FCC Test Report

Report No.:	FCC_SL19041803-SLX-007R6_5G Rev_1.0
FCC ID:	WUW-22135255
IC:	9613A-22135255
Test Model (host):	ONX-220
Series Model:	N/A
Received Date:	9/16/2019
Test Date:	9/16/2019 -9/24/2019
Issued Date:	10/14/2019
Applicant:	Viavi Solutions, Inc.
Address:	6001 America Center Drive, 6th Floor San Jose, CA 95002
Issued By:	Bureau Veritas Consumer Products Services, Inc.
Lab Address:	775 Montague Expressway, Milpitas, CA 95035, USA
Test Location (1):	775 Montague Expressway, Milpitas, CA 95035, USA
FCC Test Site Reg No.:	540430
IC Test Site No:	4842D

ACCREDITED
TESTING CERT # 2742-01

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Release Control Record

Issue No.	Description	Date Issued
FCC_SL19041803-SLX-007R6_5G	Original release	10/01/2019
FCC_SL19041803-SLX-007R6_5G Rev_1.0	Update Applicant Information	10/14/2019

1 Certificate of Conformity

Product:	DSP Series Field Meter
Brand:	Viavi
Test Model (host):	ONX-220
Series Model:	N/A
Sample Status:	Engineer Sample
Applicant:	Viavi Solutions, Inc.
Test Date:	9/16/2019 – 9/24/2019
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services, Inc. Milpitas Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** 10/01/2019

Deon Dai / Test Engineer

Approved by : _____ , **Date:** 10/14/2019

Chen Ge / Engineer Reviewer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	N/A
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.18dB at 375MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	N/A
---	Occupied Bandwidth Measurement	-	N/A
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	N/A
15.407(e)	6dB bandwidth	Pass	N/A
15.407(g)	Frequency Stability	Pass	N/A
15.203	Antenna Requirement	Pass	Antenna connector is U.FL. (The device is professionally installed)

Note:

N/A - For details, see original FCC and IC Test report No.: FCC ID: N6C-SXPCEACDB, Test Report No.: ER/2016/20015 / IC: 4908A- SXPCEACDB, Test Report No.: ER/2016/20019

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	3.51dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	3.73dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.64dB
	6GHz ~ 18GHz	4.82dB
	18GHz ~ 40GHz	4.91dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	DSP Series Field Meter
Brand	Viavi
Test Model (host)	ONX-220
Identification No. of EUT	TTDH0012190004
Series Model	N/A
Model Difference	N/A
Status of EUT	Engineer Sample
Power Supply Rating	100-240VAC,1.2A, 50-60Hz
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 1200Mbps 802.11ac: up to 3466.4Mbps
Operating Frequency	5150 ~ 5350MHz, 5470 ~ 5725MHz, 5745~5825MHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5260~5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5500~5700MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 11 802.11n (HT40), 802.11ac (VHT40): 5 802.11ac (VHT80): 2 5745~5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Antenna Type	PIFA Antenna, 4.4dBi
Antenna Connector	U.FL Connector

Note:

1. The EUT uses following adapter.

Brand	FSP
Model	FSP045-D3MR3
Input Power	100-240V,1.2A, 50-60Hz
Output Power	5.0V/9.0V/12.0V/15.0V 3.0A
Power Line	20.0V 2.25A

2. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Operation Modes

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5260 ~ 5320MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

FOR 5500 ~ 5700MHz

11 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

5 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530MHz	122	5610 MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Powered by adapter
B	-	√	√	-	Powered by POE

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	13.5
-	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
-	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
-	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	13.5
-	802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
-	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	6.5
-	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
-	802.11ac (VHT80)		106	106	OFDM	BPSK	29.3
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5320	36 to 64	62	OFDM	BPSK	6
-	802.11a	5500-5700	100 to 140	140	OFDM	BPSK	6
-	802.11a	5745-5825	149 to 165	149	OFDM	BPSK	6

Power Line Conducted Emission Test:

☐ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☐ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5320	36 to 64	62	OFDM	BPSK	6
-	802.11a	5500-5700	100 to 140	140	OFDM	BPSK	6
-	802.11a	5745-5825	149 to 165	149	OFDM	BPSK	6

Antenna Port Conducted Measurement:

☐ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☐ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☐ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	13.5
-	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
-	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
-	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	13.5
-	802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
-	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	6.5
-	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
-	802.11ac (VHT80)		106	106	OFDM	BPSK	29.3
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Deon Dai
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Deon Dai
PLC	25deg. C, 68%RH	120Vac, 60Hz	-
APCM	21deg. C, 60%RH	120Vac, 60Hz	-

