Qualcomm Technologies, Inc.

Netgear 5G MHS Travel Router (FCC ID: PY319100441) RF Exposure Compliance Test Report

(Part 1: Test Under Static Transmission Scenario)

80-W5669-1 Rev. B

May 14, 2019

Qualcomm Technologies, Inc.
5775 Morehouse Drive
San Diego, CA 92121
U.S.A.

Revision history

Revision	Date	Description
A	May 08, 2019	Initial release
B	May 14, 2019	Correction in SAR tables

Contents

Figures

Tables

1 Introduction

The equipment under test (EUT) is Netgear 5G MHS Travel Router (FCC ID: PY319100441), it contains the Qualcomm® SM8150 modem supporting 2G/3G/4G technologies and SDX50 modem supporting mmW 5G NR bands. Both of these WWAN modems are enabled in Qualcomm Smart Transmit feature with algorithms to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure from WWAN is in compliance with FCC requirements.

In addition to these WWAN modems, the EUT contains a different modem to support WLAN, and time-averaging is not applied in WLAN modem.

The purpose of this Part 1 report is to demonstrate that this EUT complies with FCC RF exposure limits at maximum time-averaged transmit power limits for WWAN technologies, and at maximum transmit power limits for WLAN technologies.

- SAR and power density (PD) compliance for all WWAN radios (4G + 5G mmW NR) is assessed based on maximum time-averaged transmit power (static transmission condition). Relevant FCC KDBs and exclusion criteria are applied on a time-average power basis for WWAN technologies. The maximum time-averaged transmit power limits for supported WWAN technologies, bands, and antennas in this report are derived in Part 0 report. The validation of the Qualcomm Smart Transmit time-averaging algorithm and compliance under the Tx varying transmission scenario for WWAN technologies are reported in Part 2 report.
- SAR compliance for WLAN radios is assessed based on maximum transmit power as per relevant FCC KDBs.
- Demonstrate compliance in simultaneous transmission scenarios involving both WWAN and WLAN transmissions, where WWAN exposure is assessed based on time-averaged transmit power limits, and WLAN exposure is assessed based on maximum transmit power limits.

By following the above steps, this report demonstrates that this EUT complies with FCC RF exposure limits for FCC equipment authorization of Netgear 5G MHS Travel Router (FCC ID: PY319100441).

The P_{limit} and *input.power.limit* used in this report are determined and listed in Part 0 report.

Refer to Compliance Summary report for product description and terminology used in this report.

2 Measurement Setup and General Information

The SAR measurement was conducted at Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories. See Bureau Veritas Report No. SA181015C09: *FCC SAR Test Report* for details.

This section provides the details of the test setup used for PD measurement.

2.1 Test environment

Test location	Qualcomm Incorporated, Inc. 5775 Morehouse Dr., San Diego, CA 92121
Ambient temperature	22 ± 2^0C
Tissue simulating liquid	22 ± 2^0C
Humidity range	30% ~ 49%

2.2 Power density measurement system

The power density measurement system is constructed based on the DASY6 platform by SPEAG. The DASY6 with EUmmWv2 and 5G software module can measure the electromagnetic exposure (electromagnetic and power density) up to 110GHz as close as 2mm from any transmitter.

2.2.1 Power density probe

The novel EUmmWV2 probe is used in the power density measurement. It is designed for precise near-field measurements in the mm-wave range by Schmid & Partner Engineering AG of Zurich, Switzerland. The specifications are:

- Frequency range: 0.75 ~ 110 GHz
- Dynamic range: <50 – 3000 V/m (up to 10000 V/m with additional PRE-10 voltage divider)
- Linearity: < ± 0.2 dB
- Supports sensor model calibration (SMC)
- ISO17025 accredited calibration

2.2.2 Power density measurement system verification

The power density system verification is performed using the SPEAG verification device. It consists of a ka-band horn antenna with a corresponding gun oscillator packaged within a cube-shaped housing.

The specification of the verification device is

- Calibrated frequency: 30 GHz at 10 mm from the case surface
- Frequency accuracy: ± 100 MHz
- E-field polarization: linear
- Harmonics: -20 dBc (typ)
- Total radiated power: 14 dBm (typ)
- Power stability: 0.05 dB
- Power consumption: 5 W (max)
- Size: 100 × 100 × 100 mm
- Weight: 1 kg

Table 2-1 shows the verification test results. The measured power density (PD) value is within 0.4dB of target level. Note that the uncertainty of 5G verification source is 1.4dB (k=2).

Table 2-1 System validation results

Validation kit	S/N	Frequency (GHz)	14dBm Target PD (W/m^2)	14dBm Meas. PD (W/m^2)	Deviation (dB)	Date
Ka-band source	1012	30	47.9 ($4cm^2$)	51.8($4cm^2$)	0.34dB ($4cm^2$)	4/22/2019
Ka-band source	1012	30	47.9 ($4cm^2$)	49.9 ($4cm^2$)	0.18dB ($4cm^2$)	4/23/2019
Ka-band source	1012	30	47.9 ($4cm^2$)	50.2 ($4cm^2$)	0.20dB ($4cm^2$)	4/24/2019
Ka-band source	1012	30	47.9 ($4cm^2$)	50.2 ($4cm^2$)	0.20dB ($4cm^2$)	4/25/2019
Ka-band source	1012	30	47.9 ($4cm^2$)	50.0 ($4cm^2$)	0.19dB ($4cm^2$)	4/262019
Ka-band source	1012	30	47.9 ($4cm^2$)	50.2 ($4cm^2$)	0.20dB ($4cm^2$)	4/29/2019
Ka-band source	1012	30	47.9 ($4cm^2$)	51.0 ($4cm^2$)	0.27dB ($4cm^2$)	4/30/2019

