

IMPORTANT NOTICE

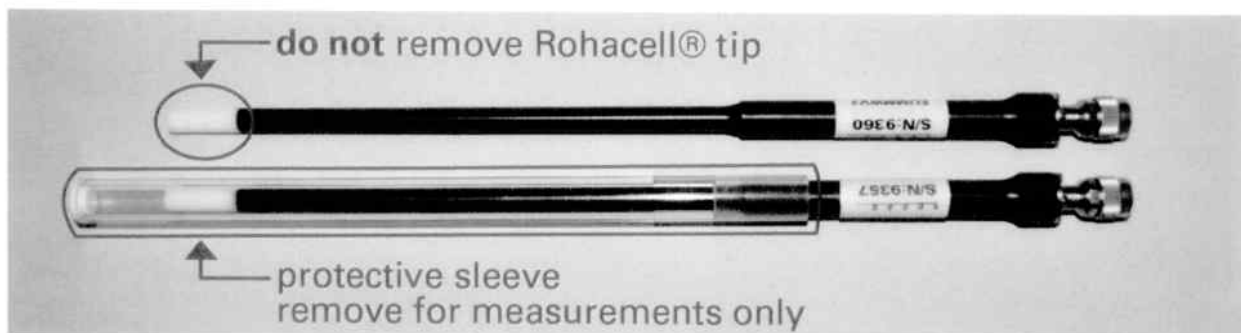
READ INSTRUCTIONS BEFORE USE

Usage and handling of EUmmWVx PROBES

CAUTION!

Never remove protective Rohacell® tip - it is part of the probe design and removal will cause permanent probe damage!

- Each EUmmWVx probe consists of a black PEEK probe body and a white Rohacell® tip.
- The white tip is part of the probe design and extremely fragile; **make sure to handle the probe with utmost care**; in particular, never flex or bend the probe tip.
- The probe is protected with a transparent sleeve; the sleeve must be removed before each measurement; **after using the probe, carefully re-attach the sleeve.**
- **Probe usage is limited to free-space measurements**; water, sugar-water solutions, nutrient solutions and glycol solutions will permanently damage the probe.
- When returning the probe to SPEAG, it must be sent with (1) the protective sleeve mounted to the probe and (2) inside the original packing; take extra care that the shipping box is sent with sufficient paddings.



For support please contact us at: support@speag.com



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

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

Client **Qualcomm USA**

Certificate No: **EUmmWV3-9367_Sep18**

CALIBRATION CERTIFICATE

Object **EUmmWV3 - SN:9367**

Calibration procedure(s) **QA CAL-02.v8, QA CAL-25.v6, QA CAL-42.v2**
Calibration procedure for E-field probes optimized for close near field
evaluations in air

Calibration date: **September 26, 2018**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
Reference Probe ER3DV6	SN: 2328	10-Oct-17 (No. ER3-2328_Oct17)	Oct-18
DAE4	SN: 789	7-Aug-18 (No. DAE4-789_Aug18)	Aug-19
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

Calibrated by:	Name Jeton Kastrati	Function Laboratory Technician	Signature 
Approved by:	Katja Pokovic	Technical Manager	
			Issued: September 29, 2018
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			



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Glossary:

$NORM_{x,y,z}$	sensitivity in free space
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system
Sensor Angles	sensor deviation from the probe axis, used to calculate the field orientation and polarization
$\vec{k}$	is the wave propagation direction

Calibration is Performed According to the Following Standards:

- IEEE Std 1309-2005, "IEEE Standard for calibration of electromagnetic field sensors and probes, excluding antennas, from 9 kHz to 40 GHz", December 2005

Methods Applied and Interpretation of Parameters:

- $NORM_{x,y,z}$: Assessed for E-field polarization $\vartheta = 0$ for XY sensors and $\vartheta = 90$ for Z sensor ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). For frequencies > 6 GHz, the far field in front of waveguide horn antennas is measured for a set of frequencies in various waveguide bands up to 110 GHz.
- $DCP_{x,y,z}$: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- The frequency sensor model parameters are determined prior to calibration based on a frequency sweep (sensor model involving resistors R, R_p , inductance L and capacitors C, C_p).
- $A_{x,y,z}$; $B_{x,y,z}$; $C_{x,y,z}$; $D_{x,y,z}$; $VR_{x,y,z}$: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- Sensor Offset: The sensor offset corresponds to the mechanical from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the $NORM_x$ (no uncertainty required).
- Equivalent Sensor Angle: The two probe sensors are mounted in the same plane at different angles. The angles are assessed using the information gained by determining the $NORM_x$ (no uncertainty required).
- Spherical isotropy (3D deviation from isotropy): in a locally homogeneous field realized using an open waveguide / horn setup.

DASY - Parameters of Probe: EUmmWV3 - SN:9367

Basic Calibration Parameters (750 MHz – 3 GHz)

	Sensor X	Sensor Y	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$)	0.02171	0.02498	$\pm 10.1 \%$
DCP (mV) ^B	118.0	99.0	
Equivalent Sensor Angle	-56.8	29.9	

Calibration results for Frequency Response (6 – 110 GHz)

Frequency GHz	Target E-Field V/m	Deviation Sensor X dB	Deviation Sensor Y dB	Unc (k=2) dB
6.6	40.04	-0.09	0.01	± 0.98 dB
8	48.41	-0.38	-0.39	± 0.98 dB
10	54.41	-0.24	-0.14	± 0.98 dB
15	75.04	0.50	0.19	± 0.98 dB
18	85.30	0.13	0.26	± 0.98 dB
26.6	96.89	0.15	0.28	± 0.98 dB
30	92.55	0.26	0.27	± 0.98 dB
35	93.71	-0.12	0.08	± 0.98 dB
40	91.46	-0.05	-0.25	± 0.98 dB
50	19.62	0.33	0.36	± 0.98 dB
55	22.38	0.58	0.36	± 0.98 dB
60	23.03	0.07	-0.03	± 0.98 dB
65	27.40	-0.02	-0.11	± 0.98 dB
70	23.95	-0.08	-0.26	± 0.98 dB
75	19.61	-0.55	-0.48	± 0.98 dB
75	14.11	-0.34	-0.13	± 0.98 dB
80	21.51	-0.14	-0.02	± 0.98 dB
85	22.75	0.18	0.16	± 0.98 dB
90	23.84	0.15	0.25	± 0.98 dB
92	23.93	0.07	0.07	± 0.98 dB
95	20.55	0.03	0.02	± 0.98 dB
97	24.41	0.17	0.02	± 0.98 dB
100	22.61	0.03	0.03	± 0.98 dB
105	22.75	-0.06	-0.02	± 0.98 dB
110	18.85	-0.26	-0.25	± 0.98 dB

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB/ μV	C	D dB	VR mV	Max dev.	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	124.4	+ 3.5 %	$\pm 4.7 \%$
		Y	0.0	0.0	1.0		55.2		

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%.

^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 - Parameters of Probe: EUmmWV3 - SN:9367

Sensor Frequency Model Parameters

	Sensor X	Sensor Y
R (Ω)	39.03	41.96
R _p (Ω)	95.81	91.97
L (nH)	0.03214	0.03396
C (pF)	0.2228	0.2427
C _p (pF)	0.1243	0.1132

Sensor Model Parameters

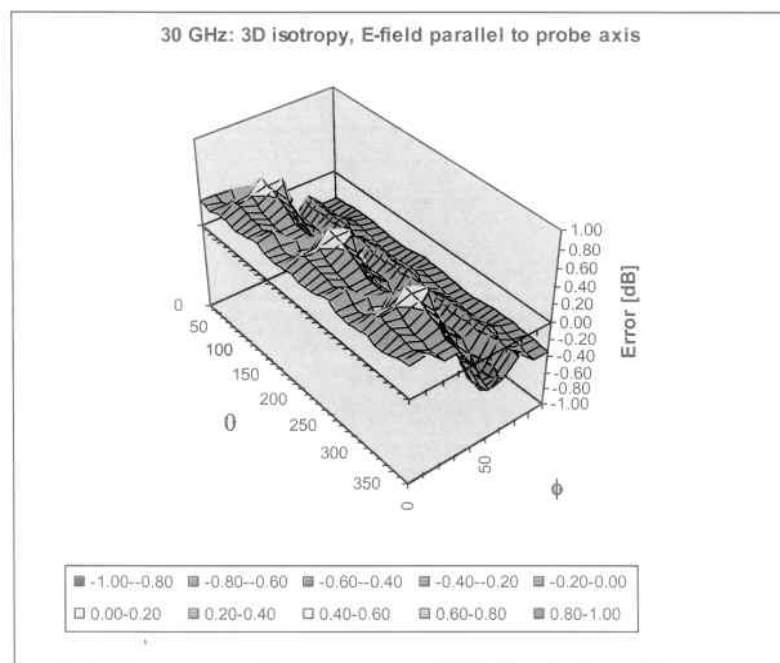
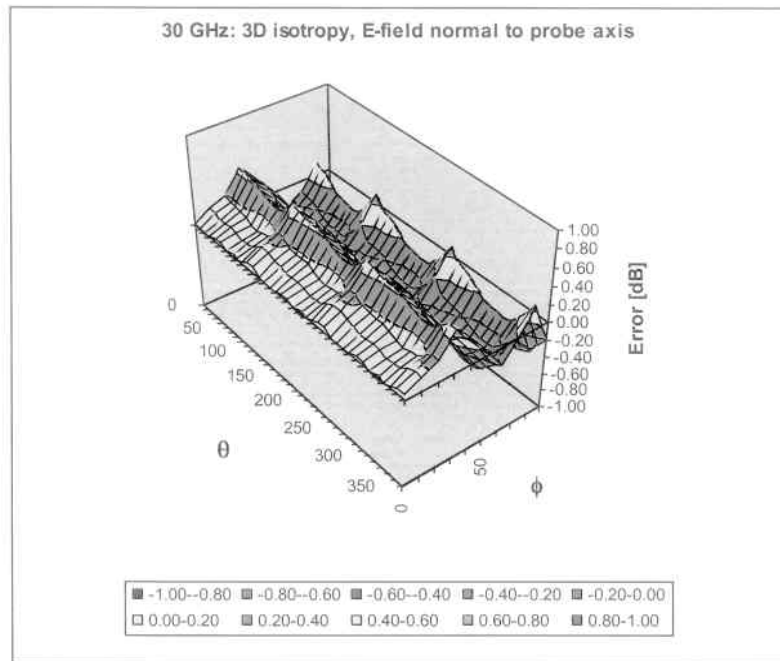
	C1 fF	C2 fF	α V ⁻¹	T1 ms.V ⁻²	T2 ms.V ⁻¹	T3 ms	T4 V ⁻²	T5 V ⁻¹	T6
X	7.329	49.74	30.07	0.916	1.785	4.911	0.449	0.442	0.997
Y	5.629	40.96	33.97	0.916	1.643	4.965	0.000	0.577	1.001

