

## C2PC FCC/IC Test Report

**Report No.:** FCC\_IC\_SL21020901-SLX-160A1\_5G Rev\_2.0

**FCC ID:** U4G-RHINO

**IC ID:** 3862E-RHINO

**Test Model/HVIN:** QCNFA324

**Received Date:** 01/04/2021

**Test Date:** 02/15/2021-12/17/2021

**Issued Date:** 01/14/2022

**Applicant:** Datalogic S.r.l.

**Address:** Via San Vitalino 13, 40012 Lippo di Calderara di Reno, Italy

**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 Registration /  
Designation Number:** 540430/4842D

**ISED# / CAB identifier:** 4842D



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Table of Contents

<b>Release Control Record .....</b>	<b>3</b>
<b>1 Certificate of Conformity .....</b>	<b>4</b>
<b>2 Summary of Test Results .....</b>	<b>5</b>
2.1 Measurement Uncertainty .....	5
2.2 Modification Record .....	5
<b>3 General Information .....</b>	<b>6</b>
3.1 General Description of EUT .....	6
3.2 Description of Test Modes .....	7
3.2.1 Test Mode Applicability and Tested Channel Detail .....	9
3.3 Description of Support Units .....	10
3.3.1 Configuration of System under Test .....	10
3.4 General Description of Applied Standard .....	11
<b>4 Test Types and Results .....</b>	<b>11</b>
Radiated Emission Measurement .....	11
Limits of Radiated Emission Measurement .....	11
4.1.1 Test Instruments .....	13
4.1.2 Test Procedure .....	13
4.1.3 Deviation from Test Standard .....	14
4.1.4 Test Setup .....	15
4.1.5 EUT Operating Condition .....	16
4.1.6 Test Results .....	17
<b>5 Pictures of Test Arrangements .....</b>	<b>47</b>
5.1 Radiated Emissions up to 1 GHz .....	47
5.2 Radiated Emissions above 1 GHz .....	<b>Error! Bookmark not defined.</b>
<b>Appendix – Information on the Testing Laboratories .....</b>	<b>48</b>

### Release Control Record

Issue No.	Description	Date Issued
FCC_IC_SL21020901-SLX-160A1_5GHz	Original release	3/18/2021
FCC_IC_SL21020901-SLX-160A1_5G Rev_1.0	Updated Title page, Section 2 - Summary of Test Results, Section 3 – General Information, Section 4 – Test Types and Results	12/20/2021
FCC_IC_SL21020901-SLX-160A1_5G Rev_2.0	Updated Antenna type, calibration list, and 18-25 GHz test results	01/14/2022

## 1 Certificate of Conformity

**Product:** PCIe 2x2 AC Wireless Module

**Brand:** Datalogic S.r.l

**Test Model:** QCNFA324


**Sample Status:** Engineering sample


**Applicant:** Datalogic S.r.l

**Test Date:** 02/15/2021-12/17/2021

**Standard:** 47 CFR FCC Part 15, Subpart E (Section 15.407)  
RSS-247 Issue 2, RSS-GEN  
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:** 03/18/2021  
Tony Evers / Test Engineer

**Approved by :** , **Date:** 03/18/2021  
Deon Dai / Engineer Reviewer

## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)				
RSS-247 Issue 2				
FCC	RSS Section(s)	Test Item	Result	Remarks
15.407 (b)(1/2/3/ 4(i/ii)/6)	RSS-GEN 7.3 RSS-247 6.2	Radiated Emissions Measurement*	Pass	Meet the requirement of limit.
15.203	RSS- GEN 6.8	Antenna Requirement	Pass	Antenna connector is I-PEX MHF-4. (The device is professionally installed)

Note: The purpose of this report is to add an additional antenna with higher gain and/or different type to the grant. Please refer to FCC ID: U4G-RHINO for all other tests.

### 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) ( $\pm$ )
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	PCIe 2x2 AC Wireless Module
Brand	Datalogic S.r.l
Test Model	QCNFA324
Status of EUT	Engineering Sample
Power Supply Rating	3.3Vdc from the host equipment
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	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 and 5470 ~ 5725MHz
Number of Channel	For 5GHz(U-NII-2A+U-NII-2C): 802.11a, 802.11n (HT20), 802.11ac (VHT20): 15 802.11n (HT40), 802.11ac (VHT40): 7 802.11ac (VHT80): 3 For 5GHz(U-NII-1+ U-NII-3): 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Antenna Brand	Huber+Suhner
Antenna Type	Dual band WiFi embedded patch antenna pair
Antenna Model	1399.99.0151
Antenna Gain	1 dBi
Antenna Connector	I-PEX MHF-4

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
2. Output power was verified and transmitting at full max output power. Measurements were taken prior to starting RSE testing.
3. The purpose of this report is to address the C2PC changes due to the addition of the dual patch antenna.

### 3.2 Description of Test Mode

#### 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	
-	√	√	-	-	-

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, 56, 64	OFDM	BPSK	6
-	802.11n (HT20)		52 to 64	52, 56, 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, 120, 140	OFDM	BPSK	6
-	802.11n (HT20)		100 to 140	100, 120, 140	OFDM	BPSK	6.5
-	802.11n (HT40)		102 to 134	102, 118, 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	5500-5700	100 to 140	140	OFDM	BPSK	6

**Test Condition:**

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Tony Evers
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Tony Evers
PLC	25deg. C, 68%RH	120Vac, 60Hz	-
APCM	21deg. C, 60%RH	120Vac, 60Hz	-

### 3.3 Description of Support Units

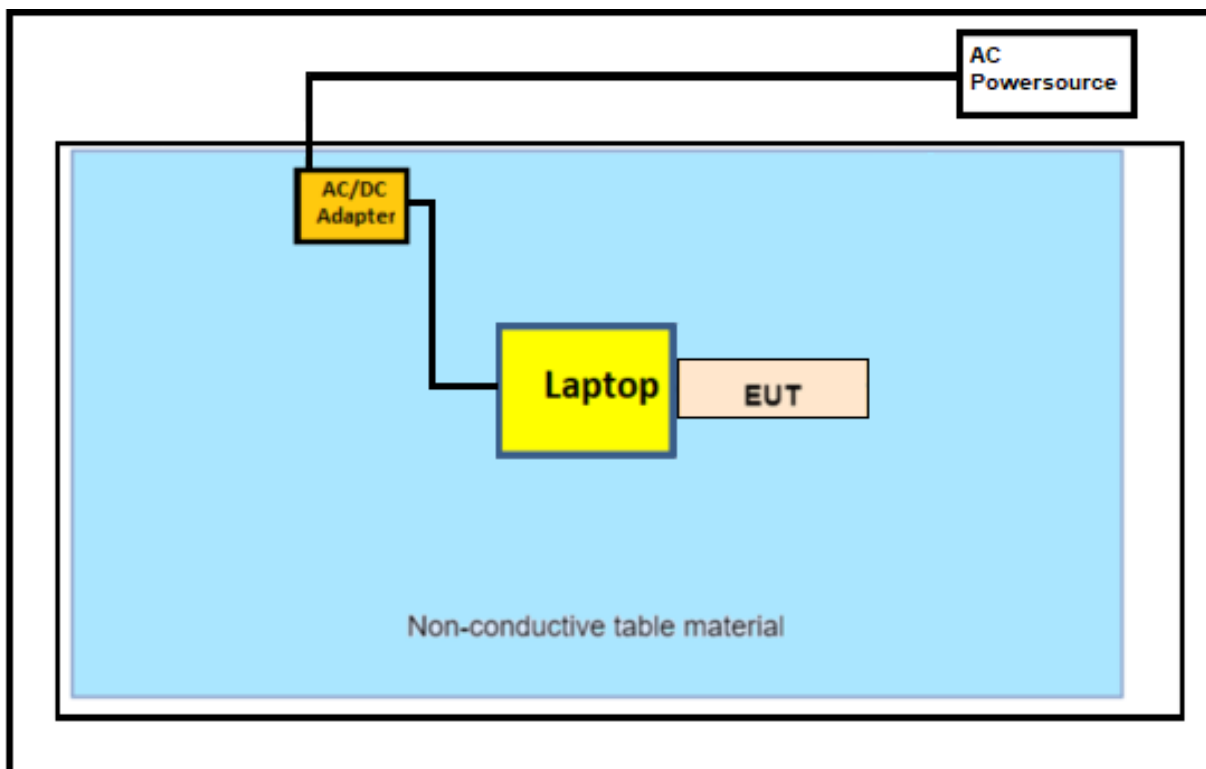
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	Dell	Latitude E6420	56CK3R1	N/A	N/A
B.	Power Supply(Laptop)	Dell	DA130PEI-00	JU012	N/A	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. EUT is connected via an express card adapter.

#### 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)**

**RSS-247 Issue 2, February 2017**

**RSS-Gen, Issue 5 March 2019**

**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

### Radiated Emission Measurement

The peak field strength of emissions from 18-40 GHz did not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation. Therefore, only 1-18 GHz has been included in the report

### 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

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	<input checked="" type="checkbox"/> 15.407(b)(4)(i)	PK:-27 (dBm/MHz) <sup>*1</sup> PK:10 (dBm/MHz) <sup>*2</sup> PK:15.6 (dBm/MHz) <sup>*3</sup> PK:27 (dBm/MHz) <sup>*4</sup>	PK: 68.2(dBμV/m) <sup>*1</sup> PK:105.2 (dBμV/m) <sup>*2</sup> PK: 110.8(dBμV/m) <sup>*3</sup> PK:122.2 (dBμV/m) <sup>*4</sup>
	<input type="checkbox"/> 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
*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.	

**Note:**

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

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

#### 4.1.1 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
EMI Receiver Rohde and Schwarz	ESW44	1328.4100K- 101662-MH	10/23/2020	10/23/2021
Biconilog Antenna Sunol	JB1	A111717	9/4/2020	9/4/2022
Horn Antenna ETS-Lindgren	3117	218553	2/20/2020	2/20/2022
Pre-Amplifier RF-Lambda	RAMP00M50GA	18040300055	08/05/2020	08/05/2022

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
EMI Receiver Rohde and Schwarz	ESW44	1328.4100K- 101662-MH	09/22/2021	09/22/2022
Biconilog Antenna Sunol	JB1	A111717	09/04/2020	9/4/2022
Horn Antenna ETS-Lindgren	3117	218553	02/20/2020	2/20/2022
DRG Horn Antenna	SAS-117	579	08/05/2020	08/05/2022
Pre-Amplifier RF-Lambda	RAMP00M50GA	18040300055	08/05/2020	08/05/2022
Microwavetown (0.80 m)	FSB360PK-KMKM	201906110002	12/09/2021	12/09/2022
Microwavetown (6.0 m)	FSB360PK-KMKM	202103270001	12/09/2021	12/09/2022

#### 4.1.2 Test Procedure

##### For Radiated emission below 30MHz

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- 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.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

