**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** **Sporton - TW (Auden)**

**Certificate No: DAE3-495_May16**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE3 - SD 000 D03 AD - SN: 495 |
| Calibration procedure(s) | QA CAL-06.v29<br>Calibration procedure for the data acquisition electronics (DAE) |
| Calibration date: | May 27, 2016 |

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 |
|---|---|---|---|
| Keithley Multimeter Type 2001 | SN: 0810278 | 09-Sep-15 (No:17153) | Sep-16 |
| **Secondary Standards** | **ID #** | **Check Date (in house)** | **Scheduled Check** |
| Auto DAE Calibration Unit | SE UWS 053 AA 1001 | 05-Jan-16 (in house check) | In house check: Jan-17 |
| Calibrator Box V2.1 | SE UMS 006 AA 1002 | 05-Jan-16 (in house check) | In house check: Jan-17 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | R.Mayoraz | Technician | |
| Approved by: | Fin Bomholt | Deputy Technical Manager | |

Issued: May 27, 2016

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

## Glossary

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

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV , full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| **High Range** | 404.392 ± 0.02% (k=2) | 405.369 ± 0.02% (k=2) | 405.725 ± 0.02% (k=2) |
| **Low Range** | 3.95295 ± 1.50% (k=2) | 3.99096 ± 1.50% (k=2) | 3.96580 ± 1.50% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 78.0 ° ± 1 ° |

## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

| High Range | | Reading (µV) | Difference (µV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 199996.62 | 1.58 | 0.00 |
| Channel X | + Input | 20000.74 | -0.12 | -0.00 |
| Channel X | - Input | -19996.44 | 4.68 | -0.02 |
| Channel Y | + Input | 199995.94 | 1.53 | 0.00 |
| Channel Y | + Input | 20002.54 | 1.56 | 0.01 |
| Channel Y | - Input | -19999.75 | 1.29 | -0.01 |
| Channel Z | + Input | 199992.83 | -1.82 | -0.00 |
| Channel Z | + Input | 20002.61 | 1.74 | 0.01 |
| Channel Z | - Input | -19998.46 | 2.69 | -0.01 |

| Low Range | | Reading (µV) | Difference (µV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 2001.48 | 0.75 | 0.04 |
| Channel X | + Input | 201.55 | 0.46 | 0.23 |
| Channel X | - Input | -198.32 | 0.30 | -0.15 |
| Channel Y | + Input | 2000.13 | -0.57 | -0.03 |
| Channel Y | + Input | 200.91 | -0.45 | -0.22 |
| Channel Y | - Input | -199.30 | -0.77 | 0.39 |
| Channel Z | + Input | 1999.63 | -0.96 | -0.05 |
| Channel Z | + Input | 200.82 | -0.44 | -0.22 |
| Channel Z | - Input | -199.88 | -1.27 | 0.64 |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Common mode Input Voltage (mV) | High Range Average Reading (µV) | Low Range Average Reading (µV) |
|---|---|---|---|
| Channel X | 200 | 3.18 | 2.27 |
| | - 200 | -2.19 | -3.80 |
| Channel Y | 200 | 0.69 | 0.05 |
| | - 200 | -0.39 | -0.92 |
| Channel Z | 200 | 2.28 | 2.22 |
| | - 200 | -4.44 | -4.68 |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Input Voltage (mV) | Channel X (µV) | Channel Y (µV) | Channel Z (µV) |
|---|---|---|---|---|
| Channel X | 200 | - | -0.76 | -2.16 |
| Channel Y | 200 | 7.44 | - | -0.52 |
| Channel Z | 200 | 5.77 | 5.68 | - |

## 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | High Range (LSB) | Low Range (LSB) |
|---|---|---|
| **Channel X** | 15817 | 17431 |
| **Channel Y** | 15765 | 17509 |
| **Channel Z** | 15903 | 17029 |

## 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|---|---|---|---|---|
| **Channel X** | -0.15 | -1.92 | 1.72 | 0.56 |
| **Channel Y** | 0.33 | -0.86 | 2.13 | 0.60 |
| **Channel Z** | -1.62 | -2.91 | -0.07 | 0.62 |

## 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

## 7. Input Resistance (Typical values for information)

| | Zeroing (kOhm) | Measuring (MOhm) |
|---|---|---|
| **Channel X** | 200 | 200 |
| **Channel Y** | 200 | 200 |
| **Channel Z** | 200 | 200 |

## 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|---|---|
| **Supply (+ Vcc)** | +7.9 |
| **Supply (- Vcc)** | -7.6 |

## 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|---|---|---|---|
| **Supply (+ Vcc)** | +0.01 | +6 | +14 |
| **Supply (- Vcc)** | –0.01 | -8 | -9 |

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**Accreditation No.: SCS 0108**

**Client** **Sporton-TW (Auden)**

**Certificate No: DAE4-1399_Nov16**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE4 - SD 000 D04 BM - SN: 1399 |
| Calibration procedure(s) | QA CAL-06.v29<br>Calibration procedure for the data acquisition electronics (DAE) |
| Calibration date: | November 17, 2016 |

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 |
|---|---|---|---|
| Keithley Multimeter Type 2001 | SN: 0810278 | 09-Sep-16 (No:19065) | Sep-17 |
| **Secondary Standards** | **ID #** | **Check Date (in house)** | **Scheduled Check** |
| Auto DAE Calibration Unit | SE UWS 053 AA 1001 | 05-Jan-16 (in house check) | In house check: Jan-17 |
| Calibrator Box V2.1 | SE UMS 006 AA 1002 | 05-Jan-16 (in house check) | In house check: Jan-17 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Dominique Steffen | Technician | |
| Approved by: | Fin Bomholt | Deputy Technical Manager | i.V. |

Issued: November 17, 2016

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## Glossary

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

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

| | | | | |
|---|---|---|---|---|
| High Range: | 1LSB = | 6.1μV , | full range = | -100...+300 mV |
| Low Range: | 1LSB = | 61nV , | full range = | -1.....+3mV |

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| **High Range** | 403.601 ± 0.02% (k=2) | 403.860 ± 0.02% (k=2) | 403.715 ± 0.02% (k=2) |
| **Low Range** | 3.98192 ± 1.50% (k=2) | 3.99210 ± 1.50% (k=2) | 3.98028 ± 1.50% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 302.5 ° ± 1 ° |

## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

| High Range | | Reading (µV) | Difference (µV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 199995.88 | 1.05 | 0.00 |
| Channel X | + Input | 20002.28 | 0.87 | 0.00 |
| Channel X | - Input | -19998.50 | 2.29 | -0.01 |
| Channel Y | + Input | 199993.59 | -1.44 | -0.00 |
| Channel Y | + Input | 20000.11 | -1.26 | -0.01 |
| Channel Y | - Input | -20001.82 | -0.91 | 0.00 |
| Channel Z | + Input | 199995.29 | -0.07 | -0.00 |
| Channel Z | + Input | 19998.72 | -2.63 | -0.01 |
| Channel Z | - Input | -20002.93 | -1.99 | 0.01 |

| Low Range | | Reading (µV) | Difference (µV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 2001.09 | -0.18 | -0.01 |
| Channel X | + Input | 201.99 | 0.26 | 0.13 |
| Channel X | - Input | -197.66 | 0.46 | -0.23 |
| Channel Y | + Input | 2001.13 | -0.06 | -0.00 |
| Channel Y | + Input | 200.58 | -0.99 | -0.49 |
| Channel Y | - Input | -198.74 | -0.44 | 0.22 |
| Channel Z | + Input | 2001.38 | 0.15 | 0.01 |
| Channel Z | + Input | 200.84 | -0.68 | -0.34 |
| Channel Z | - Input | -199.07 | -0.83 | 0.42 |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Common mode Input Voltage (mV) | High Range Average Reading (µV) | Low Range Average Reading (µV) |
|---|---|---|---|
| Channel X | 200 | -4.94 | -6.62 |
| | - 200 | 8.38 | 6.51 |
| Channel Y | 200 | -6.22 | -6.54 |
| | - 200 | 5.04 | 4.27 |
| Channel Z | 200 | -6.68 | -6.74 |
| | - 200 | 4.86 | 5.05 |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Input Voltage (mV) | Channel X (µV) | Channel Y (µV) | Channel Z (µV) |
|---|---|---|---|---|
| Channel X | 200 | - | 4.65 | -1.72 |
| Channel Y | 200 | 9.38 | - | 6.88 |
| Channel Z | 200 | 8.80 | 6.72 | - |

## 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | High Range (LSB) | Low Range (LSB) |
|---|---|---|
| **Channel X** | 15826 | 16053 |
| **Channel Y** | 16118 | 16526 |
| **Channel Z** | 15887 | 15918 |

## 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

| | Average (µV) | min. Offset (µV) | max. Offset (µV) | Std. Deviation (µV) |
|---|---|---|---|---|
| **Channel X** | 0.11 | -0.73 | 0.73 | 0.27 |
| **Channel Y** | -0.19 | -1.32 | 1.76 | 0.44 |
| **Channel Z** | -0.78 | -2.06 | 0.51 | 0.41 |

## 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

## 7. Input Resistance (Typical values for information)

| | Zeroing (kOhm) | Measuring (MOhm) |
|---|---|---|
| **Channel X** | 200 | 200 |
| **Channel Y** | 200 | 200 |
| **Channel Z** | 200 | 200 |

## 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|---|---|
| **Supply (+ Vcc)** | +7.9 |
| **Supply (- Vcc)** | -7.6 |

## 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|---|---|---|---|
| **Supply (+ Vcc)** | +0.01 | +6 | +14 |
| **Supply (- Vcc)** | –0.01 | -8 | -9 |

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Accreditation No.: **SCS 0108**

Client **Auden**

Certificate No: **DAE4-914_Jan17**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE4 - SD 000 D04 BK - SN: 914 |
| Calibration procedure(s) | QA CAL-06.v29<br>Calibration procedure for the data acquisition electronics (DAE) |
| Calibration date: | January 06, 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 |
|---|---|---|---|
| Keithley Multimeter Type 2001 | SN: 0810278 | 09-Sep-16 (No:19065) | Sep-17 |
| **Secondary Standards** | **ID #** | **Check Date (in house)** | **Scheduled Check** |
| Auto DAE Calibration Unit | SE UWS 053 AA 1001 | 05-Jan-16 (in house check) | In house check: Jan-17 |
| Calibrator Box V2.1 | SE UMS 006 AA 1002 | 05-Jan-16 (in house check) | In house check: Jan-17 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Adrian Gehring | Technician | |
| Approved by: | Fin Bomholt | Deputy Technical Manager | |

Issued: January 6, 2017

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

## Glossary

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

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV , full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| **High Range** | 405.068 ± 0.02% (k=2) | 404.262 ± 0.02% (k=2) | 403.838 ± 0.02% (k=2) |
| **Low Range** | 3.99100 ± 1.50% (k=2) | 3.98852 ± 1.50% (k=2) | 3.98993 ± 1.50% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 63.0 ° ± 1 ° |

## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

| High Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 200030.35 | -2.48 | -0.00 |
| Channel X | + Input | 20004.16 | -0.79 | -0.00 |
| Channel X | - Input | -20002.66 | 2.18 | -0.01 |
| Channel Y | + Input | 200031.50 | -1.21 | -0.00 |
| Channel Y | + Input | 20001.20 | -3.60 | -0.02 |
| Channel Y | - Input | -20005.09 | -0.13 | 0.00 |
| Channel Z | + Input | 200030.04 | -2.90 | -0.00 |
| Channel Z | + Input | 20001.59 | -3.09 | -0.02 |
| Channel Z | - Input | -20005.25 | -0.22 | 0.00 |

| Low Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 2001.33 | 0.09 | 0.00 |
| Channel X | + Input | 201.16 | -0.23 | -0.11 |
| Channel X | - Input | -198.51 | 0.20 | -0.10 |
| Channel Y | + Input | 2001.28 | 0.13 | 0.01 |
| Channel Y | + Input | 200.65 | -0.57 | -0.28 |
| Channel Y | - Input | -198.57 | 0.21 | -0.10 |
| Channel Z | + Input | 2001.06 | -0.12 | -0.01 |
| Channel Z | + Input | 200.14 | -1.11 | -0.55 |
| Channel Z | - Input | -200.23 | -1.40 | 0.70 |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Common mode Input Voltage (mV) | High Range Average Reading (μV) | Low Range Average Reading (μV) |
|---|---|---|---|
| Channel X | 200 | -12.74 | -14.35 |
| | - 200 | 15.28 | 13.78 |
| Channel Y | 200 | -5.02 | -5.61 |
| | - 200 | 4.04 | 3.96 |
| Channel Z | 200 | 5.14 | 5.29 |
| | - 200 | -8.12 | -7.94 |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Input Voltage (mV) | Channel X (μV) | Channel Y (μV) | Channel Z (μV) |
|---|---|---|---|---|
| Channel X | 200 | - | 2.77 | -4.96 |
| Channel Y | 200 | 7.37 | - | 3.14 |
| Channel Z | 200 | 9.77 | 5.64 | - |

## 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | High Range (LSB) | Low Range (LSB) |
|---|---|---|
| Channel X | 16120 | 13405 |
| Channel Y | 16156 | 16416 |
| Channel Z | 16016 | 14609 |

## 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|---|---|---|---|---|
| Channel X | 0.49 | -1.54 | 2.62 | 0.45 |
| Channel Y | 0.81 | -0.16 | 2.34 | 0.55 |
| Channel Z | -0.14 | -2.56 | 1.83 | 0.56 |

## 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

## 7. Input Resistance (Typical values for information)

| | Zeroing (kOhm) | Measuring (MOhm) |
|---|---|---|
| Channel X | 200 | 200 |
| Channel Y | 200 | 200 |
| Channel Z | 200 | 200 |

## 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|---|---|
| Supply (+ Vcc) | +7.9 |
| Supply (- Vcc) | -7.6 |

## 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|---|---|---|---|
| Supply (+ Vcc) | +0.01 | +6 | +14 |
| Supply (- Vcc) | –0.01 | -8 | -9 |

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Accredited by the Swiss Accreditation Service (SAS)
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**Accreditation No.: SCS 0108**

**Client** **Sporton - TW (Auden)**

**Certificate No: DAE3-577_Sep16**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE3 - SD 000 D03 AA - SN: 577 |
| Calibration procedure(s) | QA CAL-06.v29<br>Calibration procedure for the data acquisition electronics (DAE) |
| Calibration date: | September 28, 2016 |

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 |
|---|---|---|---|
| Keithley Multimeter Type 2001 | SN: 0810278 | 09-Sep-16 (No:19065) | Sep-17 |
| **Secondary Standards** | **ID #** | **Check Date (in house)** | **Scheduled Check** |
| Auto DAE Calibration Unit | SE UWS 053 AA 1001 | 05-Jan-16 (in house check) | In house check: Jan-17 |
| Calibrator Box V2.1 | SE UMS 006 AA 1002 | 05-Jan-16 (in house check) | In house check: Jan-17 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Eric Hainfeld | Technician | |
| Approved by: | Fin Bomholt | Deputy Technical Manager | i.V. |

Issued: September 28, 2016

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## Glossary

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

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

| | | | | |
|---|---|---|---|---|
| High Range: | 1LSB = | 6.1μV , | full range = | -100...+300 mV |
| Low Range: | 1LSB = | 61nV , | full range = | -1.....+3mV |

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| **High Range** | 403.533 ± 0.02% (k=2) | 403.512 ± 0.02% (k=2) | 403.819 ± 0.02% (k=2) |
| **Low Range** | 3.92648 ± 1.50% (k=2) | 3.94206 ± 1.50% (k=2) | 3.96074 ± 1.50% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 190.0 ° ± 1 ° |

## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

| High Range | | Reading (µV) | Difference (µV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 200038.14 | 2.56 | 0.00 |
| Channel X | + Input | 20010.51 | 5.45 | 0.03 |
| Channel X | - Input | -20002.01 | 3.17 | -0.02 |
| Channel Y | + Input | 200032.33 | -3.18 | -0.00 |
| Channel Y | + Input | 20006.38 | 1.35 | 0.01 |
| Channel Y | - Input | -20004.73 | 0.65 | -0.00 |
| Channel Z | + Input | 200031.49 | -4.11 | -0.00 |
| Channel Z | + Input | 20005.92 | 0.98 | 0.00 |
| Channel Z | - Input | -20007.03 | -1.64 | 0.01 |

| Low Range | | Reading (µV) | Difference (µV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 2001.00 | -0.10 | -0.01 |
| Channel X | + Input | 201.47 | 0.40 | 0.20 |
| Channel X | - Input | -198.57 | 0.28 | -0.14 |
| Channel Y | + Input | 2001.38 | 0.31 | 0.02 |
| Channel Y | + Input | 200.40 | -0.54 | -0.27 |
| Channel Y | - Input | -199.63 | -0.73 | 0.37 |
| Channel Z | + Input | 2000.35 | -0.56 | -0.03 |
| Channel Z | + Input | 199.97 | -0.93 | -0.46 |
| Channel Z | - Input | -200.50 | -1.56 | 0.79 |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Common mode Input Voltage (mV) | High Range Average Reading (µV) | Low Range Average Reading (µV) |
|---|---|---|---|
| Channel X | 200 | -2.76 | -4.30 |
| | - 200 | 6.04 | 3.73 |
| Channel Y | 200 | -14.29 | -14.35 |
| | - 200 | 12.74 | 12.77 |
| Channel Z | 200 | 3.10 | 2.81 |
| | - 200 | -5.90 | -5.65 |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Input Voltage (mV) | Channel X (µV) | Channel Y (µV) | Channel Z (µV) |
|---|---|---|---|---|
| Channel X | 200 | - | -1.07 | -3.44 |
| Channel Y | 200 | 8.43 | - | 0.12 |
| Channel Z | 200 | 5.44 | 4.83 | - |

## 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | High Range (LSB) | Low Range (LSB) |
|---|---|---|
| **Channel X** | 16132 | 16062 |
| **Channel Y** | 16099 | 16321 |
| **Channel Z** | 16116 | 15372 |

## 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|---|---|---|---|---|
| **Channel X** | 0.37 | -1.07 | 1.49 | 0.43 |
| **Channel Y** | 1.21 | -0.41 | 3.21 | 0.59 |
| **Channel Z** | -1.38 | -2.63 | -0.30 | 0.45 |

## 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

## 7. Input Resistance (Typical values for information)

| | Zeroing (kOhm) | Measuring (MOhm) |
|---|---|---|
| **Channel X** | 200 | 200 |
| **Channel Y** | 200 | 200 |
| **Channel Z** | 200 | 200 |

## 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|---|---|
| **Supply (+ Vcc)** | +7.9 |
| **Supply (- Vcc)** | -7.6 |

## 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|---|---|---|---|
| **Supply (+ Vcc)** | +0.01 | +6 | +14 |
| **Supply (- Vcc)** | –0.01 | -8 | -9 |

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CNAS L0570

Client **Sporton_TW** **Certificate No: Z16-97123**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | ES3DV3 - SN:3270 |
| Calibration Procedure(s) | FD-Z11-2-004-01<br>Calibration Procedures for Dosimetric E-field Probes |
| Calibration date: | August 26, 2016 |

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 101919 | 27-Jun-16 (CTTL, No.J16X04777) | Jun-17 |
| Power sensor NRP-Z91 | 101547 | 27-Jun-16 (CTTL, No.J16X04777) | Jun-17 |
| Power sensor NRP-Z91 | 101548 | 27-Jun-16 (CTTL, No.J16X04777) | Jun-17 |
| Reference10dBAttenuator | 18N50W-10dB | 13-Mar-16(CTTL,No.J16X01547) | Mar-18 |
| Reference20dBAttenuator | 18N50W-20dB | 13-Mar-16(CTTL, No.J16X01548) | Mar-18 |
| Reference Probe EX3DV4 | SN 7307 | 19-Feb-16(SPEAG,No.EX3-7307_Feb16) | Feb-17 |
| DAE4 | SN 1331 | 21-Jan-16(SPEAG, No.DAE4-1331_Jan16) | Jan -17 |
| **Secondary Standards** | **ID #** | **Cal Date(Calibrated by, Certificate No.)** | **Scheduled Calibration** |
| SignalGeneratorMG3700A | 6201052605 | 27-Jun-16 (CTTL, No.J16X04776) | Jun-17 |
| Network Analyzer E5071C | MY46110673 | 26-Jan-16 (CTTL, No.J16X00894) | Jan -17 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Yu Zongying | SAR Test Engineer | |
| Reviewed by: | Qi Dianyuan | SAR Project Leader | |
| Approved by: | Lu Bingsong | Deputy Director of the laboratory | |

Issued: August 27, 2016

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## Glossary:

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A,B,C,D | modulation dependent linearization parameters |
| Polarization Φ | Φ rotation around probe axis |
| Polarization θ | θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i 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, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) IEC 62209-2, "Procedure to 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≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect 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 (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;VRx,y,z:*A,B,C 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≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued 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±50MHz to±100MHz.
- *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 ES3DV3

# SN: 3270

Calibrated: August 26, 2016

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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# DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3270

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm(μV/(V/m)$^2$)[A] | 1.09 | 1.22 | 1.19 | ±10.8% |
| DCP(mV)[B] | 100.9 | 103.3 | 101.0 | |

## 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 | 274.7 | ±2.7% |
| | | Y | 0.0 | 0.0 | 1.0 | | 295.4 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 288.4 | |

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 Page 5 and Page 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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# DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3270

## 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) | Unct. (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 6.19 | 6.19 | 6.19 | 0.50 | 1.35 | ±12% |
| 835 | 41.5 | 0.90 | 6.03 | 6.03 | 6.03 | 0.42 | 1.47 | ±12% |
| 900 | 41.5 | 0.97 | 6.09 | 6.09 | 6.09 | 0.37 | 1.61 | ±12% |
| 1750 | 40.1 | 1.37 | 5.21 | 5.21 | 5.21 | 0.52 | 1.53 | ±12% |
| 1900 | 40.0 | 1.40 | 5.08 | 5.08 | 5.08 | 0.55 | 1.50 | ±12% |
| 2000 | 40.0 | 1.40 | 4.98 | 4.98 | 4.98 | 0.57 | 1.47 | ±12% |
| 2100 | 39.8 | 1.49 | 5.02 | 5.02 | 5.02 | 0.68 | 1.41 | ±12% |
| 2450 | 39.2 | 1.80 | 4.51 | 4.51 | 4.51 | 0.73 | 1.30 | ±12% |
| 2600 | 39.0 | 1.96 | 4.37 | 4.37 | 4.37 | 0.90 | 1.13 | ±12% |

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of 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 frequency 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 the 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: ES3DV3 - SN: 3270

## 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) | Unct. (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 55.5 | 0.96 | 6.09 | 6.09 | 6.09 | 0.50 | 1.35 | ±12% |
| 835 | 55.2 | 0.97 | 6.01 | 6.01 | 6.01 | 0.42 | 1.60 | ±12% |
| 1750 | 53.4 | 1.49 | 4.95 | 4.95 | 4.95 | 0.50 | 1.66 | ±12% |
| 1900 | 53.3 | 1.52 | 4.70 | 4.70 | 4.70 | 0.53 | 1.64 | ±12% |
| 2450 | 52.7 | 1.95 | 4.28 | 4.28 | 4.28 | 0.90 | 1.20 | ±12% |
| 2600 | 52.5 | 2.16 | 4.12 | 4.12 | 4.12 | 0.90 | 1.18 | ±12% |

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of 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 frequency 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 the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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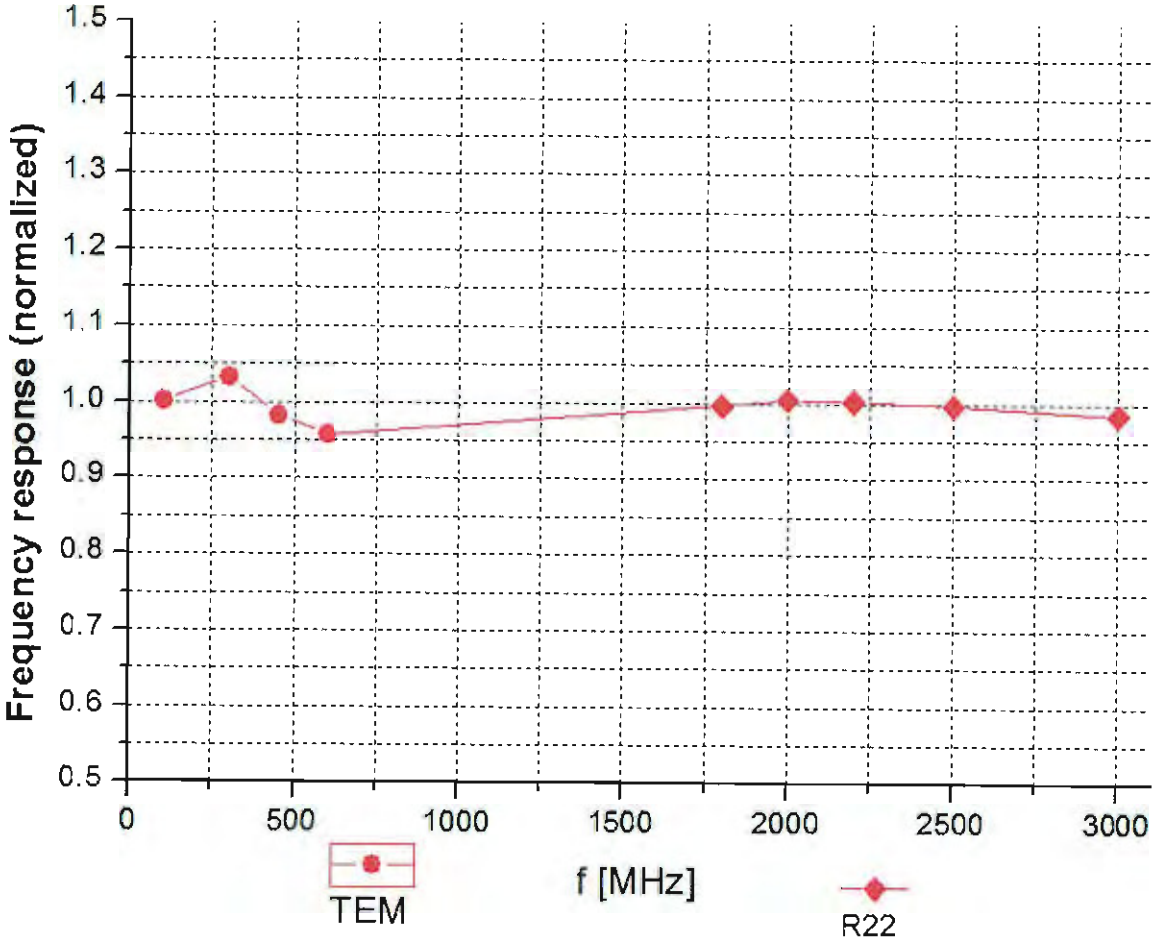
# Frequency Response of E-Field

