | 115.61 | 37.14 | | 65.0 | |
| 10248-CAD | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM) | X | 19.94 | 102.84 | 32.32 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 12.37 | 91.96 | 28.28 | | 65.0 | |
| | | Z | 25.65 | 108.84 | 34.98 | | 65.0 | |
| 10249-CAD | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK) | X | 100.00 | 142.13 | 43.85 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 139.80 | 42.66 | | 65.0 | |
| | | Z | 100.00 | 144.01 | 45.28 | | 65.0 | |
| 10250-CAD | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) | X | 14.16 | 96.66 | 31.79 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 10.60 | 89.28 | 28.74 | | 65.0 | |
| | | Z | 16.50 | 100.10 | 33.53 | | 65.0 | |
| 10251-CAD | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM) | X | 11.44 | 90.13 | 28.96 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.95 | 83.94 | 26.19 | | 65.0 | |
| | | Z | 13.03 | 92.85 | 30.48 | | 65.0 | |
| 10252-CAD | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK) | X | 86.73 | 139.25 | 43.94 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 25.31 | 110.44 | 35.49 | | 65.0 | |
| | | Z | 100.00 | 143.74 | 45.83 | | 65.0 | |
| 10253-CAD | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM) | X | 9.53 | 84.86 | 27.13 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.01 | 80.28 | 24.89 | | 65.0 | |
| | | Z | 10.62 | 86.95 | 28.39 | | 65.0 | |
| 10254-CAD | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM) | X | 9.88 | 85.45 | 27.63 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.44 | 81.20 | 25.56 | | 65.0 | |
| | | Z | 10.94 | 87.40 | 28.82 | | 65.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10255-CAD | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK) | X | 19.27 | 103.27 | 33.71 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 12.47 | 92.65 | 29.67 | | 65.0 | |
| | | Z | 23.07 | 107.47 | 35.61 | | 65.0 | |
| 10256-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | X | 100.00 | 131.21 | 38.25 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 129.71 | 37.50 | | 65.0 | |
| | | Z | 100.00 | 134.15 | 40.24 | | 65.0 | |
| 10257-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | X | 100.00 | 130.27 | 37.82 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 128.83 | 37.10 | | 65.0 | |
| | | Z | 100.00 | 133.22 | 39.81 | | 65.0 | |
| 10258-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK) | X | 100.00 | 138.46 | 41.20 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 100.00 | 135.86 | 39.90 | | 65.0 | |
| | | Z | 100.00 | 141.53 | 43.27 | | 65.0 | |
| 10259-CAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM) | X | 18.72 | 102.43 | 32.80 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 12.23 | 92.35 | 28.98 | | 65.0 | |
| | | Z | 23.11 | 107.46 | 35.11 | | 65.0 | |
| 10260-CAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM) | X | 16.99 | 99.86 | 31.91 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 11.61 | 90.80 | 28.39 | | 65.0 | |
| | | Z | 20.73 | 104.52 | 34.13 | | 65.0 | |
| 10261-CAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK) | X | 100.00 | 142.40 | 44.29 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 40.47 | 120.92 | 38.14 | | 65.0 | |
| | | Z | 100.00 | 144.04 | 45.59 | | 65.0 | |
| 10262-CAD | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | X | 14.15 | 96.62 | 31.76 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 10.58 | 89.20 | 28.68 | | 65.0 | |
| | | Z | 16.50 | 100.07 | 33.50 | | 65.0 | |
| 10263-CAD | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) | X | 11.41 | 90.08 | 28.95 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.93 | 83.91 | 26.19 | | 65.0 | |
| | | Z | 13.00 | 92.81 | 30.47 | | 65.0 | |
| 10264-CAD | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | X | 83.61 | 138.36 | 43.69 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 24.73 | 109.90 | 35.30 | | 65.0 | |
| | | Z | 100.00 | 143.68 | 45.79 | | 65.0 | |
| 10265-CAD | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | X | 10.12 | 86.35 | 27.73 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.36 | 81.35 | 25.34 | | 65.0 | |
| | | Z | 11.38 | 88.68 | 29.05 | | 65.0 | |
| 10266-CAD | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM) | X | 10.40 | 86.77 | 28.19 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.78 | 82.23 | 26.04 | | 65.0 | |
| | | Z | 11.58 | 88.89 | 29.43 | | 65.0 | |
| 10267-CAD | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | X | 24.37 | 107.88 | 34.88 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 14.48 | 95.50 | 30.43 | | 65.0 | |
| | | Z | 30.32 | 113.09 | 37.06 | | 65.0 | |
| 10268-CAD | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM) | X | 9.53 | 82.61 | 26.37 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.39 | 79.16 | 24.61 | | 65.0 | |
| | | Z | 10.43 | 84.30 | 27.42 | | 65.0 | |
| 10269-CAD | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM) | X | 9.19 | 81.42 | 25.91 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.19 | 78.25 | 24.25 | | 65.0 | |
| | | Z | 10.01 | 82.98 | 26.91 | | 65.0 | |
| 10270-CAD | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | X | 13.08 | 91.53 | 29.30 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 10.34 | 85.71 | 26.80 | | 65.0 | |
| | | Z | 15.01 | 94.48 | 30.82 | | 65.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10274-CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10) | X | 5.17 | 80.96 | 24.89 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.90 | 83.68 | 25.92 | | 150.0 | |
| | | Z | 6.22 | 85.10 | 27.31 | | 150.0 | |
| 10275-CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4) | X | 100.00 | 162.88 | 50.73 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 160.87 | 49.77 | | 150.0 | |
| | | Z | 100.00 | 167.87 | 53.61 | | 150.0 | |
| 10277-CAA | PHS (QPSK) | X | 100.00 | 116.48 | 29.27 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 115.49 | 29.25 | | 50.0 | |
| | | Z | 100.00 | 125.32 | 34.15 | | 50.0 | |
| 10278-CAA | PHS (QPSK, BW 884MHz, Rolloff 0.5) | X | 100.00 | 138.54 | 41.23 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 132.53 | 38.69 | | 50.0 | |
| | | Z | 100.00 | 144.20 | 44.66 | | 50.0 | |
| 10279-CAA | PHS (QPSK, BW 884MHz, Rolloff 0.38) | X | 100.00 | 138.20 | 41.13 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 132.31 | 38.64 | | 50.0 | |
| | | Z | 100.00 | 143.71 | 44.48 | | 50.0 | |
| 10290-AAB | CDMA2000, RC1, SO55, Full Rate | X | 100.00 | 165.50 | 50.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 163.79 | 49.87 | | 150.0 | |
| | | Z | 100.00 | 172.07 | 54.44 | | 150.0 | |
| 10291-AAB | CDMA2000, RC3, SO55, Full Rate | X | 100.00 | 188.22 | 59.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 184.87 | 58.14 | | 150.0 | |
| | | Z | 100.00 | 195.98 | 64.13 | | 150.0 | |
| 10292-AAB | CDMA2000, RC3, SO32, Full Rate | X | 100.00 | 195.75 | 63.03 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 192.85 | 61.68 | | 150.0 | |
| | | Z | 100.00 | 202.96 | 67.27 | | 150.0 | |
| 10293-AAB | CDMA2000, RC3, SO3, Full Rate | X | 100.00 | 197.41 | 64.00 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 195.19 | 62.96 | | 150.0 | |
| | | Z | 100.00 | 204.14 | 68.03 | | 150.0 | |
| 10295-AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr. | X | 100.00 | 146.51 | 46.82 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 38.46 | 118.92 | 38.14 | | 50.0 | |
| | | Z | 100.00 | 149.97 | 49.11 | | 50.0 | |
| 10297-AAC | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK) | X | 17.63 | 109.54 | 34.90 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 29.80 | 120.05 | 37.74 | | 150.0 | |
| | | Z | 41.55 | 129.95 | 41.64 | | 150.0 | |
| 10298-AAC | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | X | 100.00 | 158.51 | 48.24 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 157.15 | 47.57 | | 150.0 | |
| | | Z | 100.00 | 164.25 | 51.55 | | 150.0 | |
| 10299-AAC | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | X | 100.00 | 141.59 | 41.41 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 141.28 | 41.28 | | 150.0 | |
| | | Z | 100.00 | 145.88 | 44.01 | | 150.0 | |
| 10300-AAC | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | X | 100.00 | 136.02 | 38.60 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 135.23 | 38.23 | | 150.0 | |
| | | Z | 100.00 | 140.68 | 41.35 | | 150.0 | |
| 10301-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC) | X | 5.82 | 69.15 | 20.80 | 4.17 | 50.0 | ± 9.6 % |
| | | Y | 5.78 | 68.98 | 20.70 | | 50.0 | |
| | | Z | 6.08 | 69.60 | 21.33 | | 50.0 | |
| 10302-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols) | X | 6.16 | 69.16 | 21.19 | 4.96 | 50.0 | ± 9.6 % |
| | | Y | 6.13 | 68.92 | 21.01 | | 50.0 | |
| | | Z | 6.45 | 69.79 | 21.82 | | 50.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10303-AAA | IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC) | X | 5.90 | 68.89 | 21.12 | 4.96 | 50.0 | ± 9.6 % |
| | | Y | 5.88 | 68.66 | 20.95 | | 50.0 | |
| | | Z | 6.20 | 69.57 | 21.79 | | 50.0 | |
| 10304-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC) | X | 5.77 | 69.07 | 20.80 | 4.17 | 50.0 | ± 9.6 % |
| | | Y | 5.75 | 68.95 | 20.72 | | 50.0 | |
| | | Z | 6.07 | 69.80 | 21.51 | | 50.0 | |
| 10305-AAA | IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols) | X | 5.50 | 72.11 | 23.82 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.73 | 72.68 | 23.85 | | 35.0 | |
| | | Z | 5.89 | 73.23 | 24.80 | | 35.0 | |
| 10306-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols) | X | 5.63 | 69.93 | 22.60 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.75 | 70.15 | 22.54 | | 35.0 | |
| | | Z | 5.94 | 70.17 | 22.89 | | 35.0 | |
| 10307-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols) | X | 5.59 | 70.46 | 22.80 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.74 | 70.80 | 22.78 | | 35.0 | |
| | | Z | 5.94 | 71.40 | 23.65 | | 35.0 | |
| 10308-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC) | X | 5.58 | 70.77 | 23.01 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.74 | 71.11 | 22.99 | | 35.0 | |
| | | Z | 5.93 | 71.71 | 23.87 | | 35.0 | |
| 10309-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols) | X | 5.72 | 70.28 | 22.80 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.83 | 70.43 | 22.70 | | 35.0 | |