##### NOTE:

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

##### For Radiated emission above 30MHz

- 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:**

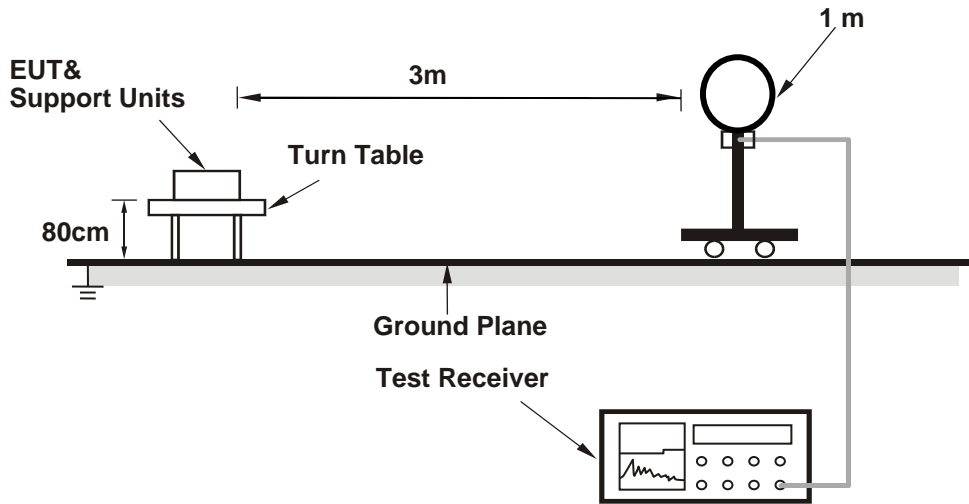
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz, and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above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

**4.1.3 Deviation from Test Standard**

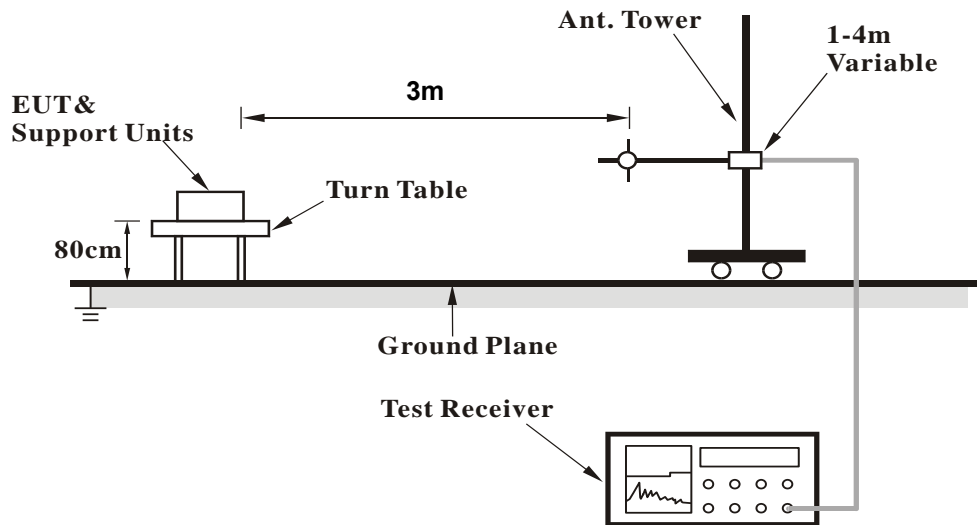
No deviation.

#### 4.1.4 Test Setup

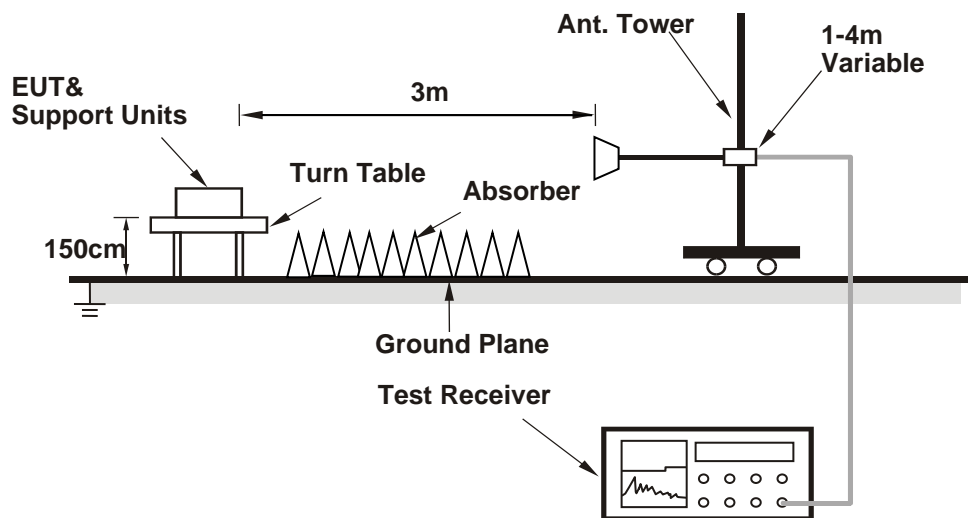
For Radiated emission below 30MHz



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).

#### 4.1.5 EUT Operating Condition

- Connected the EUT with the Notebook Computer which is placed on the table with the EUT.
- Prepared notebooks to act as communication partner and placed it outside of testing area.
- 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.
- The communication partner sent data to EUT by command "PING".
- The necessary accessories enable the system in full functions.



#### 4.1.6 Test Results

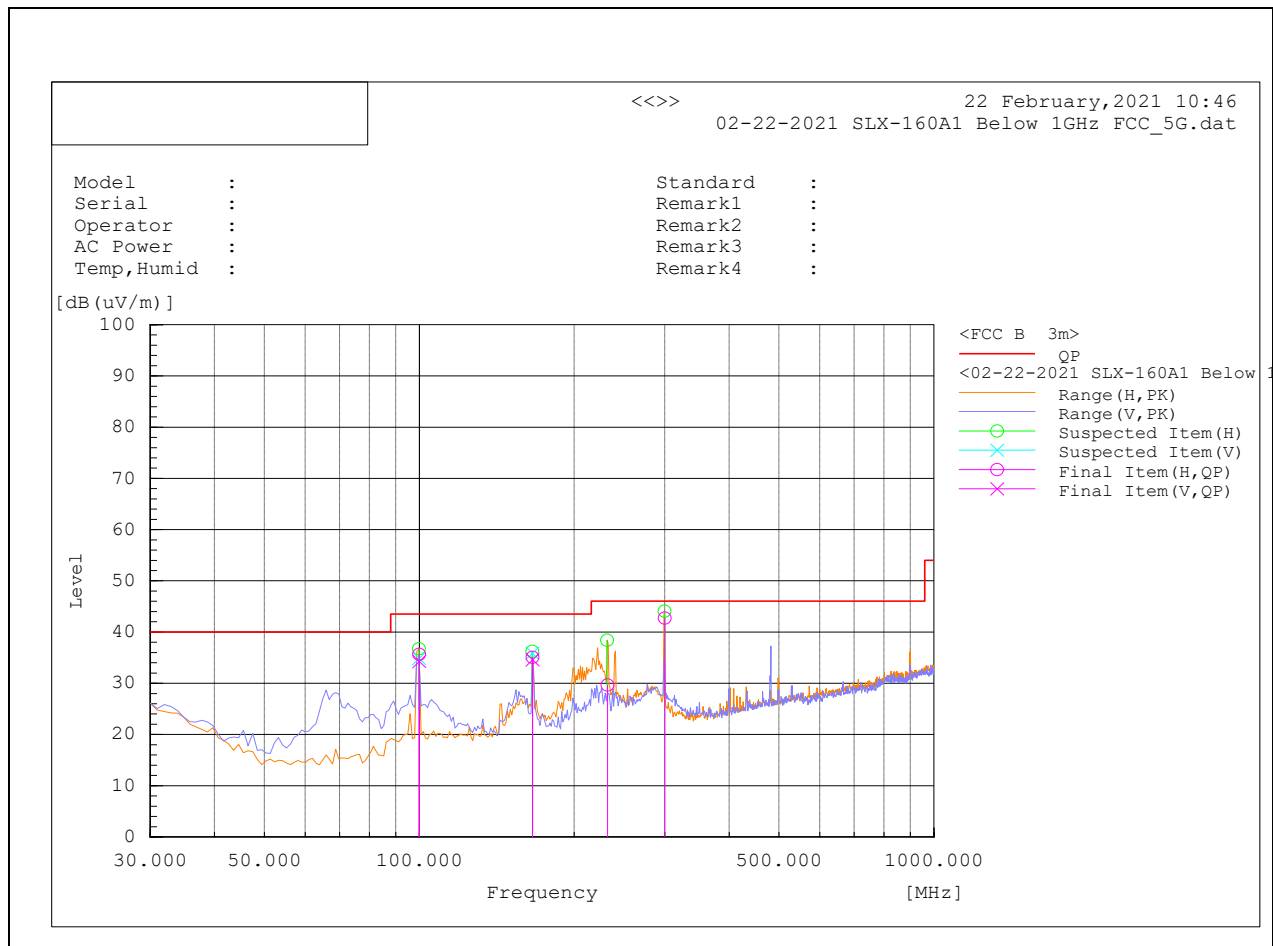
##### Below 1GHz Worst-Case Data:

<b>CHANNEL</b>	802.11a Channel 140	<b>DETECTOR FUNCTION</b>	Quasi Peak
<b>FREQUENCY RANGE</b>	30MHz – 1GHz		

ANTENNA POLARITY & test distance: HORIZONTAL & VERTICAL at 3 m										
	Frequency [MHz]	Pol	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	Limit\QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Pass/Fail
1	99.944	H	19.6	16	35.6	43.5	-7.9	304	152.2	Pass
2	99.942	V	17.7	16.6	34.3	43.5	-9.2	100	101.8	Pass
3	166.006	H	16.5	18.6	35.1	43.5	-8.4	152	246.2	Pass
4	166	V	15.8	18.8	34.6	43.5	-8.9	100	260.1	Pass
5	232.258	H	11.6	18.1	29.7	46	-16.3	124	186.7	Pass
6	299.88	H	22.2	20.5	42.7	46	-3.3	100	178.7	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 more than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. \* Worst case points outside of the restricted band were measured.



