REPORT No.: SZ17080188W04

FCC RF TEST REPORT

APPLICANT	:	Shenzhen Chuangwei Electronic Appliance Tech Co., Ltd.
PRODUCT NAME	:	Tablet PC
MODEL NAME	:	101S/M1019/M101/M105/M1018E/M1016/ S1016/M1010/BNT-1011W
TRADE NAME	:	Hatch, Skyworth
BRAND NAME	:	Hatch/Skyworth/Tatung/BLUEDOT/TOSHIBA /SINOTEC/INVIO/IRIVER/SINGER
FCC ID	:	2AABK-101S
STANDARD(S)	:	47 CFR Part 15 Subpart E
ISSUE DATE	:	2017-11-30

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

MORLAB GROUP
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China
Tel: 86-755-36698555 Http://www.morlab.com
Fax: 86-755-36698525 E-mail: service@morlab.cn

DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2017-09-19	First edition
2.0	2017-11-30	Second edition

TEST REPORT DECLARATION

Applicant	Shenzhen Chuangwei Electronic Appliance Tech Co., Ltd.
Applicant Address	4F & 6F, Overseas plant south, Skyworth Industrial Park, Shiyan Street, Bao'an District, Shenzhen
Manufacturer	Shenzhen Chuangwei Electronic Appliance Tech Co., Ltd.
Manufacturer Address	4F & 6F, Overseas plant south, Skyworth Industrial Park, Shiyan Street, Bao'an District, Shenzhen
Product Name	Tablet PC
Model Name	101S/M1019/M101/M105/M1018E/M1016/S1016/M1010/BNT-1011W
Brand Name	Hatch/Skyworth/Tatung/BLUEDOT/TOSHIBA/SINOTEC/ INVIO/IRIVER/SINGER
HW Version	H1CWG_V1
SW Version	alps-mp-n0.mp102-v1.6-elink8163.tb.n_29
Test Standards	47 CFR Part 15 Subpart E
Test Date	2017-09-07 to 2017-09-19
Test Result	PASS

Tested by : Su Hang

Su Hang (Test Engineer)

Approved by : Peng Huarui

Peng Huarui (Supervisor)

1. GENERAL INFORMATION

1.1 EUT Description

Product Name ..... :	Tablet PC
Serial No. ..... :	(n.a, marked #1 by test site)
Hardware Version ..... :	H1CWG_V1
Software Version ..... :	alps-mp-n0.mp102-v1.6-elink8163.tb.n_29
Applicant ..... :	Shenzhen Chuangwei Electronic Appliance Tech Co., Ltd. 4F & 6F, Overseas plant south, Skyworth Industrial Park, Shiyan Street, Bao'an District, Shenzhen
Manufacturer ..... :	Shenzhen Chuangwei Electronic Appliance Tech Co., Ltd. 4F & 6F, Overseas plant south, Skyworth Industrial Park, Shiyan Street, Bao'an District, Shenzhen
Frequency Range ..... :	802.11a /n: 5.725GHz- 5.850GHz
Channel Number ..... :	Refer Note(2)
Modulation Type ..... :	DSSS, OFDM
Antenna Type ..... :	PIFA Antenna
Antenna Gain ..... :	2 dBi

Note 1: The U-NII band is applicable to this report, another bands of operation (2.4GHz) is documented in a separate report.

Note 2: According to the designer 101S, they hereby declare that the model M1019, M101, M105, M1018E, M1016, S1016, M1010, BNT-1011W and 101S are accordant in both hardware and software. These nine models only differ in brand name or model name.
The application information of M1019, M101, M105, M1018E, M1016, S1016, M1010, BNT-1011Wand 101S are identical only except above mentioned points.

Note 3: The following tables are the channel number and frequency of the EUT, the black bold channels were selected for test.

20MHz Bandwidth:

Frequency Range	5725~5850MHz				
Channel Number	**149**	153	**157**	161	**165**
Frequency (MHz)	**5745**	5765	**5785**	5805	**5825**

40MHz Bandwidth:

Frequency Range	5725~5850 MHz	
Channel Number	**151**	**159**
Frequency (MHz)	**5755**	**5795**

Note 3: During test, the duty cycle of the EUT was setting to 100%.

Note 4: For a more detailed description, please refer to Specification or User's Manual supplied by

the applicant and/or manufacturer.

Note 5: The antenna connector of EUT is designed with permanent attachment and no consideration of replacement.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart E (UNII band) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 (5-1-14 Edition)	Radio Frequency Devices

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

No.	Section	Description	Result
1	15.203	Antenna Requirement	**PASS**
2	15.407(a) (e)	Emission Bandwidth	**PASS**
3	15.407(a)	Maximum conducted output Power	**PASS**
4	15.407(a)	Peak Power spectral density	**PASS**
5	15.407(b)	Restricted Frequency Bands	**N/A**Note1
6	15.407(g)	Frequency Stability	**PASS**
7	15.407(h)	TPC and DFS	**N/A**Note2
8	15.207	Conducted Emission	**PASS**
9	15.407(b)	Radiated Emission	**PASS**
10	15.407(f)	RF exposure evaluation	**PASS**
Note 1: This test case not applies this kind of EUT. **Note 2:** EUT is a Client Device Without Radar Detection, WIFI hotspot does not support U-NII band; A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.			

The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10 2013.

These RF tests were performed according to the method of measurements prescribed in KDB789033 D02 v01r04 (05/02/2017), KDB905462 D03 v01r02 (08/22/2016) and KDB644545 D03 v01 (08/14/2014).

1.3 Test Environment 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 15E 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.

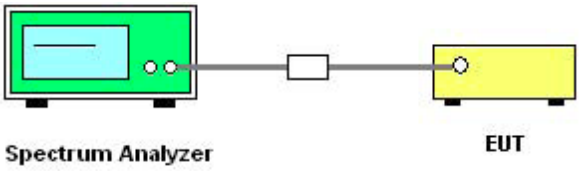
2.2 Emission Bandwidth

2.2.1 Requirement

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement. Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

2.2.2 Test Description

A. Test Set:



The EUT which is powered by the battery, 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.

B. Test Procedure

1. KDB 789033 Section C) 1) Emission Bandwidth was used in order to prove compliance

1) Set RBW = approximately 1% of the emission bandwidth.

2) Set the VBW > RBW.

3) Detector = Peak.

4) Trace mode = max hold.

5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. KDB 789033 Section C) 2) minimum emission bandwidth for the band 5.725-5.85GHz was used in order to prove compliance.

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

2.2.3 Test Result

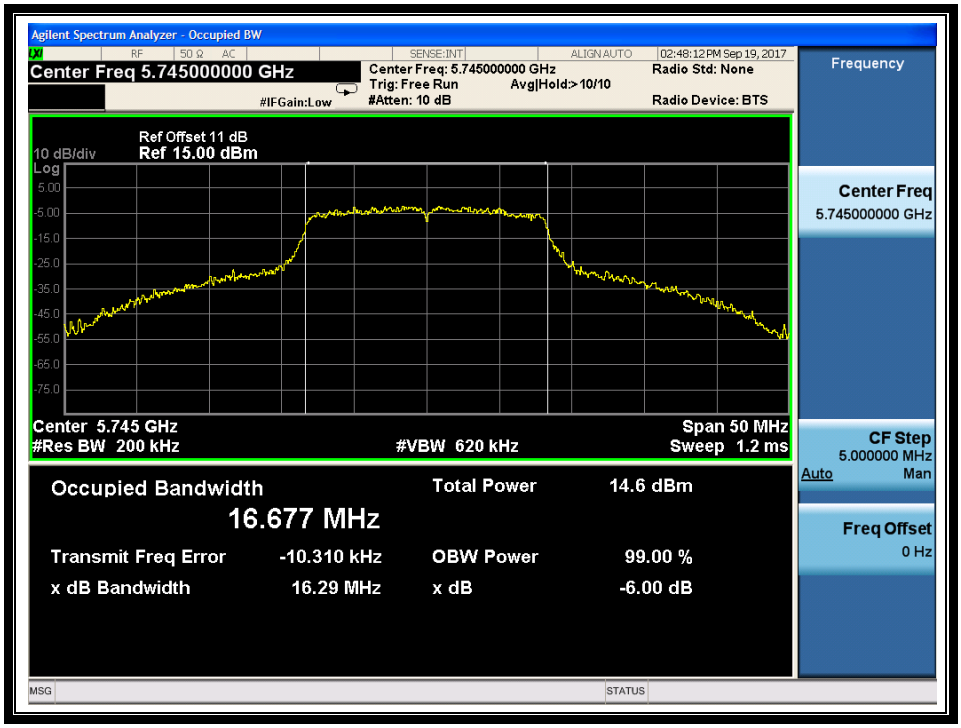
The lowest, middle and highest channels are selected to perform testing to record the 26 dB bandwidth of the Module.

2.2.3.1 802.11a-20MHz Test mode

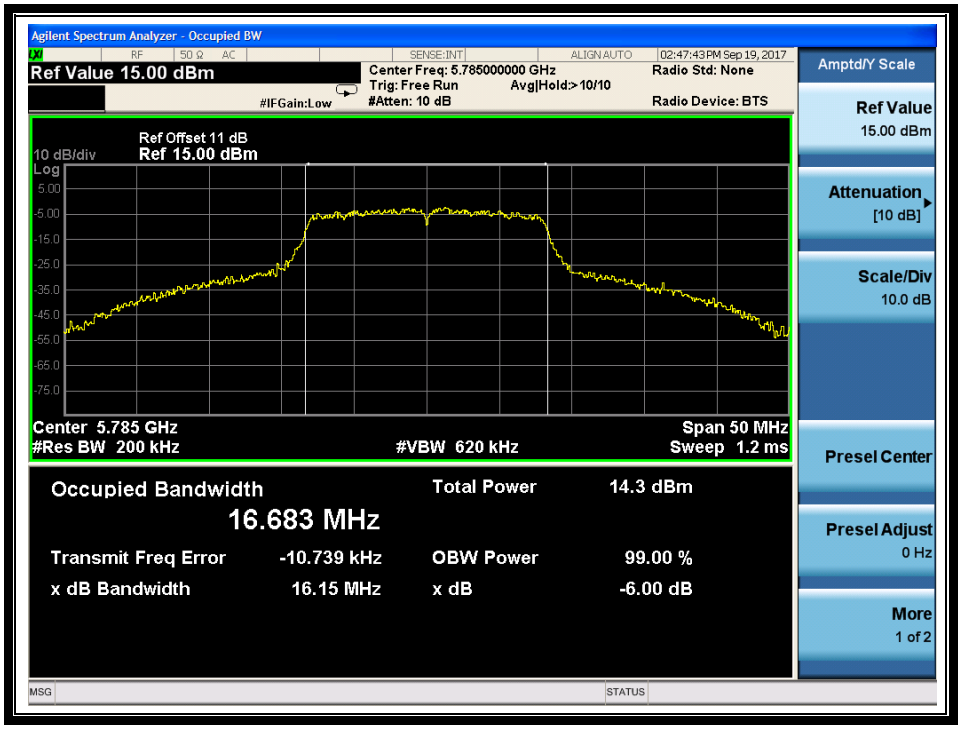
A. Test Verdict:

Channel	Frequency (MHz)	6dB Bandwidth (MHz)
149	5745	16.29
157	5785	16.15
165	5825	16.01