Other Probe Parameters

Sensor Arrangement	Rectangular
Connector Angle (°)	15.8
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	320 mm
Probe Body Diameter	8 mm
Tip Length	23 mm
Tip Diameter	8.0 mm
Probe Tip to Sensor X Calibration Point	1.5 mm
Probe Tip to Sensor Y Calibration Point	1.5 mm

Deviation from Isotropy in Air

$f = 30 \text{ GHz}$



Probe isotropy for E_{tot} : probe rotated $\phi = 0^\circ$ to 360° , tilted from field propagation direction $\vec{k}$
 Parallel to the field propagation ($\psi = 0^\circ - 90^\circ$): deviation within $\pm 0.47 \text{ dB}$
 Normal to field orientation ($\theta = 0^\circ - 90^\circ$): deviation within $\pm 0.52 \text{ dB}$

Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB $\sqrt{\mu V}$	C	D dB	VR mV	Max Unc ^E (k=2)
0	CW	X	0.00	0.00	1.00	0.00	124.4	+ 3.5 %
		Y	0.00	0.00	1.00		55.2	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	57.17	110.11	28.37	10.00	6.0	± 9.6 %
		Y	100.00	121.14	31.54		6.0	
10011-CAB	UMTS-FDD (WCDMA)	X	1.18	74.35	16.27	0.00	34.0	± 9.6 %
		Y	100.00	112.17	22.27		34.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.19	65.34	14.52	0.41	42.0	± 9.6 %
		Y	1.22	67.89	15.47		42.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	3.61	67.29	15.27	1.46	10.0	± 9.6 %
		Y	3.33	67.43	14.81		10.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	100.00	122.88	33.10	9.39	7.0	± 9.6 %
		Y	100.00	128.25	35.53		7.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	27.12	100.32	26.71	9.57	7.0	± 9.6 %
		Y	100.00	123.50	33.23		7.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	100.00	124.22	32.04	6.56	13.0	± 9.6 %
		Y	100.00	132.43	35.63		13.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	4.25	60.00	17.14	12.57	4.0	± 9.6 %
		Y	6.14	60.00	16.41		4.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	5.39	75.57	24.87	9.56	7.0	± 9.6 %
		Y	5.65	78.73	27.46		7.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100.00	131.38	34.17	4.80	19.0	± 9.6 %
		Y	100.00	148.40	41.51		19.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	142.28	38.03	3.55	25.0	± 9.6 %
		Y	100.00	175.07	51.90		25.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	4.10	71.51	22.38	7.80	11.0	± 9.6 %
		Y	4.32	74.58	25.07		11.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	4.76	80.44	18.61	5.30	17.0	± 9.6 %
		Y	100.00	122.53	30.12		17.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	0.95	73.14	17.08	1.88	37.0	± 9.6 %
		Y	100.00	148.27	38.03		37.0	
10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	0.47	67.89	16.02	1.17	43.0	± 9.6 %
		Y	1.53	96.08	28.26		43.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	2.61	69.39	12.90	5.30	11.0	± 9.6 %
		Y	3.08	72.58	13.99		11.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	0.42	60.00	5.63	1.88	23.0	± 9.6 %
		Y	0.32	60.00	4.14		23.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	0.29	60.00	4.93	1.17	27.0	± 9.6 %
		Y	13.58	61.19	1.83		27.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	2.81	70.25	13.28	5.30	11.0	± 9.6 %
		Y	3.96	75.33	15.02		11.0	

10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	3.74	67.41	15.65	2.30	9.0	± 9.6 %
		Y	3.58	68.13	15.62		9.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	3.83	67.55	15.98	2.83	9.0	± 9.6 %
		Y	3.72	68.51	16.15		9.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	3.95	67.80	16.38	3.30	8.0	± 9.6 %
		Y	3.86	68.90	16.72		8.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	4.10	68.17	16.78	3.82	7.0	± 9.6 %
		Y	4.06	69.48	17.30		7.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	4.26	68.38	17.08	4.15	7.0	± 9.6 %
		Y	4.26	69.92	17.74		7.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	4.30	68.44	17.23	4.30	7.0	± 9.6 %
		Y	4.31	70.02	17.93		7.0	
10081-CAB	CDMA2000 (1xRTT, RC3)	X	1.31	206.00	28.61	0.00	27.0	± 9.6 %
		Y	0.00	82.49	50.30		27.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	0.74	60.00	7.05	4.77	19.0	± 9.6 %
		Y	0.66	60.00	6.81		19.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	100.00	124.08	31.99	6.56	13.0	± 9.6 %
		Y	100.00	132.24	35.56		13.0	
10097-CAB	UMTS-FDD (HSDPA)	X	0.85	65.52	10.13	0.00	28.0	± 9.6 %
		Y	0.33	60.00	4.41		28.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	0.91	66.27	10.57	0.00	28.0	± 9.6 %
		Y	0.32	60.00	4.51		28.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	5.41	75.59	24.86	9.56	7.0	± 9.6 %
		Y	5.67	78.77	27.47		7.0	
10100-CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	2.25	69.92	16.86	0.00	21.0	± 9.6 %
		Y	2.38	72.94	18.23		21.0	
10101-CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	2.54	68.39	15.68	0.00	18.0	± 9.6 %
		Y	2.49	69.77	15.99		18.0	
10102-CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	2.64	68.74	15.86	0.00	17.0	± 9.6 %
		Y	2.60	70.10	16.13		17.0	
10103-CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	1.92	60.00	12.77	3.98	9.0	± 9.6 %
		Y	1.57	60.00	13.62		9.0	
10104-CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	4.20	69.09	16.60	3.98	8.0	± 9.6 %
		Y	4.03	69.89	16.88		8.0	
10105-CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	2.27	60.00	12.74	3.98	8.0	± 9.6 %
		Y	1.62	60.00	13.58		8.0	
10108-CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	1.90	70.63	16.34	0.00	20.0	± 9.6 %
		Y	2.20	74.69	17.17		20.0	
10109-CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	2.04	68.49	14.22	0.00	18.0	± 9.6 %
		Y	1.47	65.63	11.46		18.0	
10110-CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	1.19	67.25	12.29	0.00	20.0	± 9.6 %
		Y	0.49	60.00	6.18		20.0	