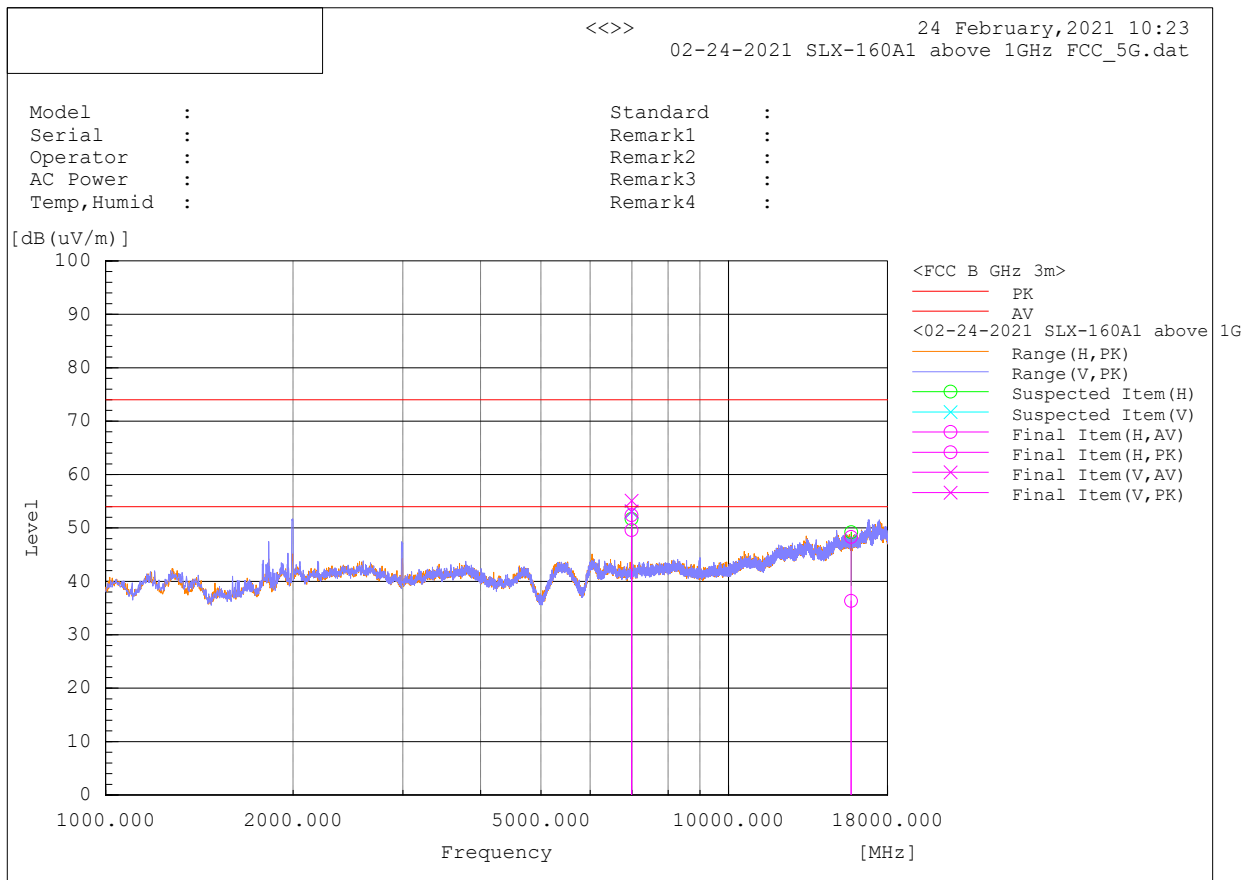
**Above 1GHz Worst-Case Data:**

<b>CHANNEL</b>	802.11n Channel 48	<b>DETECTOR FUNCTION</b>	Peak
<b>FREQUENCY RANGE</b>	1GHz – 18GHz		

ANTENNA POLARITY & test distance: HORIZONTAL & VERTICAL at 3 m														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6986.719	V	55.7	57.7	-2.6	53.1	55.1	-	68.2	-	-13.1	212	158.7	Pass
2	6986.699	H	52.2	55	-2.6	49.6	52.4	-	68.2	-	-15.8	100	353.7	Pass
3	15739.921	H	27	39	9.3	36.3	48.3	54	74	-17.7	-25.7	275	28.7	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 more than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. \* Worst case points outside of the restricted band were measured.



**Above 1GHz Worst-Case Data:**

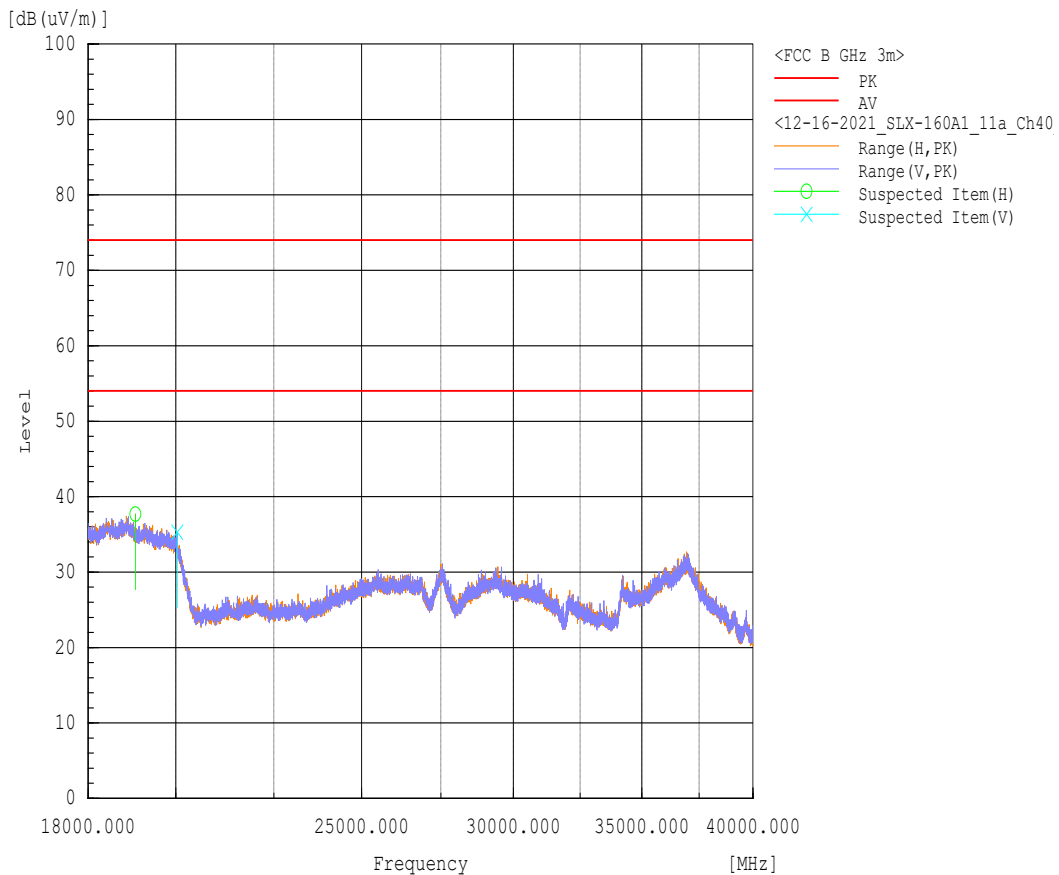
<b>CHANNEL</b>	802.11a Channel 36	<b>DETECTOR FUNCTION</b>	Peak
<b>FREQUENCY RANGE</b>	18GHz – 40GHz		

**ANTENNA POLARITY & test distance: HORIZONTAL & VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	19053.8	H	33.7	4	37.7	54	74	16.3	36.3	200	4.5	Pass
2	20032.8	V	32.6	2.7	35.3	54	74	18.7	38.7	400	8.8	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 more than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.



### Above 1GHz Test Data:

#### 1 GHz - 18 GHz – 802.11a – 5180MHz

1-18 GHz ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6093.965*	V	37.6	49	-4	33.6	45	-	68.2	-	-23.2	100	78.1	Pass
2	6906.711*	V	49.5	53.1	-2.5	47	50.6	-	68.2	-	-17.6	132	115.1	Pass
3	15427.757	V	27.9	39.8	9.1	37	48.9	54	74	-17	-25.1	268	24.2	Pass

Note: \* Worst case points outside of the restricted band were measured.

#### 1 GHz - 18 GHz – 802.11a – 5200MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6933.388*	V	53.4	55.8	-2.5	50.9	53.3	-	68.2	-	-14.9	223	143.2	Pass
2	7550.001	V	33.2	46.1	-1.3	31.9	44.8	54	74	-22.1	-29.2	318	172.9	Pass
3	10499.248*	V	30.8	42.4	2.7	33.5	45.1	-	68.2	-	-23.1	103	56.9	Pass

Note: \* Worst case points outside of the restricted band were measured.

#### 1 GHz - 18 GHz – 802.11a – 5240MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6986.745*	V	55.6	57.5	-2.6	53	54.9	-	68.2	-	-13.3	227	141.4	Pass
2	6986.709*	H	50.9	53.9	-2.6	48.3	51.3	-	68.2	-	-16.9	192	349.3	Pass
3	8968.54*	V	32.7	45.9	0.3	33	46.2	-	68.2	-	-22.0	238	161.4	Pass

Note: \* Worst case points outside of the restricted band were measured.

#### 1 GHz - 18 GHz – 802.11a – 5260MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7013.38*	V	52.8	55.4	-2.5	50.3	52.9	-	68.2	-	-15.3	172.8	194.4	Pass
2	7013.404*	H	50.7	54.1	-2.5	48.2	51.6	-	68.2	-	-16.6	135.4	327	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11a – 5280MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7040.044*	V	52.6	55.4	-2.5	50.1	52.9	-	68.2	-	-15.3	239.7	358.8	Pass
2	7040.013*	H	48.6	52.8	-2.5	46.1	50.3	-	68.2	-	-17.9	152.4	350.5	Pass
3	7656.194	H	33.8	45.4	-0.9	32.9	44.5	54	74	-21.1	-29.5	101.5	116.1	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11a – 5320MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7093.409*	V	53.2	55.8	-2.5	50.7	53.3	-	68.2	-	-14.9	100.4	359.9	Pass
2	7093.382*	H	49.8	53.2	-2.5	47.3	50.7	-	68.2	-	-17.5	206.2	278.9	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11a – 5500MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5499.122*	H	47.5	57.4	-5.7	41.8	51.7	-	68.2	-	-16.5	162	3.7	Pass
2	7333.443	V	52.8	55.6	-2.2	50.6	53.4	54	74	-3.4	-20.6	223	141.6	Pass
3	7333.369	H	49.5	53.1	-2.2	47.3	50.9	54	74	-6.7	-23.1	208	151.8	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11a – 5600MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5601.656*	H	42.6	53.3	-5.6	37	47.7	-	68.2	-	-20.5	100	326.8	Pass
2	7466.781	V	47.1	51.6	-1.7	45.4	49.9	54	74	-8.6	-24.1	132	167.2	Pass
3	13514.06*4	V	31.7	42.6	4.6	36.3	47.2	-	68.2	-	-21.0	268	3.3	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11a – 5700MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7600.035	H	47	51.3	-1.1	45.9	50.2	54	74	-8.1	-23.8	103	318.4	Pass
2	7600.01	V	43	48.7	-1.1	41.9	47.6	54	74	-12.1	-26.4	147	357.4	Pass
3	11760.388	V	31.2	41.9	3.6	34.8	45.5	54	74	-19.2	-28.5	320	185.4	Pass