| | | Z | 6.04 | 70.51 | 23.09 | | 35.0 | |
| 10310-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols) | X | 5.60 | 70.13 | 22.66 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.73 | 70.40 | 22.63 | | 35.0 | |
| | | Z | 5.93 | 70.97 | 23.46 | | 35.0 | |
| 10311-AAC | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | X | 16.49 | 103.18 | 32.21 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 26.96 | 112.65 | 34.87 | | 150.0 | |
| | | Z | 36.51 | 121.10 | 38.28 | | 150.0 | |
| 10313-AAA | iDEN 1:3 | X | 100.00 | 147.23 | 44.36 | 6.99 | 70.0 | ± 9.6 % |
| | | Y | 100.00 | 144.16 | 42.97 | | 70.0 | |
| | | Z | 100.00 | 152.82 | 47.63 | | 70.0 | |
| 10314-AAA | iDEN 1:6 | X | 100.00 | 162.69 | 52.78 | 10.00 | 30.0 | ± 9.6 % |
| | | Y | 100.00 | 153.59 | 48.78 | | 30.0 | |
| | | Z | 100.00 | 167.17 | 55.64 | | 30.0 | |
| 10315-AAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle) | X | 2.81 | 86.18 | 31.37 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 4.00 | 95.24 | 34.63 | | 150.0 | |
| | | Z | 3.73 | 93.57 | 35.46 | | 150.0 | |
| 10316-AAB | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle) | X | 5.50 | 70.18 | 19.72 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 5.56 | 70.39 | 19.80 | | 150.0 | |
| | | Z | 5.80 | 71.08 | 20.53 | | 150.0 | |
| 10317-AAB | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle) | X | 5.50 | 70.18 | 19.72 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 5.56 | 70.39 | 19.80 | | 150.0 | |
| | | Z | 5.80 | 71.08 | 20.53 | | 150.0 | |
| 10400-AAC | IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle) | X | 5.69 | 70.71 | 19.77 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.77 | 70.99 | 19.90 | | 150.0 | |
| | | Z | 6.02 | 71.68 | 20.60 | | 150.0 | |
| 10401-AAC | IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle) | X | 6.27 | 70.08 | 19.32 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.34 | 70.27 | 19.41 | | 150.0 | |
| | | Z | 6.53 | 70.76 | 19.97 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10402-AAC | IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle) | X | 6.56 | 70.41 | 19.31 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.62 | 70.59 | 19.41 | | 150.0 | |
| | | Z | 6.87 | 71.27 | 20.05 | | 150.0 | |
| 10403-AAB | CDMA2000 (1xEV-DO, Rev. 0) | X | 100.00 | 165.50 | 50.69 | 0.00 | 115.0 | ± 9.6 % |
| | | Y | 100.00 | 163.79 | 49.87 | | 115.0 | |
| | | Z | 100.00 | 172.07 | 54.44 | | 115.0 | |
| 10404-AAB | CDMA2000 (1xEV-DO, Rev. A) | X | 100.00 | 165.50 | 50.69 | 0.00 | 115.0 | ± 9.6 % |
| | | Y | 100.00 | 163.79 | 49.87 | | 115.0 | |
| | | Z | 100.00 | 172.07 | 54.44 | | 115.0 | |
| 10406-AAB | CDMA2000, RC3, SO32, SCH0, Full Rate | X | 100.00 | 153.07 | 46.52 | 0.00 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 152.22 | 46.23 | | 100.0 | |
| | | Z | 100.00 | 154.92 | 48.01 | | 100.0 | |
| 10410-AAC | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 156.31 | 48.07 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 152.74 | 46.39 | | 80.0 | |
| | | Z | 100.00 | 158.54 | 49.86 | | 80.0 | |
| 10415-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle) | X | 2.52 | 83.98 | 30.40 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.64 | 93.54 | 34.03 | | 150.0 | |
| | | Z | 3.33 | 91.09 | 34.47 | | 150.0 | |
| 10416-AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle) | X | 5.46 | 70.26 | 19.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.55 | 70.61 | 19.88 | | 150.0 | |
| | | Z | 5.77 | 71.20 | 20.52 | | 150.0 | |
| 10417-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle) | X | 5.46 | 70.26 | 19.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.55 | 70.61 | 19.88 | | 150.0 | |
| | | Z | 5.77 | 71.20 | 20.52 | | 150.0 | |
| 10418-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule) | X | 5.50 | 70.62 | 19.83 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.59 | 70.99 | 20.02 | | 150.0 | |
| | | Z | 5.82 | 71.61 | 20.69 | | 150.0 | |
| 10419-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule) | X | 5.50 | 70.47 | 19.77 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.59 | 70.83 | 19.96 | | 150.0 | |
| | | Z | 5.81 | 71.43 | 20.61 | | 150.0 | |
| 10422-AAA | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK) | X | 5.59 | 70.26 | 19.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.67 | 70.59 | 19.81 | | 150.0 | |
| | | Z | 5.90 | 71.17 | 20.44 | | 150.0 | |
| 10423-AAA | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM) | X | 5.80 | 70.64 | 19.75 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.88 | 70.95 | 19.91 | | 150.0 | |
| | | Z | 6.12 | 71.57 | 20.56 | | 150.0 | |
| 10424-AAA | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM) | X | 5.73 | 70.67 | 19.78 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.81 | 71.00 | 19.96 | | 150.0 | |
| | | Z | 6.05 | 71.62 | 20.61 | | 150.0 | |
| 10425-AAA | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK) | X | 6.29 | 70.50 | 19.56 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.37 | 70.76 | 19.70 | | 150.0 | |
| | | Z | 6.59 | 71.32 | 20.28 | | 150.0 | |
| 10426-AAA | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM) | X | 6.30 | 70.53 | 19.57 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.39 | 70.81 | 19.72 | | 150.0 | |
| | | Z | 6.60 | 71.36 | 20.30 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10427-AAA | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM) | X | 6.29 | 70.44 | 19.52 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.37 | 70.70 | 19.66 | | 150.0 | |
| | | Z | 6.59 | 71.26 | 20.24 | | 150.0 | |
| 10430-AAB | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1) | X | 7.16 | 82.33 | 25.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 9.01 | 87.67 | 27.87 | | 150.0 | |
| | | Z | 8.06 | 84.95 | 27.30 | | 150.0 | |
| 10431-AAB | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1) | X | 5.45 | 72.35 | 20.62 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.59 | 72.91 | 20.89 | | 150.0 | |
| | | Z | 5.86 | 73.62 | 21.66 | | 150.0 | |
| 10432-AAB | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1) | X | 5.58 | 71.25 | 20.08 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.68 | 71.65 | 20.29 | | 150.0 | |
| | | Z | 5.94 | 72.32 | 20.99 | | 150.0 | |
| 10433-AAB | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1) | X | 5.74 | 70.72 | 19.81 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.83 | 71.05 | 19.98 | | 150.0 | |
| | | Z | 6.07 | 71.68 | 20.64 | | 150.0 | |
| 10434-AAA | W-CDMA (BS Test Model 1, 64 DPCH) | X | 9.02 | 87.64 | 27.37 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 13.21 | 96.09 | 30.52 | | 150.0 | |
| | | Z | 10.54 | 91.28 | 29.41 | | 150.0 | |
| 10435-AAC | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 156.08 | 47.97 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 152.48 | 46.27 | | 80.0 | |
| | | Z | 100.00 | 158.33 | 49.76 | | 80.0 | |
| 10447-AAB | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%) | X | 5.56 | 76.55 | 22.29 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.93 | 77.90 | 22.86 | | 150.0 | |
| | | Z | 6.25 | 78.89 | 23.90 | | 150.0 | |
| 10448-AAB | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%) | X | 5.29 | 72.31 | 20.63 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.44 | 72.91 | 20.92 | | 150.0 | |
| | | Z | 5.70 | 73.65 | 21.71 | | 150.0 | |
| 10449-AAB | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%) | X | 5.41 | 71.31 | 20.16 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.52 | 71.77 | 20.39 | | 150.0 | |
| | | Z | 5.77 | 72.46 | 21.12 | | 150.0 | |
| 10450-AAB | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | X | 5.51 | 70.71 | 19.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.61 | 71.08 | 20.04 | | 150.0 | |
| | | Z | 5.84 | 71.75 | 20.73 | | 150.0 | |
| 10451-AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%) | X | 6.34 | 79.90 | 23.36 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.00 | 81.90 | 24.14 | | 150.0 | |
| | | Z | 7.42 | 83.21 | 25.38 | | 150.0 | |
| 10456-AAA | IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle) | X | 7.09 | 70.50 | 19.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.16 | 70.66 | 19.36 | | 150.0 | |
| | | Z | 7.38 | 71.23 | 19.92 | | 150.0 | |
| 10457-AAA | UMTS-FDD (DC-HSDPA) | X | 4.56 | 68.72 | 19.50 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.64 | 69.16 | 19.74 | | 150.0 | |
| | | Z | 4.81 | 69.64 | 20.36 | | 150.0 | |
| 10458-AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers) | X | 9.06 | 88.62 | 27.60 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 13.52 | 97.28 | 30.73 | | 150.0 | |
| | | Z | 10.54 | 92.23 | 29.68 | | 150.0 | |
| 10459-AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers) | X | 6.53 | 73.36 | 22.10 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.24 | 75.86 | 23.35 | | 150.0 | |
| | | Z | 7.13 | 74.92 | 23.21 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10460-AAA | UMTS-FDD (WCDMA, AMR) | X | 100.00 | 201.40 | 66.12 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 196.70 | 63.96 | | 150.0 | |
| | | Z | 100.00 | 207.95 | 69.97 | | 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 | 169.78 | 54.27 | 3.29 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 163.99 | 51.56 | | 80.0 | |
| | | Z | 100.00 | 172.57 | 56.37 | | 80.0 | |
| 10462-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 155.05 | 46.93 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 149.43 | 44.37 | | 80.0 | |
| | | Z | 100.00 | 159.74 | 49.87 | | 80.0 | |
| 10463-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 151.90 | 45.34 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 146.25 | 42.78 | | 80.0 | |
| | | Z | 100.00 | 157.05 | 48.49 | | 80.0 | |
| 10464-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 170.17 | 54.19 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 164.08 | 51.36 | | 80.0 | |
| | | Z | 100.00 | 173.16 | 56.41 | | 80.0 | |
| 10465-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 154.44 | 46.62 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 148.65 | 43.98 | | 80.0 | |
| | | Z | 100.00 | 159.23 | 49.60 | | 80.0 | |