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




**Uncertainty of Frequency Response of E-field: ±7.5% (k=2)**

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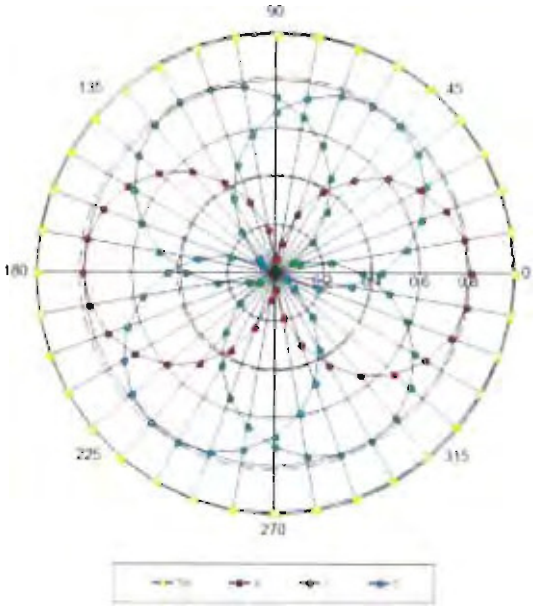
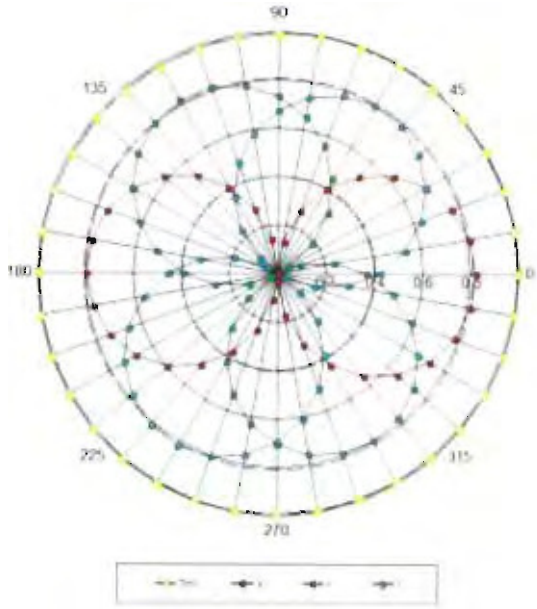
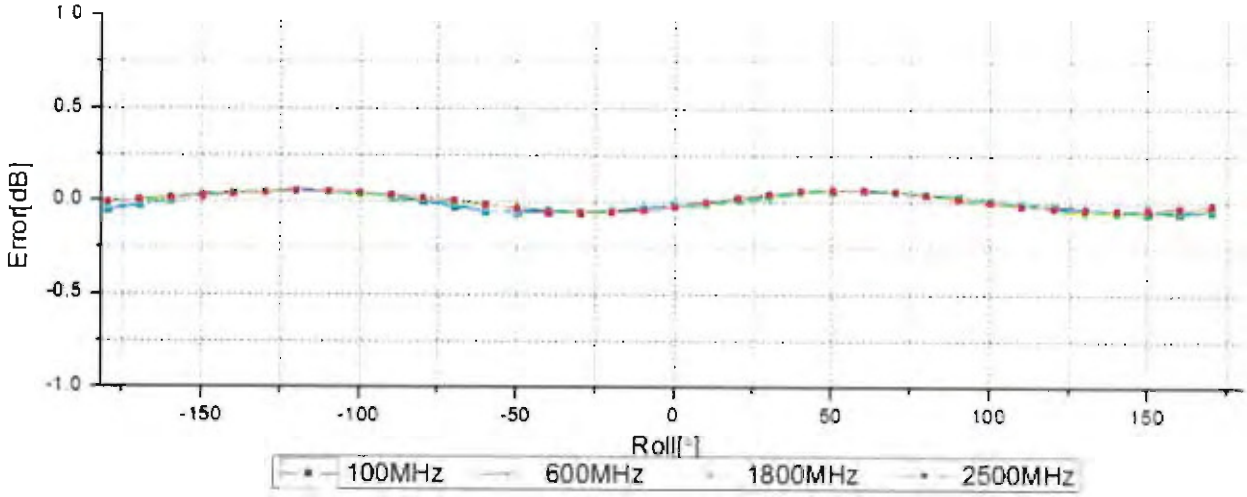
# Receiving Pattern (Φ), θ=0°

## f=600 MHz, TEM




## f=1800 MHz, R22




**Uncertainty of Axial Isotropy Assessment: ±0.9% (k=2)**

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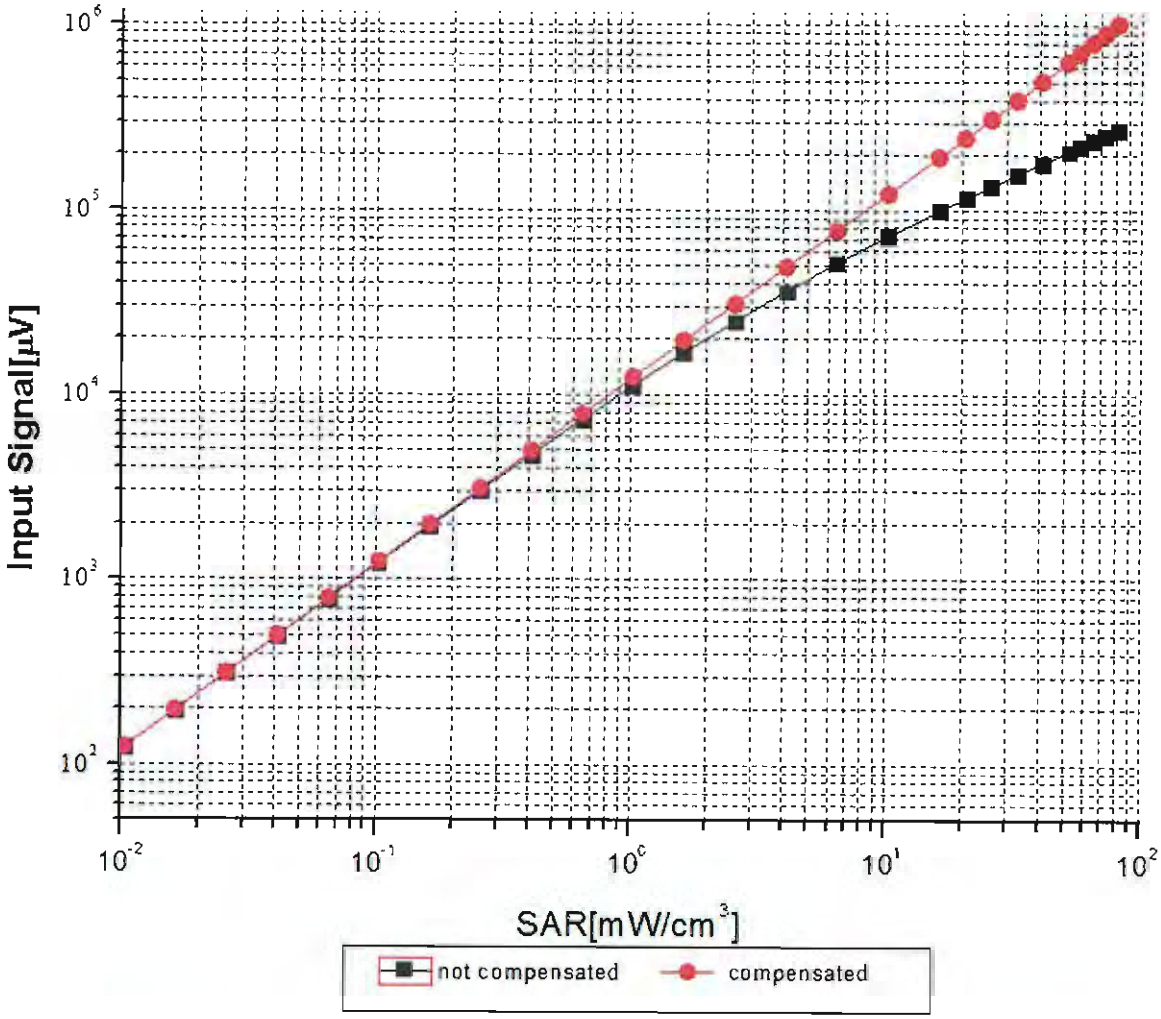
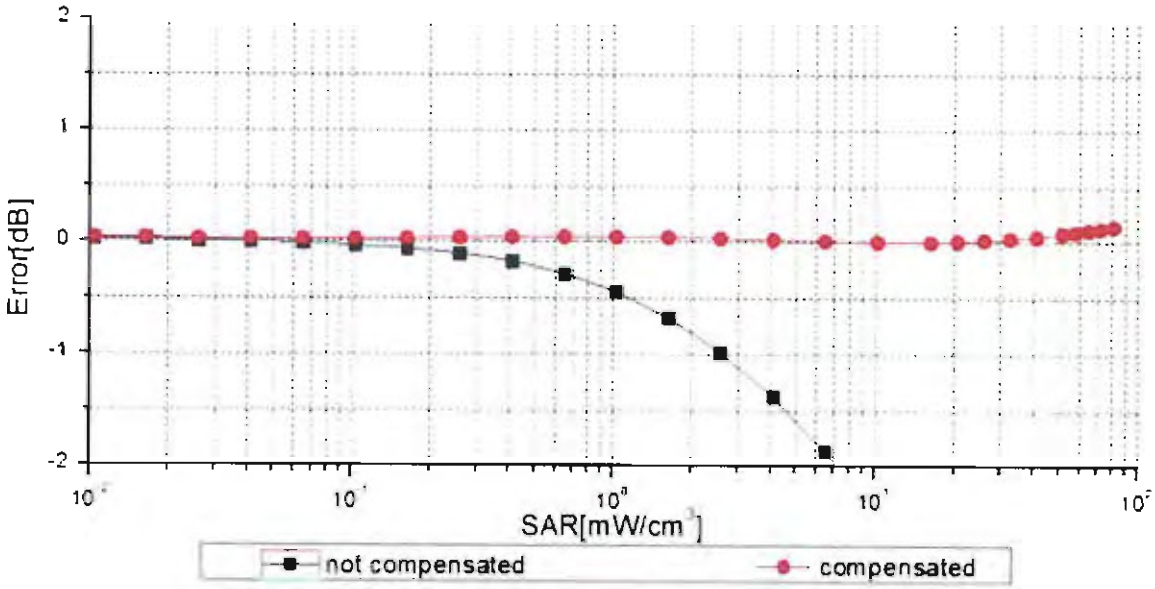
# Dynamic Range f($SAR_{head}$)
## (TEM cell, f = 900 MHz)




**Uncertainty of Linearity Assessment: ±0.9% (k=2)**

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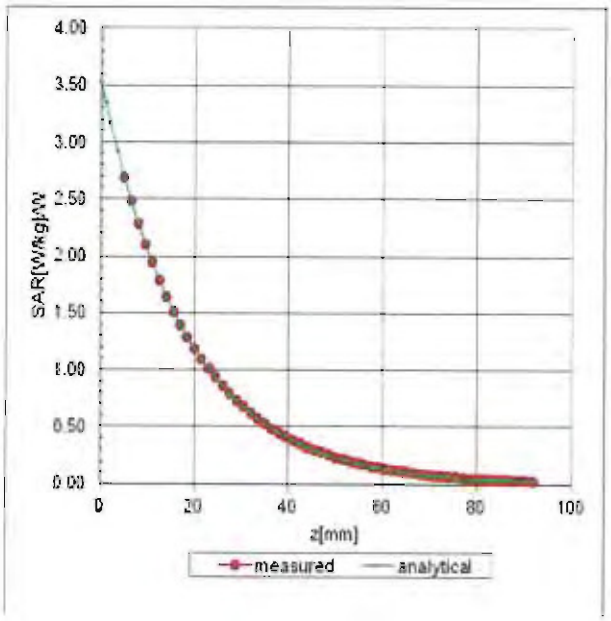
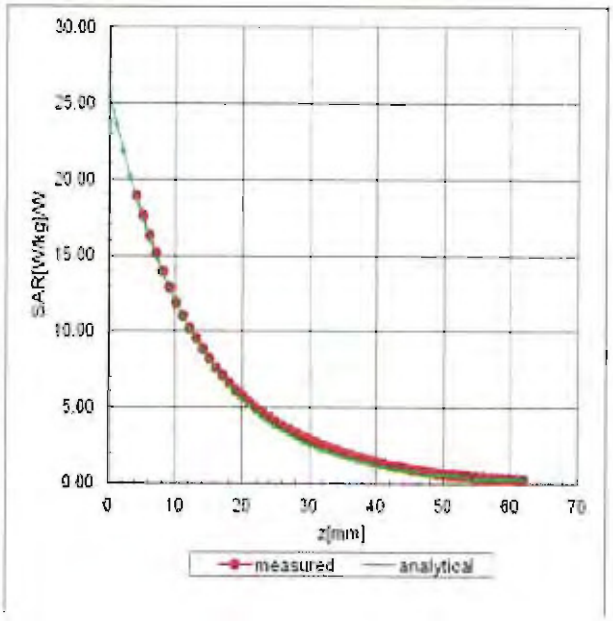
# Conversion Factor Assessment

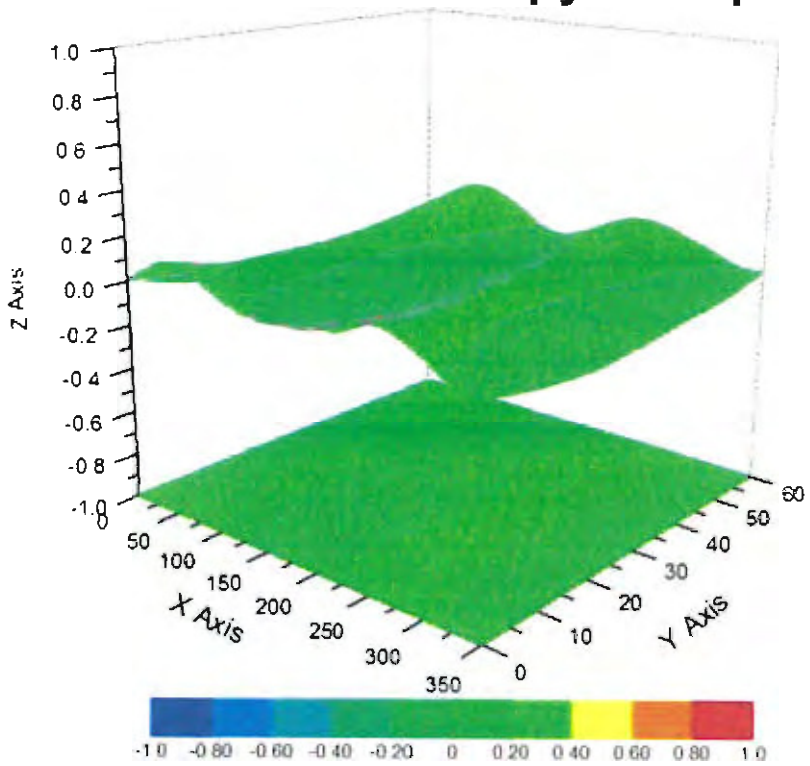
**f=900 MHz, WGLS R9(H_convF)**




**f=1750 MHz, WGLS R22(H_convF)**




# Deviation from Isotropy in Liquid




**Uncertainty of Spherical Isotropy Assessment: ±2.8% (K=2)**

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# DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3270

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 168.9 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disable |
| Probe Overall Length | 337mm |
| Probe Body Diameter | 10mm |
| Tip Length | 10mm |
| Tip Diameter | 4mm |
| Probe Tip to Sensor X Calibration Point | 2mm |
| Probe Tip to Sensor Y Calibration Point | 2mm |
| Probe Tip to Sensor Z Calibration Point | 2mm |
| Recommended Measurement Distance from Surface | 3mm |

**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** Sporton-TW (Auden)

**Certificate No: EX3-3925_May16**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | EX3DV4 - SN:3925 |
| Calibration procedure(s) | QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6<br>Calibration procedure for dosimetric E-field probes |
| Calibration date: | May 26, 2016 |

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 | 06-Apr-16 (No. 217-02288/02289) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103244 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103245 | 06-Apr-16 (No. 217-02289) | Apr-17 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 05-Apr-16 (No. 217-02293) | Apr-17 |
| Reference Probe ES3DV2 | SN: 3013 | 31-Dec-15 (No. ES3-3013_Dec15) | Dec-16 |
| DAE4 | SN: 660 | 23-Dec-15 (No. DAE4-660_Dec15) | Dec-16 |
| | | | |
| 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-16 |
| Power sensor E4412A | SN: MY41498087 | 06-Apr-16 (No. 217-02285) | In house check: Jun-16 |
| Power sensor E4412A | SN: 000110210 | 06-Apr-16 (No. 217-02284) | In house check: Jun-16 |
| RF generator HP 8648C | SN: US3642U01700 | 04-Aug-99 (in house check Apr-13) | In house check: Jun-16 |
| Network Analyzer HP 8753E | SN: US37390585 | 18-Oct-01 (in house check Oct-15) | In house check: Oct-16 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Leif Klysner | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: May 31, 2016

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

## 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, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Methods Applied and Interpretation of Parameters:

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

# Probe EX3DV4

# SN:3925

Manufactured: March 8, 2013
Calibrated: May 26, 2016

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3925

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$)[A] | 0.59 | 0.52 | 0.50 | ± 10.1 % |
| DCP (mV)[B] | 96.5 | 97.9 | 98.9 | |

## 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 | 152.6 | ±2.7 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 143.7 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 138.9 | |

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

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3925

## 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) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 10.37 | 10.37 | 10.37 | 0.48 | 0.80 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 9.92 | 9.92 | 9.92 | 0.47 | 0.81 | ± 12.0 % |
| 900 | 41.5 | 0.97 | 9.72 | 9.72 | 9.72 | 0.41 | 0.80 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 8.57 | 8.57 | 8.57 | 0.29 | 0.80 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 8.30 | 8.30 | 8.30 | 0.30 | 0.80 | ± 12.0 % |
| 2000 | 40.0 | 1.40 | 8.26 | 8.26 | 8.26 | 0.30 | 0.80 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 7.47 | 7.47 | 7.47 | 0.35 | 0.80 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 7.28 | 7.28 | 7.28 | 0.36 | 0.86 | ± 12.0 % |
| 3500 | 37.9 | 2.91 | 7.14 | 7.14 | 7.14 | 0.29 | 1.30 | ± 13.1 % |
| 5200 | 36.0 | 4.66 | 5.31 | 5.31 | 5.31 | 0.35 | 1.80 | ± 13.1 % |
| 5300 | 35.9 | 4.76 | 5.15 | 5.15 | 5.15 | 0.35 | 1.80 | ± 13.1 % |
| 5500 | 35.6 | 4.96 | 4.66 | 4.66 | 4.66 | 0.45 | 1.80 | ± 13.1 % |
| 5600 | 35.5 | 5.07 | 4.47 | 4.47 | 4.47 | 0.50 | 1.80 | ± 13.1 % |
| 5800 | 35.3 | 5.27 | 4.51 | 4.51 | 4.51 | 0.50 | 1.80 | ± 13.1 % |

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

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

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3925

## Calibration Parameter Determined in Body Tissue Simulating Media

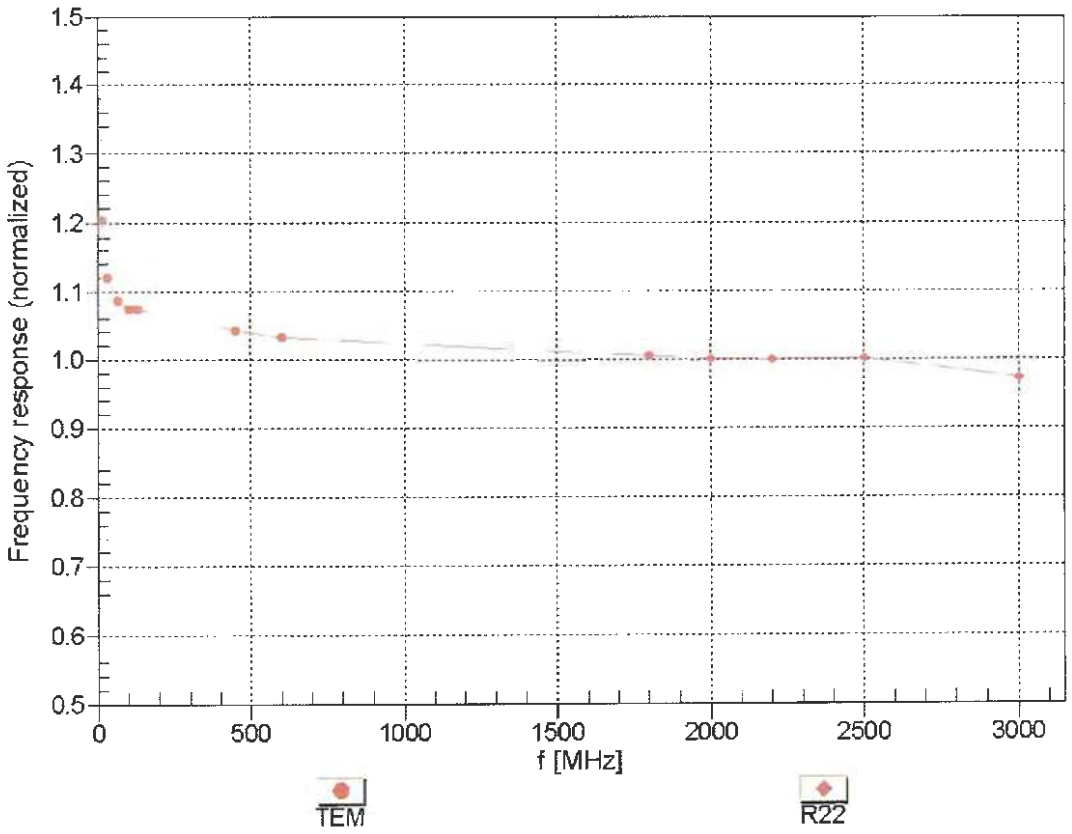
| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (mm) | Unc (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 55.5 | 0.96 | 10.18 | 10.18 | 10.18 | 0.49 | 0.80 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 9.91 | 9.91 | 9.91 | 0.44 | 0.88 | ± 12.0 % |
| 900 | 55.0 | 1.05 | 9.96 | 9.96 | 9.96 | 0.47 | 0.80 | ± 12.0 % |
| 1750 | 53.4 | 1.49 | 8.30 | 8.30 | 8.30 | 0.34 | 0.80 | ± 12.0 % |
| 1900 | 53.3 | 1.52 | 8.00 | 8.00 | 8.00 | 0.38 | 0.80 | ± 12.0 % |
| 2000 | 53.3 | 1.52 | 8.18 | 8.18 | 8.18 | 0.37 | 0.80 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 7.64 | 7.64 | 7.64 | 0.36 | 0.80 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 7.38 | 7.38 | 7.38 | 0.26 | 0.80 | ± 12.0 % |
| 3500 | 51.3 | 3.31 | 6.73 | 6.73 | 6.73 | 0.29 | 1.30 | ± 13.1 % |
| 5200 | 49.0 | 5.30 | 4.39 | 4.39 | 4.39 | 0.50 | 1.90 | ± 13.1 % |
| 5300 | 48.9 | 5.42 | 4.22 | 4.22 | 4.22 | 0.50 | 1.90 | ± 13.1 % |
| 5500 | 48.6 | 5.65 | 4.02 | 4.02 | 4.02 | 0.55 | 1.90 | ± 13.1 % |
| 5600 | 48.5 | 5.77 | 3.85 | 3.85 | 3.85 | 0.60 | 1.90 | ± 13.1 % |
| 5800 | 48.2 | 6.00 | 3.85 | 3.85 | 3.85 | 0.60 | 1.90 | ± 13.1 % |

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

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

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

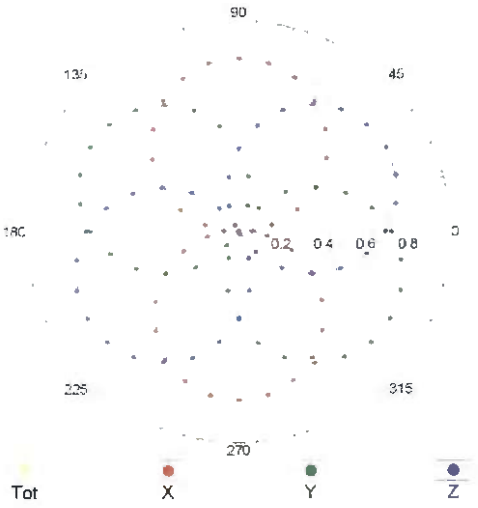
# Frequency Response of E-Field
## (TEM-Cell:ifi110 EXX, Waveguide: R22)



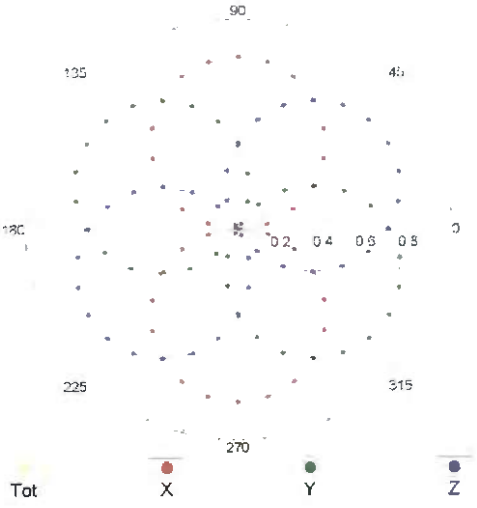

**Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)**

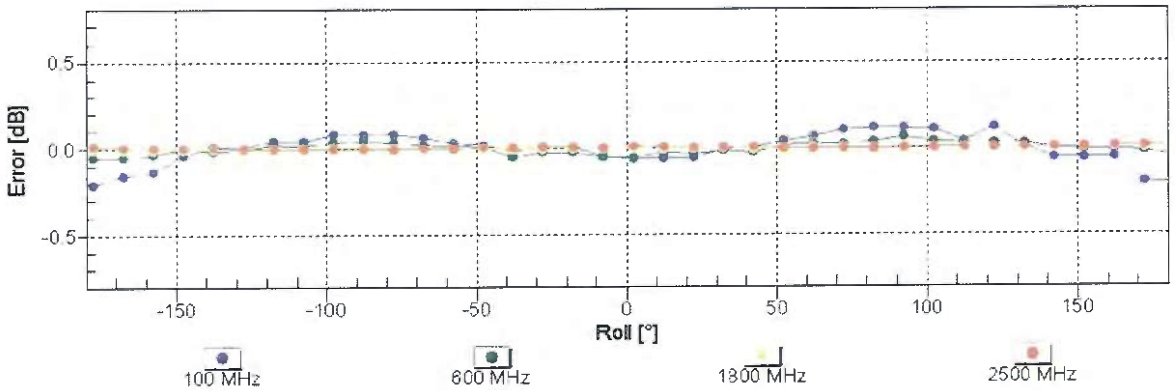
# Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



