



REPORT No.: SZ17120080W03

# TEST REPORT

**APPLICANT** : Shenzhen Chainway Information Technology Co.,Ltd.

**PRODUCT NAME** : Mobile Data Terminal

**MODEL NAME** : C6000

**BRAND NAME** : CHAINWAY

**FCC ID** : 2AC6AC6000

**STANDARD(S)** : 47 CFR Part 15 Subpart C

**TEST DATE** : 2018-01-06 to 2018-05-09

**ISSUE DATE** : 2018-05-09

Tested by:

*Tu Ya'nan*

Tu Ya'nan (Test Engineer)

Approved by:

*Andy Yeh*

Andy Yeh (Technical Director)

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Change History		
Issue	Date	Reason for change
1.0	2018-03-09	First edition
2.0	2018-05-09	Second edition

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# 1. Technical Information

**Note:** Provide by applicant.

## 1.1. Applicant and Manufacturer Information

<b>Applicant:</b>	Shenzhen Chainway Information Technology Co.,Ltd.
<b>Applicant Address:</b>	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen
<b>Manufacturer:</b>	Shenzhen Chainway Information Technology Co.,Ltd.
<b>Manufacturer Address:</b>	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen

## 1.2. Equipment Under Test (EUT) Description

<b>Product Name:</b>	Mobile Data Terminal
<b>Serial No:</b>	(N/A, marked #1 by test site)
<b>Hardware Version:</b>	C6000EA_MB_10
<b>Software Version:</b>	C6000A_MT6735_V3_AM_GITe978618_20180315
<b>Modulation Type:</b>	GFSK
<b>Operating Frequency Range:</b>	802.11b/g/n-20MHz: 2.412GHz - 2.462GHz 802.11n-40MHz: 2.422GHz - 2.452GHz
<b>Channel Number:</b>	802.11b/g/n-20MHz: 11 802.11n-40MHz: 7
<b>Modulation Type:</b>	DSSS, OFDM
<b>Antenna Type:</b>	PIFA Antenna
<b>Antenna Gain:</b>	0.58 dBi

**Note 1:** The EUT is operating at 2.4GHz ISM; it supports 802.11b, 802.11g, 802.11n and they are all tested in this report.

For 802.11b/g/n-20MHz (2.4GHz band), the frequencies allocated is  $F$  (MHz) =  $2412+5*(n-1)$  ( $1 \leq n \leq 11$ ). The lowest, middle, highest channel numbers of the EUT used and tested in this report are separately 1 (2412MHz), 6 (2437MHz) and 11 (2462MHz).

For 802.11n-40MHz, the frequencies allocated is  $F$  (MHz) =  $2412+5*(n-1)$  ( $3 \leq n \leq 9$ ). The lowest, middle, highest channel numbers of the EUT used and tested in this report are separately 3 (2422MHz), 6 (2437MHz) and 9 (2452MHz).

**Note 2:** The EUT connected to the serial port of the computer with a serial communication cable, we use the dedicated software to control the EUT continuous transmission.



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**Note 3:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

## 1.3. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C (Bluetooth, 2.4GHz ISM band radiators) for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 15 (10-1-15 Edition)	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result
1	15.203	Antenna Requirement	N/A	N/A	PASS
2	15.247(b)	Peak Output Power	Feb 02, 2018	Tu Ya'nan	PASS
3	15.247(a)	Bandwidth	Feb 02, 2018	Tu Ya'nan	PASS
4	15.247(d)	Conducted Spurious Emission and Band Edge	Feb 02, 2018	Tu Ya'nan	PASS
5	15.247(d)	Restricted Frequency Bands	Jan 07, 2018	Wu Zhognwen	PASS
6	15.207	Conducted Emission	Jan 06, 2018	Wu Zhognwen	PASS
7	15.209, 15.247(d)	Radiated Emission	Jan 07, 2018	Wu Zhognwen	PASS
8	15.247(e)	Power spectral density (PSD)	Feb 02, 2018 May 09, 2018	Tu Ya'nan	PASS

**Note:** The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10 2013 and KDB558074 D01 v04 (04/05/2017).

## 1.4. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106

## 2. 47 CFR Part 15C Requirements

### 2.1. Antenna requirement

#### 2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

#### 2.1.2. Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

### 2.2. Peak Output Power

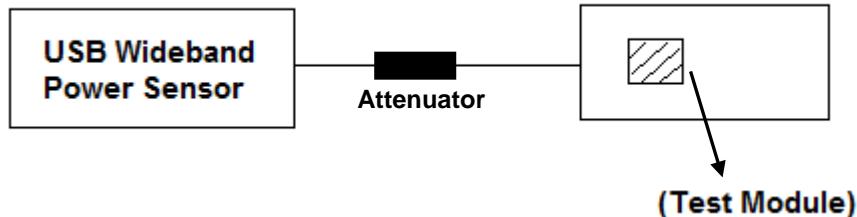
#### 2.2.1. Requirement

According to FCC section 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: The maximum peak conducted output power of the intentional radiator shall not exceed 1 Watt.

#### 2.2.2. Test Description

The measured output power was calculated by the reading of the USB Wideband Power Sensor and calibration.

##### A. Test Setup:





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The EUT (Equipment under the test) which is coupled to the USB Wideband Power Sensor; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

## B. Equipments List:

Please refer ANNEX A(1.5).

### 2.2.3. Test Result

#### 2.2.3.1 802.11b Test Mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	15.86	0.03855	30	1	PASS
6	2437	15.70	0.03715			PASS
11	2462	13.29	0.02133			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	13.07	0.02028	30	1	PASS
6	2437	13.70	0.02344			PASS
11	2462	10.42	0.01102			PASS

#### 2.2.3.2 802.11g Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	19.02	0.07980	30	1	PASS
6	2437	17.99	0.06295			PASS
11	2462	17.74	0.05943			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	10.82	0.01208	30	1	PASS
6	2437	12.45	0.01758			PASS
11	2462	8.84	0.00766			PASS



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### 2.2.3.3 802.11n-20MHz Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	19.05	0.08035	30	1	PASS
6	2437	18.01	0.06324			PASS
11	2462	19.82	0.09594			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	10.84	0.01213	30	1	PASS
6	2437	12.43	0.01750			PASS
11	2462	8.81	0.00760			PASS

### 2.2.3.4 802.11n-40MHz Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
3	2422	17.07	0.05093	30	1	PASS
6	2437	17.89	0.06152			PASS
9	2452	16.40	0.04365			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
3	2422	9.96	0.00991	30	1	PASS
6	2437	10.32	0.01076			PASS
9	2452	8.81	0.00760			PASS

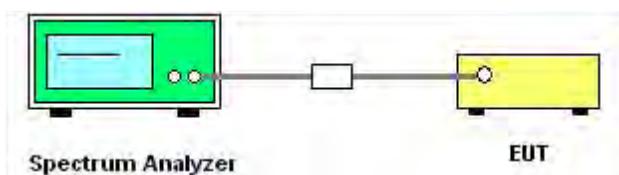
## 2.3. Bandwidth

### 2.3.1. Requirement

According to FCC section 15.247(a) (2), Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

### 2.3.2. Test Description

#### A. Test Set:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

KDB 558074 Section 8.1 Option 1 was used in order to prove compliance.

#### B. Equipments List:

Please refer ANNEX A(1.5).

### 2.3.3. Test Result

#### 2.3.3.1 802.11b Test mode

##### A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	9.11	≥500	PASS
6	2437	9.11	≥500	PASS
11	2462	9.59	≥500	PASS

##### B. Test Plots



(Channel 1: 2412MHz @ 802.11b)



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(Channel 6: 2437 MHz @ 802.11b)



(Channel 11: 2462MHz @ 802.11b)

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### 2.3.3.2 802.11g Test mode

#### A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	16.08	≥500	PASS
6	2437	15.22	≥500	PASS
11	2462	16.48	≥500	PASS

#### B. Test Plots:



(Channel 1: 2412MHz @ 802.11g)



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(Channel 6: 2437MHz @ 802.11g)



(Channel 11: 2462MHz @ 802.11g)

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### 2.3.3.3 802.11n-20 Test mode

#### A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	16.84	≥500	PASS
6	2437	14.31	≥500	PASS
11	2462	17.43	≥500	PASS

#### B. Test Plots:



(Channel 1: 2412MHz @ 802.11n-20)



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(Channel 6: 2437MHz @ 802.11n-20)



(Channel 11: 2462MHz @ 802.11n-20)

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### 2.3.3.4 802.11n-40 Test mode

#### A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
3	2422	25.48	≥500	PASS
6	2437	24.84	≥500	PASS
9	2452	22.06	≥500	PASS

#### B. Test Plots:



(Channel 3: 2422MHz @ 802.11n-40)



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(Channel 6: 2437MHz @ 802.11n-40)



(Channel 9: 2452MHz @ 802.11n-40)

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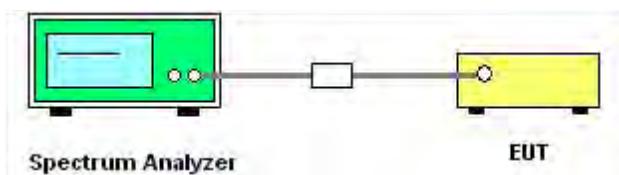
## 2.4. Conducted Spurious Emissions and Band Edge

### 2.4.1. Requirement

According to FCC section 15.247(c), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

### 2.4.2. Test Description

#### A. Test Set:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

KDB 558074 Section 11.0 was used in order to prove compliance.

#### B. Equipments List:

Please refer ANNEX A(1.5).

## 2.4.3. Test Result

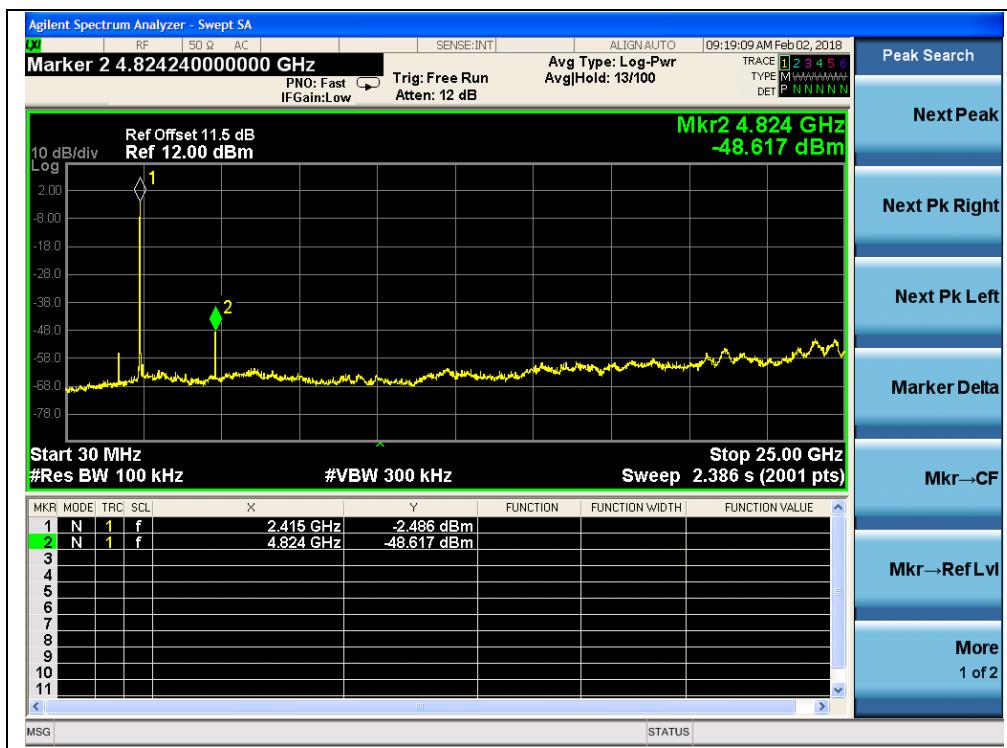
### 2.4.3.1 802.11b Test mode

#### A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-48.62	-2.49	-22.49	PASS
6	2437	-51.24	0.28	-19.72	PASS
11	2462	-46.05	-1.33	-21.33	PASS

#### B. Test Plots:

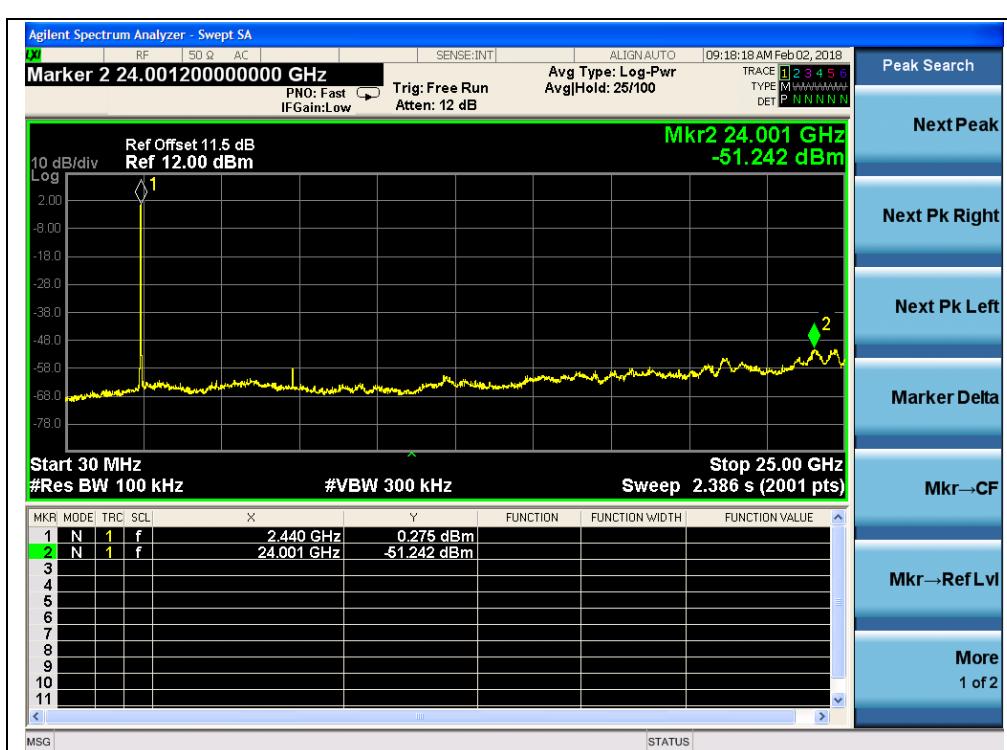
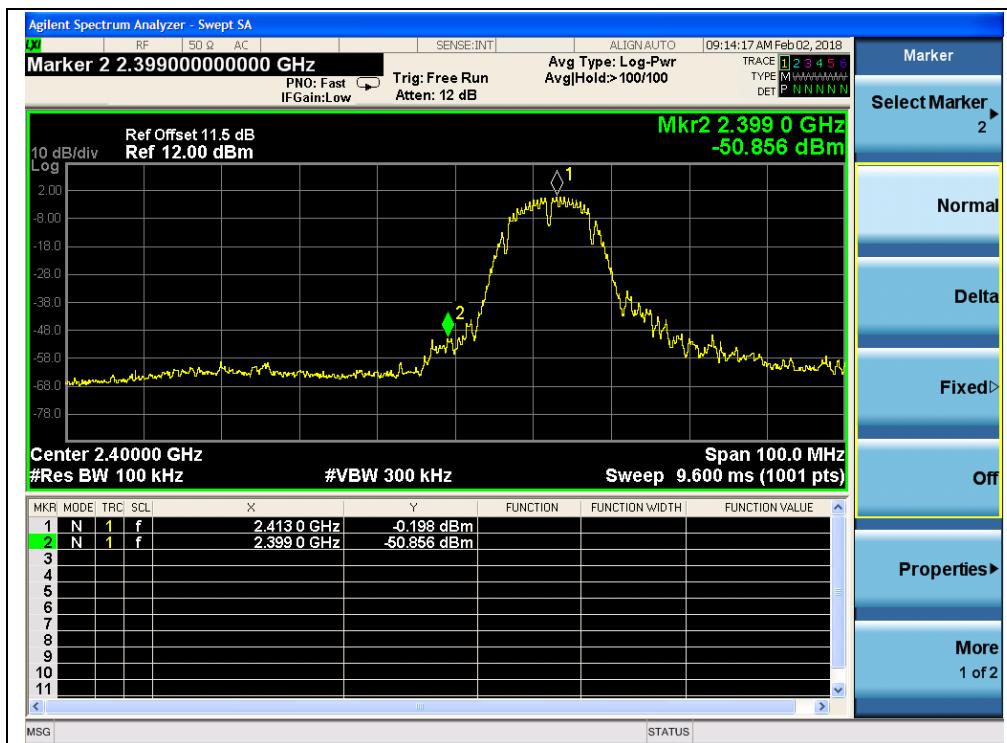
**Note:** The power of the Module transmitting frequency should be ignored.