10153-CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	3.55	68.04	14.65	3.98	8.0	± 9.6 %
		Y	3.02	66.90	13.32		8.0	
10154-CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	1.23	67.73	12.55	0.00	20.0	± 9.6 %
		Y	0.49	60.00	6.21		20.0	
10155-CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	0.85	61.67	7.83	0.00	18.0	± 9.6 %
		Y	0.51	60.00	4.52		18.0	
10156-CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	0.32	60.00	4.11	0.00	20.0	± 9.6 %
		Y	0.00	196.85	109.01		20.0	
10157-CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	36.97	364.62	40.10	0.00	17.0	± 9.6 %
		Y	0.00	60.00	0.00		17.0	
10158-CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	0.83	61.03	7.31	0.00	17.0	± 9.6 %
		Y	0.53	60.00	4.36		17.0	
10159-CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	13.62	348.94	45.07	0.00	17.0	± 9.6 %
		Y	0.00	60.00	0.00		17.0	
10160-CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	1.91	70.04	14.69	0.00	20.0	± 9.6 %
		Y	4.24	75.46	13.93		20.0	
10161-CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	1.61	65.90	11.74	0.00	18.0	± 9.6 %
		Y	0.81	60.00	6.62		18.0	
10162-CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	1.62	65.79	11.61	0.00	17.0	± 9.6 %
		Y	0.81	60.00	6.52		17.0	
10166-CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	2.42	65.17	16.76	3.01	20.0	± 9.6 %
		Y	2.45	66.04	17.90		20.0	
10167-CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	2.57	66.73	16.74	3.01	17.0	± 9.6 %
		Y	2.63	67.74	17.88		17.0	
10168-CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	2.84	69.22	18.51	3.01	16.0	± 9.6 %
		Y	3.03	71.36	20.28		16.0	
10169-CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	2.67	66.42	17.05	3.01	19.0	± 9.6 %
		Y	2.75	67.37	18.16		19.0	
10170-CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	3.38	71.11	19.11	3.01	16.0	± 9.6 %
		Y	3.65	73.21	20.78		16.0	
10171-AAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	2.80	67.22	16.29	3.01	16.0	± 9.6 %
		Y	2.88	68.04	17.25		16.0	
10172-CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	1.95	60.00	13.40	6.02	9.0	± 9.6 %
		Y	1.85	60.00	14.69		9.0	
10173-CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	3.46	70.67	17.50	6.02	8.0	± 9.6 %
		Y	4.05	74.71	20.25		8.0	
10174-CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	2.38	60.00	11.40	6.02	7.0	± 9.6 %
		Y	2.06	60.00	12.97		7.0	
10175-CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	2.64	66.15	16.81	3.01	19.0	± 9.6 %
		Y	2.71	67.02	17.88		19.0	
10176-CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	3.39	71.12	19.12	3.01	16.0	± 9.6 %
		Y	3.66	73.23	20.79		16.0	

10221-CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	3.44	68.40	15.41	0.00	13.0	± 9.6 %
		Y	3.04	67.91	14.49		13.0	
10222-CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	4.06	67.80	16.25	0.00	13.0	± 9.6 %
		Y	3.91	68.39	16.55		13.0	
10223-CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	4.20	68.26	16.29	0.00	12.0	± 9.6 %
		Y	4.02	68.89	16.53		12.0	
10224-CAC	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	4.07	68.07	16.28	0.00	13.0	± 9.6 %
		Y	3.90	68.66	16.55		13.0	
10225-CAB	UMTS-FDD (HSPA+)	X	0.82	60.00	5.52	0.00	20.0	± 9.6 %
		Y	27.79	61.46	1.96		20.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	3.52	71.06	17.74	6.02	8.0	± 9.6 %
		Y	4.19	75.46	20.65		8.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	3.35	70.20	16.96	6.02	7.0	± 9.6 %
		Y	3.95	74.33	19.74		7.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	3.01	69.62	18.46	6.02	9.0	± 9.6 %
		Y	3.32	73.03	21.14		9.0	
10229-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	3.46	70.71	17.52	6.02	8.0	± 9.6 %
		Y	4.06	74.80	20.29		8.0	
10230-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	3.29	69.86	16.75	6.02	7.0	± 9.6 %
		Y	3.83	73.70	19.41		7.0	
10231-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	2.97	69.31	18.24	6.02	9.0	± 9.6 %
		Y	3.25	72.50	20.81		9.0	
10232-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	3.46	70.70	17.52	6.02	8.0	± 9.6 %
		Y	4.06	74.79	20.29		8.0	
10233-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	3.29	69.86	16.76	6.02	7.0	± 9.6 %
		Y	3.83	73.69	19.41		7.0	
10234-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	2.92	69.00	18.01	6.02	9.0	± 9.6 %
		Y	3.18	72.00	20.48		9.0	
10235-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	3.46	70.70	17.52	6.02	8.0	± 9.6 %
		Y	4.06	74.76	20.28		8.0	
10236-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	3.30	69.88	16.77	6.02	7.0	± 9.6 %
		Y	3.84	73.71	19.41		7.0	
10237-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	2.96	69.27	18.23	6.02	9.0	± 9.6 %
		Y	3.24	72.43	20.78		9.0	
10238-CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	3.46	70.70	17.51	6.02	8.0	± 9.6 %
		Y	4.06	74.76	20.28		8.0	
10239-CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	3.29	69.85	16.75	6.02	7.0	± 9.6 %
		Y	3.83	73.66	19.40		7.0	
10240-CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	2.96	69.27	18.22	6.02	9.0	± 9.6 %
		Y	3.24	72.42	20.78		9.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	3.84	69.71	19.46	6.98	8.0	± 9.6 %
		Y	3.92	71.21	21.12		8.0	

10263-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.06	62.34	8.98	3.98	8.0	± 9.6 %
		Y	1.44	60.00	6.42		8.0	
10264-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	2.36	66.27	12.47	3.98	9.0	± 9.6 %
		Y	1.76	63.84	10.17		9.0	
10265-CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	3.26	66.84	13.75	3.98	8.0	± 9.6 %
		Y	2.73	65.59	12.36		8.0	
10266-CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	3.54	68.02	14.63	3.98	8.0	± 9.6 %
		Y	3.01	66.87	13.30		8.0	
10267-CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	3.45	70.23	16.21	3.98	9.0	± 9.6 %
		Y	3.38	71.54	16.42		9.0	
10268-CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	4.24	69.26	16.38	3.98	8.0	± 9.6 %
		Y	3.99	69.75	16.28		8.0	
10269-CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	4.26	69.08	16.21	3.98	8.0	± 9.6 %
		Y	3.96	69.37	15.98		8.0	
10270-CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	4.15	71.27	17.55	3.98	9.0	± 9.6 %
		Y	4.27	73.65	18.59		9.0	
10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	0.71	60.00	5.82	0.00	24.0	± 9.6 %
		Y	19.23	61.11	1.86		24.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	1.10	69.49	12.87	0.00	28.0	± 9.6 %
		Y	0.32	60.00	5.48		28.0	
10277-CAA	PHS (QPSK)	X	2.72	63.48	9.26	9.03	5.0	± 9.6 %
		Y	2.33	62.43	8.42		5.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	3.11	64.17	9.63	9.03	5.0	± 9.6 %
		Y	2.60	63.07	8.76		5.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	3.09	63.99	9.49	9.03	4.0	± 9.6 %
		Y	2.57	62.85	8.59		4.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	4.02	216.28	19.34	0.00	28.0	± 9.6 %
		Y	0.00	114.07	76.74		28.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	1.35	206.02	28.20	0.00	30.0	± 9.6 %
		Y	0.00	81.66	49.62		30.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	20.09	270.51	35.93	0.00	31.0	± 9.6 %
		Y	0.00	91.74	58.80		31.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	0.10	60.00	3.71	0.00	30.0	± 9.6 %
		Y	0.00	99.41	78.41		30.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	100.00	106.27	25.03	9.03	4.0	± 9.6 %
		Y	2243.57	133.00	28.68		4.0	
10297-AAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	1.93	70.93	16.51	0.00	20.0	± 9.6 %
		Y	2.32	75.49	17.52		20.0	
10298-AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	0.09	230.80	12.81	0.00	20.0	± 9.6 %
		Y	0.00	60.00	0.00		20.0	
10299-AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	4.50	347.37	43.23	0.00	17.0	± 9.6 %
		Y	0.00	60.00	0.00		17.0	

10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	4.02	216.28	19.34	0.00	29.0	± 9.6 %
		Y	0.00	114.07	76.74		29.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	12.28	89.29	18.44	0.00	22.0	± 9.6 %
		Y	100.00	115.54	25.55		22.0	
10410-AAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4)	X	1.53	66.69	13.20	3.23	12.0	± 9.6 %
		Y	2.31	74.20	17.45		12.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	1.11	66.03	14.92	0.00	45.0	± 9.6 %
		Y	1.16	69.18	15.97		45.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	3.35	68.29	15.22	0.00	13.0	± 9.6 %
		Y	2.92	67.61	14.12		13.0	
10417-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	3.35	68.29	15.22	0.00	13.0	± 9.6 %
		Y	2.92	67.61	14.12		13.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preamble)	X	3.28	68.32	15.26	0.00	13.0	± 9.6 %
		Y	2.86	67.69	14.18		13.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preamble)	X	3.31	68.30	15.23	0.00	13.0	± 9.6 %
		Y	2.88	67.61	14.11		13.0	
10422-AAB	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	3.42	68.31	15.36	0.00	13.0	± 9.6 %
		Y	3.03	67.88	14.46		13.0	
10423-AAB	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	3.42	68.32	15.31	0.00	12.0	± 9.6 %
		Y	3.00	67.74	14.32		12.0	
10424-AAB	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	3.41	68.32	15.33	0.00	12.0	± 9.6 %
		Y	3.01	67.85	14.40		12.0	
10425-AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	4.18	68.13	16.29	0.00	12.0	± 9.6 %
		Y	4.03	68.80	16.56		12.0	
10426-AAB	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	4.17	68.14	16.29	0.00	12.0	± 9.6 %
		Y	3.99	68.72	16.52		12.0	
10427-AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	4.20	68.17	16.30	0.00	12.0	± 9.6 %
		Y	4.02	68.77	16.54		12.0	
10430-AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	0.89	60.00	5.80	0.00	12.0	± 9.6 %
		Y	97.73	61.49	1.75		12.0	
10431-AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	2.10	64.67	11.21	0.00	12.0	± 9.6 %
		Y	1.27	60.33	7.13		12.0	
10432-AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	2.99	67.69	14.30	0.00	12.0	± 9.6 %
		Y	2.33	65.52	12.13		12.0	
10433-AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	3.43	68.37	15.40	0.00	12.0	± 9.6 %
		Y	3.04	67.92	14.49		12.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	0.72	60.00	4.64	0.00	11.0	± 9.6 %
		Y	755.27	62.45	1.82		11.0	
10435-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.52	66.58	13.11	3.23	12.0	± 9.6 %
		Y	2.26	73.83	17.26		12.0	