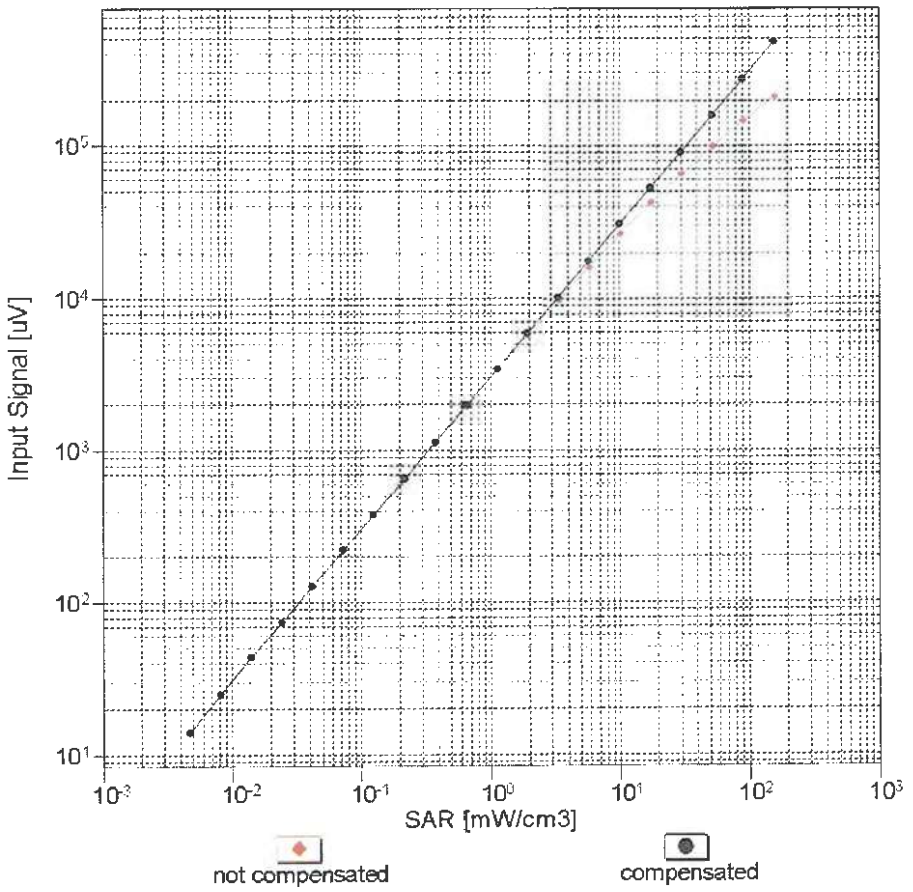

f=1800 MHz,R22

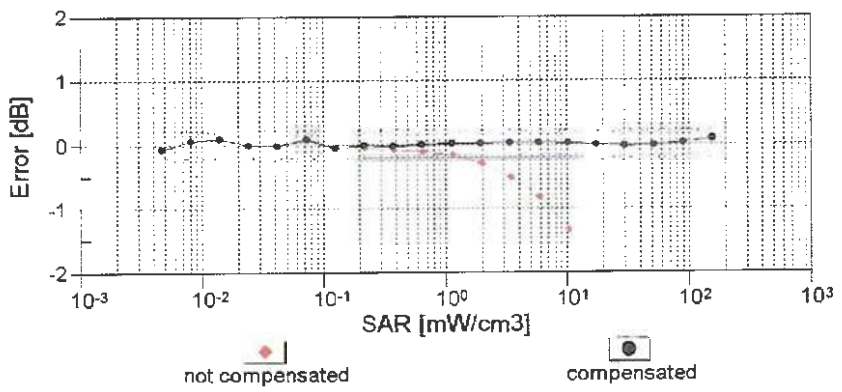



**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

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

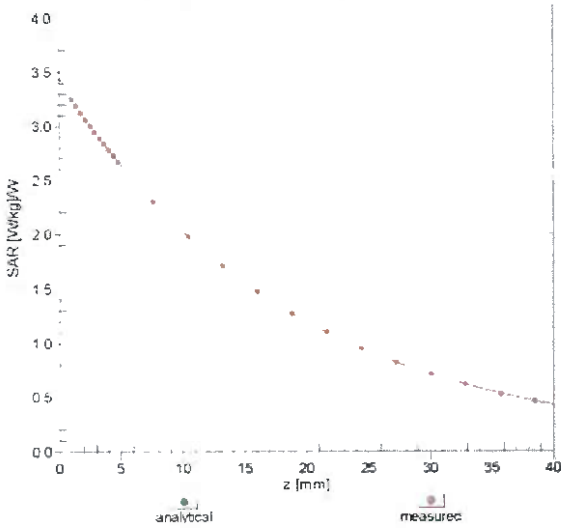


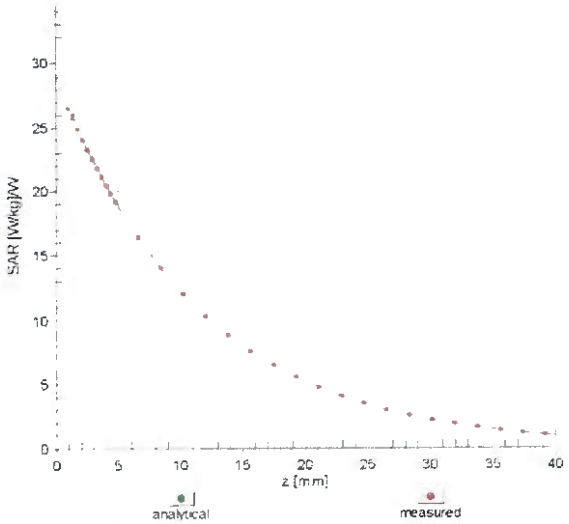

**Uncertainty of Linearity Assessment: ± 0.6% (k=2)**

# Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

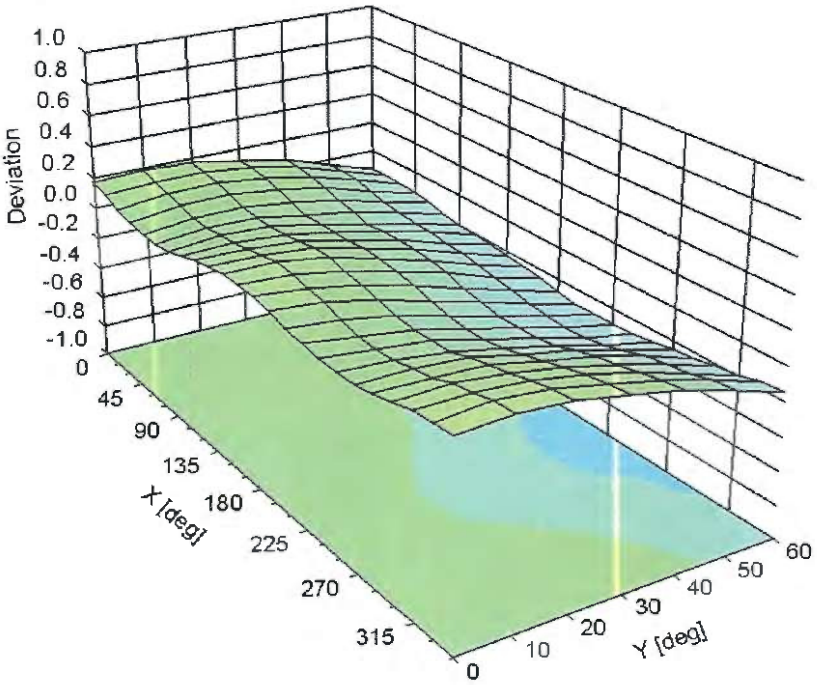


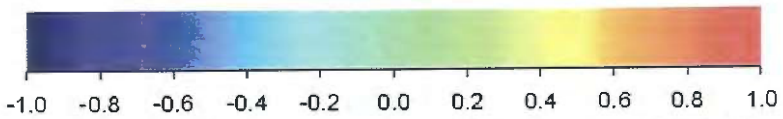

f = 1900 MHz,WGLS R22 (H_convF)




# 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:3925

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 92.2 |
| 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 |

**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** **Sporton-TW (Auden)**

**Certificate No: EX3-3955_Nov16**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | EX3DV4 - SN:3955 |
| Calibration procedure(s) | QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6<br>Calibration procedure for dosimetric E-field probes |
| Calibration date: | November 24, 2016 |

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 | 06-Apr-16 (No. 217-02288/02289) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103244 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103245 | 06-Apr-16 (No. 217-02289) | Apr-17 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 05-Apr-16 (No. 217-02293) | Apr-17 |
| Reference Probe ES3DV2 | SN: 3013 | 31-Dec-15 (No. ES3-3013_Dec15) | Dec-16 |
| DAE4 | SN: 660 | 23-Dec-15 (No. DAE4-660_Dec15) | Dec-16 |
| | | | |
| 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: | Leif Klysner | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: November 28, 2016

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

## 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:

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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:

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- *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*.
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- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

# Probe EX3DV4

# SN:3955

Manufactured: August 6, 2013
Calibrated: November 24, 2016

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3955

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$)[A] | 0.34 | 0.40 | 0.31 | ± 10.1 % |
| DCP (mV)[B] | 100.5 | 101.5 | 97.2 | |

## 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 | 128.6 | ±3.3 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 140.6 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 128.8 | |

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

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3955

## 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) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 10.65 | 10.65 | 10.65 | 0.49 | 0.80 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 10.33 | 10.33 | 10.33 | 0.44 | 0.80 | ± 12.0 % |
| 900 | 41.5 | 0.97 | 10.07 | 10.07 | 10.07 | 0.34 | 1.01 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 8.68 | 8.68 | 8.68 | 0.32 | 0.80 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 8.43 | 8.43 | 8.43 | 0.32 | 0.80 | ± 12.0 % |
| 2000 | 40.0 | 1.40 | 8.38 | 8.38 | 8.38 | 0.33 | 0.80 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 7.56 | 7.56 | 7.56 | 0.24 | 1.06 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 7.28 | 7.28 | 7.28 | 0.30 | 0.95 | ± 12.0 % |
| 5250 | 35.9 | 4.71 | 5.04 | 5.04 | 5.04 | 0.40 | 1.80 | ± 13.1 % |
| 5600 | 35.5 | 5.07 | 4.50 | 4.50 | 4.50 | 0.50 | 1.80 | ± 13.1 % |
| 5750 | 35.4 | 5.22 | 4.63 | 4.63 | 4.63 | 0.50 | 1.80 | ± 13.1 % |

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

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

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3955

## 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) |
|---|---|---|---|---|---|---|---|---|
| 750 | 55.5 | 0.96 | 10.42 | 10.42 | 10.42 | 0.38 | 0.90 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 10.18 | 10.18 | 10.18 | 0.33 | 0.97 | ± 12.0 % |
| 1750 | 53.4 | 1.49 | 8.31 | 8.31 | 8.31 | 0.46 | 0.80 | ± 12.0 % |
| 1900 | 53.3 | 1.52 | 8.00 | 8.00 | 8.00 | 0.30 | 0.95 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 7.65 | 7.65 | 7.65 | 0.39 | 0.80 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 7.42 | 7.42 | 7.42 | 0.37 | 0.80 | ± 12.0 % |
| 5250 | 48.9 | 5.36 | 4.51 | 4.51 | 4.51 | 0.50 | 1.90 | ± 13.1 % |
| 5600 | 48.5 | 5.77 | 3.91 | 3.91 | 3.91 | 0.55 | 1.90 | ± 13.1 % |
| 5750 | 48.3 | 5.94 | 4.12 | 4.12 | 4.12 | 0.55 | 1.90 | ± 13.1 % |

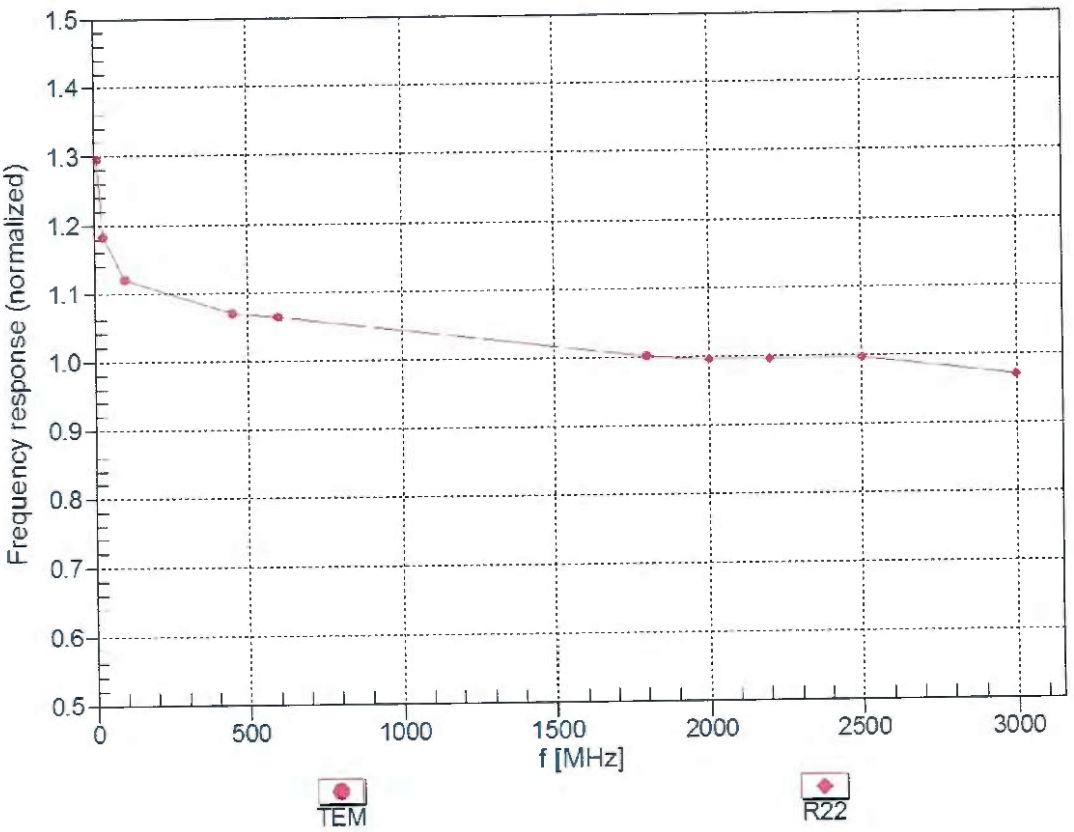
[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz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

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

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

# Frequency Response of E-Field

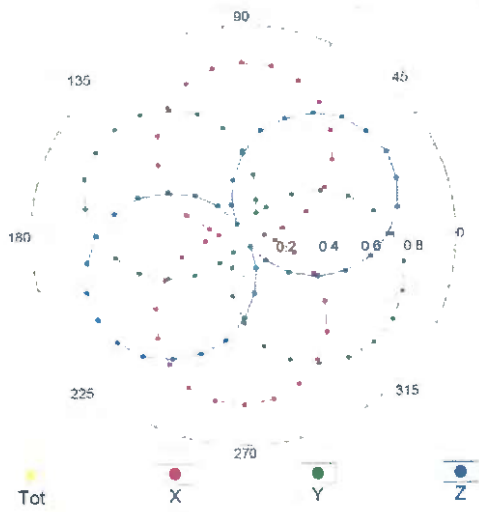
**(TEM-Cell:ifi110 EXX, Waveguide: R22)**



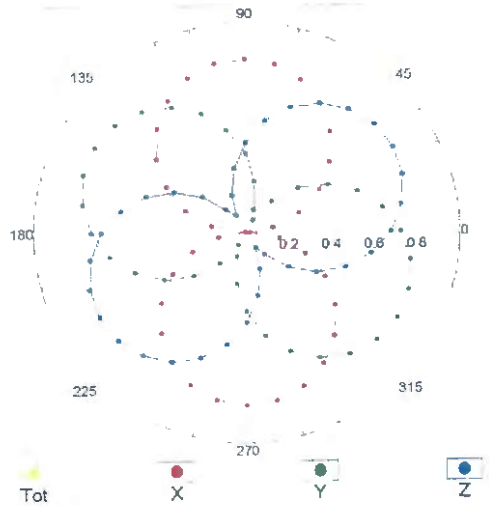

**Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)**

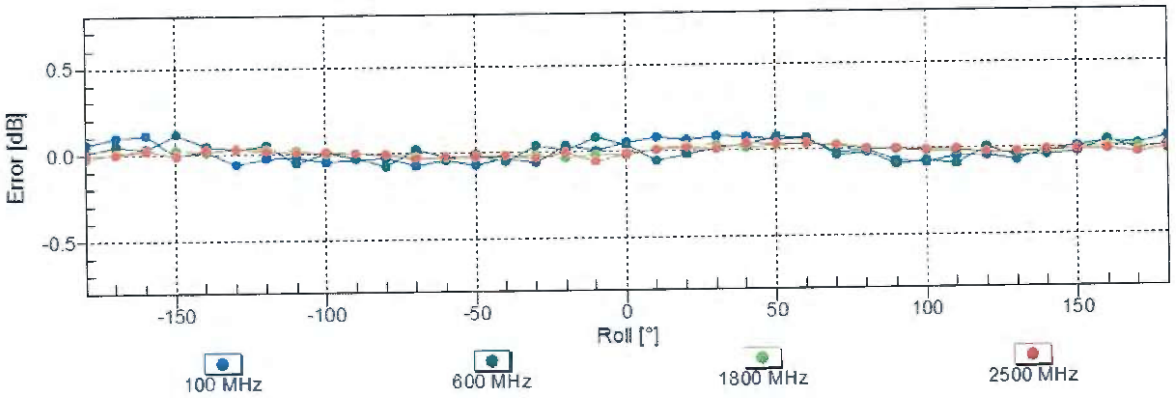
# Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM




f=1800 MHz,R22

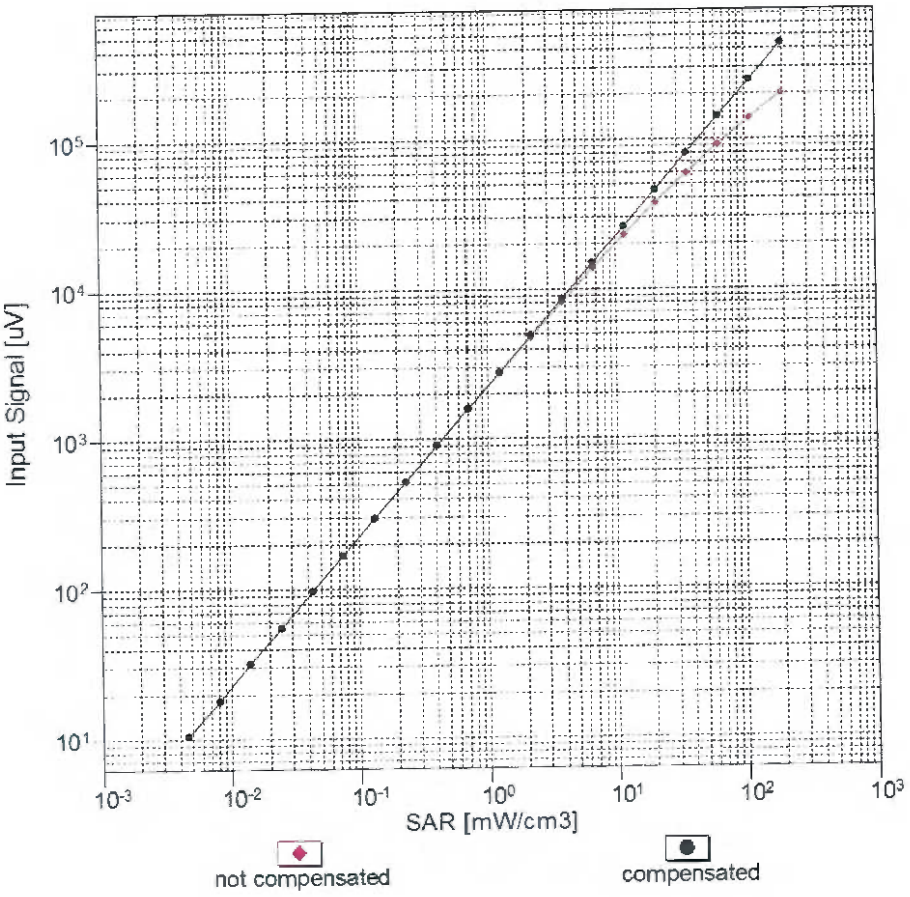


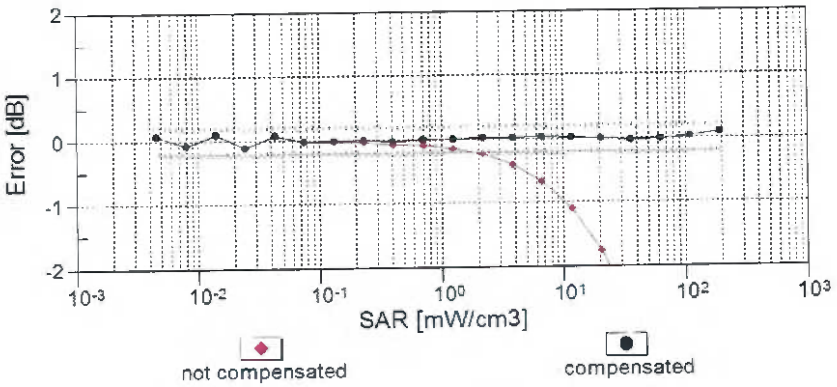




**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

# Dynamic Range f($SAR_{head}$)

**(TEM cell , $f_{eval}$= 1900 MHz)**

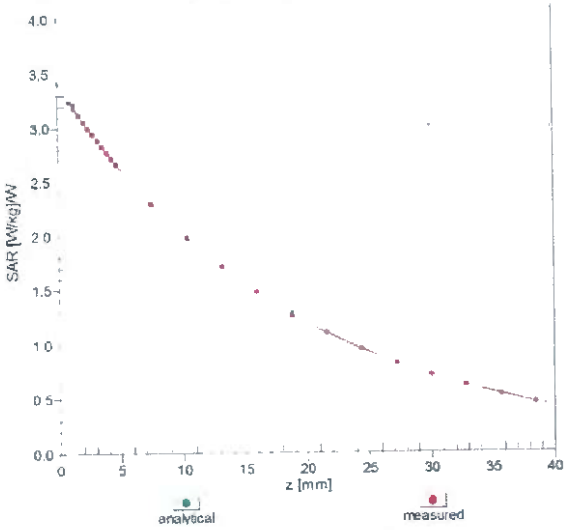


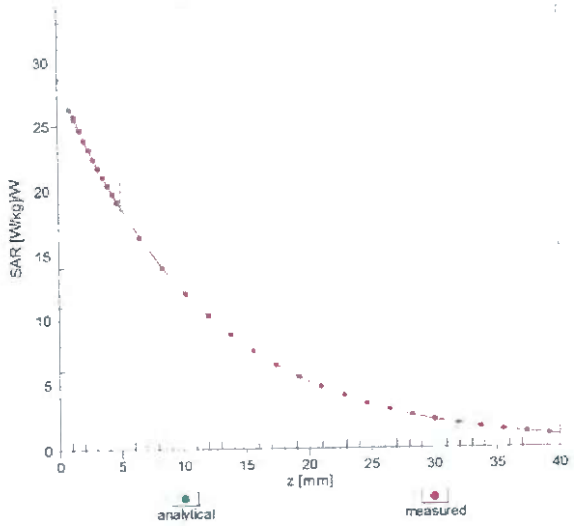

**Uncertainty of Linearity Assessment: ± 0.6% (k=2)**

# Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

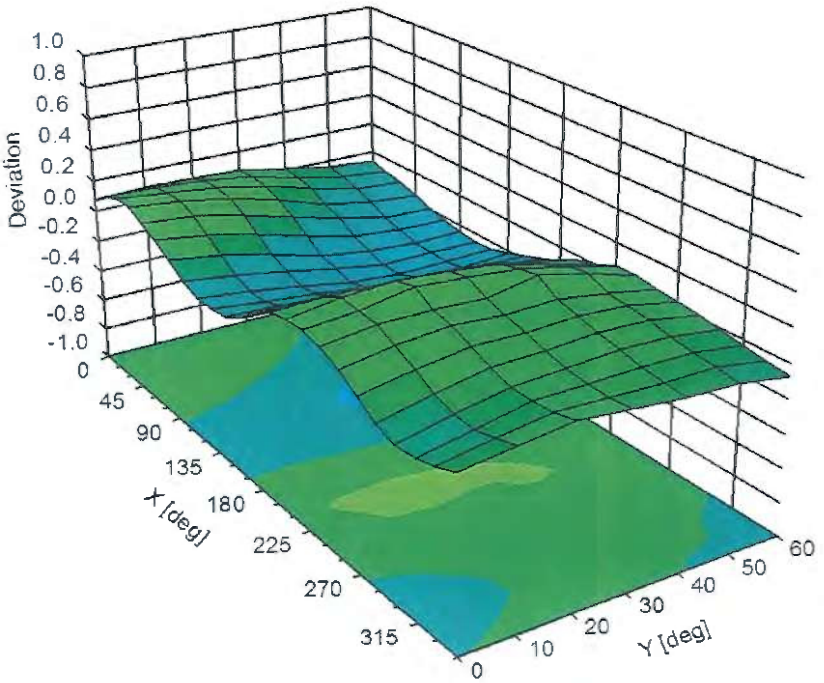


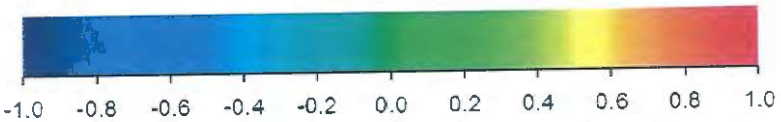

f = 1900 MHz,WGLS R22 (H_convF)




# 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:3955

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 130.3 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disabled |
| Probe Overall Length | 337 mm |
| Probe Body Diameter | 10 mm |
| Tip Length | 9 mm |
| Tip Diameter | 2.5 mm |
| Probe Tip to Sensor X Calibration Point | 1 mm |
| Probe Tip to Sensor Y Calibration Point | 1 mm |
| Probe Tip to Sensor Z Calibration Point | 1 mm |
| Recommended Measurement Distance from Surface | 1.4 mm |

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CNAS L0570

Client **Auden** **Certificate No: Z16-97054**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | EX3DV4 - SN:3578 |
| Calibration Procedure(s) | FD-Z11-2-004-01<br>Calibration Procedures for Dosimetric E-field Probes |
| Calibration date: | May 11, 2016 |

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 101919 | 01-Jul-15 (CTTL, No.J15X04256) | Jun-16 |
| Power sensor NRP-Z91 | 101547 | 01-Jul-15 (CTTL, No.J15X04256) | Jun-16 |
| Power sensor NRP-Z91 | 101548 | 01-Jul-15 (CTTL, No.J15X04256) | Jun-16 |
| Reference10dBAttenuator | 18N50W-10dB | 13-Mar-16(CTTL,No.J16X01547) | Mar-18 |
| Reference20dBAttenuator | 18N50W-20dB | 13-Mar-16(CTTL, No.J16X01548) | Mar-18 |
| Reference Probe EX3DV4 | SN 3617 | 26-Aug-15(SPEAG,No.EX3-3617_Aug15) | Aug-16 |
| DAE4 | SN 1331 | 21-Jan-16(SPEAG, No.DAE4-1331_Jan16) | Jan -17 |
| **Secondary Standards** | **ID #** | **Cal Date(Calibrated by, Certificate No.)** | **Scheduled Calibration** |
| SignalGeneratorMG3700A | 6201052605 | 01-Jul-15 (CTTL, No.J15X04255) | Jun-16 |
| Network Analyzer E5071C | MY46110673 | 26-Jan-16 (CTTL, No.J16X00894) | Jan -17 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Yu Zongying | SAR Test Engineer | |
| Reviewed by: | Qi Dianyuan | SAR Project Leader | |
| Approved by: | Lu Bingsong | Deputy Director of the laboratory | |

Issued: May 13, 2016

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

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**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| 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 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, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) IEC 62209-2, "Procedure to 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≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect 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 (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;VRx,y,z:*A,B,C 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≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued 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±50MHz to±100MHz.
- *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: 3578

Calibrated: May 11, 2016

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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# DASY/EASY – Parameters of Probe: EX3DV4 – SN: 3578

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm(μV/(V/m)$^2$) [A] | 0.41 | 0.37 | 0.44 | ±10.8% |
| DCP(mV) [B] | 105.4 | 109.9 | 112.3 | |

## 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 | 183.7 | ±2.6% |
| | | Y | 0.0 | 0.0 | 1.0 | | 169.0 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 189.6 | |

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 Page 5 and Page 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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# DASY/EASY – Parameters of Probe: EX3DV4 – SN: 3578