(Channel = 1, 30MHz to 25GHz)



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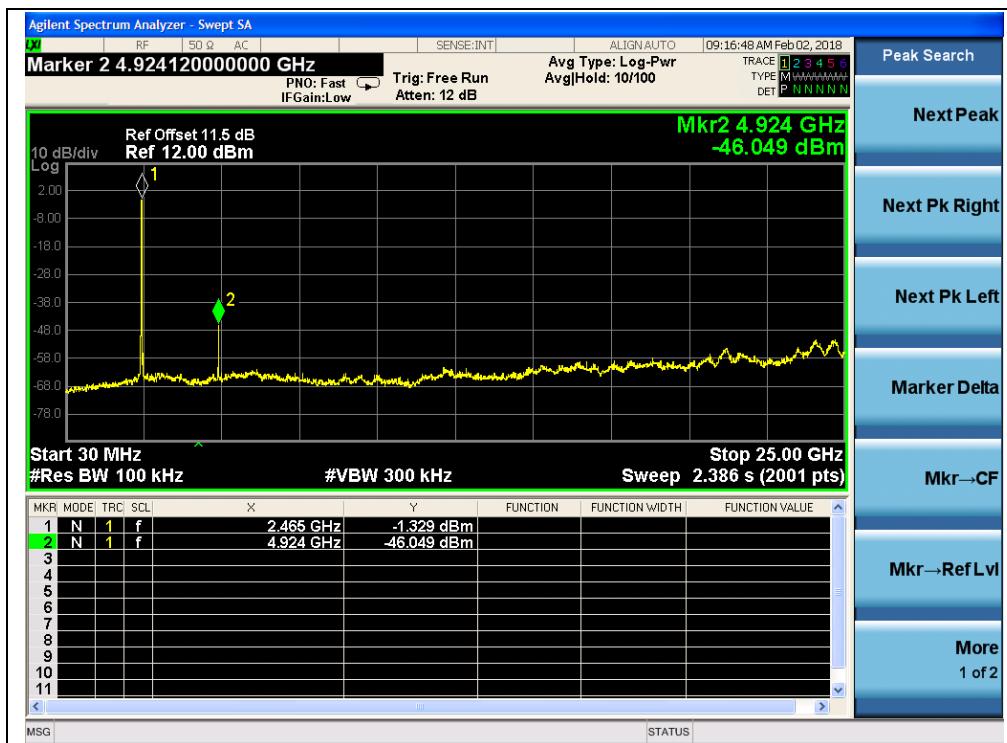
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(Band Edge @ Channel = 11)

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### 2.4.3.2 802.11g Test mode

#### A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-57.57	-8.93	-28.93	PASS
6	2437	-56.86	-3.29	-23.29	PASS
11	2462	-57.65	-7.06	-27.06	PASS

#### B. Test Plots:

Note: The power of the Module transmitting frequency should be ignored.



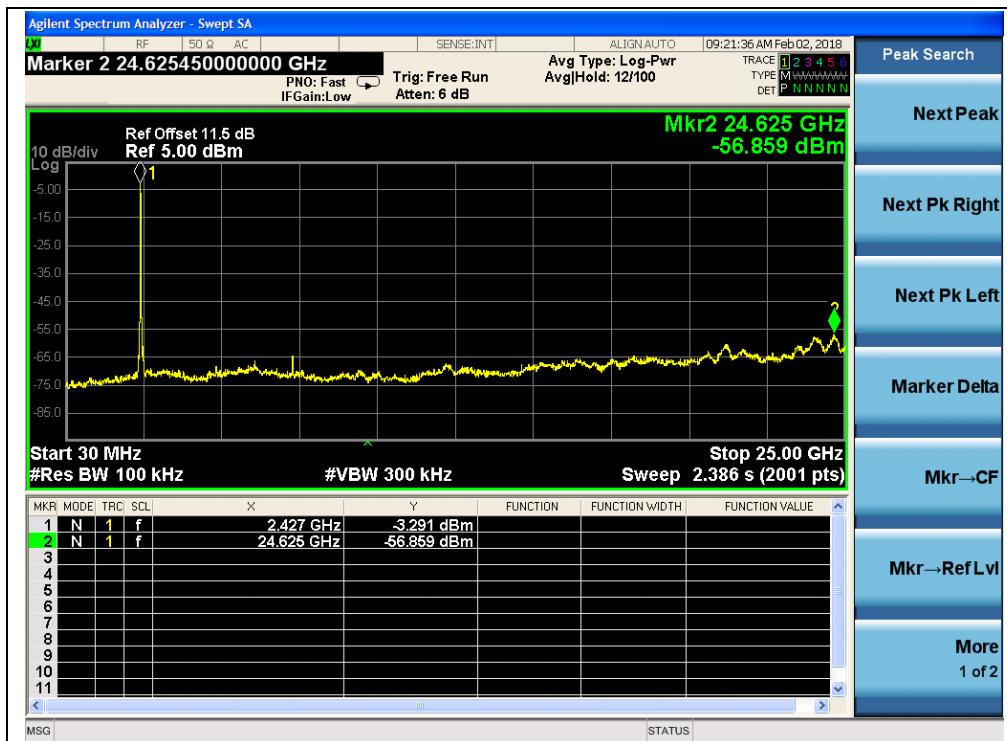
(Channel = 1, 30MHz to 25GHz)



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(Band Edge @ Channel = 1)



(Channel = 6, 30MHz to 25GHz)

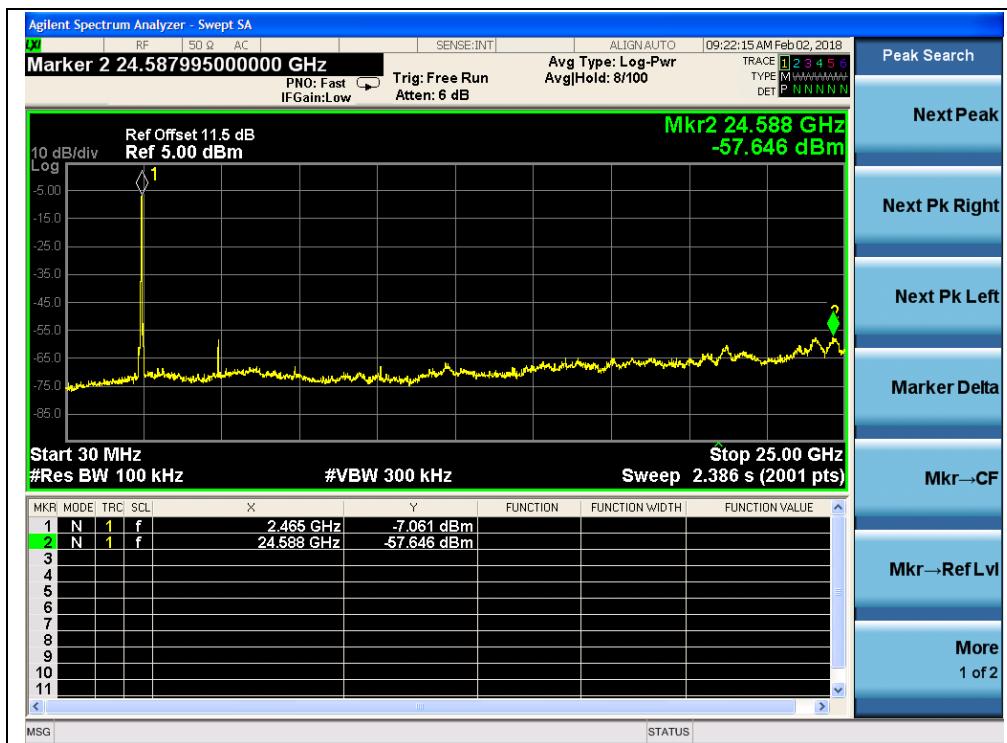
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(Channel = 11, 30MHz to 25GHz)



(Band Edge @ Channel = 11)

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### 2.4.3.3 802.11n -20MHz Test mode

#### A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-56.31	-9.13	-29.13	PASS
6	2437	-57.24	-4.10	-24.10	PASS
11	2462	-54.72	-4.71	-24.71	PASS

#### B. Test Plots:

Note: The power of the Module transmitting frequency should be ignored.



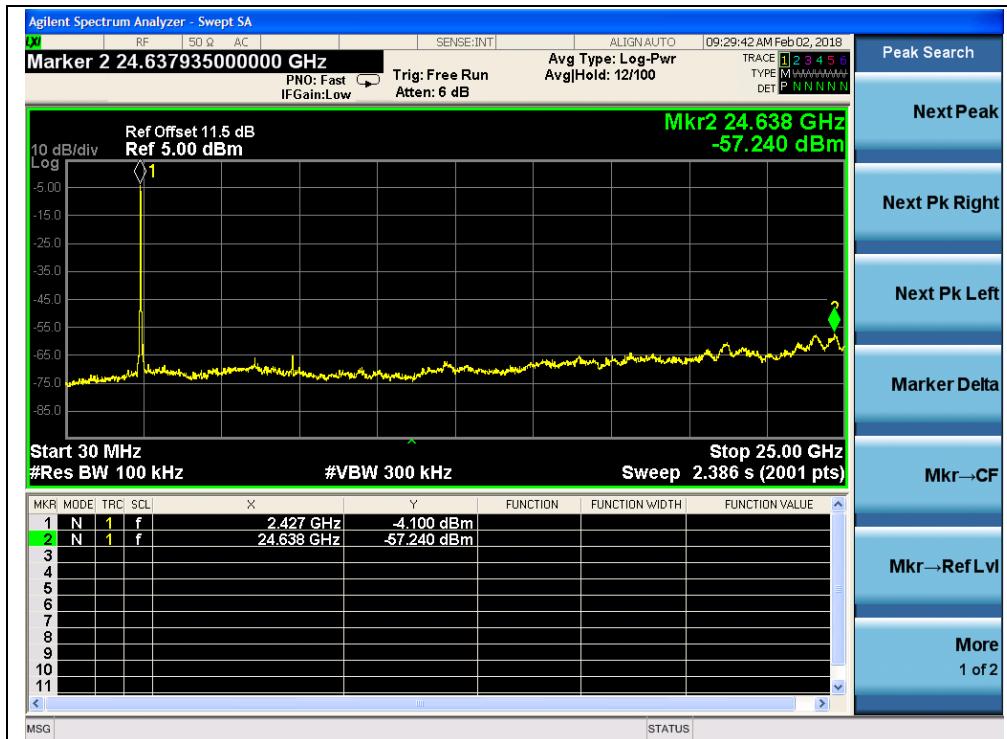
(Channel = 1, 30MHz to 25GHz)



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(Band Edge @ Channel = 1)



(Channel = 6, 30MHz to 25GHz)

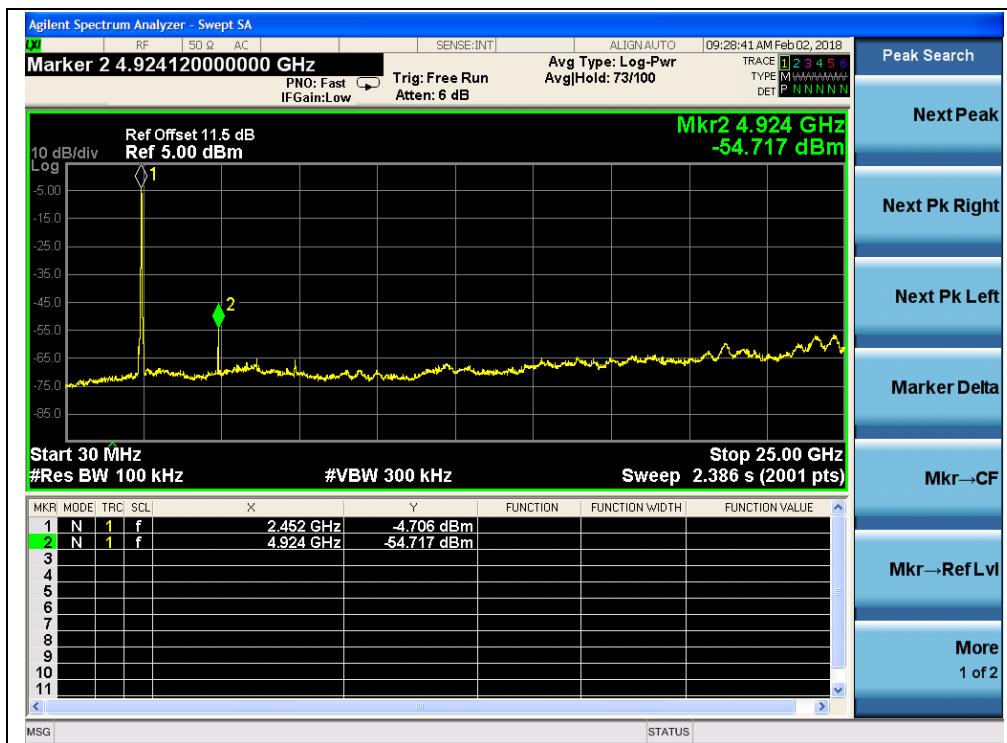
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(Channel = 11, 30MHz to 25GHz)



(Band Edge @ Channel = 11)

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#### 2.4.3.4 802.11n -40MHz Test mode

##### A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
3	2422	-56.13	-6.42	-26.42	PASS
6	2437	-56.90	-9.11	-29.11	PASS
9	2452	-57.53	-7.31	-27.31	PASS

##### B. Test Plots:

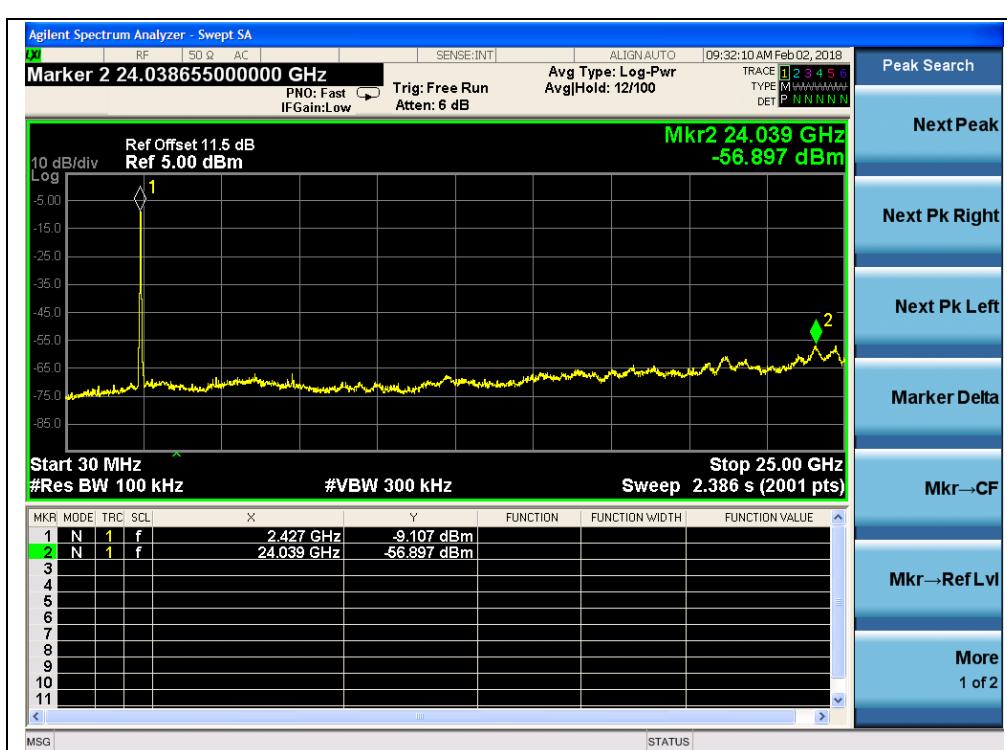
Note: The power of the Module transmitting frequency should be ignored.