| 10466-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 151.03 | 44.93 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 145.25 | 42.30 | | 80.0 | |
| | | Z | 100.00 | 156.28 | 48.12 | | 80.0 | |
| 10467-AAC | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 170.52 | 54.35 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 164.43 | 51.53 | | 80.0 | |
| | | Z | 100.00 | 173.48 | 56.56 | | 80.0 | |
| 10468-AAC | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 154.75 | 46.76 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 148.97 | 44.13 | | 80.0 | |
| | | Z | 100.00 | 159.51 | 49.73 | | 80.0 | |
| 10469-AAC | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 151.20 | 45.00 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 145.42 | 42.37 | | 80.0 | |
| | | Z | 100.00 | 156.45 | 48.19 | | 80.0 | |
| 10470-AAC | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 170.71 | 54.43 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 164.59 | 51.59 | | 80.0 | |
| | | Z | 100.00 | 173.66 | 56.63 | | 80.0 | |
| 10471-AAC | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 154.79 | 46.77 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 148.99 | 44.13 | | 80.0 | |
| | | Z | 100.00 | 159.56 | 49.75 | | 80.0 | |
| 10472-AAC | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 151.27 | 45.02 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 145.46 | 42.39 | | 80.0 | |
| | | Z | 100.00 | 156.53 | 48.22 | | 80.0 | |
| 10473-AAC | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 170.68 | 54.42 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 164.56 | 51.58 | | 80.0 | |
| | | Z | 100.00 | 173.64 | 56.62 | | 80.0 | |
| 10474-AAC | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 154.85 | 46.80 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 149.04 | 44.15 | | 80.0 | |
| | | Z | 100.00 | 159.62 | 49.77 | | 80.0 | |
| 10475-AAC | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 151.30 | 45.04 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 145.49 | 42.40 | | 80.0 | |
| | | Z | 100.00 | 156.57 | 48.24 | | 80.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10477-AAC | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 154.69 | 46.71 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 148.86 | 44.06 | | 80.0 | |
| | | Z | 100.00 | 159.48 | 49.70 | | 80.0 | |
| 10478-AAC | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 151.24 | 45.01 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 145.41 | 42.36 | | 80.0 | |
| | | Z | 100.00 | 156.51 | 48.21 | | 80.0 | |
| 10479-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 150.16 | 46.79 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 147.19 | 45.33 | | 80.0 | |
| | | Z | 100.00 | 153.10 | 48.79 | | 80.0 | |
| 10480-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 138.44 | 41.18 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 136.02 | 40.01 | | 80.0 | |
| | | Z | 100.00 | 141.74 | 43.33 | | 80.0 | |
| 10481-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 136.73 | 40.29 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 134.35 | 39.14 | | 80.0 | |
| | | Z | 100.00 | 140.23 | 42.52 | | 80.0 | |
| 10482-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 146.96 | 44.59 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 143.32 | 42.79 | | 80.0 | |
| | | Z | 100.00 | 150.55 | 46.88 | | 80.0 | |
| 10483-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 136.34 | 40.29 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 134.39 | 39.31 | | 80.0 | |
| | | Z | 100.00 | 140.00 | 42.59 | | 80.0 | |
| 10484-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 135.57 | 39.98 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 133.67 | 39.03 | | 80.0 | |
| | | Z | 100.00 | 139.21 | 42.26 | | 80.0 | |
| 10485-AAC | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 147.59 | 45.40 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 144.14 | 43.68 | | 80.0 | |
| | | Z | 100.00 | 150.47 | 47.31 | | 80.0 | |
| 10486-AAC | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 137.83 | 41.30 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 135.37 | 40.05 | | 80.0 | |
| | | Z | 100.00 | 140.85 | 43.24 | | 80.0 | |
| 10487-AAC | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 136.92 | 40.95 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 134.56 | 39.74 | | 80.0 | |
| | | Z | 100.00 | 139.91 | 42.87 | | 80.0 | |
| 10488-AAC | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 143.94 | 44.47 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 141.07 | 43.01 | | 80.0 | |
| | | Z | 100.00 | 146.15 | 45.98 | | 80.0 | |
| 10489-AAC | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 16.63 | 101.71 | 32.59 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 16.09 | 99.98 | 31.61 | | 80.0 | |
| | | Z | 26.73 | 112.45 | 36.58 | | 80.0 | |
| 10490-AAC | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 14.08 | 97.41 | 31.13 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 13.69 | 95.95 | 30.25 | | 80.0 | |
| | | Z | 20.83 | 106.16 | 34.60 | | 80.0 | |
| 10491-AAC | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 36.97 | 118.89 | 37.69 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 29.43 | 112.66 | 35.43 | | 80.0 | |
| | | Z | 93.18 | 139.88 | 43.90 | | 80.0 | |
| 10492-AAC | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 9.04 | 86.25 | 27.30 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 8.79 | 85.15 | 26.58 | | 80.0 | |
| | | Z | 11.52 | 91.41 | 29.72 | | 80.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10493-AAC | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 8.63 | 84.73 | 26.69 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 8.40 | 83.71 | 26.01 | | 80.0 | |
| | | Z | 10.75 | 89.36 | 28.94 | | 80.0 | |
| 10494-AAC | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 139.08 | 42.62 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 90.18 | 134.73 | 40.94 | | 80.0 | |
| | | Z | 100.00 | 141.11 | 43.99 | | 80.0 | |
| 10495-AAC | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 9.80 | 88.23 | 28.06 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 9.48 | 86.97 | 27.29 | | 80.0 | |
| | | Z | 12.92 | 94.21 | 30.74 | | 80.0 | |
| 10496-AAC | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 8.89 | 85.44 | 27.00 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 8.65 | 84.39 | 26.31 | | 80.0 | |
| | | Z | 11.24 | 90.42 | 29.36 | | 80.0 | |
| 10497-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 146.06 | 43.66 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 142.19 | 41.77 | | 80.0 | |
| | | Z | 100.00 | 150.68 | 46.47 | | 80.0 | |
| 10498-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 133.24 | 37.80 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 130.04 | 36.22 | | 80.0 | |
| | | Z | 100.00 | 138.55 | 40.89 | | 80.0 | |
| 10499-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 131.73 | 37.09 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 128.56 | 35.53 | | 80.0 | |
| | | Z | 100.00 | 137.13 | 40.21 | | 80.0 | |
| 10500-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 145.75 | 44.88 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 142.57 | 43.28 | | 80.0 | |
| | | Z | 100.00 | 148.34 | 46.62 | | 80.0 | |
| 10501-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 137.73 | 41.64 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 135.40 | 40.44 | | 80.0 | |
| | | Z | 100.00 | 140.35 | 43.36 | | 80.0 | |
| 10502-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 136.71 | 41.21 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 134.48 | 40.06 | | 80.0 | |
| | | Z | 100.00 | 139.32 | 42.92 | | 80.0 | |
| 10503-AAC | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 143.91 | 44.44 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 141.02 | 42.98 | | 80.0 | |
| | | Z | 100.00 | 146.13 | 45.97 | | 80.0 | |
| 10504-AAC | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 16.42 | 101.41 | 32.48 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 15.81 | 99.58 | 31.46 | | 80.0 | |
| | | Z | 26.33 | 112.08 | 36.45 | | 80.0 | |
| 10505-AAC | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 13.91 | 97.15 | 31.03 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 13.47 | 95.60 | 30.12 | | 80.0 | |
| | | Z | 20.53 | 105.83 | 34.48 | | 80.0 | |
| 10506-AAC | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 139.02 | 42.59 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 84.37 | 133.35 | 40.59 | | 80.0 | |
| | | Z | 100.00 | 141.05 | 43.96 | | 80.0 | |
| 10507-AAC | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 9.74 | 88.10 | 28.01 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 9.41 | 86.81 | 27.22 | | 80.0 | |
| | | Z | 12.83 | 94.06 | 30.68 | | 80.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10508-AAC | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 8.83 | 85.28 | 26.92 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 8.58 | 84.19 | 26.23 | | 80.0 | |
| | | Z | 11.15 | 90.24 | 29.28 | | 80.0 | |
| 10509-AAC | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 25.33 | 107.10 | 33.69 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 21.45 | 102.77 | 32.01 | | 80.0 | |
| | | Z | 49.47 | 121.84 | 38.52 | | 80.0 | |
| 10510-AAC | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 8.26 | 81.82 | 25.43 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 7.99 | 80.77 | 24.78 | | 80.0 | |
| | | Z | 9.99 | 85.76 | 27.42 | | 80.0 | |
| 10511-AAC | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 7.82 | 80.16 | 24.77 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 7.60 | 79.23 | 24.18 | | 80.0 | |
| | | Z | 9.26 | 83.60 | 26.58 | | 80.0 | |
| 10512-AAC | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 95.34 | 134.45 | 40.90 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 60.52 | 123.74 | 37.72 | | 80.0 | |
| | | Z | 100.00 | 137.39 | 42.45 | | 80.0 | |
| 10513-AAC | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 8.83 | 84.11 | 26.39 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 8.50 | 82.89 | 25.66 | | 80.0 | |
| | | Z | 11.06 | 88.88 | 28.66 | | 80.0 | |
| 10514-AAC | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 8.03 | 81.58 | 25.42 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 7.79 | 80.58 | 24.78 | | 80.0 | |
