



## Calibration Laboratory of

Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





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Accreditation No.: SCS 0108

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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  $\varphi$   $\varphi$  rotation around probe axis

Polarization 9 9 rotation around an axis that is in the plane normal to probe axis (at measurement center),

i.e., 9 = 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) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices -Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- b) 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 9 = 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 E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z \* frequency\_response (see Frequency Response Chart). This linearization is
  implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included
  in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom
  exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

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## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7464

**Basic Calibration Parameters** 

|                          | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|--------------------------|----------|----------|----------|-----------|
| Norm $(\mu V/(V/m)^2)^A$ | 0.46     | 0.44     | 0.45     | ± 10.1 %  |
| DCP (mV)B                | 100.5    | 101.1    | 99.2     |           |

Calibration Results for Modulation Response

| UID    | Communication System Name   |   | A<br>dB | B<br>dBõV | С     | D<br>dB                                 | VR<br>mV | Max<br>dev. | Max<br>Unc <sup>E</sup><br>(k=2) |
|--------|-----------------------------|---|---------|-----------|-------|-----------------------------------------|----------|-------------|----------------------------------|
| 0      | CW                          | X | 0.00    | 0.00      | 1.00  | 0.00                                    | 129.8    | ± 2.7 %     | ± 4.7 %                          |
|        |                             | Y | 0.00    | 0.00      | 1.00  |                                         | 143.1    |             |                                  |
|        |                             | Z | 0.00    | 0.00      | 1.00  |                                         | 149.5    |             |                                  |
| 10352- | Pulse Waveform (200Hz, 10%) | X | 20.00   | 93.08     | 21.80 | 10.00                                   | 60.0     | ± 3.7 %     | ± 9.6 %                          |
| AAA    |                             | Y | 20.00   | 91.15     | 21.40 | 1                                       | 60.0     |             | 0.000                            |
|        |                             | Z | 20.00   | 93.95     | 22.82 |                                         | 60.0     |             |                                  |
| 10353- | Pulse Waveform (200Hz, 20%) | X | 20.00   | 94.89     | 21.67 | 6.99                                    | 80.0     | ± 2.0 %     | ± 9.6 %                          |
| AAA    |                             | Y | 20.00   | 91.07     | 20.01 |                                         | 80.0     |             |                                  |
|        |                             | Z | 20.00   | 94.48     | 22.03 |                                         | 80.0     |             |                                  |
| 10354- | Pulse Waveform (200Hz, 40%) | X | 20.00   | 100.94    | 23.29 | 3.98                                    | 95.0     | ± 1.1 %     | ± 9.6 %                          |
| AAA    |                             | Y | 20.00   | 91.64     | 18.69 |                                         | 95.0     |             |                                  |
|        |                             | Z | 20.00   | 98.54     | 22.66 |                                         | 95.0     | 1           |                                  |
| 10355- | Pulse Waveform (200Hz, 60%) | X | 20.00   | 111.81    | 26.93 | 2.22                                    | 120.0    | ± 1.2 %     | ± 9.6 %                          |
| AAA    | ,                           | Y | 20.00   | 91.67     | 17.31 |                                         | 120.0    |             |                                  |
|        |                             | Z | 20.00   | 106.21    | 24.89 |                                         | 120.0    |             |                                  |
| 10387- | QPSK Waveform, 1 MHz        | X | 1.95    | 67.66     | 16.42 | 1.00                                    | 150.0    | ± 2.3 %     | ± 9.6 %                          |
| AAA    |                             | Y | 1.71    | 65.07     | 14.73 |                                         | 150.0    |             | / .                              |
|        |                             | Z | 1.98    | 67.42     | 16.43 |                                         | 150.0    |             |                                  |
| 10388- | QPSK Waveform, 10 MHz       | X | 2.73    | 71.10     | 17.33 | 0.00                                    | 150.0    | ± 0.9 %     | ± 9.6 %                          |
| AAA    |                             | Y | 2.26    | 67.69     | 15.37 |                                         | 150.0    | - 0.0 /0    | 2 0.0 70                         |
|        |                             | Z | 2.79    | 71.26     | 17.38 |                                         | 150.0    |             |                                  |
| 10396- | 64-QAM Waveform, 100 kHz    | X | 3.50    | 72.58     | 19.72 | 3.01                                    | 150.0    | ± 0.7 %     | ± 9.6 %                          |
| AAA    |                             | Y | 3.46    | 71.32     | 18.87 | 0.0.                                    | 150.0    | _ 0., ,,    | 2 0.0 70                         |
|        |                             | Z | 3.75    | 73.23     | 20.03 |                                         | 150.0    |             |                                  |
| 10399- | 64-QAM Waveform, 40 MHz     | X | 3.79    | 68.38     | 16.54 | 0.00                                    | 150.0    | ± 2.0 %     | ± 9.6 %                          |
| AAA    |                             | Y | 3.52    | 66.93     | 15.61 | 0.0000000000000000000000000000000000000 | 150.0    |             |                                  |
|        |                             | Z | 3.82    | 68.42     | 16.57 |                                         | 150.0    |             |                                  |
| 10414- | WLAN CCDF, 64-QAM, 40MHz    | X | 4.98    | 65.65     | 15.65 | 0.00                                    | 150.0    | ± 3.8 %     | ± 9.6 %                          |
| AAA    |                             | Y | 4.98    | 65.46     | 15.42 |                                         | 150.0    |             | 70                               |
|        |                             | Z | 5.02    | 65.62     | 15.64 |                                         | 150.0    |             |                                  |

Note: For details on UID parameters see Appendix

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

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<sup>&</sup>lt;sup>A</sup> The uncertainties of Norm X,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).