**1 GHz - 18 GHz – 802.11a – 5745MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5746.967*	H	39.5	51.1	-5	34.5	46.1	-	68.2	-	-22.1	238	263.1	Pass
2	7660.092	V	42.9	49.1	-0.9	42	48.2	54	74	-12	-25.8	177	251.8	Pass
3	7660.067	H	45.7	50.4	-0.9	44.8	49.5	54	74	-9.2	-24.5	268	302.9	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11a – 5785MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5786.217*	H	41.2	52.1	-4.9	36.3	47.2	-	68.2	-	-21.0	100	283.1	Pass
2	7713.367	H	46.8	51	-0.7	46.1	50.3	54	74	-7.9	-23.7	100	301.9	Pass
3	7713.393	V	45.7	50.5	-0.7	45	49.8	54	74	-9.0	-24.2	123	162.9	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11a – 5825MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5821.508*	H	40.1	51	-4.8	35.3	46.2	-	68.2	-	-22.0	117	244.9	Pass
2	7766.754*	H	49	52.5	-0.5	48.5	52	-	68.2	-	-16.2	253	317.8	Pass
3	7766.666*	V	45.6	50.5	-0.5	45.1	50	-	68.2	-	-18.2	103	4.2	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11ac -20M – 5180MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL & VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6906.712*	H	51.5	54.6	-2.5	49	52.1	-	68.2	-	-16.0	162	352.9	Pass
2	6906.745*	V	50.9	54.1	-2.5	48.4	51.6	-	68.2	-	-16.6	177	202.4	Pass
3	10633.027	H	31	42	2.7	33.7	44.7	54	74	-20.3	-29.3	105	49	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5200MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL & VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6933.358*	V	54.2	56.2	-2.5	51.7	53.7	-	68.2	-	-14.5	223	141.6	Pass
2	6933.317*	H	52.2	55.1	-2.5	49.7	52.6	-	68.2	-	-15.6	100	349.6	Pass
3	15606.687	V	27.7	39.6	9.4	37.1	49	54	74	-16.9	-25.0	177	226.4	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5240MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL & VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6986.719*	V	55.7	57.7	-2.6	53.1	55.1	-	68.2	-	-13.1	212	158.7	Pass
2	6986.699*	H	52.2	55	-2.6	49.6	52.4	-	68.2	-	-15.8	100	353.7	Pass
3	15739.921	H	27	39	9.3	36.3	48.3	54	74	-17.7	-25.7	275	28.7	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5260MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL & VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7013.376*	V	52.2	54.9	-2.5	49.7	52.4	-	68.2	-	-15.8	251	194.6	Pass
2	7013.368*	H	50.9	54.1	-2.5	48.4	51.6	-	68.2	-	-16.6	162.9	326.6	Pass
3	13091.722	V	31.2	42.6	4.8	36	47.4	54	74	-18.0	-26.6	182.6	12	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5280MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7039.983*	V	52.7	55.4	-2.5	50.2	52.9	-	68.2	-	-15.3	241	218.5	Pass
2	7040.031*	H	49.9	53.5	-2.5	47.4	51	-	68.2	-	-17.2	100	326.8	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5320MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7093.336*	V	53.7	56	-2.5	51.2	53.5	-	68.2	-	-14.7	184.1	194.6	Pass
2	7093.323*	H	50.1	53.5	-2.5	47.6	51	-	68.2	-	-17.2	144.5	327.6	Pass
3	12321.127	H	29.6	42	4.4	34	46.4	54	74	-20	-27.6	182.6	98.5	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5500MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5495.519*	H	45.8	57.7	-5.7	40.1	52	-	68.2	-	-16.2	117	264.6	Pass
2	6191.474*	V	35.5	47.1	-3.7	31.8	43.4	-	68.2	-	-24.8	103	312.7	Pass
3	7333.324	V	51.8	54.7	-2.2	49.6	52.5	54	74	-4.4	-21.5	177	141.7	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5600MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5598.633*	H	41.9	52.5	-5.6	36.3	46.9	-	68.2	-	-21.3	132	298.1	Pass
2	7466.714	V	47.3	51.4	-1.7	45.6	49.7	54	74	-8.4	-24.3	132	165.8	Pass
3	11996.96	H	30.7	42.3	4.1	34.8	46.4	54	74	-19.2	-27.6	100	321.6	Pass
4	12473.686	V	30	41.5	4.5	34.5	46	54	74	-19.5	-28.0	183	259.8	Pass

Note: \* Worst case points outside of the restricted band were measured.



**1 GHz - 18 GHz – 802.11n -20M – 5700MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7600.014	H	46.9	50.9	-1.1	45.8	49.8	54	74	-8.2	-24.2	103	318.4	Pass
2	7600.082	V	40.3	48.2	-1.1	39.2	47.1	54	74	-14.8	-26.9	132	200.6	Pass
3	7917.638*	H	33.2	44.8	-0.1	33.1	44.7	-	68.2	-	-23.5	100	212.8	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5745MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5740.956*	H	40.3	52	-5	35.3	47	-	68.2	-	-21.2	132	0	Pass
2	7660.074	V	43.4	49.2	-0.9	42.5	48.3	54	74	-11.5	-25.7	103	359.9	Pass
3	7660.072	H	47.8	51.5	-0.9	46.9	50.6	54	74	-7.1	-23.4	100	318.8	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5785MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5782.295*	H	39.1	50.7	-4.9	34.2	45.8	-	68.2	-	-22.4	100	0	Pass
2	7713.364	H	47.7	51.6	-0.7	47	50.9	54	74	-7	-23.1	103	319.7	Pass
3	7713.293	V	46.2	50.6	-0.7	45.5	49.9	54	74	-8.5	-24.1	103	186.8	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11n -20M – 5825MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7766.676*	H	51	54.4	-0.5	50.5	53.9	-	68.2	-	-14.3	238	304.6	Pass
2	7766.66*	V	48.2	52.3	-0.5	47.7	51.8	-	68.2	-	-16.4	208	170.9	Pass
3	8980.653*	V	33.4	45.6	0.3	33.7	45.9	-	68.2	-	22.3	317	149.5	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11ac -40M – 5190MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6920.026*	V	53.2	55.8	-2.5	50.7	53.3	-	68.2	-	-14.9	253	167.2	Pass
2	6920.054*	H	52.5	55.3	-2.5	50	52.8	-	68.2	-	-15.4	103	353.6	Pass
3	7151.34*	V	34.4	46.6	-2.4	32	44.2	-	68.2	-	-24.0	117	323.3	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11ac -40M – 5230MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5381.000	H	39.1	51.5	-5.8	33.3	45.7	54	74	-20.7	-28.3	100	108.5	Pass
2	5827.042*	H	33	45.1	-4.8	28.2	40.3	-	68.2	-	-27.9	283	252	Pass
3	6276.132*	H	34.8	46.8	-3.6	31.2	43.2	-	68.2	-	-25.0	207	327.2	Pass
4	6724.742*	H	34	46.2	-2.6	31.4	43.6	-	68.2	-	-24.6	283	359.9	Pass
5	6973.268*	V	53.8	56.6	-2.6	51.2	54	-	68.2	-	-14.2	192	143.2	Pass
6	6973.381*	H	52.3	55.3	-2.6	49.7	52.7	-	68.2	-	-15.5	117	316.8	Pass
7	7172.903*	H	34.5	47.2	-2.4	32.1	44.8	-	68.2	-	-23.4	192	118	Pass
8	7620.983	H	32.6	44.8	-1	31.6	43.8	54	74	-22.4	-30.2	353	123.9	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11ac -40M – 5270MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5822.827*	H	37.6	49.2	-4.8	32.8	44.4	-	68.2	-	-23.8	238	139.1	Pass
2	7766.761*	V	53.5	55.5	-0.5	53	55	-	68.2	-	-13.2	207	149.4	Pass
3	7766.745*	H	47.8	51.5	-0.5	47.3	51	-	68.2	-	-17.2	117	319	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11ac -40M – 5310MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6193.817*	V	35.1	51.7	-3.7	31.4	48	-	68.2	-	-20.2	103	1.1	Pass
2	7080.043*	V	53.7	56.1	-2.5	51.2	53.6	-	68.2	-	-14.6	181	184.2	Pass
3	7079.979*	H	51	54.4	-2.5	48.5	51.9	-	68.2	-	-16.3	226	327.9	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11ac -40M – 5510MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5504.594*	H	39.8	52.5	-5.6	34.2	46.9	-	68.2	-	-21.3	162	132	Pass
2	7346.659	V	52.2	55.2	-2.2	50	53	54	74	-4	-21.0	207	141.6	Pass
3	7346.702	H	46.5	51.3	-2.2	44.3	49.1	54	74	-9.7	-24.9	226	312.2	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11ac -40M – 5590MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	5575.683*	H	41	52.9	-5.6	35.4	47.3	-	68.2	-	20.9	111.3	296.4	Pass
2	7453.32	H	45.4	50.8	-1.8	43.6	49	54	74	-10.4	-25.0	100.4	343.1	Pass
3	7453.307	V	46.5	51	-1.8	44.7	49.2	54	74	-9.3	-24.8	195.6	149.5	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1 GHz - 18 GHz – 802.11ac -40M – 5670MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7559.97	V	40.3	48.4	-1.3	39	47.1	54	74	-15	-26.9	282.7	123.1	Pass
2	7560.007	H	46.8	51.5	-1.3	45.5	50.2	54	74	-8.5	-23.8	122.4	353.9	Pass
3	12600.561	H	31.5	42.2	4.6	36.1	46.8	54	74	-17.9	-27.2	365.1	359	Pass

**1 GHz - 18 GHz – 802.11ac -40M – 5755MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7673.325	V	45.6	50.4	-0.8	44.8	49.6	54	74	-9.2	-24.4	101.8	314.6	Pass
2	7673.346	H	49.4	52.5	-0.8	48.6	51.7	54	74	-5.4	-22.3	136.7	341.9	Pass

**1 GHz - 18 GHz – 802.11ac -40M – 5795MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7726.687	V	45.6	50.2	-0.6	45	49.6	54	74	-9	-24.4	196.2	337.5	Pass
2	7726.737	H	49.6	52.7	-0.6	49	52.1	54	74	-5	-21.9	107.6	342.9	Pass

**1 GHz - 18 GHz – 802.11ac -80M – 5210MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6946.706*	V	52.6	55.6	-2.5	50.1	53.1	-	68.2	-	-15.1	153.4	189.2	Pass
2	6946.687*	H	54.7	57	-2.5	52.2	54.5	-	68.2	-	-13.7	111.1	309.4	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1GHz-18 GHz – 802.11ac -80M – 5290MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7053.275*	H	55.1	57.4	-2.5	52.6	54.9	-	68.2	-	-13.3	129.2	304.1	Pass
2	7053.373*	V	53.9	56.5	-2.5	51.4	54	-	68.2	-	-14.2	206.4	150.7	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1GHz-18 GHz – 802.11ac -80M – 5530MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	6188.496*	V	35.7	47.3	-3.7	32	43.6	-	68.2	-	-24.6	100.5	243.5	Pass
2	7373.347	V	50.4	53.6	-2.1	48.3	51.5	54	74	-5.7	-22.5	136.2	190.6	Pass
3	7373.323	H	47.8	52.3	-2.1	45.7	50.2	54	74	-8.3	-23.8	99.9	304	Pass

Note: \* Worst case points outside of the restricted band were measured.

**1GHz-18 GHz – 802.11ac -80M – 5775MHz**
**ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m**

No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	7700.039	V	45.7	50.2	-0.7	45	49.5	54	74	-9	-24.5	153.5	165.2	Pass
2	7699.998	H	50.3	53.5	-0.7	49.6	52.8	54	74	-4.4	-21.2	206.3	318.7	Pass

### Above 18 GHz Test Data:

#### 18 GHz - 40 GHz – 802.11a – 5180MHz

1-18 GHz ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m														
No	Frequency [MHz]	Pol	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	22069.988	H	32.5	44.3	3	35.5	47.3	54	74	18.5	26.7	132	231.2	Pass
2	23218.074*	V	32.3	43.8	3.7	36	47.5	54	74	18	26.5	400	34	Pass
3	24853.586*	H	32.6	43.5	5.8	38.4	49.3	54	74	15.6	24.7	140	359.9	Pass

Note: \* Worst case points outside of the restricted band were measured.