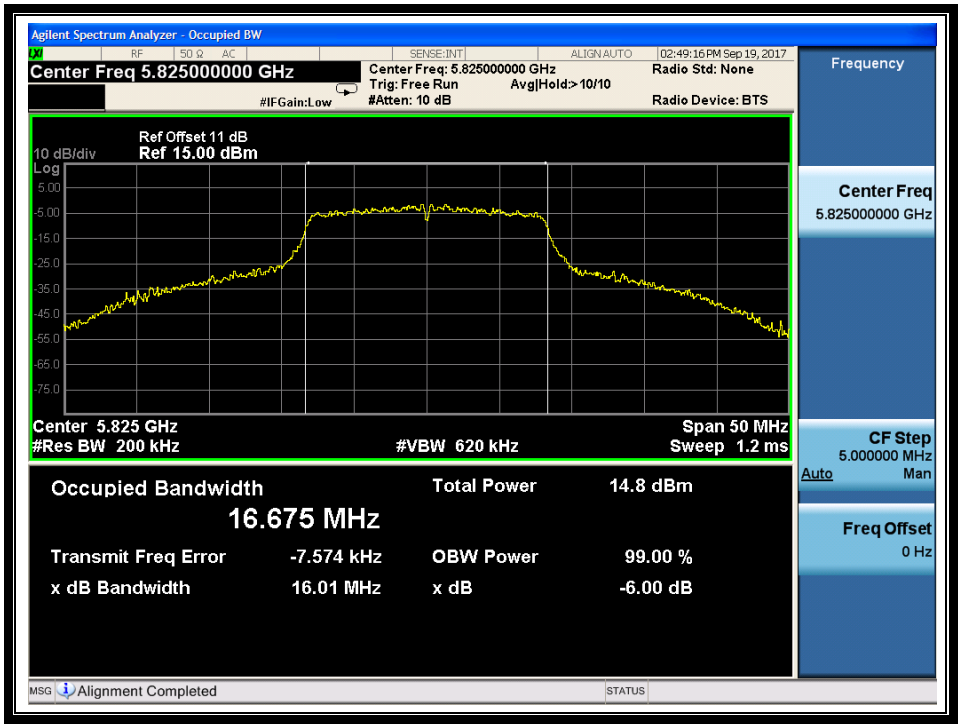
B. Test Plots



(Channel 149: 5745MHz @ 802.11a)



(Channel 157: 5785MHz @ 802.11a)



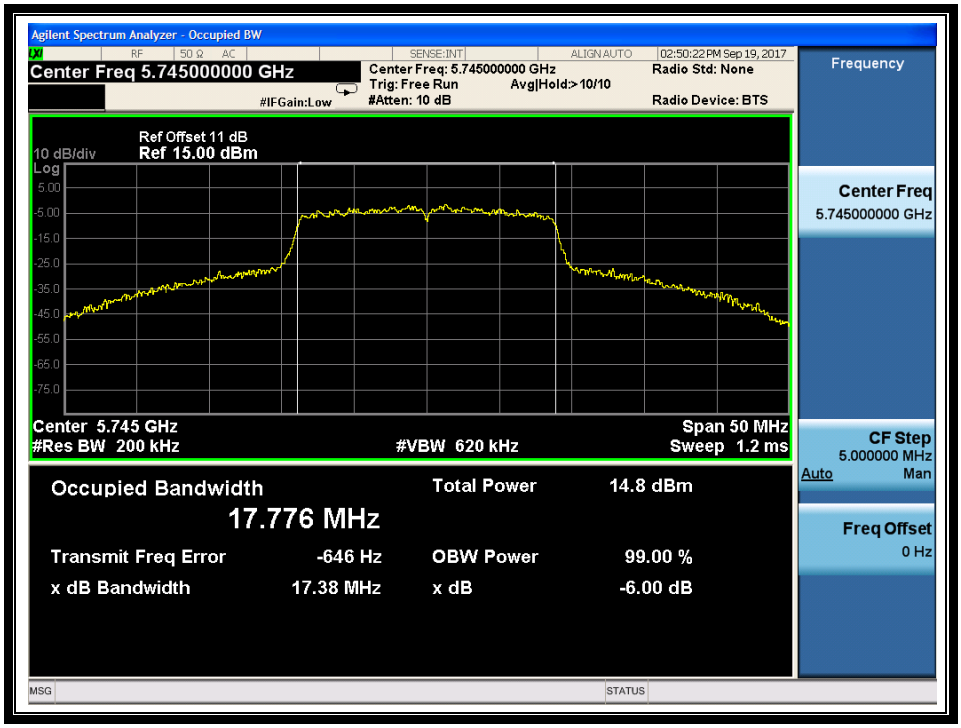
(Channel 165: 5825MHz @ 802.11a)

2.2.3.2 802.11n-20MHz Test mode

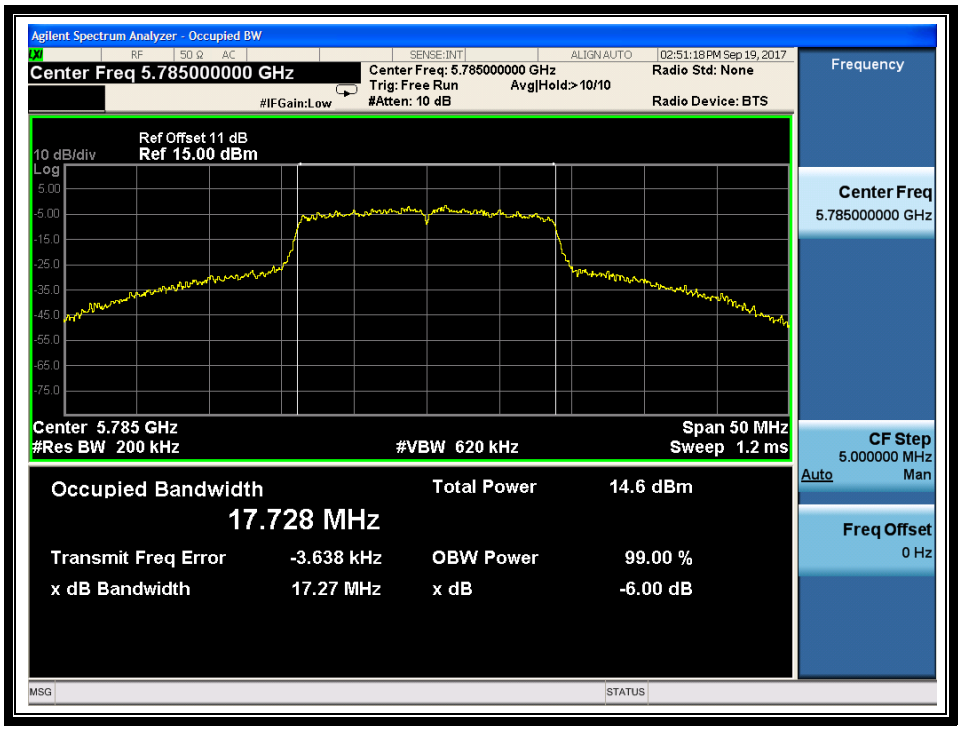
A. Test Verdict:

Channel	Frequency (MHz)	6dB Bandwidth (MHz)
149	5745	17.38
157	5785	17.27
165	5825	17.32

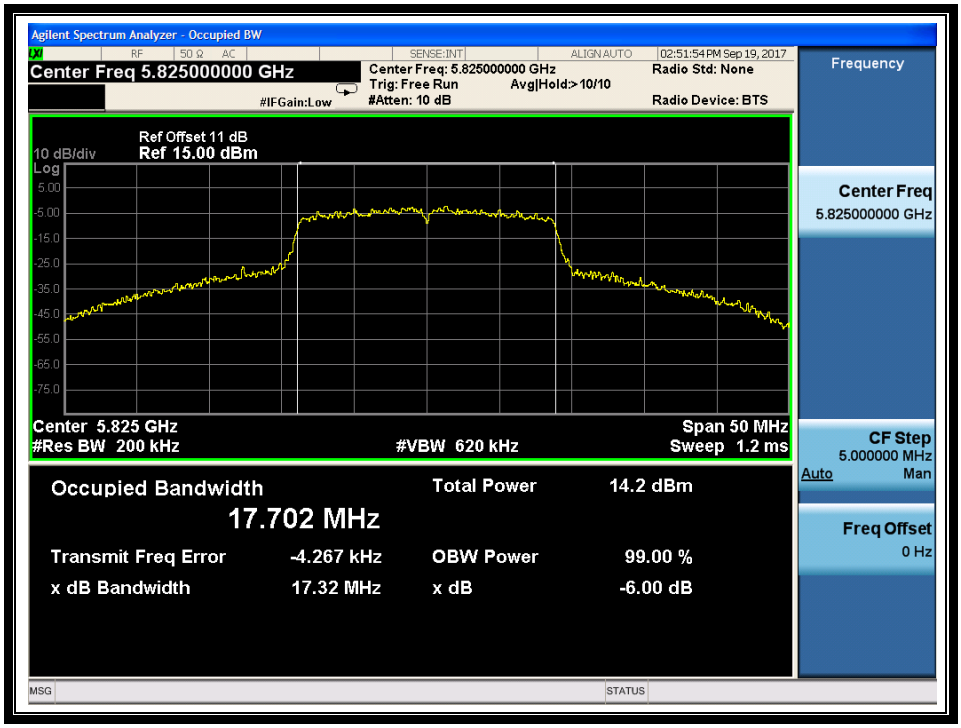
B. Test Plots



(Channel 149: 5745MHz @ 802.11n-20MHz)



(Channel 157: 5785MHz @802.11n-20MHz)



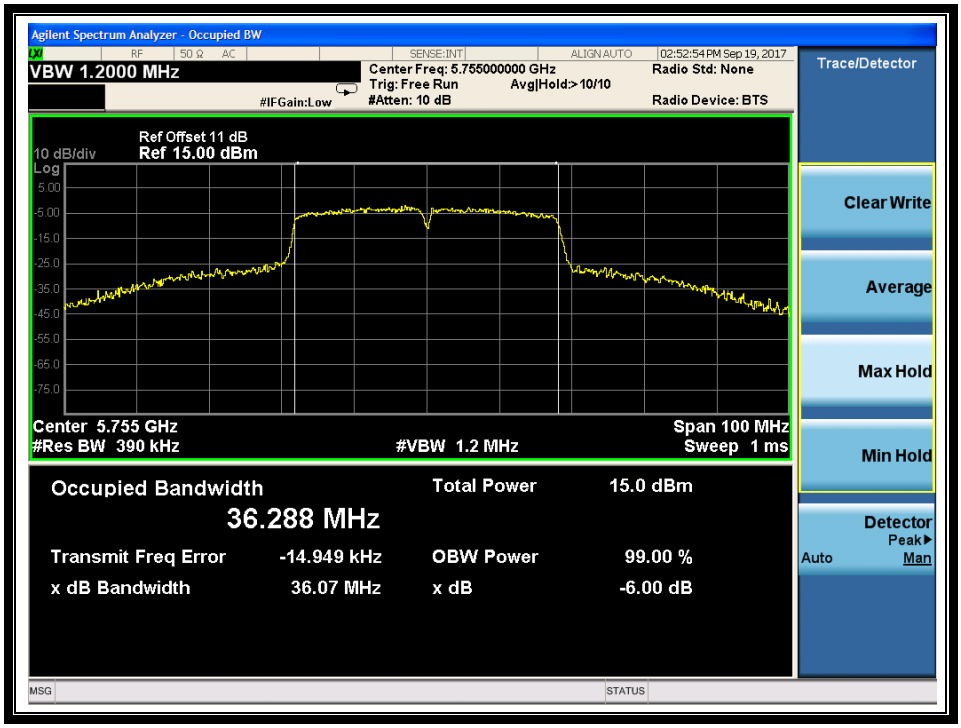
(Channel 165: 5825MHz @ 802.11n-20MHz)