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# DASY/EASY - Parameters of Probe: EX3DV4 - SN:7464

#### **Sensor Model Parameters**

|   | C1<br>fF | C2<br>fF | α<br>V <sup>-1</sup> | T1<br>ms.V <sup>-2</sup> | T2<br>ms.V <sup>-1</sup> | T3<br>ms | T4<br>V <sup>-2</sup> | T5<br>V <sup>-1</sup> | T6   |
|---|----------|----------|----------------------|--------------------------|--------------------------|----------|-----------------------|-----------------------|------|
| X | 61.5     | 458.49   | 35.65                | 15.95                    | 0.16                     | 5.10     | 0.72                  | 0.47                  | 1.01 |
| Υ | 63.7     | 481.59   | 36.30                | 14.98                    | 0.81                     | 5.06     | 0.73                  | 0.58                  | 1.01 |
| Z | 68.2     | 509.89   | 35.77                | 20.70                    | 0.43                     | 5.10     | 0.63                  | 0.55                  | 1.01 |

#### Other Probe Parameters

| Sensor Arrangement                            | Triangular |
|-----------------------------------------------|------------|
| Connector Angle (°)                           | -150.6     |
| Mechanical Surface Detection Mode             | enabled    |
| Optical Surface Detection Mode                | disabled   |
| Probe Overall Length                          | 337 mm     |
| Probe Body Diameter                           | 10 mm      |
| Tip Length                                    | 9 mm       |
| Tip Diameter                                  | 2.5 mm     |
| Probe Tip to Sensor X Calibration Point       | 1 mm       |
| Probe Tip to Sensor Y Calibration Point       | 1 mm       |
| Probe Tip to Sensor Z Calibration Point       | 1 mm       |
| Recommended Measurement Distance from Surface | 1.4 mm     |

Note: Measurement distance from surface can be increased to 3-4 mm for an Area Scan job.

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# DASY/EASY - Parameters of Probe: EX3DV4 - SN:7464

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative<br>Permittivity <sup>F</sup> | Conductivity<br>(S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup><br>(mm) | Unc<br>(k=2) |
|----------------------|---------------------------------------|------------------------------------|---------|---------|---------|--------------------|----------------------------|--------------|
| 64                   | 54.2                                  | 0.75                               | 13.80   | 13.80   | 13.80   | 0.00               | 1.00                       | ± 13.3 %     |
| 150                  | 52.3                                  | 0.76                               | 11.94   | 11.94   | 11.94   | 0.00               | 1.00                       | ± 13.3 %     |
| 300                  | 45.3                                  | 0.87                               | 11.78   | 11.78   | 11.78   | 0.09               | 1.00                       | ± 13.3 %     |
| 450                  | 43.5                                  | 0.87                               | 11.02   | 11.02   | 11.02   | 0.16               | 1.30                       | ± 13.3 %     |
| 750                  | 41.9                                  | 0.89                               | 10.26   | 10.26   | 10.26   | 0.56               | 0.81                       | ± 12.0 %     |
| 835                  | 41.5                                  | 0.90                               | 9.96    | 9.96    | 9.96    | 0.41               | 0.91                       | ± 12.0 %     |
| 900                  | 41.5                                  | 0.97                               | 9.72    | 9.72    | 9.72    | 0.52               | 0.80                       | ± 12.0 %     |
| 1450                 | 40.5                                  | 1.20                               | 8.86    | 8.86    | 8.86    | 0.43               | 0.80                       | ± 12.0 %     |
| 1640                 | 40.2                                  | 1.31                               | 8.64    | 8.64    | 8.64    | 0.33               | 0.86                       | ± 12.0 %     |
| 1750                 | 40.1                                  | 1.37                               | 8.52    | 8.52    | 8.52    | 0.39               | 0.86                       | ± 12.0 %     |
| 1810                 | 40.0                                  | 1.40                               | 8.20    | 8.20    | 8.20    | 0.37               | 0.86                       | ± 12.0 %     |
| 1900                 | 40.0                                  | 1.40                               | 8.18    | 8.18    | 8.18    | 0.35               | 0.86                       | ± 12.0 %     |
| 2000                 | 40.0                                  | 1.40                               | 8.20    | 8.20    | 8.20    | 0.34               | 0.86                       | ± 12.0 %     |
| 2100                 | 39.8                                  | 1.49                               | 8.38    | 8.38    | 8.38    | 0.32               | 0.86                       | ± 12.0 %     |
| 2300                 | 39.5                                  | 1.67                               | 8.36    | 8.36    | 8.36    | 0.32               | 0.90                       | ± 12.0 %     |
| 2450                 | 39.2                                  | 1.80                               | 7.77    | 7.77    | 7.77    | 0.36               | 0.90                       | ± 12.0 %     |
| 2600                 | 39.0                                  | 1.96                               | 7.64    | 7.64    | 7.64    | 0.40               | 0.90                       | ± 12.0 %     |
| 3300                 | 38.2                                  | 2.71                               | 7.27    | 7.27    | 7.27    | 0.30               | 1.35                       | ± 13.1 %     |
| 3500                 | 37.9                                  | 2.91                               | 7.20    | 7.20    | 7.20    | 0.30               | 1.35                       | ± 13.1 %     |
| 3700                 | 37.7                                  | 3.12                               | 6.78    | 6.78    | 6.78    | 0.30               | 1.35                       | ± 13.1 %     |
| 3900                 | 37.5                                  | 3.32                               | 6.76    | 6.76    | 6.76    | 0.40               | 1.60                       | ± 13.1 %     |
| 4100                 | 37.2                                  | 3.53                               | 6.71    | 6.71    | 6.71    | 0.40               | 1.60                       | ± 13.1 %     |
| 4200                 | 37.1                                  | 3.63                               | 6.60    | 6.60    | 6.60    | 0.40               | 1.70                       | ± 13.1 %     |
| 4400                 | 36.9                                  | 3.84                               | 6.53    | 6.53    | 6.53    | 0.40               | 1.70                       | ± 13.1 %     |
| 4600                 | 36.7                                  | 4.04                               | 6.40    | 6.40    | 6.40    | 0.40               | 1.70                       | ± 13.1 %     |
| 4800                 | 36.4                                  | 4.25                               | 6.35    | 6.35    | 6.35    | 0.40               | 1.80                       | ± 13.1 %     |
| 4950                 | 36.3                                  | 4.40                               | 6.00    | 6.00    | 6.00    | 0.40               | 1.80                       | ± 13.1 %     |
| 5200                 | 36.0                                  | 4.66                               | 5.60    | 5.60    | 5.60    | 0.40               | 1.80                       | ± 13.1 %     |
| 5250                 | 35.9                                  | 4.71                               | 5.43    | 5.43    | 5.43    | 0.40               | 1.80                       | ± 13.1 %     |
| 5300                 | 35.9                                  | 4.76                               | 5.32    | 5.32    | 5.32    | 0.40               | 1.80                       | ± 13.1 %     |
| 5500                 | 35.6                                  | 4.96                               | 5.11    | 5.11    | 5.11    | 0.40               | 1.80                       | ± 13.1 %     |
| 5600                 | 35.5                                  | 5.07                               | 4.91    | 4.91    | 4.91    | 0.40               | 1.80                       | ± 13.1 %     |
| 5750                 | 35.4                                  | 5.22                               | 4.85    | 4.85    | 4.85    | 0.40               | 1.80                       | ± 13.1 %     |
| 5800                 | 35.3                                  | 5.27                               | 5.00    | 5.00    | 5.00    | 0.40               | 1.80                       | ± 13.1 %     |