#### 18 GHz - 40 GHz – 802.11a – 5200MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	19053.8	H	33.7	4	37.7	54	74	16.3	36.3	200	4.5	Pass
2	20032.8	V	32.6	2.7	35.3	54	74	18.7	38.7	400	8.8	Pass

#### 18 GHz - 40 GHz – 802.11a – 5240MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18886.6	H	33.2	4.2	37.4	54	74	16.6	36.6	100	11.4	Pass
2	19328.8	V	32.9	3.5	36.4	54	74	17.6	37.6	200	161	Pass

#### 18 GHz - 40 GHz – 802.11a – 5260MHz

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	LimitAV [dB(uV/m)]	LimitPK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18651.2	H	32.7	4.6	37.3	54	74	16.7	36.7	300	15.2	Pass
2	18990	V	32.8	4.1	36.9	54	74	17.1	37.1	300	92.6	Pass

**18 GHz – 40 GHz – 802.11a – 5280MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18651.2	H	32.7	4.6	37.3	54	74	16.7	36.7	300	15.2	Pass
2	19335.4	V	32.6	3.5	36.1	54	74	17.9	37.9	300	353.5	Pass

**18 GHz - 40 GHz – 802.11a – 5320MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18444.4	H	32.4	4.8	37.2	54	74	16.8	36.8	200	6	Pass
2	19181.4	V	32.5	3.9	36.4	54	74	17.6	37.6	100	171.3	Pass

**18 GHz - 40 GHz – 802.11a – 5500MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	22027.1	V	43.9	3	46.9	54	74	7.1	27.1	200	9.4	Pass
2	22058.6	H	44.1	3	47.1	54	74	6.9	26.9	100	174.1	Pass

**18 GHz - 40 GHz – 802.11a – 5600MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18998.8	H	32.4	4.1	36.5	54	74	17.5	37.5	100	1.5	Pass
2	19918.4	V	31.8	3.5	35.3	54	74	18.7	38.7	400	230.1	Pass

**18 GHz - 40 GHz – 802.11a – 5700MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18985.6	H	32.7	4	36.7	54	74	17.3	37.3	100	15.2	Pass
2	19931.6	V	31.6	3.4	35	54	74	19	39	200	254	Pass

**18 GHz - 40 GHz – 802.11a – 5745MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	21997*	V	44.4	3	47.4	54	74	6.6	26.6	200	352	Pass
2	22081	H	44	3	47	54	74	7	27	300	349.9	Pass

Note: \* Worst case points outside of the restricted band were measured.

**18 GHz - 40 GHz – 802.11a – 5785MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18847	H	33.4	4.1	37.5	54	74	16.5	36.5	400	85.7	Pass
2	19984.4	V	32.2	3.6	35.8	54	74	18.2	38.2	100	311.3	Pass

**18 GHz - 40 GHz – 802.11a – 5825MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	22459	H	44.8	3.1	47.9	54	74	6.1	26.1	100	321.6	Pass
2	23837.3	H	42.9	4.2	47.1	54	74	6.9	26.9	100	65.7	Pass

**18 GHz - 40 GHz – 802.11ac -20M – 5180MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	21960.6*	V	43.9	3	46.9	54	74	7.1	27.1	300	53.2	Pass
2	23963.3	V	42.1	4.5	46.6	54	74	7.4	27.4	100	299.8	Pass

Note: \* Worst case points outside of the restricted band were measured.

**18 GHz - 40 GHz – 802.11n -20M – 5200MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18825	H	33.2	4.3	37.5	54	74	16.5	36.5	400	15.8	Pass
2	19315.6	V	32.5	3.5	36	54	74	18	38	400	348.4	Pass

**18 GHz - 40 GHz – 802.11n -20M – 5240MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18389.4	H	33.6	4.9	38.5	54	74	15.5	35.5	300	144.7	Pass
2	19273.8	V	34.5	3.5	38	54	74	16	36	400	237.2	Pass

**18 GHz - 40 GHz – 802.11n -20M – 5260MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18895.4	H	34.1	4.2	38.3	54	74	15.7	35.7	200	231.1	Pass
2	19414.6	V	33.1	3.6	36.7	54	74	17.3	37.3	400	12.1	Pass



**18 GHz - 40 GHz – 802.11n -20M – 5280MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18882.2	H	33.2	4.2	37.4	54	74	16.6	36.6	400	2	Pass
2	19236.4	V	32.4	3.8	36.2	54	74	17.8	37.8	400	7.8	Pass

**18 GHz - 40 GHz – 802.11n -20M – 5320MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18992.2	H	33.7	4.1	37.8	54	74	16.2	36.2	200	16	Pass
2	19298	V	33	3.7	36.7	54	74	17.3	37.3	100	4.2	Pass

**18 GHz - 40 GHz – 802.11n -20M – 5500MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	21836*	H	44.1	2.8	46.9	54	74	7.1	27.1	400	252.6	Pass
2	22643.8	H	43.4	3.2	46.6	54	74	7.4	27.4	100	261.9	Pass

Note: \* Worst case points outside of the restricted band were measured.

**18 GHz - 40 GHz – 802.11n -20M – 5600MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18367.4	H	33	4.7	37.7	54	74	16.3	36.3	400	7.3	Pass
2	18805.2	V	32.8	4.3	37.1	54	74	16.9	36.9	300	126.2	Pass

**18 GHz - 40 GHz – 802.11n -20M – 5700MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18838.2	H	33.6	4.1	37.7	54	74	16.3	36.3	400	14.9	Pass
2	19311.2	V	33	3.6	36.6	54	74	17.4	37.4	200	4	Pass

**18 GHz - 40 GHz – 802.11n -20M – 5745MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	20893.1	V	43.3	2.5	45.8	54	74	8.2	28.2	400	239.6	Pass
2	22020.8	H	43.8	3	46.8	54	74	7.2	27.2	200	342.3	Pass

**18 GHz - 40 GHz – 802.11n -20M – 5785MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18906.4	H	33.6	4	37.6	54	74	16.4	36.4	200	121.3	Pass
2	19104.4	V	32.7	3.8	36.5	54	74	17.5	37.5	200	92.5	Pass

**18 GHz - 40 GHz – 802.11n -20M – 5825MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	22048.1	H	43.6	3	46.6	54	74	7.4	27.4	400	217.6	Pass
2	22048.1	V	42.5	3	45.5	54	74	8.5	28.5	200	197.8	Pass

**18 GHz - 40 GHz – 802.11ac -40M – 5190MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	24811*	H	43.2	5.8	49	54	74	5	25	100	25.1	Pass
2	24585.6*	V	43	5.5	48.5	54	74	5.5	25.5	200	76.6	Pass

Note: \* Worst case points outside of the restricted band were measured.

**18 GHz - 40 GHz – 802.11ac -40M – 5230MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18402.6	H	32.4	4.8	37.2	54	74	16.8	36.8	300	286.5	Pass
2	18952.6	V	33	4.1	37.1	54	74	16.9	36.9	300	0.6	Pass

**18 GHz - 40 GHz – 802.11ac -40M – 5270MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18897.6	H	32.9	4.2	37.1	54	74	16.9	36.9	200	0	Pass
2	19449.8	V	33.3	3.5	36.8	54	74	17.2	37.2	100	221.3	Pass

Note: \* Worst case points outside of the restricted band were measured.

**18 GHz - 40 GHz – 802.11ac -40M – 5310MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18728.2	V	33	4.4	37.4	54	74	16.6	36.6	400	359.9	Pass
2	18279.4	H	32.3	4.9	37.2	54	74	16.8	36.8	200	356.7	Pass

**18 GHz - 40 GHz – 802.11ac -40M – 5510MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18334.6	H	39.2	3.1	42.3	54	74	11.7	31.7	300	9.6	Pass
2	18334.6	V	41.5	3.1	44.6	54	74	9.4	29.4	300	346.4	Pass

**18 GHz - 40 GHz – 802.11ac -40M – 5590MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18941.6	H	33.3	4.2	37.5	54	74	16.5	36.5	200	351.1	Pass
2	19350.8	V	32.2	3.6	35.8	54	74	18.2	38.2	300	0.1	Pass

**18 GHz - 40 GHz – 802.11ac -40M – 5670MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18382.8	H	32.3	4.9	37.2	54	74	16.8	36.8	400	254.9	Pass
2	18893.2	V	32.9	4.2	37.1	54	74	16.9	36.9	100	355.9	Pass

**18 GHz - 40 GHz – 802.11ac -40M – 5755MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	22040.4	H	44.7	3	47.7	54	74	6.3	26.3	400	298.1	Pass
2	22054.4	V	44.2	3	47.2	54	74	6.8	26.8	400	35.8	Pass

**18 GHz - 40 GHz – 802.11ac -40M – 5795MHz**

<b>ANTENNA POLARITY &amp; test distance: HORIZONTAL&amp; VERTICAL at 3 m</b>												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	22015.2	H	43.8	3	46.8	54	74	7.2	27.2	300	192.5	Pass
2	22060	V	44	3	47	54	74	7	27	400	213	Pass

**18 GHz - 40 GHz – 802.11ac -80M – 5210MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	22055.8	H	44.8	3	47.8	54	74	6.2	26.2	100	352	Pass
2	22055.8	V	43.5	3	46.5	54	74	7.5	27.5	200	314.1	Pass

**18GHz-40 GHz – 802.11ac -80M – 5290MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18908.6	H	34.4	4	38.4	54	74	15.6	35.6	200	344.8	Pass
2	19315.6	V	33.6	3.5	37.1	54	74	16.9	36.9	400	5.4	Pass

**18 GHz-40 GHz – 802.11ac -80M – 5530MHz**

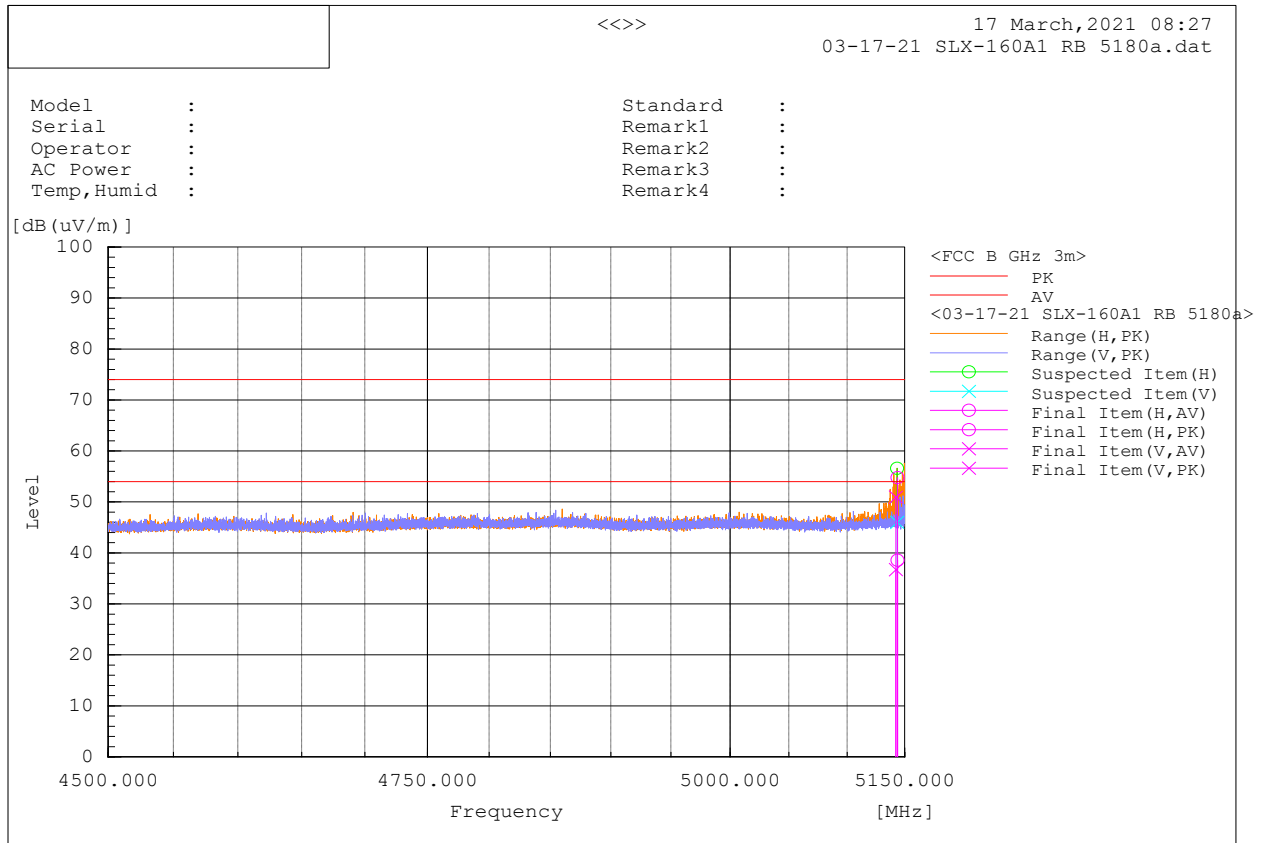
ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	18800.8	H	32.8	4.3	37.1	54	74	16.9	36.9	400	25	Pass
2	18800.8	V	32.4	4.3	36.7	54	74	17.3	37.3	200	11.1	Pass

**18 GHz-40 GHz – 802.11ac -80M – 5775MHz**

ANTENNA POLARITY & test distance: HORIZONTAL& VERTICAL at 3 m												
No	Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit\AV [dB(uV/m)]	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Pass /Fail
1	24911.1*	V	43.3	5.9	49.2	54	74	4.8	24.8	400	229.6	Pass
2	24853.7*	H	43.3	5.8	49.1	54	74	4.9	24.9	300	347	Pass

Note: \* Worst case points outside of the restricted band were measured.