2.2.3.3 802.11n-40MHz Test mode

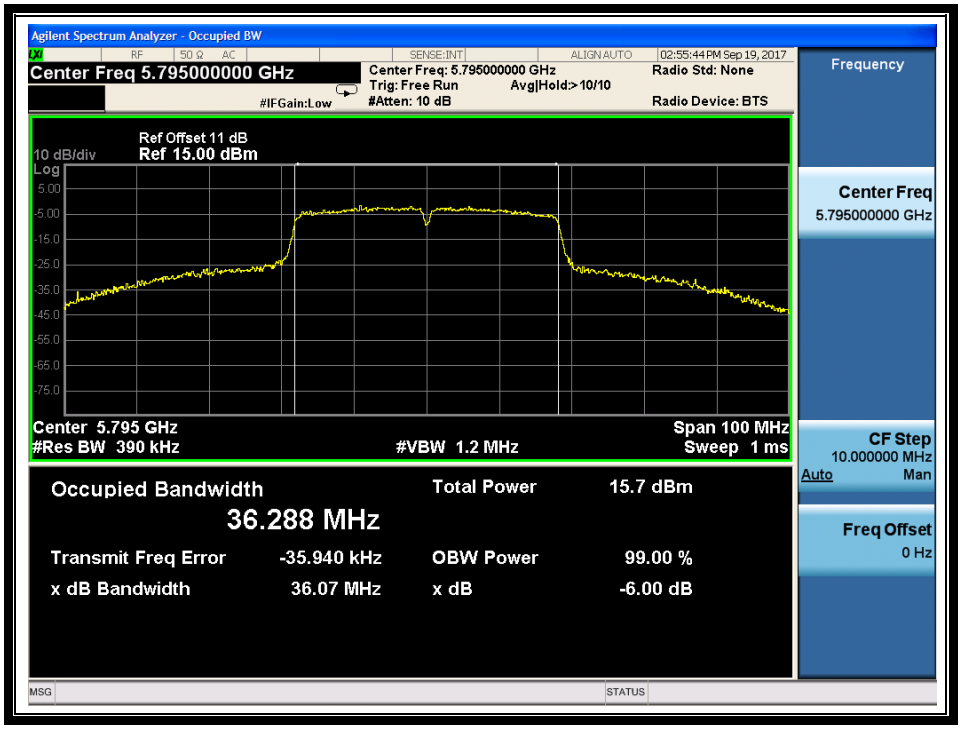
A. Test Verdict:

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
151	5755	36.07
159	5795	36.07

B. Test Plots



(Channel 151: 5755MHz @ 802.11 n-40)



(Channel 159: 5795MHz @ 802.11 n-40)

2.3 Maximum conducted output power

2.3.1 Requirement

(1) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

(2) For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10log B, where B is the 26 dB emission bandwidth in megahertz.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

According FCC KDB644545 D03 D)1)b)3) requirement:

a) The maximum conducted output power within each band of operation shall comply with the limits for that band.

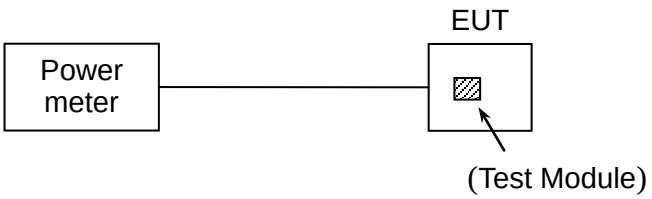
b) The limit on maximum conducted output power in each U-NII band is computed based on the portion of the emission bandwidth contained within that band

If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

2.3.2 Test Description

Section E) 3) of KDB 789033 defines a methodology using an RF average power meter.

A. Test Setup:



The EUT (Equipment under the test) which is powered by the Battery is coupled to the Power Meter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in power meter.

2.3.3 Test Result

2.3.3.1 802.11a-20MHz Test mode

Channel	Frequency (MHz)	Measured Output Peak Power(dBm)	Limit (dBm)	Verdict
149	5745	13.58	30	PASS
157	5785	13.39		
165	5825	12.07		

Channel	Frequency (MHz)	Measured Output Average Power(dBm)	Limit (dBm)	Verdict
149	5745	9.51	30	PASS
157	5785	9.29		
165	5825	9.91		

2.3.3.2 802.11n-20MHz Test mode

Channel	Frequency (MHz)	Measured Output Peak Power(dBm)	Limit (dBm)	Verdict
149	5745	17.48	30	PASS
157	5785	17.51		
165	5825	17.18		

Channel	Frequency (MHz)	Measured Output Average Power(dBm)	Limit (dBm)	Verdict
149	5745	7.21	30	PASS
157	5785	6.95		
165	5825	7.22		

2.3.3.3 802.11n-40MHz Test mode

Channel	Frequency (MHz)	Measured Output Peak Power(dBm)	Limit (dBm)	Verdict
151	5755	17.06	30	PASS
159	5795	14.71		

Channel	Frequency (MHz)	Measured Output Average Power(dBm)	Limit (dBm)	Verdict
151	5755	7.31	30	PASS
159	5795	7.05		

2.4 Peak Power spectral density

2.4.1 Requirement

(1) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(2) For the 5.25–5.35 GHz and 5.47–5.725GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500KHz band.

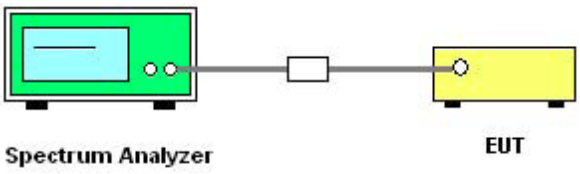
According FCC KDB644545 D03 D)1)b)2) requirement:

Emissions in each band shall comply with the PSD limits applicable to that band under the appropriate rule section.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

2.4.2 Test Description

A. Test Set:



The EUT which is powered by the Battery, 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.

B. Test Procedure

KDB 789033 Section F) Maximum Power Spectral Density (PSD) Method SA-1 was used in order to prove compliance

1) Set span to encompass the entire 26-dB emission bandwidth

2) Set RBW = 1 MHz. Set VBW ≥ 3 MHz.

3) Number of points in sweep ≥ 2 Span / RBW. Sweep time = auto.

4) Detector = RMS (i.e., power averaging)

5) Trace average at least 100 traces in power averaging (i.e., RMS) mode

6) Record the max value

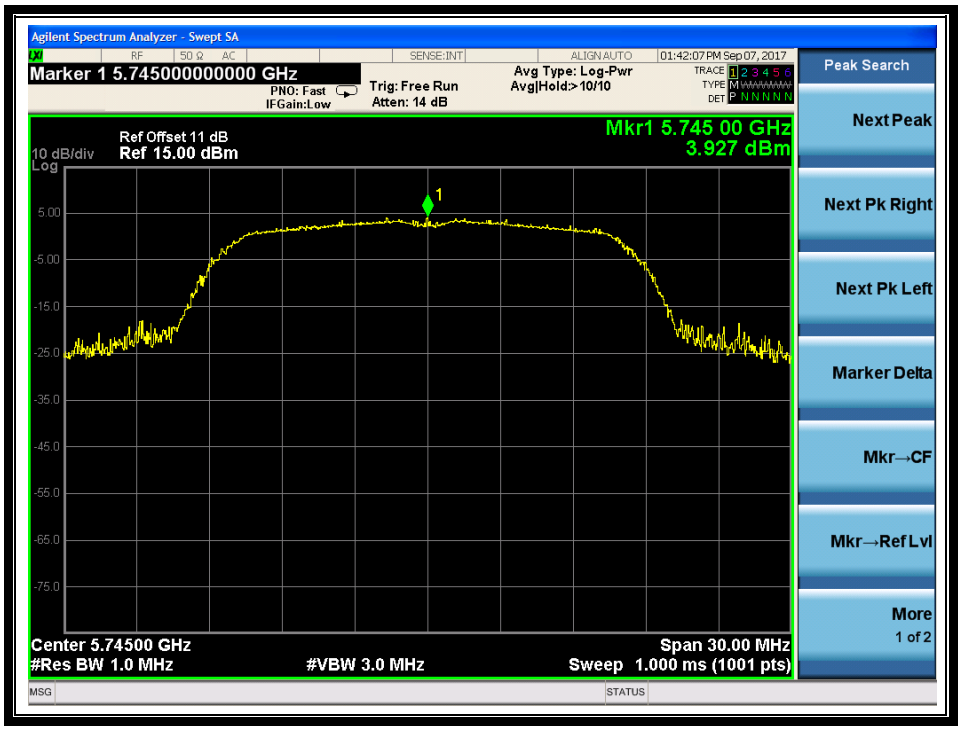
2.4.3 Test Result

2.4.3.1 802.11a Test mode

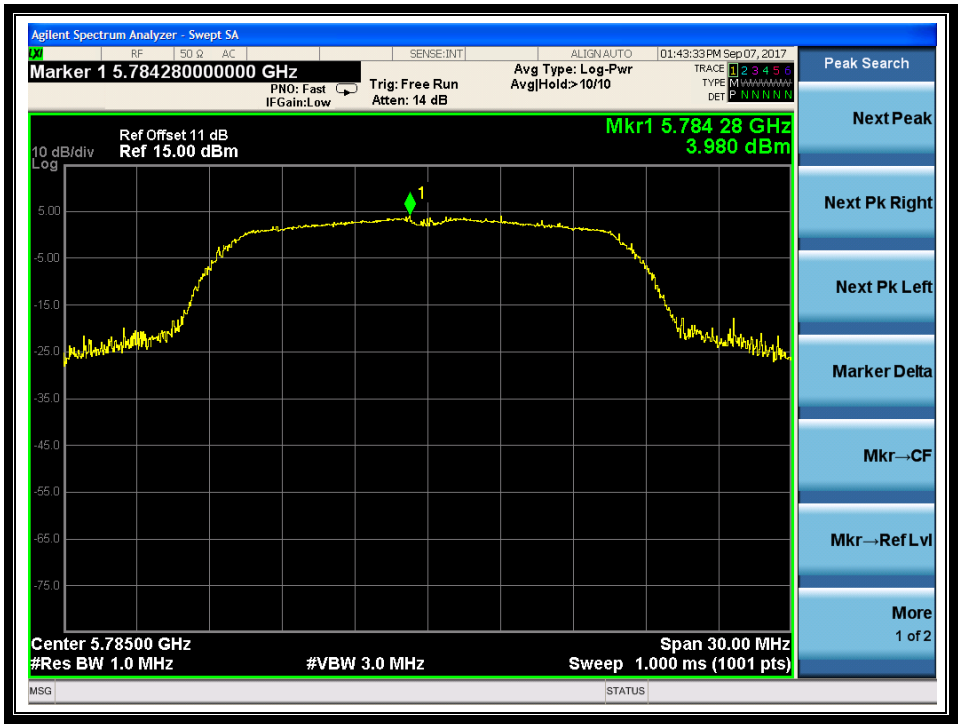
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	3.93	30	PASS
157	5785	3.98		
165	5825	4.10		