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

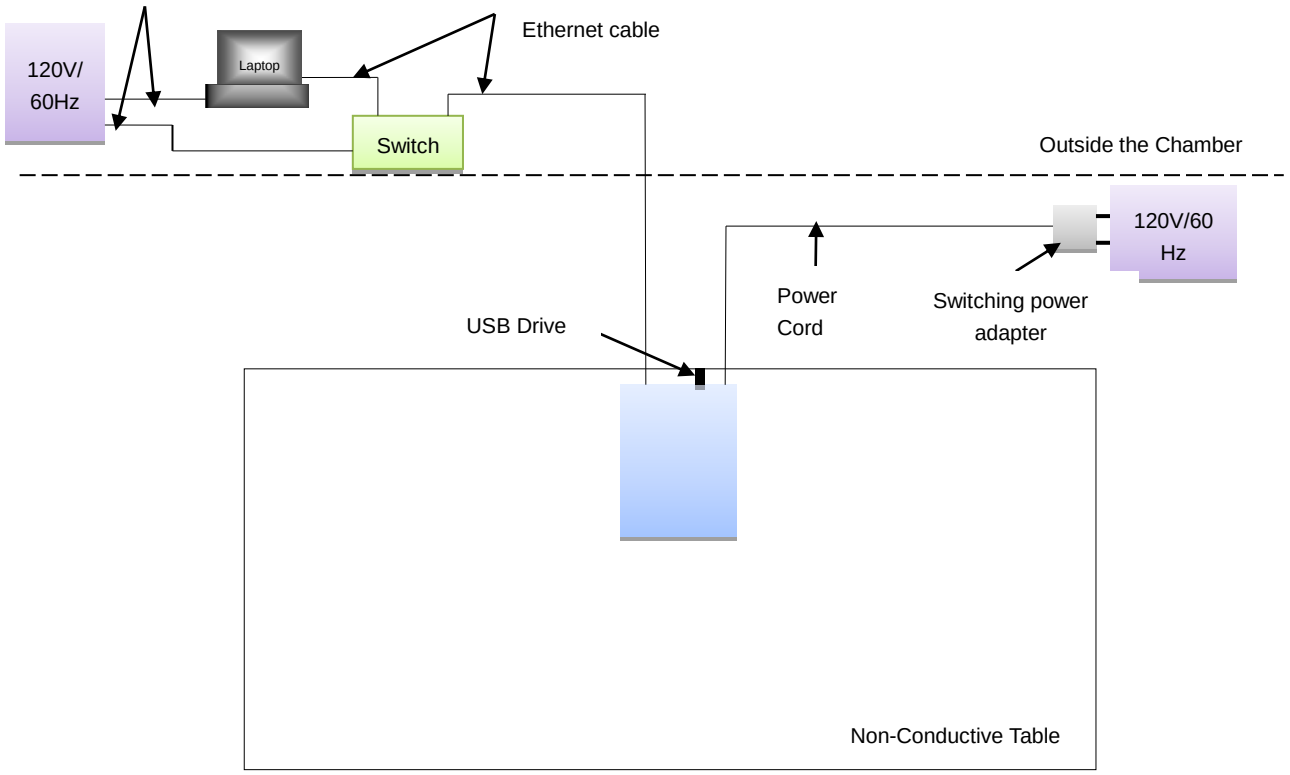
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Switch	TP-LINK	TL-WR841HP	2151802000460	TE7WR841HPV1	N/A
B.	Laptop	Acer	Aspire A315-51	N/A	N/A	N/A
C.	Power Supply(Laptop)	LITEON	PA-1450-26	N/A	N/A	N/A
D.	Laptop	Acer	Aspire A315-51	N/A	N/A	N/A
E.	Switching Power Adapter for Switch	Zebra	FSP025-DYAA3	N/A	N/A	N/A
F.	Switching Power Adapter for EUT	FSP	FSP045-D3MR3	H00000093	N/A	N/A
G.	USB Drive	SanDisk	Ultra	N/A	N/A	N/A

Note:
1. All power cords of the above support units are non-shielded (1.8m).
2. Items E~F acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Ethernet	1	3m	No	0	Connect from EUT to Switch
2.	Switching power adapter	1	2.4m	No	0	Use for power
3.						

Note: The core(s) is(are) originally attached to the cable(s).

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standard

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission Measurement

4.1.1 Limits of Radiated Emission Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBµV/m)</td><td>AV:54 (dBµV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBµV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☐</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBµV/m) *1
PK:105.2 (dBµV/m) *2
PK: 110.8(dBµV/m) *3
PK:122.2 (dBµV/m) *4</td></tr>
<tr><td>☒</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

Note:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ µV/m, where P is the eirp (Watts).

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
50GHz Spectrum Analyzer	N9030B (PXA)	MY57140597	6/5/2019	6/5/2020
Biconilog Antenna Sunol	JB1	A030702	3/9/2018	3/9/2020
Pre-Amplifier RF Bay, Inc.	LPA-6-30	11170601	4/27/2019	4/27/2020
Horn Antenna ETS-Lindgren	3117	218554	11/22/2017	11/22/2019
Pre-Amplifier RF-Lambda	RAMP00M50GA	17032300048	6/18/2019	6/18/2020

4.1.3 Test Procedure

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

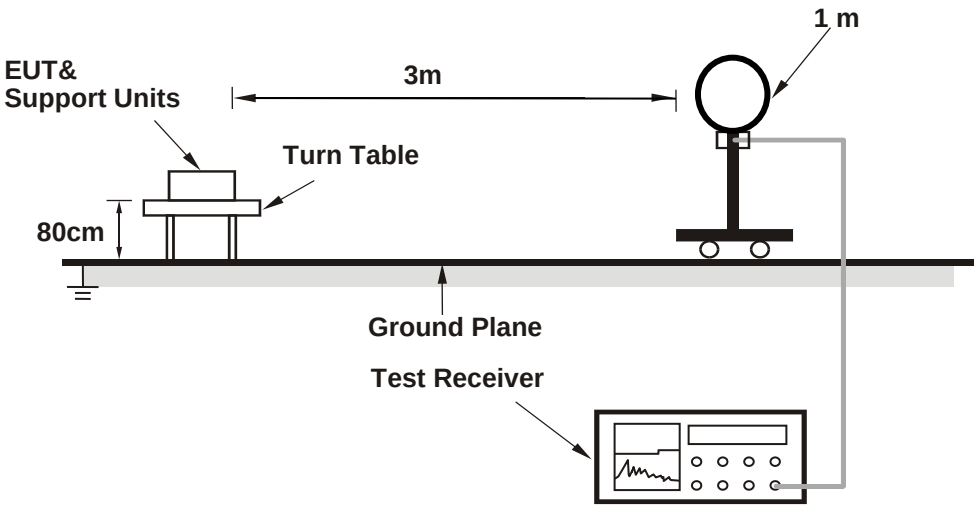
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