### Restricted band for 5G Restricted Band (802.11a\_5180MHz)



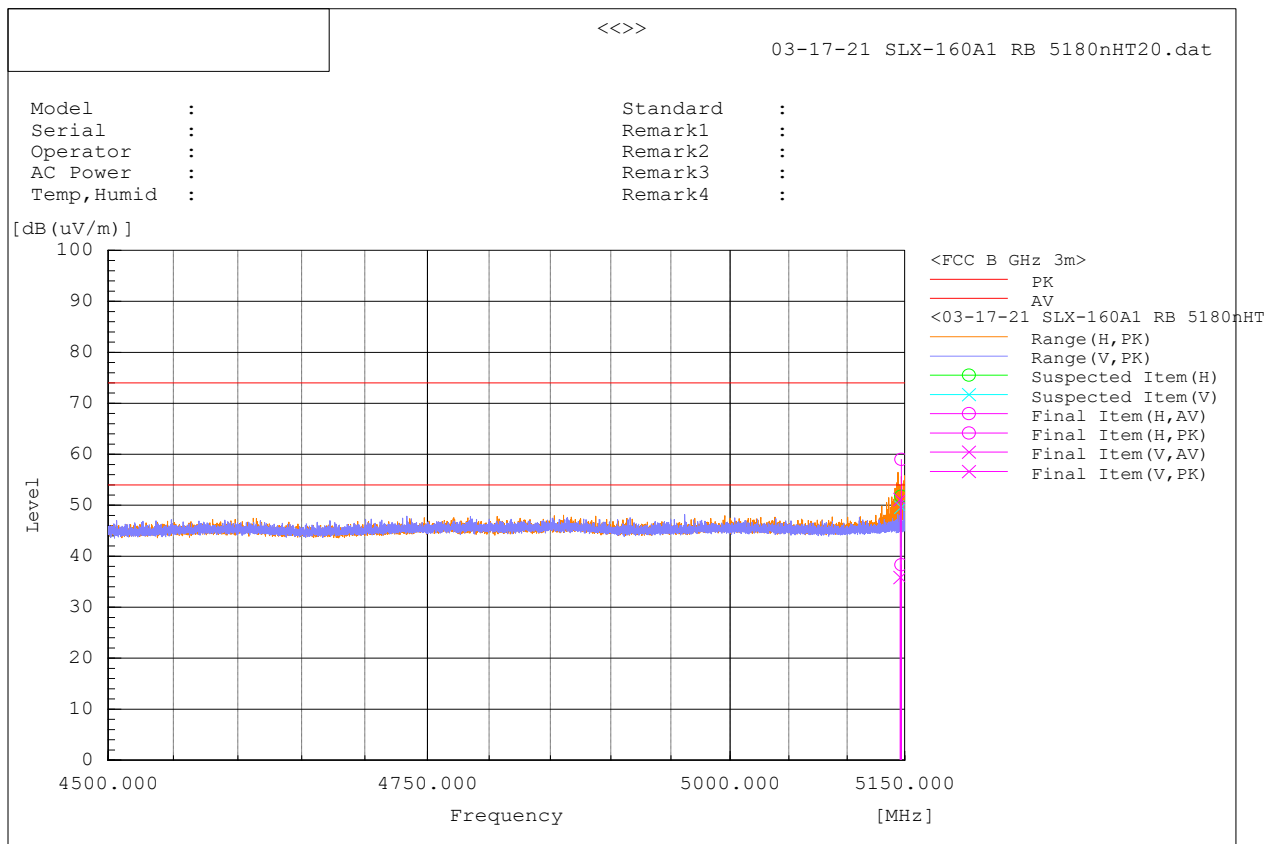
#### Antenna Polarity & Test Distance: Vertical and Horizontal at 3m

No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	5143.686	H	40.3	56.5	-1.7	38.6	54.8	54	74	-15.4	-19.2	172.1	0	Pass
2	5142.359	V	38.4	52.7	-1.7	36.7	51	54	74	-17.3	-23	184.9	0	Pass

#### REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value (dBuV/m)

### Restricted Band (802.11n\_5180MHz)



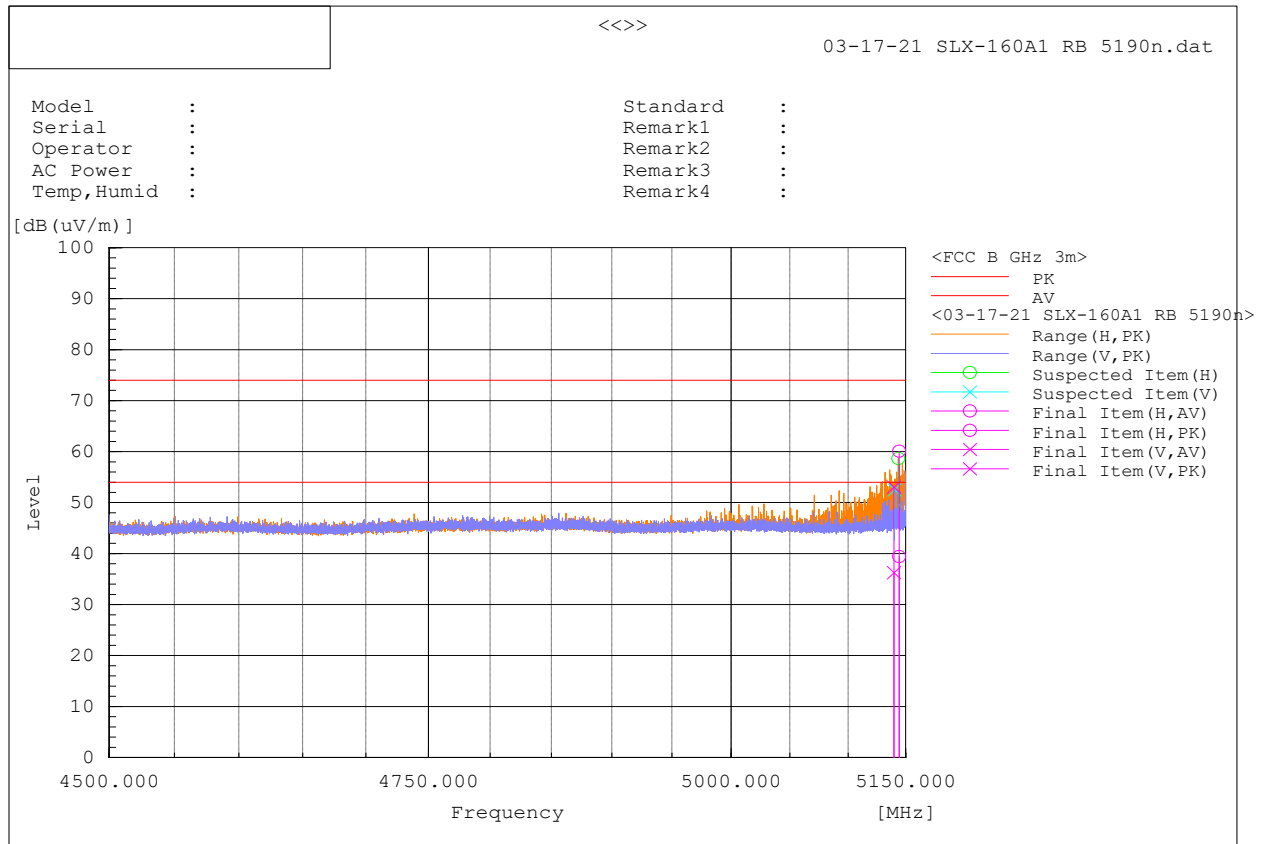
#### Antenna Polarity & Test Distance: Vertical and Horizontal at 3m

No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	5146.077	V	37.5	52.8	-1.7	35.8	51.1	54	74	-18.2	-22.9	240	0	Pass
2	5147.086	H	40	60.7	-1.7	38.3	59	54	74	-15.7	-15	102	202.6	Pass

#### REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value (dBuV/m)

### Restricted Band (802.11n\_5190MHz)



#### Antenna Polarity & Test Distance: Vertical and Horizontal at 3m

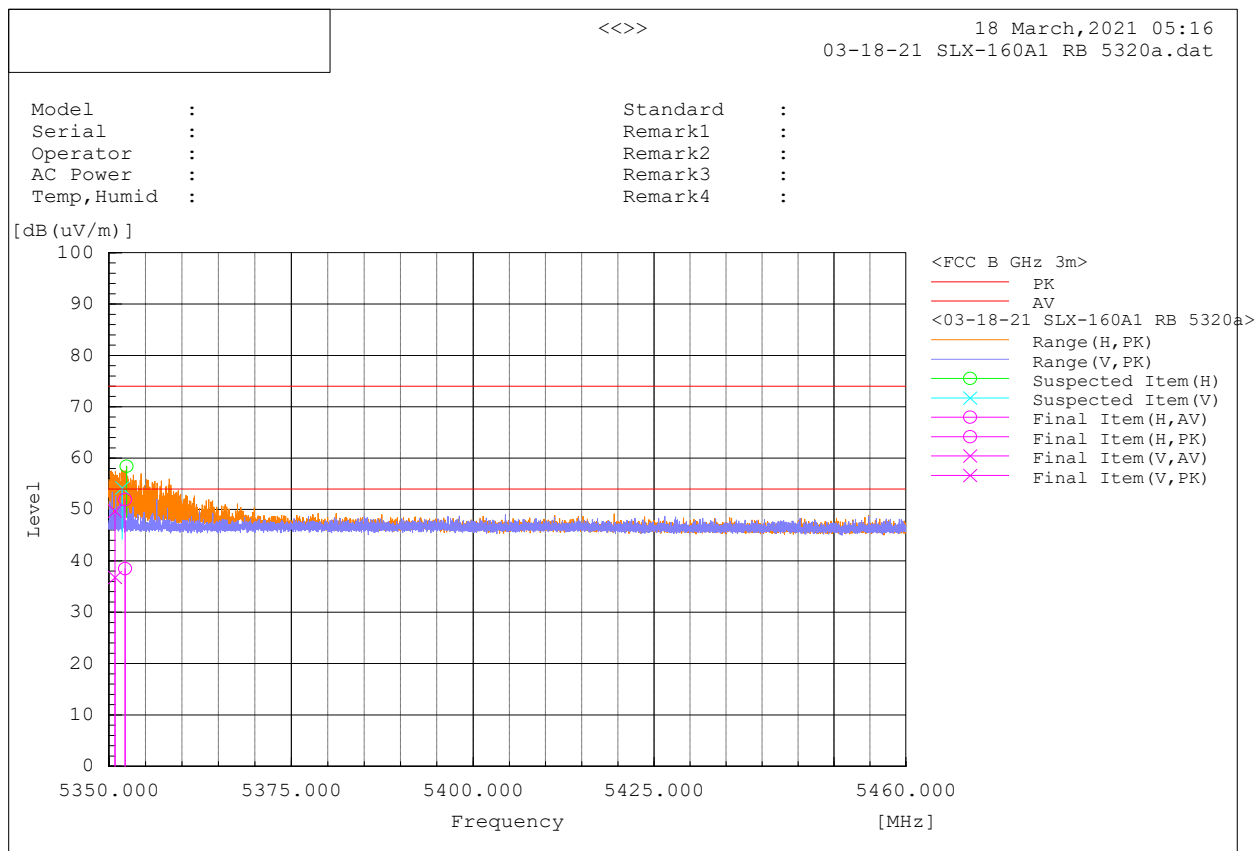
No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	5139.692	V	38.1	54.9	-1.8	36.3	53.1	54	74	-17.7	-20.9	315.8	215.9	Pass
2	5144.311	H	41.1	61.8	-1.7	39.4	60.1	54	74	-14.6	-13.9	100	320.6	Pass

#### REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value (dBuV/m)



### Restricted Band (802.11a\_5320MHz)



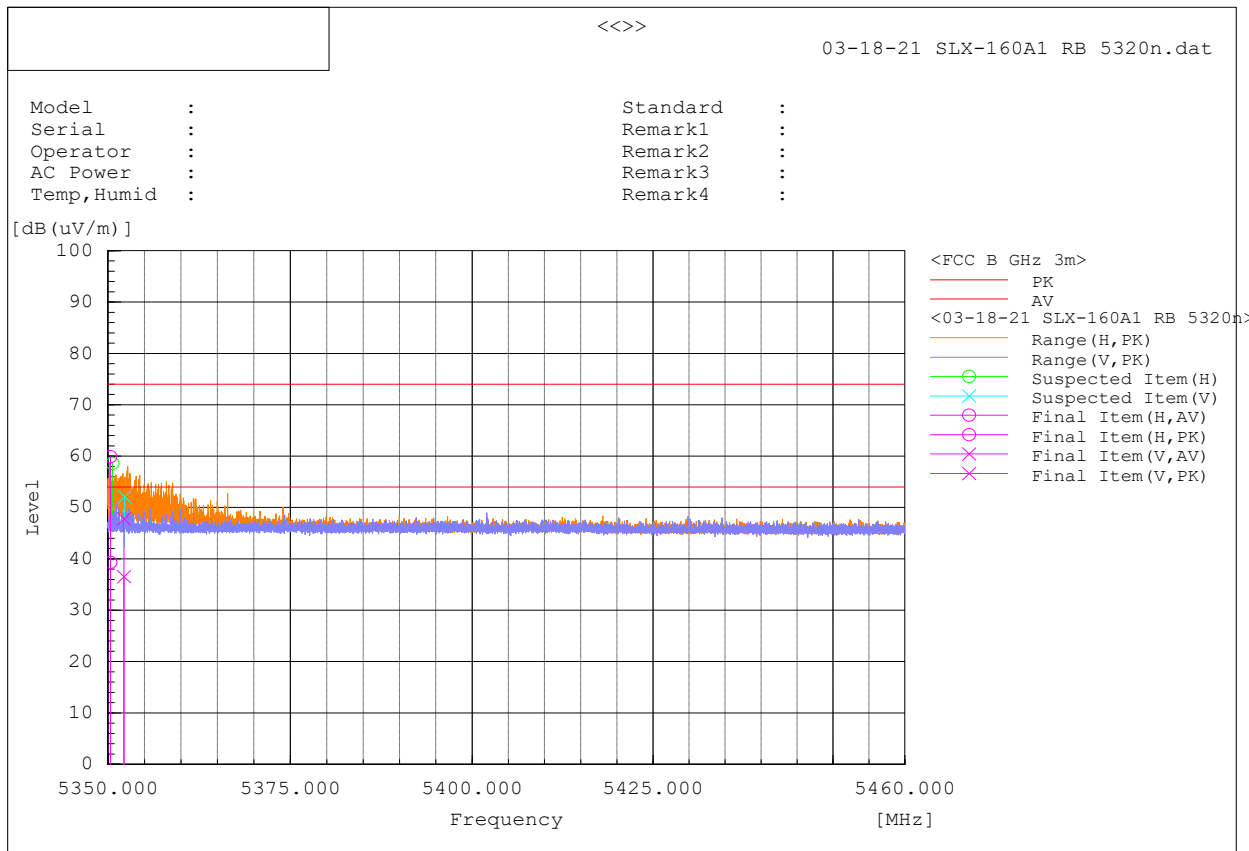
#### Antenna Polarity & Test Distance: Vertical and Horizontal at 3m

No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	5350.845	V	37.8	50.7	-1	36.8	49.7	54	74	-17.2	-24.3	399.2	274.5	Pass
2	5352.225	H	39.5	52.9	-1	38.5	51.9	54	74	-15.5	-22.1	356.2	282.4	Pass

#### REMARKS:

- Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
- Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) - Preamplifier Gain (dB)
- Margin = Level (dBuV/m) - Limit value (dBuV/m)

### Restricted Band (802.11n\_5320MHz)



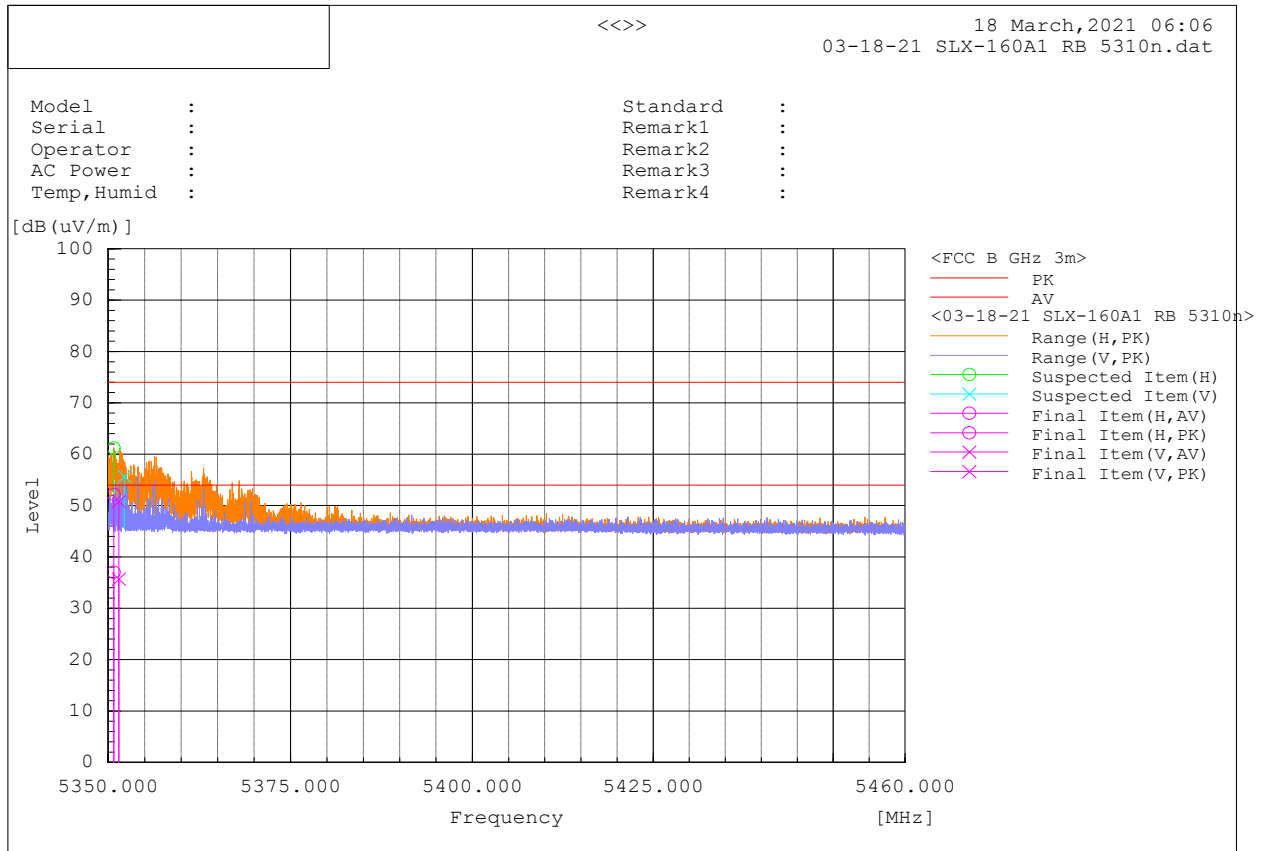
#### Antenna Polarity & Test Distance: Vertical and Horizontal at 3m

No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	5350.358	H	40.3	60.9	-1	39.3	59.9	54	74	-14.7	-14.1	102	289.2	Pass
2	5352.185	V	37.5	48.8	-1	36.5	47.8	54	74	-17.5	-26.2	172.9	337.6	Pass

**REMARKS:**

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) –Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value (dBuV/m)

### Restricted Band (802.11n\_5310MHz)



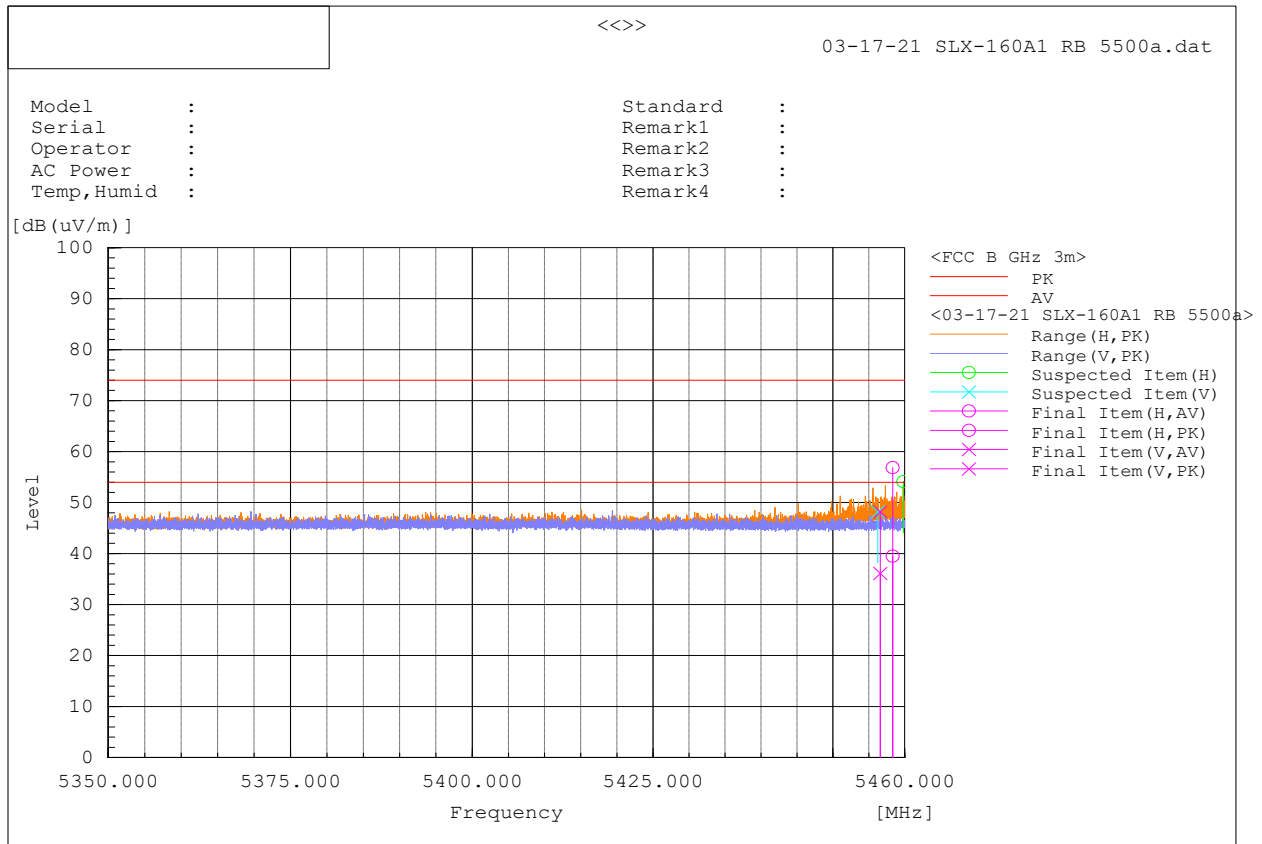
#### Antenna Polarity & Test Distance: Vertical and Horizontal at 3m