## 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) | Unct. (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 9.65 | 9.65 | 9.65 | 0.40 | 0.80 | ±12% |
| 835 | 41.5 | 0.90 | 9.48 | 9.48 | 9.48 | 0.13 | 1.68 | ±12% |
| 900 | 41.5 | 0.97 | 9.40 | 9.40 | 9.40 | 0.20 | 1.28 | ±12% |
| 1750 | 40.1 | 1.37 | 8.35 | 8.35 | 8.35 | 0.18 | 1.49 | ±12% |
| 1900 | 40.0 | 1.40 | 7.99 | 7.99 | 7.99 | 0.18 | 1.50 | ±12% |
| 2000 | 40.0 | 1.40 | 7.99 | 7.99 | 7.99 | 0.17 | 1.58 | ±12% |
| 2300 | 39.5 | 1.67 | 7.77 | 7.77 | 7.77 | 0.40 | 0.82 | ±12% |
| 2450 | 39.2 | 1.80 | 7.28 | 7.28 | 7.28 | 0.46 | 0.83 | ±12% |
| 2600 | 39.0 | 1.96 | 7.21 | 7.21 | 7.21 | 0.49 | 0.81 | ±12% |
| 3500 | 37.9 | 2.91 | 7.07 | 7.07 | 7.07 | 0.40 | 1.10 | ±13% |
| 5200 | 36.0 | 4.66 | 5.42 | 5.42 | 5.42 | 0.40 | 1.50 | ±13% |
| 5300 | 35.9 | 4.76 | 5.22 | 5.22 | 5.22 | 0.39 | 1.40 | ±13% |
| 5500 | 35.6 | 4.96 | 4.99 | 4.99 | 4.99 | 0.40 | 1.40 | ±13% |
| 5600 | 35.5 | 5.07 | 4.75 | 4.75 | 4.75 | 0.42 | 1.45 | ±13% |
| 5800 | 35.3 | 5.27 | 4.82 | 4.82 | 4.82 | 0.45 | 1.45 | ±13% |

[C] Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequency 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 the 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: 3578

## 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) | Unct. (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 55.5 | 0.96 | 9.81 | 9.81 | 9.81 | 0.40 | 0.85 | ±12% |
| 835 | 55.2 | 0.97 | 9.53 | 9.53 | 9.53 | 0.16 | 1.51 | ±12% |
| 900 | 55.0 | 1.05 | 9.47 | 9.47 | 9.47 | 0.18 | 1.44 | ±12% |
| 1750 | 53.4 | 1.49 | 8.02 | 8.02 | 8.02 | 0.16 | 1.67 | ±12% |
| 1900 | 53.3 | 1.52 | 7.78 | 7.78 | 7.78 | 0.16 | 1.78 | ±12% |
| 2000 | 53.3 | 1.52 | 7.79 | 7.79 | 7.79 | 0.18 | 2.30 | ±12% |
| 2300 | 52.9 | 1.81 | 7.63 | 7.63 | 7.63 | 0.53 | 0.80 | ±12% |
| 2450 | 52.7 | 1.95 | 7.41 | 7.41 | 7.41 | 0.41 | 0.97 | ±12% |
| 2600 | 52.5 | 2.16 | 7.17 | 7.17 | 7.17 | 0.50 | 0.80 | ±12% |
| 3500 | 51.3 | 3.31 | 6.47 | 6.47 | 6.47 | 0.51 | 1.10 | ±13% |
| 5200 | 49.0 | 5.30 | 4.93 | 4.93 | 4.93 | 0.50 | 1.39 | ±13% |
| 5300 | 48.9 | 5.42 | 4.73 | 4.73 | 4.73 | 0.50 | 1.41 | ±13% |
| 5500 | 48.6 | 5.65 | 4.40 | 4.40 | 4.40 | 0.55 | 1.35 | ±13% |
| 5600 | 48.5 | 5.77 | 4.30 | 4.30 | 4.30 | 0.50 | 1.55 | ±13% |
| 5800 | 48.2 | 6.00 | 4.42 | 4.42 | 4.42 | 0.55 | 1.46 | ±13% |

[C] Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequency 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 the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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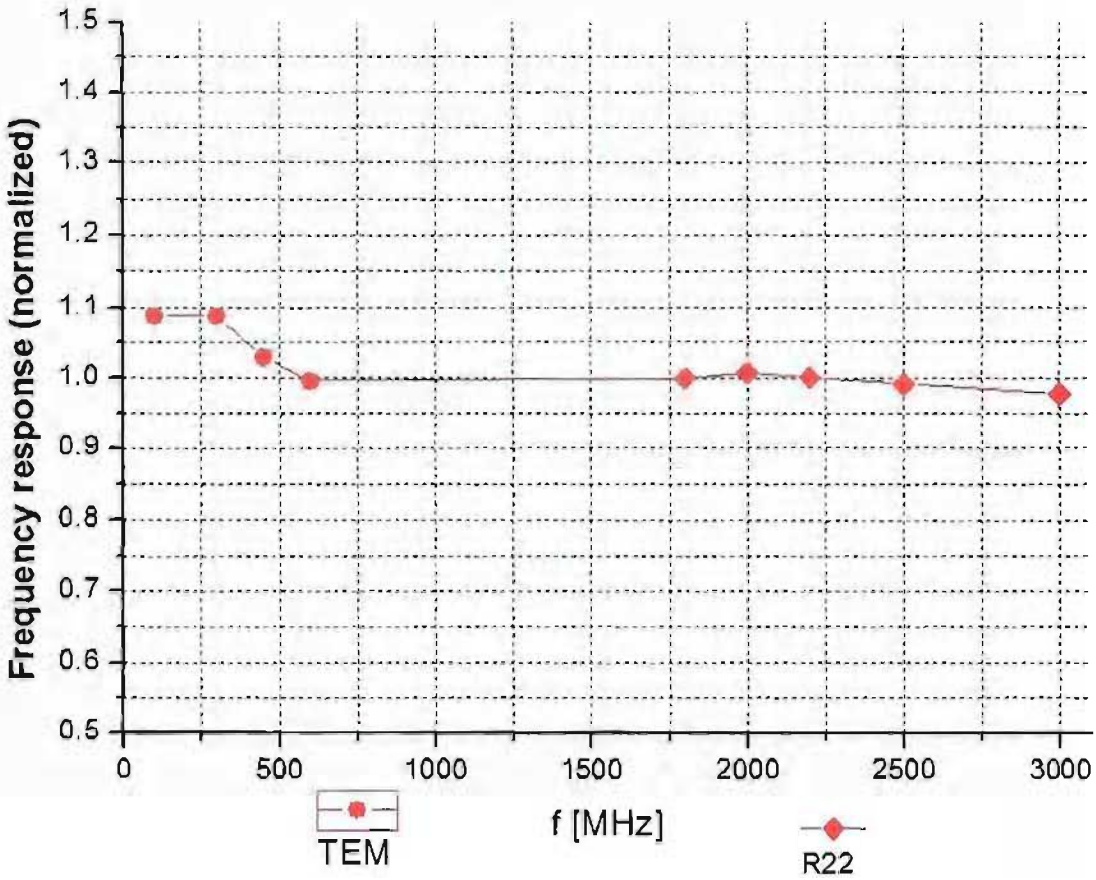
E-mail: cttl@chinattl.com Http://www.chinattl.cn

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




**Uncertainty of Frequency Response of E-field: ±7.5% (k=2)**

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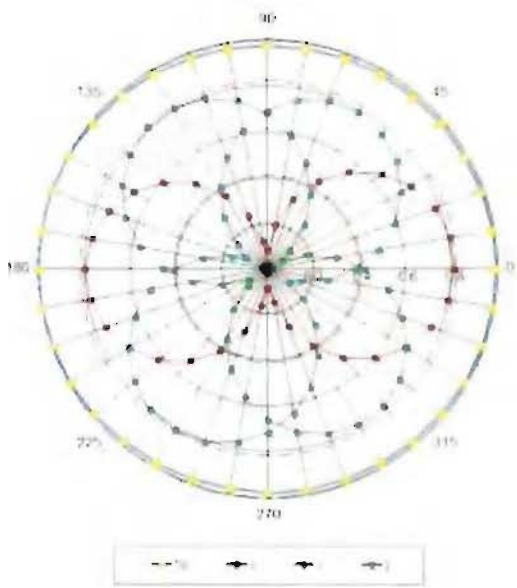
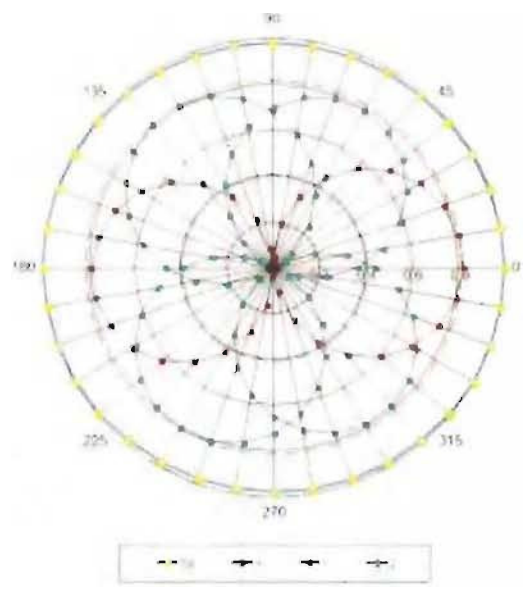
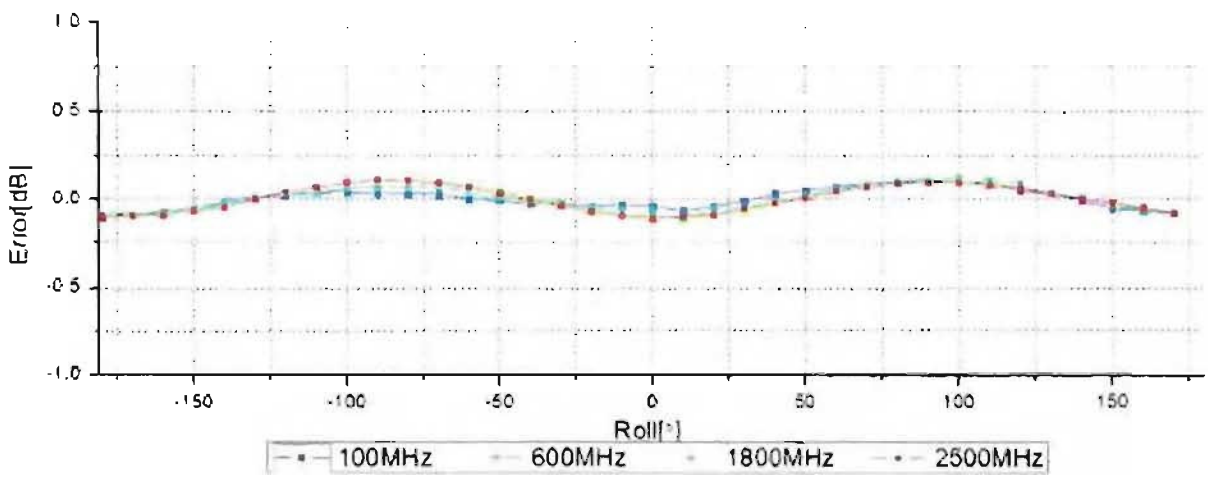
# Receiving Pattern (Φ), θ=0°

## f=600 MHz, TEM



## f=1800 MHz, R22






**Uncertainty of Axial Isotropy Assessment: ±0.9% (k=2)**

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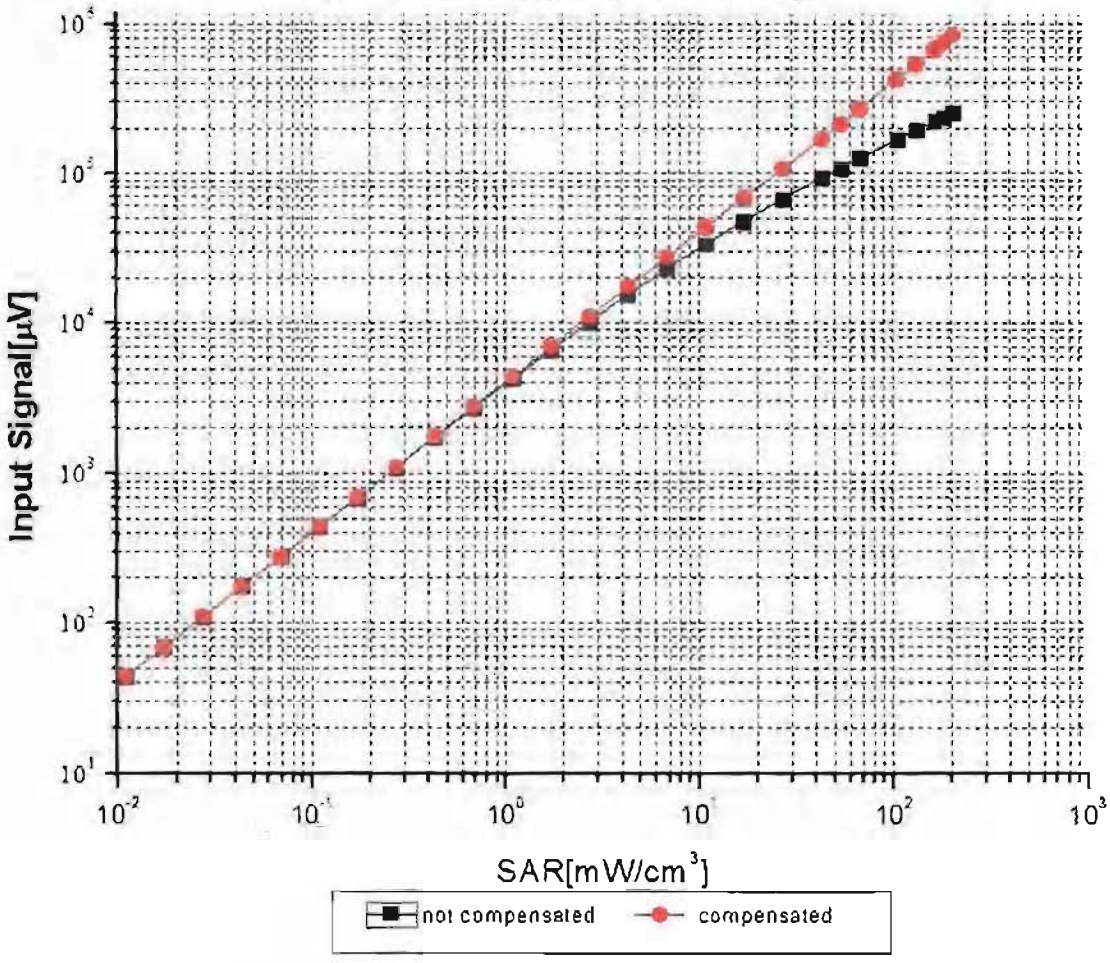
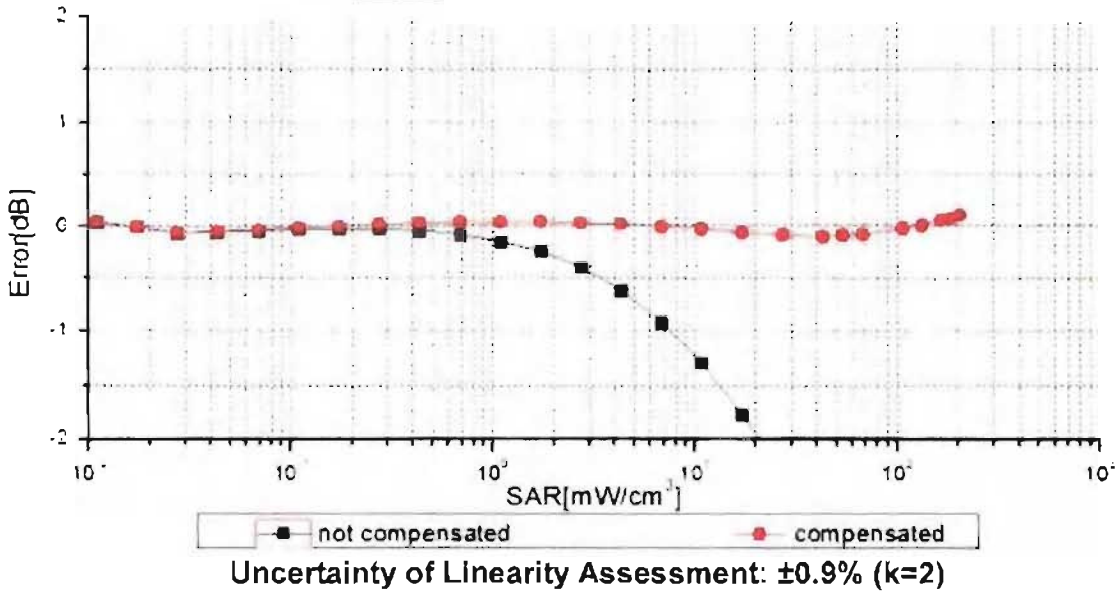
## Dynamic Range f($SAR_{head}$)
## (TEM cell, f = 900 MHz)




**Uncertainty of Linearity Assessment: ±0.9% (k=2)**

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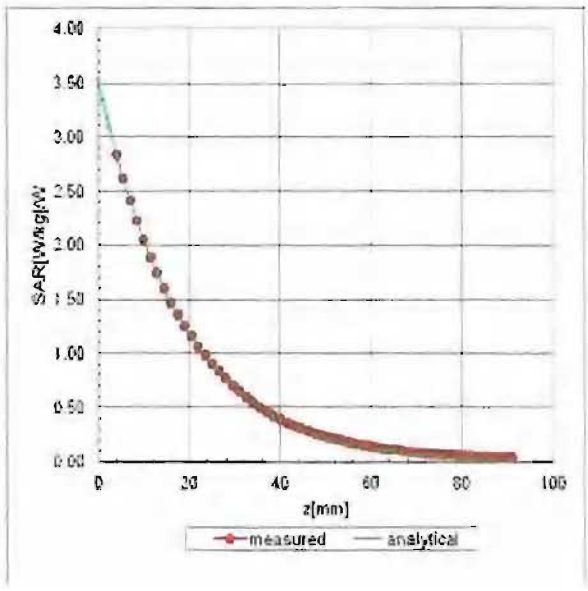
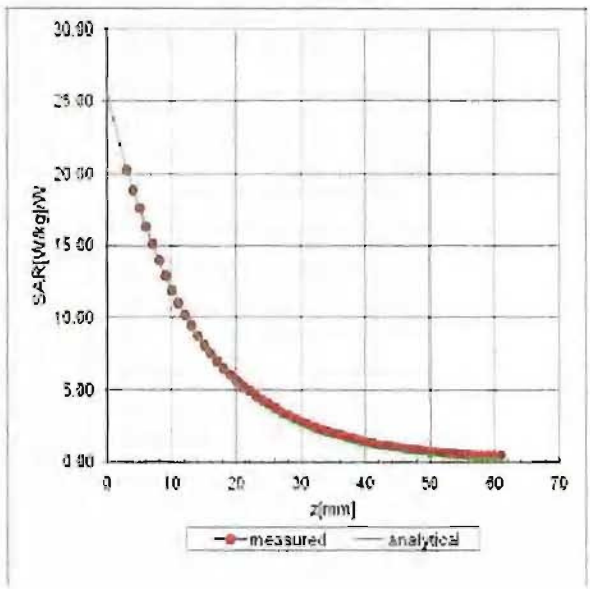
# Conversion Factor Assessment

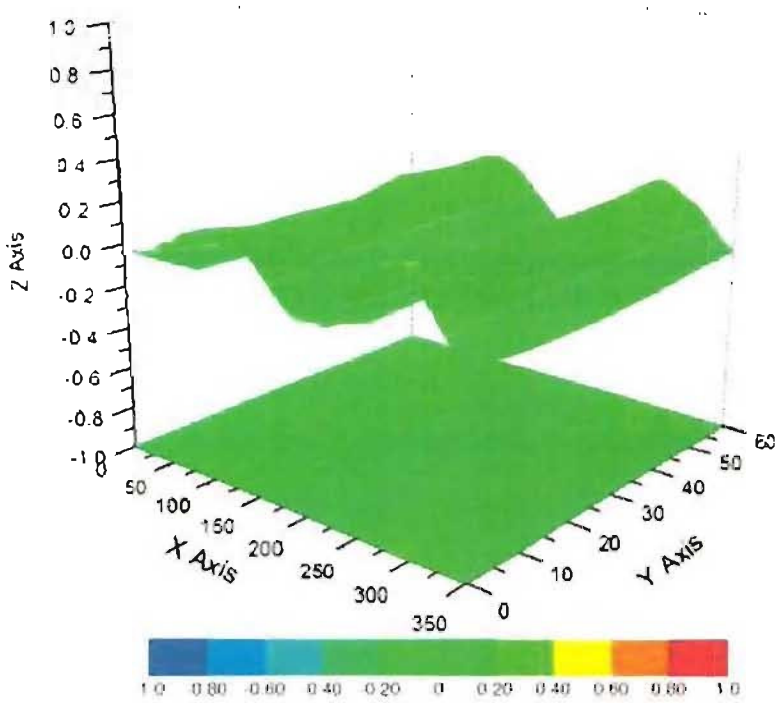
**f=900 MHz, WGLS R9(H_convF)**




**f=1750 MHz, WGLS R22(H_convF)**




# Deviation from Isotropy in Liquid




**Uncertainty of Spherical Isotropy Assessment: ±2.8% (K=2)**

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# DASY/EASY – Parameters of Probe: EX3DV4 – SN: 3578

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 165.9 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disable |
| Probe Overall Length | 337mm |
| Probe Body Diameter | 10mm |
| Tip Length | 9mm |
| Tip Diameter | 2.5mm |
| Probe Tip to Sensor X Calibration Point | 1mm |
| Probe Tip to Sensor Y Calibration Point | 1mm |
| Probe Tip to Sensor Z Calibration Point | 1mm |
| Recommended Measurement Distance from Surface | 1.4mm |

**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** **Sporton-TW (Auden)**

**Certificate No: EX3-3931_Oct16**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | EX3DV4 - SN:3931 |
| Calibration procedure(s) | QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6<br>Calibration procedure for dosimetric E-field probes |
| Calibration date: | October 3, 2016 |

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 | 06-Apr-16 (No. 217-02288/02289) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103244 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103245 | 06-Apr-16 (No. 217-02289) | Apr-17 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 05-Apr-16 (No. 217-02293) | Apr-17 |
| Reference Probe ES3DV2 | SN: 3013 | 31-Dec-15 (No. ES3-3013_Dec15) | Dec-16 |
| DAE4 | SN: 660 | 23-Dec-15 (No. DAE4-660_Dec15) | Dec-16 |
| | | | |
| 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-15) | In house check: Oct-16 |

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

Issued: October 4, 2016

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

## 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, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Methods Applied and Interpretation of Parameters:

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

# Probe EX3DV4

# SN:3931

| | |
|---|---|
| Manufactured: | July 24, 2013 |
| Repaired: | September 27, 2016 |
| Calibrated: | October 3, 2016 |

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3931

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$)[A] | 0.50 | 0.56 | 0.47 | ± 10.1 % |
| DCP (mV)[B] | 99.3 | 102.3 | 99.2 | |

## 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 | 165.2 | ±2.2 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 169.6 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 158.4 | |

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 | 39.73 | 299.4 | 36.38 | 13.81 | 1.099 | 5.004 | 0.119 | 0.351 | 1.005 |
| Y | 59.82 | 447.7 | 35.85 | 21.83 | 1.546 | 5.045 | 0.719 | 0.472 | 1.007 |
| Z | 54.23 | 405.8 | 35.74 | 19.34 | 1.491 | 5.007 | 0.433 | 0.514 | 1.005 |

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

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3931

## 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) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 10.68 | 10.68 | 10.68 | 0.47 | 0.86 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 10.35 | 10.35 | 10.35 | 0.43 | 0.80 | ± 12.0 % |
| 900 | 41.5 | 0.97 | 10.09 | 10.09 | 10.09 | 0.44 | 0.86 | ± 12.0 % |
| 1450 | 40.5 | 1.20 | 8.73 | 8.73 | 8.73 | 0.45 | 0.80 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 8.68 | 8.68 | 8.68 | 0.37 | 0.80 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 8.42 | 8.42 | 8.42 | 0.34 | 0.80 | ± 12.0 % |
| 2000 | 40.0 | 1.40 | 8.43 | 8.43 | 8.43 | 0.37 | 0.80 | ± 12.0 % |
| 2300 | 39.5 | 1.67 | 7.94 | 7.94 | 7.94 | 0.28 | 0.86 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 7.60 | 7.60 | 7.60 | 0.36 | 0.84 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 7.37 | 7.37 | 7.37 | 0.31 | 0.97 | ± 12.0 % |
| 5250 | 35.9 | 4.71 | 5.38 | 5.38 | 5.38 | 0.35 | 1.80 | ± 13.1 % |
| 5600 | 35.5 | 5.07 | 4.68 | 4.68 | 4.68 | 0.40 | 1.80 | ± 13.1 % |
| 5750 | 35.4 | 5.22 | 4.84 | 4.84 | 4.84 | 0.40 | 1.80 | ± 13.1 % |

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

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

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

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3931

## Calibration Parameter Determined in Body Tissue Simulating Media

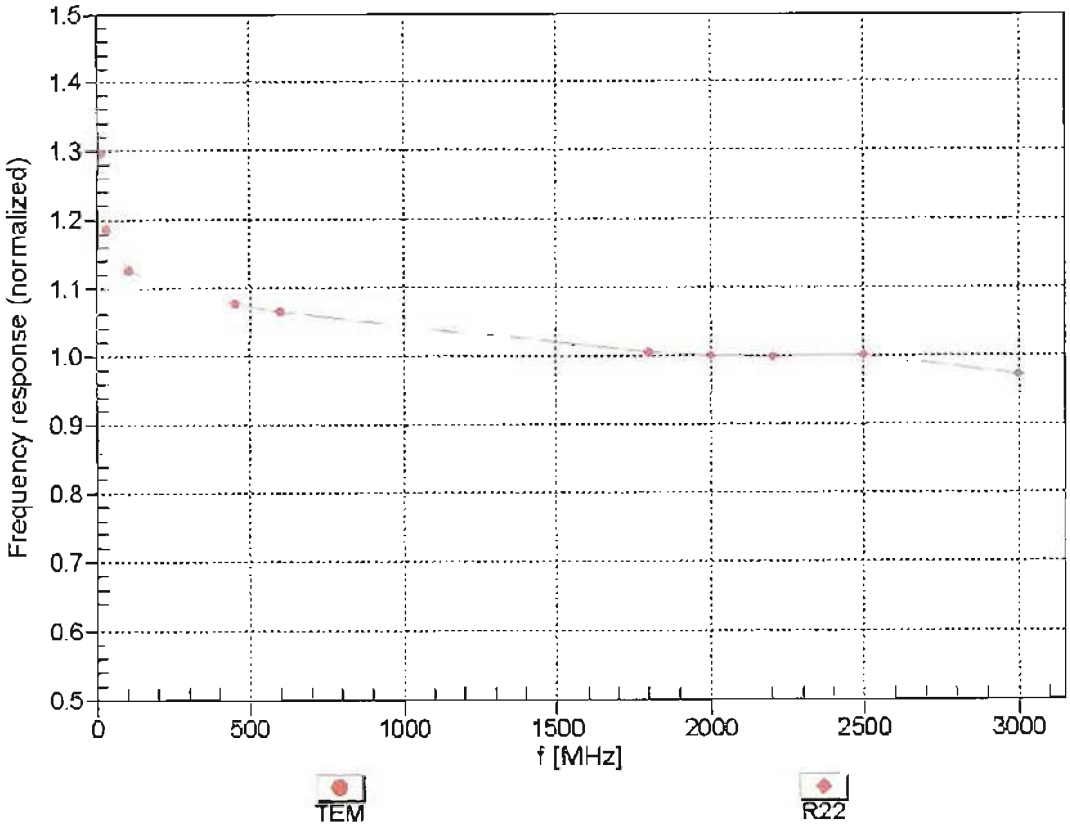
| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (mm) | Unc (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 55.5 | 0.96 | 10.37 | 10.37 | 10.37 | 0.38 | 0.97 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 10.14 | 10.14 | 10.14 | 0.36 | 0.99 | ± 12.0 % |
| 1450 | 54.0 | 1.30 | 8.53 | 8.53 | 8.53 | 0.31 | 0.80 | ± 12.0 % |
| 1750 | 53.4 | 1.49 | 8.45 | 8.45 | 8.45 | 0.37 | 0.80 | ± 12.0 % |
| 1900 | 53.3 | 1.52 | 8.14 | 8.14 | 8.14 | 0.33 | 0.90 | ± 12.0 % |
| 2300 | 52.9 | 1.81 | 7.96 | 7.96 | 7.96 | 0.39 | 0.80 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 7.73 | 7.73 | 7.73 | 0.38 | 0.85 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 7.46 | 7.46 | 7.46 | 0.25 | 0.95 | ± 12.0 % |
| 5250 | 48.9 | 5.36 | 4.57 | 4.57 | 4.57 | 0.50 | 1.90 | ± 13.1 % |
| 5600 | 48.5 | 5.77 | 3.71 | 3.71 | 3.71 | 0.60 | 1.90 | ± 13.1 % |
| 5750 | 48.3 | 5.94 | 4.01 | 4.01 | 4.01 | 0.60 | 1.90 | ± 13.1 % |