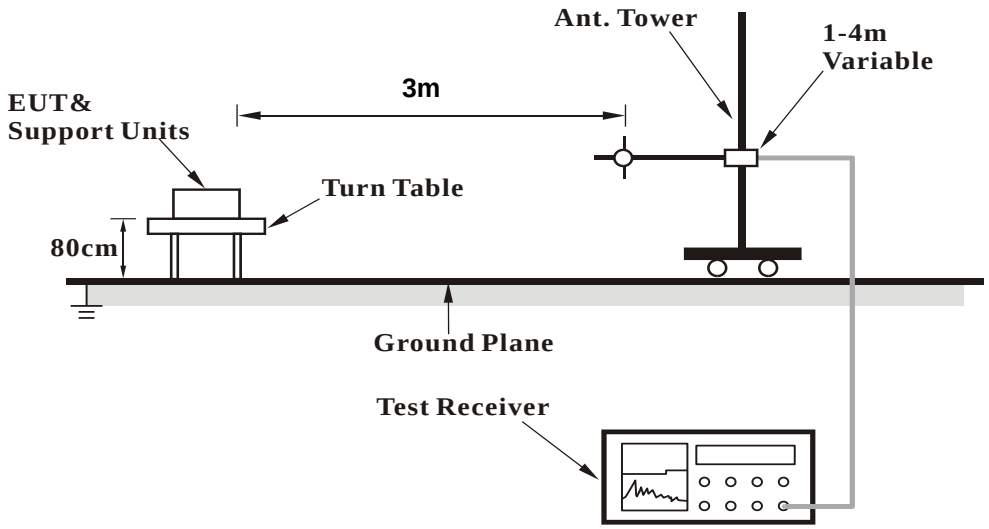
No deviation.

4.1.5 Test Setup

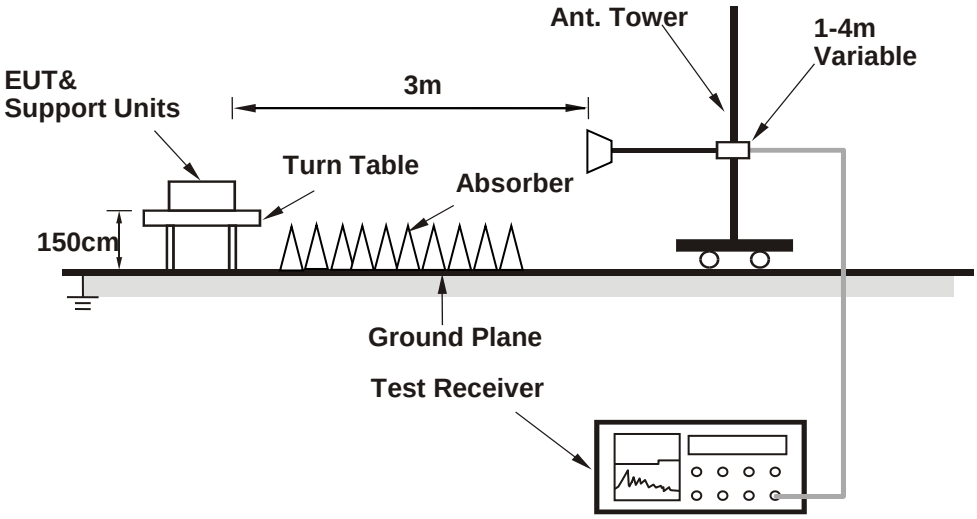
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Condition

a. Placed the EUT on the testing table.
b. Prepared notebooks to act as communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".
e. The necessary accessories enable the system in full functions.

4.1.7 Test Results

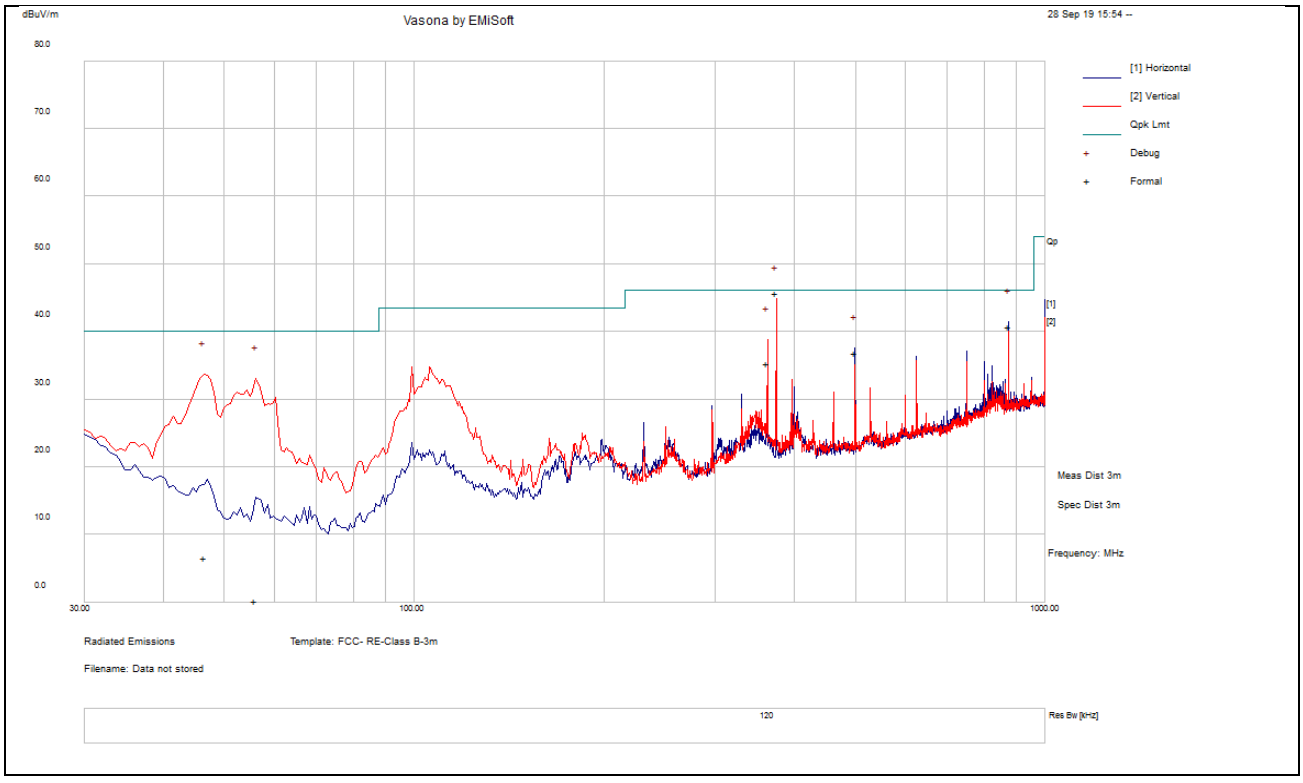
Below 1GHz Worst-Case Data:

CHANNEL	802.11ac Channel 42	**DETECTOR FUNCTION**	Quasi Peak
FREQUENCY RANGE	30MHz – 1GHz		

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	375.00	52.89	13.65	-20.72	45.82	Quasi Max	V	137	301	46	-0.18	Pass
2	875.01	38.58	15.79	-13.55	40.82	Quasi Max	H	99	192	46	-5.18	Pass
3	46.59	19.44	11.42	-24.22	6.65	Quasi Max	V	360	223	40	-33.35	Pass
4	55.92	15.74	11.48	-26.97	0.25	Quasi Max	V	258	184	40	-39.75	Pass
5	362.99	42.68	13.58	-20.97	35.3	Quasi Max	V	102	63	46	-10.7	Pass
6	500.00	41.26	14.17	-18.46	36.97	Quasi Max	H	166	288	46	-9.04	Pass

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Cable Loss (dB) + AF (dB)
2. AF (dB/m) = Antenna Factor (dB/m) – Preamplifier Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.



Above 1GHz Test Data:

1GHz-40GHz – 802.11a – 5180MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7861.95	50.24	5.31	-7.15	48.4	Peak Max	V	205	296	74	-25.6	Pass
2	10360.08	52.13	6	-3.87	54.26	Peak Max	V	219	25	74	-19.74	Pass
3	13209.44	54.84	6.98	-1.91	59.91	Peak Max	H	169	145	74	-14.09	Pass
4	7861.95	35.26	5.31	-7.15	33.42	Average Max	V	205	296	54	-20.58	Pass
5	10360.08	37.88	6	-3.87	40.01	Average Max	V	219	25	54	-13.99	Pass
6	13209.44	40.32	6.98	-1.91	45.39	Average Max	H	169	145	54	-8.61	Pass

1GHz-40GHz – 802.11a – 5200MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7000.05	49.89	5.08	-7.81	47.16	Peak Max	V	212	299	74	-26.84	Pass
2	10399.44	52.59	6.02	-3.85	54.76	Peak Max	V	224	29	74	-19.24	Pass
3	13790.10	54.12	7.15	-1.7	59.57	Peak Max	H	169	147	74	-14.43	Pass
4	7000.05	35.71	5.08	-7.81	32.98	Average Max	V	212	299	54	-21.02	Pass
5	10399.44	37.92	6.02	-3.85	40.09	Average Max	V	224	29	54	-13.91	Pass
6	13790.10	39.37	7.15	-1.7	44.82	Average Max	H	169	147	54	-9.18	Pass

1GHz-40GHz – 802.11a – 5240MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7513.36	49.55	5.13	-7.52	47.16	Peak Max	V	213	297	74	-26.84	Pass
2	10480.57	52.57	6.07	-3.82	54.82	Peak Max	V	223	26	74	-19.18	Pass
3	13355.86	54.39	7.02	-1.7	59.71	Peak Max	V	168	147	74	-14.29	Pass
4	7513.36	34.7	5.13	-7.52	32.31	Average Max	V	213	297	54	-21.69	Pass
5	10480.57	37.62	6.07	-3.82	39.87	Average Max	V	223	26	54	-14.13	Pass
6	13355.86	40.18	7.02	-1.7	45.5	Average Max	V	168	147	54	-8.5	Pass

1GHz-40GHz – 802.11ac – 5180MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7992.44	50.18	5.42	-7.04	48.56	Peak Max	V	213	292	74	-25.44	Pass
2	10360.60	52.16	6	-3.87	54.29	Peak Max	H	217	32	74	-19.71	Pass
3	13451.50	54.69	7.04	-1.61	60.12	Peak Max	V	165	152	74	-13.88	Pass
4	7992.44	35.82	5.42	-7.04	34.2	Average Max	V	213	292	54	-19.8	Pass
5	10360.60	37.45	6	-3.87	39.58	Average Max	H	217	32	54	-14.42	Pass
6	13451.50	39.79	7.04	-1.61	45.22	Average Max	V	165	152	54	-8.78	Pass

1GHz-40GHz – 802.11ac -20M – 5200MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7979.04	50.1	5.41	-7.05	48.46	Peak Max	H	207	300	74	-25.54	Pass
2	10399.14	52.64	6.02	-3.85	54.81	Peak Max	V	216	30	74	-19.19	Pass
3	13096.81	54.67	6.94	-1.82	59.79	Peak Max	H	161	149	74	-14.21	Pass
4	7979.04	35.65	5.41	-7.05	34.01	Average Max	H	207	300	54	-19.99	Pass
5	10399.14	38.44	6.02	-3.85	40.61	Average Max	V	216	30	54	-13.39	Pass
6	13096.81	40.3	6.94	-1.82	45.42	Average Max	H	161	149	54	-8.58	Pass

1GHz-40GHz – 802.11ac -20M – 5240MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7762.41	49.31	5.23	-7.24	47.3	Peak Max	H	210	301	74	-26.7	Pass
2	10480.33	52.58	6.07	-3.82	54.83	Peak Max	V	215	33	74	-19.17	Pass
3	13085.40	54.96	6.93	-1.79	60.1	Peak Max	V	169	146	74	-13.9	Pass
4	7762.41	34.4	5.23	-7.24	32.39	Average Max	H	210	301	54	-21.61	Pass
5	10480.33	38.57	6.07	-3.82	40.82	Average Max	V	215	33	54	-13.18	Pass
6	13085.40	39.98	6.93	-1.79	45.12	Average Max	V	169	146	54	-8.88	Pass

1GHz-40GHz – 802.11ac -40M – 5190MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7315.50	50.37	5.15	-7.66	47.86	Peak Max	V	208	297	74	-26.14	Pass
2	10379.04	51.78	6.01	-3.86	53.93	Peak Max	H	222	26	74	-20.07	Pass
3	13653.28	54.53	7.09	-1.53	60.09	Peak Max	H	166	147	74	-13.91	Pass
4	7315.50	35.88	5.15	-7.66	33.37	Average Max	V	208	297	54	-20.63	Pass
5	10379.04	37.24	6.01	-3.86	39.39	Average Max	H	222	26	54	-14.61	Pass
6	13653.28	39.85	7.09	-1.53	45.41	Average Max	H	166	147	54	-8.59	Pass