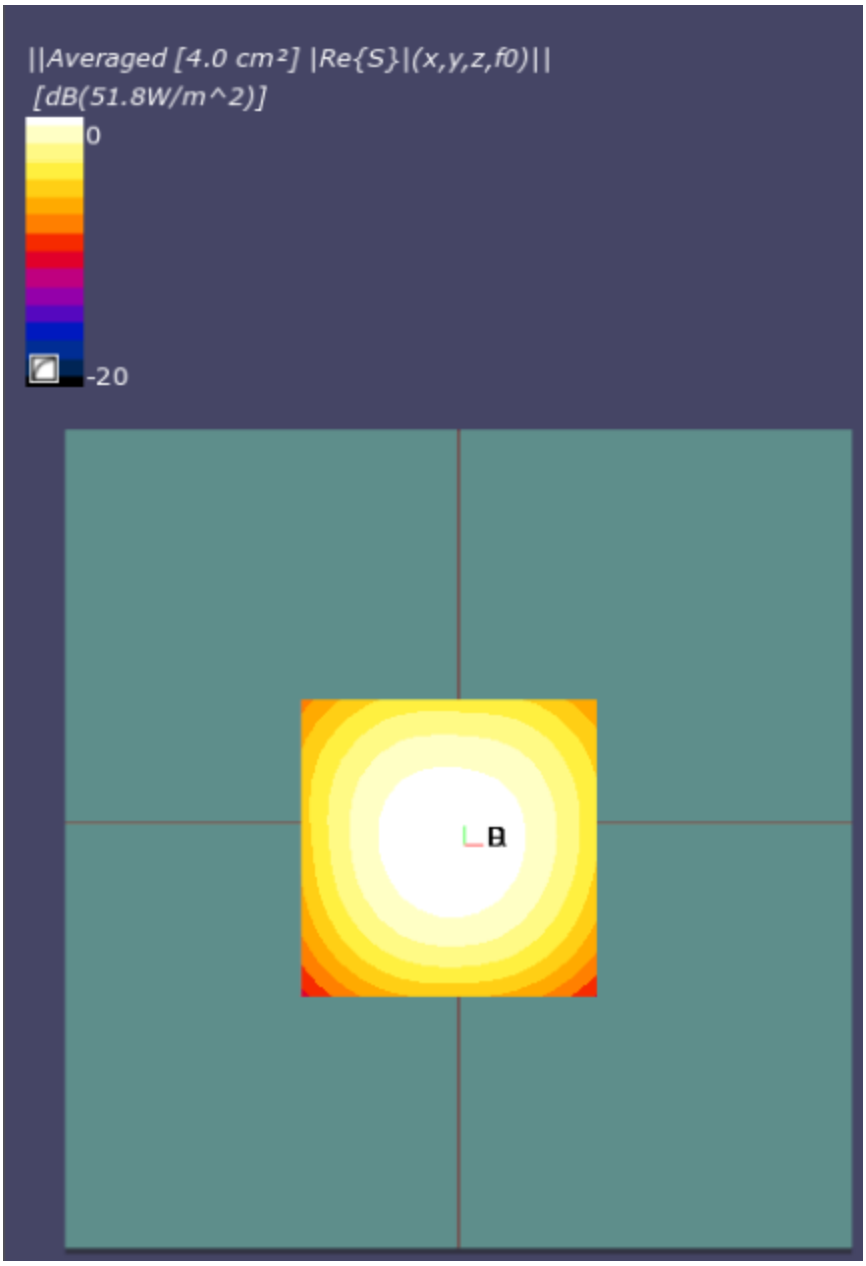


Figure 2-1 *4cm²PD* for source validation on 4/22/2019

3 Test Condition, Configuration, and Assessment

3.1 Qualcomm Smart Transmit parameters

The input parameters described in Section 2.3 of the Compliance Summary report are required for functionality of Qualcomm Smart Transmit algorithm.

These parameters are entered through the embedded file System (EFS) and cannot be accessed by the end-user.

Part 0 report documents determination of P_{limit} for sub-6 WWAN bands, and *input.power.limit* for 5G mmW NR bands using the below design targets and device related uncertainty.:

- *SAR_design_target* of 1.2W/kg 1gSAR and sub-6 WWAN device design related uncertainty of 1.0dB.
- *PD_design_target* of 5.2W/m^2 4cm^{2}PD and mmW device design related uncertainty of 2.8dB.

3.1.1 Qualcomm Smart Transmit parameters for the 4G modem

For this EUT, the following input parameters determined in Section 2.3 of Part 0 report are populated via the EFS entry.

Table 3-1 Smart Transmit EFS entries for sub-6 WWAN bands

Regulatory requirement	FCC
Reserve_power_margin	3
DSI	15
Tech/Band, Antenna	Plimit (dBm)
LTE 2	24.1
LTE 5	27.3
LTE 12	27.1
LTE 14	25.8
LTE 30	23.9
LTE 4/66	24.8

3.1.2 Qualcomm Smart Transmit parameters for the 5G modem

The *input.power.limit* parameter for 5G mmW NR radio determined in Section 3.7.3 of Part 0 report are populated via EFS entry into the EUT.