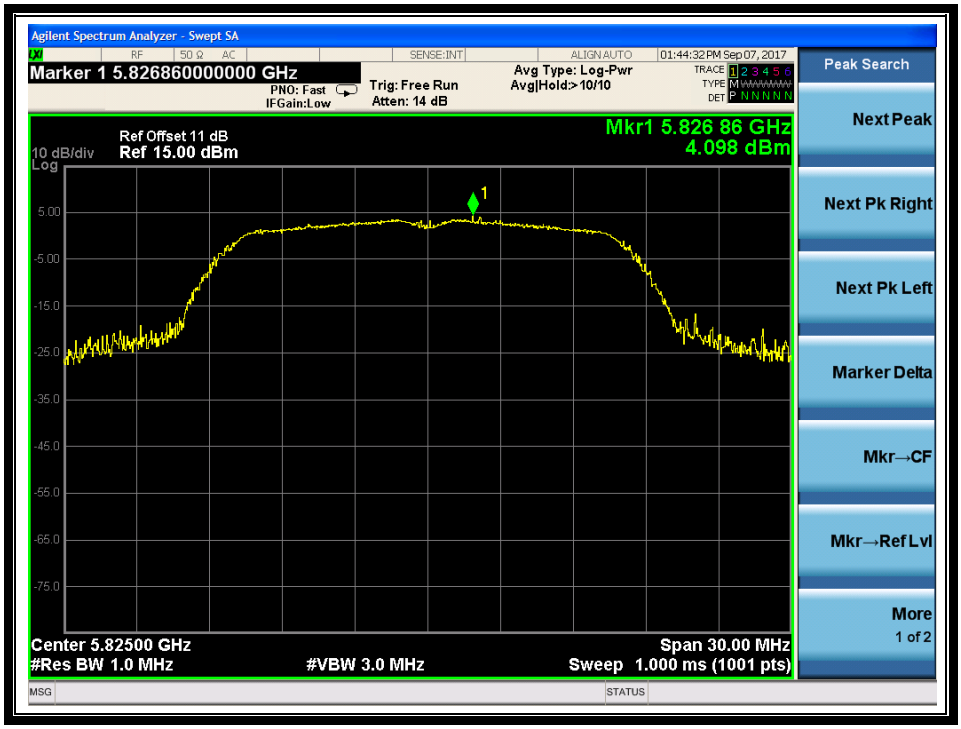
B. Test Plots



(Channel 149: 5745MHz @ 802.11a)



(Channel 157: 5785MHz @ 802.11a)



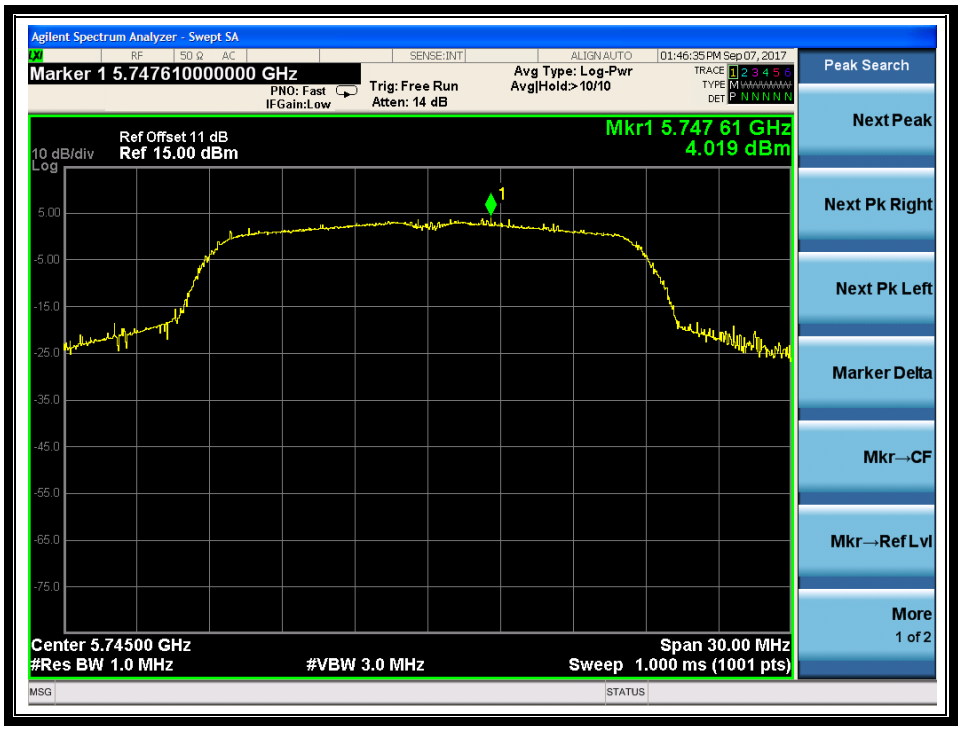
(Channel 165: 5825MHz @ 802.11a)

2.4.3.2 802.11n-20MHz Test mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	4.02	30	PASS
157	5785	4.02		
165	5825	3.72		

B. Test Plots



(Channel 149: 5745MHz @ 802.11n-20MHz)

(Channel 157: 5785MHz @802.11n-20MHz)

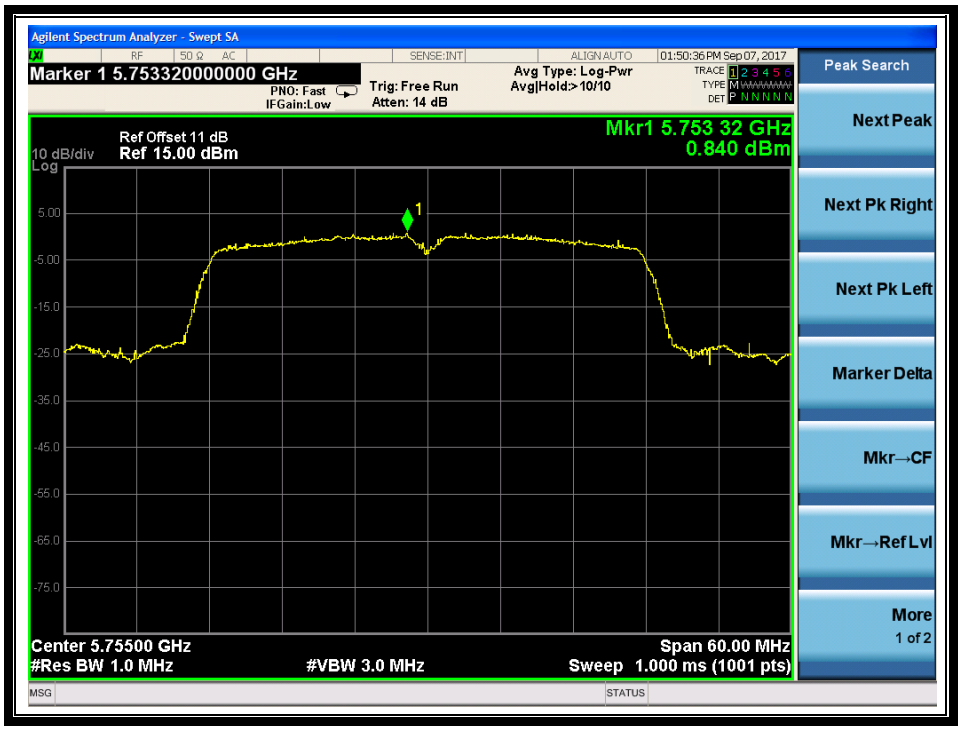
(Channel 165: 5825MHz @ 802.11n-20MHz)

2.4.3.3 802.11n-40MHz Test mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
151	5755	0.84	30	PASS
159	5795	1.19		

B. Test Plots



(Channel 151: 5755MHz @ 802.11 n-40)

(Channel 159: 5795MHz @ 802.11 n-40)

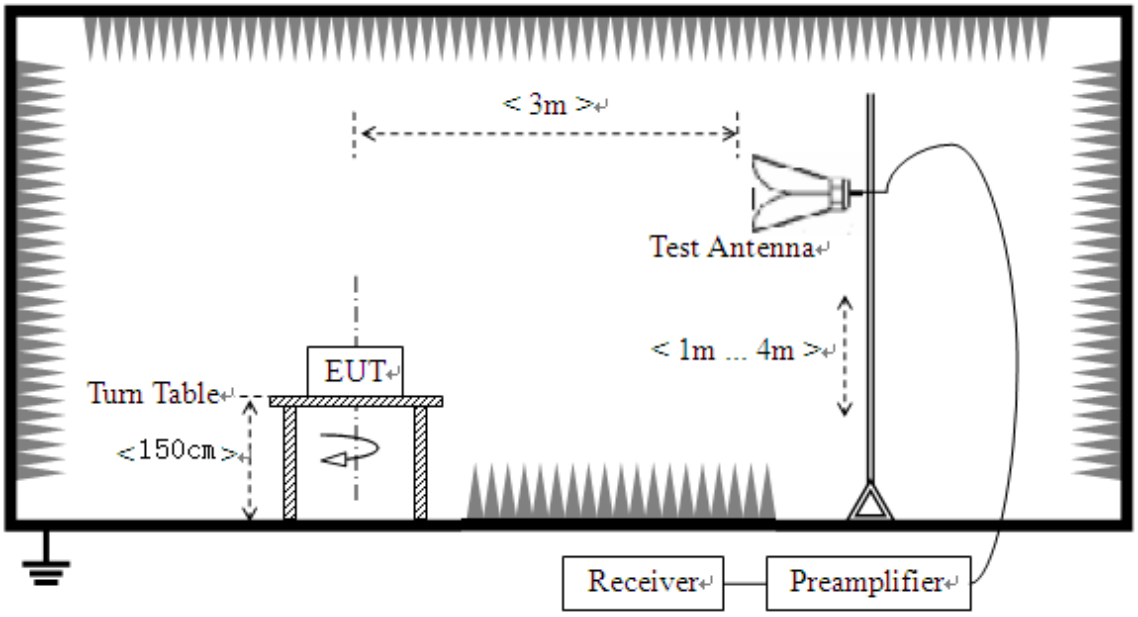
2.5 Restricted Frequency Bands

2.5.1 Requirement

According to FCC section 15.407(b)(7), 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).

2.5.2 Test Description

A. Test Setup



The Module 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.

KDB 789033 Section H) 3)5)6(d)) was used in order to prove compliance

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.

2.5.3 Test Result

This test case not applies this kind of EUT.

2.6 Frequency Stability

2.6.1 Requirement

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

2.6.2 Test Procedure

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10^{o} intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

2.6.3 Test Result

Frequency Stability Measurements for UNII Band 3 (Ch. 149)

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	14.52	+20(Ref)	5,745,000,044	44	0.0000008
100%		-30	5,744,999,977	23	0.0000004
100%		-20	5,745,000,015	15	0.0000003
100%		-10	5,744,999,985	15	0.0000003
100%		0	5,745,000,004	4	0.0000001
100%		+10	5,744,999,987	13	0.0000002
100%		+20	5,745,000,015	15	0.0000003
100%		+30	5,745,000,011	11	0.0000002
100%		+40	5,744,999,996	4	0.0000001
100%		+50	5,745,000,017	17	0.0000003
85%	12.00	+20	5,744,999,989	11	0.0000002
115%	16.80	+20	5,745,000,021	21	0.0000004

Note: Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

2.7 Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS)

2.7.1 Requirement

According to FCC section 15.407(h), (1) Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

(2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is −64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is −62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.1

Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.2

Tables 1 and 2 shown below summarize the information contained in sections 5.1.1 and 5.1.2.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

The operational behavior and individual DFS requirements that are associated with these modes are as follows:

2.7.1.1 Master Devices

a) The Master Device will use DFS in order to detect Radar Waveforms with received signal strength above the DFS Detection Threshold in the 5250 − 5350 MHz and 5470 − 5725 MHz bands. DFS is not required in the 5150 − 5250 MHz or 5725 − 5825 MHz bands.

b) Before initiating a network on a Channel, the Master Device will perform a Channel Availability Check for a specified time duration (Channel Availability Check Time) to ensure that there is no radar system operating on the Channel, using DFS described under subsection a) above.

c) The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.

d) During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).

e) If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited to

the Channel Closing Transmission Time.

f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period. 3

g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the combination will be tested to the requirements described under d) through f) above.