<sup>&</sup>lt;sup>c</sup> 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. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

\*\*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.

\*\*A Iffequencies below a GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7464

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative<br>Permittivity <sup>F</sup> | Conductivity<br>(S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup><br>(mm) | Unc<br>(k=2) |
|----------------------|---------------------------------------|------------------------------------|---------|---------|---------|--------------------|----------------------------|--------------|
| 6500                 | 34.5                                  | 6.07                               | 5.45    | 5.45    | 5.45    | 0.20               | 2.50                       | ± 18.6 %     |
| 7000                 | 33.9                                  | 6.65                               | 5.75    | 5.75    | 5.75    | 0.20               | 2.00                       | ± 18.6 %     |

<sup>&</sup>lt;sup>c</sup> Frequency validity above 6GHz is ± 700 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for

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Frequency valuinty above 6GHz is ± 700 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

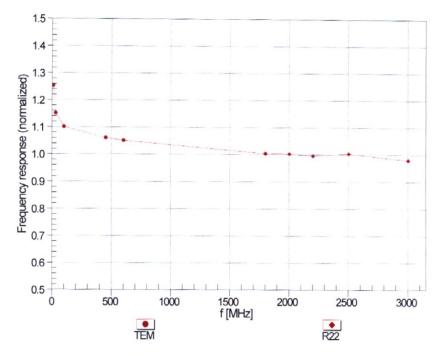
F At frequencies 6-10 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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; below ± 2% for frequencies between 3-6 GHz; and below ± 4% for frequencies between 6-10 GHz at any distance larger than half the probe tip diameter from the boundary.



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



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

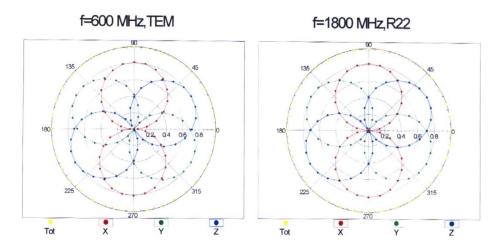
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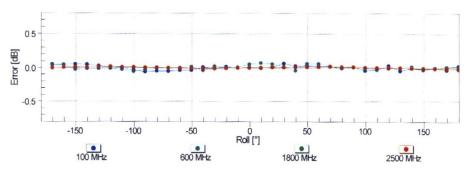
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# Receiving Pattern ( $\phi$ ), $\vartheta = 0^{\circ}$





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

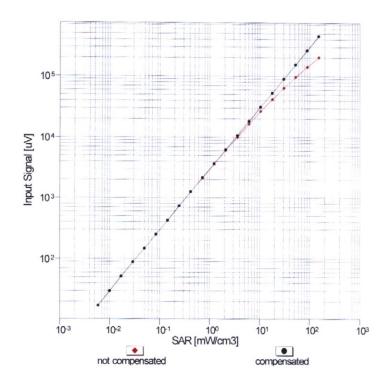
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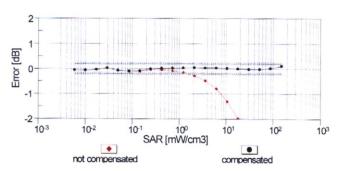
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# Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f<sub>eval</sub>= 1900 MHz)





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

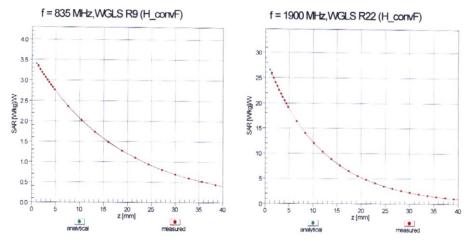
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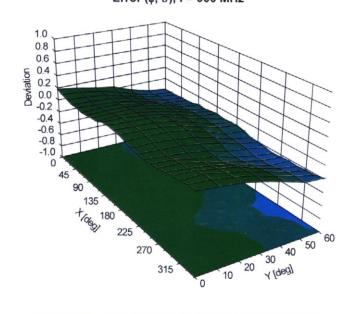