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

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

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

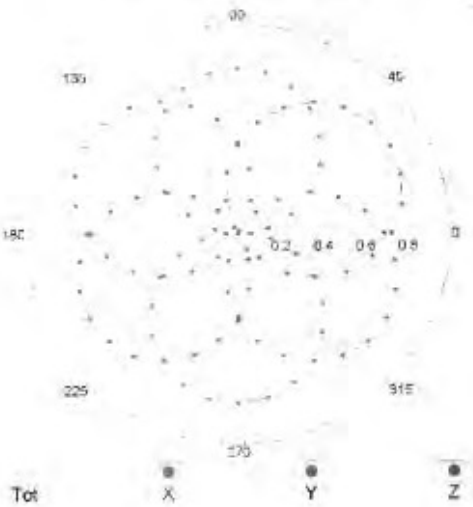
# Frequency Response of E-Field
## (TEM-Cell:ifi110 EXX, Waveguide: R22)



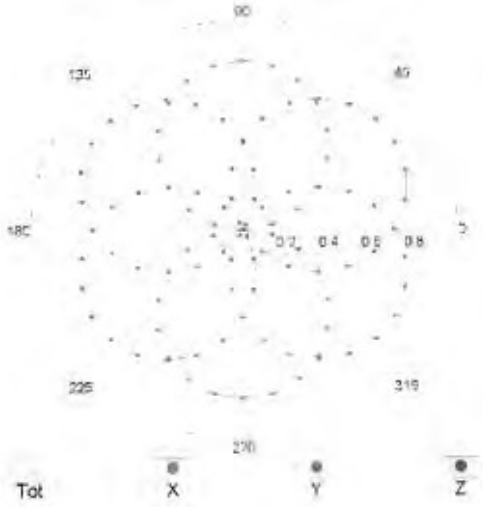

**Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)**

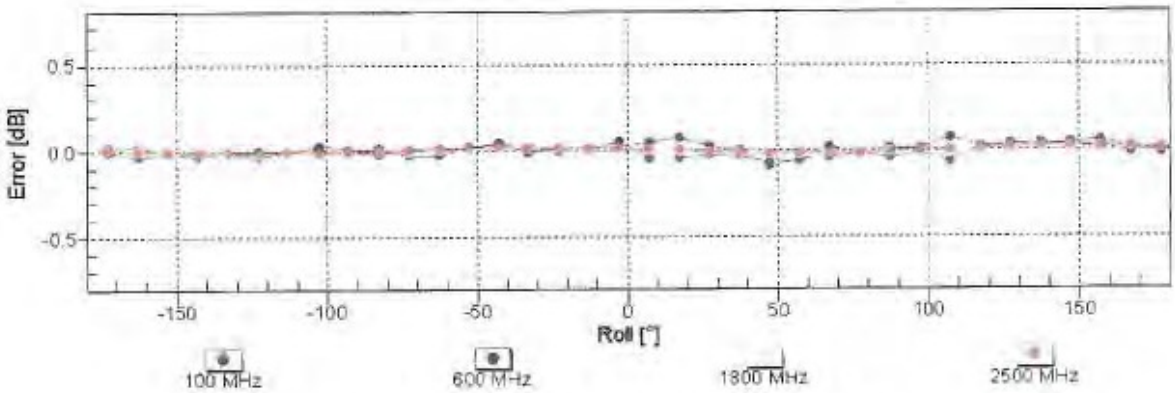
# Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



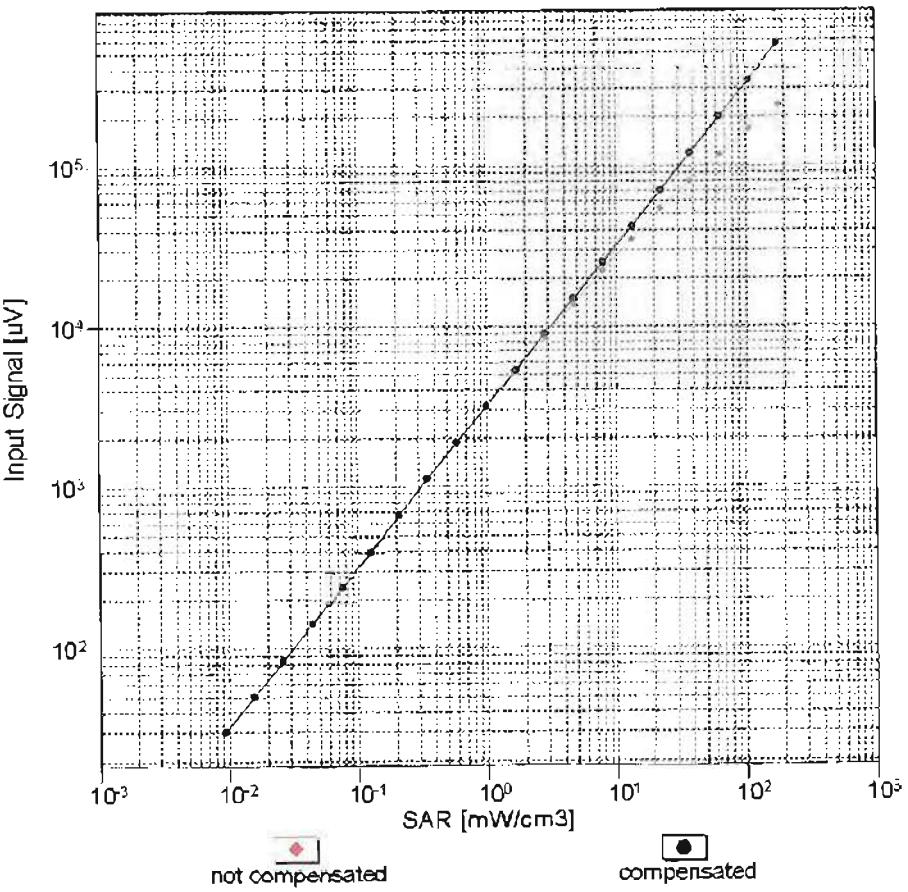

f=1800 MHz,R22

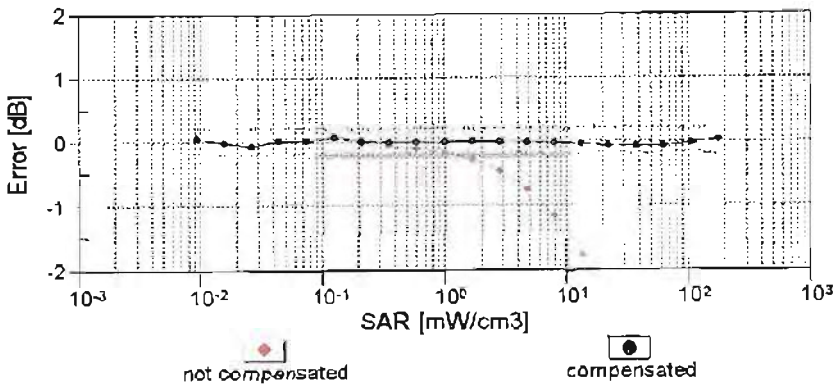



**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

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

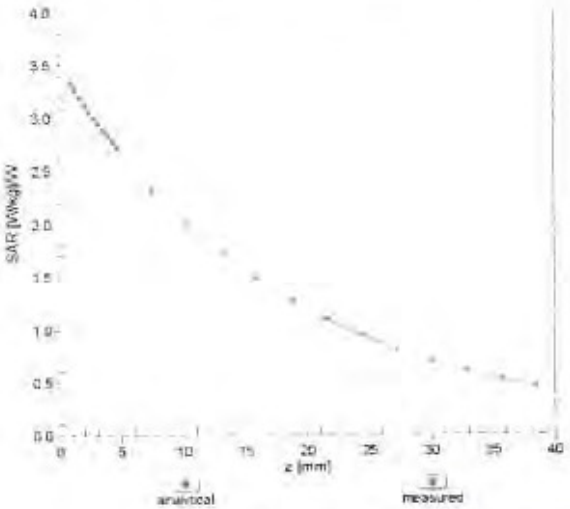


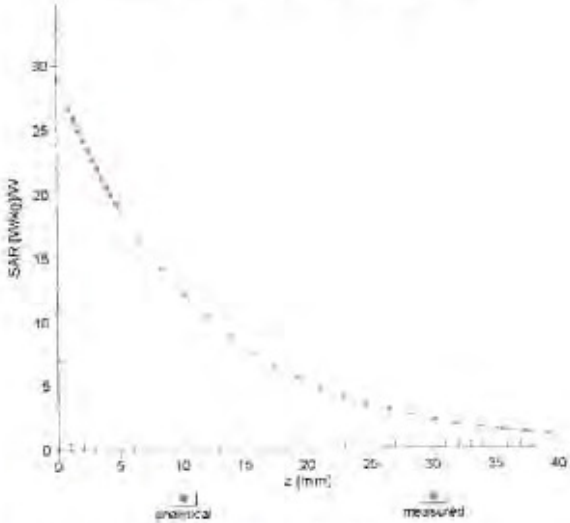

**Uncertainty of Linearity Assessment: ± 0.6% (k=2)**

# Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

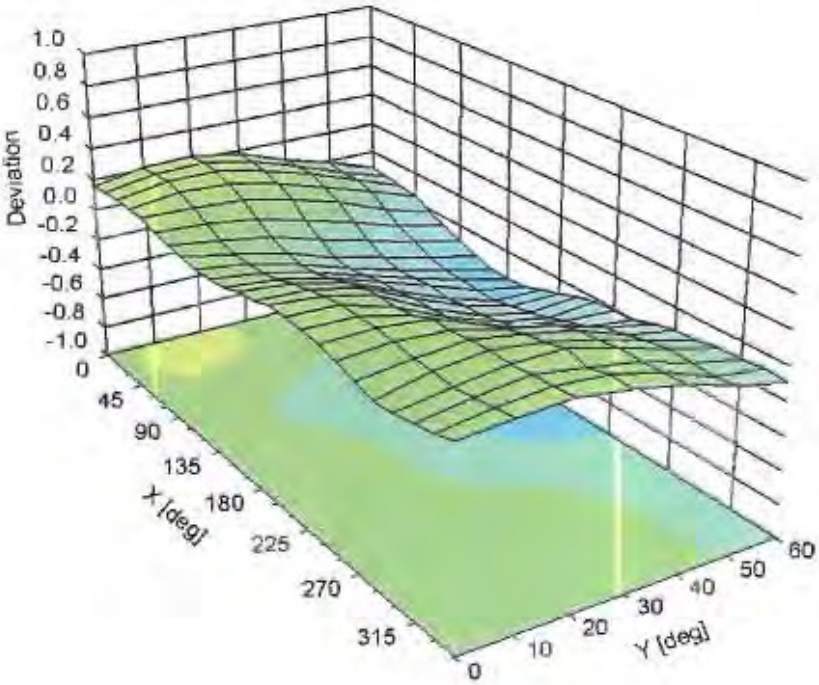


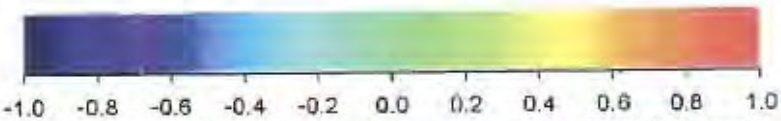

f = 1900 MHz,WGLS R22 (H_convF)




# 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:3931

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 127.3 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disabled |
| Probe Overall Length | 337 mm |
| Probe Body Diameter | 10 mm |
| Tip Length | 9 mm |
| Tip Diameter | 2.5 mm |
| Probe Tip to Sensor X Calibration Point | 1 mm |
| Probe Tip to Sensor Y Calibration Point | 1 mm |
| Probe Tip to Sensor Z Calibration Point | 1 mm |
| Recommended Measurement Distance from Surface | 1.4 mm |