2.7.1.2 Client Devices

a) A Client Device will not transmit before having received appropriate control signals from a Master Device.

b) A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements. The Client Device will not resume any transmissions until it has again received control signals from a Master Device.

c) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section 5.1.1 apply.

d) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.

e) The client test frequency must be monitored to ensure no transmission of any type has occurred for 30 minutes. Note: If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear.

2.7.1.3 DFS Detection Thresholds

Table 3 below provides the DFS Detection Thresholds for Master Devices as well as Client Devices incorporating In-Service Monitoring.

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

2.7.1.4 Response Requirements

Table 4 provides the response requirements for Master and Client Devices incorporating DFS.

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

2.7.2 Test Description

Section 7.2 of KDB 905462 D02 V01R01

B. Test Setup:

B .1 Setup for Master with injection at the Master

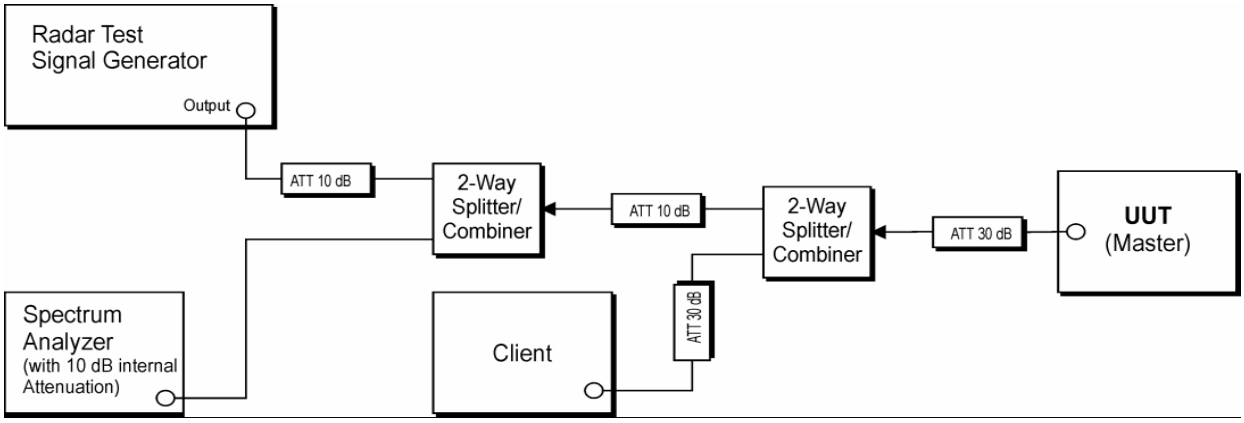


Figure 2: Example Conducted Setup where UUT is a Master and Radar Test Waveforms are injected into the Master

B.2 Setup for Client with injection at the Master

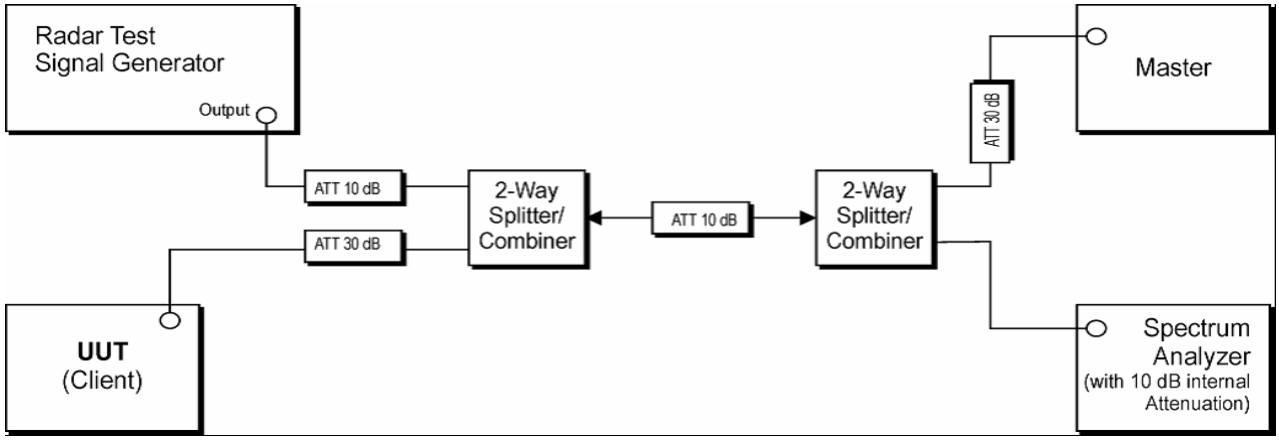


Figure 3: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Master

B.3 Setup for Client with injection at the Client

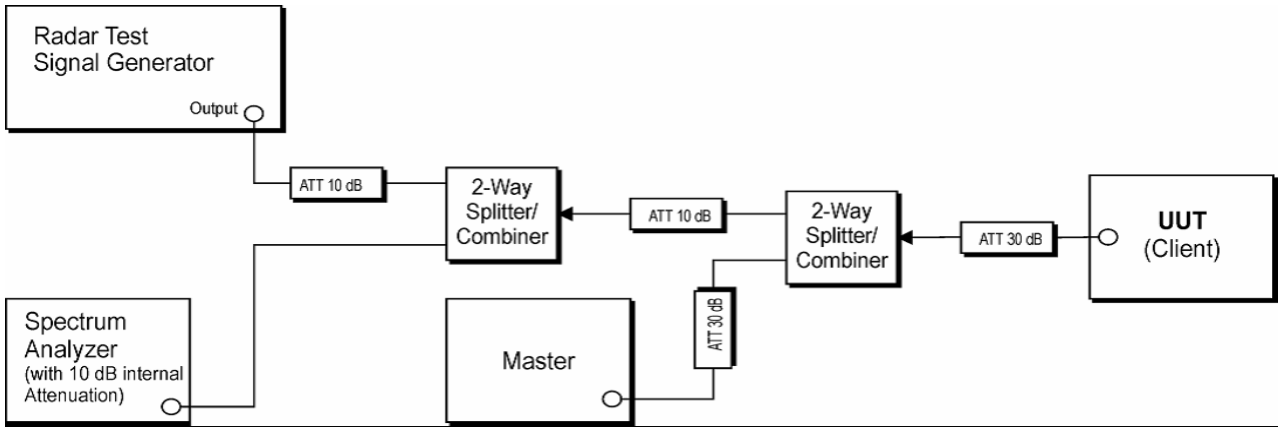


Figure 4: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Client

2.7.3 Test Result

This test case not applies this kind of EUT.

2.8 Conducted Emission

2.8.1 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 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

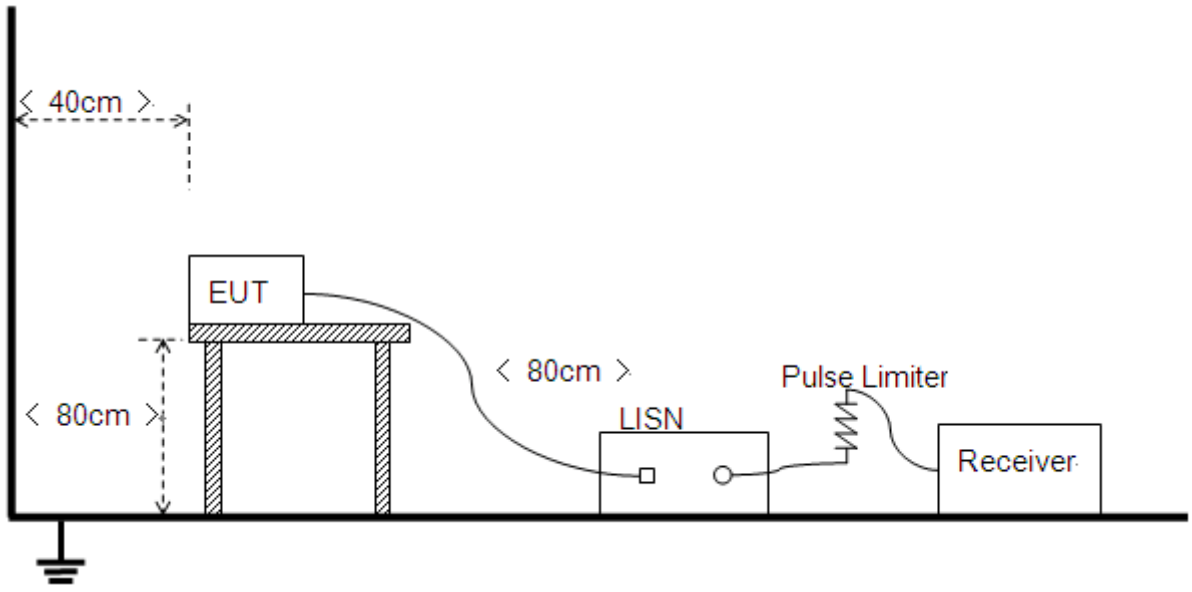
NOTE:

(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.

2.8.2 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.

The EUT is powered by the Battery charged with the AC Adapter which is powered by 120V, 60Hz AC mains supply. The factors of the site are calibrated to correct the reading. During the

measurement, the EUT is activated and controlled by the Wi-Fi Service Supplier (SS) via a Common Antenna.

2.8.3 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.

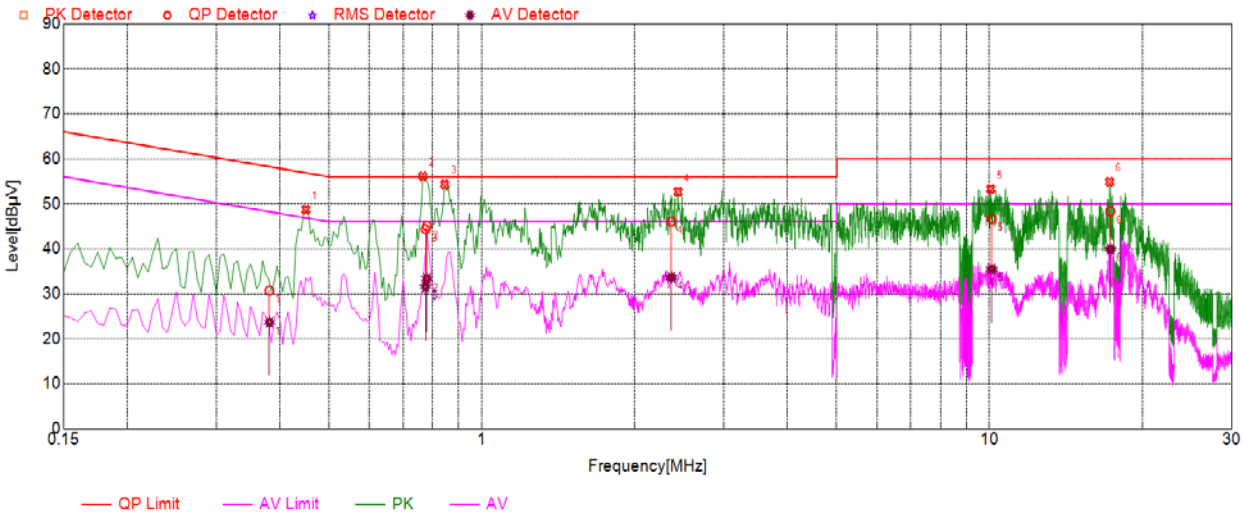
Note: All test modes are performed, only the worst case is recorded in this report.