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# **Conversion Factor Assessment**



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



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

0.6 0.8

-1.0 -0.8 -0.6 -0.4 -0.2 0.0 0.2 0.4



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**Appendix: Modulation Calibration Parameters** 

| UID   | Rev | Communication System Name                           | Group     | PAR<br>(dB) | Unc <sup>E</sup><br>(k=2) |
|-------|-----|-----------------------------------------------------|-----------|-------------|---------------------------|
| 0     | -   | CW                                                  | CW        | 0.00        | ± 4.7 %                   |
| 10010 | CAA | SAR Validation (Square, 100ms, 10ms)                | Test      | 10.00       | ± 9.6 %                   |
| 10011 | CAB | UMTS-FDD (WCDMA)                                    | WCDMA     | 2.91        | ± 9.6 %                   |
| 10012 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)            | WLAN      | 1.87        | ± 9.6 %                   |
| 10013 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)       | WLAN      | 9.46        | ± 9.6 %                   |
| 10021 | DAC | GSM-FDD (TDMA, GMSK)                                | GSM       | 9.39        | ± 9.6 %                   |
| 10023 | DAC | GPRS-FDD (TDMA, GMSK, TN 0)                         | GSM       | 9.57        | ± 9.6 %                   |
| 10024 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1)                       | GSM       | 6.56        | ± 9.6 %                   |
| 10025 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0)                         | GSM       | 12.62       | ± 9.6 %                   |
| 10026 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1)                       | GSM       | 9.55        | ± 9.6 %                   |
| 10027 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2)                     | GSM       | 4.80        | ± 9.6 %                   |
| 10028 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)                   | GSM       | 3.55        | ± 9.6 %                   |
| 10029 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2)                     | GSM       | 7.78        | ± 9.6 %                   |
| 10030 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1)                 | Bluetooth | 5.30        | ± 9.6 %                   |
| 10031 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3)                 | Bluetooth | 1.87        | ± 9.6 %                   |
| 10032 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5)                 | Bluetooth | 1.16        | ± 9.6 %                   |
| 10033 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)           | Bluetooth | 7.74        | ± 9.6 %                   |
| 10034 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)           | Bluetooth | 4.53        | ± 9.6 %                   |
| 10035 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)           | Bluetooth | 3.83        | ± 9.6 %                   |
| 10036 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1)               | Bluetooth | 8.01        | ± 9.6 %                   |
| 10037 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3)               | Bluetooth | 4.77        | ± 9.6 %                   |
| 10038 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5)               | Bluetooth | 4.10        | ± 9.6 %                   |
| 10039 | CAB | CDMA2000 (1xRTT, RC1)                               | CDMA2000  | 4.57        | ± 9.6 %                   |
| 10042 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | AMPS      | 7.78        | ± 9.6 %                   |
| 10044 | CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM)                    | AMPS      | 0.00        | ± 9.6 %                   |
| 10048 | CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)           | DECT      | 13.80       | ± 9.6 %                   |
| 10049 | CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)         | DECT      | 10.79       | ± 9.6 %                   |
| 10056 | CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps)                      | TD-SCDMA  | 11.01       | ± 9.6 %                   |
| 10058 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)                   | GSM       | 6.52        | ± 9.6 %                   |
| 10059 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)            | WLAN      | 2.12        | ± 9.6 %                   |
| 10060 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)          | WLAN      | 2.83        | ± 9.6 %                   |
| 10061 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)           | WLAN      | 3.60        | ± 9.6 %                   |
| 10062 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)            | WLAN      | 8.68        | ± 9.6 %                   |
| 10063 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)            | WLAN      | 8.63        | ± 9.6 %                   |
| 10064 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)           | WLAN      | 9.09        | ± 9.6 %                   |
| 10065 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)           | WLAN      | 9.00        | ± 9.6 %                   |
| 10066 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)           | WLAN      | 9.38        | ± 9.6 %                   |
| 10067 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)           | WLAN      | 10.12       | ± 9.6 %                   |
| 10068 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)           | WLAN      | 10.12       | ± 9.6 %                   |
| 10069 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)           | WLAN      | 10.56       |                           |
| 10071 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)       | WLAN      |             | ± 9.6 %                   |
| 10072 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)      | WLAN      | 9.83        | ± 9.6 %                   |
| 10073 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)      | WLAN      | 9.62        | ± 9.6 %                   |
| 10074 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)      | WLAN      | 9.94        | ± 9.6 %                   |
| 10075 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)      |           | 10.30       | ± 9.6 %                   |
| 10076 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)      | WLAN      | 10.77       | ± 9.6 %                   |
| 10077 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)      | WLAN      | 10.94       | ± 9.6 %                   |
| 10081 | CAB | CDMA2000 (1xRTT, RC3)                               | WLAN      | 11.00       | ± 9.6 %                   |
| 10081 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | CDMA2000  | 3.97        | ± 9.6 %                   |
| 10090 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-4)                       | AMPS      | 4.77        | ± 9.6 %                   |
| 10090 | CAB | UMTS-FDD (HSDPA)                                    | GSM       | 6.56        | ± 9.6 %                   |
| 10097 | CAB | UMTS-FDD (HSUPA, Subtest 2)                         | WCDMA     | 3.98        | ± 9.6 %                   |
| 10098 |     |                                                     | WCDMA     | 3.98        | ± 9.6 %                   |
| 10099 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4)                       | GSM       | 9.55        | ± 9.6 %                   |