(Channel = 3, 30MHz to 25GHz)



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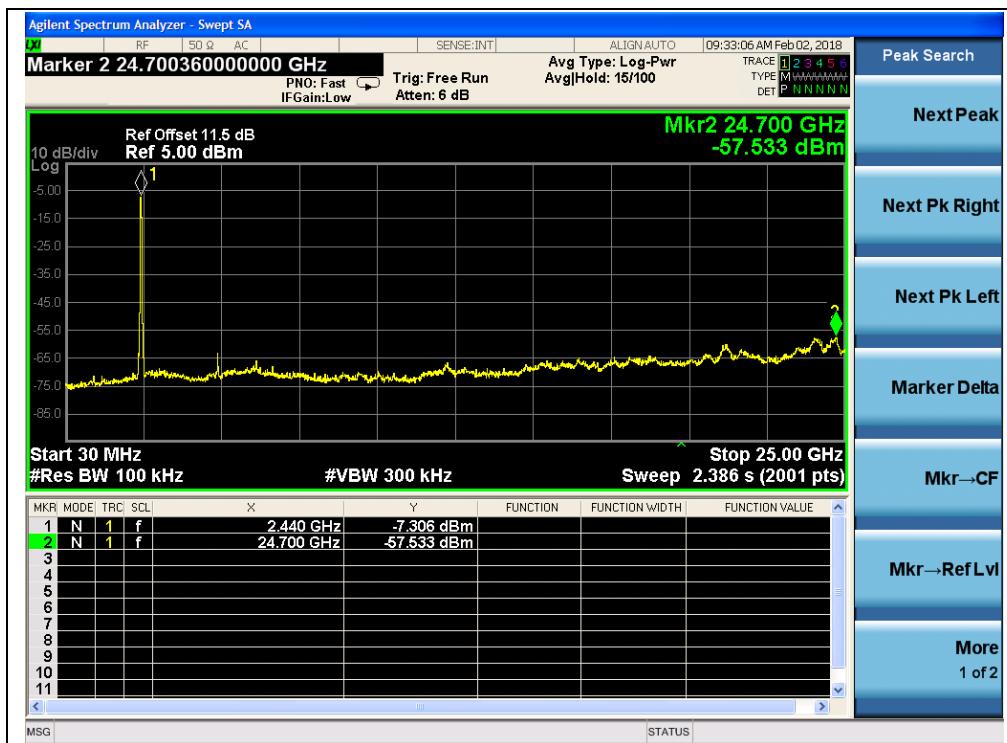
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(Channel = 9, 30MHz to 25GHz)



(Band Edge @ Channel = 9)

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## 2.5. Power spectral density (PSD)

### 2.5.1. Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

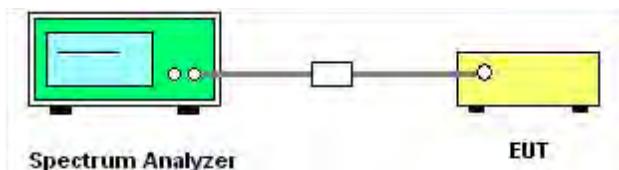
### 2.5.2. Test Description

#### A. Test procedure

The measured power spectral density was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for PSD test:

- a) Set analyzer center frequency to channel center frequency.
- b) Set the span to 1.5 times DTS
- c) Set the RBW to 3 kHz
- d) Set the VBW to 10 kHz
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.

#### B. Test Set:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

KDB 558074 Section 10.2 was used in order to prove compliance.

#### C. Equipments List:

Please refer ANNEX A(1.5).



## 2.5.3. Test Result

### 2.5.3.1 802.11b Test mode

#### A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-13.17	8	PASS
6	2437	-13.22	8	PASS
11	2462	-15.16	8	PASS

Measurement uncertainty:  $\pm 1.3\text{dB}$

#### B. Test Plots:



(Channel = 1 @ 802.11b)



REPORT No.: SZ17120080W03



(Channel = 6 @ 802.11b)



(Channel = 11 @ 802.11b)

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### 2.5.3.2 802.11g Test mode

#### A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-21.19	8	PASS
6	2437	-19.35	8	PASS
11	2462	-23.26	8	PASS

Measurement uncertainty:  $\pm 1.3\text{dB}$

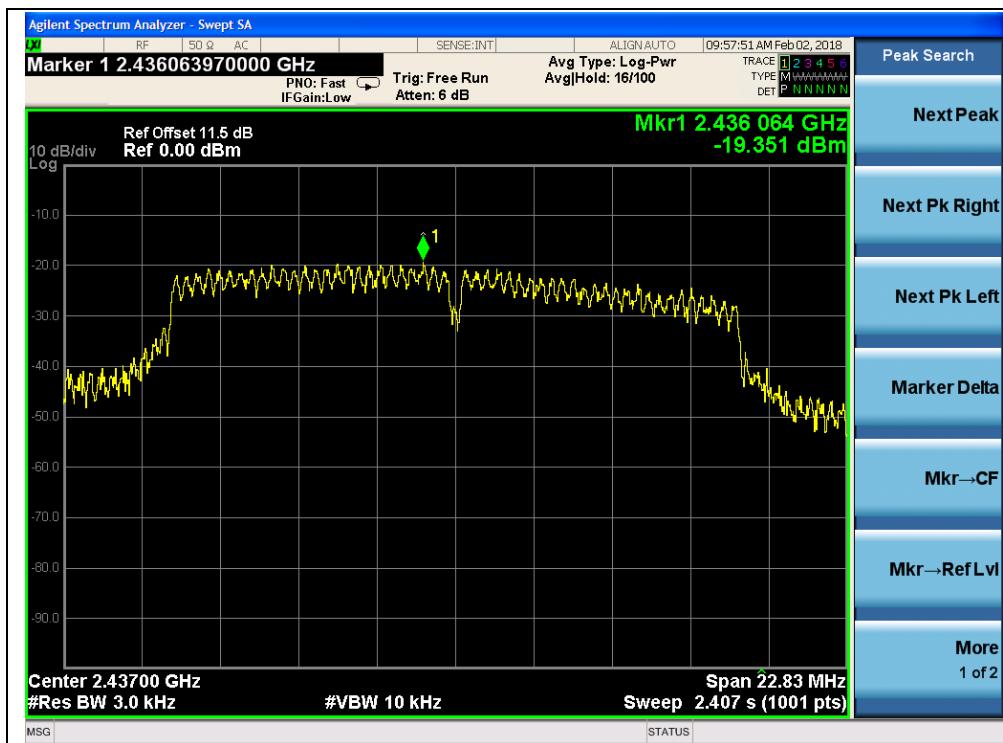
#### B. Test Plots:



(Channel = 1 @ 802.11g)



REPORT No.: SZ17120080W03



(Channel = 6 @ 802.11g)



(Channel = 11 @ 802.11g)

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### 2.5.3.3 802.11n-20MHz Test mode

#### A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-20.54	8	PASS
6	2437	-18.92	8	PASS
11	2462	-22.72	8	PASS
Measurement uncertainty: ±1.3dB				

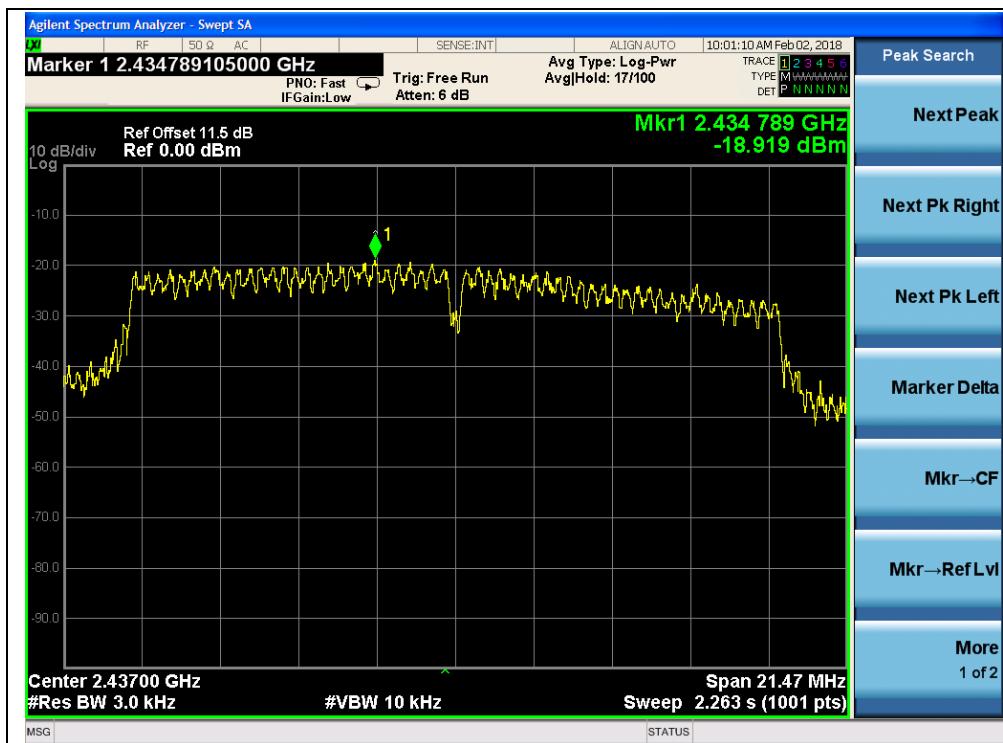
#### B. Test Plots:



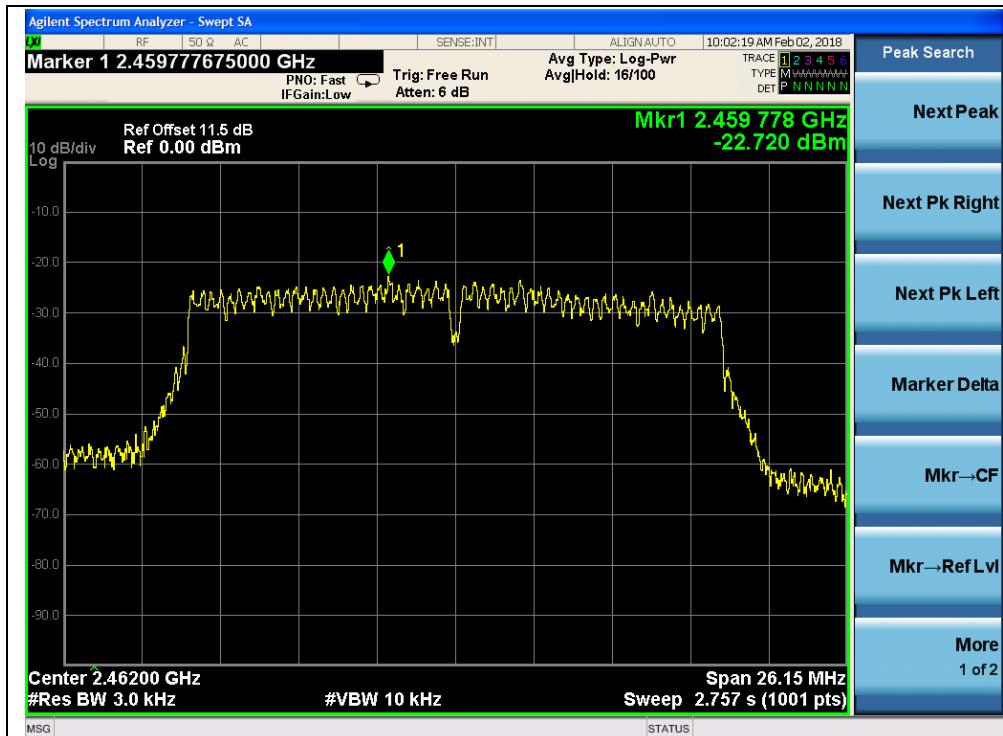
(Channel = 1 @ 802.11n-20MHz)



REPORT No.: SZ17120080W03



(Channel = 6 @ 802.11n-20MHz)



(Channel = 11 @ 802.11n-20MHz)

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### 2.5.3.4 802.11n-40MHz Test mode

#### A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
3	2422	-16.11	8	PASS
6	2437	-16.20	8	PASS
9	2452	-17.09	8	PASS

Measurement uncertainty: ±1.3dB

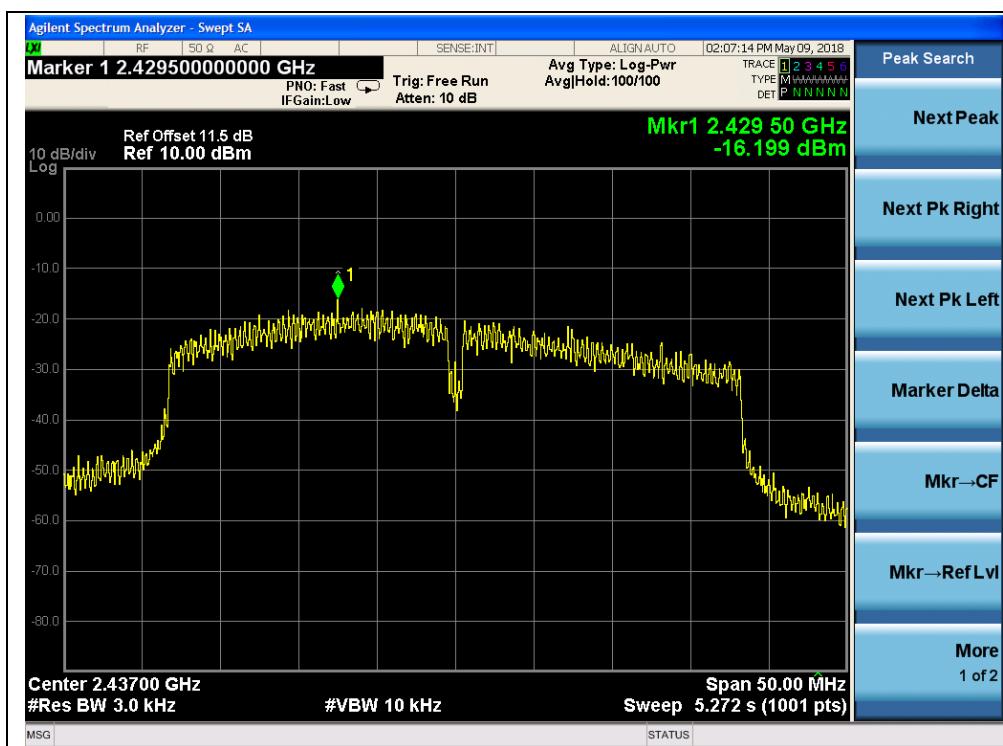
#### B. Test Plots:



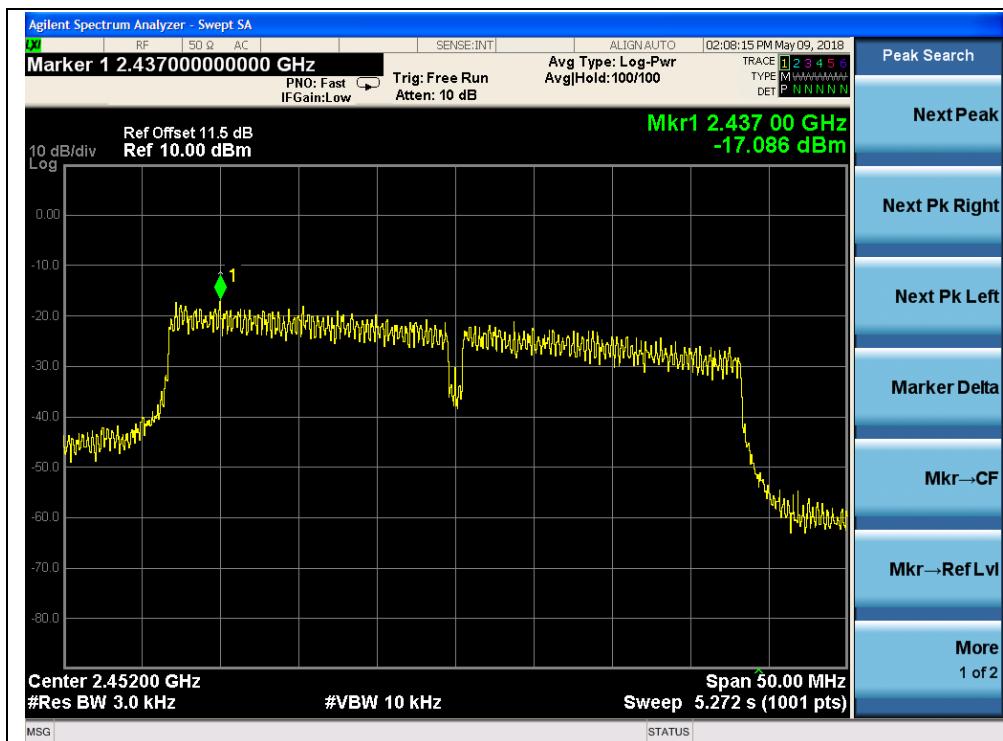
(Channel = 3 @ 802.11n-40MHz)



REPORT No.: SZ17120080W03



(Channel = 6 @ 802.11n-40MHz)



(Channel = 9 @ 802.11n-40MHz)

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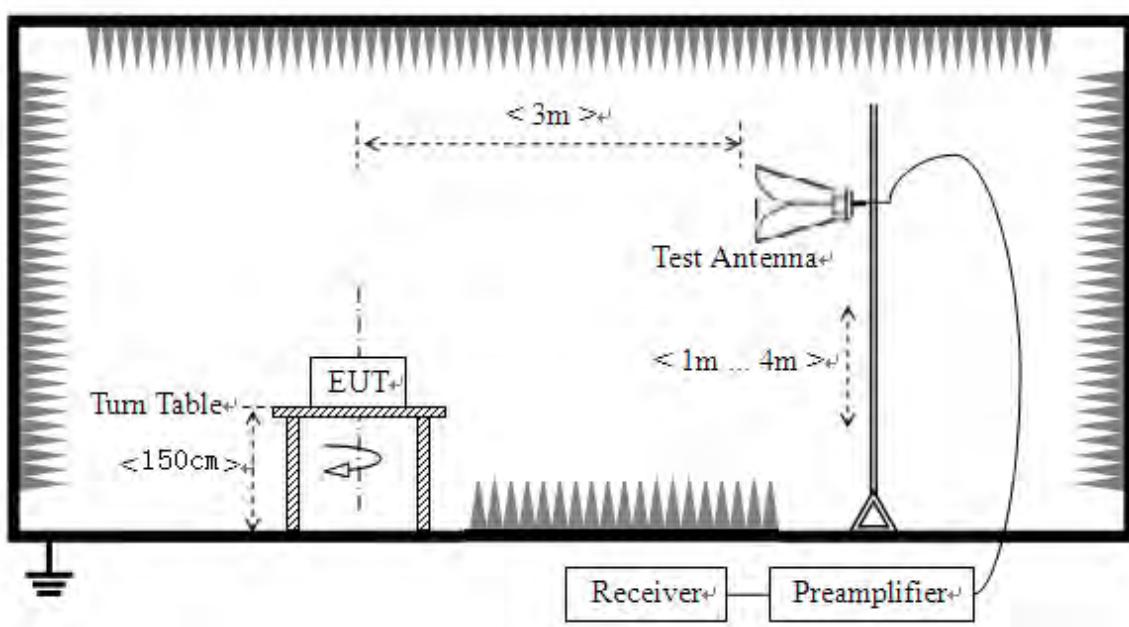
## 2.6. Restricted Frequency Bands

### 2.6.1. Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

### 2.6.2. Test Description

#### A. Test Setup



The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

KDB 558074 Section 12.1 was used in order to prove compliance.