## Appendix: Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | C | D dB | VR mV | Max Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.00 | 0.00 | 1.00 | 0.00 | 165.2 | ± 2.2 % |
| | | Y | 0.00 | 0.00 | 1.00 | | 169.6 | |
| | | Z | 0.00 | 0.00 | 1.00 | | 158.4 | |
| 10010-CAA | SAR Validation (Square, 100ms, 10ms) | X | 3.48 | 69.31 | 12.63 | 10.00 | 20.0 | ± 9.6 % |
| | | Y | 5.87 | 75.87 | 16.27 | | 20.0 | |
| | | Z | 4.02 | 70.66 | 13.78 | | 20.0 | |
| 10011-CAB | UMTS-FDD (WCDMA) | X | 1.30 | 72.39 | 18.20 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.19 | 69.63 | 16.77 | | 150.0 | |
| | | Z | 1.01 | 66.38 | 14.76 | | 150.0 | |
| 10012-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) | X | 1.24 | 65.29 | 16.42 | 0.41 | 150.0 | ± 9.6 % |
| | | Y | 1.26 | 64.91 | 16.05 | | 150.0 | |
| | | Z | 1.20 | 63.67 | 14.96 | | 150.0 | |
| 10013-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps) | X | 4.82 | 66.95 | 17.27 | 1.46 | 150.0 | ± 9.6 % |
| | | Y | 5.04 | 66.77 | 17.23 | | 150.0 | |
| | | Z | 4.95 | 66.50 | 16.90 | | 150.0 | |
| 10021-DAB | GSM-FDD (TDMA, GMSK) | X | 100.00 | 114.09 | 27.93 | 9.39 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 118.26 | 30.54 | | 50.0 | |
| | | Z | 25.45 | 96.76 | 24.27 | | 50.0 | |
| 10023-DAB | GPRS-FDD (TDMA, GMSK, TN 0) | X | 83.93 | 111.52 | 27.32 | 9.57 | 50.0 | ± 9.6 % |
| | | Y | 99.99 | 118.26 | 30.60 | | 50.0 | |
| | | Z | 19.40 | 92.86 | 23.18 | | 50.0 | |
| 10024-DAB | GPRS-FDD (TDMA, GMSK, TN 0-1) | X | 100.00 | 112.26 | 25.94 | 6.56 | 60.0 | ± 9.6 % |
| | | Y | 100.00 | 115.42 | 28.11 | | 60.0 | |
| | | Z | 100.00 | 112.41 | 26.50 | | 60.0 | |
| 10025-DAB | EDGE-FDD (TDMA, 8PSK, TN 0) | X | 5.67 | 76.70 | 28.63 | 12.57 | 50.0 | ± 9.6 % |
| | | Y | 15.06 | 105.00 | 40.92 | | 50.0 | |
| | | Z | 5.92 | 75.84 | 27.63 | | 50.0 | |
| 10026-DAB | EDGE-FDD (TDMA, 8PSK, TN 0-1) | X | 9.71 | 91.87 | 32.18 | 9.56 | 60.0 | ± 9.6 % |
| | | Y | 18.06 | 104.69 | 36.55 | | 60.0 | |
| | | Z | 11.21 | 92.21 | 31.55 | | 60.0 | |
| 10027-DAB | GPRS-FDD (TDMA, GMSK, TN 0-1-2) | X | 100.00 | 112.68 | 25.31 | 4.80 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 114.88 | 27.06 | | 80.0 | |
| | | Z | 100.00 | 111.26 | 25.19 | | 80.0 | |
| 10028-DAB | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3) | X | 100.00 | 114.77 | 25.52 | 3.55 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 115.72 | 26.71 | | 100.0 | |
| | | Z | 100.00 | 111.32 | 24.54 | | 100.0 | |
| 10029-DAB | EDGE-FDD (TDMA, 8PSK, TN 0-1-2) | X | 6.19 | 82.03 | 27.36 | 7.80 | 80.0 | ± 9.6 % |
| | | Y | 10.55 | 92.05 | 31.00 | | 80.0 | |
| | | Z | 7.53 | 83.82 | 27.35 | | 80.0 | |
| 10030-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1) | X | 100.00 | 110.56 | 24.66 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 100.00 | 113.96 | 26.95 | | 70.0 | |
| | | Z | 100.00 | 110.53 | 25.16 | | 70.0 | |
| 10031-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3) | X | 100.00 | 116.75 | 24.95 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 117.62 | 26.11 | | 100.0 | |
| | | Z | 100.00 | 110.75 | 23.01 | | 100.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10032-CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5) | X | 100.00 | 131.18 | 29.75 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 125.29 | 28.26 | | 100.0 | |
| | | Z | 100.00 | 114.95 | 23.87 | | 100.0 | |
| 10033-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1) | X | 10.93 | 90.53 | 23.32 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 20.55 | 101.44 | 27.99 | | 70.0 | |
| | | Z | 7.67 | 84.45 | 21.88 | | 70.0 | |
| 10034-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3) | X | 5.70 | 84.58 | 20.06 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 5.85 | 85.75 | 22.03 | | 100.0 | |
| | | Z | 2.95 | 74.86 | 17.34 | | 100.0 | |
| 10035-CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5) | X | 3.92 | 81.20 | 18.80 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 3.48 | 79.72 | 19.80 | | 100.0 | |
| | | Z | 2.10 | 71.76 | 15.97 | | 100.0 | |
| 10036-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1) | X | 15.13 | 95.54 | 24.90 | 5.30 | 70.0 | ± 9.6 % |
| | | Y | 28.86 | 107.18 | 29.66 | | 70.0 | |
| | | Z | 9.07 | 87.21 | 22.88 | | 70.0 | |
| 10037-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3) | X | 4.82 | 82.50 | 19.36 | 1.88 | 100.0 | ± 9.6 % |
| | | Y | 5.58 | 85.13 | 21.78 | | 100.0 | |
| | | Z | 2.82 | 74.36 | 17.11 | | 100.0 | |
| 10038-CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5) | X | 4.08 | 82.09 | 19.24 | 1.17 | 100.0 | ± 9.6 % |
| | | Y | 3.57 | 80.38 | 20.14 | | 100.0 | |
| | | Z | 2.12 | 72.10 | 16.20 | | 100.0 | |
| 10039-CAB | CDMA2000 (1xRTT, RC1) | X | 5.80 | 88.31 | 21.06 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.44 | 75.65 | 18.16 | | 150.0 | |
| | | Z | 1.80 | 71.10 | 15.73 | | 150.0 | |
| 10042-CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | X | 100.00 | 110.27 | 25.32 | 7.78 | 50.0 | ± 9.6 % |
| | | Y | 100.00 | 114.03 | 27.70 | | 50.0 | |
| | | Z | 32.06 | 97.64 | 22.93 | | 50.0 | |
| 10044-CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM) | X | 0.00 | 105.67 | 0.52 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.00 | 101.10 | 0.34 | | 150.0 | |
| | | Z | 0.00 | 94.56 | 3.16 | | 150.0 | |
| 10048-CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24) | X | 11.94 | 82.95 | 20.71 | 13.80 | 25.0 | ± 9.6 % |
| | | Y | 15.06 | 89.64 | 24.59 | | 25.0 | |
| | | Z | 9.78 | 81.31 | 21.11 | | 25.0 | |
| 10049-CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12) | X | 15.54 | 88.48 | 21.39 | 10.79 | 40.0 | ± 9.6 % |
| | | Y | 23.79 | 97.14 | 25.51 | | 40.0 | |
| | | Z | 11.46 | 84.91 | 21.03 | | 40.0 | |
| 10056-CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps) | X | 13.32 | 89.14 | 23.36 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 16.34 | 93.59 | 26.16 | | 50.0 | |
| | | Z | 10.18 | 84.57 | 22.45 | | 50.0 | |
| 10058-DAB | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3) | X | 4.78 | 77.20 | 24.69 | 6.55 | 100.0 | ± 9.6 % |
| | | Y | 7.46 | 84.92 | 27.60 | | 100.0 | |
| | | Z | 5.76 | 78.94 | 24.73 | | 100.0 | |
| 10059-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps) | X | 1.30 | 66.67 | 17.10 | 0.61 | 110.0 | ± 9.6 % |
| | | Y | 1.37 | 66.65 | 16.91 | | 110.0 | |
| | | Z | 1.27 | 64.87 | 15.53 | | 110.0 | |
| 10060-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps) | X | 100.00 | 139.37 | 36.42 | 1.30 | 110.0 | ± 9.6 % |
| | | Y | 100.00 | 134.75 | 34.85 | | 110.0 | |
| | | Z | 5.80 | 90.90 | 23.07 | | 110.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10061-CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps) | X | 4.16 | 86.26 | 24.31 | 2.04 | 110.0 | ± 9.6 % |
| | | Y | 6.78 | 92.08 | 26.03 | | 110.0 | |
| | | Z | 3.18 | 78.55 | 20.67 | | 110.0 | |
| 10062-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps) | X | 4.62 | 66.99 | 16.77 | 0.49 | 100.0 | ± 9.6 % |
| | | Y | 4.83 | 66.75 | 16.66 | | 100.0 | |
| | | Z | 4.75 | 66.51 | 16.38 | | 100.0 | |
| 10063-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps) | X | 4.64 | 67.08 | 16.86 | 0.72 | 100.0 | ± 9.6 % |
| | | Y | 4.86 | 66.87 | 16.78 | | 100.0 | |
| | | Z | 4.77 | 66.60 | 16.47 | | 100.0 | |
| 10064-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps) | X | 4.89 | 67.27 | 17.04 | 0.86 | 100.0 | ± 9.6 % |
| | | Y | 5.19 | 67.18 | 17.02 | | 100.0 | |
| | | Z | 5.08 | 66.89 | 16.71 | | 100.0 | |
| 10065-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps) | X | 4.77 | 67.14 | 17.11 | 1.21 | 100.0 | ± 9.6 % |
| | | Y | 5.06 | 67.12 | 17.13 | | 100.0 | |
| | | Z | 4.94 | 66.80 | 16.79 | | 100.0 | |
| 10066-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps) | X | 4.78 | 67.15 | 17.25 | 1.46 | 100.0 | ± 9.6 % |
| | | Y | 5.09 | 67.18 | 17.31 | | 100.0 | |
| | | Z | 4.97 | 66.83 | 16.94 | | 100.0 | |
| 10067-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps) | X | 5.07 | 67.35 | 17.68 | 2.04 | 100.0 | ± 9.6 % |
| | | Y | 5.38 | 67.26 | 17.72 | | 100.0 | |
| | | Z | 5.26 | 66.92 | 17.34 | | 100.0 | |
| 10068-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps) | X | 5.11 | 67.30 | 17.84 | 2.55 | 100.0 | ± 9.6 % |
| | | Y | 5.48 | 67.51 | 18.02 | | 100.0 | |
| | | Z | 5.34 | 67.10 | 17.60 | | 100.0 | |
| 10069-CAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps) | X | 5.18 | 67.33 | 18.03 | 2.67 | 100.0 | ± 9.6 % |
| | | Y | 5.55 | 67.43 | 18.19 | | 100.0 | |
| | | Z | 5.42 | 67.05 | 17.77 | | 100.0 | |
| 10071-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps) | X | 4.92 | 67.02 | 17.54 | 1.99 | 100.0 | ± 9.6 % |
| | | Y | 5.15 | 66.91 | 17.55 | | 100.0 | |
| | | Z | 5.05 | 66.61 | 17.20 | | 100.0 | |
| 10072-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps) | X | 4.89 | 67.32 | 17.73 | 2.30 | 100.0 | ± 9.6 % |
| | | Y | 5.18 | 67.36 | 17.81 | | 100.0 | |
| | | Z | 5.06 | 66.97 | 17.41 | | 100.0 | |
| 10073-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps) | X | 4.97 | 67.51 | 18.05 | 2.83 | 100.0 | ± 9.6 % |
| | | Y | 5.26 | 67.57 | 18.16 | | 100.0 | |
| | | Z | 5.13 | 67.15 | 17.71 | | 100.0 | |
| 10074-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps) | X | 4.97 | 67.45 | 18.19 | 3.30 | 100.0 | ± 9.6 % |
| | | Y | 5.25 | 67.52 | 18.35 | | 100.0 | |
| | | Z | 5.12 | 67.08 | 17.88 | | 100.0 | |
| 10075-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps) | X | 5.01 | 67.53 | 18.46 | 3.82 | 90.0 | ± 9.6 % |
| | | Y | 5.35 | 67.85 | 18.77 | | 90.0 | |
| | | Z | 5.20 | 67.32 | 18.23 | | 90.0 | |
| 10076-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps) | X | 5.05 | 67.39 | 18.61 | 4.15 | 90.0 | ± 9.6 % |
| | | Y | 5.33 | 67.57 | 18.84 | | 90.0 | |
| | | Z | 5.20 | 67.09 | 18.32 | | 90.0 | |
| 10077-CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps) | X | 5.08 | 67.49 | 18.72 | 4.30 | 90.0 | ± 9.6 % |
| | | Y | 5.35 | 67.63 | 18.93 | | 90.0 | |
| | | Z | 5.23 | 67.15 | 18.41 | | 90.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10081-CAB | CDMA2000 (1xRTT, RC3) | X | 1.31 | 72.98 | 15.39 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.11 | 69.20 | 15.13 | | 150.0 | |
| | | Z | 0.87 | 65.58 | 12.79 | | 150.0 | |
| 10082-CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | X | 0.85 | 60.00 | 5.02 | 4.77 | 80.0 | ± 9.6 % |
| | | Y | 1.21 | 60.81 | 6.24 | | 80.0 | |
| | | Z | 1.05 | 60.00 | 5.50 | | 80.0 | |
| 10090-DAB | GPRS-FDD (TDMA, GMSK, TN 0-4) | X | 100.00 | 112.28 | 25.96 | 6.56 | 60.0 | ± 9.6 % |
| | | Y | 100.00 | 115.46 | 28.15 | | 60.0 | |
| | | Z | 100.00 | 112.45 | 26.54 | | 60.0 | |
| 10097-CAB | UMTS-FDD (HSDPA) | X | 2.10 | 70.95 | 17.43 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.95 | 68.39 | 16.42 | | 150.0 | |
| | | Z | 1.81 | 67.01 | 15.42 | | 150.0 | |
| 10098-CAB | UMTS-FDD (HSUPA, Subtest 2) | X | 2.06 | 70.93 | 17.43 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.91 | 68.38 | 16.41 | | 150.0 | |
| | | Z | 1.77 | 66.95 | 15.38 | | 150.0 | |
| 10099-DAB | EDGE-FDD (TDMA, 8PSK, TN 0-4) | X | 9.76 | 91.94 | 32.20 | 9.56 | 60.0 | ± 9.6 % |
| | | Y | 18.08 | 104.66 | 36.54 | | 60.0 | |
| | | Z | 11.25 | 92.22 | 31.54 | | 60.0 | |
| 10100-CAB | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | X | 3.35 | 72.13 | 17.90 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.43 | 71.55 | 17.33 | | 150.0 | |
| | | Z | 3.14 | 69.99 | 16.48 | | 150.0 | |
| 10101-CAB | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | X | 3.28 | 68.30 | 16.59 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.42 | 68.10 | 16.32 | | 150.0 | |
| | | Z | 3.28 | 67.37 | 15.82 | | 150.0 | |
| 10102-CAB | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | X | 3.39 | 68.25 | 16.67 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.51 | 67.99 | 16.38 | | 150.0 | |
| | | Z | 3.39 | 67.35 | 15.92 | | 150.0 | |
| 10103-CAB | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | X | 6.41 | 75.89 | 20.51 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.77 | 77.49 | 21.00 | | 65.0 | |
| | | Z | 6.54 | 74.47 | 19.52 | | 65.0 | |
| 10104-CAB | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | X | 6.38 | 73.95 | 20.45 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.62 | 75.73 | 21.18 | | 65.0 | |
| | | Z | 6.97 | 74.03 | 20.17 | | 65.0 | |
| 10105-CAB | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | X | 5.88 | 72.23 | 19.98 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.31 | 74.91 | 21.13 | | 65.0 | |
| | | Z | 6.85 | 73.64 | 20.32 | | 65.0 | |
| 10108-CAC | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | X | 2.91 | 71.53 | 17.82 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.02 | 70.68 | 17.15 | | 150.0 | |
| | | Z | 2.76 | 69.18 | 16.29 | | 150.0 | |
| 10109-CAC | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | X | 2.95 | 68.44 | 16.61 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.08 | 67.93 | 16.28 | | 150.0 | |
| | | Z | 2.95 | 67.17 | 15.72 | | 150.0 | |
| 10110-CAC | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | X | 2.39 | 71.08 | 17.59 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.47 | 69.75 | 16.86 | | 150.0 | |
| | | Z | 2.25 | 68.18 | 15.88 | | 150.0 | |
| 10111-CAC | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | X | 2.79 | 70.36 | 17.30 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.80 | 68.64 | 16.65 | | 150.0 | |
| | | Z | 2.65 | 67.83 | 16.01 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10112-CAC | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM) | X | 3.07 | 68.42 | 16.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.20 | 67.83 | 16.29 | | 150.0 | |
| | | Z | 3.07 | 67.16 | 15.79 | | 150.0 | |
| 10113-CAC | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) | X | 2.94 | 70.45 | 17.39 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.95 | 68.67 | 16.72 | | 150.0 | |
| | | Z | 2.81 | 67.97 | 16.15 | | 150.0 | |
| 10114-CAB | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK) | X | 5.09 | 67.47 | 16.77 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.23 | 67.24 | 16.53 | | 150.0 | |
| | | Z | 5.18 | 67.08 | 16.35 | | 150.0 | |
| 10115-CAB | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM) | X | 5.34 | 67.51 | 16.78 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.60 | 67.53 | 16.67 | | 150.0 | |
| | | Z | 5.52 | 67.36 | 16.50 | | 150.0 | |
| 10116-CAB | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | X | 5.18 | 67.67 | 16.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.36 | 67.51 | 16.58 | | 150.0 | |
| | | Z | 5.29 | 67.32 | 16.39 | | 150.0 | |
| 10117-CAB | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK) | X | 5.07 | 67.38 | 16.74 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.24 | 67.25 | 16.55 | | 150.0 | |
| | | Z | 5.16 | 67.03 | 16.34 | | 150.0 | |
| 10118-CAB | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM) | X | 5.42 | 67.71 | 16.89 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.67 | 67.69 | 16.76 | | 150.0 | |
| | | Z | 5.59 | 67.53 | 16.59 | | 150.0 | |
| 10119-CAB | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM) | X | 5.17 | 67.64 | 16.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.33 | 67.45 | 16.57 | | 150.0 | |
| | | Z | 5.26 | 67.25 | 16.37 | | 150.0 | |
| 10140-CAB | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM) | X | 3.41 | 68.25 | 16.57 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.56 | 67.99 | 16.30 | | 150.0 | |
| | | Z | 3.43 | 67.35 | 15.84 | | 150.0 | |
| 10141-CAB | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM) | X | 3.54 | 68.37 | 16.75 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.68 | 68.01 | 16.43 | | 150.0 | |
| | | Z | 3.56 | 67.45 | 16.01 | | 150.0 | |
| 10142-CAC | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK) | X | 2.25 | 71.96 | 17.48 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.26 | 69.83 | 16.74 | | 150.0 | |
| | | Z | 2.02 | 68.09 | 15.61 | | 150.0 | |
| 10143-CAC | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM) | X | 2.82 | 72.22 | 17.26 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.71 | 69.55 | 16.65 | | 150.0 | |
| | | Z | 2.52 | 68.51 | 15.83 | | 150.0 | |
| 10144-CAC | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM) | X | 2.29 | 68.06 | 14.75 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.50 | 67.47 | 15.19 | | 150.0 | |
| | | Z | 2.32 | 66.44 | 14.34 | | 150.0 | |
| 10145-CAC | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK) | X | 1.16 | 65.56 | 11.35 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.65 | 68.53 | 14.65 | | 150.0 | |
| | | Z | 1.36 | 65.83 | 12.76 | | 150.0 | |
| 10146-CAC | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | X | 1.35 | 63.40 | 9.39 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.12 | 72.00 | 15.52 | | 150.0 | |
| | | Z | 2.16 | 67.04 | 12.61 | | 150.0 | |
| 10147-CAC | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | X | 1.53 | 64.72 | 10.19 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.03 | 75.63 | 17.18 | | 150.0 | |
| | | Z | 2.54 | 69.13 | 13.74 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10149-CAB | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM) | X | 2.96 | 68.52 | 16.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.09 | 67.99 | 16.32 | | 150.0 | |
| | | Z | 2.96 | 67.23 | 15.77 | | 150.0 | |
| 10150-CAB | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM) | X | 3.08 | 68.50 | 16.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.21 | 67.88 | 16.33 | | 150.0 | |
| | | Z | 3.08 | 67.21 | 15.83 | | 150.0 | |
| 10151-CAB | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK) | X | 7.03 | 79.10 | 21.82 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.21 | 79.75 | 22.00 | | 65.0 | |
| | | Z | 7.10 | 77.15 | 20.67 | | 65.0 | |
| 10152-CAB | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM) | X | 5.92 | 73.94 | 20.06 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.21 | 75.88 | 21.03 | | 65.0 | |
| | | Z | 6.48 | 73.87 | 19.84 | | 65.0 | |
| 10153-CAB | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM) | X | 6.35 | 75.11 | 20.94 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.55 | 76.62 | 21.69 | | 65.0 | |
| | | Z | 6.87 | 74.79 | 20.60 | | 65.0 | |
| 10154-CAC | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK) | X | 2.46 | 71.67 | 17.92 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.54 | 70.24 | 17.15 | | 150.0 | |
| | | Z | 2.30 | 68.63 | 16.17 | | 150.0 | |
| 10155-CAC | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) | X | 2.79 | 70.40 | 17.33 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.80 | 68.64 | 16.65 | | 150.0 | |
| | | Z | 2.66 | 67.83 | 16.02 | | 150.0 | |
| 10156-CAC | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK) | X | 2.17 | 72.73 | 17.45 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.14 | 70.24 | 16.79 | | 150.0 | |
| | | Z | 1.88 | 68.21 | 15.48 | | 150.0 | |
| 10157-CAC | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM) | X | 2.21 | 69.24 | 14.98 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.36 | 68.31 | 15.46 | | 150.0 | |
| | | Z | 2.15 | 66.99 | 14.43 | | 150.0 | |
| 10158-CAC | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM) | X | 2.95 | 70.56 | 17.46 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.95 | 68.72 | 16.76 | | 150.0 | |
| | | Z | 2.82 | 68.03 | 16.20 | | 150.0 | |
| 10159-CAC | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM) | X | 2.36 | 69.87 | 15.32 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.49 | 68.78 | 15.76 | | 150.0 | |
| | | Z | 2.27 | 67.50 | 14.75 | | 150.0 | |
| 10160-CAB | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK) | X | 2.90 | 70.47 | 17.47 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.94 | 69.28 | 16.77 | | 150.0 | |
| | | Z | 2.76 | 68.21 | 16.07 | | 150.0 | |
| 10161-CAB | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM) | X | 2.98 | 68.55 | 16.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.10 | 67.79 | 16.29 | | 150.0 | |
| | | Z | 2.98 | 67.13 | 15.77 | | 150.0 | |
| 10162-CAB | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM) | X | 3.10 | 68.74 | 16.76 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.21 | 67.84 | 16.35 | | 150.0 | |
| | | Z | 3.09 | 67.25 | 15.86 | | 150.0 | |
| 10166-CAC | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) | X | 3.31 | 69.42 | 19.40 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.85 | 69.94 | 19.41 | | 150.0 | |
| | | Z | 3.63 | 68.92 | 18.65 | | 150.0 | |
| 10167-CAC | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | X | 3.89 | 72.11 | 19.78 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.89 | 73.20 | 20.04 | | 150.0 | |
| | | Z | 4.45 | 71.60 | 19.05 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10168-CAC | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) | X | 4.43 | 75.02 | 21.48 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.37 | 75.20 | 21.21 | | 150.0 | |
| | | Z | 4.92 | 73.76 | 20.36 | | 150.0 | |
| 10169-CAB | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK) | X | 2.61 | 67.65 | 18.68 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.41 | 71.01 | 19.90 | | 150.0 | |
| | | Z | 3.09 | 68.90 | 18.61 | | 150.0 | |
| 10170-CAB | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM) | X | 3.32 | 73.16 | 21.10 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.09 | 78.14 | 22.55 | | 150.0 | |
| | | Z | 4.27 | 74.69 | 20.88 | | 150.0 | |
| 10171-AAB | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM) | X | 2.74 | 69.02 | 18.13 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.10 | 73.53 | 19.72 | | 150.0 | |
| | | Z | 3.48 | 70.44 | 18.07 | | 150.0 | |
| 10172-CAB | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK) | X | 5.53 | 83.56 | 25.72 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 21.34 | 105.31 | 32.41 | | 65.0 | |
| | | Z | 7.30 | 84.26 | 24.94 | | 65.0 | |
| 10173-CAB | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM) | X | 10.58 | 92.60 | 26.95 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 29.30 | 105.74 | 30.57 | | 65.0 | |
| | | Z | 12.37 | 90.08 | 25.23 | | 65.0 | |
| 10174-CAB | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM) | X | 7.41 | 85.53 | 24.05 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 21.20 | 98.69 | 27.99 | | 65.0 | |
| | | Z | 10.53 | 86.42 | 23.55 | | 65.0 | |
| 10175-CAC | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK) | X | 2.58 | 67.36 | 18.42 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.37 | 70.66 | 19.64 | | 150.0 | |
| | | Z | 3.05 | 68.56 | 18.35 | | 150.0 | |
| 10176-CAC | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM) | X | 3.33 | 73.19 | 21.11 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.10 | 78.16 | 22.56 | | 150.0 | |
| | | Z | 4.27 | 74.71 | 20.89 | | 150.0 | |
| 10177-CAE | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK) | X | 2.60 | 67.50 | 18.51 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.40 | 70.83 | 19.75 | | 150.0 | |
| | | Z | 3.07 | 68.74 | 18.46 | | 150.0 | |
| 10178-CAC | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) | X | 3.30 | 73.00 | 21.00 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.02 | 77.85 | 22.40 | | 150.0 | |
| | | Z | 4.22 | 74.44 | 20.74 | | 150.0 | |
| 10179-CAC | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM) | X | 3.00 | 71.00 | 19.50 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.55 | 75.67 | 20.98 | | 150.0 | |
| | | Z | 3.82 | 72.37 | 19.31 | | 150.0 | |
| 10180-CAC | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) | X | 2.73 | 68.97 | 18.09 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.08 | 73.43 | 19.65 | | 150.0 | |
| | | Z | 3.47 | 70.35 | 18.01 | | 150.0 | |
| 10181-CAB | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK) | X | 2.59 | 67.48 | 18.51 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.39 | 70.81 | 19.74 | | 150.0 | |
| | | Z | 3.07 | 68.71 | 18.45 | | 150.0 | |
| 10182-CAB | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) | X | 3.30 | 72.98 | 20.99 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.01 | 77.82 | 22.39 | | 150.0 | |
| | | Z | 4.21 | 74.41 | 20.73 | | 150.0 | |
| 10183-AAA | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | X | 2.73 | 68.94 | 18.08 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.07 | 73.40 | 19.64 | | 150.0 | |
| | | Z | 3.46 | 70.33 | 18.00 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10184-CAC | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK) | X | 2.60 | 67.52 | 18.53 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.40 | 70.86 | 19.76 | | 150.0 | |
| | | Z | 3.08 | 68.76 | 18.47 | | 150.0 | |
| 10185-CAC | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM) | X | 3.31 | 73.05 | 21.03 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.04 | 77.90 | 22.43 | | 150.0 | |
| | | Z | 4.23 | 74.49 | 20.77 | | 150.0 | |
| 10186-AAC | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) | X | 2.74 | 69.01 | 18.12 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.10 | 73.47 | 19.68 | | 150.0 | |
| | | Z | 3.48 | 70.39 | 18.03 | | 150.0 | |
| 10187-CAC | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK) | X | 2.61 | 67.58 | 18.60 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 3.41 | 70.90 | 19.81 | | 150.0 | |
| | | Z | 3.09 | 68.80 | 18.52 | | 150.0 | |
| 10188-CAC | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | X | 3.41 | 73.70 | 21.42 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 5.24 | 78.69 | 22.84 | | 150.0 | |
| | | Z | 4.38 | 75.22 | 21.18 | | 150.0 | |
| 10189-AAC | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM) | X | 2.80 | 69.41 | 18.40 | 3.01 | 150.0 | ± 9.6 % |
| | | Y | 4.20 | 73.97 | 19.98 | | 150.0 | |
| | | Z | 3.56 | 70.83 | 18.32 | | 150.0 | |
| 10193-CAB | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK) | X | 4.49 | 67.07 | 16.51 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.67 | 66.69 | 16.32 | | 150.0 | |
| | | Z | 4.59 | 66.49 | 16.09 | | 150.0 | |
| 10194-CAB | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM) | X | 4.64 | 67.34 | 16.63 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.86 | 67.05 | 16.43 | | 150.0 | |
| | | Z | 4.77 | 66.83 | 16.21 | | 150.0 | |
| 10195-CAB | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM) | X | 4.68 | 67.36 | 16.65 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.90 | 67.06 | 16.44 | | 150.0 | |
| | | Z | 4.82 | 66.86 | 16.22 | | 150.0 | |
| 10196-CAB | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK) | X | 4.48 | 67.10 | 16.51 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.68 | 66.78 | 16.36 | | 150.0 | |
| | | Z | 4.60 | 66.57 | 16.12 | | 150.0 | |
| 10197-CAB | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM) | X | 4.66 | 67.35 | 16.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.88 | 67.07 | 16.45 | | 150.0 | |
| | | Z | 4.79 | 66.86 | 16.22 | | 150.0 | |
| 10198-CAB | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM) | X | 4.68 | 67.37 | 16.65 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.91 | 67.08 | 16.45 | | 150.0 | |
| | | Z | 4.82 | 66.87 | 16.23 | | 150.0 | |
| 10219-CAB | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK) | X | 4.44 | 67.14 | 16.49 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.63 | 66.80 | 16.32 | | 150.0 | |
| | | Z | 4.55 | 66.58 | 16.08 | | 150.0 | |
| 10220-CAB | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM) | X | 4.65 | 67.31 | 16.63 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.87 | 67.06 | 16.44 | | 150.0 | |
| | | Z | 4.79 | 66.83 | 16.21 | | 150.0 | |
| 10221-CAB | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM) | X | 4.69 | 67.30 | 16.64 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.91 | 67.01 | 16.44 | | 150.0 | |
| | | Z | 4.83 | 66.81 | 16.22 | | 150.0 | |
| 10222-CAB | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK) | X | 5.04 | 67.37 | 16.73 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.22 | 67.27 | 16.55 | | 150.0 | |