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| 10100 | CAE   | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)       | LTE-FDD            | 5.67  | ± 9.6 % |
|-------|-------|------------------------------------------------|--------------------|-------|---------|
| 10101 | CAE   | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)     | LTE-FDD            | 6.42  | ± 9.6 % |
| 10102 | CAE   | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)     | LTE-FDD            | 6.60  | ± 9.6 % |
| 10103 | CAG   | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)       | LTE-TDD            | 9.29  | ± 9.6 % |
| 10104 | CAG   | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)     | LTE-TDD            | 9.97  | ± 9.6 % |
| 10105 | CAG   | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)     | LTE-TDD            | 10.01 | ± 9.6 % |
| 10108 | CAG   | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)       | LTE-FDD            | 5.80  | ± 9.6 % |
| 10109 | CAG   | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)     | LTE-FDD            | 6.43  | ± 9.6 % |
| 10110 | CAG   | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)        | LTE-FDD            | 5.75  | ± 9.6 % |
| 10111 | CAG   | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)      | LTE-FDD            | 6.44  | ± 9.6 % |
| 10112 | CAG   | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)     | LTE-FDD            | 6.59  | ± 9.6 % |
| 10113 | CAG   | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)      | LTE-FDD            | 6.62  | ± 9.6 % |
| 10114 | CAD   | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)  | WLAN               | 8.10  | ± 9.6 % |
| 10115 | CAD   | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)  | WLAN               | 8.46  | ± 9.6 % |
| 10116 | CAD   | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | WLAN               | 8.15  | ± 9.6 % |
| 10117 | CAD   | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)       | WLAN               | 8.07  | ± 9.6 % |
| 10118 | CAD   | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)       | WLAN               | 8.59  | ± 9.6 % |
| 10119 | CAD   | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)      | WLAN               | 8.13  | ± 9.6 % |
| 10140 | CAE   | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)     | LTE-FDD            | 6.49  | ± 9.6 % |
| 10141 | CAE   | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)     | LTE-FDD            | 6.53  | ± 9.6 % |
| 10142 | CAE   | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)        | LTE-FDD            | 5.73  | ± 9.6 % |
| 10143 | CAE   | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)      | LTE-FDD            | 6.35  |         |
| 10144 | CAE   | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)      | LTE-FDD            | 6.65  | ± 9.6 % |
| 10145 | CAF   | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)      | LTE-FDD            | 5.76  |         |
| 10146 | CAF   | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)    | LTE-FDD            | 6.41  | ± 9.6 % |
| 10147 | CAF   | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)    | LTE-FDD            |       |         |
| 10149 | CAE   | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-FDD            | 6.72  | ± 9.6 % |
| 10150 | CAE   | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-FDD            | 6.42  | ± 9.6 % |
| 10151 | CAG   | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)        | LTE-TDD            | 9.28  | ± 9.6 % |
| 10152 | CAG   | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-TDD            | 9.92  | ± 9.6 % |
| 10153 | CAG   | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-TDD            | 10.05 | ± 9.6 % |
| 10154 | CAG   | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)        | LTE-FDD            | 5.75  | ± 9.6 % |
| 10155 | CAG   | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)      | LTE-FDD            | 6.43  | ± 9.6 % |
| 10156 | CAG   | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)         | LTE-FDD            | 5.79  | ± 9.6 % |
| 10157 | CAG   | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)       | LTE-FDD            | 6.49  | ± 9.6 % |
| 10158 | CAG   | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)      | LTE-FDD            | 6.62  | ± 9.6 % |
| 10159 | CAG   | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)       | LTE-FDD            | 6.56  | ± 9.6 % |
| 10160 | CAE   | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)        | LTE-FDD            | 5.82  | ± 9.6 % |
| 10161 | CAE   | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)      | LTE-FDD            |       |         |
| 10162 | CAE   | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)      | LTE-FDD            | 6.43  | ± 9.6 % |
| 10166 | CAF   | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)       | LTE-FDD            | 5.46  | ± 9.6 % |
| 10167 | CAF   | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)     | LTE-FDD            |       | ± 9.6 % |
| 10168 | CAF   | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)     | LTE-FDD            | 6.21  | ± 9.6 % |
| 10169 | CAE   | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-FDD            | 6.79  | ± 9.6 % |
| 10170 | CAE   | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        |                    | 5.73  | ± 9.6 % |
| 10171 | AAE   | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-FDD            | 6.52  | ± 9.6 % |
| 10172 | CAG   | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-FDD<br>LTE-TDD | 6.49  | ± 9.6 % |
| 10173 | CAG   | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        |                    | 9.21  | ± 9.6 % |
| 10174 | CAG   | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-TDD            | 9.48  | ± 9.6 % |
| 10175 | CAG   | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)          |                    | 10.25 | ± 9.6 % |
| 10176 | CAG   | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)        | LTE-FDD            | 5.72  | ± 9.6 % |
| 10177 | CAI   | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)           |                    | 6.52  | ± 9.6 % |
| 10178 | CAG   | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)         | LTE-FDD            | 5.73  | ± 9.6 % |
| 10179 | CAG   | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)        | LTE-FDD            | 6.52  | ± 9.6 % |
| 10180 | CAG   | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)         | LTE-FDD            | 6.50  | ± 9.6 % |
| 10181 | CAE   | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)          | LTE-FDD            | 6.50  | ± 9.6 % |
| .0101 | O, IL | (00 ) 200 ( 1 100 )                            | LTE-FDD            | 5.73  | ± 9.6 % |