1GHz-40GHz – 802.11ac -40M – 5230MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7267.27	48.83	5.16	-7.7	46.29	Peak Max	H	206	301	74	-27.71	Pass
2	10460.02	52.8	6.06	-3.83	55.03	Peak Max	H	215	32	74	-18.97	Pass
3	13745.51	54.1	7.12	-1.61	59.61	Peak Max	V	165	145	74	-14.39	Pass
4	7267.27	34.47	5.16	-7.7	31.93	Average Max	H	206	301	54	-22.07	Pass
5	10460.02	38.45	6.06	-3.83	40.68	Average Max	H	215	32	54	-13.32	Pass
6	13745.51	39.11	7.12	-1.61	44.62	Average Max	V	165	145	54	-9.38	Pass

1GHz-40GHz – 802.11ac -80M – 5210MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7740.97	51.08	5.22	-7.26	49.04	Peak Max	V	213	300	74	-24.96	Pass
2	10419.93	51.96	6.04	-3.85	54.15	Peak Max	H	216	26	74	-19.85	Pass
3	13135.17	53.9	6.95	-1.86	58.99	Peak Max	H	169	147	74	-15.01	Pass
4	7740.97	36.85	5.22	-7.26	34.81	Average Max	V	213	300	54	-19.19	Pass
5	10419.93	37.43	6.04	-3.85	39.62	Average Max	H	216	26	54	-14.38	Pass
6	13135.17	39.1	6.95	-1.86	44.19	Average Max	H	169	147	54	-9.81	Pass

1GHz-40GHz – 802.11a – 5745MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7720.85	49.23	5.21	-7.27	47.17	Peak Max	V	205	297	74	-26.83	Pass
2	11490.26	53.07	6.07	-2.79	56.35	Peak Max	H	220	33	74	-17.65	Pass
3	13799.47	54.44	7.15	-1.72	59.87	Peak Max	H	162	154	74	-14.13	Pass
4	7720.85	34.57	5.21	-7.27	32.51	Average Max	V	205	297	54	-21.49	Pass
5	11490.26	38.76	6.07	-2.79	42.04	Average Max	H	220	33	54	-11.96	Pass
6	13799.47	39.94	7.15	-1.72	45.37	Average Max	H	162	154	54	-8.63	Pass

1GHz-40GHz – 802.11a – 5785MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7248.10	48.61	5.16	-7.71	46.06	Peak Max	H	211	298	74	-27.94	Pass
2	11569.72	52.36	6.13	-2.68	55.81	Peak Max	H	218	25	74	-18.19	Pass
3	13378.54	54.22	7.03	-1.66	59.59	Peak Max	H	167	148	74	-14.41	Pass
4	7248.10	34.16	5.16	-7.71	31.61	Average Max	H	211	298	54	-22.39	Pass
5	11569.72	37.98	6.13	-2.68	41.43	Average Max	H	218	25	54	-12.57	Pass
6	13378.54	40	7.03	-1.66	45.37	Average Max	H	167	148	54	-8.63	Pass

1GHz-40GHz – 802.11a – 5825MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7742.57	51.27	5.22	-7.26	49.23	Peak Max	V	205	298	74	-24.77	Pass
2	11650.94	53.38	6.2	-2.52	57.06	Peak Max	V	222	31	74	-16.94	Pass
3	13397.26	54.28	7.03	-1.64	59.67	Peak Max	H	166	151	74	-14.33	Pass
4	7742.57	37.2	5.22	-7.26	35.16	Average Max	V	205	298	54	-18.84	Pass
5	11650.94	39.15	6.2	-2.52	42.83	Average Max	V	222	31	54	-11.17	Pass
6	13397.26	40.02	7.03	-1.64	45.41	Average Max	H	166	151	54	-8.59	Pass

1GHz-40GHz – 802.11ac -20M – 5745MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7452.97	49.13	5.14	-7.56	46.71	Peak Max	V	209	297	74	-27.29	Pass
2	11491.00	52.99	6.07	-2.79	56.27	Peak Max	H	218	29	74	-17.73	Pass
3	13810.15	53.95	7.16	-1.71	59.4	Peak Max	V	167	145	74	-14.6	Pass
4	7452.97	34.9	5.14	-7.56	32.48	Average Max	V	209	297	54	-21.52	Pass
5	11491.00	38.61	6.07	-2.79	41.89	Average Max	H	218	29	54	-12.11	Pass
6	13810.15	39.04	7.16	-1.71	44.49	Average Max	V	167	145	54	-9.51	Pass

1GHz-40GHz – 802.11ac -20M – 5785MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7615.49	49.74	5.17	-7.42	47.49	Peak Max	V	211	297	74	-26.51	Pass
2	11569.41	52.38	6.13	-2.68	55.83	Peak Max	V	224	27	74	-18.17	Pass
3	13036.65	54.52	6.91	-1.65	59.78	Peak Max	H	161	152	74	-14.22	Pass
4	7615.49	35.33	5.17	-7.42	33.08	Average Max	V	211	297	54	-20.92	Pass
5	11569.41	38.08	6.13	-2.68	41.53	Average Max	V	224	27	54	-12.47	Pass
6	13036.65	39.56	6.91	-1.65	44.82	Average Max	H	161	152	54	-9.18	Pass

1GHz-40GHz – 802.11ac -20M – 5825MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7634.96	50.04	5.18	-7.36	47.86	Peak Max	H	210	297	74	-26.14	Pass
2	11650.84	53.38	6.2	-2.52	57.06	Peak Max	V	224	31	74	-16.94	Pass
3	13315.80	54.6	7.01	-1.76	59.85	Peak Max	V	170	147	74	-14.15	Pass
4	7634.96	35.67	5.18	-7.36	33.49	Average Max	H	210	297	54	-20.51	Pass
5	11650.84	39.12	6.2	-2.52	42.8	Average Max	V	224	31	54	-11.2	Pass
6	13315.80	40.1	7.01	-1.76	45.35	Average Max	V	170	147	54	-8.65	Pass