10472-AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.89	60.00	7.60	3.23	10.0	± 9.6 %
		Y	0.86	60.00	8.16		10.0	
10473-AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.91	61.14	10.79	3.23	12.0	± 9.6 %
		Y	1.47	68.89	15.51		12.0	
10474-AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.90	60.00	8.10	3.23	11.0	± 9.6 %
		Y	0.90	60.37	8.91		11.0	
10475-AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.89	60.00	7.60	3.23	10.0	± 9.6 %
		Y	0.85	60.00	8.16		10.0	
10477-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.90	60.00	8.08	3.23	11.0	± 9.6 %
		Y	0.90	60.28	8.84		11.0	
10478-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.89	60.00	7.59	3.23	10.0	± 9.6 %
		Y	0.86	60.00	8.15		10.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.91	61.51	11.56	3.23	12.0	± 9.6 %
		Y	1.48	70.43	16.93		12.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.83	60.00	8.57	3.23	11.0	± 9.6 %
		Y	0.92	61.92	10.16		11.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.82	60.00	8.10	3.23	11.0	± 9.6 %
		Y	0.77	60.00	8.61		11.0	
10482-AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	14.45	197.77	17.14	2.23	13.0	± 9.6 %
		Y	0.00	118.41	58.10		13.0	
10483-AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.22	153.07	4.55	2.23	11.0	± 9.6 %
		Y	0.00	60.00	0.00		11.0	
10484-AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.00	155.87	4.23	2.23	11.0	± 9.6 %
		Y	0.00	123.20	68.98		11.0	
10485-AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.35	53.98	2.00	2.23	13.0	± 9.6 %
		Y	4.91	222.19	33.77		13.0	
10486-AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	44.74	195.39	2.43	2.23	11.0	± 9.6 %
		Y	0.00	60.00	0.00		11.0	
10487-AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	47.80	197.91	0.92	2.23	11.0	± 9.6 %
		Y	0.00	132.76	57.95		11.0	
10488-AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.12	61.45	9.84	2.23	13.0	± 9.6 %
		Y	0.80	60.00	7.64		13.0	
10489-AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.10	60.00	7.68	2.23	12.0	± 9.6 %
		Y	0.98	60.00	5.77		12.0	
10490-AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.12	60.00	7.54	2.23	11.0	± 9.6 %
		Y	1.03	60.00	5.58		11.0	
10491-AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.62	63.65	12.21	2.23	13.0	± 9.6 %
		Y	1.36	63.23	11.02		13.0	
10492-AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.57	61.37	10.03	2.23	11.0	± 9.6 %
		Y	1.18	60.00	7.98		11.0	

10512-AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.36	65.91	15.08	2.23	13.0	± 9.6 %
		Y	2.66	69.78	17.11		13.0	
10513-AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.71	65.34	14.62	2.23	12.0	± 9.6 %
		Y	2.85	67.76	15.69		12.0	
10514-AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.78	65.34	14.59	2.23	11.0	± 9.6 %
		Y	2.89	67.55	15.52		11.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	1.07	66.24	15.01	0.00	45.0	± 9.6 %
		Y	1.15	69.91	16.24		45.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	0.73	70.31	18.04	0.00	43.0	± 9.6 %
		Y	4.12	105.93	31.04		43.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.93	67.85	16.02	0.00	44.0	± 9.6 %
		Y	1.48	78.23	20.16		44.0	
10518-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	3.33	68.46	15.30	0.00	13.0	± 9.6 %
		Y	2.89	67.77	14.22		13.0	
10519-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	3.32	68.26	15.18	0.00	12.0	± 9.6 %
		Y	2.86	67.43	13.99		12.0	
10520-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	3.29	68.41	15.25	0.00	13.0	± 9.6 %
		Y	2.86	67.73	14.15		13.0	
10521-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	3.27	68.36	15.17	0.00	13.0	± 9.6 %
		Y	2.85	67.70	14.05		13.0	
10522-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	3.31	68.57	15.27	0.00	12.0	± 9.6 %
		Y	2.86	67.81	14.15		12.0	
10523-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	3.22	68.45	15.25	0.00	13.0	± 9.6 %
		Y	2.81	67.79	14.15		13.0	
10524-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	3.19	68.08	15.10	0.00	13.0	± 9.6 %
		Y	2.82	67.58	14.08		13.0	
10525-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	3.34	67.87	15.19	0.00	12.0	± 9.6 %
		Y	2.97	67.53	14.34		12.0	
10526-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	3.38	68.00	15.25	0.00	12.0	± 9.6 %
		Y	2.99	67.63	14.39		12.0	
10527-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	3.31	67.87	15.16	0.00	13.0	± 9.6 %
		Y	2.93	67.49	14.28		13.0	
10528-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	3.33	67.88	15.15	0.00	12.0	± 9.6 %
		Y	2.95	67.48	14.26		12.0	
10529-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	3.33	67.88	15.15	0.00	12.0	± 9.6 %
		Y	2.95	67.48	14.26		12.0	
10531-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	3.32	67.97	15.19	0.00	12.0	± 9.6 %
		Y	2.96	67.71	14.37		12.0	
10532-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	3.25	67.76	15.08	0.00	13.0	± 9.6 %
		Y	2.91	67.54	14.27		13.0	

10556-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	4.98	66.69	15.79	0.00	12.0	± 9.6 %
		Y	4.80	66.56	15.95		12.0	
10557-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	4.96	66.67	15.80	0.00	12.0	± 9.6 %
		Y	4.77	66.51	15.94		12.0	
10558-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	4.97	66.70	15.82	0.00	12.0	± 9.6 %
		Y	4.81	66.63	16.00		12.0	
10560-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	4.99	66.67	15.82	0.00	12.0	± 9.6 %
		Y	4.82	66.55	15.98		12.0	
10561-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	4.94	66.63	15.81	0.00	12.0	± 9.6 %
		Y	4.76	66.50	15.96		12.0	
10562-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	4.97	66.70	15.85	0.00	12.0	± 9.6 %
		Y	4.79	66.56	15.99		12.0	
10563-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	5.10	66.99	15.98	0.00	12.0	± 9.6 %
		Y	4.95	67.00	16.19		12.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	3.56	68.05	15.42	0.46	13.0	± 9.6 %
		Y	3.20	67.88	14.80		13.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	3.70	68.63	15.85	0.46	12.0	± 9.6 %
		Y	3.37	68.67	15.33		12.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	3.58	68.33	15.61	0.46	13.0	± 9.6 %
		Y	3.25	68.30	15.06		13.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	3.86	69.82	16.58	0.46	13.0	± 9.6 %
		Y	3.68	70.59	16.43		13.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	3.38	67.36	14.83	0.46	12.0	± 9.6 %
		Y	3.00	67.00	14.10		12.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	3.88	70.26	16.90	0.46	13.0	± 9.6 %
		Y	3.77	71.33	16.92		13.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	3.72	69.25	16.34	0.46	13.0	± 9.6 %
		Y	3.54	69.94	16.15		13.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.16	65.27	14.31	0.46	41.0	± 9.6 %
		Y	1.18	67.79	15.16		41.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.17	65.93	14.78	0.46	41.0	± 9.6 %
		Y	1.27	69.53	16.18		41.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	0.95	71.34	18.12	0.46	39.0	± 9.6 %
		Y	6.59	108.79	31.39		39.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.36	71.90	18.41	0.46	40.0	± 9.6 %
		Y	11.21	110.87	31.54		40.0	
10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	3.32	67.35	14.74	0.46	12.0	± 9.6 %
		Y	2.91	66.78	13.74		12.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	3.38	67.89	15.11	0.46	12.0	± 9.6 %
		Y	3.00	67.49	14.24		12.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	3.41	67.91	15.14	0.46	12.0	± 9.6 %
		Y	3.01	67.41	14.19		12.0	