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| 10182          | CAE | LTE EDD (SC EDMA 4 DD 45 MHz 40 CM)                                             |               |       |         |
|----------------|-----|---------------------------------------------------------------------------------|---------------|-------|---------|
| 10183          | AAD | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | LTE-FDD       | 6.52  | ± 9.6 % |
| 10184          | CAE |                                                                                 | LTE-FDD       | 6.50  | ± 9.6 % |
| 10185          | CAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK) LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)     | LTE-FDD       | 5.73  | ± 9.6 % |
| 10186          | AAE |                                                                                 | LTE-FDD       | 6.51  | ± 9.6 % |
| 10187          | CAF | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)                                          | LTE-FDD       | 6.50  | ± 9.6 % |
| 10188          | CAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)                                          | LTE-FDD       | 5.73  | ± 9.6 % |
|                |     | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)                                        | LTE-FDD       | 6.52  | ± 9.6 % |
| 10189          | AAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)                                        | LTE-FDD       | 6.50  | ± 9.6 % |
| 10193          | CAD | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)                                    | WLAN          | 8.09  | ± 9.6 % |
| 10194          | CAD | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)                                   | WLAN          | 8.12  | ± 9.6 % |
| 10195          | CAD | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)                                   | WLAN          | 8.21  | ± 9.6 % |
| 10196          | CAD | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)                                         | WLAN          | 8.10  | ± 9.6 % |
| 10197          | CAD | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)                                        | WLAN          | 8.13  | ± 9.6 % |
| 10198          | CAD | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)                                        | WLAN          | 8.27  | ± 9.6 % |
| 10219          | CAD | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)                                         | WLAN          | 8.03  | ± 9.6 % |
| 10220          | CAD | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)                                      | WLAN          | 8.13  | ± 9.6 % |
| 10221          | CAD | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)                                      | WLAN          | 8.27  | ± 9.6 % |
| 10222          | CAD | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)                                          | WLAN          | 8.06  | ± 9.6 % |
| 10223          | CAD | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)                                        | WLAN          | 8.48  | ± 9.6 % |
| 10224          | CAD | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)                                       | WLAN          | 8.08  | ± 9.6 % |
| 10225          | CAB | UMTS-FDD (HSPA+)                                                                | WCDMA         | 5.97  | ± 9.6 % |
| 10226          | CAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)                                        | LTE-TDD       | 9.49  | ± 9.6 % |
| 10227          | CAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)                                        | LTE-TDD       | 10.26 | ± 9.6 % |
| 10228          | CAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)                                          | LTE-TDD       | 9.22  | ± 9.6 % |
| 10229          | CAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)                                          | LTE-TDD       | 9.48  | ± 9.6 % |
| 10230          | CAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)                                          | LTE-TDD       | 10.25 | ± 9.6 % |
| 10231          | CAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)                                            | LTE-TDD       | 9.19  | ± 9.6 % |
| 10232          | CAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)                                          | LTE-TDD       | 9.48  | ± 9.6 % |
| 10233          | CAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)                                          | LTE-TDD       | 10.25 | ± 9.6 % |
| 10234          | CAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)                                            | LTE-TDD       | 9.21  | ± 9.6 % |
| 10235          | CAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)                                         | LTE-TDD       | 9.48  | ± 9.6 % |
| 10236          | CAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)                                         | LTE-TDD       | 10.25 | ± 9.6 % |
| 10237          | CAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)                                           | LTE-TDD       | 9.21  | ± 9.6 % |
| 10238          | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)                                         | LTE-TDD       | 9.48  | ± 9.6 % |
| 10239          | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)                                         | LTE-TDD       | 10.25 | ± 9.6 % |
| 10240          | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)                                           | LTE-TDD       | 9.21  | ± 9.6 % |
| 10241          | CAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)                                      | LTE-TDD       | 9.82  | ± 9.6 % |
| 10242          | CAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)                                      | LTE-TDD       | 9.86  | ± 9.6 % |
| 10243          | CAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)                                        | LTE-TDD       | 9.46  | ± 9.6 % |
| 10244          | CAD | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)                                        | LTE-TDD       | 10.06 | ± 9.6 % |
| 10245          | CAD | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)                                        | LTE-TDD       | 10.06 | ± 9.6 % |
| 10246          | CAD | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)                                          | LTE-TDD       | 9.30  | ± 9.6 % |
| 10247          | CAG | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)                                        | LTE-TDD       | 9.91  | ± 9.6 % |
| 10248          | CAG | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)                                        | LTE-TDD       | 10.09 | ± 9.6 % |
| 10249          | CAG | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)                                          | LTE-TDD       | 9.29  | ± 9.6 % |
| 10250          | CAG | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)                                       | LTE-TDD       | 9.81  | ± 9.6 % |
| 10251          | CAG | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)                                       | LTE-TDD       | 10.17 | ± 9.6 % |
| 10252          |     | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)                                         | LTE-TDD       | 9.24  | ± 9.6 % |
| 10253          | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)                                       | LTE-TDD       | 9.90  |         |
| 10254          | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)                                       | LTE-TDD       |       | ± 9.6 % |
| 10255          | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)                                         |               | 10.14 | ± 9.6 % |
| 10256          | CAB | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)                                     | LTE-TDD       | 9.20  | ± 9.6 % |
| 10257          | CAB | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)                                     | LTE-TDD       | 9.96  | ± 9.6 % |
| . 5401         | CAB | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)                                       | LTE-TDD       | 10.08 | ± 9.6 % |
| 10258          |     | ( T.                                        | L L I E- I DD | 9.34  | ± 9.6 % |
| 10258<br>10259 | CAD | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)                                       | LTE-TDD       | 9.98  | ± 9.6 % |