| | | Z | 5.14 | 67.04 | 16.34 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10223-CAB | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM) | X | 5.33 | 67.57 | 16.84 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.58 | 67.57 | 16.72 | | 150.0 | |
| | | Z | 5.46 | 67.24 | 16.46 | | 150.0 | |
| 10224-CAB | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM) | X | 5.08 | 67.48 | 16.71 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.27 | 67.38 | 16.53 | | 150.0 | |
| | | Z | 5.19 | 67.14 | 16.31 | | 150.0 | |
| 10225-CAB | UMTS-FDD (HSPA+) | X | 2.82 | 67.14 | 15.84 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.95 | 66.38 | 15.78 | | 150.0 | |
| | | Z | 2.86 | 65.91 | 15.30 | | 150.0 | |
| 10226-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | X | 11.41 | 94.07 | 27.52 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 31.67 | 107.27 | 31.09 | | 65.0 | |
| | | Z | 13.11 | 91.16 | 25.67 | | 65.0 | |
| 10227-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM) | X | 11.04 | 92.14 | 26.24 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 24.12 | 100.92 | 28.72 | | 65.0 | |
| | | Z | 11.71 | 88.12 | 24.16 | | 65.0 | |
| 10228-CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK) | X | 7.63 | 90.07 | 28.10 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 23.55 | 107.62 | 33.18 | | 65.0 | |
| | | Z | 10.51 | 91.21 | 27.39 | | 65.0 | |
| 10229-CAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM) | X | 10.66 | 92.71 | 26.99 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 29.42 | 105.79 | 30.60 | | 65.0 | |
| | | Z | 12.45 | 90.17 | 25.27 | | 65.0 | |
| 10230-CAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) | X | 10.25 | 90.80 | 25.74 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 22.68 | 99.76 | 28.30 | | 65.0 | |
| | | Z | 11.15 | 87.26 | 23.80 | | 65.0 | |
| 10231-CAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK) | X | 7.27 | 89.04 | 27.66 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 22.20 | 106.36 | 32.73 | | 65.0 | |
| | | Z | 10.05 | 90.30 | 27.01 | | 65.0 | |
| 10232-CAB | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) | X | 10.64 | 92.69 | 26.99 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 29.42 | 105.80 | 30.60 | | 65.0 | |
| | | Z | 12.43 | 90.15 | 25.26 | | 65.0 | |
| 10233-CAB | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) | X | 10.23 | 90.76 | 25.73 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 22.67 | 99.78 | 28.30 | | 65.0 | |
| | | Z | 11.14 | 87.24 | 23.80 | | 65.0 | |
| 10234-CAB | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK) | X | 6.99 | 88.15 | 27.23 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 20.93 | 105.02 | 32.23 | | 65.0 | |
| | | Z | 9.64 | 89.40 | 26.60 | | 65.0 | |
| 10235-CAB | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM) | X | 10.65 | 92.73 | 27.00 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 29.50 | 105.86 | 30.62 | | 65.0 | |
| | | Z | 12.44 | 90.18 | 25.27 | | 65.0 | |
| 10236-CAB | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM) | X | 10.34 | 90.92 | 25.77 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 22.93 | 99.94 | 28.35 | | 65.0 | |
| | | Z | 11.22 | 87.34 | 23.83 | | 65.0 | |
| 10237-CAB | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK) | X | 7.28 | 89.10 | 27.69 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 22.38 | 106.55 | 32.79 | | 65.0 | |
| | | Z | 10.07 | 90.36 | 27.03 | | 65.0 | |
| 10238-CAB | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) | X | 10.61 | 92.67 | 26.98 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 29.40 | 105.80 | 30.59 | | 65.0 | |
| | | Z | 12.41 | 90.13 | 25.25 | | 65.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10239-CAB | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | X | 10.19 | 90.73 | 25.72 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 22.65 | 99.78 | 28.31 | | 65.0 | |
| | | Z | 11.11 | 87.22 | 23.79 | | 65.0 | |
| 10240-CAB | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK) | X | 7.26 | 89.06 | 27.67 | 6.02 | 65.0 | ± 9.6 % |
| | | Y | 22.30 | 106.48 | 32.77 | | 65.0 | |
| | | Z | 10.04 | 90.32 | 27.01 | | 65.0 | |
| 10241-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | X | 7.75 | 81.08 | 25.21 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 10.21 | 83.82 | 26.43 | | 65.0 | |
| | | Z | 8.73 | 80.32 | 24.52 | | 65.0 | |
| 10242-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) | X | 6.80 | 78.38 | 24.02 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 9.63 | 82.52 | 25.83 | | 65.0 | |
| | | Z | 8.38 | 79.47 | 24.10 | | 65.0 | |
| 10243-CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) | X | 5.61 | 75.06 | 23.46 | 6.98 | 65.0 | ± 9.6 % |
| | | Y | 7.74 | 79.46 | 25.50 | | 65.0 | |
| | | Z | 6.88 | 76.70 | 23.79 | | 65.0 | |
| 10244-CAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | X | 4.85 | 72.20 | 16.09 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.02 | 78.99 | 20.43 | | 65.0 | |
| | | Z | 6.19 | 74.48 | 17.94 | | 65.0 | |
| 10245-CAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | X | 4.70 | 71.53 | 15.74 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.89 | 78.48 | 20.19 | | 65.0 | |
| | | Z | 6.13 | 74.10 | 17.74 | | 65.0 | |
| 10246-CAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | X | 5.22 | 76.54 | 18.28 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.14 | 82.43 | 21.79 | | 65.0 | |
| | | Z | 5.87 | 76.86 | 19.08 | | 65.0 | |
| 10247-CAB | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM) | X | 4.92 | 73.01 | 17.55 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.62 | 76.59 | 20.16 | | 65.0 | |
| | | Z | 5.63 | 73.71 | 18.45 | | 65.0 | |
| 10248-CAB | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM) | X | 4.84 | 72.32 | 17.23 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.62 | 76.08 | 19.95 | | 65.0 | |
| | | Z | 5.66 | 73.31 | 18.26 | | 65.0 | |
| 10249-CAB | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK) | X | 7.10 | 81.85 | 21.45 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 9.09 | 84.35 | 23.13 | | 65.0 | |
| | | Z | 6.82 | 79.25 | 20.73 | | 65.0 | |
| 10250-CAB | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) | X | 6.14 | 76.72 | 21.07 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.40 | 78.29 | 22.09 | | 65.0 | |
| | | Z | 6.54 | 75.95 | 20.75 | | 65.0 | |
| 10251-CAB | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM) | X | 5.70 | 74.17 | 19.61 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.04 | 76.19 | 20.94 | | 65.0 | |
| | | Z | 6.27 | 74.04 | 19.64 | | 65.0 | |
| 10252-CAB | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK) | X | 7.47 | 82.32 | 22.88 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.82 | 83.02 | 23.29 | | 65.0 | |
| | | Z | 7.18 | 79.27 | 21.49 | | 65.0 | |
| 10253-CAB | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM) | X | 5.82 | 73.49 | 19.80 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.99 | 75.20 | 20.79 | | 65.0 | |
| | | Z | 6.34 | 73.34 | 19.64 | | 65.0 | |
| 10254-CAB | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM) | X | 6.20 | 74.53 | 20.56 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.35 | 75.96 | 21.41 | | 65.0 | |
| | | Z | 6.71 | 74.22 | 20.33 | | 65.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10255-CAB | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK) | X | 6.71 | 78.47 | 21.74 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.84 | 79.18 | 22.03 | | 65.0 | |
| | | Z | 6.83 | 76.67 | 20.70 | | 65.0 | |
| 10256-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | X | 3.47 | 67.38 | 12.72 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.90 | 76.38 | 18.57 | | 65.0 | |
| | | Z | 5.11 | 71.48 | 15.77 | | 65.0 | |
| 10257-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | X | 3.38 | 66.76 | 12.32 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.74 | 75.67 | 18.20 | | 65.0 | |
| | | Z | 5.05 | 70.99 | 15.48 | | 65.0 | |
| 10258-CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK) | X | 3.49 | 70.18 | 14.59 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.78 | 79.22 | 19.98 | | 65.0 | |
| | | Z | 4.80 | 73.56 | 17.06 | | 65.0 | |
| 10259-CAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM) | X | 5.42 | 74.50 | 18.87 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.93 | 77.16 | 20.83 | | 65.0 | |
| | | Z | 5.98 | 74.51 | 19.26 | | 65.0 | |
| 10260-CAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM) | X | 5.41 | 74.15 | 18.72 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 6.95 | 76.90 | 20.74 | | 65.0 | |
| | | Z | 6.03 | 74.34 | 19.21 | | 65.0 | |
| 10261-CAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK) | X | 6.87 | 81.15 | 21.70 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.53 | 83.00 | 22.95 | | 65.0 | |
| | | Z | 6.70 | 78.62 | 20.83 | | 65.0 | |
| 10262-CAB | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | X | 6.12 | 76.64 | 21.02 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.39 | 78.26 | 22.06 | | 65.0 | |
| | | Z | 6.53 | 75.90 | 20.71 | | 65.0 | |
| 10263-CAB | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) | X | 5.69 | 74.15 | 19.60 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.03 | 76.18 | 20.94 | | 65.0 | |
| | | Z | 6.26 | 74.03 | 19.63 | | 65.0 | |
| 10264-CAB | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | X | 7.38 | 82.08 | 22.77 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.75 | 82.86 | 23.22 | | 65.0 | |
| | | Z | 7.12 | 79.11 | 21.41 | | 65.0 | |
| 10265-CAB | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | X | 5.92 | 73.94 | 20.06 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.20 | 75.88 | 21.03 | | 65.0 | |
| | | Z | 6.48 | 73.87 | 19.85 | | 65.0 | |
| 10266-CAB | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM) | X | 6.35 | 75.09 | 20.93 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.55 | 76.61 | 21.68 | | 65.0 | |
| | | Z | 6.86 | 74.78 | 20.59 | | 65.0 | |
| 10267-CAB | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | X | 7.01 | 79.05 | 21.80 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 8.19 | 79.71 | 21.98 | | 65.0 | |
| | | Z | 7.09 | 77.11 | 20.65 | | 65.0 | |
| 10268-CAB | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM) | X | 6.54 | 73.87 | 20.51 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.70 | 75.41 | 21.18 | | 65.0 | |
| | | Z | 7.12 | 73.89 | 20.25 | | 65.0 | |
| 10269-CAB | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM) | X | 6.52 | 73.47 | 20.39 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.63 | 74.96 | 21.06 | | 65.0 | |
| | | Z | 7.08 | 73.52 | 20.16 | | 65.0 | |
| 10270-CAB | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | X | 6.72 | 76.10 | 20.81 | 3.98 | 65.0 | ± 9.6 % |
| | | Y | 7.77 | 76.91 | 21.02 | | 65.0 | |
| | | Z | 7.04 | 75.13 | 20.02 | | 65.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10274-CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10) | X | 2.68 | 67.93 | 16.00 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.70 | 66.71 | 15.69 | | 150.0 | |
| | | Z | 2.60 | 66.12 | 15.13 | | 150.0 | |
| 10275-CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4) | X | 1.86 | 71.35 | 17.51 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.79 | 69.27 | 16.54 | | 150.0 | |
| | | Z | 1.60 | 67.20 | 15.22 | | 150.0 | |
| 10277-CAA | PHS (QPSK) | X | 2.51 | 62.07 | 7.69 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 3.60 | 65.47 | 10.92 | | 50.0 | |
| | | Z | 3.21 | 64.00 | 9.69 | | 50.0 | |
| 10278-CAA | PHS (QPSK, BW 884MHz, Rolloff 0.5) | X | 4.14 | 68.90 | 13.57 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 8.03 | 79.56 | 19.93 | | 50.0 | |
| | | Z | 5.72 | 73.56 | 16.82 | | 50.0 | |
| 10279-CAA | PHS (QPSK, BW 884MHz, Rolloff 0.38) | X | 4.23 | 69.12 | 13.72 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 8.23 | 79.82 | 20.06 | | 50.0 | |
| | | Z | 5.85 | 73.80 | 16.95 | | 50.0 | |
| 10290-AAB | CDMA2000, RC1, SO55, Full Rate | X | 2.16 | 75.12 | 16.21 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.91 | 71.91 | 16.34 | | 150.0 | |
| | | Z | 1.49 | 68.32 | 14.21 | | 150.0 | |
| 10291-AAB | CDMA2000, RC3, SO55, Full Rate | X | 1.24 | 72.30 | 15.09 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.08 | 68.86 | 14.96 | | 150.0 | |
| | | Z | 0.85 | 65.38 | 12.66 | | 150.0 | |
| 10292-AAB | CDMA2000, RC3, SO32, Full Rate | X | 13.33 | 104.67 | 25.79 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.50 | 74.81 | 18.02 | | 150.0 | |
| | | Z | 1.03 | 68.79 | 14.75 | | 150.0 | |
| 10293-AAB | CDMA2000, RC3, SO3, Full Rate | X | 100.00 | 135.60 | 33.89 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.41 | 82.36 | 21.43 | | 150.0 | |
| | | Z | 1.44 | 73.75 | 17.42 | | 150.0 | |
| 10295-AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr. | X | 11.05 | 85.41 | 22.93 | 9.03 | 50.0 | ± 9.6 % |
| | | Y | 8.87 | 82.92 | 23.80 | | 50.0 | |
| | | Z | 7.57 | 79.23 | 21.65 | | 50.0 | |
| 10297-AAA | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK) | X | 2.93 | 71.67 | 17.91 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.03 | 70.79 | 17.22 | | 150.0 | |
| | | Z | 2.77 | 69.28 | 16.35 | | 150.0 | |
| 10298-AAB | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | X | 1.80 | 70.98 | 15.29 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.94 | 70.01 | 16.02 | | 150.0 | |
| | | Z | 1.64 | 67.53 | 14.38 | | 150.0 | |
| 10299-AAB | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | X | 2.25 | 68.93 | 13.39 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.57 | 73.44 | 16.90 | | 150.0 | |
| | | Z | 2.68 | 69.23 | 14.47 | | 150.0 | |
| 10300-AAB | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | X | 1.52 | 63.47 | 9.92 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 2.60 | 68.00 | 13.77 | | 150.0 | |
| | | Z | 2.12 | 65.38 | 11.93 | | 150.0 | |
| 10301-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC) | X | 4.73 | 66.14 | 17.79 | 4.17 | 50.0 | ± 9.6 % |
| | | Y | 5.14 | 66.14 | 17.98 | | 50.0 | |
| | | Z | 4.87 | 65.30 | 17.38 | | 50.0 | |
| 10302-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols) | X | 5.19 | 66.64 | 18.43 | 4.96 | 50.0 | ± 9.6 % |
| | | Y | 5.69 | 67.11 | 18.91 | | 50.0 | |
| | | Z | 5.42 | 66.20 | 18.24 | | 50.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10303-AAA | IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC) | X | 4.96 | 66.34 | 18.27 | 4.96 | 50.0 | ± 9.6 % |
| | | Y | 5.48 | 66.96 | 18.88 | | 50.0 | |
| | | Z | 5.20 | 65.95 | 18.14 | | 50.0 | |
| 10304-AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC) | X | 4.76 | 66.23 | 17.80 | 4.17 | 50.0 | ± 9.6 % |
| | | Y | 5.21 | 66.54 | 18.19 | | 50.0 | |
| | | Z | 4.96 | 65.68 | 17.56 | | 50.0 | |
| 10305-AAA | IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols) | X | 4.83 | 70.07 | 20.50 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.51 | 71.60 | 22.16 | | 35.0 | |
| | | Z | 4.98 | 69.23 | 20.55 | | 35.0 | |
| 10306-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols) | X | 4.91 | 68.09 | 19.77 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.42 | 68.18 | 20.25 | | 35.0 | |
| | | Z | 5.11 | 67.47 | 19.73 | | 35.0 | |
| 10307-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols) | X | 4.83 | 68.37 | 19.78 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.47 | 69.61 | 21.06 | | 35.0 | |
| | | Z | 5.07 | 67.89 | 19.81 | | 35.0 | |
| 10308-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC) | X | 4.84 | 68.69 | 19.98 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.46 | 69.92 | 21.24 | | 35.0 | |
| | | Z | 5.05 | 68.12 | 19.96 | | 35.0 | |
| 10309-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols) | X | 4.94 | 68.23 | 19.88 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.52 | 68.51 | 20.43 | | 35.0 | |
| | | Z | 5.19 | 67.72 | 19.88 | | 35.0 | |
| 10310-AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols) | X | 4.88 | 68.25 | 19.79 | 6.02 | 35.0 | ± 9.6 % |
| | | Y | 5.44 | 69.18 | 20.91 | | 35.0 | |
| | | Z | 5.08 | 67.61 | 19.74 | | 35.0 | |
| 10311-AAA | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | X | 3.31 | 70.70 | 17.41 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.40 | 70.05 | 16.83 | | 150.0 | |
| | | Z | 3.13 | 68.65 | 16.04 | | 150.0 | |
| 10313-AAA | iDEN 1:3 | X | 4.31 | 74.90 | 16.96 | 6.99 | 70.0 | ± 9.6 % |
| | | Y | 5.76 | 76.90 | 17.84 | | 70.0 | |
| | | Z | 4.08 | 72.13 | 15.67 | | 70.0 | |
| 10314-AAA | iDEN 1:6 | X | 7.33 | 84.94 | 23.33 | 10.00 | 30.0 | ± 9.6 % |
| | | Y | 7.31 | 83.11 | 22.80 | | 30.0 | |
| | | Z | 4.98 | 76.71 | 20.14 | | 30.0 | |
| 10315-AAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle) | X | 1.15 | 65.39 | 16.53 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 1.15 | 64.64 | 15.92 | | 150.0 | |
| | | Z | 1.10 | 63.46 | 14.86 | | 150.0 | |
| 10316-AAB | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle) | X | 4.52 | 67.01 | 16.57 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 4.73 | 66.76 | 16.44 | | 150.0 | |
| | | Z | 4.65 | 66.51 | 16.17 | | 150.0 | |
| 10317-AAB | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle) | X | 4.52 | 67.01 | 16.57 | 0.17 | 150.0 | ± 9.6 % |
| | | Y | 4.73 | 66.76 | 16.44 | | 150.0 | |
| | | Z | 4.65 | 66.51 | 16.17 | | 150.0 | |
| 10400-AAC | IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle) | X | 4.62 | 67.36 | 16.62 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.87 | 67.12 | 16.43 | | 150.0 | |
| | | Z | 4.77 | 66.88 | 16.19 | | 150.0 | |
| 10401-AAC | IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle) | X | 5.32 | 67.33 | 16.68 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.49 | 67.16 | 16.50 | | 150.0 | |
| | | Z | 5.43 | 67.01 | 16.32 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10402-AAC | IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle) | X | 5.60 | 67.66 | 16.72 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.79 | 67.68 | 16.60 | | 150.0 | |
| | | Z | 5.72 | 67.47 | 16.40 | | 150.0 | |
| 10403-AAB | CDMA2000 (1xEV-DO, Rev. 0) | X | 2.16 | 75.12 | 16.21 | 0.00 | 115.0 | ± 9.6 % |
| | | Y | 1.91 | 71.91 | 16.34 | | 115.0 | |
| | | Z | 1.49 | 68.32 | 14.21 | | 115.0 | |
| 10404-AAB | CDMA2000 (1xEV-DO, Rev. A) | X | 2.16 | 75.12 | 16.21 | 0.00 | 115.0 | ± 9.6 % |
| | | Y | 1.91 | 71.91 | 16.34 | | 115.0 | |
| | | Z | 1.49 | 68.32 | 14.21 | | 115.0 | |
| 10406-AAB | CDMA2000, RC3, SO32, SCH0, Full Rate | X | 100.00 | 127.59 | 32.37 | 0.00 | 100.0 | ± 9.6 % |
| | | Y | 100.00 | 123.98 | 31.83 | | 100.0 | |
| | | Z | 14.26 | 95.15 | 24.05 | | 100.0 | |
| 10410-AAA | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 124.06 | 30.89 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 119.95 | 30.07 | | 80.0 | |
| | | Z | 11.66 | 89.63 | 21.52 | | 80.0 | |
| 10415-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle) | X | 1.06 | 64.51 | 16.01 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.04 | 63.51 | 15.25 | | 150.0 | |
| | | Z | 1.01 | 62.60 | 14.33 | | 150.0 | |
| 10416-AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle) | X | 4.49 | 67.08 | 16.58 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.67 | 66.72 | 16.37 | | 150.0 | |
| | | Z | 4.59 | 66.53 | 16.14 | | 150.0 | |
| 10417-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle) | X | 4.49 | 67.08 | 16.58 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.67 | 66.72 | 16.37 | | 150.0 | |
| | | Z | 4.59 | 66.53 | 16.14 | | 150.0 | |
| 10418-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule) | X | 4.49 | 67.30 | 16.63 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.65 | 66.87 | 16.37 | | 150.0 | |
| | | Z | 4.58 | 66.67 | 16.15 | | 150.0 | |
| 10419-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule) | X | 4.50 | 67.22 | 16.62 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.68 | 66.82 | 16.38 | | 150.0 | |
| | | Z | 4.60 | 66.63 | 16.16 | | 150.0 | |
| 10422-AAA | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK) | X | 4.61 | 67.18 | 16.61 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.80 | 66.83 | 16.39 | | 150.0 | |
| | | Z | 4.73 | 66.64 | 16.18 | | 150.0 | |
| 10423-AAA | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM) | X | 4.75 | 67.46 | 16.71 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.00 | 67.20 | 16.53 | | 150.0 | |
| | | Z | 4.91 | 66.98 | 16.30 | | 150.0 | |
| 10424-AAA | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM) | X | 4.68 | 67.42 | 16.69 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.91 | 67.14 | 16.49 | | 150.0 | |
| | | Z | 4.82 | 66.93 | 16.27 | | 150.0 | |
| 10425-AAA | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK) | X | 5.29 | 67.59 | 16.82 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.47 | 67.41 | 16.61 | | 150.0 | |
| | | Z | 5.41 | 67.25 | 16.44 | | 150.0 | |
| 10426-AAA | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM) | X | 5.31 | 67.68 | 16.86 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.48 | 67.44 | 16.63 | | 150.0 | |
| | | Z | 5.41 | 67.26 | 16.44 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10427-AAA | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM) | X | 5.29 | 67.52 | 16.78 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.50 | 67.46 | 16.63 | | 150.0 | |
| | | Z | 5.43 | 67.26 | 16.43 | | 150.0 | |
| 10430-AAA | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1) | X | 4.63 | 73.67 | 19.48 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.38 | 70.39 | 18.28 | | 150.0 | |
| | | Z | 4.34 | 70.59 | 18.21 | | 150.0 | |
| 10431-AAA | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1) | X | 4.15 | 67.84 | 16.60 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.40 | 67.31 | 16.45 | | 150.0 | |
| | | Z | 4.29 | 67.04 | 16.16 | | 150.0 | |
| 10432-AAA | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1) | X | 4.45 | 67.57 | 16.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.69 | 67.19 | 16.47 | | 150.0 | |
| | | Z | 4.59 | 66.95 | 16.22 | | 150.0 | |
| 10433-AAA | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1) | X | 4.70 | 67.46 | 16.71 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.93 | 67.18 | 16.52 | | 150.0 | |
| | | Z | 4.84 | 66.96 | 16.29 | | 150.0 | |
| 10434-AAA | W-CDMA (BS Test Model 1, 64 DPCH) | X | 4.94 | 75.22 | 19.61 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.49 | 71.19 | 18.31 | | 150.0 | |
| | | Z | 4.45 | 71.43 | 18.22 | | 150.0 | |
| 10435-AAA | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 123.75 | 30.75 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 119.75 | 29.98 | | 80.0 | |
| | | Z | 11.13 | 88.92 | 21.27 | | 80.0 | |
| 10447-AAA | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%) | X | 3.46 | 68.09 | 15.85 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.73 | 67.44 | 16.02 | | 150.0 | |
| | | Z | 3.59 | 67.02 | 15.56 | | 150.0 | |
| 10448-AAA | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%) | X | 4.01 | 67.64 | 16.48 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.23 | 67.09 | 16.31 | | 150.0 | |
| | | Z | 4.12 | 66.82 | 16.01 | | 150.0 | |
| 10449-AAA | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%) | X | 4.28 | 67.42 | 16.58 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.48 | 67.02 | 16.38 | | 150.0 | |
| | | Z | 4.39 | 66.78 | 16.12 | | 150.0 | |
| 10450-AAA | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | X | 4.48 | 67.25 | 16.58 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.66 | 66.95 | 16.38 | | 150.0 | |
| | | Z | 4.58 | 66.72 | 16.14 | | 150.0 | |
| 10451-AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%) | X | 3.33 | 68.18 | 15.32 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.67 | 67.76 | 15.79 | | 150.0 | |
| | | Z | 3.50 | 67.23 | 15.24 | | 150.0 | |
| 10456-AAA | IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle) | X | 6.23 | 68.21 | 17.00 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.33 | 68.03 | 16.78 | | 150.0 | |
| | | Z | 6.26 | 67.85 | 16.61 | | 150.0 | |
| 10457-AAA | UMTS-FDD (DC-HSDPA) | X | 3.79 | 65.76 | 16.30 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.86 | 65.36 | 16.10 | | 150.0 | |
| | | Z | 3.82 | 65.17 | 15.85 | | 150.0 | |
| 10458-AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers) | X | 3.05 | 67.01 | 14.29 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 3.48 | 67.05 | 15.31 | | 150.0 | |
| | | Z | 3.32 | 66.56 | 14.71 | | 150.0 | |
| 10459-AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers) | X | 4.19 | 65.60 | 15.56 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.63 | 65.36 | 16.07 | | 150.0 | |
| | | Z | 4.50 | 65.15 | 15.72 | | 150.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10460-AAA | UMTS-FDD (WCDMA, AMR) | X | 1.27 | 75.41 | 20.14 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.05 | 70.71 | 17.81 | | 150.0 | |
| | | Z | 0.86 | 66.76 | 15.37 | | 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 | 127.84 | 32.72 | 3.29 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 123.27 | 31.69 | | 80.0 | |
| | | Z | 6.47 | 83.77 | 20.46 | | 80.0 | |
| 10462-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.26 | 63.91 | 10.22 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 14.90 | 86.82 | 19.02 | | 80.0 | |
| | | Z | 1.81 | 64.45 | 10.77 | | 80.0 | |
| 10463-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 0.85 | 60.00 | 7.76 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 4.74 | 73.69 | 14.47 | | 80.0 | |
| | | Z | 1.46 | 62.00 | 9.21 | | 80.0 | |
| 10464-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 124.65 | 31.09 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 121.04 | 30.50 | | 80.0 | |
| | | Z | 5.02 | 79.91 | 18.70 | | 80.0 | |
| 10465-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.13 | 62.86 | 9.67 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 9.25 | 81.62 | 17.45 | | 80.0 | |
| | | Z | 1.69 | 63.74 | 10.38 | | 80.0 | |
| 10466-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 0.85 | 60.00 | 7.71 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.78 | 71.31 | 13.57 | | 80.0 | |
| | | Z | 1.40 | 61.59 | 8.96 | | 80.0 | |
| 10467-AAA | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 125.03 | 31.26 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 121.26 | 30.60 | | 80.0 | |
| | | Z | 5.32 | 80.71 | 18.99 | | 80.0 | |
| 10468-AAA | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.17 | 63.15 | 9.83 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 10.30 | 82.81 | 17.81 | | 80.0 | |
| | | Z | 1.71 | 63.90 | 10.47 | | 80.0 | |
| 10469-AAA | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 0.85 | 60.00 | 7.71 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.80 | 71.39 | 13.60 | | 80.0 | |
| | | Z | 1.40 | 61.60 | 8.96 | | 80.0 | |
| 10470-AAA | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 125.05 | 31.26 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 121.29 | 30.60 | | 80.0 | |
| | | Z | 5.31 | 80.70 | 18.98 | | 80.0 | |
| 10471-AAA | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.16 | 63.09 | 9.79 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 10.21 | 82.69 | 17.77 | | 80.0 | |
| | | Z | 1.70 | 63.86 | 10.44 | | 80.0 | |
| 10472-AAA | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 0.85 | 60.00 | 7.70 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.77 | 71.31 | 13.56 | | 80.0 | |
| | | Z | 1.40 | 61.57 | 8.94 | | 80.0 | |
| 10473-AAA | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 100.00 | 125.02 | 31.24 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 100.00 | 121.25 | 30.59 | | 80.0 | |
| | | Z | 5.30 | 80.66 | 18.96 | | 80.0 | |
| 10474-AAA | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.15 | 63.05 | 9.77 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 10.08 | 82.57 | 17.73 | | 80.0 | |
| | | Z | 1.70 | 63.84 | 10.43 | | 80.0 | |
| 10475-AAA | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 0.85 | 60.00 | 7.70 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.75 | 71.25 | 13.54 | | 80.0 | |
| | | Z | 1.39 | 61.55 | 8.93 | | 80.0 | |