**B. Equipments List:**

Please refer ANNEX A(1.5).

**2.6.3. Test Result**

The lowest and highest channels are tested to verify Restricted Frequency Bands.

The measurement results are obtained as below:

$$E [\text{dB}\mu\text{V}/\text{m}] = U_R + A_T + A_{\text{Factor}} [\text{dB}]; A_T = L_{\text{Cable loss}} [\text{dB}] - G_{\text{preamp}} [\text{dB}]$$

$A_T$ : Total correction Factor except Antenna

$U_R$ : Receiver Reading

$G_{\text{preamp}}$ : Preamplifier Gain

$A_{\text{Factor}}$ : Antenna Factor at 3m

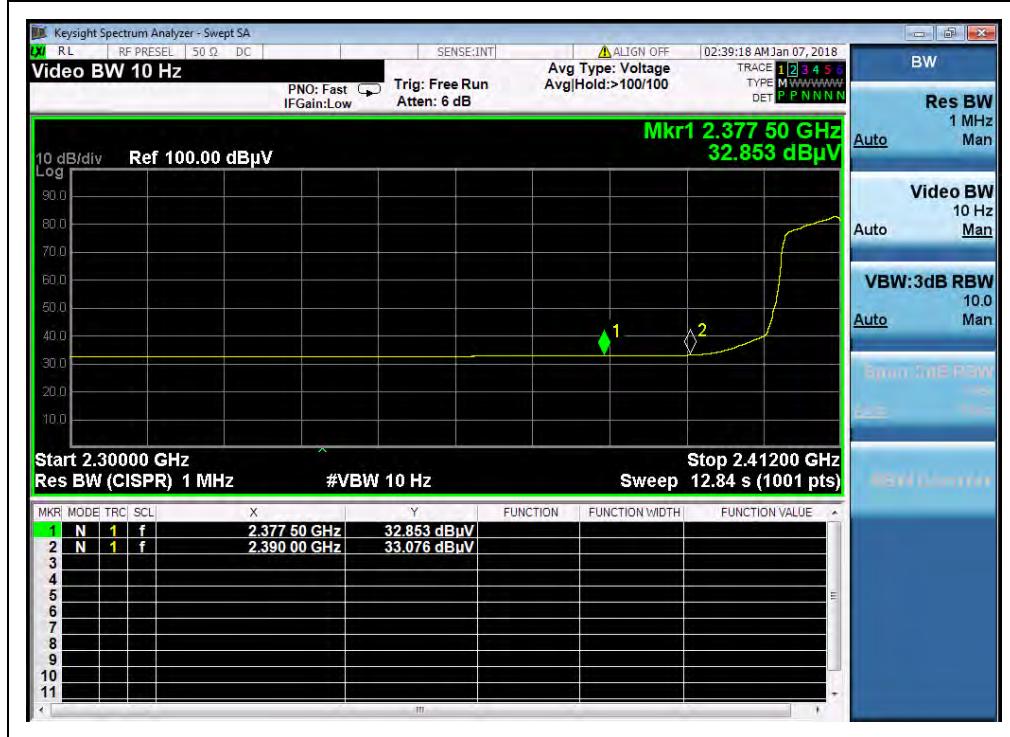
**Note:** Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

**2.6.3.1 802.11b Test mode****A. Test Verdict:**

Channel	Frequency (MHz)	Detector	Receiver	$A_T$ (dB)	$A_{\text{Factor}}$ (dB@3m)	Max. Emission $E$ (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Verdict
			Reading $U_R$ (dB $\mu$ V)					
1	2377.50	PK	45.31	-33.63	32.56	44.24	74	Pass
1	2377.50	AV	32.85	-33.63	32.56	31.78	54	Pass
11	2484.57	PK	54.30	-33.18	32.5	53.62	74	Pass
11	2484.57	AV	38.13	-33.18	32.5	37.45	54	Pass

**B. Test Plots:**


(Channel = 1 PEAK, 802.11b)



(Channel = 1 AVG, 802.11b)



REPORT No.: SZ17120080W03



(Channel = 11 PEAK, 802.11b)



(Channel = 11 AVG, 802.11b)

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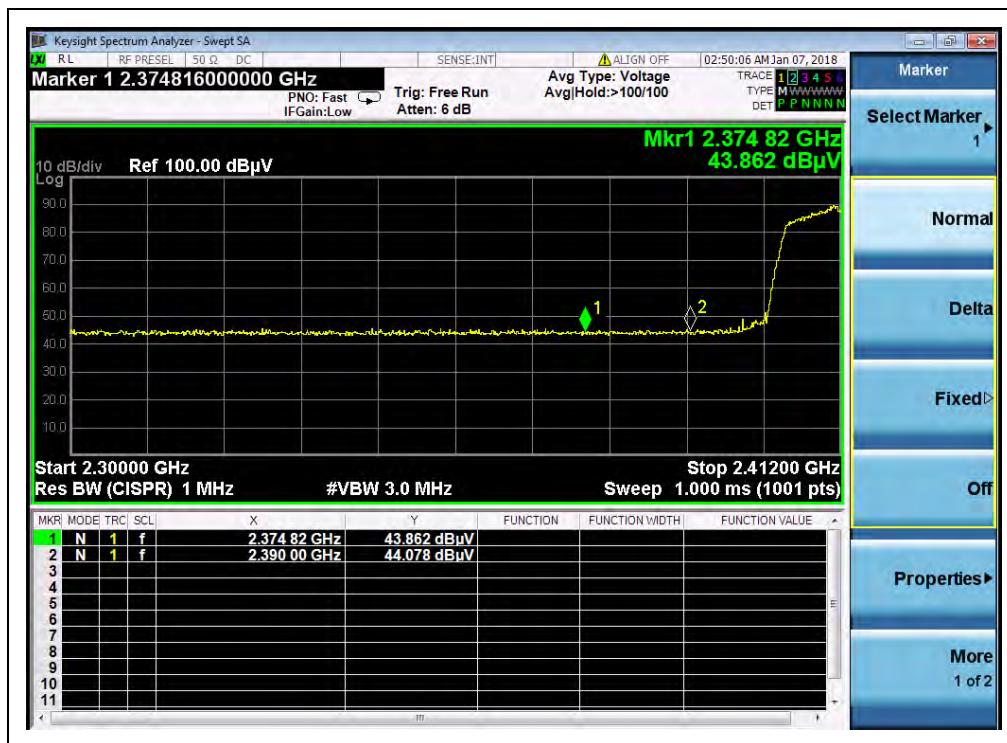
### 2.6.3.2 802.11g Test mode

The lowest and highest channels are tested to verify the band edge emissions.

#### A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U <sub>R</sub> (dB <sub>u</sub> V)	A <sub>T</sub> (dB)	A <sub>Factor</sub> (dB@3m)	Max. Emission E (dB <sub>u</sub> V/m)	Limit (dB <sub>u</sub> V/m)	Verdict
		PK/AV						
1	2374.82	PK	43.86	-33.63	32.56	42.79	74	Pass
1	2374.82	AV	32.52	-33.63	32.56	31.45	54	Pass
11	2483.89	PK	56.17	-33.18	32.5	55.49	74	Pass
11	2483.89	AV	38.37	-33.18	32.5	37.69	54	Pass

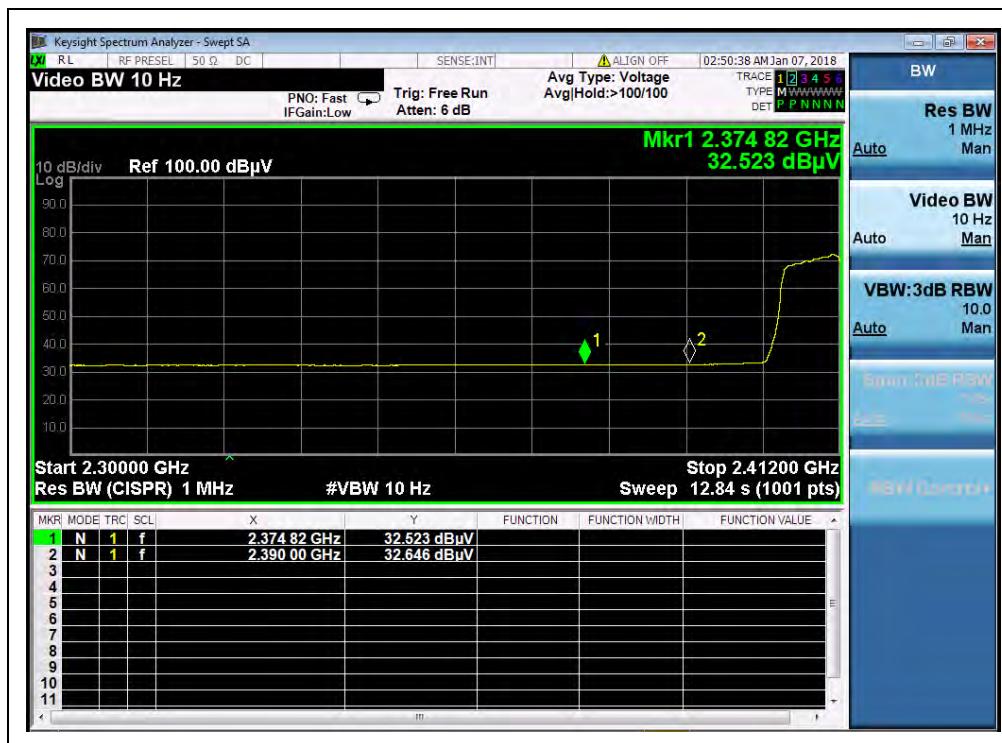
#### B. Test Plots:



(Channel = 1 PEAK, 802.11g)



REPORT No.: SZ17120080W03



(Channel = 1 AVG, 802.11g)



(Channel = 11 PEAK, 802.11g)

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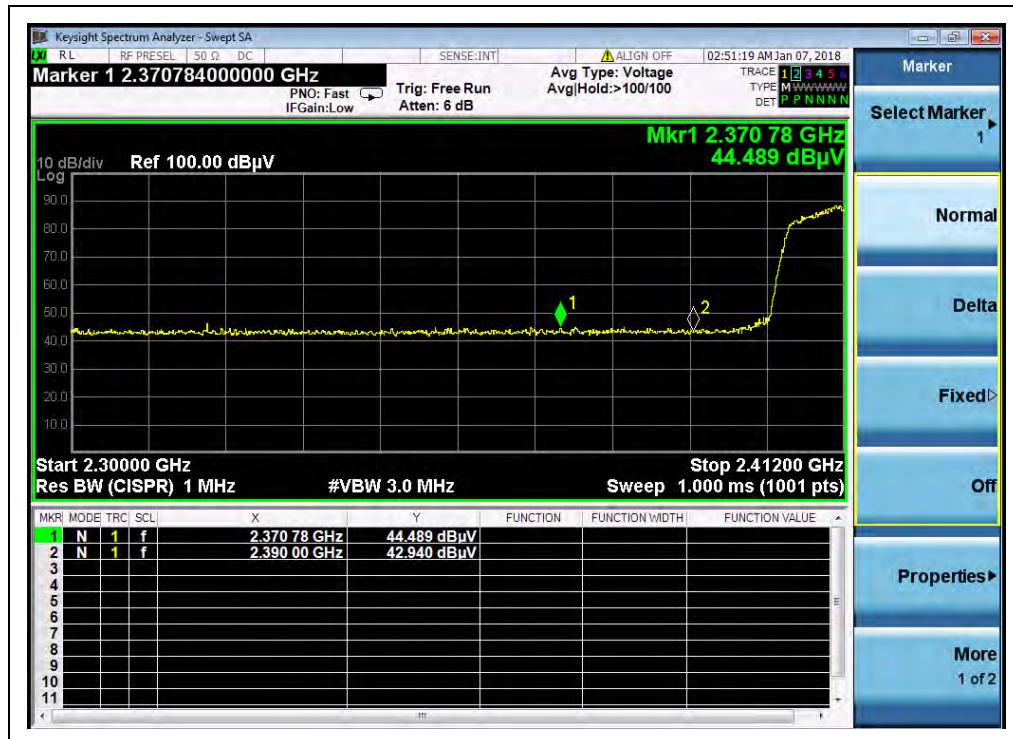
(Channel = 11 AVG, 802.11g)

### 2.6.3.3 802.11n-20MHz Test mode

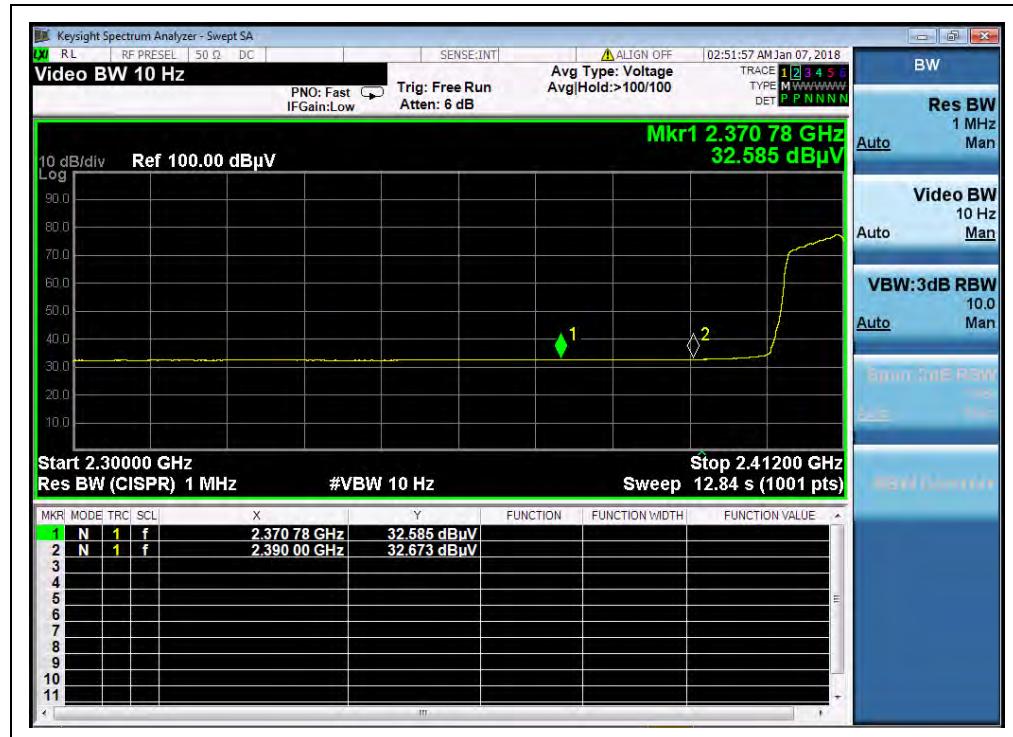
The lowest and highest channels are tested to verify the band edge emissions.