| | | Z | 9.72 | 85.56 | 27.43 | | 80.0 | |
| 10515-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle) | X | 2.74 | 87.56 | 32.13 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.33 | 99.49 | 36.43 | | 150.0 | |
| | | Z | 3.77 | 96.11 | 36.71 | | 150.0 | |
| 10516-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle) | X | 100.00 | 250.55 | 85.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 240.21 | 81.20 | | 150.0 | |
| | | Z | 100.00 | 255.68 | 89.44 | | 150.0 | |
| 10517-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle) | X | 61.59 | 185.49 | 62.67 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 194.72 | 63.60 | | 150.0 | |
| | | Z | 100.00 | 205.38 | 69.31 | | 150.0 | |
| 10518-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle) | X | 5.49 | 70.47 | 19.75 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.58 | 70.83 | 19.94 | | 150.0 | |
| | | Z | 5.80 | 71.44 | 20.60 | | 150.0 | |
| 10519-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) | X | 5.68 | 70.61 | 19.77 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.77 | 70.94 | 19.95 | | 150.0 | |
| | | Z | 6.01 | 71.56 | 20.60 | | 150.0 | |
| 10520-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) | X | 5.58 | 70.86 | 19.88 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.67 | 71.23 | 20.08 | | 150.0 | |
| | | Z | 5.92 | 71.90 | 20.77 | | 150.0 | |
| 10521-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) | X | 5.53 | 70.98 | 19.96 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.63 | 71.37 | 20.16 | | 150.0 | |
| | | Z | 5.88 | 72.07 | 20.87 | | 150.0 | |
| 10522-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) | X | 5.58 | 70.97 | 19.97 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.67 | 71.35 | 20.17 | | 150.0 | |
| | | Z | 5.91 | 71.97 | 20.84 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10523-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) | X | 5.48 | 71.03 | 19.96 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.58 | 71.44 | 20.17 | | 150.0 | |
| | | Z | 5.83 | 72.12 | 20.88 | | 150.0 | |
| 10524-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) | X | 5.52 | 70.92 | 19.97 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.62 | 71.31 | 20.18 | | 150.0 | |
| | | Z | 5.86 | 71.95 | 20.85 | | 150.0 | |
| 10525-AAA | IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) | X | 5.53 | 69.99 | 19.53 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.65 | 70.46 | 19.78 | | 150.0 | |
| | | Z | 5.87 | 71.05 | 20.42 | | 150.0 | |
| 10526-AAA | IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) | X | 5.75 | 70.45 | 19.68 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.88 | 70.91 | 19.93 | | 150.0 | |
| | | Z | 6.12 | 71.54 | 20.57 | | 150.0 | |
| 10527-AAA | IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) | X | 5.70 | 70.57 | 19.73 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.83 | 71.06 | 19.99 | | 150.0 | |
| | | Z | 6.08 | 71.72 | 20.66 | | 150.0 | |
| 10528-AAA | IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) | X | 5.71 | 70.55 | 19.74 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.83 | 71.03 | 19.99 | | 150.0 | |
| | | Z | 6.08 | 71.68 | 20.65 | | 150.0 | |
| 10529-AAA | IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) | X | 5.71 | 70.55 | 19.74 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.83 | 71.03 | 19.99 | | 150.0 | |
| | | Z | 6.08 | 71.68 | 20.65 | | 150.0 | |
| 10531-AAA | IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) | X | 5.75 | 70.84 | 19.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.88 | 71.34 | 20.11 | | 150.0 | |
| | | Z | 6.14 | 72.04 | 20.80 | | 150.0 | |
| 10532-AAA | IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) | X | 5.61 | 70.83 | 19.89 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.75 | 71.37 | 20.17 | | 150.0 | |
| | | Z | 6.01 | 72.08 | 20.87 | | 150.0 | |
| 10533-AAA | IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) | X | 5.74 | 70.65 | 19.76 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.86 | 71.14 | 20.01 | | 150.0 | |
| | | Z | 6.11 | 71.79 | 20.67 | | 150.0 | |
| 10534-AAA | IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle) | X | 6.13 | 69.88 | 19.25 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.23 | 70.22 | 19.44 | | 150.0 | |
| | | Z | 6.46 | 70.84 | 20.05 | | 150.0 | |
| 10535-AAA | IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle) | X | 6.22 | 70.11 | 19.35 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.33 | 70.46 | 19.55 | | 150.0 | |
| | | Z | 6.56 | 71.06 | 20.14 | | 150.0 | |
| 10536-AAA | IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle) | X | 6.12 | 70.23 | 19.43 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.22 | 70.60 | 19.63 | | 150.0 | |
| | | Z | 6.47 | 71.26 | 20.27 | | 150.0 | |
| 10537-AAA | IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle) | X | 6.15 | 70.08 | 19.34 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.26 | 70.44 | 19.54 | | 150.0 | |
| | | Z | 6.50 | 71.09 | 20.16 | | 150.0 | |
| 10538-AAA | IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle) | X | 6.22 | 69.96 | 19.29 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.32 | 70.29 | 19.47 | | 150.0 | |
| | | Z | 6.56 | 70.93 | 20.09 | | 150.0 | |
| 10540-AAA | IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle) | X | 6.17 | 70.08 | 19.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.27 | 70.43 | 19.58 | | 150.0 | |
| | | Z | 6.50 | 71.04 | 20.18 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10541-AAA | IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle) | X | 6.11 | 69.86 | 19.27 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.21 | 70.20 | 19.46 | | 150.0 | |
| | | Z | 6.44 | 70.82 | 20.07 | | 150.0 | |
| 10542-AAA | IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle) | X | 6.24 | 69.76 | 19.20 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.34 | 70.08 | 19.38 | | 150.0 | |
| | | Z | 6.57 | 70.68 | 19.97 | | 150.0 | |
| 10543-AAA | IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle) | X | 6.32 | 69.73 | 19.18 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.41 | 70.04 | 19.36 | | 150.0 | |
| | | Z | 6.64 | 70.60 | 19.92 | | 150.0 | |
| 10544-AAA | IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle) | X | 6.39 | 69.67 | 19.02 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.48 | 69.94 | 19.17 | | 150.0 | |
| | | Z | 6.71 | 70.57 | 19.77 | | 150.0 | |
| 10545-AAA | IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle) | X | 6.67 | 70.26 | 19.24 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.77 | 70.56 | 19.40 | | 150.0 | |
| | | Z | 7.00 | 71.19 | 20.00 | | 150.0 | |
| 10546-AAA | IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle) | X | 6.51 | 70.03 | 19.16 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.60 | 70.31 | 19.31 | | 150.0 | |
| | | Z | 6.85 | 70.99 | 19.94 | | 150.0 | |
| 10547-AAA | IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle) | X | 6.58 | 70.04 | 19.14 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.67 | 70.31 | 19.29 | | 150.0 | |
| | | Z | 6.94 | 71.02 | 19.93 | | 150.0 | |
| 10548-AAA | IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle) | X | 7.14 | 71.81 | 19.97 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.29 | 72.19 | 20.15 | | 150.0 | |
| | | Z | 7.59 | 73.01 | 20.85 | | 150.0 | |
| 10550-AAA | IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle) | X | 6.53 | 70.00 | 19.15 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.62 | 70.29 | 19.31 | | 150.0 | |
| | | Z | 6.86 | 70.91 | 19.90 | | 150.0 | |
| 10551-AAA | IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle) | X | 6.54 | 70.05 | 19.14 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.63 | 70.32 | 19.29 | | 150.0 | |
| | | Z | 6.88 | 71.00 | 19.91 | | 150.0 | |
| 10552-AAA | IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle) | X | 6.42 | 69.80 | 19.03 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.51 | 70.06 | 19.18 | | 150.0 | |
| | | Z | 6.75 | 70.72 | 19.80 | | 150.0 | |
| 10553-AAA | IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle) | X | 6.49 | 69.73 | 19.01 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.57 | 69.98 | 19.15 | | 150.0 | |
| | | Z | 6.82 | 70.63 | 19.76 | | 150.0 | |
| 10554-AAB | IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle) | X | 6.80 | 69.87 | 18.96 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.88 | 70.09 | 19.09 | | 150.0 | |
| | | Z | 7.12 | 70.74 | 19.69 | | 150.0 | |
| 10555-AAB | IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle) | X | 6.99 | 70.30 | 19.14 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.07 | 70.53 | 19.27 | | 150.0 | |
| | | Z | 7.32 | 71.19 | 19.87 | | 150.0 | |
| 10556-AAB | IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle) | X | 7.01 | 70.34 | 19.15 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.09 | 70.56 | 19.27 | | 150.0 | |
| | | Z | 7.34 | 71.22 | 19.88 | | 150.0 | |
| 10557-AAB | IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle) | X | 6.96 | 70.20 | 19.10 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.04 | 70.42 | 19.22 | | 150.0 | |
| | | Z | 7.29 | 71.10 | 19.84 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10558-AAB | IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle) | X | 7.03 | 70.43 | 19.22 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.11 | 70.65 | 19.35 | | 150.0 | |
| | | Z | 7.38 | 71.35 | 19.97 | | 150.0 | |
| 10560-AAB | IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle) | X | 6.97 | 70.11 | 19.10 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.05 | 70.32 | 19.22 | | 150.0 | |
| | | Z | 7.30 | 70.98 | 19.81 | | 150.0 | |
| 10561-AAB | IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle) | X | 6.91 | 70.15 | 19.16 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.99 | 70.37 | 19.29 | | 150.0 | |
| | | Z | 7.23 | 71.02 | 19.89 | | 150.0 | |
| 10562-AAB | IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle) | X | 7.11 | 70.74 | 19.45 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.20 | 70.97 | 19.57 | | 150.0 | |
| | | Z | 7.47 | 71.71 | 20.22 | | 150.0 | |