Table 3-2 Smart Transmit EFS entries for mmW WWAN bands

	n260 mmW NR		
Pair with Beam_ID	**Beam_ID**	**module#**	***Input.power.limit* (dBm)**
	0	1	8.6
	1	1	8.0
	2	0	7.5
	3	0	9.2
	4	2	11.1
	5	2	8.0
	6	1	4.0
	7	1	3.8
	8	1	6.4
	9	1	6.2
	10	1	4.6
	11	1	6.5
	12	0	3.8
	13	0	2.9
	14	0	4.3
	15	0	6.8
	16	0	6.6
	17	0	7.1
	18	2	7.8
	19	2	6.9
	20	2	8.1
	21	2	4.4
	22	2	3.2
	23	2	5.7
	24	1	3.7
	25	1	4.7
	26	1	4.6
	27	1	6.0
	28	0	3.1
	29	0	4.0
	30	0	6.8
	31	0	7.4
	32	2	7.0
	33	2	7.8
	34	2	3.5
	35	2	3.6
	36	1	3.7
	37	1	1.3
	38	1	1.8
	39	1	3.6
	40	1	3.8

	n260 mmW NR		
Pair with Beam_ID	**Beam_ID**	**module#**	***Input.power.limit* (dBm)**
	41	0	3.9
	42	0	4.0
	43	0	4.1
	44	0	4.2
	45	0	4.2
	46	2	4.0
	47	2	4.6
	48	2	3.9
	49	2	4.1
	50	2	4.0
	51	1	1.8
	52	1	1.3
	53	1	3.2
	54	1	4.0
	55	0	4.0
	56	0	3.0
	57	0	4.2
	58	0	4.2
	59	2	4.1
	60	2	3.3
	61	2	4.6
	62	2	4.0
	128	1	10.3
	129	1	8.2
	130	0	8.4
	131	0	10.3
	132	2	9.7
	133	2	10.0
	134	1	6.3
	135	1	5.7
	136	1	7.5
	137	1	4.8
	138	1	3.7
	139	1	4.6
	140	0	4.5
	141	0	4.5
	142	0	5.4
	143	0	6.4
	144	0	5.3
	145	0	7.4
	146	2	6.9
	147	2	5.8
	148	2	8.3
	149	2	6.1

	n260 mmW NR		
Pair with Beam_ID	**Beam_ID**	**module#**	***Input.power.limit* (dBm)**
	150	2	4.5
	151	2	6.7
	152	1	5.7
	153	1	6.6
	154	1	3.7
	155	1	3.9
	156	0	4.2
	157	0	5.0
	158	0	5.7
	159	0	5.6
	160	2	5.6
	161	2	6.6
	162	2	4.5
	163	2	5.9
	164	1	1.4
	165	1	1.0
	166	1	0.8
	167	1	1.0
	168	1	2.1
	169	0	3.2
	170	0	3.0
	171	0	2.3
	172	0	3.4
	173	0	4.2
	174	2	4.1
	175	2	2.8
	176	2	3.3
	177	2	4.7
	178	2	4.3
	179	1	1.0
	180	1	0.8
	181	1	3.2
	182	1	1.3
	183	0	3.1
	184	0	2.6
	185	0	2.7
	186	0	3.9
	187	2	3.3
	188	2	2.8
	189	2	4.0
	190	2	4.7
0	128	1	6.0
1	129	1	4.8
2	130	0	4.7

	n260 mmW NR		
Pair with Beam_ID	**Beam_ID**	**module#**	***Input.power.limit* (dBm)**
3	131	0	7.4
4	132	2	7.0
5	133	2	5.9
6	135	1	2.2
7	134	1	1.7
8	136	1	3.3
9	138	1	1.6
10	137	1	1.6
11	139	1	1.6
12	140	0	0.6
13	142	0	0.6
14	141	0	1.7
15	143	0	3.7
16	144	0	3.4
17	145	0	4.1
18	147	2	3.3
19	146	2	3.1
20	148	2	4.9
21	150	2	2.3
22	149	2	0.9
23	151	2	2.1
24	152	1	1.7
25	153	1	2.2
26	155	1	1.4
27	154	1	2.2
28	156	0	0.5
29	157	0	0.8
30	158	0	3.1
31	159	0	3.3
32	161	2	3.9
33	160	2	3.1
34	162	2	1.5
35	163	2	1.3
36	167	1	-1.3
37	166	1	-2.2
38	165	1	-1.6
39	164	1	-1.2
40	168	1	-1.2
41	172	0	0.6
42	170	0	-0.2
43	169	0	1.0
44	173	0	1.5
45	171	0	0.0
46	177	2	0.2

n260 mmW NR			
Pair with Beam_ID	**Beam_ID**	**module#**	***Input.power.limit* (dBm)**
47	178	2	2.2
48	174	2	0.4
49	175	2	1.0
50	176	2	0.6
51	181	1	-0.7
52	180	1	-2.1
53	182	1	0.0
54	179	1	-1.0
55	183	0	0.0
56	185	0	-0.4
57	186	0	0.5
58	184	0	0.2
59	189	2	0.2
60	190	2	1.3
61	187	2	0.6
62	188	2	0.9

3.2 Device Test Configuration for SAR Measurements

In summary, SAR is evaluated on this EUT in below test configurations and test condition:

- Test configurations: Hotspot SAR exposure (1gSAR) from all device surfaces/edges (front, back, left, right, top, bottom) having a transmitting antenna located ≤ 25mm from that device surface/edge when in direct contact with flat section of SAM phantom. Hotspot SAR is evaluated at 10mm separation distance for all selected device surfaces as per FCC KDB publication 648474 D04.
- Test condition: The SAR measurements on all supported sub-6 WWAN technologies and bands are conducted with the EUT transmitting at maximum time-average transmit power (P_{limit}) or maximum RF tune-up power (P_{max}) if $P_{max} \leq P_{limit}$.

See Bureau Veritas Report No. SA181015C09: *FCC SAR Test Report* for details

3.3 Device test configuration for PD measurements

As can be seen in Section 3 of Part 0 report, the PD exposure for this EUT has been assessed against 5.2 W/m^2 of *PD_design_target* using validated simulation approach for the worst cases of all the beams. To further confirm the compliance, a subset of beams and test cases is selected for PD verification in Section 4.2.