#### A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver	$A_T$ (dB)	$A_{\text{Factor}}$ (dB@3m)	Max. Emission E (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Verdict
			U <sub>R</sub> (dB $\mu$ V)					
1	2370.78	PK	44.49	-33.63	32.56	43.42	74	Pass
1	2370.78	AV	32.59	-33.63	32.56	31.52	54	Pass
11	2485.45	PK	54.73	-33.18	32.5	54.05	74	Pass
11	2485.45	AV	36.23	-33.18	32.5	35.55	54	Pass

**B. Test Plots:**


(Channel = 1 PEAK, 802.11n-20)



(Channel = 1 AVG, 802.11n-20)



REPORT No.: SZ17120080W03



(Channel = 11 PEAK, 802.11n-20)



(Channel = 11 AVG, 802.11n-20)

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### 2.6.3.4 802.11n-40MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

#### A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	$A_T$ (dB)	$A_{Factor}$ (dB@3m)	Max. Emission E (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Verdict
			$U_R$ (dB $\mu$ V)					
3	2388.37	PK	51.48	-33.63	32.56	50.41	74	Pass
3	2388.37	AV	32.49	-33.63	32.56	31.42	54	Pass
9	2484.72	PK	55.83	-33.18	32.5	55.15	74	Pass
9	2484.72	AV	33.68	-33.18	32.5	33.00	54	Pass

#### B. Test Plots:



(Channel = 3 PEAK, 802.11n-40)



REPORT No.: SZ17120080W03



(Channel = 3 AVG, 802.11n-40)



(Channel = 9 PEAK, 802.11n-40)

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(Channel = 9 AVG, 802.11n-40)

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## 2.7. Conducted Emission

### 2.7.1. Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

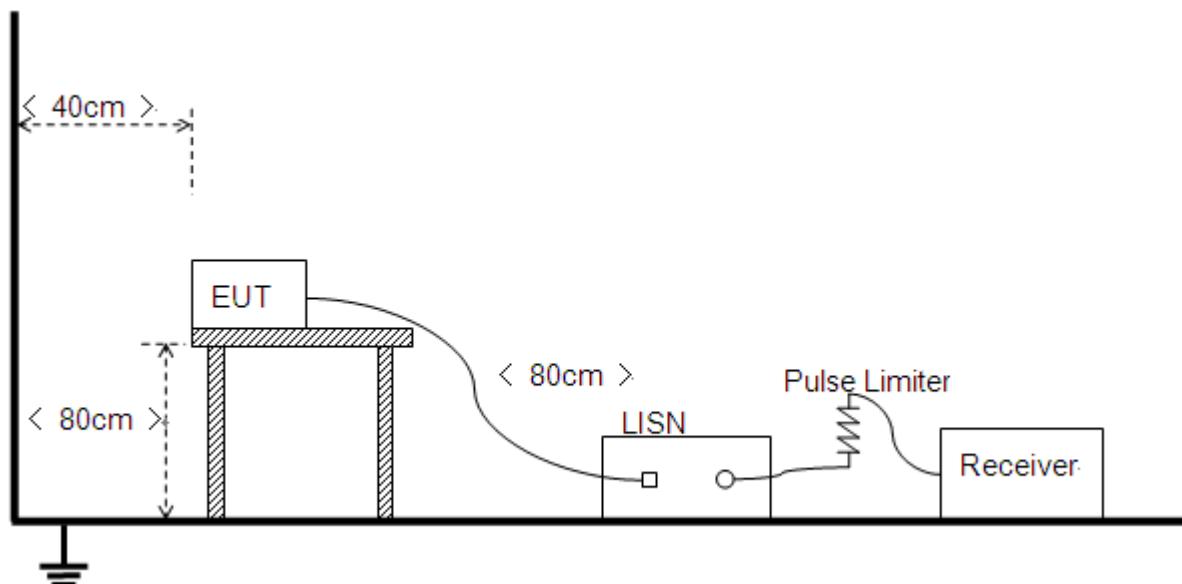
Frequency range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

**NOTE:**

- (a) The lower limit shall apply at the band edges.
- (b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

### 2.7.2. Test Description

#### A. Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10 2013.

## B. Equipments List:

Please refer ANNEX A(1.5).

### 2.7.3. Test Result

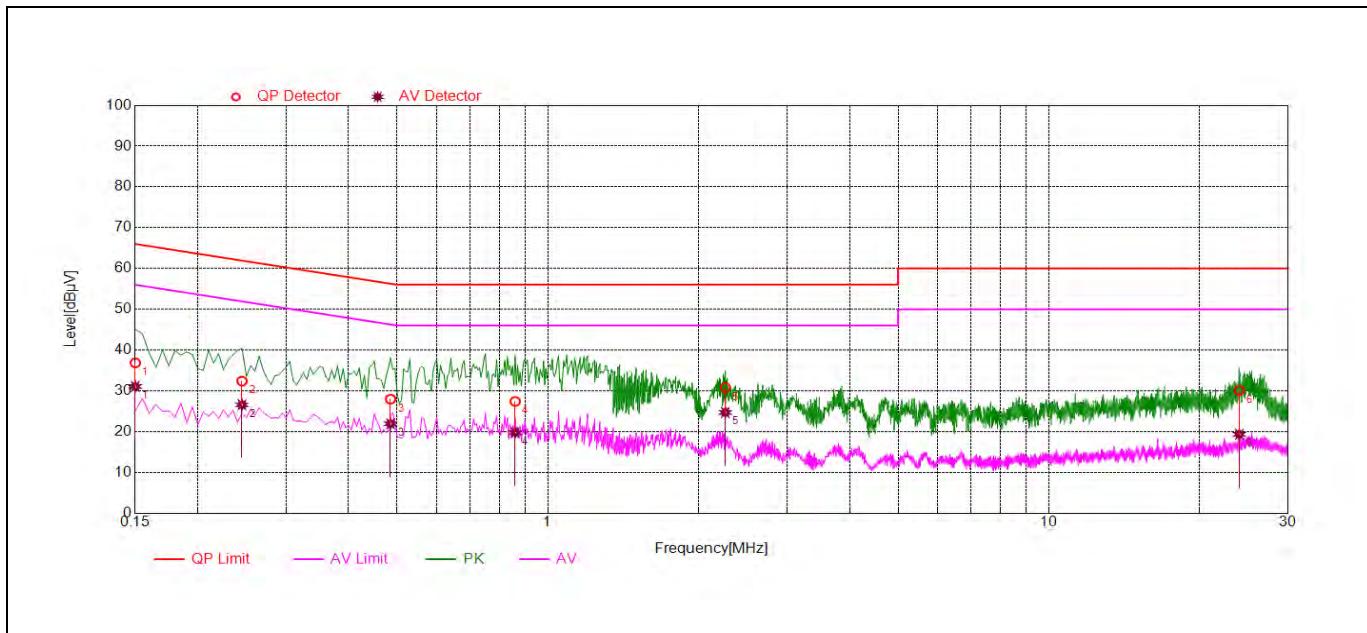
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

#### A. Test setup:

The EUT configuration of the emission tests is EUT + Link.

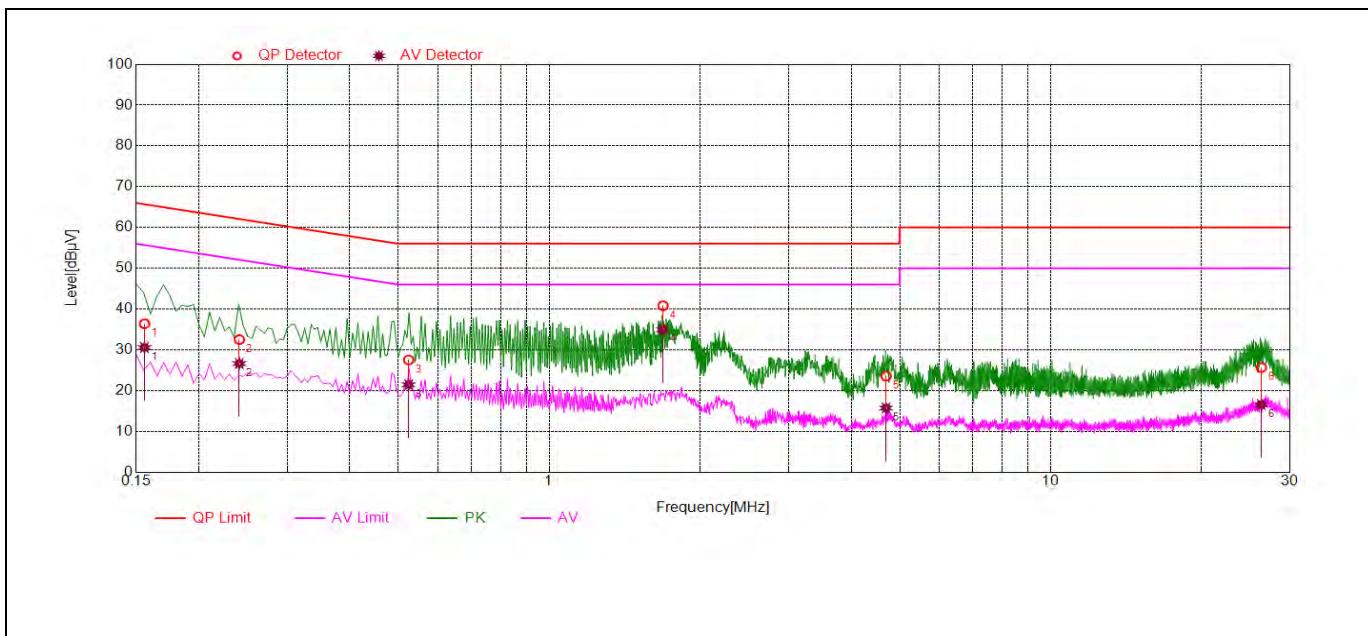
**Note:** The test voltage is AC 120V/60Hz.

#### B. Test Plots:



(Plot A: L Phase)

NO.	Fre. (MHz)	Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.15	36.85	31.05	66.00	56.00	Line	PASS
2	0.24	32.38	26.57	61.93	51.93		PASS
3	0.48	27.94	21.91	56.25	46.25		PASS
4	0.86	27.39	19.73	56.00	46.00		PASS
5	2.26	30.76	24.69	56.00	46.00		PASS
6	24.01	30.11	19.31	60.00	50.00		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.16	36.39	30.56	65.69	55.69	Neutral	PASS
2	0.24	32.50	26.63	62.07	52.07		PASS
3	0.52	27.51	21.41	56.00	46.00		PASS
4	1.69	40.80	34.93	56.00	46.00		PASS
5	4.70	23.55	15.72	56.00	46.00		PASS
6	26.33	25.64	16.55	60.00	50.00		PASS



## 2.8. Radiated Emission

### 2.8.1. Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ( $\mu$ V/m)	Measurement Distance (m)
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:

For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

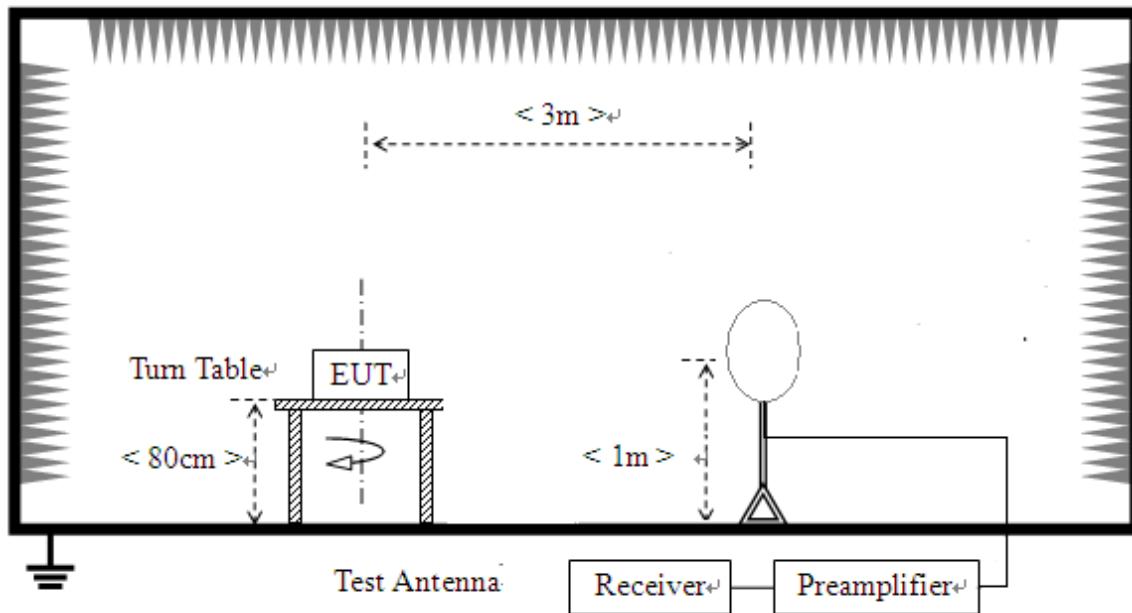
For above 1000MHz, limit field strength of harmonics: 54dB<sub>UV</sub>/m@3m (AV) and 74dB<sub>UV</sub>/m@3m (PK)

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

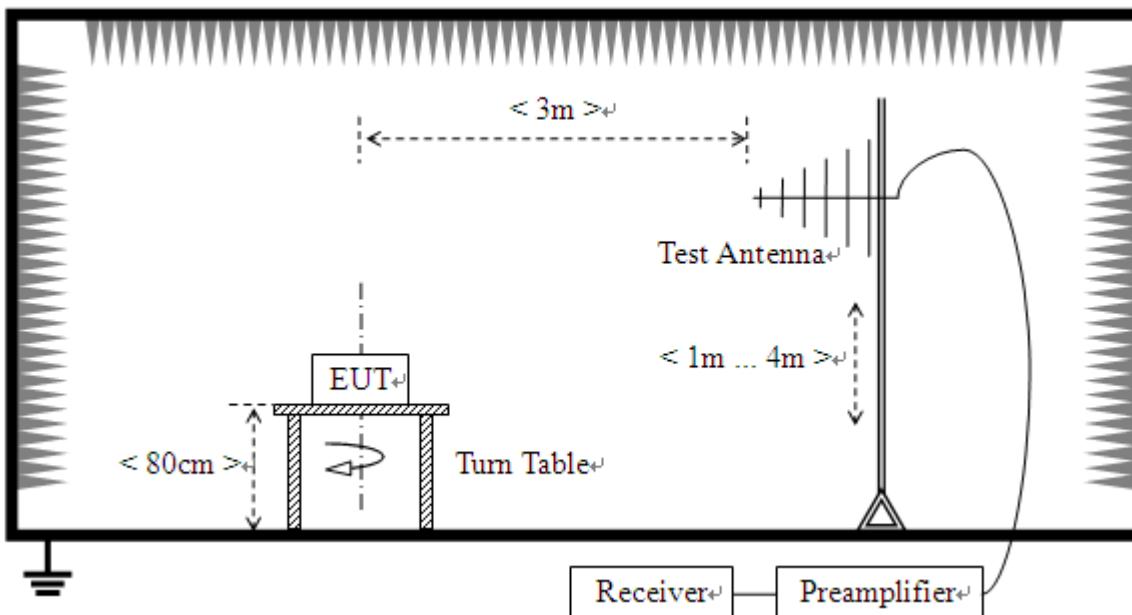
## 2.8.2. Test Description

### A. Test Setup:

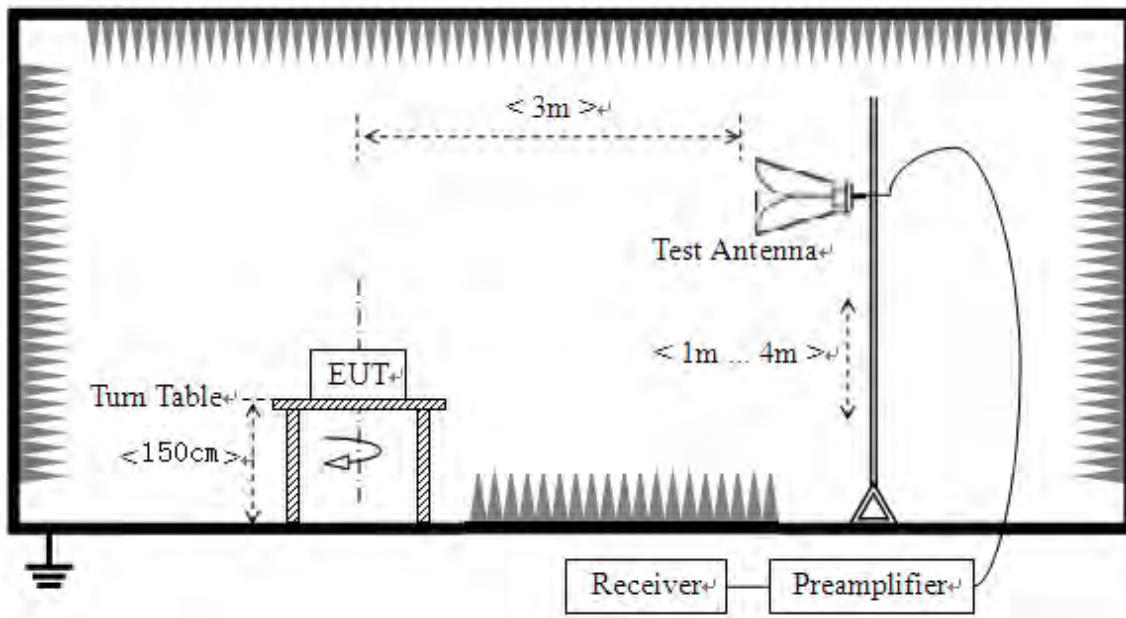
- 1) For radiated emissions from 9kHz to 30MHz



- 2) For radiated emissions from 30MHz to 1GHz



## 3) For radiated emissions above 1GHz



The RF absorbing material used on the reference ground plane and on the turntable have a maximum height (thickness) of 30 cm (12 in) and have a minimum-rated attenuation of 20 dB at all frequencies from 1 GHz to 18 GHz. Test site have a minimum area of the ground plane covered with RF absorbing material as specified in Figure 6 of ANSI C63.4: 2014.