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| 10261 | CAD | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)                   | LTE-TDD  | 9.24  | ± 9.6 % |
|-------|-----|-----------------------------------------------------------|----------|-------|---------|
| 10262 | CAG | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)                 | LTE-TDD  | 9.83  | ± 9.6 % |
| 10263 | CAG | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)                 | LTE-TDD  | 10.16 | ± 9.6 % |
| 10264 | CAG | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)                   | LTE-TDD  | 9.23  | ± 9.6 % |
| 10265 | CAG | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)                | LTE-TDD  | 9.92  | ± 9.6 % |
| 10266 | CAG | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)                | LTE-TDD  | 10.07 | ± 9.6 % |
| 10267 | CAG | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)                  | LTE-TDD  | 9.30  | ± 9.6 % |
| 10268 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)                | LTE-TDD  | 10.06 | ± 9.6 % |
| 10269 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)                | LTE-TDD  | 10.13 | ± 9.6 % |
| 10270 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)                  | LTE-TDD  | 9.58  | ± 9.6 % |
| 10274 | CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)                 | WCDMA    | 4.87  | ± 9.6 % |
| 10275 | CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)                  | WCDMA    | 3.96  |         |
| 10277 | CAA | PHS (QPSK)                                                | PHS      | 11.81 | ± 9.6 % |
| 10278 | CAA | PHS (QPSK, BW 884MHz, Rolloff 0.5)                        | PHS      |       | ± 9.6 % |
| 10279 | CAA | PHS (QPSK, BW 884MHz, Rolloff 0.38)                       |          | 11.81 | ± 9.6 % |
| 10290 | AAB | CDMA2000, RC1, SO55, Full Rate                            | PHS      | 12.18 | ± 9.6 % |
| 10291 | AAB | CDMA2000, RC3, SO55, Full Rate                            | CDMA2000 | 3.91  | ± 9.6 % |
| 10291 | AAB | CDMA2000, RC3, SO33, Full Rate                            | CDMA2000 | 3.46  | ± 9.6 % |
|       |     |                                                           | CDMA2000 | 3.39  | ± 9.6 % |
| 10293 | AAB | CDMA2000, RC3, SO3, Full Rate                             | CDMA2000 | 3.50  | ± 9.6 % |
| 10295 | AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr.                     | CDMA2000 | 12.49 | ± 9.6 % |
| 10297 | AAD | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)                   | LTE-FDD  | 5.81  | ± 9.6 % |
| 10298 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)                    | LTE-FDD  | 5.72  | ± 9.6 % |
| 10299 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)                  | LTE-FDD  | 6.39  | ± 9.6 % |
| 10300 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)                  | LTE-FDD  | 6.60  | ± 9.6 % |
| 10301 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)        | WiMAX    | 12.03 | ± 9.6 % |
| 10302 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3CTRL) | WiMAX    | 12.57 | ± 9.6 % |
| 10303 | AAA | IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)       | WiMAX    | 12.52 | ± 9.6 % |
| 10304 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)       | WiMAX    | 11.86 | ± 9.6 % |
| 10305 | AAA | IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC)      | WiMAX    | 15.24 | ± 9.6 % |
| 10306 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC)      | WiMAX    | 14.67 | ± 9.6 % |
| 10307 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC)       | WiMAX    | 14.49 | ± 9.6 % |
| 10308 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)      | WiMAX    | 14.46 | ± 9.6 % |
| 10309 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM,AMC 2x3)    | WiMAX    | 14.58 | ± 9.6 % |
| 10310 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3     | WiMAX    | 14.57 | ± 9.6 % |
| 10311 | AAD | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)                  | LTE-FDD  | 6.06  | ± 9.6 % |
| 10313 | AAA | iDEN 1:3                                                  | iDEN     | 10.51 | ± 9.6 % |
| 10314 | AAA | iDEN 1:6                                                  | iDEN     | 13.48 | _       |
| 10315 | AAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc dc)         | WLAN     |       | ± 9.6 % |
| 10316 | AAB | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc dc)     |          | 1.71  | ± 9.6 % |
| 10317 | AAD | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc dc)           | WLAN     | 8.36  | ± 9.6 % |
| 10352 | AAA | Pulse Waveform (200Hz, 10%)                               | WLAN     | 8.36  | ± 9.6 % |
| 10352 | AAA | Pulse Waveform (200Hz, 10%)                               | Generic  | 10.00 | ± 9.6 % |
|       |     |                                                           | Generic  | 6.99  | ± 9.6 % |
| 10354 | AAA | Pulse Waveform (200Hz, 40%)                               | Generic  | 3.98  | ± 9.6 % |
| 10355 | AAA | Pulse Waveform (200Hz, 60%)                               | Generic  | 2.22  | ± 9.6 % |
| 10356 | AAA | Pulse Waveform (200Hz, 80%)                               | Generic  | 0.97  | ± 9.6 % |
| 10387 | AAA | QPSK Waveform, 1 MHz                                      | Generic  | 5.10  | ± 9.6 % |
| 10388 | AAA | QPSK Waveform, 10 MHz                                     | Generic  | 5.22  | ± 9.6 % |
| 10396 |     | 64-QAM Waveform, 100 kHz                                  | Generic  | 6.27  | ± 9.6 % |
| 10399 | AAA | 64-QAM Waveform, 40 MHz                                   | Generic  | 6.27  | ± 9.6 % |
| 10400 | AAE | IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc dc)               | WLAN     | 8.37  | ± 9.6 % |
| 10401 | AAE | IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc dc)               | WLAN     | 8.60  | ± 9.6 % |
| 10402 | AAE | IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc dc)               | WLAN     | 8.53  | ± 9.6 % |
| 10403 | AAB | CDMA2000 (1xEV-DO, Rev. 0)                                | CDMA2000 | 3.76  | ± 9.6 % |
| 10404 | AAB | CDMA2000 (1xEV-DO, Rev. A)                                | CDMA2000 | 3.77  | ± 9.6 % |
| 10406 | AAB | CDMA2000, RC3, SO32, SCH0, Full Rate                      | CDMA2000 | 5.22  | ± 9.6 % |
| 10410 | AAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub=2,3,4,7,8,9) | LTE-TDD  | 7.82  | ± 9.6 % |