The below beam selection criteria for the PD verification test is followed:

- Select one single beam (antenna array config) per antenna type (dipole or patch) and per mmW antenna module
  - The single beam containing highest number of active antenna ports. For example, the single beam with 4 active patch ports should be selected over the beam with a single active patch port

- Select one beam pair (if applicable) per antenna type (dipole or patch) and per mmW antenna module
  - The beam pair containing the highest number of active antenna ports.

Additionally, since the worst-case surface dictates the compliance, the PD measurement is made on the worst channel and worst surface determined through the validated simulation approach, see Appendix B of Part 0 report.

Based on the aforementioned criteria and the EUT codebook in Section 3.3 of Part 0 report, below Table 3-3 lists the selected beams and test cases for PD verification measurement. The definition of the EUT surface is illustrated in Figure xxx.

Table 3-3 PD verification test cases

Band	mmW Module#	Beam ID	# of active ports	ant type	Channel	Side
n260	0	13	4	dipole	low	front
		56	4	patch	mid	right
		56/185	8	patch	high	right
	1	6	4	dipole	high	front
		37	4	patch	mid	bottom
		37/166	8	patch	mid	bottom
	2	21	4	dipole	low	front
		177	4	patch	high	top
		61/187	8	patch	mid	top

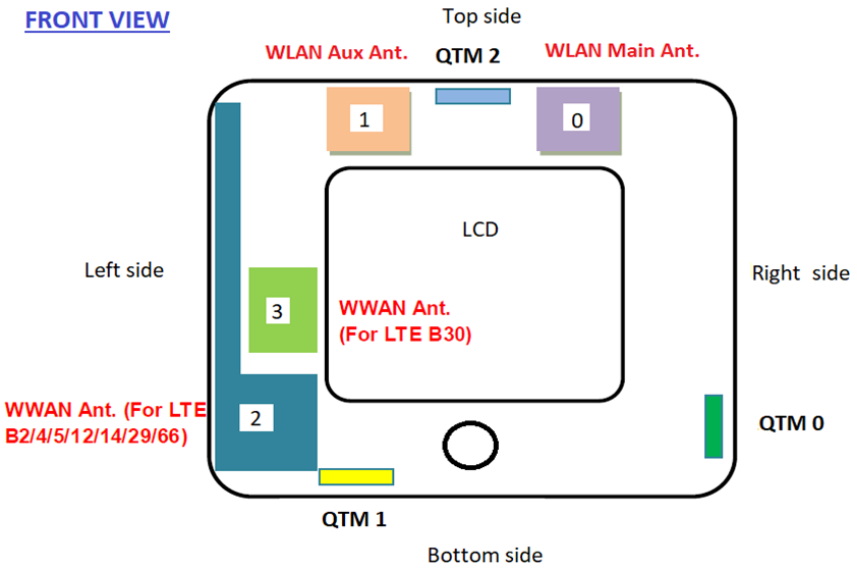


Figure 3-1: EUT surface definition

4 Summary of Results

4.1 SAR Measurement and Conducted Power Results at P_{limit}

The transmit power limit P_{limit} that corresponds to the *SAR_design_target* of 1.2W/kg (for 1gSAR) for all technologies and bands were determined through Part 0 report and are listed in EFS entries in Table 3-1. Based on Bureau Veritas Report No. SA181015C09: *FCC SAR Test Report*, for this EUT, the P_{max} (maximum RF tune-up power) for all the LTE bands is less than the corresponding P_{limit} as summarized and shown in Table 4-1 below.

Table 4-1: Comparison of P_{limit} and P_{max}

Regulatory requirement	FCC	max RF tune-up power (Pmax)
Reserve_power_margin	3	(not part of Smart Transmit settings
DSI	15	15
Tech/Band, Antenna	Plimit (dBm)	Pmax (dBm)
LTE 2	24.1	24.0
LTE 5	27.3	24.0
LTE 12	27.1	24.0
LTE 14	25.8	24.0
LTE 30	23.9	23.5
LTE 4/66	24.8	24.0

Therefore, for this EUT, SAR and conducted power measurements at P_{limit} will be the same as those performed at P_{max}. Thus, SAR measured at P_{max} reported in Bureau Veritas Report No. SA181015C09: *FCC SAR Test Report* can be leveraged in this section to avoid re-testing. The worst-case reported SAR values from Bureau Veritas Report No. SA181015C09: *FCC SAR Test Report* for LTE and WLAN are:

Table 4-2: Worst-case *reported* SAR (extracted from Bureau Veritas Report No. SA181015C09: *FCC SAR Test Report*)

Band	*Reported* SAR 1g (W/kg)	Pmax (dBm)
LTE 2	1.16	24.0
LTE 5	0.56	24.0
LTE 12	0.59	24.0
LTE 14	0.79	24.0
LTE 30	1.09	23.5
LTE 4/66	1.00	24.0
WLAN 2.4GHz	0.05	10.0
WLAN 5GHz	0.13	10.0

Note that WLAN SAR for each of the bands in the above table lists the worst-case SAR out of both WLAN antennas and WLAN MIMO.

4.2 PD Measurement results at *input.power.limit*

Table 3-3 lists the beams selected for PD verification test for this EUT and Table 4-3 lists the corresponding PD measurement results at 10mm spacing. Qualcomm Smart Transmit algorithm operates based on time-averaged transmit power reported on a per symbol basis, which is independent of modulation, channel and bandwidth (RBs). Therefore, PD measurements in Table 4-3 were conducted with the EUT in FTM mode, with CW modulation and in worst-case channel determined through simulations (See Appendix B of Part 0 report), with EUT transmitting at *input.power.limit* (listed in Table 3-2) corresponding to the tested beams.