10599-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	4.34	68.03	16.34	0.46	11.0	± 9.6 %
		Y	4.28	69.06	16.80		11.0	
10600-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	4.23	67.66	16.10	0.46	11.0	± 9.6 %
		Y	4.08	68.32	16.40		11.0	
10601-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	4.21	67.66	16.16	0.46	11.0	± 9.6 %
		Y	4.06	68.35	16.49		11.0	
10602-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	4.19	67.33	15.90	0.46	11.0	± 9.6 %
		Y	4.07	68.09	16.26		11.0	
10603-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	4.31	67.93	16.39	0.46	11.0	± 9.6 %
		Y	4.27	69.04	16.91		11.0	
10604-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	4.26	67.61	16.18	0.46	12.0	± 9.6 %
		Y	4.11	68.27	16.51		12.0	
10605-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	4.19	67.30	16.00	0.46	11.0	± 9.6 %
		Y	4.05	67.95	16.30		11.0	
10606-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	4.08	66.88	15.60	0.46	11.0	± 9.6 %
		Y	3.96	67.56	15.90		11.0	
10607-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	3.37	67.19	14.95	0.46	12.0	± 9.6 %
		Y	3.04	67.08	14.28		12.0	
10608-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	3.42	67.38	15.06	0.46	11.0	± 9.6 %
		Y	3.09	67.28	14.40		11.0	
10609-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	3.27	66.84	14.67	0.46	12.0	± 9.6 %
		Y	2.92	66.57	13.91		12.0	
10610-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	3.39	67.34	15.01	0.46	11.0	± 9.6 %
		Y	3.06	67.25	14.33		11.0	
10611-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	3.29	67.00	14.77	0.46	11.0	± 9.6 %
		Y	2.96	66.89	14.09		11.0	
10612-AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	3.20	66.67	14.51	0.46	11.0	± 9.6 %
		Y	2.84	66.34	13.70		11.0	
10613-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	3.20	66.51	14.40	0.46	11.0	± 9.6 %
		Y	2.85	66.22	13.63		11.0	
10614-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	3.35	67.46	15.09	0.46	12.0	± 9.6 %
		Y	3.08	67.62	14.55		12.0	
10615-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	3.08	65.96	14.02	0.46	11.0	± 9.6 %
		Y	2.70	65.45	13.11		11.0	
10616-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	4.12	67.14	15.92	0.46	11.0	± 9.6 %
		Y	3.99	67.92	16.30		11.0	
10617-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	4.09	67.01	15.83	0.46	11.0	± 9.6 %
		Y	3.95	67.73	16.18		11.0	
10618-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	4.06	67.18	15.96	0.46	12.0	± 9.6 %
		Y	3.93	67.95	16.35		12.0	
10619-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	4.03	66.82	15.71	0.46	11.0	± 9.6 %
		Y	3.86	67.42	16.01		11.0	

10641-AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	5.08	66.33	15.71	0.46	11.0	± 9.6 %
		Y	5.01	66.59	16.07		11.0	
10642-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	5.16	66.75	16.13	0.46	11.0	± 9.6 %
		Y	5.02	66.82	16.42		11.0	
10643-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	4.98	66.20	15.67	0.46	11.0	± 9.6 %
		Y	4.83	66.19	15.90		11.0	
10644-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	5.03	66.36	15.78	0.46	11.0	± 9.6 %
		Y	4.88	66.33	16.00		11.0	
10645-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	5.20	66.76	15.96	0.46	11.0	± 9.6 %
		Y	5.08	66.90	16.26		11.0	
10646-AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	4.08	72.32	21.51	9.30	5.0	± 9.6 %
		Y	4.20	74.65	23.67		5.0	
10647-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	3.79	71.39	21.20	9.30	5.0	± 9.6 %
		Y	3.88	73.51	23.29		5.0	
10648-AAA	CDMA2000 (1x Advanced)	X	1.87	268.09	27.53	0.00	30.0	± 9.6 %
		Y	0.00	62.43	33.47		30.0	
10652-AAD	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	1.30	60.02	8.52	2.23	80.0	± 9.6 %
		Y	1.06	60.00	7.04		80.0	
10653-AAD	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	2.61	64.60	13.08	2.23	80.0	± 9.6 %
		Y	2.15	63.55	11.71		80.0	
10654-AAD	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	3.06	65.52	14.49	2.23	80.0	± 9.6 %
		Y	2.98	66.68	14.63		80.0	
10655-AAE	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	3.32	65.59	15.06	2.23	80.0	± 9.6 %
		Y	3.33	67.14	15.68		80.0	
10658-AAA	Pulse Waveform (200Hz, 10%)	X	7.24	77.24	18.30	10.00	6.0	± 9.6 %
		Y	10.50	83.67	20.67		6.0	
10659-AAA	Pulse Waveform (200Hz, 20%)	X	6.38	79.94	18.40	6.99	12.0	± 9.6 %
		Y	49.00	107.93	26.55		12.0	
10660-AAA	Pulse Waveform (200Hz, 40%)	X	4.20	81.74	18.71	3.98	23.0	± 9.6 %
		Y	100.00	123.95	29.84		23.0	
10661-AAA	Pulse Waveform (200Hz, 60%)	X	1.71	78.31	18.38	2.22	27.0	± 9.6 %
		Y	100.00	137.06	33.92		27.0	
10662-AAA	Pulse Waveform (200Hz, 80%)	X	0.45	68.60	16.52	0.97	44.0	± 9.6 %
		Y	3.38	112.44	33.12		44.0	
10670-AAA	Bluetooth Low Energy	X	1.31	75.76	18.10	2.19	43.0	± 9.6 %
		Y	100.00	145.88	37.62		43.0	

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

10620-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	4.08	66.85	15.72	0.46	11.0	± 9.6 %
		Y	3.92	67.48	16.02		11.0	
10621-AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	4.22	67.50	16.25	0.46	12.0	± 9.6 %
		Y	4.11	68.42	16.73		12.0	
10622-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	4.18	67.43	16.22	0.46	12.0	± 9.6 %
		Y	4.07	68.32	16.68		12.0	
10623-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	4.05	66.77	15.64	0.46	11.0	± 9.6 %
		Y	3.91	67.49	15.99		11.0	
10624-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	4.20	67.18	15.95	0.46	11.0	± 9.6 %
		Y	4.06	67.94	16.33		11.0	
10625-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	4.29	67.40	16.14	0.46	11.0	± 9.6 %
		Y	4.18	68.28	16.58		11.0	
10626-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	4.56	66.41	15.78	0.46	11.0	± 9.6 %
		Y	4.38	66.59	16.04		11.0	
10627-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	4.58	66.51	15.83	0.46	11.0	± 9.6 %
		Y	4.42	66.77	16.12		11.0	
10628-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	4.50	66.21	15.55	0.46	12.0	± 9.6 %
		Y	4.33	66.39	15.81		12.0	
10629-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	4.50	66.14	15.52	0.46	11.0	± 9.6 %
		Y	4.36	66.42	15.82		11.0	
10630-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	4.52	66.43	15.68	0.46	12.0	± 9.6 %
		Y	4.43	66.93	16.09		12.0	
10631-AAB	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	4.67	67.25	16.37	0.46	11.0	± 9.6 %
		Y	4.55	67.68	16.77		11.0	
10632-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	4.62	66.95	16.21	0.46	12.0	± 9.6 %
		Y	4.49	67.32	16.55		12.0	
10633-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	4.54	66.48	15.76	0.46	11.0	± 9.6 %
		Y	4.40	66.81	16.09		11.0	
10634-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	4.53	66.65	15.88	0.46	11.0	± 9.6 %
		Y	4.37	66.89	16.16		11.0	
10635-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	4.32	65.56	14.91	0.46	11.0	± 9.6 %
		Y	4.12	65.62	15.06		11.0	
10636-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	5.06	66.39	15.79	0.46	11.0	± 9.6 %
		Y	4.92	66.42	16.06		11.0	
10637-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	5.07	66.45	15.83	0.46	12.0	± 9.6 %
		Y	4.94	66.49	16.10		12.0	
10638-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	5.05	66.39	15.77	0.46	11.0	± 9.6 %
		Y	4.91	66.41	16.03		11.0	
10639-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	5.06	66.46	15.85	0.46	11.0	± 9.6 %
		Y	4.90	66.44	16.10		11.0	
10640-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	5.01	66.28	15.67	0.46	11.0	± 9.6 %
		Y	4.89	66.35	15.95		11.0	

10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	3.51	68.73	15.68	0.46	12.0	± 9.6 %
		Y	3.18	68.64	14.97		12.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	3.05	66.28	13.86	0.46	12.0	± 9.6 %
		Y	2.64	65.54	12.74		12.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	3.05	66.24	13.79	0.46	11.0	± 9.6 %
		Y	2.62	65.43	12.65		11.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	3.41	68.57	15.54	0.46	12.0	± 9.6 %
		Y	3.09	68.47	14.81		12.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	2.87	65.36	13.24	0.46	11.0	± 9.6 %
		Y	2.48	64.62	12.11		11.0	
10583-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	3.32	67.35	14.74	0.46	12.0	± 9.6 %
		Y	2.91	66.78	13.74		12.0	
10584-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	3.38	67.89	15.11	0.46	12.0	± 9.6 %
		Y	3.00	67.49	14.24		12.0	
10585-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	3.41	67.91	15.14	0.46	12.0	± 9.6 %
		Y	3.01	67.41	14.19		12.0	
10586-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	3.51	68.73	15.68	0.46	12.0	± 9.6 %
		Y	3.18	68.64	14.97		12.0	
10587-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	3.05	66.28	13.86	0.46	12.0	± 9.6 %
		Y	2.64	65.54	12.74		12.0	
10588-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	3.05	66.24	13.79	0.46	11.0	± 9.6 %
		Y	2.62	65.43	12.65		11.0	
10589-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	3.41	68.57	15.54	0.46	12.0	± 9.6 %
		Y	3.09	68.47	14.81		12.0	
10590-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	2.87	65.36	13.24	0.46	11.0	± 9.6 %
		Y	2.48	64.62	12.11		11.0	
10591-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	3.52	67.81	15.23	0.46	12.0	± 9.6 %
		Y	3.17	67.61	14.51		12.0	
10592-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	3.55	67.95	15.32	0.46	11.0	± 9.6 %
		Y	3.19	67.75	14.60		11.0	
10593-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	3.43	67.57	15.03	0.46	12.0	± 9.6 %
		Y	3.06	67.23	14.23		12.0	
10594-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	3.54	68.00	15.35	0.46	11.0	± 9.6 %
		Y	3.20	67.86	14.66		11.0	
10595-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	3.46	67.83	15.17	0.46	11.0	± 9.6 %
		Y	3.12	67.69	14.48		11.0	
10596-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	3.37	67.46	14.96	0.46	11.0	± 9.6 %
		Y	3.02	67.16	14.16		11.0	
10597-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	3.36	67.47	14.89	0.46	11.0	± 9.6 %
		Y	2.99	67.14	14.12		11.0	
10598-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	3.51	68.32	15.54	0.46	12.0	± 9.6 %
		Y	3.23	68.47	15.01		12.0	