A. Test setup:

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

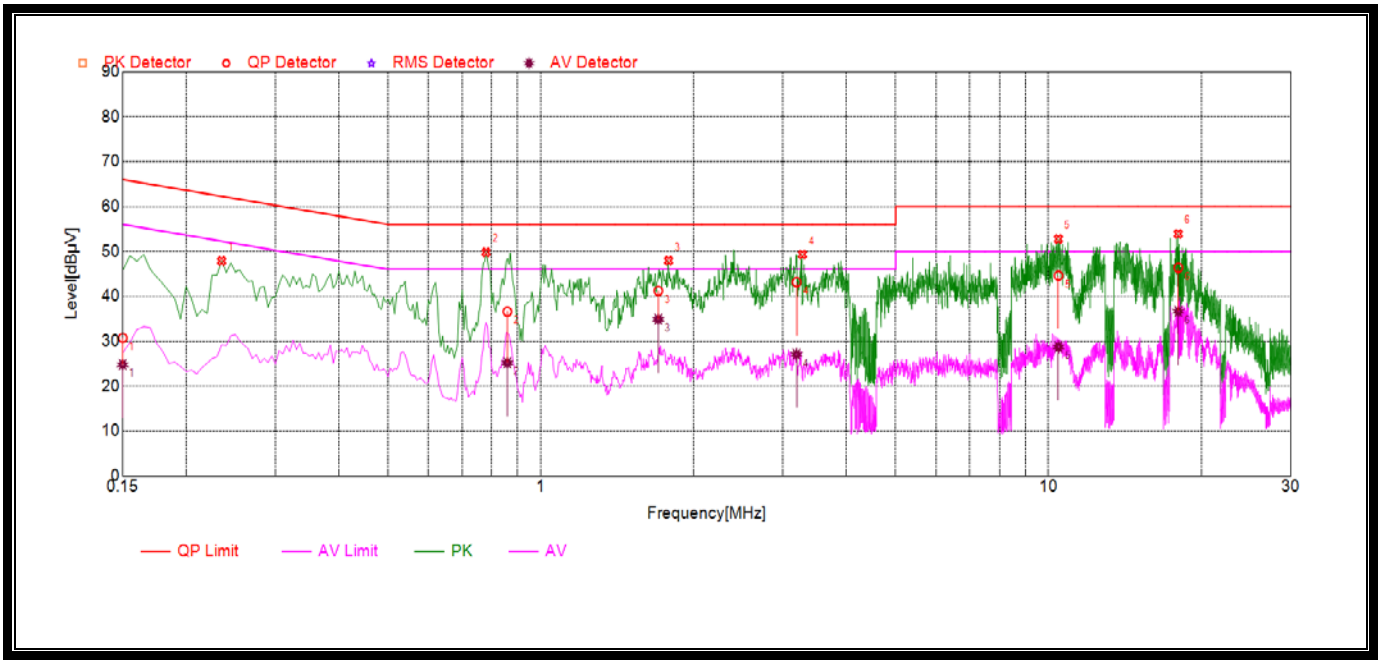
Note: The test voltage is AC 120V/60Hz.

A. Test Plots:



(Plot A: L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.3814	30.73	23.68	59.39	49.39	Line	PASS
2	0.7792	45.06	33.41	56	46		PASS
3	0.7744	44.32	31.56	56	46		PASS
4	2.3616	46.10	33.66	56	46		PASS
5	10.0934	46.67	35.51	60	50		PASS
6	17.303	48.35	39.95	60	50		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.15	30.75	24.80	66	56	Line	PASS
2	0.8588	36.62	25.19	56	46		PASS
3	1.7032	41.20	34.90	56	46		PASS
4	3.1888	43.15	27.09	56	46		PASS
5	10.4644	44.61	28.73	60	50		PASS
6	18.0222	46.39	36.66	60	50		PASS

2.9 Radiated Emission

2.9.1 Requirement

The peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.

(2) For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.

(3) For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of -27dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

The following formula is used to convert the equipment isotropic radiated power(eirp) to field strength (dBμV/m);

$$E = 1000000 \times \sqrt{30P} / 3 \ \mu V/m$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBuV/m

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. 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 (μV/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:

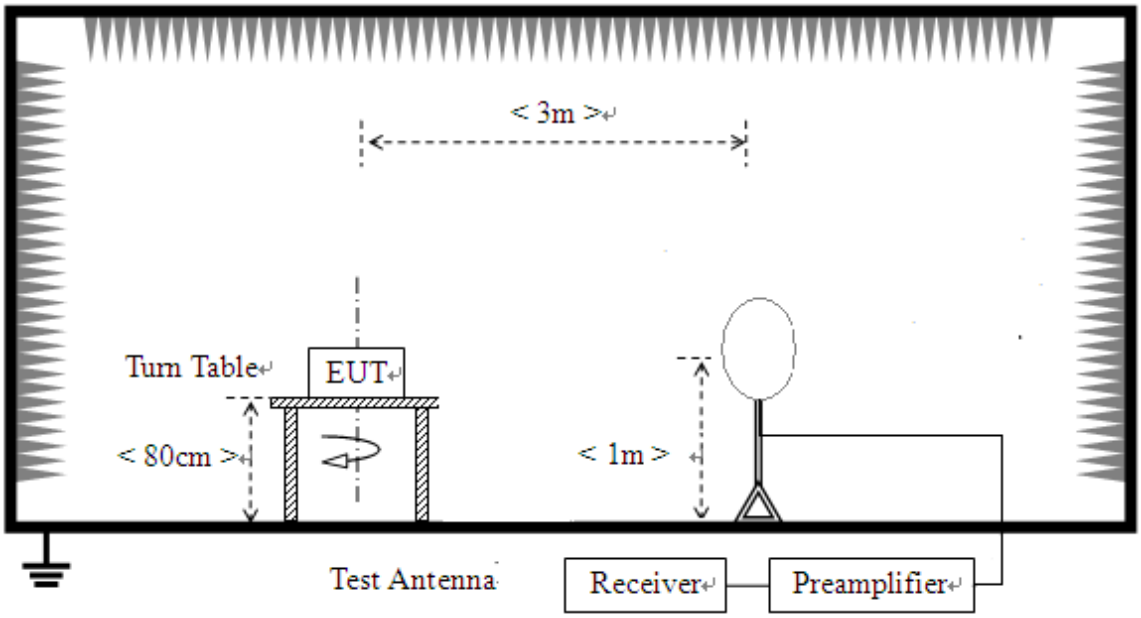
For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

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)

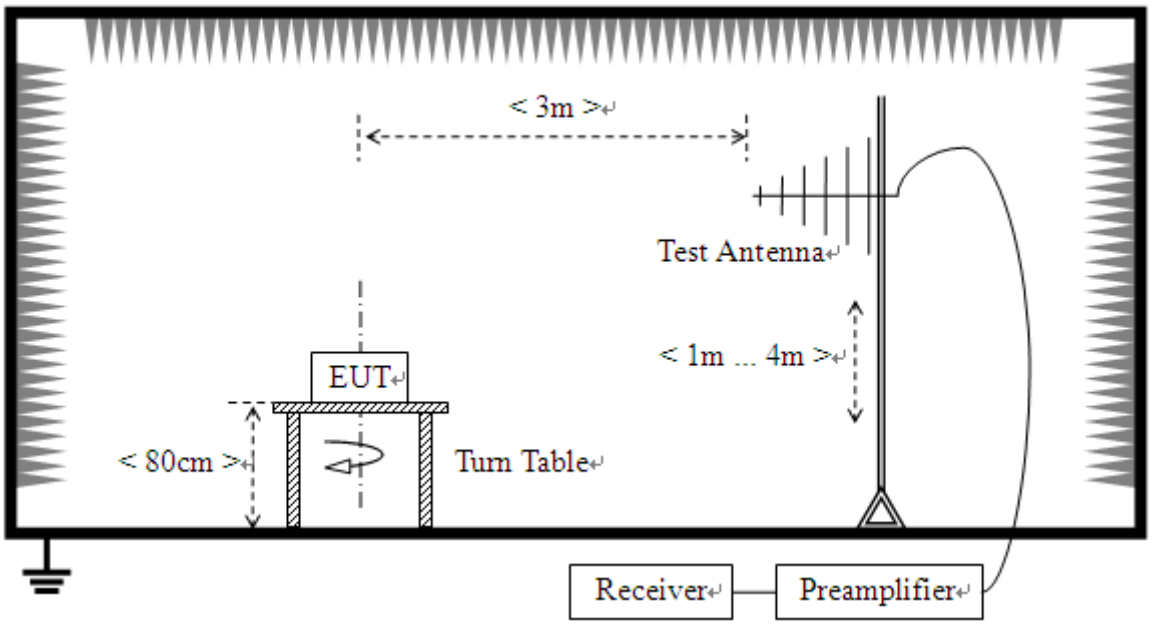
2.9.2 Test Description

A. Test Setup:

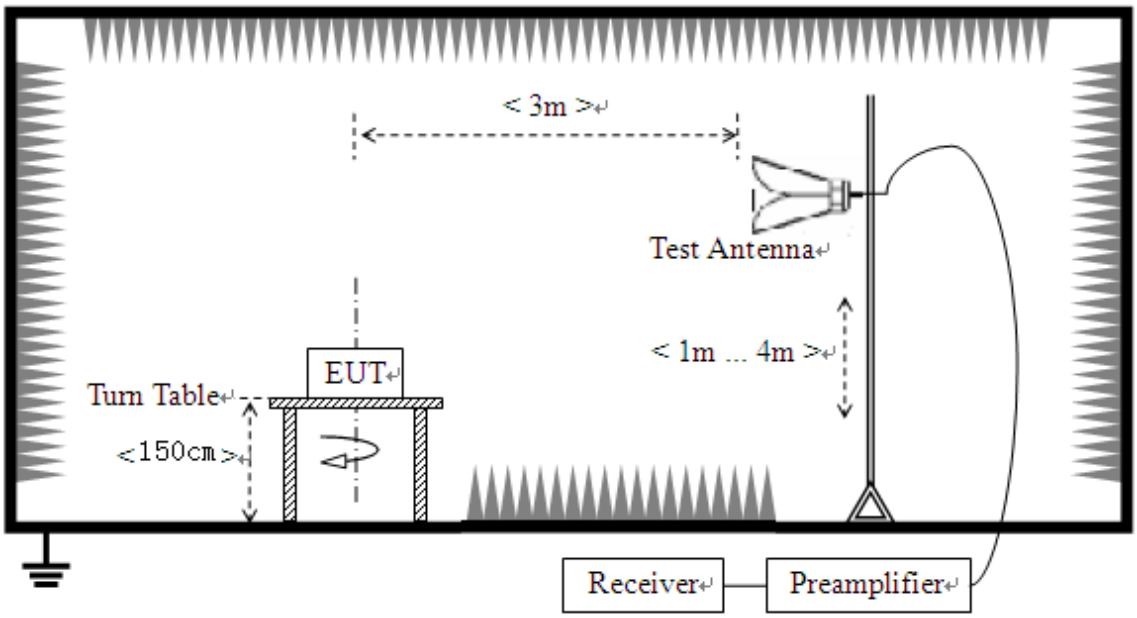
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



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.