All 4cm^{2}PD values for the selected beams are listed in Table 4-3. In addition to these selected beams, 4cm^{2}PD for few more beams (highlighted in Table 4-3) that were used in Part 2 report were also measured. Beam 171 was used during maximum power test in Part 2 report. Beams 158 and 131 were used during beam switch test in Part 2 report.

Table 4-3 PD Measurement results

Band	mmW Module#	Beam ID	Channel	CH number	modulation	Side	input.power.limit (dBm)	4cm2 PD (W/m2)
n260	0	13	low	2229167	CW	front	2.9	1.65
		56	mid	2254166	CW	right	3	1.68
		56/185	high	2279165	CW	right	-0.4	2.56
		171	mid	2254166	CW	right	2.3	2.69
		158	mid	2254166	CW	right	5.7	2.11
		131	mid	2279165	CW	right	6.5	1.12
	1	6	high	2279165	CW	front	4	2.96
		37	mid	2254166	CW	bottom	1.3	2.69
		37/166	mid	2254166	CW	bottom	-2.2	1.97
	2	21	low	2229167	CW	front	4.4	1.91
		177	high	2279165	CW	top	4.7	2.78
		61/187	mid	2254166	CW	top	0.6	2.27

The PD distribution plots for both point PD and 4cm^2 avg PD for the highest PD configuration in Table 4-3 is given below.

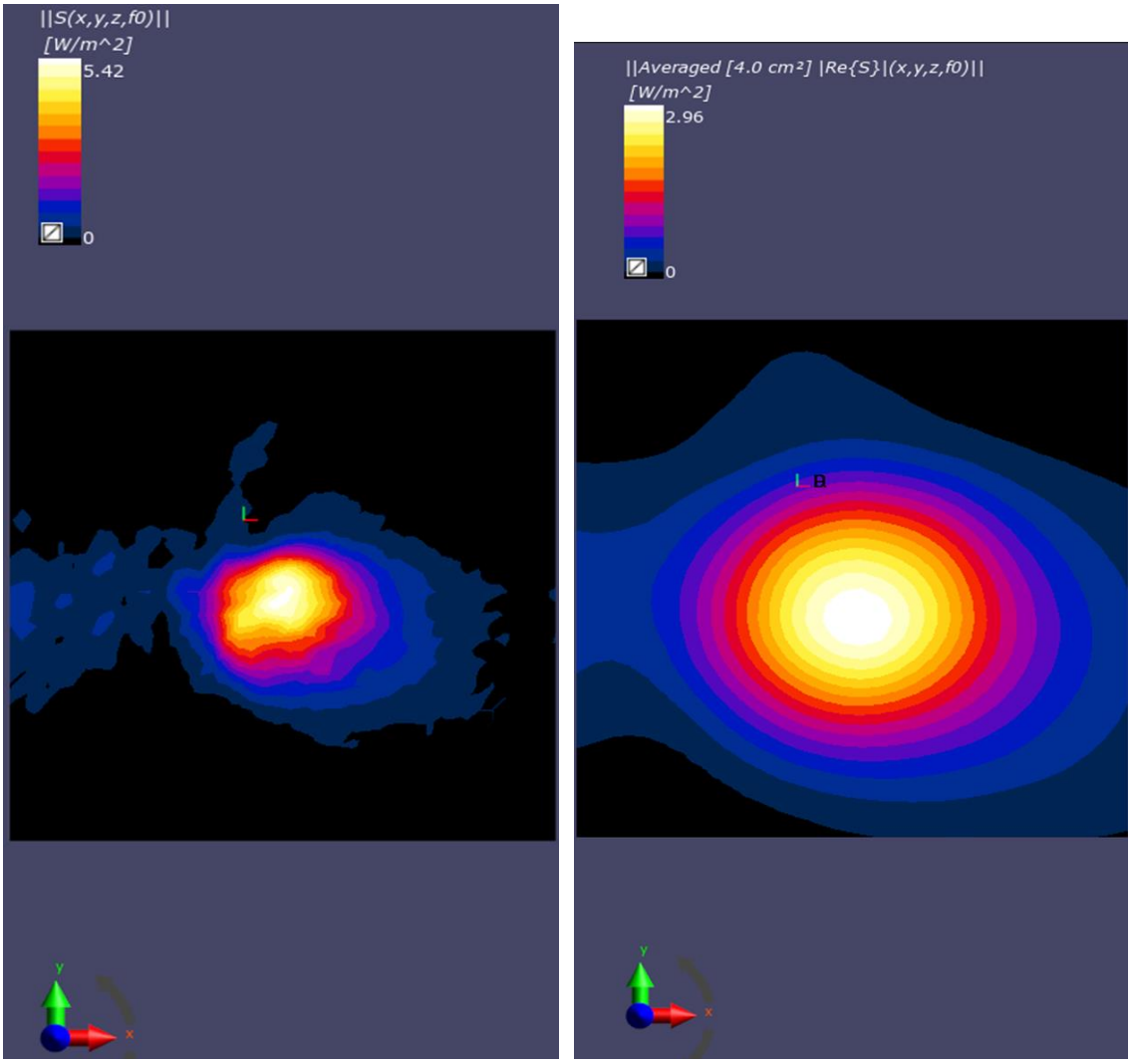


Figure 4-1 Band 260, beam ID 6, *pointPD* and *4cm^{2}PD*, Front

4.3 Simultaneous Transmission Analysis

The EUT supports simultaneous transmission of multiple radios. RF exposure compliance in simultaneous transmission scenarios is evaluated in this section.