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10 (2013). For radiated emissions below or equal to 1GHz, The EUT was set-up on insulator 80cm above the Ground Plane, For radiated emissions above 1GHz, The EUT was set-up on insulator 150cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading



For the Test Antenna:

- (a) In the frequency range of 9kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- (b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Place the test antenna at 3m away from area of the EUT, while keeping the test antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The test antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final test antenna elevation shall be that which maximizes the emissions. The test antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. The emission levels at both horizontal and vertical polarizations should be tested.

#### A. Equipments List:

Please refere ANNEX A(1.5).

#### 2.8.3. Test Result

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak limit, it is unnecessary to perform an quasi-peak measurement.

The measurement results are obtained as below:

$$E [\text{dB}\mu\text{V/m}] = U_R + A_T + A_{\text{Factor}} [\text{dB}]; A_T = L_{\text{Cable loss}} [\text{dB}] - G_{\text{preamp}} [\text{dB}]$$

$A_T$ : Total correction Factor except Antenna

$U_R$ : Receiver Reading

$G_{\text{preamp}}$ : Preamplifier Gain

$A_{\text{Factor}}$ : Antenna Factor at 3m

During the test, the total correction Factor  $A_T$  and  $A_{\text{Factor}}$  were built in test software.

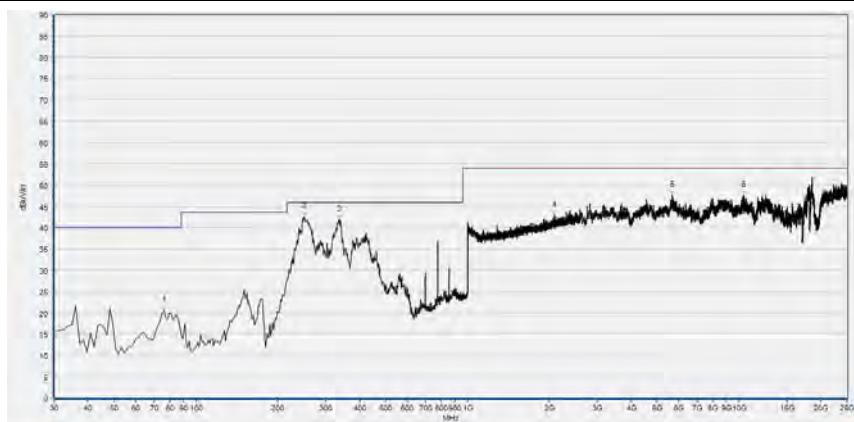
**Note1:** All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

**Note2:** For the frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

**Note3:** For the frequency, which started from 25GHz to 40GHz, was pre-scanned and the result which was 10dB lower than the limit was not recorded.

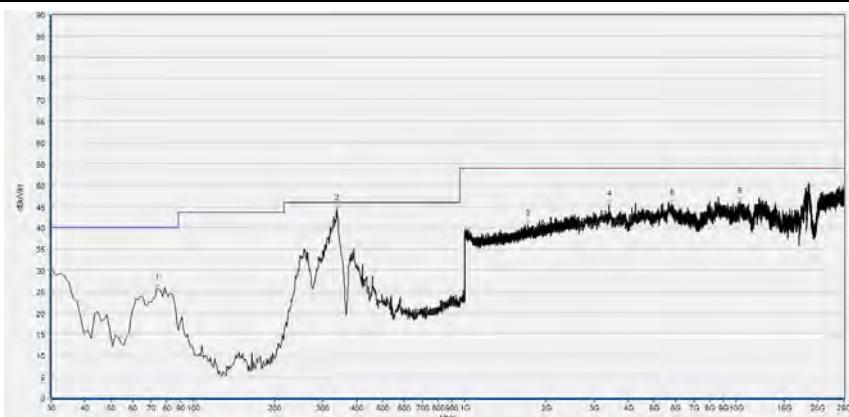
### 2.8.3.1 802.11b Test mode

Plots for Channel = 1



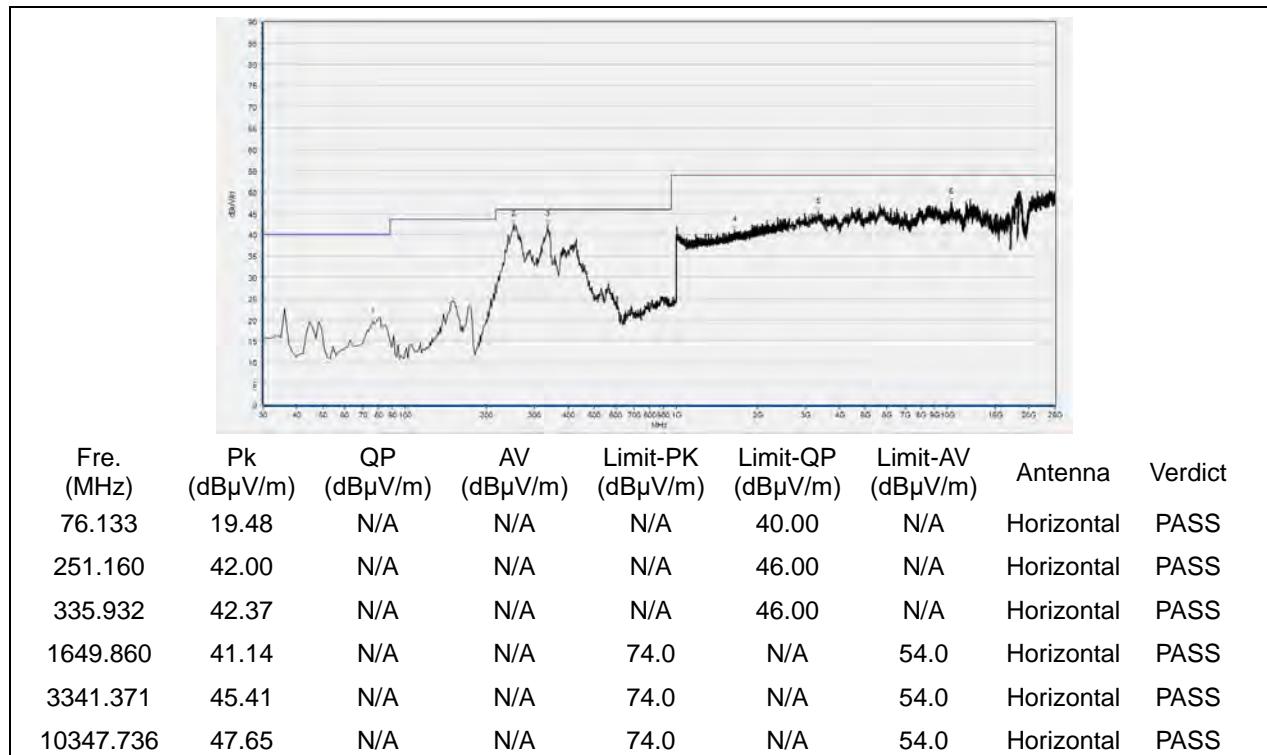
Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
76.133	20.62	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
249.737	42.54	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
337.146	41.83	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2089.716	42.90	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
5671.395	47.59	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
10355.883	47.58	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)

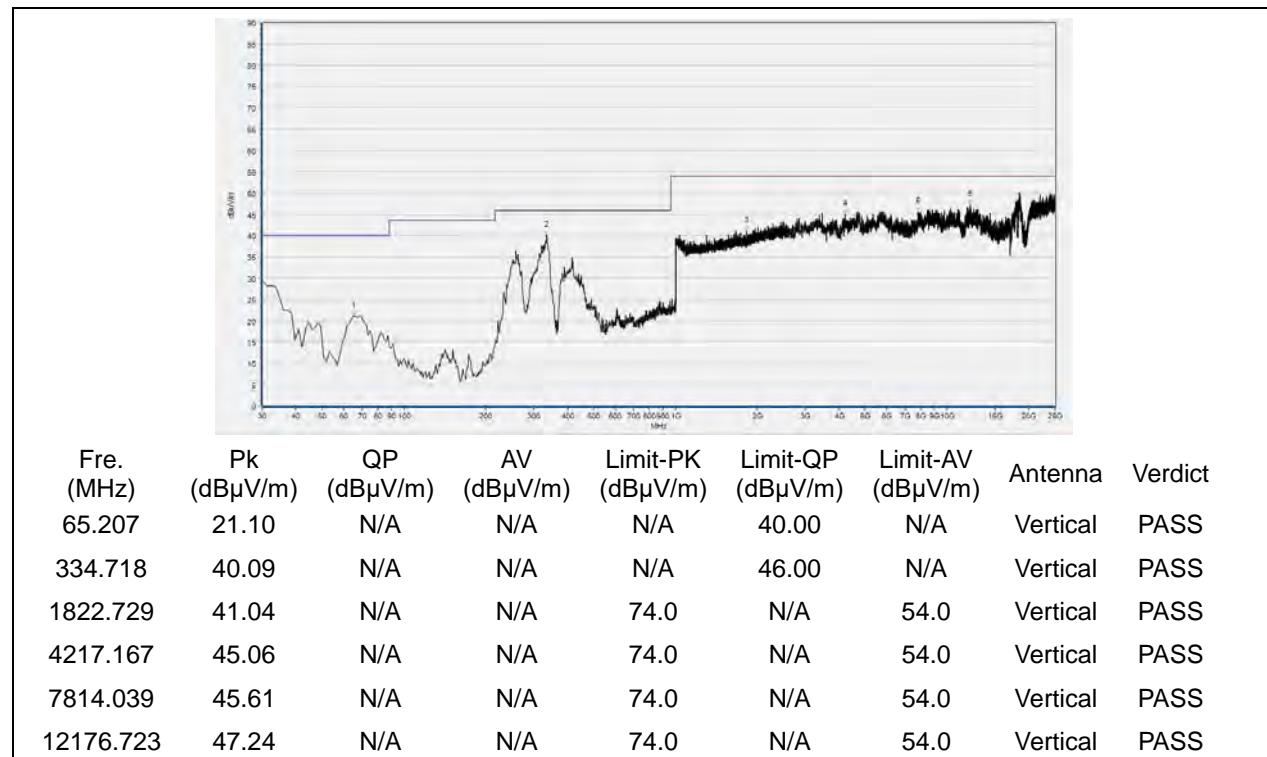


Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
73.705	25.87	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
339.574	44.33	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1707.483	40.81	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
3410.620	45.39	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
5797.672	45.65	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
10307.001	46.11	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

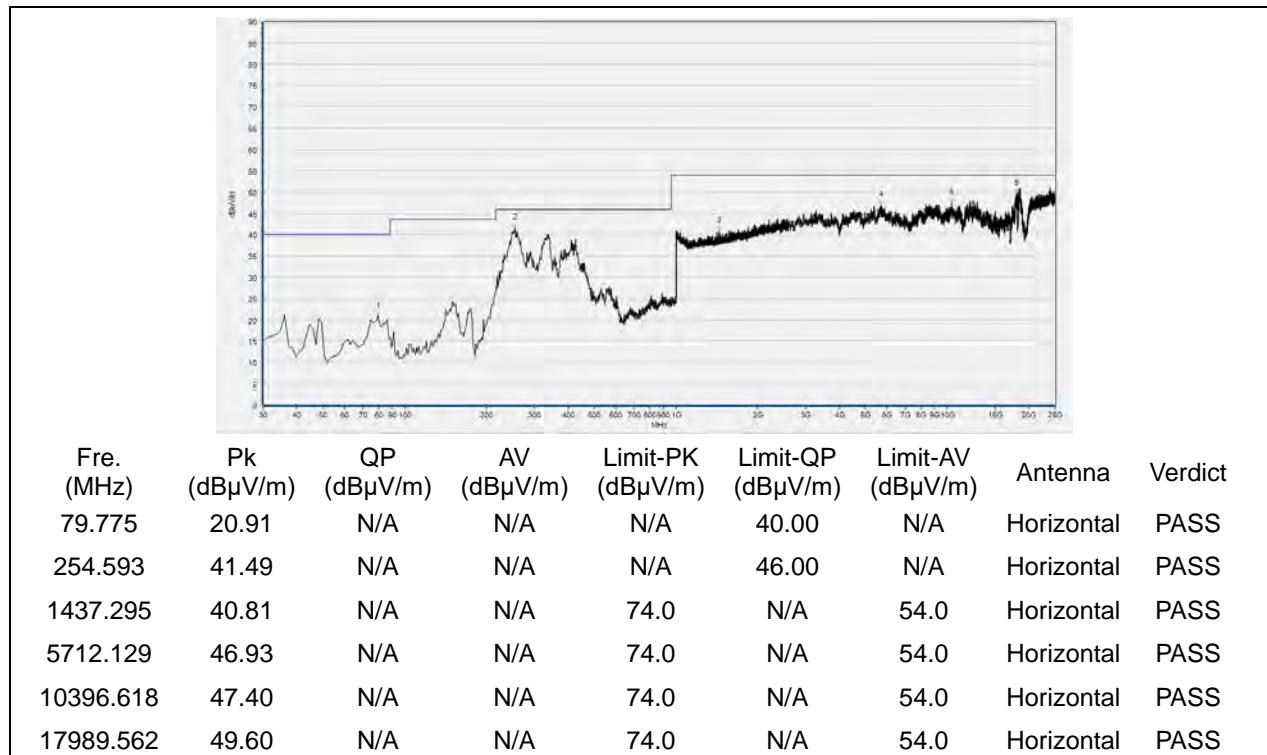
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 6


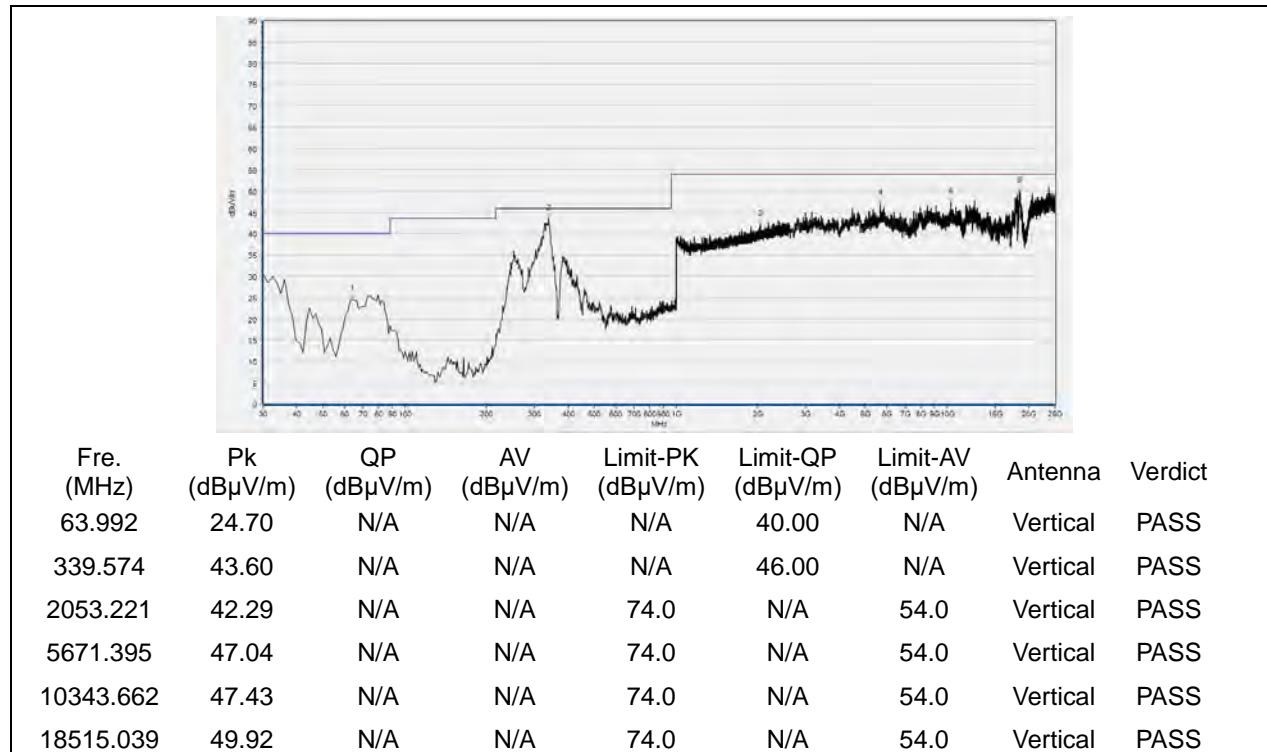
(Antenna Horizontal, 30MHz to 25GHz)



