APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Hunan GM Innovation Technology Co., Ltd.

Vaxis wireless video system

Model No.: Vaxis Atom 500, Vaxis Atom500 pro, Vaxis Atom 500 DS, Vaxis Atom 600, Vaxis Atom 600 pro, Vaxis Atom 600 DS

FCC ID: 2AJOF-ATOM500-RX

Prepared for	:	Hunan GM Innovation Technology Co., Ltd.
Address	:	No.46, Jiefang East Road, Furong District, Changsha City, Hunan Province, China
Prepared by	:	Shenzhen Accurate Technology Co., Ltd.
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Report No.	:	ATE20191740
Date of Test	:	Dec. 06, 2019-Dec. 23, 2019
Date of Report	:	Dec. 24, 2019

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Description Page

Test Report Certification

Applicant	:	Hunan GM Innovation Technology Co., Ltd.
Address	:	No.46, Jiefang East Road, Furong District, Changsha City, Hunan Province, China
Manufacturer	:	Hunan GM Innovation Technology Co., Ltd.
Address	:	No.46, Jiefang East Road, Furong District, Changsha City, Hunan Province, China
Product	:	Vaxis wireless video system
Model No.	:	Vaxis Atom 500, Vaxis Atom500 pro, Vaxis Atom 500 DS, Vaxis Atom 600, Vaxis Atom 600 pro, Vaxis Atom 600 DS
Trade name	:	N/A

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart E Section 15.407
ANSI C63.10: 2013
KDB 789033 D02 General UNII Test Procedures New Rules v02r01
KDB 558074 D01 DTS Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01

The device described above is tested by SHENZHEN ACCURATE TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart E Section 15.407 limits. The measurement results are contained in this test report and SHENZHEN ACCURATE TECHNOLOGY CO., LTD. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of SHENZHEN ACCURATE TECHNOLOGY CO., LTD.

Date of Test : Dec. 06, 2019-Dec. 23, 2019
Date of Report : Dec. 24, 2019

Prepared by : (Tim Zhang, Engineer)

Approved & Authorized Signer : (Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Vaxis wireless video system
Model Number	:	Vaxis Atom 500, Vaxis Atom500 pro, Vaxis Atom 500 DS, Vaxis Atom 600, Vaxis Atom 600 pro, Vaxis Atom 600 DS
IEEE 802.11 WLAN	:	802.11a (20 MHz channel bandwidth) , 802.11n (20 MHz channel bandwidth)
Frequency Range	:	U-NII(5150-5250, 5725-5850MHz)
Number of Channels	:	fc = 5000 MHz + N * 5 MHz, where: - fc = "Operating Frequency" in MHz, - N = "Channel Number". 5150-5250 MHz: N = 36 to 48 with step of 4 for the 20 MHz channel bandwidth. 5725-5850 MHz: N = 149 to 165 with step of 4 for the 20 MHz channel bandwidth.
$G_{ANT\ MAX}$	:	ANT1:2.5 dBi (per antenna port, max.) ANT2:2.5 dBi(per antenna port, max.)
Directional gain	:	5.51 Note: If any transmit signals are correlated with each other, Directional gain=G_{ANT}+lolog(N_{ANT}) dBi
Type of Antenna	:	SISO (for 802.11a/n) MIMO Antenna(for 802.11n)
Power Supply	:	DC 7.4V via battery or DC 5V via adapter
Modulation Type	:	BPSK/QPSK/16QAM/64QAM (OFDM)
TPC	:	Not Supported
Applicant	:	Hunan GM Innovation Technology Co., Ltd.
Address	:	No.46, Jiefang East Road, Furong District, Changsha City, Hunan Province, China

Manufacturer	:	Hunan GM Innovation Technology Co., Ltd.
Address	:	No.46, Jiefang East Road, Furong District, Changsha City, Hunan Province, China
Date of sample received	:	Dec. 06, 2019
Date of Test	:	Dec. 06, 2019-Dec. 23, 2019

1.2.Special Accessory and Auxiliary Equipment

PC	Manufacturer: LENOVO M/N: 4290-RT8 S/N: R9-FW93G 11/08
AC/DC Power Adapter: (provided by laboratory)	Model: MX12X6-0502000VU INPUT: 100-240V~50/60Hz 0.35A OUTPUT: 5V/1A

1.3.Model difference declaration

Vaxis Atom 500, Vaxis Atom500 pro, Vaxis Atom 500 DS, Vaxis Atom 600, Vaxis Atom 600 pro, Vaxis Atom 600 DS are identical in interior structure, electrical circuits and components, and just model number is different for the marketing requirement.

1.4.Laboratory Accreditation and Relationship to Customer

EMC Lab : Recognition of accreditation by Federal Communications Commission (FCC)
The Designation Number is CN1189
The Registration Number is 708358

Listed by Innovation, Science and Economic Development Canada (ISEDC)
The Registration Number is 5077A-2

Accredited by China National Accreditation Service for Conformity Assessment (CNAS)
The Registration Number is CNAS L3193

Accredited by American Association for Laboratory Accreditation (A2LA)
The Certificate Number is 4297.01

Name of Firm : Shenzhen Accurate Technology Co., Ltd.
Site Location : 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.5.Measurement Uncertainty

Conducted Emission Expanded Uncertainty (Mains ports, 9kHz-30MHz)	=	2.72dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	2.66dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.28dB, k=2
Radiated emission expanded uncertainty (1G-18GHz)	=	4.98dB, k=2
Radiated emission expanded uncertainty (18G-26.5GHz)	=	5.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