It must be noted here that Qualcomm Smart Transmit time-averaging algorithm was applied to only WWAN (4G/5G mmW NR) on this device, where the time-averaged power level is controlled so that RF exposure is ≤ *SAR_design_target* (corresponding *to* P_{limit}) for 4G WWAN and ≤ *PD_design_target* (corresponding to *input.power.limit*) for 5G mmW NR. Since there is total design-related uncertainty arising from TxAGC and device-to-device variation, the worst-case RF exposure should be determined by accounting for this uncertainty in the corresponding design target, thus, with 1dB of device uncertantiy for sub-6 WWAN and 2.8dB of device uncertainty for 5G mmW NR. Therefore, the worst-case RF exposure for this EUT is:

Table 4-4 Worst-case time-averaged RF exposure for WWAN

	WWAN	
	4G	5G mmW NR
Maximum time-averaged power level	P_{limit}	*input.power.limit*
Maximum time-averaged exposure	*SAR_design_target =1.2W/kg (1gSAR)*	*PD_design_target = 5.2 W/m²*
Design-related uncertainty	*1.0 dB*	*2.8 dB*
Worst-case time-averaged RF exposure	*reported* SAR† =1.16W/kg (1gSAR)	*reported PD** = =75% × *PD_design_target*+2.8dB = 7.43W/m²

† Highest SAR value obtained from Bureau Veritas Report No. SA181015C09: *FCC SAR Test Report*. For this EUT, (P_{limit}+1.0dB uncertainty) ≥ P_{max} (maximum RF tune-up output power). Therefore, time-averaged SAR exposure from Smart Transmit enabled EUT (at P_{limit}) cannot exceed *reported* SAR corresponding to P_{max} listed in Table 4-2.

* Smart Transmit allows only 75% of maximum PD exposure for this EUT utilizing EFS entries listed in Table 3-1. See Section 4.3.1 for details.

WLAN does not employ time-averaging in this device, reported 1gSAR at the maximum RF tune-up output power is listed in Table 4-2.

4.3.1 Analysis

RF exposure compliance with WWAN+WLAN simultaneous transmission scenarios is demonstrated for various radio configurations using below equation:

Total norm. RF exposure = norm. RF exposure from Smart Transmit enabled WWAN (norm. SAR from 4G + norm. PD from 5G mmW NR) + norm. SAR from WLAN ≤ 1.0 normalized limit (1)

Smart Transmit algorithm in WWAN adds directly the time-averaged RF exposure from 4G and time-averaged RF exposure from 5G mmW NR, i.e.,

norm. RF exposure from Smart Transmit enabled WWAN: (normalized SAR exposure from 4G) + (normalized PD exposure from 5G mmW NR) ≤ 1.0 normalized limit (2)

In other words, Smart Transmit algorithm controls the total RF exposure from both 4G radio and 5G mmW NR to not exceed FCC limit. Smart transmit algorithm assumes hotspots are collocated (i.e., ignoring spatial distribution of hotspots) and directly adds normalized RF exposures from 4G and from 5G mmW NR, i.e.,

If *A = max normalized time-averaged SAR exposure from 4G*,

B = max normalized time-averaged PD exposure from 5G mmW NR,

then, equation (2) can be re-written as below because Smart Transmit assumes 4G hotspots are collocated with 5G mmW NR hotspot:

*Smart Transmit enabled WWAN: x(t) * A + (1-x(t)) * B ≤ 1.0 normalized limit* (3)

Here, "*x(t)*A*" represents percentage of normalized time-averaged RF exposure from 4G, and *x(t)* ranges between [0,1]; "*(1-x(t))*B*" is remaining percentage of RF exposure contribution from 5G mmW NR. Smart Transmit controls '*x*' in real time such that the sum of these exposures never exceeds 1.0 normalized limit.

Note that mathematically,

$x(t) * A + (1 - x(t)) * B \leq max(A, B) \leq 1.0\ normalized\ limit$, for *x(t)* ∈ [0,1] (4)

Therefore, if below equations (5a) and (5b) are proven,

$A + norm.SAR\ from\ WLAN \leq 1.0\ norm.limit$ (5a),

and

$B + norm.SAR\ from\ WLAN \leq 1.0\ norm.limit$ (5b),

Then, based on equation (4), below condition is also proved:

$[x(t) * A + (1 - x(t)) * B] + norm.SAR\ from\ WLAN \leq 1.0\ norm.limit$ (5c),

which is same as equation (1), to demonstrate compliance for simultaneous transmission.

Additionally, it should be noted that in the absence of 5G mmW NR, Smart Transmit limits the maximum RF exposure contributed from 4G to 100% normalized exposure (i.e., *x*=1.0 in equation 3), while with 5G mmW NR active, Smart Transmit limits the maximum RF exposure contributed from 5G mmW NR to 75% normalized exposure to guarantee at least 25% margin allocated to 4G LTE anchor to maintain the link (i.e., *x*=0.25 in equation 3). Therefore,

Smart Transmit enabled WWAN: A=max (normalized SAR exposure from 4G) ≤ 1.0 normalized limit (6a)

Smart Transmit enabled WWAN: B=max (normalized PD exposure from 5G mmW NR) ≤ 0.75 normalized limit (6b)

Thus, for compliance demonstration given by equation (1), below equation (7) obtained by combining equations (5a & 5b) and (6a & 6b), should be proven to guarantee simultaneous transmission compliance:

Total normalized RF exposure = norm. SAR from 4G WWAN + norm. SAR from WLAN < 1.0 normalized FCC limit (7a)

*Total normalized RF exposure = 0.75*norm. PD from 5G mmW NR WWAN + norm. SAR from WLAN < 1.0 normalized FCC limit* (7b)

The compliance for simultaneous transmission scenarios of WWAN (4G/5G mmW NR) radio enabled with Smart Transmit and WLAN without Smart Transmit is re-evaluated for all transmission scenarios supported by this EUT.