| 10563-AAB | IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle) | X | 7.52 | 71.42 | 19.70 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 7.61 | 71.64 | 19.82 | | 150.0 | |
| | | Z | 7.98 | 72.60 | 20.56 | | 150.0 | |
| 10564-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle) | X | 5.73 | 70.00 | 19.54 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.79 | 70.20 | 19.62 | | 150.0 | |
| | | Z | 6.02 | 70.82 | 20.29 | | 150.0 | |
| 10565-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle) | X | 5.99 | 70.44 | 19.80 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 6.06 | 70.70 | 19.94 | | 150.0 | |
| | | Z | 6.29 | 71.26 | 20.55 | | 150.0 | |
| 10566-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle) | X | 5.85 | 70.47 | 19.76 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.91 | 70.70 | 19.87 | | 150.0 | |
| | | Z | 6.16 | 71.36 | 20.55 | | 150.0 | |
| 10567-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle) | X | 5.92 | 71.04 | 20.21 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 6.02 | 71.47 | 20.45 | | 150.0 | |
| | | Z | 6.24 | 71.98 | 21.03 | | 150.0 | |
| 10568-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle) | X | 5.75 | 70.23 | 19.54 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.79 | 70.33 | 19.55 | | 150.0 | |
| | | Z | 6.05 | 71.07 | 20.30 | | 150.0 | |
| 10569-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle) | X | 5.89 | 71.25 | 20.36 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 6.01 | 71.74 | 20.62 | | 150.0 | |
| | | Z | 6.22 | 72.21 | 21.18 | | 150.0 | |
| 10570-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle) | X | 5.89 | 70.90 | 20.16 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.99 | 71.28 | 20.37 | | 150.0 | |
| | | Z | 6.20 | 71.78 | 20.95 | | 150.0 | |
| 10571-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle) | X | 3.02 | 86.99 | 31.58 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 3.94 | 93.49 | 33.73 | | 130.0 | |
| | | Z | 3.96 | 94.04 | 35.47 | | 130.0 | |
| 10572-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle) | X | 3.40 | 90.80 | 33.28 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.74 | 98.93 | 35.89 | | 130.0 | |
| | | Z | 4.62 | 99.06 | 37.56 | | 130.0 | |
| 10573-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle) | X | 100.00 | 227.39 | 76.80 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 100.00 | 218.85 | 72.90 | | 130.0 | |
| | | Z | 100.00 | 232.98 | 80.45 | | 130.0 | |
| 10574-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle) | X | 100.00 | 194.44 | 64.43 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 100.00 | 189.82 | 62.23 | | 130.0 | |
| | | Z | 100.00 | 199.38 | 67.45 | | 130.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10575-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle) | X | 5.50 | 69.85 | 19.68 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.55 | 70.02 | 19.73 | | 130.0 | |
| | | Z | 5.78 | 70.67 | 20.44 | | 130.0 | |
| 10576-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle) | X | 5.55 | 70.12 | 19.80 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.61 | 70.35 | 19.89 | | 130.0 | |
| | | Z | 5.84 | 70.98 | 20.59 | | 130.0 | |
| 10577-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) | X | 5.77 | 70.35 | 19.89 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.83 | 70.58 | 19.98 | | 130.0 | |
| | | Z | 6.07 | 71.19 | 20.65 | | 130.0 | |
| 10578-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) | X | 5.72 | 70.79 | 20.18 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.80 | 71.12 | 20.33 | | 130.0 | |
| | | Z | 6.03 | 71.72 | 20.99 | | 130.0 | |
| 10579-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) | X | 5.45 | 70.06 | 19.52 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.48 | 70.08 | 19.46 | | 130.0 | |
| | | Z | 5.77 | 70.99 | 20.35 | | 130.0 | |
| 10580-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) | X | 5.49 | 70.02 | 19.49 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.51 | 70.00 | 19.41 | | 130.0 | |
| | | Z | 5.80 | 70.89 | 20.28 | | 130.0 | |
| 10581-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) | X | 5.66 | 71.10 | 20.30 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.74 | 71.42 | 20.43 | | 130.0 | |
| | | Z | 5.99 | 72.11 | 21.16 | | 130.0 | |
| 10582-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) | X | 5.38 | 69.73 | 19.27 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.38 | 69.65 | 19.14 | | 130.0 | |
| | | Z | 5.68 | 70.62 | 20.07 | | 130.0 | |
| 10583-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) | X | 5.50 | 69.85 | 19.68 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.55 | 70.02 | 19.73 | | 130.0 | |
| | | Z | 5.78 | 70.67 | 20.44 | | 130.0 | |
| 10584-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) | X | 5.55 | 70.12 | 19.80 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.61 | 70.35 | 19.89 | | 130.0 | |
| | | Z | 5.84 | 70.98 | 20.59 | | 130.0 | |
| 10585-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) | X | 5.77 | 70.35 | 19.89 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.83 | 70.58 | 19.98 | | 130.0 | |
| | | Z | 6.07 | 71.19 | 20.65 | | 130.0 | |
| 10586-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) | X | 5.72 | 70.79 | 20.18 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.80 | 71.12 | 20.33 | | 130.0 | |
| | | Z | 6.03 | 71.72 | 20.99 | | 130.0 | |
| 10587-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle) | X | 5.45 | 70.06 | 19.52 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.48 | 70.08 | 19.46 | | 130.0 | |
| | | Z | 5.77 | 70.99 | 20.35 | | 130.0 | |
| 10588-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle) | X | 5.49 | 70.02 | 19.49 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.51 | 70.00 | 19.41 | | 130.0 | |
| | | Z | 5.80 | 70.89 | 20.28 | | 130.0 | |
| 10589-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle) | X | 5.66 | 71.10 | 20.30 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.74 | 71.42 | 20.43 | | 130.0 | |
| | | Z | 5.99 | 72.11 | 21.16 | | 130.0 | |
| 10590-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle) | X | 5.38 | 69.73 | 19.27 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.38 | 69.65 | 19.14 | | 130.0 | |
| | | Z | 5.68 | 70.62 | 20.07 | | 130.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10591-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle) | X | 5.62 | 69.71 | 19.63 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.68 | 69.91 | 19.70 | | 130.0 | |
| | | Z | 5.90 | 70.49 | 20.36 | | 130.0 | |
| 10592-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle) | X | 5.81 | 70.12 | 19.77 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.87 | 70.31 | 19.84 | | 130.0 | |
| | | Z | 6.11 | 70.91 | 20.50 | | 130.0 | |
| 10593-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle) | X | 5.75 | 70.12 | 19.72 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.80 | 70.28 | 19.77 | | 130.0 | |
| | | Z | 6.05 | 70.95 | 20.47 | | 130.0 | |
| 10594-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle) | X | 5.81 | 70.29 | 19.87 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.87 | 70.50 | 19.95 | | 130.0 | |
| | | Z | 6.11 | 71.11 | 20.62 | | 130.0 | |
| 10595-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle) | X | 5.79 | 70.30 | 19.81 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.84 | 70.49 | 19.87 | | 130.0 | |
| | | Z | 6.09 | 71.15 | 20.57 | | 130.0 | |
| 10596-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle) | X | 5.74 | 70.38 | 19.87 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.79 | 70.55 | 19.91 | | 130.0 | |
| | | Z | 6.04 | 71.24 | 20.64 | | 130.0 | |
| 10597-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle) | X | 5.69 | 70.34 | 19.79 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.74 | 70.49 | 19.82 | | 130.0 | |
| | | Z | 6.00 | 71.22 | 20.58 | | 130.0 | |
| 10598-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle) | X | 5.70 | 70.71 | 20.14 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.77 | 71.00 | 20.26 | | 130.0 | |
| | | Z | 6.02 | 71.65 | 20.96 | | 130.0 | |
| 10599-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle) | X | 6.29 | 69.92 | 19.51 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.34 | 70.06 | 19.56 | | 130.0 | |
| | | Z | 6.57 | 70.65 | 20.18 | | 130.0 | |
| 10600-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle) | X | 6.55 | 70.72 | 19.87 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.61 | 70.88 | 19.91 | | 130.0 | |
| | | Z | 6.87 | 71.57 | 20.59 | | 130.0 | |
| 10601-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle) | X | 6.37 | 70.29 | 19.69 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.43 | 70.44 | 19.73 | | 130.0 | |
| | | Z | 6.67 | 71.07 | 20.38 | | 130.0 | |
| 10602-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle) | X | 6.46 | 70.23 | 19.56 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.50 | 70.33 | 19.56 | | 130.0 | |
| | | Z | 6.73 | 70.94 | 20.21 | | 130.0 | |
| 10603-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS4 90pc duty cycle) | X | 6.54 | 70.54 | 19.83 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.60 | 70.70 | 19.89 | | 130.0 | |
| | | Z | 6.83 | 71.28 | 20.50 | | 130.0 | |
| 10604-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle) | X | 6.28 | 69.83 | 19.48 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.33 | 69.96 | 19.53 | | 130.0 | |
| | | Z | 6.56 | 70.56 | 20.15 | | 130.0 | |
| 10605-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) | X | 6.46 | 70.37 | 19.75 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.51 | 70.49 | 19.76 | | 130.0 | |
| | | Z | 6.73 | 71.07 | 20.39 | | 130.0 | |
| 10606-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle) | X | 6.16 | 69.63 | 19.27 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.19 | 69.65 | 19.23 | | 130.0 | |
| | | Z | 6.43 | 70.33 | 19.92 | | 130.0 | |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10607-AAA | IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle) | X | 5.58 | 69.53 | 19.53 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.66 | 69.84 | 19.67 | | 130.0 | |
| | | Z | 5.89 | 70.45 | 20.34 | | 130.0 | |
| 10608-AAA | IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle) | X | 5.82 | 70.03 | 19.71 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.90 | 70.33 | 19.84 | | 130.0 | |