10533-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	3.26	67.81	15.09	0.00	12.0	± 9.6 %
		Y	2.88	67.40	14.18		12.0	
10534-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	4.06	67.56	16.01	0.00	12.0	± 9.6 %
		Y	3.90	68.23	16.30		12.0	
10535-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	4.05	67.55	16.01	0.00	12.0	± 9.6 %
		Y	3.90	68.22	16.30		12.0	
10536-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	3.98	67.51	15.98	0.00	13.0	± 9.6 %
		Y	3.82	68.15	16.26		13.0	
10537-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	4.03	67.56	16.04	0.00	12.0	± 9.6 %
		Y	3.85	68.15	16.31		12.0	
10538-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	4.07	67.53	16.01	0.00	12.0	± 9.6 %
		Y	3.90	68.13	16.27		12.0	
10540-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	4.04	67.49	16.04	0.00	12.0	± 9.6 %
		Y	3.88	68.11	16.32		12.0	
10541-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	4.06	67.57	16.03	0.00	12.0	± 9.6 %
		Y	3.92	68.30	16.35		12.0	
10542-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	4.15	67.69	16.11	0.00	12.0	± 9.6 %
		Y	3.98	68.34	16.40		12.0	
10543-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	4.18	67.64	16.11	0.00	12.0	± 9.6 %
		Y	4.03	68.32	16.42		12.0	
10544-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	4.48	66.72	15.80	0.00	12.0	± 9.6 %
		Y	4.28	66.77	15.97		12.0	
10545-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	4.48	66.74	15.79	0.00	12.0	± 9.6 %
		Y	4.30	66.85	15.99		12.0	
10546-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	4.49	66.79	15.81	0.00	13.0	± 9.6 %
		Y	4.29	66.87	15.99		13.0	
10547-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	4.48	66.72	15.78	0.00	12.0	± 9.6 %
		Y	4.30	66.86	15.98		12.0	
10548-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	4.47	66.87	15.83	0.00	13.0	± 9.6 %
		Y	4.33	67.17	16.11		13.0	
10550-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	4.42	66.69	15.76	0.00	13.0	± 9.6 %
		Y	4.23	66.78	15.92		13.0	
10551-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	4.46	66.81	15.82	0.00	12.0	± 9.6 %
		Y	4.28	66.97	16.03		12.0	
10552-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	4.42	66.77	15.75	0.00	12.0	± 9.6 %
		Y	4.23	66.88	15.92		12.0	
10553-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	4.48	66.90	15.82	0.00	12.0	± 9.6 %
		Y	4.27	66.99	15.98		12.0	
10554-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	4.97	66.64	15.77	0.00	12.0	± 9.6 %
		Y	4.80	66.53	15.94		12.0	
10555-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	4.98	66.66	15.79	0.00	12.0	± 9.6 %
		Y	4.80	66.55	15.96		12.0	

10493-AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.55	61.05	9.75	2.23	11.0	± 9.6 %
		Y	1.19	60.00	7.85		11.0	
10494-AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.86	65.14	13.80	2.23	13.0	± 9.6 %
		Y	2.15	69.05	15.12		13.0	
10495-AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.02	63.92	12.40	2.23	12.0	± 9.6 %
		Y	1.66	63.02	11.05		12.0	
10496-AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.04	63.71	12.22	2.23	11.0	± 9.6 %
		Y	1.62	62.39	10.62		11.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.55	139.19	8.53	2.23	13.0	± 9.6 %
		Y	0.00	60.00	0.00		13.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.00	60.00	0.00	2.23	11.0	± 9.6 %
		Y	0.00	66.91	33.03		11.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.00	60.00	0.00	2.23	10.0	± 9.6 %
		Y	0.00	60.00	0.00		10.0	
10500-AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.77	60.00	6.69	2.23	13.0	± 9.6 %
		Y	32.58	60.11	2.40		13.0	
10501-AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.32	60.00	4.33	2.23	11.0	± 9.6 %
		Y	238.34	58.17	1.25		11.0	
10502-AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.57	60.00	4.05	2.23	11.0	± 9.6 %
		Y	160.61	57.70	1.09		11.0	
10503-AAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.10	61.31	9.75	2.23	13.0	± 9.6 %
		Y	0.80	60.00	7.61		13.0	
10504-AAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.10	60.00	7.65	2.23	12.0	± 9.6 %
		Y	0.99	60.00	5.73		12.0	
10505-AAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.12	60.00	7.52	2.23	11.0	± 9.6 %
		Y	1.04	60.00	5.54		11.0	
10506-AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.84	65.02	13.72	2.23	13.0	± 9.6 %
		Y	2.10	68.71	14.95		13.0	
10507-AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.00	63.83	12.33	2.23	12.0	± 9.6 %
		Y	1.64	62.88	10.96		12.0	
10508-AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.03	63.61	12.15	2.23	11.0	± 9.6 %
		Y	1.60	62.25	10.53		11.0	
10509-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.34	65.78	14.85	2.23	12.0	± 9.6 %
		Y	2.58	69.31	16.48		12.0	
10510-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.66	65.30	14.24	2.23	11.0	± 9.6 %
		Y	2.67	67.01	14.70		11.0	
10511-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.71	65.24	14.15	2.23	11.0	± 9.6 %
		Y	2.66	66.62	14.41		11.0	

10447-AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	0.82	60.00	5.09	0.00	14.0	± 9.6 %
		Y	22.51	346.38	34.52		14.0	
10448-AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	2.09	64.80	11.32	0.00	15.0	± 9.6 %
		Y	1.27	60.43	7.23		15.0	
10449-AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	2.97	67.85	14.44	0.00	15.0	± 9.6 %
		Y	2.35	65.84	12.37		15.0	
10450-AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	3.37	68.30	15.38	0.00	15.0	± 9.6 %
		Y	3.01	67.99	14.57		15.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	0.70	60.00	3.63	0.00	14.0	± 9.6 %
		Y	5.58	640.23	29.21		14.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	5.20	67.47	16.22	0.00	12.0	± 9.6 %
		Y	5.02	67.38	16.39		12.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	2.88	66.98	14.32	0.00	18.0	± 9.6 %
		Y	2.23	64.51	11.75		18.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	158.67	59.71	0.97	0.00	17.0	± 9.6 %
		Y	0.00	60.00	0.00		17.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	0.00	60.00	0.00	0.00	13.0	± 9.6 %
		Y	7.70	153.43	9.94		13.0	
10460-AAA	UMTS-FDD (WCDMA, AMR)	X	1.95	84.09	20.87	0.00	37.0	± 9.6 %
		Y	100.00	129.32	29.12		37.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.99	61.72	11.44	3.29	12.0	± 9.6 %
		Y	1.70	70.75	16.73		12.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.90	60.00	8.11	3.23	11.0	± 9.6 %
		Y	0.92	60.65	9.08		11.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.88	60.00	7.63	3.23	10.0	± 9.6 %
		Y	0.85	60.00	8.20		10.0	
10464-AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.91	61.06	10.70	3.23	12.0	± 9.6 %
		Y	1.44	68.59	15.32		12.0	
10465-AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.90	60.00	8.06	3.23	11.0	± 9.6 %
		Y	0.88	60.17	8.76		11.0	
10466-AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.89	60.00	7.57	3.23	10.0	± 9.6 %
		Y	0.85	60.00	8.13		10.0	
10467-AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.91	61.16	10.80	3.23	12.0	± 9.6 %
		Y	1.49	69.02	15.56		12.0	
10468-AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.90	60.00	8.09	3.23	11.0	± 9.6 %
		Y	0.90	60.36	8.90		11.0	
10469-AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.89	60.00	7.59	3.23	10.0	± 9.6 %
		Y	0.85	60.00	8.15		10.0	
10470-AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.91	61.15	10.80	3.23	12.0	± 9.6 %
		Y	1.48	68.93	15.53		12.0	
10471-AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.90	60.00	8.10	3.23	11.0	± 9.6 %
		Y	0.90	60.37	8.91		11.0	