As described in equation (7), simultaneous transmission analysis for WWAN + WLAN is performed in two parts:

1. 4G WWAN + WLAN (i.e., Eq. (7a) with compliance demonstration in Section 4.3.2)
2. 5G mmW NR WWAN + WLAN (i.e., Eq. (7b) with compliance demonstration in Section 4.3.3)

By combining above a. and b., the FCC requirement expressed in Eq. (1), re-written below, is met

Total norm. RF exposure = norm. RF exposure from Smart Transmit enabled WWAN (norm. SAR from 4G + norm. PD from 5G mmW NR) + norm. SAR from WLAN ≤ 1.0 normalized limit (1)

4.3.2 Simultaneous Transmission Compliance demonstration for 4G WWAN + WLAN

For this EUT in all the supported 4G WWAN technologies, bands, antennas and DSIs, P_{limit} is ≥ P_{max} (maximum RF tune-up power). Therefore, simultaneous transmission analysis for 4G WWAN + WLAN is performed at P_{max}, which is shown in Section 4.7.4 of Bureau Veritas Report No. SA181015C09: *FCC SAR Test Report*.

4.3.3 Simultaneous Transmission Compliance demonstration for 5G mmW NR WWAN + WLAN

Simultaneous transmission analysis is performed in this section using worst-case PD values listed in Table 4-3 for compliance demonstration of 5G mmW NR WWAN + WLAN, along with all worst-case *reported* SAR values for WLAN listed in Table 4-2 extracted from Bureau Veritas Report No. SA181015C09: *FCC SAR Test Report*.

Simultaneous transmission analysis on all 5G mmW NR WWAN + WLAN scenarios are listed below:

Table 4-5 Simultaneous transmission analysis scenarios for 5G mmW NR WWAN + WLAN

1	2.4GHz WLAN* + 5G mmW NR
2	5GHz WLAN* + 5G mmW NR

*For each of the WLAN bands, worst-case SAR out of both WLAN antennas and WLAN MIMO scenarios is used during simultaneous transmission analysis. Additionally, note that WLAN 2.4GHz and WLAN 5GHz cannot transmit simultaneously.

The total exposure ratio (TER) is calculated using the equation below, followed by the calculated TER for this EUT:

$$TER = \sum_{n=1}^{N} \frac{\mathrm{SAR}_n}{\mathrm{SAR}_{n,limit}} + \sum_{n=1}^{N} \frac{\mathrm{S}_{m,avg}}{\mathrm{S}_{m,limit}} < 1$$

Table 4-6 TER for WLAN + 5G mmW NR n260

Transmission Scenario	SAR (W/kg)	SAR/1.6	S (W/m2)	S/10	TER
2.4GHz WLAN + 5G mmW NR n260	0.05	0.031	7.43	0.743	0.774
5GHz WLAN + 5G mmW NR n260	0.13	0.081	7.43	0.743	0.824

5 Conclusions

Table 5-1 shows the worst-case 1gSAR at P_{limit} and worst-case 4cm^2-avg PD at *input.power.limit.*

Table 5-1 *Reported* RF exposure level

	Reported RF Exposure Level	Notes
Highest 1g SAR at P_{limit} (W/kg)	1.16	Bureau Veritas Report No. SA181015C09
Highest 4cm^2-avg PD at *input.power.limit* (W/m^2)	7.43	Section 4.3
Highest 1g SAR (W/kg) for simultaneous Tx (4G WWAN + WLAN)	1.28	Bureau Veritas Report No. SA181015C09
Highest Total Exposure Ratio for simultaneous Tx (LTE+5G mmW NR + WLAN)	0.82	Section 4.3

Qualcomm Smart Transmit feature employed in Netgear 5G MHS Travel Router (FCC ID: PY319100441) meets the *SAR_design_target* and *PD_design_target* (within the design uncertainties) when operating in the static transmission condition at P_{limit} and *input.power.limit*, respectively, and is compliant with the FCC RF exposure limits.

A DASY mmW Probe and Verification Source Certificates

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

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

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

Accreditation No.: SCS 0108

Client **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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
Reference Probe 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

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

Issued: September 29, 2018

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

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

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

Accreditation No.: SCS 0108

Glossary:

NORMx,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
k	is the wave propagation direction

Calibration is Performed According to the Following Standards:

a) 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:

- *NORMx,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.
- *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
- 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).
- *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.
- *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 *NORMx* (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 *NORMx* (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 ($\mu V/(V/m)^2$)	0.02171	0.02498	± 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 %	± 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