1GHz-40GHz – 802.11ac -40M – 5755MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7054.33	49.46	5.1	-7.79	46.77	Peak Max	V	209	297	74	-27.23	Pass
2	11509.32	53.24	6.08	-2.77	56.55	Peak Max	H	218	34	74	-17.45	Pass
3	13322.78	54.21	7.01	-1.75	59.47	Peak Max	V	169	146	74	-14.53	Pass
4	7054.33	35.08	5.1	-7.79	32.39	Average Max	V	209	297	54	-21.61	Pass
5	11509.32	38.79	6.08	-2.77	42.1	Average Max	H	218	34	54	-11.9	Pass
6	13322.78	39.22	7.01	-1.75	44.48	Average Max	V	169	146	54	-9.52	Pass

1GHz-40GHz – 802.11ac -40M – 5795MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7575.02	49.02	5.16	-7.48	46.7	Peak Max	V	210	293	74	-27.3	Pass
2	11590.02	54.22	6.15	-2.65	57.72	Peak Max	H	216	27	74	-16.28	Pass
3	13354.91	54.43	7.02	-1.7	59.75	Peak Max	V	164	147	74	-14.25	Pass
4	7575.02	34.13	5.16	-7.48	31.81	Average Max	V	210	293	54	-22.19	Pass
5	11590.02	40.1	6.15	-2.65	43.6	Average Max	H	216	27	54	-10.4	Pass
6	13354.91	40.03	7.02	-1.7	45.35	Average Max	V	164	147	54	-8.65	Pass

1GHz-40GHz – 802.11ac -80M – 5775MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7628.09	50.1	5.18	-7.38	47.9	Peak Max	V	209	301	74	-26.1	Pass
2	11549.67	52.85	6.11	-2.71	56.25	Peak Max	H	224	26	74	-17.75	Pass
3	13417.15	54.05	7.03	-1.63	59.45	Peak Max	H	167	146	74	-14.55	Pass
4	7628.09	35.75	5.18	-7.38	33.55	Average Max	V	209	301	54	-20.45	Pass
5	11549.67	37.85	6.11	-2.71	41.25	Average Max	H	224	26	54	-12.75	Pass
6	13417.15	39.91	7.03	-1.63	45.31	Average Max	H	167	146	54	-8.69	Pass

1GHz-40GHz – 802.11a – 5260MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7300.90	49.4	5.15	-7.67	46.88	Peak Max	H	206	295	74	-27.12	Pass
2	10520.16	53.01	6.09	-3.78	55.32	Peak Max	V	217	34	74	-18.68	Pass
3	13505.85	53.82	7.05	-1.58	59.29	Peak Max	V	164	152	74	-14.71	Pass
4	7300.90	34.45	5.15	-7.67	31.93	Average Max	H	206	295	54	-22.07	Pass
5	10520.16	38.28	6.09	-3.78	40.59	Average Max	V	217	34	54	-13.41	Pass
6	13505.85	39.24	7.05	-1.58	44.71	Average Max	V	164	152	54	-9.29	Pass

1GHz-40GHz – 802.11a – 5280MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7031.37	48.68	5.09	-7.8	45.97	Peak Max	V	207	298	74	-28.03	Pass
2	10559.85	52.88	6.1	-3.71	55.27	Peak Max	H	220	34	74	-18.73	Pass
3	13721.78	53.84	7.11	-1.57	59.38	Peak Max	V	166	151	74	-14.62	Pass
4	7031.37	34.16	5.09	-7.8	31.45	Average Max	V	207	298	54	-22.55	Pass
5	10559.85	38.27	6.1	-3.71	40.66	Average Max	H	220	34	54	-13.34	Pass
6	13721.78	39.72	7.11	-1.57	45.26	Average Max	V	166	151	54	-8.74	Pass

1GHz-40GHz – 802.11a – 5320MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7510.22	49.16	5.13	-7.52	46.77	Peak Max	H	210	294	74	-27.23	Pass
2	10640.50	53.22	6.14	-3.61	55.75	Peak Max	H	224	29	74	-18.25	Pass
3	13763.18	54.97	7.13	-1.64	60.46	Peak Max	V	167	147	74	-13.54	Pass
4	7510.22	34.36	5.13	-7.52	31.97	Average Max	H	210	294	54	-22.03	Pass
5	10640.50	38.38	6.14	-3.61	40.91	Average Max	H	224	29	54	-13.09	Pass
6	13763.18	40.2	7.13	-1.64	45.69	Average Max	V	167	147	54	-8.31	Pass

1GHz-40GHz – 802.11ac -20M – 5260MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7068.97	49.18	5.1	-7.78	46.5	Peak Max	H	206	298	74	-27.5	Pass
2	10520.04	53.02	6.09	-3.78	55.33	Peak Max	V	223	33	74	-18.67	Pass
3	13651.37	54.51	7.09	-1.53	60.07	Peak Max	V	165	145	74	-13.93	Pass
4	7068.97	34.85	5.1	-7.78	32.17	Average Max	H	206	298	54	-21.83	Pass
5	10520.04	38.37	6.09	-3.78	40.68	Average Max	V	223	33	54	-13.32	Pass
6	13651.37	40.45	7.09	-1.53	46.01	Average Max	V	165	145	54	-7.99	Pass

1GHz-40GHz – 802.11ac -20M – 5280MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7906.93	49.06	5.35	-7.11	47.3	Peak Max	H	204	299	74	-26.7	Pass
2	10559.47	52.89	6.1	-3.71	55.28	Peak Max	V	216	27	74	-18.72	Pass
3	13125.61	54.74	6.95	-1.85	59.84	Peak Max	V	162	146	74	-14.16	Pass
4	7906.93	34.66	5.35	-7.11	32.9	Average Max	H	204	299	54	-21.1	Pass
5	10559.47	38.66	6.1	-3.71	41.05	Average Max	V	216	27	54	-12.95	Pass
6	13125.61	40.61	6.95	-1.85	45.71	Average Max	V	162	146	54	-8.29	Pass