10300-AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	0.29	246.13	28.07	0.00	16.0	± 9.6 %
		Y	0.00	154.14	85.80		16.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	4.90	60.00	9.21	4.17	5.0	± 9.6 %
		Y	0.00	121.04	59.87		5.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	4.60	68.85	15.36	4.96	5.0	± 9.6 %
		Y	3.42	64.55	11.75		5.0	
10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	4.59	68.76	14.65	4.96	5.0	± 9.6 %
		Y	2.95	62.77	10.03		5.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	3.95	67.44	13.75	4.17	6.0	± 9.6 %
		Y	2.43	61.44	9.07		6.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	1.19	56.30	5.51	6.02	3.0	± 9.6 %
		Y	0.69	55.42	3.31		3.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	3.61	63.97	10.49	6.02	3.0	± 9.6 %
		Y	1.17	55.25	4.20		3.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	3.61	64.02	10.36	6.02	3.0	± 9.6 %
		Y	1.13	54.96	3.81		3.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	3.70	64.44	10.65	6.02	3.0	± 9.6 %
		Y	1.11	55.18	4.15		3.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	3.75	64.56	10.96	6.02	3.0	± 9.6 %
		Y	1.19	55.61	4.73		3.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	3.78	64.66	10.92	6.02	3.0	± 9.6 %
		Y	1.16	55.52	4.60		3.0	
10311-AAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	2.17	69.27	16.41	0.00	19.0	± 9.6 %
		Y	2.36	72.80	17.72		19.0	
10313-AAA	iDEN 1:3	X	8.30	89.76	24.82	6.99	6.0	± 9.6 %
		Y	100.00	141.20	40.66		6.0	
10314-AAA	iDEN 1:6	X	100.00	135.23	39.56	10.00	3.0	± 9.6 %
		Y	100.00	148.27	45.62		3.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.15	66.11	14.93	0.17	43.0	± 9.6 %
		Y	1.24	69.61	16.20		43.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	3.28	67.52	14.71	0.17	12.0	± 9.6 %
		Y	2.88	66.96	13.71		12.0	
10317-AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	3.28	67.52	14.71	0.17	12.0	± 9.6 %
		Y	2.88	66.96	13.71		12.0	
10400-AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	3.28	67.83	14.97	0.00	12.0	± 9.6 %
		Y	2.86	67.21	13.93		12.0	
10401-AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	4.12	67.56	15.93	0.00	12.0	± 9.6 %
		Y	3.90	67.91	16.05		12.0	
10402-AAD	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	4.53	67.45	16.08	0.00	12.0	± 9.6 %
		Y	4.33	67.54	16.24		12.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	4.02	216.28	19.34	0.00	29.0	± 9.6 %
		Y	0.00	114.07	76.74		29.0	

10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	2.39	60.00	14.37	6.98	8.0	± 9.6 %
		Y	2.27	60.00	15.51		8.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	2.52	60.00	14.89	6.98	8.0	± 9.6 %
		Y	2.50	60.00	15.82		8.0	
10244-CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	0.96	60.00	4.33	3.98	8.0	± 9.6 %
		Y	57.58	61.57	1.88		8.0	
10245-CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	0.96	60.00	4.22	3.98	8.0	± 9.6 %
		Y	58.12	61.16	1.69		8.0	
10246-CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	0.89	60.00	5.33	3.98	9.0	± 9.6 %
		Y	0.67	60.00	4.06		9.0	
10247-CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	1.12	60.00	5.28	3.98	8.0	± 9.6 %
		Y	0.92	59.96	3.49		8.0	
10248-CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	1.54	56.57	2.02	3.98	8.0	± 9.6 %
		Y	1.37	60.46	3.10		8.0	
10249-CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	1.21	60.65	6.85	3.98	9.0	± 9.6 %
		Y	0.87	60.00	5.42		9.0	
10250-CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.27	63.89	10.35	3.98	8.0	± 9.6 %
		Y	1.52	60.68	7.30		8.0	
10251-CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	2.07	62.35	8.99	3.98	8.0	± 9.6 %
		Y	1.44	60.00	6.43		8.0	
10252-CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	2.38	66.40	12.56	3.98	9.0	± 9.6 %
		Y	1.78	63.98	10.27		9.0	
10253-CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	2.86	65.11	11.92	3.98	8.0	± 9.6 %
		Y	2.15	62.72	9.56		8.0	
10254-CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	3.06	65.96	12.56	3.98	8.0	± 9.6 %
		Y	2.30	63.39	10.13		8.0	
10255-CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	3.10	68.59	14.69	3.98	9.0	± 9.6 %
		Y	2.63	67.57	13.44		9.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	4.16	61.93	3.04	3.98	8.0	± 9.6 %
		Y	6.85	153.44	11.41		8.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	68.07	60.01	1.14	3.98	8.0	± 9.6 %
		Y	14.88	61.07	1.89		8.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	0.73	60.00	4.45	3.98	9.0	± 9.6 %
		Y	15.68	61.11	1.92		9.0	
10259-CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	1.31	60.00	6.00	3.98	8.0	± 9.6 %
		Y	0.98	60.00	4.89		8.0	
10260-CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	1.33	60.00	5.95	3.98	8.0	± 9.6 %
		Y	46.28	60.34	1.26		8.0	
10261-CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	1.50	61.91	8.25	3.98	9.0	± 9.6 %
		Y	1.02	60.00	6.01		9.0	
10262-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.26	63.82	10.29	3.98	8.0	± 9.6 %
		Y	1.51	60.62	7.24		8.0	

10177-CAI	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	2.65	66.18	16.83	3.01	19.0	± 9.6 %
		Y	2.71	67.05	17.90		19.0	
10178-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	3.38	71.09	19.11	3.01	16.0	± 9.6 %
		Y	3.65	73.20	20.77		16.0	
10179-CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	3.03	68.89	17.51	3.01	16.0	± 9.6 %
		Y	3.17	70.18	18.74		16.0	
10180-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	2.80	67.22	16.29	3.01	16.0	± 9.6 %
		Y	2.89	68.06	17.26		16.0	
10181-CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	2.65	66.18	16.83	3.01	19.0	± 9.6 %
		Y	2.71	67.05	17.90		19.0	
10182-CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	3.38	71.06	19.09	3.01	16.0	± 9.6 %
		Y	3.65	73.16	20.75		16.0	
10183-AAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	2.80	67.21	16.28	3.01	16.0	± 9.6 %
		Y	2.88	68.04	17.25		16.0	
10184-CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	2.65	66.20	16.84	3.01	19.0	± 9.6 %
		Y	2.72	67.07	17.91		19.0	
10185-CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	3.39	71.13	19.13	3.01	16.0	± 9.6 %
		Y	3.66	73.26	20.80		16.0	
10186-AAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	2.80	67.24	16.30	3.01	16.0	± 9.6 %
		Y	2.89	68.08	17.28		16.0	
10187-CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	2.67	66.37	16.99	3.01	19.0	± 9.6 %
		Y	2.74	67.30	18.10		19.0	
10188-CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	3.47	71.64	19.45	3.01	16.0	± 9.6 %
		Y	3.78	74.01	21.25		16.0	
10189-AAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	2.84	67.50	16.50	3.01	16.0	± 9.6 %
		Y	2.93	68.40	17.51		16.0	
10193-CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	3.32	68.25	15.21	0.00	13.0	± 9.6 %
		Y	2.90	67.61	14.18		13.0	
10194-CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	3.44	68.48	15.44	0.00	13.0	± 9.6 %
		Y	3.07	68.21	14.64		13.0	
10195-CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	3.45	68.45	15.43	0.00	13.0	± 9.6 %
		Y	3.05	68.05	14.56		13.0	
10196-CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	3.33	68.34	15.23	0.00	13.0	± 9.6 %
		Y	2.91	67.75	14.24		13.0	
10197-CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	3.43	68.45	15.43	0.00	13.0	± 9.6 %
		Y	3.06	68.17	14.63		13.0	
10198-CAC	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	3.42	68.35	15.38	0.00	13.0	± 9.6 %
		Y	3.03	67.92	14.49		13.0	
10219-CAC	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	3.27	68.35	15.26	0.00	13.0	± 9.6 %
		Y	2.87	67.77	14.28		13.0	
10220-CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	3.44	68.47	15.44	0.00	13.0	± 9.6 %
		Y	3.06	68.17	14.62		13.0	