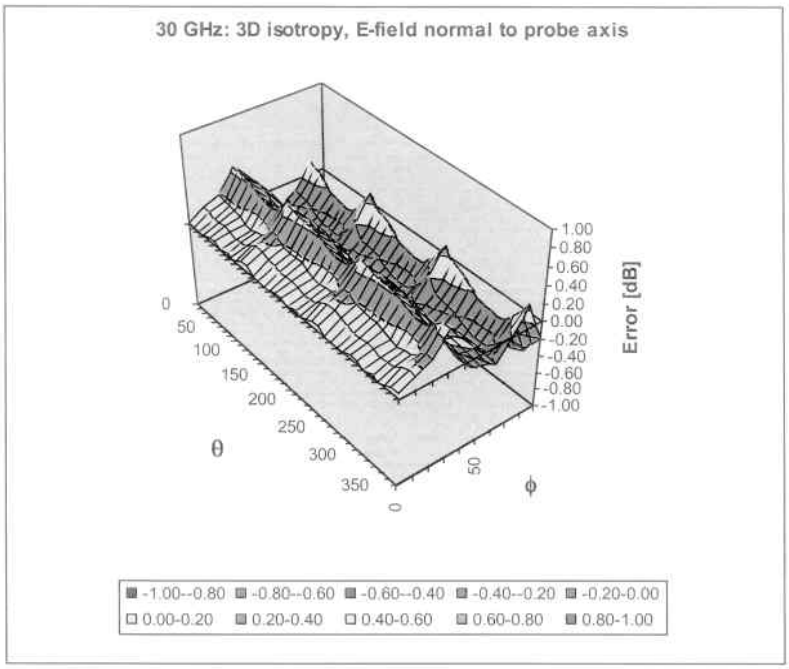
Sensor Model Parameters

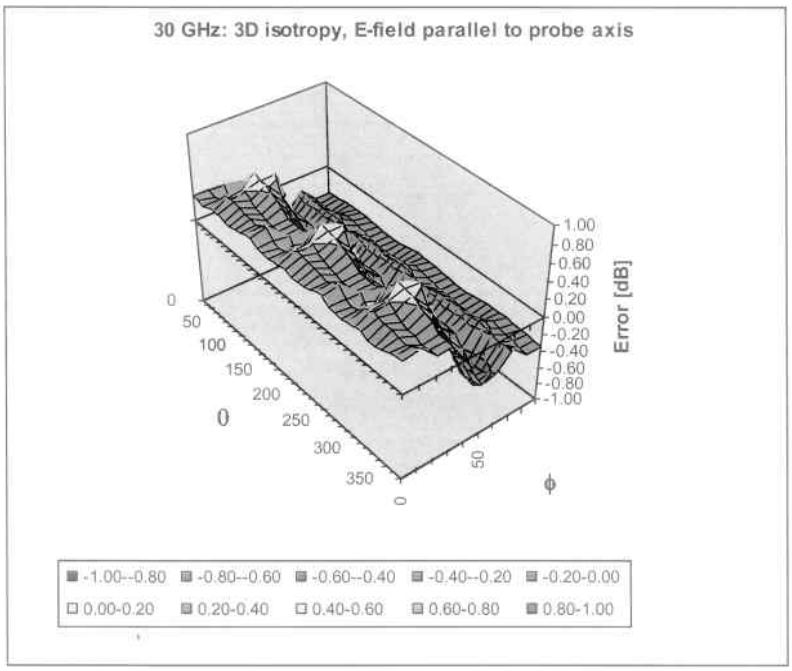
	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	7.329	49.74	30.07	0.916	1.785	4.911	0.449	0.442	0.997
Y	5.629	40.96	33.97	0.916	1.643	4.965	0.000	0.577	1.001

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 GHz





Probe isotropy for E_{tot}: probe rotated φ = 0° to 360°, tilted from field propagation direction $\vec{k}$
Parallel to the field propagation (ψ =0° - 90°): deviation within ± 0.47 dB
Normal to field orientation (ϑ =0° - 90°): deviation within ± 0.52 dB

Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Unc[E] (k=2)
0	CW	X	0.00	0.00	1.00	0.00	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 preambule)	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 preambule)	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, Clippin 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, Cliping 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	

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

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", November 2017
- DASY6 Handbook

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 mounted to the waveguide source and the reflected power is monitored and adjusted. (2) 30, 60 and 90 GHz: The verification sources are switched on for at least 30 minutes. Absorbers are used around the probe cup 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 (plane height defined by teaching the point at the surface of the flare of the horn).
- *E- field distribution:* E field is measured in four x-y-planes (10mm, 10mm + $\lambda/4$, 150mm; 150mm+ $\lambda/4$) with a vectorial E-field probe. The results at 150 mm are used to derive radiated power P_{rad} using numerically determined values. 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.
- *E-field polarization:* Above the open horn, linear polarization of the field is expected.

Calibrated Quantity

- Local peak E-field and spatial-averaged power density S ($1\ cm^2$ and $4cm^2$) at 10, 30, 60 or 90 GHz.

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%.

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

Client **Qualcomm CN**

Certificate No: 5G-Veri30-1012_Jun18

CALIBRATION CERTIFICATE

Object	5G Verification Source 30 GHz – SN: 1012
Calibration procedure(s)	QA CAL-45.v1 Calibration procedure for 5G Verification and Validation Sources
Calibration date:	June 29, 2018

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Reference Probe EUmmWV2	SN: 9374	23-Mar-18 (No. EUmmWV2-9374_Mar18)	Mar-19
DAE4	SN: 1215	26-Feb-18 (No. DAE4-1215_Feb18)	Feb-19
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**

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

Issued: July 3, 2018

Measurement Conditions

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

DASY Version	cDASY6 5G module	V1.2.0
Phantom	5G Phantom	
Distance Horn Aperture - plane	10 mm and 150 mm	
XY Scan Resolution	dx, dy = λ/4	
Number of measured planes	4 (10mm, 10mm + λ/4, 150mm; 150mm+ λ/4)	
Frequency	30 GHz ± 10 MHz	

Calibration Parameters, 30 GHz

Distance Horn Aperture to Measured Plane	P_{rad}[1] **(dBm)**	**Max E-field (V/m)**	Uncertainty E ($k = 2$)	Avg Power Density (W/m^2)		Uncertainty S ($k = 2$)
				1 cm^2	**4** cm^2	
10 mm	16.2	**153**	1.2 dB	**56.0**	**47.9**	1.4 dB
150 mm	16.2	**58.3**	1.2 dB	**8.68**	**8.23**	1.4 dB

[1] derived from far-field E-field data