2.9.3 Test Result

According to ANSI C63.4 selection 4.2.2, 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:

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

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

During the test, the total correction Factor A_T and A_{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.

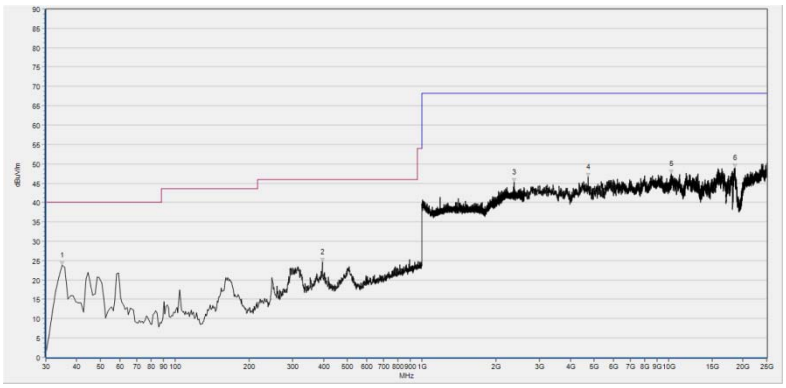
Note2: The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

For the frequency, which started from 25G to 40G, was pre-scanned and the result which was 10dB lower than the limit.

2.9.3.1 802.11a-20MHz Test mode

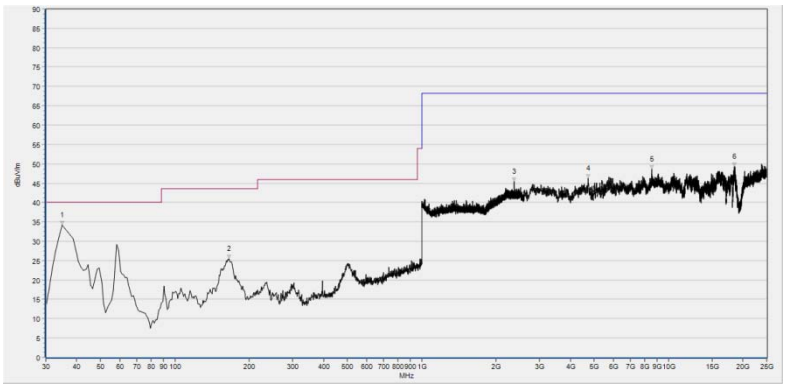
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 149



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.855	23.79	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
396.056	24.70	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2373.791	45.31	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
4728.426	46.55	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10280.256	47.43	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18525.105	48.97	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

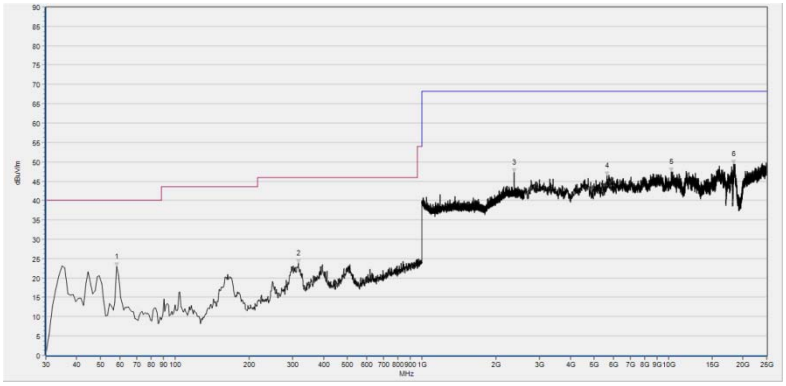
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.855	34.25	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
165.936	25.40	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2374.325	45.43	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
4728.426	46.31	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
8532.707	48.55	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18480.296	49.29	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

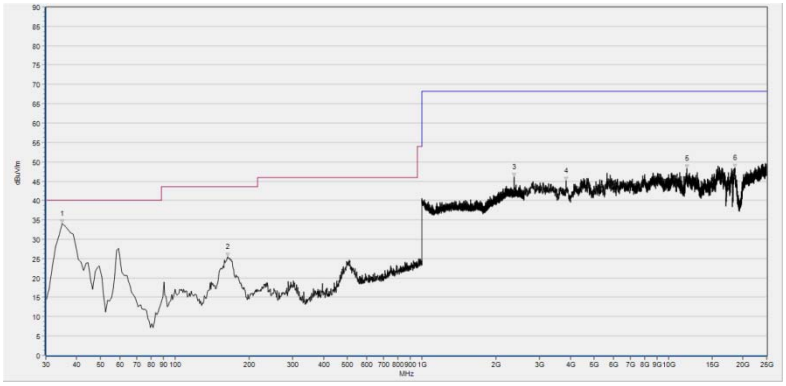
(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 157



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
58.158	22.94	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
316.436	23.73	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2373.791	47.27	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5638.048	46.43	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10280.256	47.36	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18386.197	49.48	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

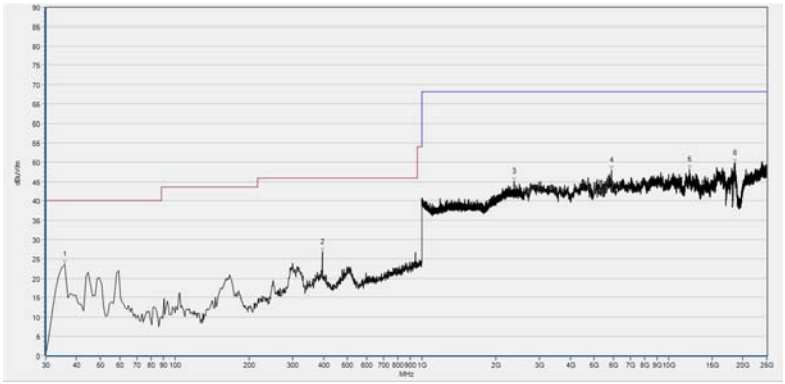
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.855	34.04	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
163.994	25.47	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2374.325	46.07	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
3845.689	45.03	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
11853.051	48.29	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18556.471	48.37	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

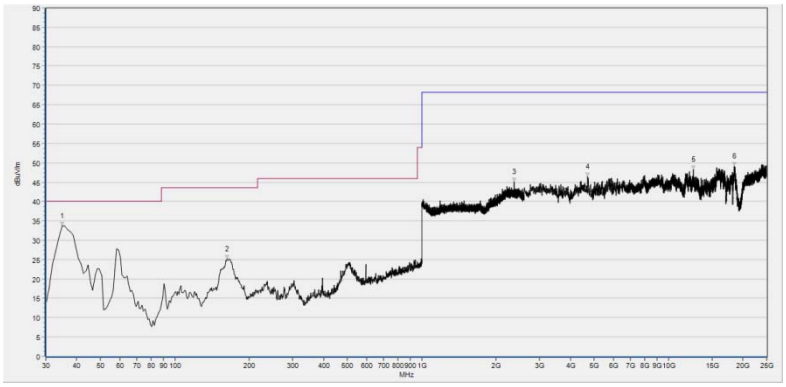
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 165



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
35.826	23.70	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
396.056	26.82	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2374.325	45.10	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5884.497	47.87	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
12139.828	48.07	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18556.471	49.79	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



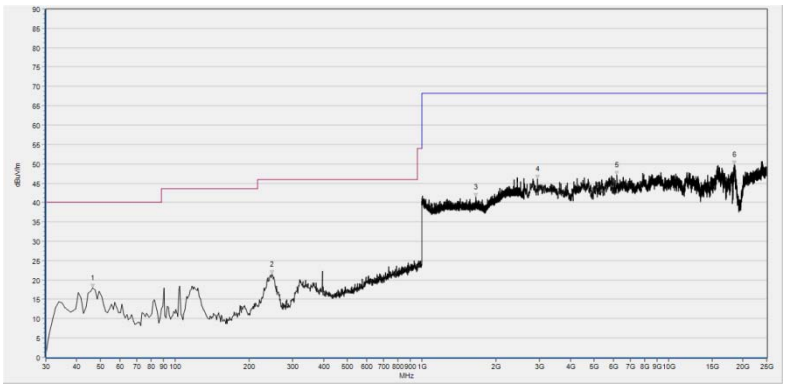
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.855	33.70	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
163.023	25.08	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2374.325	45.13	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
4706.021	46.46	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
12614.803	48.28	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18462.372	49.03	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

2.9.3.2 802.11n-20MHz Test mode

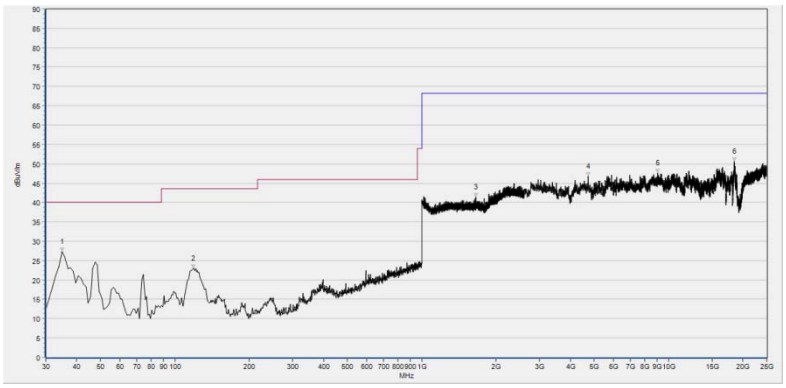
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 149



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
46.507	17.96	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
246.527	21.41	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1659.953	41.33	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
2945.029	46.05	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
6184.717	47.15	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18498.220	49.73	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

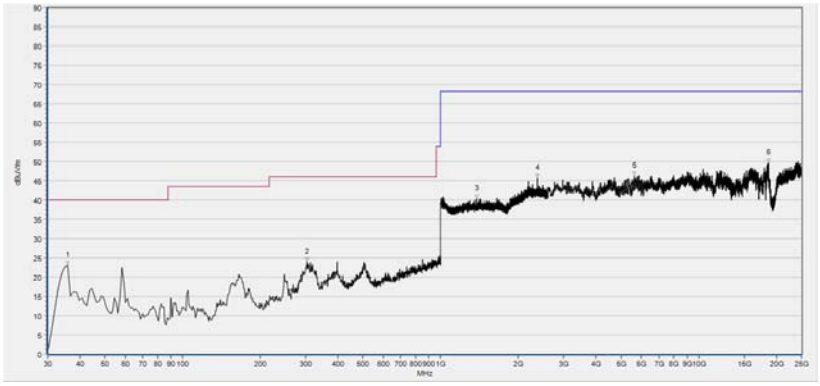
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.855	27.24	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
118.358	23.04	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1656.219	41.37	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
4728.426	46.82	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
9052.490	47.64	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18489.258	50.65	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