(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 11


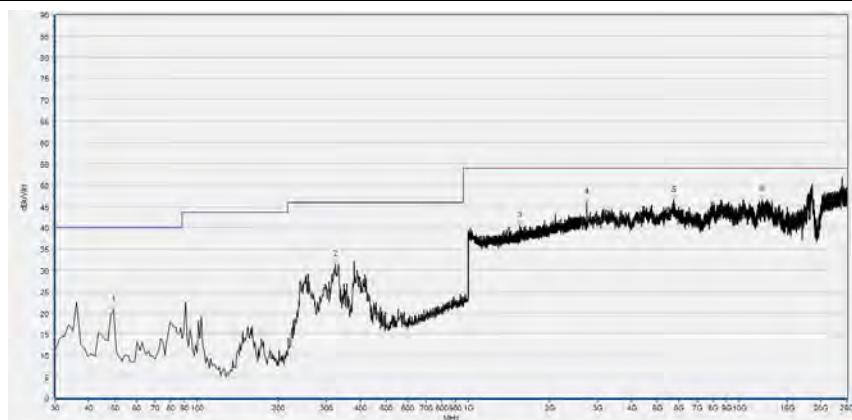
(Antenna Horizontal, 30MHz to 25GHz)



(Antenna Vertical, 30MHz to 25GHz)

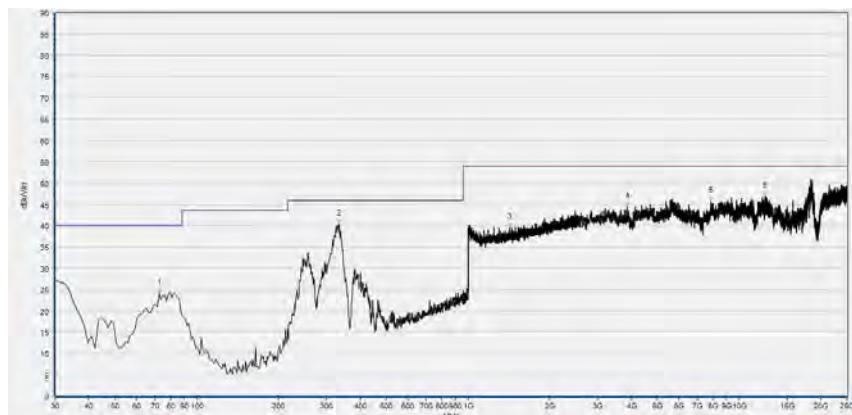
### 2.8.3.2 802.11g Test mode

Plots for Channel = 1



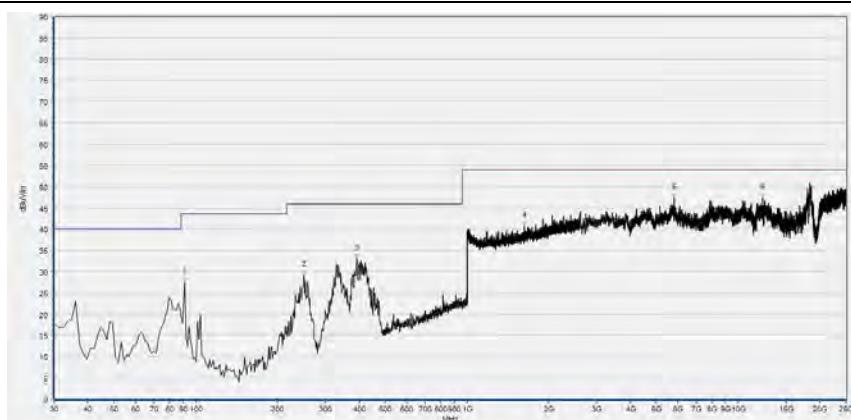
Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
49.424	20.68	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
325.006	31.36	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1550.620	40.56	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
2746.645	45.92	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
5720.276	46.37	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
12144.135	46.54	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



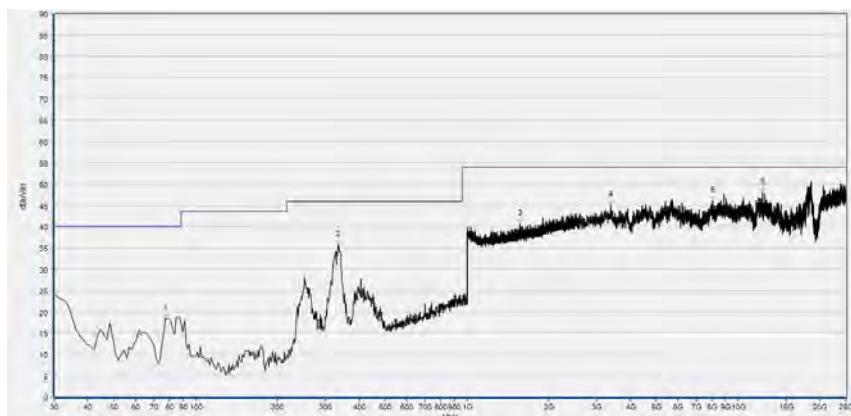
Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
72.491	24.06	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
334.718	40.45	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1421.929	39.59	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
3866.849	44.35	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
7866.994	45.75	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
12482.233	46.95	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 6


Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
90.701	27.40	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
249.737	29.22	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
390.563	32.97	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1624.250	40.74	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
5818.040	47.50	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
12286.707	47.43	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS

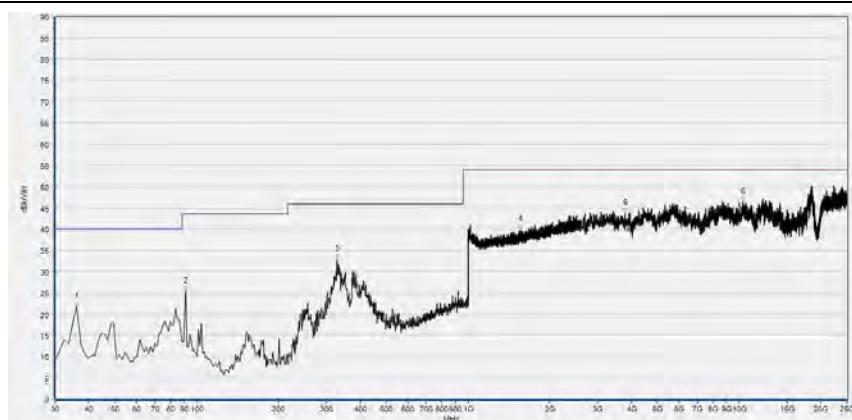
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
77.347	18.43	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
333.504	35.66	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1568.547	40.74	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
3394.326	45.05	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
8046.227	46.11	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
12307.074	48.18	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

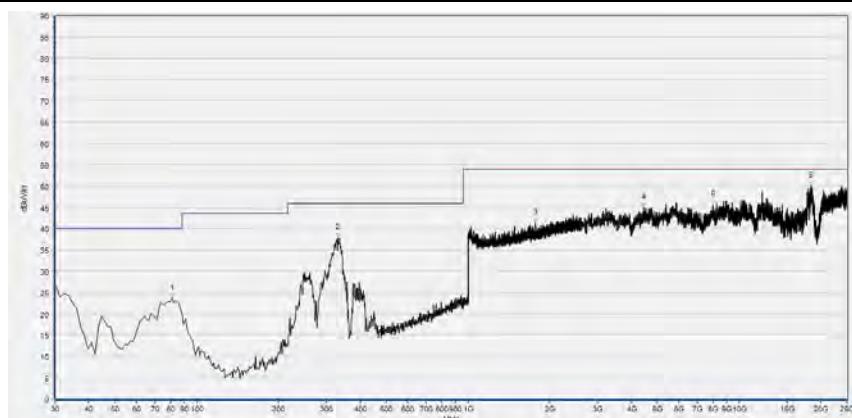
(Antenna Vertical, 30MHz to 25GHz)

## Plot for Channel = 11



Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
36.070	21.85	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.701	25.35	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
328.648	32.93	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1555.102	39.84	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
3797.600	43.70	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
10315.148	46.43	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)

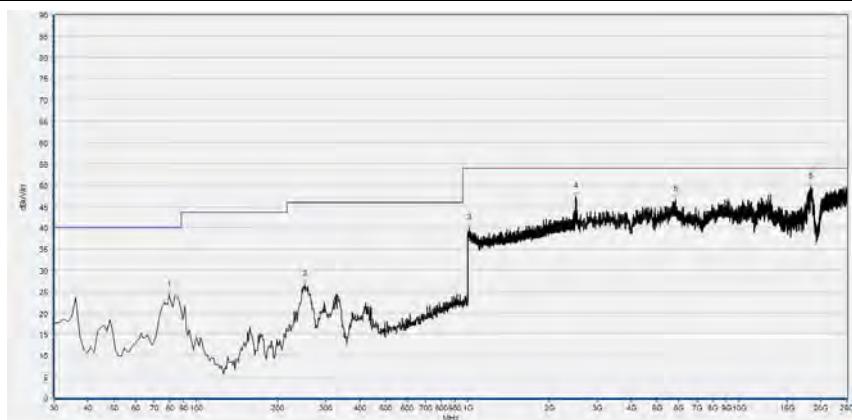


Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
80.989	23.57	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
331.076	37.95	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1766.387	41.45	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
4445.281	44.98	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
8017.712	45.56	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
18396.909	49.87	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

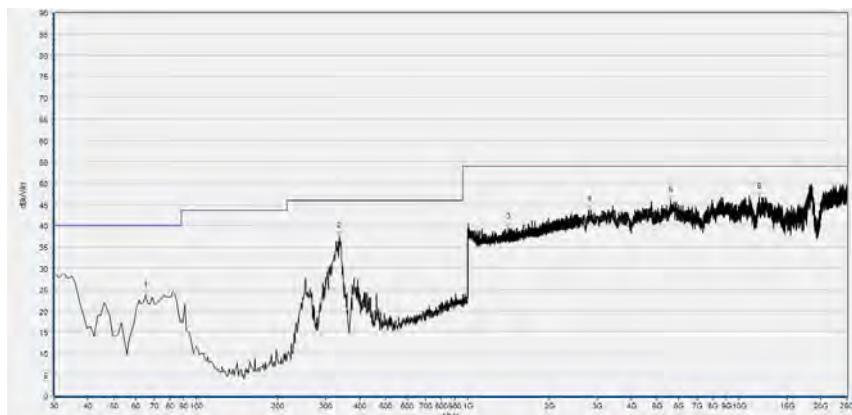
### 2.8.3.3 802.11n-20MHz Test mode

Plots for Channel = 1



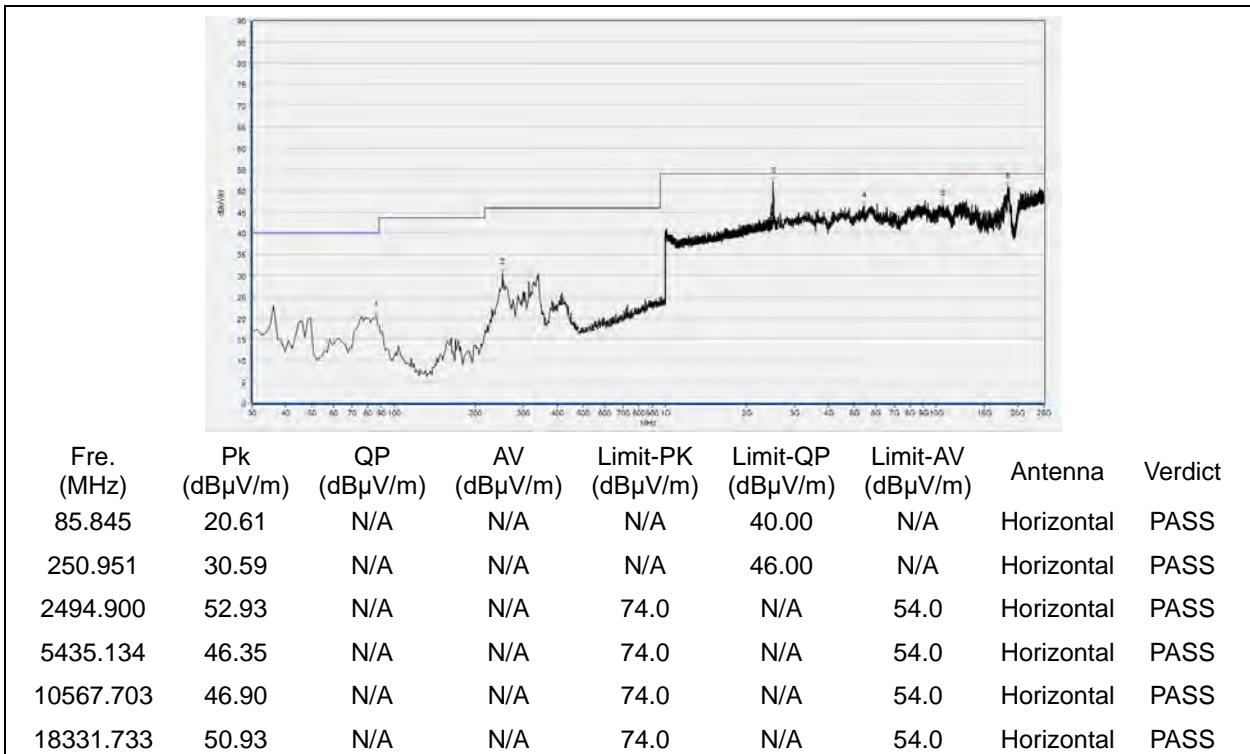
Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
79.775	24.16	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
252.165	26.66	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1011.525	39.86	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
2503.321	47.32	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
5830.260	46.53	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
18307.292	49.63	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)

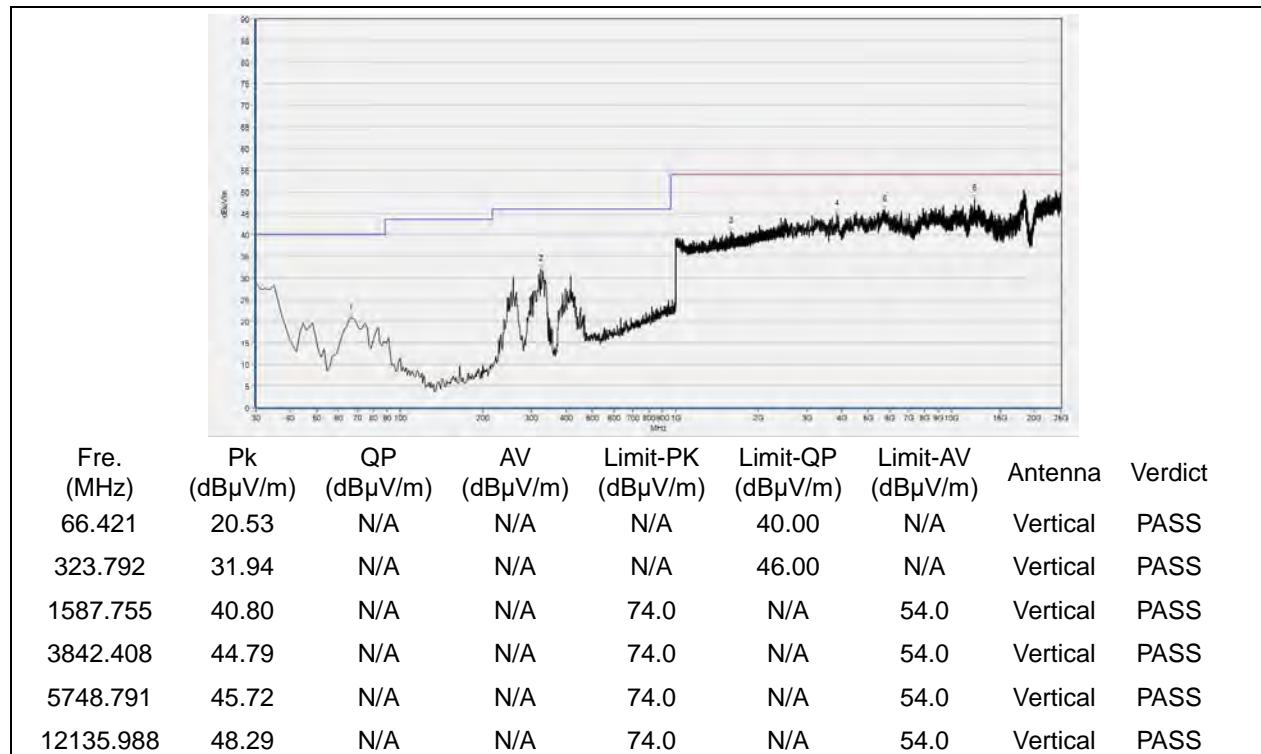


Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
65.207	23.71	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
337.146	37.47	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1415.526	39.48	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
2807.747	43.74	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
5598.072	45.95	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
11871.213	46.69	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