| | | Z | 6.15 | 70.97 | 20.52 | | 130.0 | |
| 10609-AAA | IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle) | X | 5.72 | 70.00 | 19.64 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.79 | 70.26 | 19.74 | | 130.0 | |
| | | Z | 6.06 | 70.98 | 20.48 | | 130.0 | |
| 10610-AAA | IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle) | X | 5.77 | 70.16 | 19.79 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.86 | 70.48 | 19.93 | | 130.0 | |
| | | Z | 6.11 | 71.14 | 20.62 | | 130.0 | |
| 10611-AAA | IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle) | X | 5.68 | 69.98 | 19.66 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.76 | 70.26 | 19.77 | | 130.0 | |
| | | Z | 6.02 | 70.97 | 20.50 | | 130.0 | |
| 10612-AAA | IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle) | X | 5.73 | 70.29 | 19.79 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.81 | 70.54 | 19.88 | | 130.0 | |
| | | Z | 6.08 | 71.30 | 20.64 | | 130.0 | |
| 10613-AAA | IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle) | X | 5.73 | 70.11 | 19.64 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.79 | 70.32 | 19.70 | | 130.0 | |
| | | Z | 6.07 | 71.13 | 20.49 | | 130.0 | |
| 10614-AAA | IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle) | X | 5.69 | 70.47 | 19.98 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.79 | 70.86 | 20.15 | | 130.0 | |
| | | Z | 6.05 | 71.55 | 20.87 | | 130.0 | |
| 10615-AAA | IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle) | X | 5.67 | 69.75 | 19.41 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.72 | 69.89 | 19.43 | | 130.0 | |
| | | Z | 6.01 | 70.70 | 20.23 | | 130.0 | |
| 10616-AAA | IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle) | X | 6.21 | 69.57 | 19.34 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.27 | 69.79 | 19.44 | | 130.0 | |
| | | Z | 6.51 | 70.42 | 20.08 | | 130.0 | |
| 10617-AAA | IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle) | X | 6.31 | 69.83 | 19.43 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.38 | 70.05 | 19.52 | | 130.0 | |
| | | Z | 6.60 | 70.62 | 20.14 | | 130.0 | |
| 10618-AAA | IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle) | X | 6.21 | 69.98 | 19.56 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.29 | 70.23 | 19.67 | | 130.0 | |
| | | Z | 6.53 | 70.88 | 20.32 | | 130.0 | |
| 10619-AAA | IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle) | X | 6.21 | 69.69 | 19.34 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.27 | 69.87 | 19.40 | | 130.0 | |
| | | Z | 6.52 | 70.54 | 20.07 | | 130.0 | |
| 10620-AAA | IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle) | X | 6.28 | 69.60 | 19.31 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.34 | 69.77 | 19.38 | | 130.0 | |
| | | Z | 6.60 | 70.46 | 20.05 | | 130.0 | |
| 10621-AAA | IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle) | X | 6.26 | 69.70 | 19.49 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.35 | 69.99 | 19.63 | | 130.0 | |
| | | Z | 6.57 | 70.54 | 20.21 | | 130.0 | |
| 10622-AAA | IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle) | X | 6.33 | 70.04 | 19.65 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.42 | 70.34 | 19.79 | | 130.0 | |
| | | Z | 6.63 | 70.87 | 20.38 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10623-AAA | IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle) | X | 6.14 | 69.39 | 19.21 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.20 | 69.55 | 19.27 | | 130.0 | |
| | | Z | 6.44 | 70.21 | 19.94 | | 130.0 | |
| 10624-AAA | IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle) | X | 6.33 | 69.49 | 19.29 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.40 | 69.68 | 19.37 | | 130.0 | |
| | | Z | 6.63 | 70.29 | 19.99 | | 130.0 | |
| 10625-AAA | IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle) | X | 6.89 | 70.95 | 20.02 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.98 | 71.20 | 20.12 | | 130.0 | |
| | | Z | 7.25 | 71.89 | 20.77 | | 130.0 | |
| 10626-AAA | IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle) | X | 6.46 | 69.34 | 19.09 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.51 | 69.50 | 19.15 | | 130.0 | |
| | | Z | 6.74 | 70.13 | 19.78 | | 130.0 | |
| 10627-AAA | IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle) | X | 6.80 | 70.16 | 19.43 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.88 | 70.36 | 19.51 | | 130.0 | |
| | | Z | 7.11 | 70.98 | 20.13 | | 130.0 | |
| 10628-AAA | IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle) | X | 6.54 | 69.58 | 19.10 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.59 | 69.68 | 19.13 | | 130.0 | |
| | | Z | 6.84 | 70.41 | 19.81 | | 130.0 | |
| 10629-AAA | IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle) | X | 6.63 | 69.66 | 19.12 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.68 | 69.76 | 19.14 | | 130.0 | |
| | | Z | 6.92 | 70.40 | 19.78 | | 130.0 | |
| 10630-AAA | IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle) | X | 7.51 | 72.33 | 20.41 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.62 | 72.56 | 20.47 | | 130.0 | |
| | | Z | 7.96 | 73.47 | 21.25 | | 130.0 | |
| 10631-AAA | IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle) | X | 7.16 | 71.48 | 20.20 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.28 | 71.83 | 20.36 | | 130.0 | |
| | | Z | 7.56 | 72.54 | 21.01 | | 130.0 | |
| 10632-AAA | IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle) | X | 6.75 | 70.19 | 19.59 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.85 | 70.50 | 19.75 | | 130.0 | |
| | | Z | 7.06 | 71.01 | 20.29 | | 130.0 | |
| 10633-AAA | IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle) | X | 6.60 | 69.71 | 19.19 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.65 | 69.86 | 19.25 | | 130.0 | |
| | | Z | 6.92 | 70.59 | 19.92 | | 130.0 | |
| 10634-AAA | IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle) | X | 6.58 | 69.75 | 19.27 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.65 | 69.94 | 19.36 | | 130.0 | |
| | | Z | 6.90 | 70.60 | 19.99 | | 130.0 | |
| 10635-AAA | IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle) | X | 6.41 | 68.90 | 18.58 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.42 | 68.84 | 18.49 | | 130.0 | |
| | | Z | 6.71 | 69.69 | 19.26 | | 130.0 | |
| 10636-AAB | IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle) | X | 6.89 | 69.61 | 19.05 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.94 | 69.73 | 19.10 | | 130.0 | |
| | | Z | 7.18 | 70.37 | 19.72 | | 130.0 | |
| 10637-AAB | IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle) | X | 7.11 | 70.14 | 19.29 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.17 | 70.28 | 19.34 | | 130.0 | |
| | | Z | 7.41 | 70.93 | 19.96 | | 130.0 | |
| 10638-AAB | IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle) | X | 7.11 | 70.11 | 19.25 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.17 | 70.24 | 19.30 | | 130.0 | |
| | | Z | 7.41 | 70.90 | 19.93 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10639-AAB | IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle) | X | 7.06 | 69.99 | 19.24 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.11 | 70.12 | 19.28 | | 130.0 | |
| | | Z | 7.37 | 70.79 | 19.92 | | 130.0 | |
| 10640-AAB | IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle) | X | 7.09 | 70.06 | 19.22 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.13 | 70.13 | 19.22 | | 130.0 | |
| | | Z | 7.41 | 70.90 | 19.91 | | 130.0 | |
| 10641-AAB | IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle) | X | 7.08 | 69.78 | 19.08 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.12 | 69.84 | 19.08 | | 130.0 | |
| | | Z | 7.36 | 70.49 | 19.71 | | 130.0 | |
| 10642-AAB | IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle) | X | 7.13 | 70.08 | 19.40 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.20 | 70.27 | 19.49 | | 130.0 | |
| | | Z | 7.44 | 70.86 | 20.06 | | 130.0 | |
| 10643-AAB | IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle) | X | 6.97 | 69.80 | 19.17 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.01 | 69.89 | 19.19 | | 130.0 | |
| | | Z | 7.26 | 70.57 | 19.84 | | 130.0 | |
| 10644-AAB | IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle) | X | 7.22 | 70.56 | 19.56 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.27 | 70.64 | 19.57 | | 130.0 | |
| | | Z | 7.57 | 71.46 | 20.29 | | 130.0 | |
| 10645-AAB | IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle) | X | 7.87 | 71.89 | 20.13 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.95 | 72.00 | 20.15 | | 130.0 | |
| | | Z | 8.27 | 72.83 | 20.86 | | 130.0 | |
| 10646-AAD | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7) | X | 100.00 | 163.00 | 56.56 | 9.30 | 60.0 | ± 9.6 % |
| | | Y | 37.21 | 129.52 | 45.95 | | 60.0 | |
| | | Z | 100.00 | 162.70 | 56.99 | | 60.0 | |
| 10647-AAC | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7) | X | 100.00 | 164.52 | 57.26 | 9.30 | 60.0 | ± 9.6 % |
| | | Y | 32.59 | 127.04 | 45.45 | | 60.0 | |
| | | Z | 100.00 | 164.20 | 57.68 | | 60.0 | |
| 10648-AAA | CDMA2000 (1x Advanced) | X | 100.00 | 185.52 | 58.23 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 100.00 | 181.47 | 56.38 | | 150.0 | |
| | | Z | 100.00 | 193.94 | 62.97 | | 150.0 | |
| 10652-AAB | LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%) | X | 6.86 | 79.93 | 24.78 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 7.03 | 80.14 | 24.66 | | 80.0 | |
| | | Z | 8.09 | 83.31 | 26.67 | | 80.0 | |
| 10653-AAB | LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%) | X | 5.97 | 73.58 | 22.16 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.98 | 73.46 | 21.97 | | 80.0 | |
| | | Z | 6.62 | 75.51 | 23.43 | | 80.0 | |
| 10654-AAB | LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%) | X | 5.71 | 72.44 | 21.78 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.73 | 72.34 | 21.60 | | 80.0 | |
| | | Z | 6.28 | 74.21 | 22.98 | | 80.0 | |
| 10655-AAB | LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | X | 5.73 | 72.20 | 21.68 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.73 | 72.06 | 21.48 | | 80.0 | |
| | | Z | 6.29 | 73.95 | 22.87 | | 80.0 | |