No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	5350.772	H	38	53.1	-1	37	52.1	54	74	-17	-21.9	395.7	211.7	Pass
2	5351.469	V	36.7	51.8	-1	35.7	50.8	54	74	-18.3	-23.2	116.4	0	Pass

#### REMARKS:

- Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
- Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) - Preamplifier Gain (dB)
- Margin = Level (dBuV/m) - Limit value (dBuV/m)

### Restricted Band (802.11a\_5500MHz)



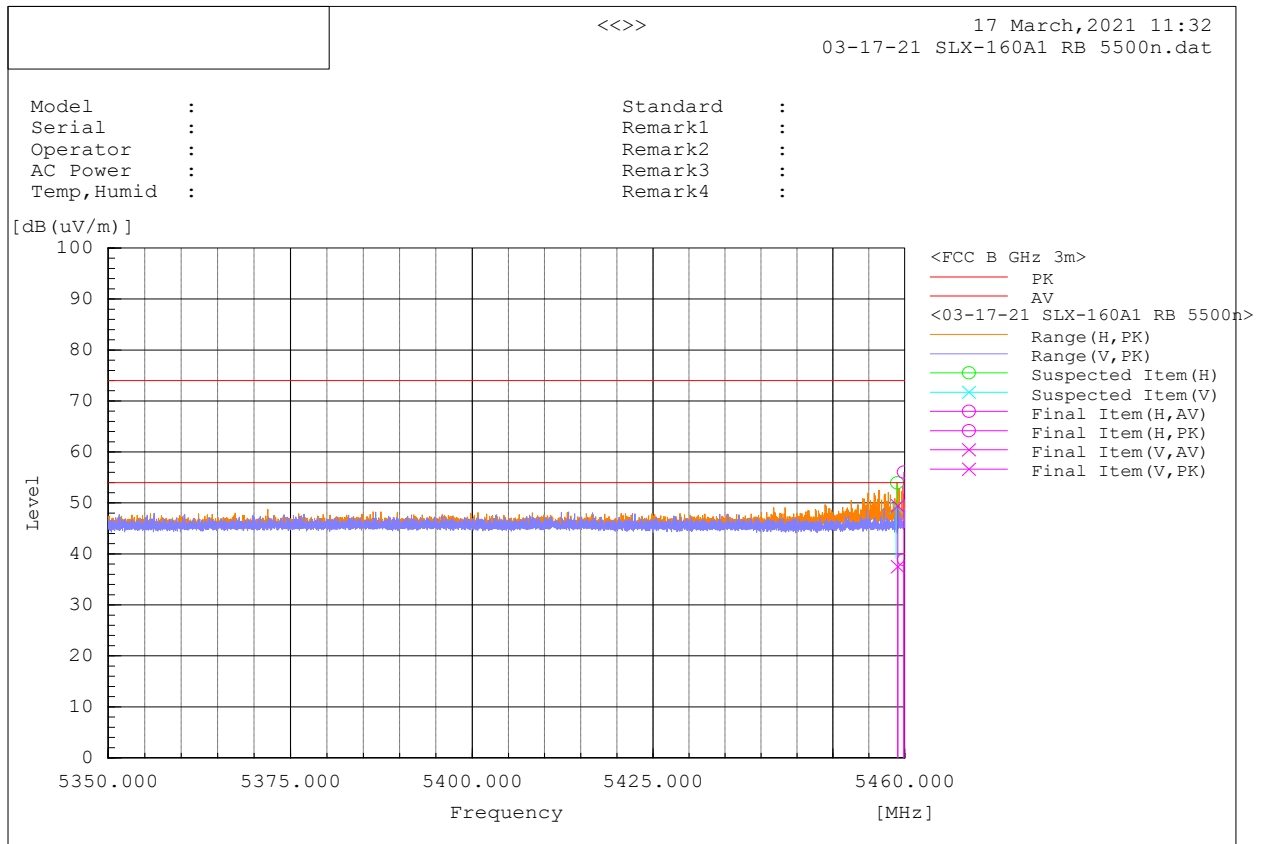
#### Antenna Polarity & Test Distance: Vertical and Horizontal at 3m

No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	5456.602	V	36.9	49	-0.8	36.1	48.2	54	74	-17.9	-25.8	184	137.9	Pass
2	5458.317	H	40.3	57.7	-0.8	39.5	56.9	54	74	-14.5	-17.1	121.9	295.5	Pass

**REMARKS:**

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) –Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value (dBuV/m)

### Restricted Band (802.11n\_5500MHz)



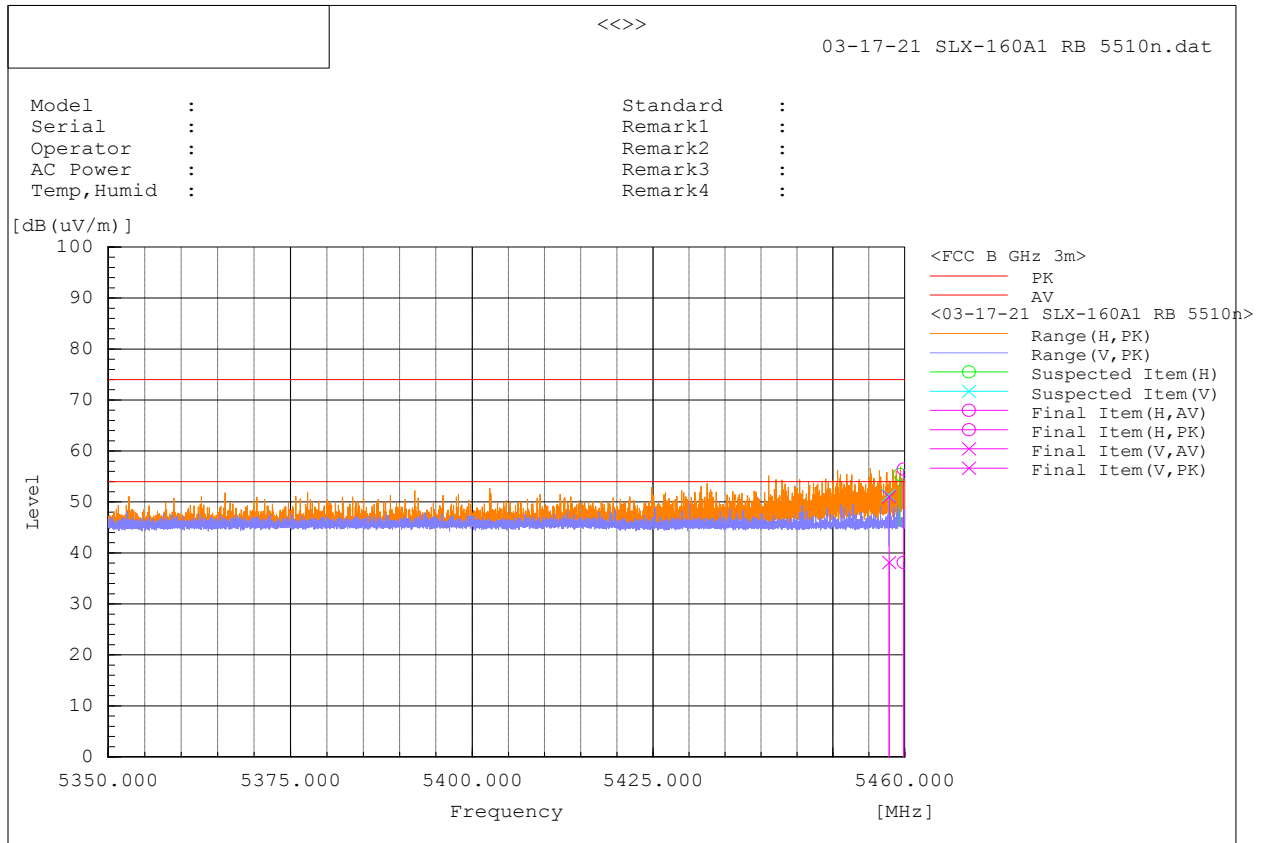
#### Antenna Polarity & Test Distance: Vertical and Horizontal at 3m

No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	5459.017	V	38.3	50.2	-0.8	37.5	49.4	54	74	-16.5	-24.6	326.9	235.8	Pass
2	5459.884	H	39.7	56.8	-0.8	38.9	56	54	74	-15.1	-18	100.5	319.2	Pass

#### REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) - Pre-amplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value (dBuV/m)

### Restricted Band (802.11n\_5510MHz)



#### Antenna Polarity & Test Distance: Vertical and Horizontal at 3m

No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	5457.833	V	38.9	51.8	-0.8	38.1	51	54	74	-15.9	-23	261.1	193.8	Pass
2	5459.866	H	38.9	57.2	-0.8	38.1	56.4	54	74	-15.9	-17.6	100	194.8	Pass

#### REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) - Pre-amplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value (dBuV/m)

## 5 Pictures of Test Arrangements

### 5.1 Radiated Emissions up to 1 GHz

Please see setup photo file.

## 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:

**Milpitas EMC/RF/Safety/Telecom Lab**

775 Montague Expressway, Milpitas, CA 95035  
Tel: +1 408 526 1188

**Sunnyvale OTA/Bluetooth Lab**

1293 Anvilwood Avenue, Sunnyvale, CA  
94089  
Tel: +1 669 600 5293

**Littleton EMC/RF/Safety/Environmental Lab**

1 Distribution Center Cir #1, Littleton, MA 01460  
Tel: +1 978 486 8880

**Irvine OTA/PTCRB/Bluetooth/V2X Lab**

15 Musick, Irvine, CA 92618  
Tel: +1 949 716 6512

**Email:** [sales.eaw@us.bureauveritas.com](mailto:sales.eaw@us.bureauveritas.com)

**Web Site:** [www.cpsusa-bureauveritas.com](http://www.cpsusa-bureauveritas.com)

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

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