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| 10414 |     | WLAN CCDF, 64-QAM, 40MHz                                   | Generic  | 8.54  | ± 9.6 % |
|-------|-----|------------------------------------------------------------|----------|-------|---------|
| 10415 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc dc)          | WLAN     | 1.54  | ± 9.6 % |
| 10416 | AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc dc)      | WLAN     | 8.23  | ± 9.6 % |
| 10417 | AAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc dc)          | WLAN     | 8.23  | ± 9.6 % |
| 10418 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Long)  | WLAN     | 8.14  | ± 9.6 % |
| 10419 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Short) | WLAN     | 8.19  | ± 9.6 % |
| 10422 | AAC | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)               | WLAN     | 8.32  | ± 9.6 % |
| 10423 | AAC | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)            | WLAN     | 8.47  | ± 9.6 % |
| 10424 | AAC | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)            | WLAN     | 8.40  | ± 9.6 % |
| 10425 | AAC | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)                | WLAN     | 8.41  | ± 9.6 % |
| 10426 | AAC | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)              | WLAN     | 8.45  | ± 9.6 % |
| 10427 | AAC | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)             | WLAN     | 8.41  | ± 9.6 % |
| 10430 | AAD | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)                           | LTE-FDD  |       |         |
| 10431 | AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)                          | LTE-FDD  | 8.28  | ± 9.6 % |
| 10432 | AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)                          | LTE-FDD  | 8.38  | ± 9.6 % |
| 10433 | AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)                          |          | 8.34  | ± 9.6 % |
| 10434 | AAA | W-CDMA (BS Test Model 1, 64 DPCH)                          | LTE-FDD  | 8.34  | ± 9.6 % |
| 10435 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub)              | WCDMA    | 8.60  | ± 9.6 % |
| 10447 | AAD |                                                            | LTE-TDD  | 7.82  | ± 9.6 9 |
|       |     | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)             | LTE-FDD  | 7.56  | ± 9.6 % |
| 10448 | AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)             | LTE-FDD  | 7.53  | ± 9.6 % |
| 10449 | AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)             | LTE-FDD  | 7.51  | ± 9.6 % |
| 10450 | AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)            | LTE-FDD  | 7.48  | ± 9.6 % |
| 10451 | AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)            | WCDMA    | 7.59  | ± 9.6 % |
| 10453 | AAD | Validation (Square, 10ms, 1ms)                             | Test     | 10.00 | ± 9.6 9 |
| 10456 | AAC | IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc dc)               | WLAN     | 8.63  | ± 9.6 9 |
| 10457 | AAA | UMTS-FDD (DC-HSDPA)                                        | WCDMA    | 6.62  | ± 9.6 % |
| 10458 | AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers)                     | CDMA2000 | 6.55  | ± 9.6 % |
| 10459 | AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers)                     | CDMA2000 | 8.25  | ± 9.6 % |
| 10460 | AAA | UMTS-FDD (WCDMA, AMR)                                      | WCDMA    | 2.39  | ± 9.6 % |
| 10461 | AAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Sub)             | LTE-TDD  | 7.82  | ± 9.6 % |
| 10462 | AAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Sub)           | LTE-TDD  | 8.30  | ± 9.6 % |
| 10463 | AAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Sub)           | LTE-TDD  | 8.56  | ± 9.6 % |
| 10464 | AAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Sub)               | LTE-TDD  | 7.82  | ± 9.6 % |
| 10465 | AAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Sub)             | LTE-TDD  | 8.32  | ± 9.6 % |
| 10466 | AAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Sub)             | LTE-TDD  | 8.57  | ± 9.6 % |
| 10467 | AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Sub)               | LTE-TDD  | 7.82  | ± 9.6 % |
| 10468 | AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Sub)             | LTE-TDD  | 8.32  | ± 9.6 % |
| 10469 | AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Sub)             | LTE-TDD  | 8.56  | ± 9.6 % |
| 10470 | AAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub)              | LTE-TDD  | 7.82  |         |
| 10471 | AAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Sub)            | LTE-TDD  |       | ± 9.6 % |
| 10472 | AAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Sub)            |          | 8.32  | ± 9.6 % |
| 10473 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Sub)              | LTE-TDD  | 8.57  | ± 9.6 % |
| 10473 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Sub)            | LTE-TDD  | 7.82  | ± 9.6 % |
| 10474 |     |                                                            | LTE-TDD  | 8.32  | ± 9.6 9 |
|       | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Sub)            | LTE-TDD  | 8.57  | ± 9.6 % |
| 10477 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Sub)            | LTE-TDD  | 8.32  | ± 9.6 % |
| 10478 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Sub)            | LTE-TDD  | 8.57  | ± 9.6 % |
| 10479 | AAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Sub)           | LTE-TDD  | 7.74  | ± 9.6 % |
| 10480 |     | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Sub)         | LTE-TDD  | 8.18  | ± 9.6 % |
| 10481 | AAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Sub)         | LTE-TDD  | 8.45  | ± 9.6 % |
| 10482 | AAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Sub)             | LTE-TDD  | 7.71  | ± 9.6 % |
| 10483 | AAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, Sub)              | LTE-TDD  | 8.39  | ± 9.6 % |
| 10484 | AAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Sub)           | LTE-TDD  | 8.47  | ± 9.6 % |
| 10485 | AAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Sub)             | LTE-TDD  | 7.59  | ± 9.6 % |
| 10486 | AAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Sub)           | LTE-TDD  | 8.38  | ± 9.6 % |
| 10487 | AAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Sub)           | LTE-TDD  | 8.60  | ± 9.6 % |
|       |     | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Sub)            |          |       |         |

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