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

# 13 Appendix C – Dipole Calibration Certificates

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

**S** Schweizerischer Kalibrierdienst
**C** Service suisse d'étalonnage
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** **BACL**

**Certificate No:** **D450V2-1010_Sep17**

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D450V2 - SN: 1010 |
| Calibration procedure(s) | QA CAL-15.v8<br>Calibration procedure for dipole validation kits below 700 MHz |
| Calibration date: | September 15, 2017 |

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°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-17 (No. 217-02521/02522) | Apr-18 |
| Power sensor NRP-Z91 | SN: 103244 | 04-Apr-17 (No. 217-02521) | Apr-18 |
| Power sensor NRP-Z91 | SN: 103245 | 04-Apr-17 (No. 217-02522) | Apr-18 |
| Reference 20 dB Attenuator | SN: 5277 (20x) | 07-Apr-17 (No. 217-02528) | Apr-18 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 07-Apr-17 (No. 217-02529) | Apr-18 |
| Reference Probe EX3DV4 | SN: 3877 | 31-Dec-16 (No. EX3-3877_Dec16) | Dec-17 |
| DAE4 | SN: 654 | 24-Jul-17 (No. DAE4-654_Jul17) | Jul-18 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power meter E4419B | SN: GB41293874 | 06-Apr-16 (No. 217-02285/02284) | In house check: Jun-18 |
| Power sensor E4412A | SN: MY41498087 | 06-Apr-16 (No. 217-02285) | In house check: Jun-18 |
| Power sensor E4412A | SN: 000110210 | 06-Apr-16 (No. 217-02284 | In house check: Jun-18 |
| RF generator HP 8648C | SN: US3642U01700 | 04-Aug-99 (in house check Jun-16) | In house check: Jun-18 |
| Network Analyzer HP 8753E | SN: US37390585 | 18-Oct-01 (in house check Oct-16) | In house check: Oct-17 |

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

Issued: September 15, 2017

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

**S** Schweizerischer Kalibrierdienst
**C** Service suisse d'étalonnage
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 | V52.10.0 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Flat Phantom V4.4 | Shell thickness: 6 ± 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 | 43.6 ± 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 | 1.20 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **4.80 W/kg ± 18.1 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 0.800 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **3.20 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 % | 0.95 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 | 1.21 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **4.79 W/kg ± 18.1 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 0.806 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **3.19 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 | 55.8 Ω - 6.8 jΩ |
| Return Loss | - 21.5 dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 52.8 Ω - 9.7 jΩ |
| Return Loss | - 20.2 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.359 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 | December 22, 2015 |

## DASY5 Validation Report for Head TSL

Date: 15.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2 - SN: 1010**

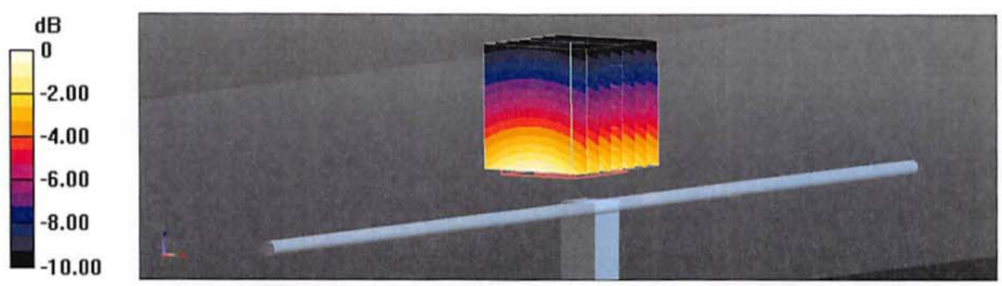
Communication System: UID 0 - CW; Frequency: 450 MHz
Medium parameters used: f = 450 MHz; $\sigma$ = 0.87 S/m; $\varepsilon_r$ = 43.6; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(10.5, 10.5, 10.5); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 24.07.2017
- Phantom: Flat Phantom 4.4 ; Type: Flat Phantom 4.4; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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

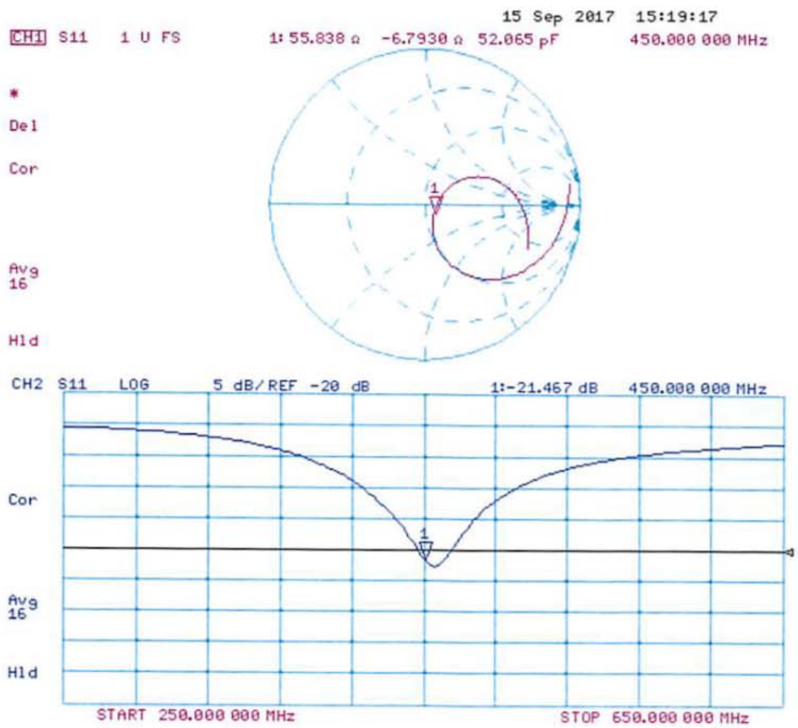
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 43.24 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.87 W/kg
**SAR(1 g) = 1.2 W/kg; SAR(10 g) = 0.800 W/kg**
Maximum value of SAR (measured) = 1.63 W/kg




0 dB = 1.63 W/kg = 2.12 dBW/kg

Certificate No: D450V2-1010_Sep17 Page 5 of 8

**Impedance Measurement Plot for Head TSL**

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**DASY5 Validation Report for Body TSL**

Date: 15.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

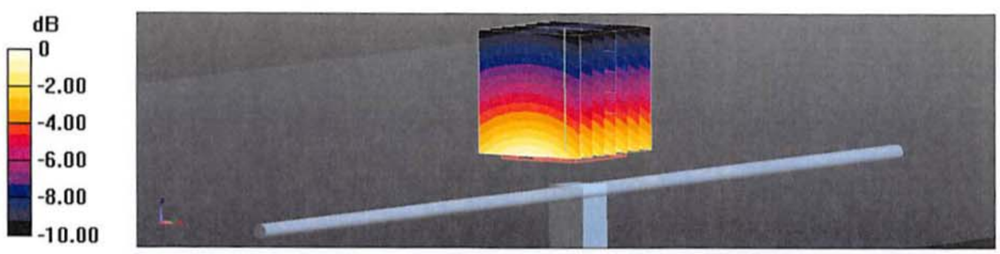
**DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2 - SN: 1010**

Communication System: UID 0 - CW; Frequency: 450 MHz
Medium parameters used: f = 450 MHz; $\sigma$ = 0.95 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:

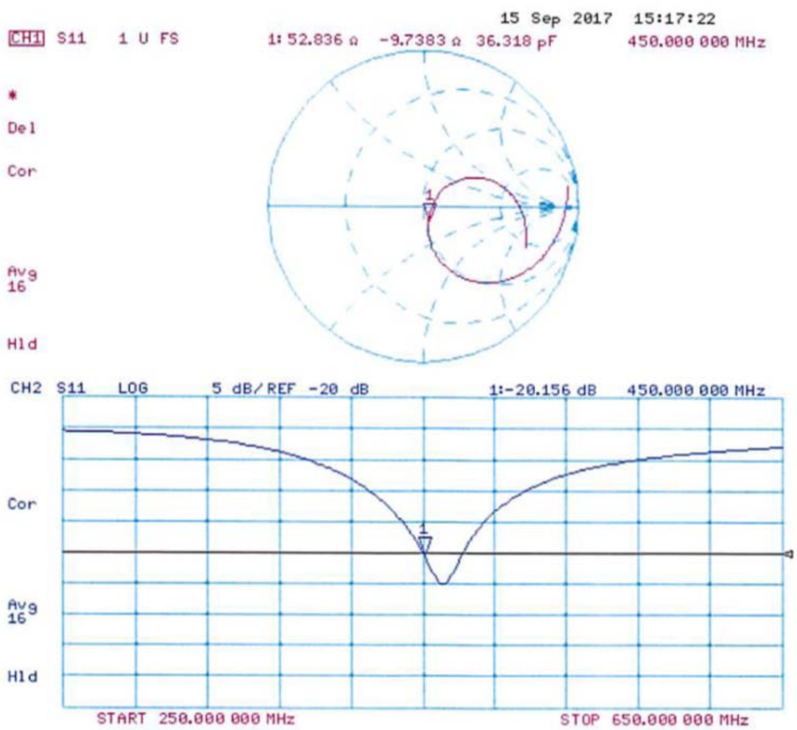
- Probe: EX3DV4 - SN3877; ConvF(10.7, 10.7, 10.7); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 24.07.2017
- Phantom: Flat Phantom 4.4 ; Type: Flat Phantom 4.4; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