1GHz-40GHz – 802.11ac -20M – 5320MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7839.85	49.47	5.3	-7.17	47.6	Peak Max	V	208	299	74	-26.4	Pass
2	10640.88	53.24	6.14	-3.61	55.77	Peak Max	V	216	34	74	-18.23	Pass
3	13883.16	55.45	7.21	-1.64	61.02	Peak Max	H	164	149	74	-12.98	Pass
4	7839.85	34.63	5.3	-7.17	32.76	Average Max	V	208	299	54	-21.24	Pass
5	10640.88	39.17	6.14	-3.61	41.7	Average Max	V	216	34	54	-12.3	Pass
6	13883.16	40.67	7.21	-1.64	46.24	Average Max	H	164	149	54	-7.76	Pass

1GHz-40GHz – 802.11ac -40M – 5270MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7315.50	49.47	5.3	-7.17	47.6	Peak Max	V	208	299	74	-26.4	Pass
2	10539.04	53.24	6.14	-3.61	55.77	Peak Max	V	216	34	74	-18.23	Pass
3	13653.28	55.45	7.21	-1.64	61.02	Peak Max	H	164	149	74	-12.98	Pass
4	7315.50	34.63	5.3	-7.17	32.76	Average Max	V	208	299	54	-21.24	Pass
5	10539.04	39.17	6.14	-3.61	41.7	Average Max	V	216	34	54	-12.3	Pass
6	13653.28	40.67	7.21	-1.64	46.24	Average Max	H	164	149	54	-7.76	Pass

1GHz-40GHz – 802.11ac -40M – 5310MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7772.29	49.71	5.24	-7.23	47.72	Peak Max	H	206	301	74	-26.28	Pass
2	10620.11	52.53	6.13	-3.62	55.04	Peak Max	H	221	32	74	-18.96	Pass
3	13722.08	53.83	7.11	-1.57	59.37	Peak Max	V	170	150	74	-14.63	Pass
4	7772.29	35.48	5.24	-7.23	33.49	Average Max	H	206	301	54	-20.51	Pass
5	10620.11	38.07	6.13	-3.62	40.58	Average Max	H	221	32	54	-13.42	Pass
6	13722.08	39.63	7.11	-1.57	45.17	Average Max	V	170	150	54	-8.83	Pass

1GHz-40GHz – 802.11ac -80M – 5290MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7864.92	50.28	5.32	-7.15	48.45	Peak Max	V	210	300	74	-25.55	Pass
2	10579.79	52.31	6.11	-3.67	54.75	Peak Max	H	218	27	74	-19.25	Pass
3	13344.44	54.26	7.02	-1.71	59.57	Peak Max	V	161	145	74	-14.43	Pass
4	7864.92	35.79	5.32	-7.15	33.96	Average Max	V	210	300	54	-20.04	Pass
5	10579.79	38.25	6.11	-3.67	40.69	Average Max	H	218	27	54	-13.31	Pass
6	13344.44	39.28	7.02	-1.71	44.59	Average Max	V	161	145	54	-9.41	Pass

1GHz-40GHz – 802.11a – 5500MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7125.66	49.88	5.12	-7.76	47.24	Peak Max	V	212	295	74	-26.76	Pass
2	11000.55	52.29	6.13	-3.08	55.34	Peak Max	H	219	25	74	-18.66	Pass
3	13495.25	55.26	7.05	-1.6	60.71	Peak Max	H	168	152	74	-13.29	Pass
4	7125.66	35.37	5.12	-7.76	32.73	Average Max	V	212	295	54	-21.27	Pass
5	11000.55	37.87	6.13	-3.08	40.92	Average Max	H	219	25	54	-13.08	Pass
6	13495.25	40.31	7.05	-1.6	45.76	Average Max	H	168	152	54	-8.24	Pass

1GHz-40GHz – 802.11a – 5580MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7589.16	49.44	5.16	-7.47	47.13	Peak Max	V	210	297	74	-26.87	Pass
2	11159.38	52.89	6.07	-3.12	55.84	Peak Max	V	219	26	74	-18.16	Pass
3	13331.22	54.18	7.02	-1.73	59.47	Peak Max	V	167	145	74	-14.53	Pass
4	7589.16	34.67	5.16	-7.47	32.36	Average Max	V	210	297	54	-21.64	Pass
5	11159.38	38.69	6.07	-3.12	41.64	Average Max	V	219	26	54	-12.36	Pass
6	13331.22	39.97	7.02	-1.73	45.26	Average Max	V	167	145	54	-8.74	Pass

1GHz-40GHz – 802.11a – 5700MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7103.46	50.18	5.11	-7.77	47.52	Peak Max	H	204	292	74	-26.48	Pass
2	11400.44	52.76	6.05	-2.88	55.93	Peak Max	V	219	27	74	-18.07	Pass
3	13155.49	54.27	6.96	-1.87	59.36	Peak Max	H	166	146	74	-14.64	Pass
4	7103.46	36	5.11	-7.77	33.34	Average Max	H	204	292	54	-20.66	Pass
5	11400.44	38.59	6.05	-2.88	41.76	Average Max	V	219	27	54	-12.24	Pass
6	13155.49	39.61	6.96	-1.87	44.7	Average Max	H	166	146	54	-9.3	Pass

1GHz-40GHz – 802.11ac -20M – 5500MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7208.74	49.25	5.15	-7.73	46.67	Peak Max	H	205	294	74	-27.33	Pass
2	11000.82	52.31	6.13	-3.08	55.36	Peak Max	V	217	34	74	-18.64	Pass
3	13649.45	54.47	7.09	-1.53	60.03	Peak Max	V	163	146	74	-13.97	Pass
4	7208.74	34.93	5.15	-7.73	32.35	Average Max	H	205	294	54	-21.65	Pass
5	11000.82	37.92	6.13	-3.08	40.97	Average Max	V	217	34	54	-13.03	Pass
6	13649.45	40.28	7.09	-1.53	45.84	Average Max	V	163	146	54	-8.16	Pass