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|---|---|---|---|---|---|---|---|---|
| 10477-AAA | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.12 | 62.81 | 9.63 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 9.29 | 81.66 | 17.43 | | 80.0 | |
| | | Z | 1.68 | 63.69 | 10.35 | | 80.0 | |
| 10478-AAA | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 0.85 | 60.00 | 7.69 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 3.71 | 71.13 | 13.49 | | 80.0 | |
| | | Z | 1.39 | 61.52 | 8.91 | | 80.0 | |
| 10479-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 16.34 | 98.15 | 26.22 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 8.05 | 85.58 | 23.31 | | 80.0 | |
| | | Z | 4.44 | 75.80 | 19.08 | | 80.0 | |
| 10480-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 8.15 | 82.28 | 19.17 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 9.14 | 82.89 | 20.82 | | 80.0 | |
| | | Z | 4.48 | 72.61 | 16.42 | | 80.0 | |
| 10481-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.98 | 75.50 | 16.46 | 3.23 | 80.0 | ± 9.6 % |
| | | Y | 7.94 | 80.29 | 19.62 | | 80.0 | |
| | | Z | 4.00 | 70.70 | 15.36 | | 80.0 | |
| 10482-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.11 | 72.47 | 16.27 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.49 | 76.30 | 19.03 | | 80.0 | |
| | | Z | 2.84 | 69.51 | 15.71 | | 80.0 | |
| 10483-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.23 | 69.48 | 14.33 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 6.12 | 77.20 | 19.06 | | 80.0 | |
| | | Z | 3.70 | 69.78 | 15.41 | | 80.0 | |
| 10484-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.99 | 68.30 | 13.84 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.80 | 76.19 | 18.70 | | 80.0 | |
| | | Z | 3.62 | 69.26 | 15.20 | | 80.0 | |
| 10485-AAA | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.90 | 76.03 | 18.96 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.65 | 76.77 | 19.89 | | 80.0 | |
| | | Z | 3.19 | 70.88 | 17.04 | | 80.0 | |
| 10486-AAA | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.22 | 69.78 | 15.73 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.07 | 71.59 | 17.54 | | 80.0 | |
| | | Z | 3.24 | 68.15 | 15.55 | | 80.0 | |
| 10487-AAA | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.17 | 69.19 | 15.46 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.05 | 71.16 | 17.36 | | 80.0 | |
| | | Z | 3.26 | 67.91 | 15.45 | | 80.0 | |
| 10488-AAA | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.89 | 74.31 | 19.36 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.74 | 75.31 | 19.78 | | 80.0 | |
| | | Z | 3.62 | 70.94 | 17.62 | | 80.0 | |
| 10489-AAA | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.61 | 70.11 | 17.53 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.17 | 70.61 | 18.05 | | 80.0 | |
| | | Z | 3.61 | 68.29 | 16.66 | | 80.0 | |
| 10490-AAA | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.68 | 69.86 | 17.43 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.25 | 70.34 | 17.96 | | 80.0 | |
| | | Z | 3.72 | 68.19 | 16.64 | | 80.0 | |
| 10491-AAA | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.96 | 72.11 | 18.69 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.74 | 73.16 | 19.02 | | 80.0 | |
| | | Z | 3.92 | 70.03 | 17.39 | | 80.0 | |
| 10492-AAA | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.88 | 69.01 | 17.48 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.46 | 69.66 | 17.87 | | 80.0 | |
| | | Z | 4.00 | 67.90 | 16.78 | | 80.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10493-AAA | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.93 | 68.84 | 17.41 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.52 | 69.48 | 17.82 | | 80.0 | |
| | | Z | 4.08 | 67.81 | 16.77 | | 80.0 | |
| 10494-AAA | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.32 | 73.69 | 19.20 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.29 | 75.06 | 19.58 | | 80.0 | |
| | | Z | 4.18 | 71.25 | 17.73 | | 80.0 | |
| 10495-AAA | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.92 | 69.34 | 17.70 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.53 | 70.19 | 18.09 | | 80.0 | |
| | | Z | 4.04 | 68.27 | 16.95 | | 80.0 | |
| 10496-AAA | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.98 | 69.05 | 17.60 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.58 | 69.81 | 17.97 | | 80.0 | |
| | | Z | 4.12 | 68.07 | 16.91 | | 80.0 | |
| 10497-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 1.72 | 64.88 | 11.75 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 3.58 | 73.16 | 17.12 | | 80.0 | |
| | | Z | 2.20 | 66.42 | 13.58 | | 80.0 | |
| 10498-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.30 | 60.00 | 8.13 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 2.81 | 67.13 | 13.70 | | 80.0 | |
| | | Z | 1.98 | 62.85 | 11.00 | | 80.0 | |
| 10499-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.32 | 60.00 | 7.98 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 2.75 | 66.54 | 13.31 | | 80.0 | |
| | | Z | 1.95 | 62.46 | 10.68 | | 80.0 | |
| 10500-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.82 | 75.04 | 19.03 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.55 | 75.62 | 19.66 | | 80.0 | |
| | | Z | 3.32 | 70.66 | 17.20 | | 80.0 | |
| 10501-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.45 | 70.22 | 16.55 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.10 | 71.10 | 17.69 | | 80.0 | |
| | | Z | 3.41 | 68.23 | 15.99 | | 80.0 | |
| 10502-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.48 | 69.95 | 16.36 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.15 | 70.89 | 17.57 | | 80.0 | |
| | | Z | 3.47 | 68.14 | 15.91 | | 80.0 | |
| 10503-AAA | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.83 | 74.06 | 19.24 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.68 | 75.11 | 19.69 | | 80.0 | |
| | | Z | 3.58 | 70.77 | 17.54 | | 80.0 | |
| 10504-AAA | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.59 | 69.99 | 17.46 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.16 | 70.53 | 18.00 | | 80.0 | |
| | | Z | 3.60 | 68.21 | 16.61 | | 80.0 | |
| 10505-AAA | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.66 | 69.75 | 17.36 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.23 | 70.25 | 17.91 | | 80.0 | |
| | | Z | 3.70 | 68.11 | 16.59 | | 80.0 | |
| 10506-AAA | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.28 | 73.52 | 19.12 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.24 | 74.92 | 19.51 | | 80.0 | |
| | | Z | 4.15 | 71.12 | 17.66 | | 80.0 | |
| 10507-AAA | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.90 | 69.27 | 17.66 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.51 | 70.14 | 18.06 | | 80.0 | |
| | | Z | 4.02 | 68.21 | 16.91 | | 80.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10508-AAA | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.97 | 68.96 | 17.55 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.57 | 69.75 | 17.93 | | 80.0 | |
| | | Z | 4.11 | 68.00 | 16.87 | | 80.0 | |
| 10509-AAA | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.54 | 71.87 | 18.48 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.35 | 73.05 | 18.77 | | 80.0 | |
| | | Z | 4.54 | 70.32 | 17.38 | | 80.0 | |
| 10510-AAA | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.34 | 68.76 | 17.59 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.97 | 69.73 | 17.95 | | 80.0 | |
| | | Z | 4.53 | 68.16 | 17.00 | | 80.0 | |
| 10511-AAA | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.39 | 68.51 | 17.51 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.00 | 69.40 | 17.85 | | 80.0 | |
| | | Z | 4.59 | 67.95 | 16.96 | | 80.0 | |
| 10512-AAA | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 4.78 | 73.48 | 18.98 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 5.80 | 75.09 | 19.41 | | 80.0 | |
| | | Z | 4.67 | 71.54 | 17.71 | | 80.0 | |
| 10513-AAA | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.24 | 69.00 | 17.69 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.89 | 70.17 | 18.11 | | 80.0 | |
| | | Z | 4.41 | 68.40 | 17.07 | | 80.0 | |
| 10514-AAA | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 4.26 | 68.58 | 17.56 | 2.23 | 80.0 | ± 9.6 % |
| | | Y | 4.87 | 69.63 | 17.95 | | 80.0 | |
| | | Z | 4.44 | 68.04 | 16.99 | | 80.0 | |
| 10515-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle) | X | 1.03 | 64.84 | 16.18 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 1.01 | 63.76 | 15.35 | | 150.0 | |
| | | Z | 0.97 | 62.74 | 14.37 | | 150.0 | |
| 10516-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle) | X | 1.37 | 87.37 | 25.57 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.82 | 76.24 | 20.55 | | 150.0 | |
| | | Z | 0.54 | 67.46 | 15.73 | | 150.0 | |
| 10517-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle) | X | 0.93 | 68.34 | 17.75 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.89 | 66.40 | 16.42 | | 150.0 | |
| | | Z | 0.81 | 64.28 | 14.78 | | 150.0 | |
| 10518-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle) | X | 4.48 | 67.19 | 16.57 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.66 | 66.80 | 16.35 | | 150.0 | |
| | | Z | 4.59 | 66.60 | 16.12 | | 150.0 | |
| 10519-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) | X | 4.64 | 67.36 | 16.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.88 | 67.08 | 16.48 | | 150.0 | |
| | | Z | 4.79 | 66.86 | 16.25 | | 150.0 | |
| 10520-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) | X | 4.50 | 67.33 | 16.59 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.73 | 67.07 | 16.42 | | 150.0 | |
| | | Z | 4.64 | 66.83 | 16.17 | | 150.0 | |
| 10521-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) | X | 4.43 | 67.32 | 16.58 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.66 | 67.08 | 16.41 | | 150.0 | |
| | | Z | 4.57 | 66.82 | 16.16 | | 150.0 | |
| 10522-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) | X | 4.49 | 67.45 | 16.68 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.71 | 67.07 | 16.44 | | 150.0 | |
| | | Z | 4.62 | 66.87 | 16.22 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10523-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) | X | 4.40 | 67.41 | 16.59 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.58 | 66.97 | 16.31 | | 150.0 | |
| | | Z | 4.50 | 66.74 | 16.07 | | 150.0 | |
| 10524-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) | X | 4.44 | 67.39 | 16.66 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.66 | 67.02 | 16.43 | | 150.0 | |
| | | Z | 4.57 | 66.80 | 16.19 | | 150.0 | |
| 10525-AAA | IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) | X | 4.46 | 66.48 | 16.28 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.62 | 66.06 | 16.02 | | 150.0 | |
| | | Z | 4.54 | 65.85 | 15.79 | | 150.0 | |
| 10526-AAA | IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) | X | 4.60 | 66.79 | 16.40 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.82 | 66.46 | 16.16 | | 150.0 | |
| | | Z | 4.72 | 66.22 | 15.93 | | 150.0 | |
| 10527-AAA | IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) | X | 4.53 | 66.77 | 16.35 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.74 | 66.44 | 16.12 | | 150.0 | |
| | | Z | 4.64 | 66.19 | 15.88 | | 150.0 | |
| 10528-AAA | IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) | X | 4.54 | 66.78 | 16.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.75 | 66.46 | 16.15 | | 150.0 | |
| | | Z | 4.66 | 66.21 | 15.91 | | 150.0 | |
| 10529-AAA | IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) | X | 4.54 | 66.78 | 16.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.75 | 66.46 | 16.15 | | 150.0 | |
| | | Z | 4.66 | 66.21 | 15.91 | | 150.0 | |
| 10531-AAA | IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) | X | 4.52 | 66.84 | 16.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.76 | 66.60 | 16.18 | | 150.0 | |
| | | Z | 4.66 | 66.32 | 15.93 | | 150.0 | |
| 10532-AAA | IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) | X | 4.39 | 66.72 | 16.32 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.61 | 66.47 | 16.13 | | 150.0 | |
| | | Z | 4.51 | 66.18 | 15.86 | | 150.0 | |
| 10533-AAA | IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) | X | 4.55 | 66.87 | 16.39 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 4.77 | 66.48 | 16.13 | | 150.0 | |
| | | Z | 4.67 | 66.24 | 15.89 | | 150.0 | |
| 10534-AAA | IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle) | X | 5.09 | 66.73 | 16.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.26 | 66.58 | 16.18 | | 150.0 | |
| | | Z | 5.19 | 66.36 | 15.98 | | 150.0 | |
| 10535-AAA | IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle) | X | 5.14 | 66.89 | 16.46 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.33 | 66.72 | 16.24 | | 150.0 | |
| | | Z | 5.25 | 66.50 | 16.04 | | 150.0 | |
| 10536-AAA | IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle) | X | 5.03 | 66.89 | 16.44 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.20 | 66.71 | 16.22 | | 150.0 | |
| | | Z | 5.12 | 66.47 | 16.01 | | 150.0 | |
| 10537-AAA | IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle) | X | 5.08 | 66.84 | 16.42 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.27 | 66.68 | 16.21 | | 150.0 | |
| | | Z | 5.18 | 66.44 | 16.00 | | 150.0 | |
| 10538-AAA | IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle) | X | 5.15 | 66.81 | 16.44 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.37 | 66.74 | 16.28 | | 150.0 | |
| | | Z | 5.28 | 66.49 | 16.06 | | 150.0 | |
| 10540-AAA | IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle) | X | 5.09 | 66.80 | 16.45 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.28 | 66.69 | 16.27 | | 150.0 | |
| | | Z | 5.20 | 66.47 | 16.06 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10541-AAA | IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle) | X | 5.06 | 66.68 | 16.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.26 | 66.60 | 16.22 | | 150.0 | |
| | | Z | 5.18 | 66.36 | 16.00 | | 150.0 | |
| 10542-AAA | IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle) | X | 5.22 | 66.77 | 16.43 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.41 | 66.64 | 16.25 | | 150.0 | |
| | | Z | 5.33 | 66.43 | 16.05 | | 150.0 | |
| 10543-AAA | IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle) | X | 5.28 | 66.79 | 16.47 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.50 | 66.65 | 16.27 | | 150.0 | |
| | | Z | 5.41 | 66.46 | 16.08 | | 150.0 | |
| 10544-AAA | IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle) | X | 5.42 | 66.77 | 16.34 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.55 | 66.69 | 16.17 | | 150.0 | |
| | | Z | 5.48 | 66.48 | 15.98 | | 150.0 | |
| 10545-AAA | IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle) | X | 5.61 | 67.23 | 16.53 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.75 | 67.07 | 16.30 | | 150.0 | |
| | | Z | 5.67 | 66.87 | 16.11 | | 150.0 | |
| 10546-AAA | IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle) | X | 5.46 | 66.92 | 16.38 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.64 | 66.96 | 16.27 | | 150.0 | |
| | | Z | 5.56 | 66.72 | 16.06 | | 150.0 | |
| 10547-AAA | IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle) | X | 5.54 | 67.00 | 16.42 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.73 | 67.04 | 16.29 | | 150.0 | |
| | | Z | 5.64 | 66.77 | 16.07 | | 150.0 | |
| 10548-AAA | IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle) | X | 5.73 | 67.79 | 16.78 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.99 | 67.96 | 16.73 | | 150.0 | |
| | | Z | 5.87 | 67.64 | 16.48 | | 150.0 | |
| 10550-AAA | IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle) | X | 5.52 | 67.07 | 16.47 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.66 | 66.92 | 16.25 | | 150.0 | |
| | | Z | 5.58 | 66.70 | 16.06 | | 150.0 | |
| 10551-AAA | IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle) | X | 5.47 | 66.93 | 16.36 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.67 | 66.99 | 16.25 | | 150.0 | |
| | | Z | 5.59 | 66.76 | 16.05 | | 150.0 | |
| 10552-AAA | IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle) | X | 5.43 | 66.87 | 16.34 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.58 | 66.77 | 16.15 | | 150.0 | |
| | | Z | 5.50 | 66.55 | 15.96 | | 150.0 | |
| 10553-AAA | IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle) | X | 5.49 | 66.84 | 16.35 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.67 | 66.82 | 16.21 | | 150.0 | |
| | | Z | 5.59 | 66.61 | 16.01 | | 150.0 | |
| 10554-AAA | IEEE 1602.11ac WiFi (160MHz, MCS0, 99pc duty cycle) | X | 5.84 | 67.09 | 16.40 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 5.94 | 67.05 | 16.25 | | 150.0 | |
| | | Z | 5.88 | 66.85 | 16.07 | | 150.0 | |
| 10555-AAA | IEEE 1602.11ac WiFi (160MHz, MCS1, 99pc duty cycle) | X | 5.95 | 67.36 | 16.52 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.09 | 67.37 | 16.39 | | 150.0 | |
| | | Z | 6.01 | 67.14 | 16.19 | | 150.0 | |
| 10556-AAA | IEEE 1602.11ac WiFi (160MHz, MCS2, 99pc duty cycle) | X | 5.98 | 67.45 | 16.56 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.10 | 67.39 | 16.39 | | 150.0 | |
| | | Z | 6.03 | 67.18 | 16.21 | | 150.0 | |
| 10557-AAA | IEEE 1602.11ac WiFi (160MHz, MCS3, 99pc duty cycle) | X | 5.93 | 67.31 | 16.50 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.09 | 67.35 | 16.39 | | 150.0 | |
| | | Z | 6.01 | 67.12 | 16.19 | | 150.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10558-AAA | IEEE 1602.11ac WiFi (160MHz, MCS4, 99pc duty cycle) | X | 5.96 | 67.43 | 16.58 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.14 | 67.53 | 16.50 | | 150.0 | |
| | | Z | 6.06 | 67.28 | 16.29 | | 150.0 | |
| 10560-AAA | IEEE 1602.11ac WiFi (160MHz, MCS6, 99pc duty cycle) | X | 5.96 | 67.30 | 16.55 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.14 | 67.38 | 16.46 | | 150.0 | |
| | | Z | 6.06 | 67.14 | 16.26 | | 150.0 | |
| 10561-AAA | IEEE 1602.11ac WiFi (160MHz, MCS7, 99pc duty cycle) | X | 5.90 | 67.30 | 16.59 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.05 | 67.33 | 16.47 | | 150.0 | |
| | | Z | 5.97 | 67.09 | 16.27 | | 150.0 | |
| 10562-AAA | IEEE 1602.11ac WiFi (160MHz, MCS8, 99pc duty cycle) | X | 5.97 | 67.52 | 16.70 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.20 | 67.78 | 16.70 | | 150.0 | |
| | | Z | 6.10 | 67.49 | 16.47 | | 150.0 | |
| 10563-AAA | IEEE 1602.11ac WiFi (160MHz, MCS9, 99pc duty cycle) | X | 6.05 | 67.43 | 16.61 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 6.51 | 68.26 | 16.88 | | 150.0 | |
| | | Z | 6.42 | 68.01 | 16.67 | | 150.0 | |
| 10564-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle) | X | 4.79 | 67.15 | 16.65 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.99 | 66.89 | 16.50 | | 150.0 | |
| | | Z | 4.91 | 66.68 | 16.27 | | 150.0 | |
| 10565-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle) | X | 5.00 | 67.58 | 16.97 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.25 | 67.37 | 16.83 | | 150.0 | |
| | | Z | 5.16 | 67.16 | 16.61 | | 150.0 | |
| 10566-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle) | X | 4.83 | 67.41 | 16.78 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.08 | 67.24 | 16.66 | | 150.0 | |
| | | Z | 4.99 | 67.00 | 16.41 | | 150.0 | |
| 10567-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle) | X | 4.88 | 67.87 | 17.20 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.11 | 67.62 | 16.99 | | 150.0 | |
| | | Z | 5.02 | 67.41 | 16.78 | | 150.0 | |
| 10568-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle) | X | 4.73 | 67.14 | 16.52 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 4.99 | 66.97 | 16.41 | | 150.0 | |
| | | Z | 4.89 | 66.73 | 16.15 | | 150.0 | |
| 10569-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle) | X | 4.86 | 68.08 | 17.32 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.05 | 67.63 | 17.01 | | 150.0 | |
| | | Z | 4.97 | 67.46 | 16.82 | | 150.0 | |
| 10570-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle) | X | 4.87 | 67.85 | 17.21 | 0.46 | 150.0 | ± 9.6 % |
| | | Y | 5.09 | 67.48 | 16.95 | | 150.0 | |
| | | Z | 5.01 | 67.31 | 16.75 | | 150.0 | |
| 10571-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle) | X | 1.23 | 65.85 | 16.68 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.28 | 65.62 | 16.38 | | 130.0 | |
| | | Z | 1.20 | 64.12 | 15.14 | | 130.0 | |
| 10572-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle) | X | 1.26 | 66.61 | 17.14 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.30 | 66.27 | 16.76 | | 130.0 | |
| | | Z | 1.21 | 64.64 | 15.46 | | 130.0 | |
| 10573-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle) | X | 15.61 | 122.59 | 34.86 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 7.32 | 105.62 | 29.57 | | 130.0 | |
| | | Z | 1.41 | 77.28 | 19.61 | | 130.0 | |
| 10574-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle) | X | 1.59 | 75.46 | 21.51 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 1.56 | 73.46 | 20.23 | | 130.0 | |
| | | Z | 1.30 | 69.51 | 17.90 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10575-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle) | X | 4.57 | 66.90 | 16.65 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.78 | 66.67 | 16.55 | | 130.0 | |
| | | Z | 4.70 | 66.43 | 16.27 | | 130.0 | |
| 10576-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle) | X | 4.60 | 67.11 | 16.74 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.81 | 66.83 | 16.61 | | 130.0 | |
| | | Z | 4.72 | 66.59 | 16.34 | | 130.0 | |
| 10577-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) | X | 4.78 | 67.36 | 16.89 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.04 | 67.16 | 16.78 | | 130.0 | |
| | | Z | 4.94 | 66.91 | 16.52 | | 130.0 | |
| 10578-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) | X | 4.68 | 67.55 | 17.03 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.93 | 67.32 | 16.88 | | 130.0 | |
| | | Z | 4.83 | 67.07 | 16.62 | | 130.0 | |
| 10579-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) | X | 4.43 | 66.68 | 16.24 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.71 | 66.69 | 16.25 | | 130.0 | |
| | | Z | 4.59 | 66.34 | 15.91 | | 130.0 | |
| 10580-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) | X | 4.47 | 66.74 | 16.26 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.75 | 66.68 | 16.26 | | 130.0 | |
| | | Z | 4.64 | 66.35 | 15.93 | | 130.0 | |
| 10581-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) | X | 4.59 | 67.62 | 16.99 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.83 | 67.38 | 16.83 | | 130.0 | |
| | | Z | 4.73 | 67.09 | 16.54 | | 130.0 | |
| 10582-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) | X | 4.35 | 66.42 | 16.00 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.66 | 66.46 | 16.06 | | 130.0 | |
| | | Z | 4.54 | 66.09 | 15.70 | | 130.0 | |
| 10583-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) | X | 4.57 | 66.90 | 16.65 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.78 | 66.67 | 16.55 | | 130.0 | |
| | | Z | 4.70 | 66.43 | 16.27 | | 130.0 | |
| 10584-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) | X | 4.60 | 67.11 | 16.74 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.81 | 66.83 | 16.61 | | 130.0 | |
| | | Z | 4.72 | 66.59 | 16.34 | | 130.0 | |
| 10585-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) | X | 4.78 | 67.36 | 16.89 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.04 | 67.16 | 16.78 | | 130.0 | |
| | | Z | 4.94 | 66.91 | 16.52 | | 130.0 | |
| 10586-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) | X | 4.68 | 67.55 | 17.03 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.93 | 67.32 | 16.88 | | 130.0 | |
| | | Z | 4.83 | 67.07 | 16.62 | | 130.0 | |
| 10587-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle) | X | 4.43 | 66.68 | 16.24 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.71 | 66.69 | 16.25 | | 130.0 | |
| | | Z | 4.59 | 66.34 | 15.91 | | 130.0 | |
| 10588-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle) | X | 4.47 | 66.74 | 16.26 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.75 | 66.68 | 16.26 | | 130.0 | |
| | | Z | 4.64 | 66.35 | 15.93 | | 130.0 | |
| 10589-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle) | X | 4.59 | 67.62 | 16.99 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.83 | 67.38 | 16.83 | | 130.0 | |
| | | Z | 4.73 | 67.09 | 16.54 | | 130.0 | |
| 10590-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle) | X | 4.35 | 66.42 | 16.00 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.66 | 66.46 | 16.06 | | 130.0 | |
| | | Z | 4.54 | 66.09 | 15.70 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10591-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle) | X | 4.72 | 66.97 | 16.76 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.93 | 66.73 | 16.63 | | 130.0 | |
| | | Z | 4.85 | 66.51 | 16.38 | | 130.0 | |
| 10592-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle) | X | 4.85 | 67.28 | 16.89 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.10 | 67.07 | 16.76 | | 130.0 | |
| | | Z | 5.01 | 66.85 | 16.51 | | 130.0 | |
| 10593-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle) | X | 4.77 | 67.16 | 16.75 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.03 | 67.02 | 16.67 | | 130.0 | |
| | | Z | 4.93 | 66.76 | 16.39 | | 130.0 | |
| 10594-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle) | X | 4.83 | 67.35 | 16.92 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.08 | 67.17 | 16.80 | | 130.0 | |
| | | Z | 4.99 | 66.92 | 16.54 | | 130.0 | |
| 10595-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle) | X | 4.79 | 67.31 | 16.82 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.06 | 67.14 | 16.71 | | 130.0 | |
| | | Z | 4.95 | 66.87 | 16.44 | | 130.0 | |
| 10596-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle) | X | 4.73 | 67.29 | 16.82 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.99 | 67.14 | 16.71 | | 130.0 | |
| | | Z | 4.89 | 66.86 | 16.43 | | 130.0 | |
| 10597-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle) | X | 4.68 | 67.16 | 16.68 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.95 | 67.07 | 16.62 | | 130.0 | |
| | | Z | 4.84 | 66.78 | 16.32 | | 130.0 | |
| 10598-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle) | X | 4.67 | 67.44 | 16.97 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.93 | 67.31 | 16.88 | | 130.0 | |
| | | Z | 4.82 | 67.03 | 16.60 | | 130.0 | |
| 10599-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle) | X | 5.39 | 67.39 | 16.95 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.60 | 67.32 | 16.82 | | 130.0 | |
| | | Z | 5.51 | 67.07 | 16.58 | | 130.0 | |
| 10600-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle) | X | 5.51 | 67.80 | 17.12 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.77 | 67.81 | 17.04 | | 130.0 | |
| | | Z | 5.65 | 67.49 | 16.76 | | 130.0 | |
| 10601-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle) | X | 5.41 | 67.56 | 17.02 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.64 | 67.51 | 16.91 | | 130.0 | |
| | | Z | 5.54 | 67.24 | 16.65 | | 130.0 | |
| 10602-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle) | X | 5.54 | 67.73 | 17.02 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.72 | 67.51 | 16.82 | | 130.0 | |
| | | Z | 5.62 | 67.22 | 16.56 | | 130.0 | |
| 10603-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle) | X | 5.62 | 68.07 | 17.33 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.82 | 67.83 | 17.11 | | 130.0 | |
| | | Z | 5.72 | 67.58 | 16.87 | | 130.0 | |
| 10604-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle) | X | 5.49 | 67.68 | 17.12 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.60 | 67.27 | 16.82 | | 130.0 | |
| | | Z | 5.51 | 67.03 | 16.58 | | 130.0 | |
| 10605-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) | X | 5.51 | 67.70 | 17.12 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.70 | 67.55 | 16.96 | | 130.0 | |
| | | Z | 5.61 | 67.31 | 16.72 | | 130.0 | |
| 10606-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle) | X | 5.26 | 67.01 | 16.63 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.49 | 67.08 | 16.60 | | 130.0 | |
| | | Z | 5.39 | 66.79 | 16.33 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10607-AAA | IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle) | X | 4.58 | 66.35 | 16.43 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.76 | 66.03 | 16.25 | | 130.0 | |
| | | Z | 4.68 | 65.79 | 15.98 | | 130.0 | |
| 10608-AAA | IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle) | X | 4.73 | 66.71 | 16.58 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.98 | 66.46 | 16.42 | | 130.0 | |
| | | Z | 4.87 | 66.20 | 16.15 | | 130.0 | |
| 10609-AAA | IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle) | X | 4.62 | 66.54 | 16.40 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.87 | 66.34 | 16.28 | | 130.0 | |
| | | Z | 4.76 | 66.05 | 15.99 | | 130.0 | |
| 10610-AAA | IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle) | X | 4.68 | 66.72 | 16.58 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.92 | 66.49 | 16.43 | | 130.0 | |
| | | Z | 4.81 | 66.21 | 16.15 | | 130.0 | |
| 10611-AAA | IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle) | X | 4.59 | 66.51 | 16.42 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.84 | 66.32 | 16.29 | | 130.0 | |
| | | Z | 4.73 | 66.02 | 16.00 | | 130.0 | |
| 10612-AAA | IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle) | X | 4.59 | 66.66 | 16.46 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.85 | 66.48 | 16.33 | | 130.0 | |
| | | Z | 4.74 | 66.16 | 16.03 | | 130.0 | |
| 10613-AAA | IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle) | X | 4.58 | 66.47 | 16.30 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.87 | 66.40 | 16.24 | | 130.0 | |
| | | Z | 4.75 | 66.06 | 15.92 | | 130.0 | |
| 10614-AAA | IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle) | X | 4.55 | 66.74 | 16.59 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.80 | 66.57 | 16.46 | | 130.0 | |
| | | Z | 4.69 | 66.26 | 16.16 | | 130.0 | |
| 10615-AAA | IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle) | X | 4.58 | 66.31 | 16.16 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 4.84 | 66.15 | 16.08 | | 130.0 | |
| | | Z | 4.73 | 65.83 | 15.77 | | 130.0 | |
| 10616-AAA | IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle) | X | 5.21 | 66.65 | 16.56 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.41 | 66.58 | 16.44 | | 130.0 | |
| | | Z | 5.33 | 66.33 | 16.20 | | 130.0 | |
| 10617-AAA | IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle) | X | 5.28 | 66.84 | 16.63 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.47 | 66.68 | 16.45 | | 130.0 | |
| | | Z | 5.38 | 66.45 | 16.22 | | 130.0 | |
| 10618-AAA | IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle) | X | 5.18 | 66.90 | 16.68 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.37 | 66.76 | 16.51 | | 130.0 | |
| | | Z | 5.28 | 66.49 | 16.27 | | 130.0 | |
| 10619-AAA | IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle) | X | 5.18 | 66.65 | 16.49 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.39 | 66.59 | 16.37 | | 130.0 | |
| | | Z | 5.30 | 66.32 | 16.11 | | 130.0 | |
| 10620-AAA | IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle) | X | 5.26 | 66.66 | 16.54 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.51 | 66.68 | 16.46 | | 130.0 | |
| | | Z | 5.40 | 66.39 | 16.19 | | 130.0 | |
| 10621-AAA | IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle) | X | 5.27 | 66.82 | 16.75 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.48 | 66.74 | 16.60 | | 130.0 | |
| | | Z | 5.39 | 66.50 | 16.37 | | 130.0 | |
| 10622-AAA | IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle) | X | 5.27 | 66.93 | 16.80 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.48 | 66.86 | 16.65 | | 130.0 | |
| | | Z | 5.39 | 66.62 | 16.42 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10623-AAA | IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle) | X | 5.14 | 66.42 | 16.40 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.37 | 66.46 | 16.34 | | 130.0 | |
| | | Z | 5.27 | 66.17 | 16.07 | | 130.0 | |
| 10624-AAA | IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle) | X | 5.34 | 66.68 | 16.59 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.56 | 66.62 | 16.48 | | 130.0 | |
| | | Z | 5.47 | 66.37 | 16.24 | | 130.0 | |
| 10625-AAA | IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle) | X | 5.51 | 67.05 | 16.84 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.94 | 67.60 | 17.02 | | 130.0 | |
| | | Z | 5.85 | 67.36 | 16.78 | | 130.0 | |
| 10626-AAA | IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle) | X | 5.53 | 66.66 | 16.50 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.68 | 66.62 | 16.38 | | 130.0 | |
| | | Z | 5.60 | 66.40 | 16.16 | | 130.0 | |
| 10627-AAA | IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle) | X | 5.78 | 67.30 | 16.79 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.92 | 67.14 | 16.59 | | 130.0 | |
| | | Z | 5.84 | 66.92 | 16.37 | | 130.0 | |
| 10628-AAA | IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle) | X | 5.53 | 66.65 | 16.39 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.74 | 66.79 | 16.36 | | 130.0 | |
| | | Z | 5.65 | 66.51 | 16.11 | | 130.0 | |
| 10629-AAA | IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle) | X | 5.63 | 66.79 | 16.45 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.82 | 66.85 | 16.38 | | 130.0 | |
| | | Z | 5.74 | 66.60 | 16.14 | | 130.0 | |
| 10630-AAA | IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle) | X | 5.95 | 67.97 | 17.05 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.32 | 68.49 | 17.20 | | 130.0 | |
| | | Z | 6.17 | 68.05 | 16.86 | | 130.0 | |
| 10631-AAA | IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle) | X | 5.89 | 67.93 | 17.23 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.21 | 68.27 | 17.26 | | 130.0 | |
| | | Z | 6.09 | 67.93 | 17.00 | | 130.0 | |
| 10632-AAA | IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle) | X | 5.77 | 67.44 | 17.00 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.90 | 67.22 | 16.76 | | 130.0 | |
| | | Z | 5.82 | 67.00 | 16.55 | | 130.0 | |
| 10633-AAA | IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle) | X | 5.60 | 66.87 | 16.54 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.83 | 67.02 | 16.49 | | 130.0 | |
| | | Z | 5.72 | 66.69 | 16.23 | | 130.0 | |
| 10634-AAA | IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle) | X | 5.59 | 66.92 | 16.62 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.81 | 67.01 | 16.55 | | 130.0 | |
| | | Z | 5.71 | 66.73 | 16.31 | | 130.0 | |
| 10635-AAA | IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle) | X | 5.44 | 66.12 | 15.93 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 5.70 | 66.39 | 15.99 | | 130.0 | |
| | | Z | 5.59 | 66.05 | 15.69 | | 130.0 | |
| 10636-AAA | IEEE 1602.11ac WiFi (160MHz, MCS0, 90pc duty cycle) | X | 5.96 | 67.00 | 16.57 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.08 | 67.01 | 16.47 | | 130.0 | |
| | | Z | 6.01 | 66.78 | 16.25 | | 130.0 | |
| 10637-AAA | IEEE 1602.11ac WiFi (160MHz, MCS1, 90pc duty cycle) | X | 6.10 | 67.36 | 16.74 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.25 | 67.39 | 16.63 | | 130.0 | |
| | | Z | 6.17 | 67.14 | 16.41 | | 130.0 | |
| 10638-AAA | IEEE 1602.11ac WiFi (160MHz, MCS2, 90pc duty cycle) | X | 6.11 | 67.36 | 16.71 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.25 | 67.36 | 16.60 | | 130.0 | |
| | | Z | 6.17 | 67.12 | 16.38 | | 130.0 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10639-AAA | IEEE 1602.11ac WiFi (160MHz, MCS3, 90pc duty cycle) | X | 6.07 | 67.26 | 16.71 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.25 | 67.37 | 16.65 | | 130.0 | |
| | | Z | 6.16 | 67.11 | 16.42 | | 130.0 | |
| 10640-AAA | IEEE 1602.11ac WiFi (160MHz, MCS4, 90pc duty cycle) | X | 6.05 | 67.22 | 16.62 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.27 | 67.44 | 16.63 | | 130.0 | |
| | | Z | 6.17 | 67.12 | 16.37 | | 130.0 | |
| 10641-AAA | IEEE 1602.11ac WiFi (160MHz, MCS5, 90pc duty cycle) | X | 6.13 | 67.23 | 16.65 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.27 | 67.20 | 16.53 | | 130.0 | |
| | | Z | 6.19 | 66.96 | 16.31 | | 130.0 | |
| 10642-AAA | IEEE 1602.11ac WiFi (160MHz, MCS6, 90pc duty cycle) | X | 6.16 | 67.45 | 16.94 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.34 | 67.53 | 16.85 | | 130.0 | |
| | | Z | 6.25 | 67.29 | 16.64 | | 130.0 | |
| 10643-AAA | IEEE 1602.11ac WiFi (160MHz, MCS7, 90pc duty cycle) | X | 6.00 | 67.14 | 16.67 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.17 | 67.21 | 16.60 | | 130.0 | |
| | | Z | 6.08 | 66.93 | 16.36 | | 130.0 | |
| 10644-AAA | IEEE 1602.11ac WiFi (160MHz, MCS8, 90pc duty cycle) | X | 6.08 | 67.39 | 16.82 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.38 | 67.85 | 16.95 | | 130.0 | |
| | | Z | 6.26 | 67.49 | 16.66 | | 130.0 | |
| 10645-AAA | IEEE 1602.11ac WiFi (160MHz, MCS9, 90pc duty cycle) | X | 6.23 | 67.50 | 16.83 | 0.46 | 130.0 | ± 9.6 % |
| | | Y | 6.74 | 68.44 | 17.18 | | 130.0 | |
| | | Z | 6.68 | 68.29 | 17.00 | | 130.0 | |
| 10646-AAB | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7) | X | 13.71 | 101.95 | 34.43 | 9.30 | 60.0 | ± 9.6 % |
| | | Y | 31.42 | 116.20 | 38.46 | | 60.0 | |
| | | Z | 15.59 | 99.47 | 32.52 | | 60.0 | |
| 10647-AAA | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7) | X | 12.18 | 100.02 | 33.95 | 9.30 | 60.0 | ± 9.6 % |
| | | Y | 30.06 | 116.00 | 38.55 | | 60.0 | |
| | | Z | 14.66 | 98.82 | 32.42 | | 60.0 | |
| 10648-AAA | CDMA2000 (1x Advanced) | X | 0.74 | 65.73 | 11.50 | 0.00 | 150.0 | ± 9.6 % |
| | | Y | 0.86 | 65.73 | 12.88 | | 150.0 | |
| | | Z | 0.73 | 63.45 | 11.13 | | 150.0 | |

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