**Dipole Calibration for Body Tissue/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:**
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 42.15 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.88 W/kg
**SAR(1 g) = 1.21 W/kg; SAR(10 g) = 0.806 W/kg**
Maximum value of SAR (measured) = 1.64 W/kg




0 dB = 1.64 W/kg = 2.15 dBW/kg

**Impedance Measurement Plot for Body TSL**




Certificate No: D450V2-1010_Sep17 Page 8 of 8

# 14 Appendix D - Test System Check Scans

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

**450 MHz Verification at 25 mW on 2018-08-09**

**DUT: 450 MHz Dipole Antenna**

Phantom: ELI V8.0 (20deg probe tilt)

Probe: EX3DV4 - SN3619

Electronics: DAE4 Sn530 Calibrated: 9/18/2017

Communication System Band: Generic

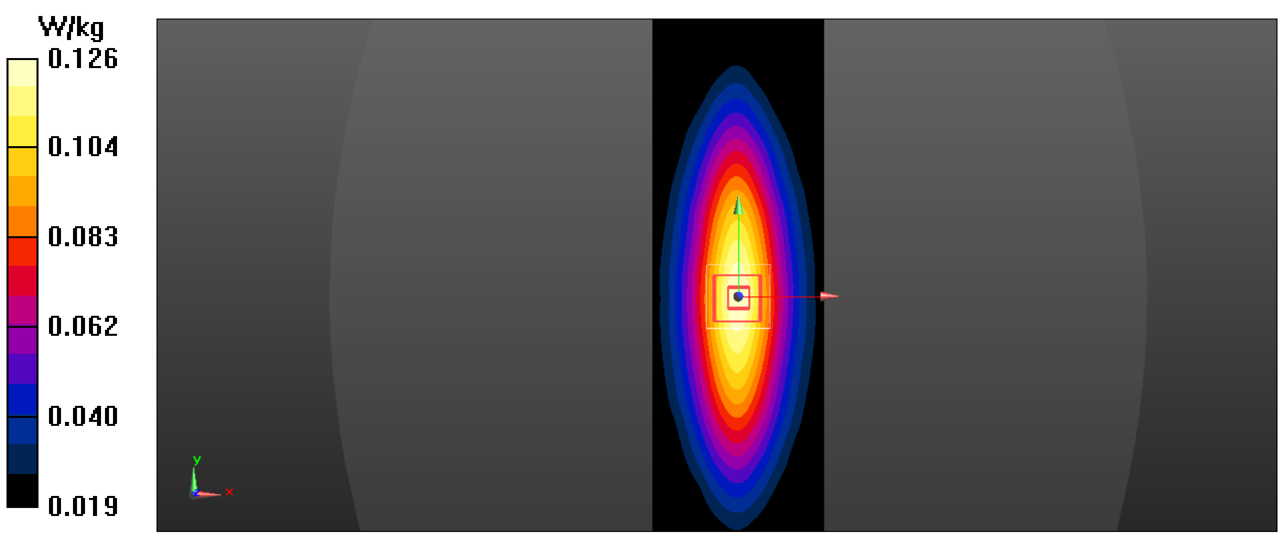
Frequency: 450 MHz

Medium: MBBL-600-6000v5 Medium parameters used: f = 450 MHz; $\sigma$ = 0.91 S/m; $\varepsilon_r$ = 55.6; $\rho$ = 1000 kg/m$^3$

**450 MHz Body System Check/Area Scan (81x321x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 11.86 V/m; Power Drift = -0.07 dB

**450 MHz Body System Check/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.86 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.171 W/kg

**SAR(1 g) = 0.120 W/kg; SAR(10 g) = 0.083 W/kg** (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.126 W/kg



# 15 Appendix E – EUT Scan Results

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

**Rear Side Touch WM-470 Mid 482.9 MHz**

**DUT: Lectrosonics; Type: Wireless Microphone Transmitter; Serial: 2369**

Phantom: ELI V8.0 (20deg probe tilt)

Probe: EX3DV4 - SN3619

Electronics: DAE4 Sn530 Calibrated: 9/18/2017

Communication System Band: Generic

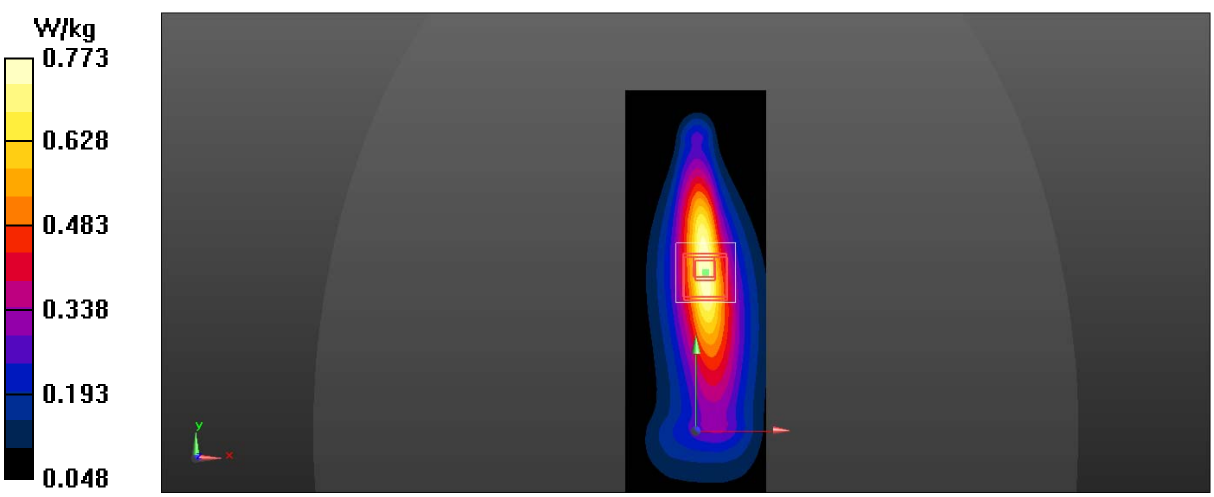
Frequency: 482.9 MHz

Medium: Lectrosonics 8-9-18 Medium parameters used: f = 482.9 MHz; $\sigma$ = 0.901 S/m; $\varepsilon_r$ = 54.93; $\rho$ = 1000 kg/m$^3$

**Rear Side Touch Middle Channel/Area Scan (71x221x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 17.23 V/m; Power Drift = -0.01 dB

**Rear Side Touch Middle Channel/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.23 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.44 W/kg

**SAR(1 g) = 0.712 W/kg; SAR(10 g) = 0.404 W/kg** (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.773 W/kg



# 16 Appendix F – RF OUTPUT POWER MEASUREMENT

**WM-470**

| Channel | Frequency (MHz) | Conducted Output Power (dBm) |
|---|---|---|
| Low | 470.1 | 23.75 |
| Middle | 482.9 | 23.76 |
| High | 495.675 | 23.73 |

Note: The Rated maximum output power is 250 mW (24 dBm).

# 17 Appendix G- EUT Photographs

Please refer to the following exhibits:

Exhibit- EUT Test Setup Photographs
Exhibit- EUT External Photographs
Exhibit- EUT Internal Photographs

# 18 Appendix H - Informative References

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[2] David L. Means Kwok Chan, Robert F. Cleveland, \Evaluating compliance with FCC guidelines for human exposure to radiofrequency electromagnetic fields", Tech. Rep., Federal Communication Commission, O_ce of Engineering & Technology, Washington, DC, 1997.

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[5] CENELEC, \Considerations for evaluating of human exposure to electromagnetic fields (EMFs) from mobile telecommunication equipment (MTE) in the frequency range 30MHz - 6GHz", Tech. Rep., CENELEC, European Committee for Electrotechnical Standardization, Brussels, 1997.

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[9] Volker Hombach, Klaus Meier, Michael Burkhardt, Eberhard K. uhn, and Niels Kuster, \The depen-dence of EM energy absorption upon human head modeling at 900 MHz", IEEE Transactions on Microwave Theory and Techniques, vol. 44, no. 10, pp. 1865-1873, Oct. 1996.

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[12] W. H. Press, S. A. Teukolsky,W. T. Vetterling, and B. P. Flannery, Numerical Recepies in C, The Art of Scientific Computing, Second Edition, Cambridge University Press, 1992.Dosimetric Evaluation of Sample device, month 1998 9

[13] NIS81 NAMAS, \The treatment of uncertainity in EMC measurement", Tech. Rep., NAMAS Executive, National Physical Laboratory, Teddington, Middlesex, England, 1994.

[14] Barry N. Taylor and Christ E. Kuyatt, \Guidelines for evaluating and expressing the uncertainty of NIST measurement results", Tech. Rep., National Institute of Standards and Technology, 1994. Dosimetric Evaluation of Sample device, month 1998 10.

# 19 Appendix I (Informative) - A2LA Electrical Testing Certificate

## Accredited Laboratory

A2LA has accredited

**BAY AREA COMPLIANCE LABORATORIES CORP.**

*Sunnyvale, CA*

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of any additional program requirements in the Electrical field. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 30th day of August 2016.

President and CEO
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2018
Revised November 14, 2016

*For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

**--- END OF REPORT ---**