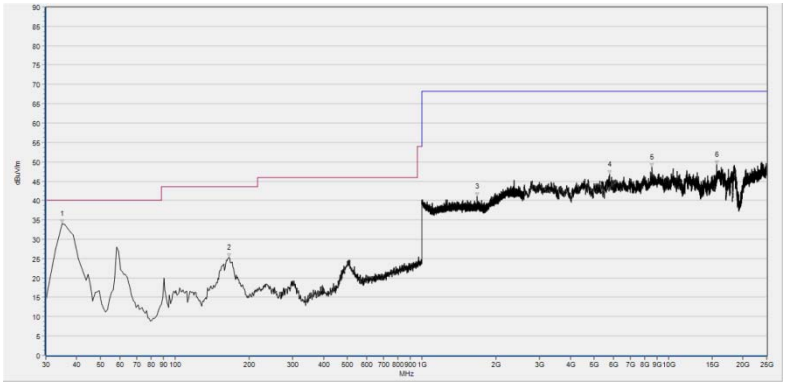
(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 157



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
35.826	23.04	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
303.814	23.99	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1377.726	40.28	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
2373.791	45.69	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5620.124	46.27	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18596.799	49.63	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

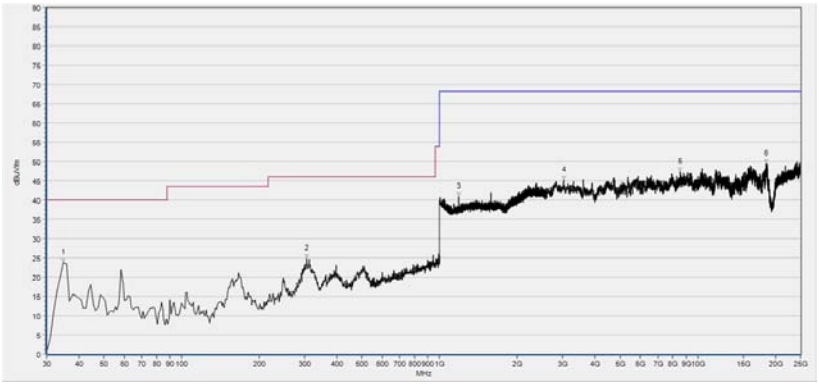
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.855	34.06	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
165.936	25.31	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1674.358	41.02	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5781.436	46.77	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
8577.516	48.57	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
15675.255	49.36	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

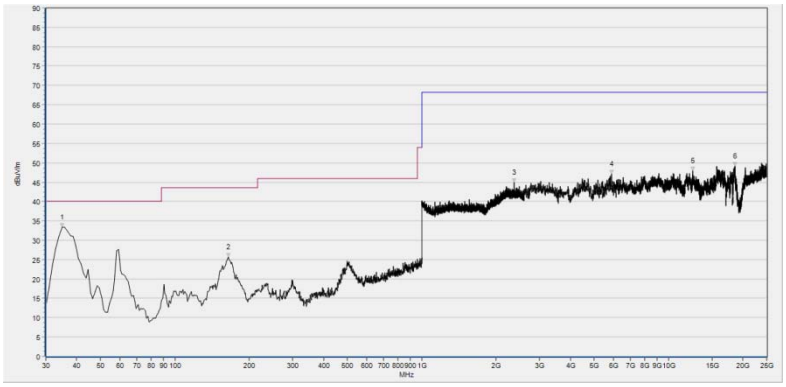
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 165



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.855	23.79	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
305.756	24.83	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1186.729	40.95	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
3021.204	45.15	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
8564.073	47.32	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18417.564	49.53	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



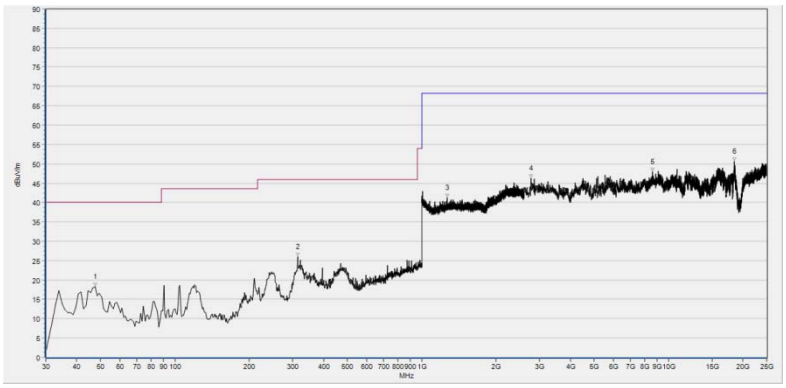
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.855	33.37	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
164.965	25.60	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2373.791	44.85	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5871.054	47.06	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
12525.185	47.96	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18543.029	49.10	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

2.9.3.3 802.11n-40MHz Test mode

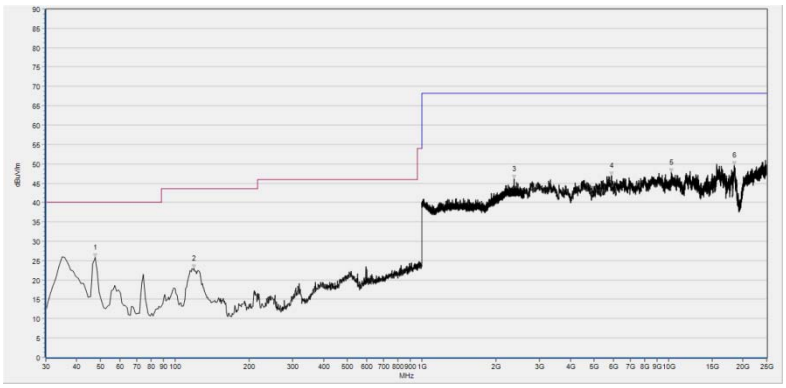
A. Test Plots for the Whole Measurement Frequency Range:

Plot for Channel = 151



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
47.477	18.19	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
314.494	25.98	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
1265.155	41.18	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
2770.274	46.27	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
8617.844	47.91	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18466.853	50.54	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

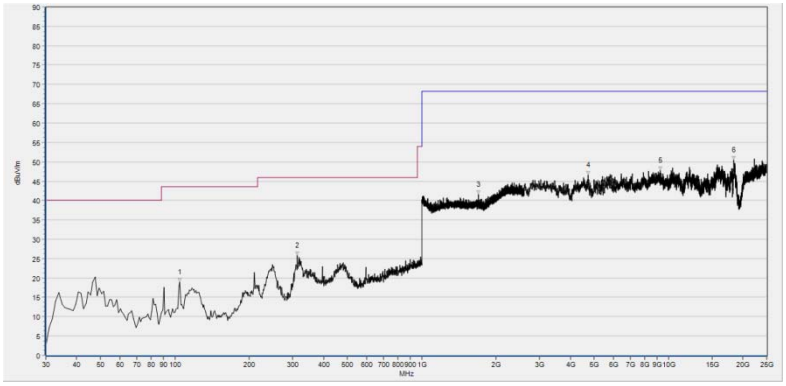
(Antenna Horizontal, 30MHz to 40GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
47.477	25.80	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
119.329	23.04	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2374.325	46.16	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5866.573	46.99	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
10289.218	47.75	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18453.411	49.56	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

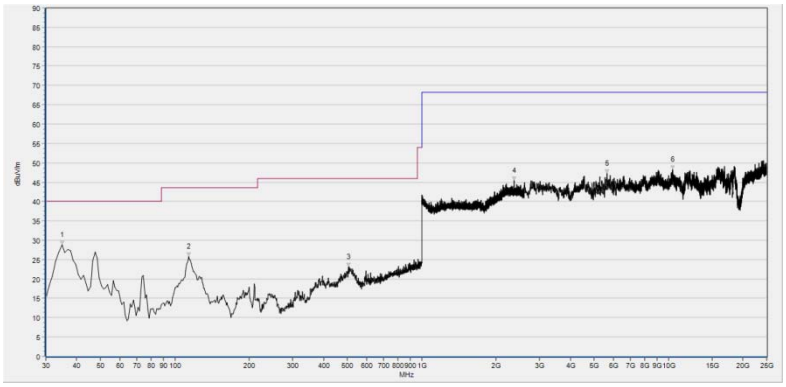
(Antenna Vertical, 30MHz to 40GHz)

Plots for Channel = 159



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
104.765	18.87	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
313.524	25.82	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1699.967	41.56	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
4723.945	46.58	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
9272.054	47.71	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18408.602	50.46	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 40GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.855	28.90	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
113.504	25.73	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
503.834	23.05	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2373.791	45.34	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5629.086	47.22	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
10414.683	48.24	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

(Antenna Vertical, 30MHz to 40GHz)

2.10 RF exposure evaluation

2.10.1 Requirement

According to § 1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy lever in excess of Commission's guideline.

2.10.2 Result

Please refer to SAR report.

ANNEX A GENERAL INFORMATION

1.1 Identification of the Responsible Testing Laboratory

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

1.2 Identification of the Responsible Testing Location

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

1.3 Facilities and Accreditations

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

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.

1.4 Maximum measurement 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%
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

1.5 Test Equipments Utilized

1.5.1 Conducted Test Equipments

Conducted Test Equipment						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal. Due**
1	Spectrum Analyzer	MY45101810	E4407B	Agilent	2017.05.24	2018.05.23
2	Power Splitter	NW521	1506A	Weinschel	2017.05.24	2018.05.23
3	Attenuator 1	(N/A.)	10dB	Resnet	2017.05.24	2018.05.23
4	Attenuator 2	(N/A.)	3dB	Resnet	2017.05.24	2018.05.23
5	EXA Signal Analzyer	MY53470836	N9010A	Agilent	2016.12.07	2017.12.06
6	RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
7	Coaxial cable	CB02	RF02	Morlab	N/A	N/A
8	SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

1.5.2 Conducted Emission Test Equipments

Conducted Emission Test Equipments						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal. Due**
1	Receiver	US44210471	E7405A	Agilent	2017.05.24	2018.05.23
2	LISN	812744	NSLK 8127	Schwarzbeck	2017.05.24	2018.05.23
3	Service Supplier	100448	CMU200	R&S	2017.05.24	2018.05.23
4	Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2017.05.24	2018.05.23
5	Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

1.5.3 Auxiliary Test Equipment

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

1.5.4 Radiated Test Equipments

Radiated Test Equipments						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal.Due Date**
1	System Simulator	GB45360846	8960-E5515C	Agilent	2017.05.17	2018.05.16
2	Receiver	MY54130016	N9038A	Agilent	2017.05.17	2018.05.16
3	Test Antenna - Bi-Log	N/A	VULB9163	Schwarzbeck	2016.12.09	2017.12.08
4	Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2017.03.30	2018.03.29
5	Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2017.03.30	2018.03.29
6	Test Antenna - Horn	71688	BBHA 9120D	Schwarzbeck	2017.03.30	2018.03.29
7	Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
8	Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
9	Coaxial cable(N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
10	1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2017.05.17	2018.05.16
11	18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2017.05.17	2018.05.16

1.5.5 Climate Chamber

Climate Chamber						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Climate Chamber	2004012	HL4003T	Yinhe	2017.01.11	2018.01.10

1.5.6 Vibration Table

Vibration Table						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Vibration Table	N/A	ACT2000-S015L	CMI-COM	2017.01.11	2018.01.10

1.5.7 Anechoic Chamber

Anechoic Chamber						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Anechoic Chamber	N/A	9m*6m*6m	Changning	2017.01.11	2018.01.10

***** END OF REPORT *****