1GHz-40GHz – 802.11ac -20M – 5580MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7902.75	49.36	5.35	-7.12	47.59	Peak Max	H	209	299	74	-26.41	Pass
2	11159.79	52.85	6.07	-3.12	55.8	Peak Max	H	216	30	74	-18.2	Pass
3	13796.35	54.5	7.15	-1.71	59.94	Peak Max	V	169	153	74	-14.06	Pass
4	7902.75	35.21	5.35	-7.12	33.44	Average Max	H	209	299	54	-20.56	Pass
5	11159.79	38.31	6.07	-3.12	41.26	Average Max	H	216	30	54	-12.74	Pass
6	13796.35	39.98	7.15	-1.71	45.42	Average Max	V	169	153	54	-8.58	Pass

1GHz-40GHz – 802.11ac -20M – 5700MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7905.54	49.05	5.35	-7.11	47.29	Peak Max	V	205	294	74	-26.71	Pass
2	11400.50	52.76	6.05	-2.88	55.93	Peak Max	V	216	33	74	-18.07	Pass
3	13880.85	55.45	7.21	-1.65	61.01	Peak Max	V	166	145	74	-12.99	Pass
4	7905.54	35.05	5.35	-7.11	33.29	Average Max	V	205	294	54	-20.71	Pass
5	11400.50	37.99	6.05	-2.88	41.16	Average Max	V	216	33	54	-12.84	Pass
6	13880.85	40.9	7.21	-1.65	46.46	Average Max	V	166	145	54	-7.54	Pass

1GHz-40GHz – 802.11ac -40M – 5510MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7871.46	50.2	5.32	-7.14	48.38	Peak Max	H	206	292	74	-25.62	Pass
2	11019.57	53.19	6.12	-3.08	56.23	Peak Max	H	221	32	74	-17.77	Pass
3	13907.80	54.52	7.23	-1.62	60.13	Peak Max	H	161	145	74	-13.87	Pass
4	7871.46	35.27	5.32	-7.14	33.45	Average Max	H	206	292	54	-20.55	Pass
5	11019.57	38.42	6.12	-3.08	41.46	Average Max	H	221	32	54	-12.54	Pass
6	13907.80	39.82	7.23	-1.62	45.43	Average Max	H	161	145	54	-8.57	Pass

1GHz-40GHz – 802.11ac -40M – 5550MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7446.77	48.82	5.14	-7.57	46.39	Peak Max	V	204	295	74	-27.61	Pass
2	11100.06	52.64	6.09	-3.1	55.63	Peak Max	V	224	29	74	-18.37	Pass
3	13265.97	54.76	7	-1.86	59.9	Peak Max	V	161	152	74	-14.1	Pass
4	7446.77	34.73	5.14	-7.57	32.3	Average Max	V	204	295	54	-21.7	Pass
5	11100.06	37.72	6.09	-3.1	40.71	Average Max	V	224	29	54	-13.29	Pass
6	13265.97	40.52	7	-1.86	45.66	Average Max	V	161	152	54	-8.34	Pass

1GHz-40GHz – 802.11ac -40M – 5670MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7008.37	48.95	5.08	-7.81	46.22	Peak Max	H	206	298	74	-27.78	Pass
2	11340.14	52.53	6.04	-3.01	55.56	Peak Max	H	215	34	74	-18.44	Pass
3	13545.55	56.13	7.06	-1.55	61.64	Peak Max	V	162	153	74	-12.36	Pass
4	7008.37	34.81	5.08	-7.81	32.08	Average Max	H	206	298	54	-21.92	Pass
5	11340.14	38.23	6.04	-3.01	41.26	Average Max	H	215	34	54	-12.74	Pass
6	13545.55	41.78	7.06	-1.55	47.29	Average Max	V	162	153	54	-6.71	Pass

1GHz-40GHz – 802.11ac -80M – 5530MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7288.19	49.01	5.16	-7.68	46.49	Peak Max	V	205	293	74	-27.51	Pass
2	11059.22	53.41	6.11	-3.09	56.43	Peak Max	H	219	25	74	-17.57	Pass
3	13693.08	54.87	7.1	-1.54	60.43	Peak Max	V	166	154	74	-13.57	Pass
4	7288.19	34.61	5.16	-7.68	32.09	Average Max	V	205	293	54	-21.91	Pass
5	11059.22	38.51	6.11	-3.09	41.53	Average Max	H	219	25	54	-12.47	Pass
6	13693.08	40.16	7.1	-1.54	45.72	Average Max	V	166	154	54	-8.28	Pass

1GHz-40GHz – 802.11ac -80M – 5610MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Freq.	Raw	Cale Loss	AF	Level	Measurement Type	Pol	Hgt	Azt	Limit	Margin	Pass /Fail
	[MHz]	(dBuV)	(dB)	(dB/m)	(dBuV/m)			(cm)	Deg	(dBuV/m)	(dB)	
1	7840.85	49.4	5.3	-7.17	47.53	Peak Max	H	212	297	74	-26.47	Pass
2	11219.50	53.01	6.04	-3.13	55.92	Peak Max	V	218	30	74	-18.08	Pass
3	13394.89	54.2	7.03	-1.64	59.59	Peak Max	V	170	146	74	-14.41	Pass
4	7840.85	35.07	5.3	-7.17	33.2	Average Max	H	212	297	54	-20.8	Pass
5	11219.50	38.45	6.04	-3.13	41.36	Average Max	V	218	30	54	-12.64	Pass
6	13394.89	39.74	7.03	-1.64	45.13	Average Max	V	170	146	54	-8.87	Pass

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

Bureau Veritas is a global leader in testing, inspection and certification (TIC) services. We help businesses improve safety, sustainability and productivity; and our clients include the majority of leading brands in retail, manufacturing and other industries. With a presence in every major country around the world, our quality assurance and compliance solutions are vital in helping our customers enhance product quality and concept-to-consumer journeys. We also assist with increasing speed to market, profitability and brand equity throughout the supply chain. Bureau Veritas is a leading wireless/IoT testing, inspection, audit and certification provider, with a global network of test laboratories to support the IoT industry in areas of connectivity, security, interoperability as well as quality, health & safety, and environmental/chemical requirements.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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