10111-CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	0.84	61.57	7.75	0.00	18.0	± 9.6 %
		Y	0.50	60.00	4.50		18.0	
10112-CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	2.09	68.44	14.11	0.00	17.0	± 9.6 %
		Y	1.44	64.99	11.01		17.0	
10113-CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	0.82	60.97	7.25	0.00	17.0	± 9.6 %
		Y	0.53	60.00	4.34		17.0	
10114-CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	4.07	67.80	16.25	0.00	13.0	± 9.6 %
		Y	3.91	68.39	16.55		13.0	
10115-CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	4.26	68.35	16.36	0.00	12.0	± 9.6 %
		Y	4.06	68.95	16.61		12.0	
10116-CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	4.10	68.15	16.31	0.00	13.0	± 9.6 %
		Y	3.93	68.76	16.59		13.0	
10117-CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	4.07	67.75	16.25	0.00	13.0	± 9.6 %
		Y	3.91	68.34	16.55		13.0	
10118-CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	4.28	68.40	16.38	0.00	12.0	± 9.6 %
		Y	4.09	69.01	16.64		12.0	
10119-CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	4.10	68.11	16.30	0.00	13.0	± 9.6 %
		Y	3.93	68.72	16.57		13.0	
10140-CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	2.52	68.59	15.40	0.00	18.0	± 9.6 %
		Y	2.34	69.16	15.01		18.0	
10141-CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	2.70	69.46	15.86	0.00	18.0	± 9.6 %
		Y	2.55	70.20	15.51		18.0	
10142-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	0.41	60.00	5.54	0.00	20.0	± 9.6 %
		Y	13.92	300.78	36.01		20.0	
10143-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	0.49	60.00	3.24	0.00	18.0	± 9.6 %
		Y	0.00	60.00	0.00		18.0	
10144-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	9.44	240.24	29.15	0.00	17.0	± 9.6 %
		Y	0.00	215.39	78.82		17.0	
10145-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	0.00	130.96	75.70	0.00	19.0	± 9.6 %
		Y	0.00	60.00	0.00		19.0	
10146-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	0.00	60.00	0.00	0.00	17.0	± 9.6 %
		Y	0.00	60.00	0.00		17.0	
10147-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	0.00	60.00	0.00	0.00	16.0	± 9.6 %
		Y	0.00	60.00	0.00		16.0	
10149-CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	2.07	68.71	14.34	0.00	18.0	± 9.6 %
		Y	1.50	65.85	11.59		18.0	
10150-CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	2.12	68.65	14.23	0.00	17.0	± 9.6 %
		Y	1.46	65.17	11.13		17.0	
10151-CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	3.45	70.26	16.24	3.98	9.0	± 9.6 %
		Y	3.38	71.60	16.46		9.0	
10152-CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	3.25	66.83	13.75	3.98	8.0	± 9.6 %
		Y	2.73	65.58	12.35		8.0	

10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	0.42	60.00	5.48	1.88	22.0	± 9.6 %
		Y	0.33	60.00	3.83		22.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	0.30	60.00	4.90	1.17	26.0	± 9.6 %
		Y	42.36	61.73	1.86		26.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	1.54	347.79	17.25	0.00	25.0	± 9.6 %
		Y	0.00	114.74	79.18		25.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	100.00	120.51	30.81	7.78	10.0	± 9.6 %
		Y	100.00	124.67	32.56		10.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.16	60.00	16.19	0.00	55.0	± 9.6 %
		Y	0.09	60.00	21.88		55.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	11.40	81.10	21.59	13.80	3.0	± 9.6 %
		Y	50.42	106.50	29.62		3.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	13.32	87.26	22.77	10.79	5.0	± 9.6 %
		Y	100.00	120.83	32.49		5.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	6.89	77.34	18.17	9.03	5.0	± 9.6 %
		Y	20.76	95.01	24.27		5.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	3.48	69.52	21.01	6.55	14.0	± 9.6 %
		Y	3.69	72.63	23.80		14.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	1.18	65.41	14.42	0.61	39.0	± 9.6 %
		Y	1.24	68.32	15.52		39.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	1.20	70.49	16.65	1.30	32.0	± 9.6 %
		Y	3.85	91.61	24.76		32.0	
10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	1.45	67.51	14.97	2.04	28.0	± 9.6 %
		Y	1.91	73.64	17.67		28.0	
10062-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	3.40	67.59	14.92	0.49	12.0	± 9.6 %
		Y	3.02	67.19	14.03		12.0	
10063-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	3.43	67.68	15.07	0.72	12.0	± 9.6 %
		Y	3.10	67.54	14.39		12.0	
10064-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	3.47	67.41	14.93	0.86	11.0	± 9.6 %
		Y	3.08	67.00	14.07		11.0	
10065-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	3.49	67.34	15.01	1.21	11.0	± 9.6 %
		Y	3.17	67.24	14.36		11.0	
10066-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	3.50	67.08	14.84	1.46	10.0	± 9.6 %
		Y	3.17	66.92	14.12		10.0	
10067-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	3.72	67.20	15.14	2.04	8.0	± 9.6 %
		Y	3.42	67.23	14.60		8.0	
10068-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	3.77	67.06	15.36	2.55	8.0	± 9.6 %
		Y	3.52	67.21	14.93		8.0	
10069-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	3.79	66.83	15.26	2.67	8.0	± 9.6 %
		Y	3.52	66.91	14.76		8.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	3.75	67.35	15.58	1.99	9.0	± 9.6 %
		Y	3.53	67.80	15.38		9.0	



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

Client **Qualcomm USA**

Certificate No: **5G-Veri30-1006_May19**

CALIBRATION CERTIFICATE

Object **5G Verification Source 30 GHz - SN: 1006**

Calibration procedure(s) **QA CAL-45.v2
Calibration procedure for sources in air above 6 GHz**

Calibration date: **May 03, 2019**

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
Reference Probe EUmmWV3	SN: 9374	31-Dec-18 (No. EUmmWV3-9374_Dec18)	Dec-19
DAE4	SN: 1215	22-Feb-19 (No. DAE4-1215_Feb19)	Feb-20
Secondary Standards	ID #	Check Date (in house)	Scheduled Check

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	

Approved by:	Katja Pokovic	Technical Manager	
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Issued: May 6, 2019

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary

CW Continuous wave

Calibration is Performed According to the Following Standards

- Internal procedure QA CAL-45-5Gsources
- IEC TR 63170 ED1, "Measurement procedure for the evaluation of power density related to human exposure to radio frequency fields from wireless communication devices operating between 6 GHz and 100 GHz", January 2018

Methods Applied and Interpretation of Parameters

- *Coordinate System:* z-axis in the waveguide horn boresight, x-axis is in the direction of the E-field, y-axis normal to the others in the field scanning plane parallel to the horn flare and horn flange.
- *Measurement Conditions:* (1) 10 GHz: The forward power to the horn antenna is measured prior and after the measurement with a power sensor. During the measurements, the horn is directly connected to the cable taking into account the 0.2dB horn loss. (2) 30, 60 and 90 GHz: The verification sources are switched on for at least 30 minutes. Absorbers are used around the probe cub and at the ceiling to minimize reflections.
- *Horn Positioning:* The waveguide horn is mounted vertically on the flange of the waveguide source to allow vertical positioning of the EUmmW probe during the scan. The plane is parallel to the phantom surface. Probe distance is verified using mechanical gauges positioned on the flare of the horn.
- *E- field distribution:* E field is measured in two x-y-plane (10mm, 10mm + $\lambda/4$) with a vectorial E-field probe. The E-field value stated as calibration value represents the E-field-maxima and the averaged (1cm^2 and 4cm^2) power density values at 10mm in front of the horn.
- *Field polarization:* Above the open horn, linear polarization of the field is expected. This is verified graphically in the field representation.

Calibrated Quantity

- Local peak E-field (V/m) and peak values of the total and normal component of the poynting vector $|\text{Re}\{S\}|$ and $n.\text{Re}\{S\}$ averaged over the surface area of 1cm^2 ($p_{S_{\text{tot}}\text{avg}1\text{cm}^2}$ and $p_{S_n\text{avg}1\text{cm}^2}$) and 4cm^2 ($p_{S_{\text{tot}}\text{avg}4\text{cm}^2}$ and $p_{S_n\text{avg}4\text{cm}^2}$) at the nominal operational frequency of the verification source.

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

Measurement Conditions

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

DASY Version	cDASY6 Module mmWave	V1.6
Phantom	5G Phantom	
Distance Horn Aperture - plane	10 mm	
XY Scan Resolution	dx, dy = 2.5 mm	
Number of measured planes	2 (10mm, 10mm + $\lambda/4$)	
Frequency	30 GHz $\pm$ 10 MHz	

Calibration Parameters, 30 GHz

Distance Horn Aperture to Measured Plane	<i>Prad1</i> (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg Power Density n.Re{S}, Re{S} (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	38.2	141	1.27 dB	45.5, 45.9	40.3, 40.8	1.28 dB

¹ derived from far-field data

DASY Report

Measurement Report for 5G Verification Source 30 GHz, UID 0 -, Channel 30000 (30000.0MHz)

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type
5G Verification Source 30 GHz	100.0 x 100.0 x 100.0	SN: 1006	-

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	5.55 mm	Validation band	CW	30000.0, 30000	1.0

Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
5G Phantom	Air	EUmmWV3 - SN9374, 2018-12-31	DAE4 Sn1215, 2019-02-22

Scan Setup

	5G Scan		5G Scan
Grid Extents [mm]	60.0 x 60.0	Date	2019-05-03, 16:30
Grid Steps [lambda]	0.25 x 0.25	Avg. Area [cm ²]	1.00
Sensor Surface [mm]	5.55	pS _{tot} avg [W/m ²]	45.9
MAIA	MAIA not used	pS _n avg [W/m ²]	45.5
		E _{peak} [V/m]	141
		Power Drift [dB]	-0.02

Measurement Results