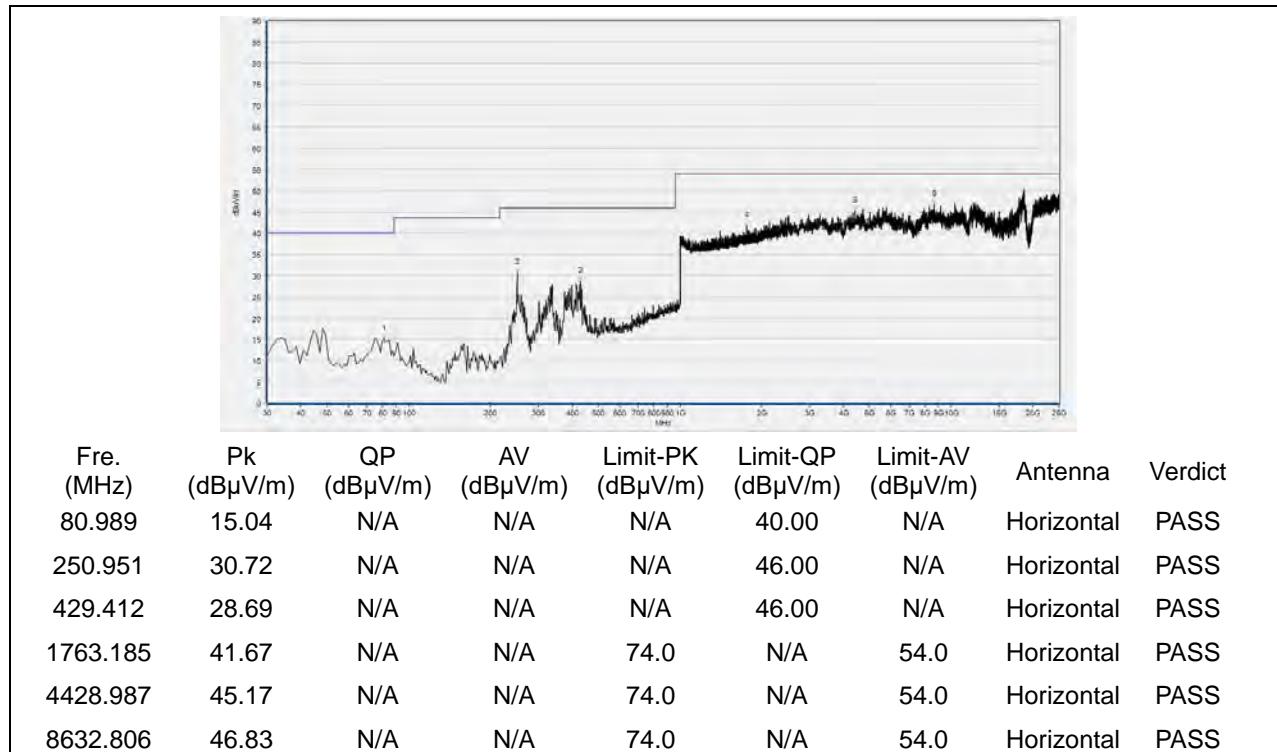
Plot for Channel = 6


(Antenna Horizontal, 30MHz to 25GHz)

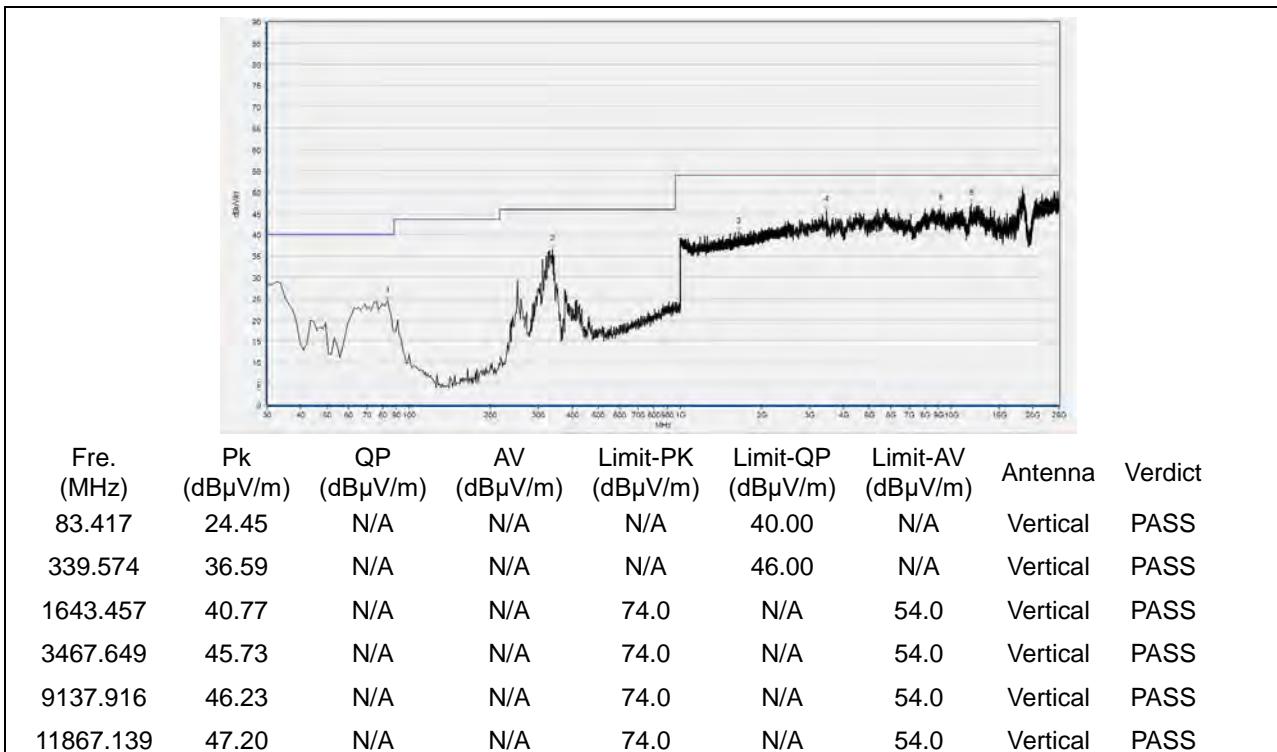


(Antenna Vertical, 30MHz to 25GHz)

## Plot for Channel = 11



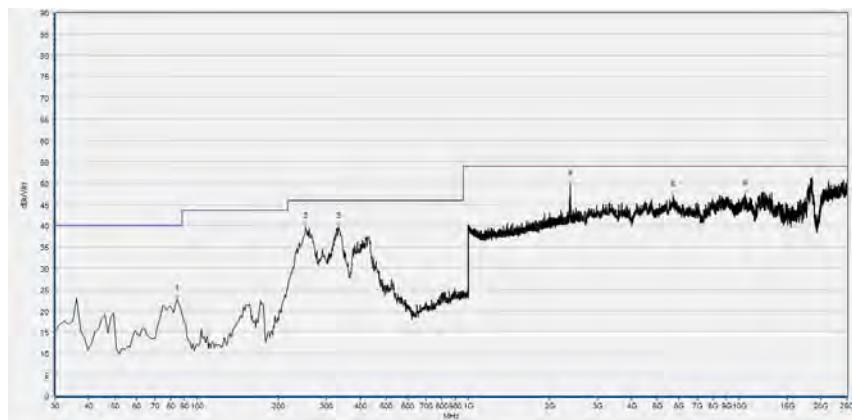
(Antenna Horizontal, 30MHz to 25GHz)



(Antenna Vertical, 30MHz to 25GHz)

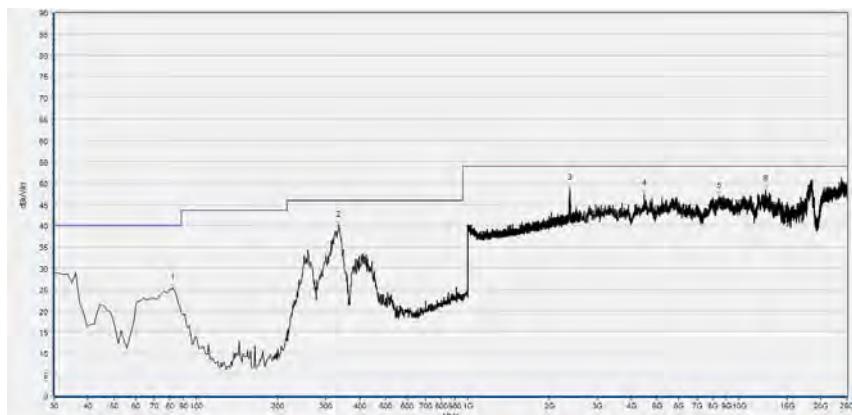
**2.8.3.4 802.11n-40MHz Test mode**

Plots for Channel = 3



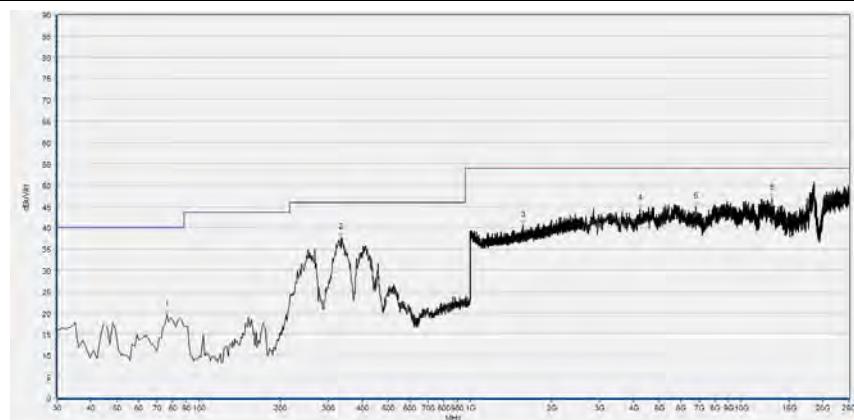
Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
84.631	22.78	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
250.951	39.66	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
332.290	39.65	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2388.075	49.76	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
5695.836	47.09	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
10518.822	47.39	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



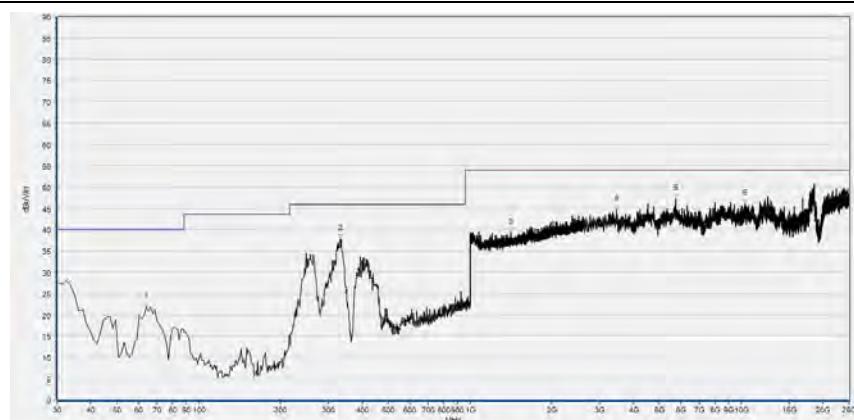
Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
82.203	25.34	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
334.718	40.14	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2388.075	48.82	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
4481.942	47.40	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
8441.353	46.91	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
12514.821	48.44	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 6


Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
76.133	19.62	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
333.504	37.63	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1566.627	40.48	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
4225.314	44.49	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
6787.525	44.84	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
13028.078	46.85	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS

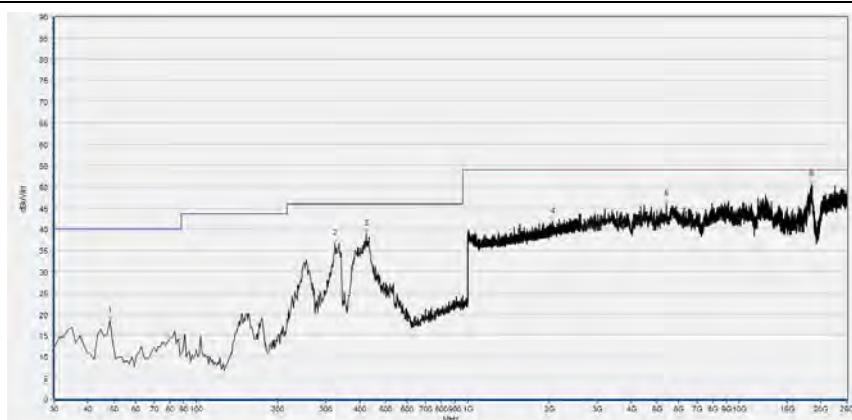
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
63.992	21.76	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
332.290	37.91	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1411.044	39.32	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
3463.575	44.68	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
5724.350	47.28	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
10351.809	46.02	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

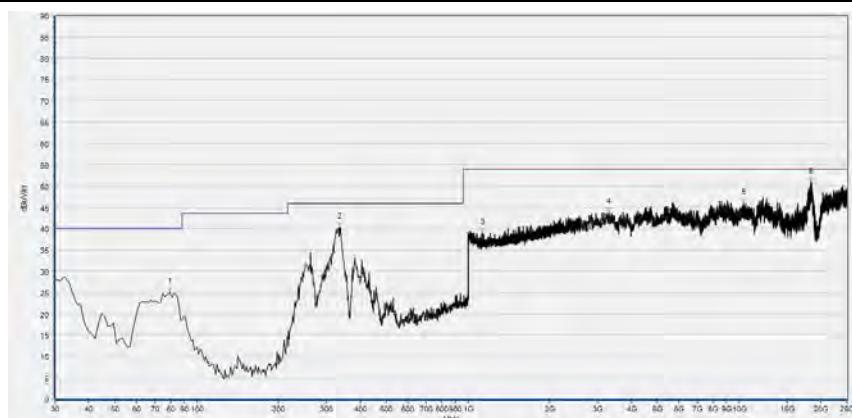
(Antenna Vertical, 30MHz to 25GHz)

## Plots for Channel = 9



Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
48.210	18.51	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
325.006	36.48	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
423.342	38.90	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2055.782	41.77	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
5390.326	45.84	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS
18510.966	50.39	N/A	N/A	74.0	N/A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dB $\mu$ V/m)	QP (dB $\mu$ V/m)	AV (dB $\mu$ V/m)	Limit-PK (dB $\mu$ V/m)	Limit-QP (dB $\mu$ V/m)	Limit-AV (dB $\mu$ V/m)	Antenna	Verdict
79.775	25.16	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
335.932	40.42	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1128.691	39.06	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
3304.710	43.94	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
10372.177	46.01	N/A	N/A	74.0	N/A	54.0	Vertical	PASS
18376.541	50.96	N/A	N/A	74.0	N/A	54.0	Vertical	PASS

(Plot C.3: Antenna Vertical, 30MHz to 25GHz)



## Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Peak Output Power	±2.22dB
Power spectral density (PSD)	±2.22dB
Bandwidth	±5%
Conducted Spurious Emission	±2.77 dB
Restricted Frequency Bands	±5%
Radiated Emission	±2.95dB
Conducted Emission	±2.44dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2



REPORT No.: SZ17120080W03

## Annex B Testing Laboratory Information

### 1. Identification of the Responsible Testing Laboratory

<b>Company Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd.
<b>Department:</b>	Morlab Laboratory
<b>Address:</b>	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
<b>Responsible Test Lab Manager:</b>	Mr. Su Feng
<b>Telephone:</b>	+86 755 36698555
<b>Faxsimile:</b>	+86 755 36698525

### 2. Identification of the Responsible Testing Location

<b>Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
<b>Address:</b>	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

### 3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192.

MORLAB

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.  
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road,  
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

Tel: 86-755-36698555      Fax: 86-755-36698525  
Http://www.morlab.cn      E-mail: service@morlab.cn



REPORT No.: SZ17120080W03

#### 4. Test Equipments Utilized

##### 4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2017.05.24	2018.05.23
Attenuator 1	(N/A.)	10dB	Resnet	2017.05.24	2018.05.23
Attenuator 2	(N/A.)	3dB	Resnet	2017.05.24	2018.05.23
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2017.12.03	2018.12.02
USB Wideband Power Sensor	MY54210011	U2021XA	Agilent	2017.05.24	2018.05.23
RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial cable	CB02	RF02	Morlab	N/A	N/A
SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

##### 4.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Receiver	MY56400093	N9038A	KEYSIGHT	2017.07.13	2018.07.12
LISN	812744	NSLK 8127	Schwarzbeck	2017.05.17	2018.05.16
Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2017.05.17	2018.05.16
Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

##### 4.3 Auxiliary Test Equipment

Equipment Name	Model No.	Brand Name	Manufacturer	Cal.Date	Cal.Due Date
Computer	T430i	Think Pad	Lenovo	N/A	N/A



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#### 4.4 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due Date
Receiver	MY54130016	N9038A	Agilent	2017.05.17	2018.05.16
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2017.05.14	2018.05.13
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2017.09.13	2018.09.12
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2017.03.07	2018.03.06
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2017.09.13	2018.09.12
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable(N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2017.05.17	2018.05.16
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2017.05.17	2018.05.16
Anechoic Chamber	N/A	9m*6m*6m	CRT	2017.11.19	2020.11.18

— END OF REPORT —

MORLAB

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