2.1.For Radiated Emission Measurement

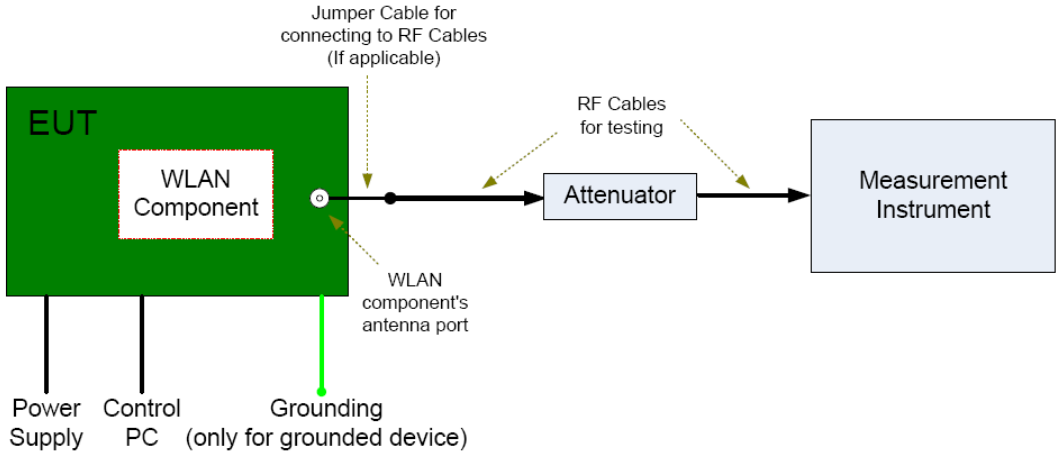
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan.05, 2019	1 Year
2.	Spectrum Analyzer	Rohde&Schwarz	FSV40	101495	Jan.05, 2019	1 Year
3.	Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan.05, 2019	1 Year
4.	Test Receiver	Rohde& Schwarz	ESPI	100396/003	Jan.05, 2019	1 Year
5.	Test Receiver	Rohde& Schwarz	ESPI	101526/003	Jan.05, 2019	1 Year
6.	Test Receiver	Rohde& Schwarz	ESR	101817	Jan.05, 2019	1 Year
7.	Bilog Antenna	Schwarzbeck	VULB9163	9163-194	Jan.05, 2019	1 Year
8.	Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan.05, 2019	1 Year
9.	Log.-Per.Antenna	Schwarzbeck	VUSLP 9111B	9111B-074	Jan.05, 2019	1 Year
10.	Biconical Broad Band Antenna	Schwarzbeck	VHBB 9124+BBA 9106	9124-617	Jan.05, 2019	1 Year
11.	Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan.05, 2019	1 Year
12.	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan.05, 2019	1 Year
13.	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Jan.05, 2019	1 Year
14.	Vertical Active Monopole Antenna	Schwarzbeck	VAMP 9243	9243-370	Jan.05, 2019	1 Year
15.	RF Switching Unit+PreAMP	Compliance Direction	RSU-M2	38322	Jan.05, 2019	1 Year
16.	Pre-Amplifier	Agilent	8447D	294A10619	Jan.05, 2019	1 Year
17.	Pre-Amplifier	Rohde&Schwarz	CBLU11835 40-01	3791	Jan.05, 2019	1 Year
18.	50 Coaxial Switch	Anritsu Corp	MP59B	6200237248	Jan.05, 2019	1 Year
19.	50 Coaxial Switch	Anritsu Corp	MP59B	6200506474	Jan.05, 2019	1 Year
20.	RF Coaxial Cable	Schwarzbeck	N-5m	No.1	Jan.05, 2019	1 Year
21.	RF Coaxial Cable	Schwarzbeck	N-1m	No.6	Jan.05, 2019	1 Year
22.	RF Coaxial Cable	Schwarzbeck	N-1m	No.7	Jan.05, 2019	1 Year
23.	RF Coaxial Cable	SUHNER	N-3m	No.8	Jan.05, 2019	1 Year
24.	RF Coaxial Cable	RESENBERGER	N-3.5m	No.9	Jan.05, 2019	1 Year
25.	RF Coaxial Cable	SUHNER	N-6m	No.10	Jan.05, 2019	1 Year
26.	RF Coaxial Cable	RESENBERGER	N-12m	No.11	Jan.05, 2019	1 Year
27.	RF Coaxial Cable	RESENBERGER	N-0.5m	No.12	Jan.05, 2019	1 Year
28.	RF Coaxial Cable	SUHNER	N-2m	No.13	Jan.05, 2019	1 Year
29.	RF Coaxial Cable	SUHNER	N-0.5m	No.15	Jan.05, 2019	1 Year
30.	RF Coaxial Cable	SUHNER	N-2m	No.16	Jan.05, 2019	1 Year
31.	RF Coaxial Cable	RESENBERGER	N-6m	No.17	Jan.05, 2019	1 Year
Radiated Emission Measurement Software: EZ_EMC V1.1.4.2						

2.2.The Equipment Used to Measure Conducted Disturbance (L.I.S.N)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	100307	Jan.05, 2019	1 Year
2.	Test Receiver	Rohde & Schwarz	ESPI3	100396/003	Jan.05, 2019	1 Year
3.	Test Receiver	Rohde & Schwarz	ESPI3	101526/003	Jan.05, 2019	1 Year
4.	L.I.S.N.	Schwarzbeck	NLSK8126	8126431	Jan.05, 2019	1 Year
5.	L.I.S.N.	Rohde & Schwarz	ESH3-Z5	100305	Jan.05, 2019	1 Year
6.	L.I.S.N.	Rohde & Schwarz	ESH3-Z5	100310	Jan.05, 2019	1 Year
7.	L.I.S.N.	Rohde & Schwarz	ESH3-Z6	100132	Jan.05, 2019	1 Year
8.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100305	Jan.05, 2019	1 Year
9.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100312	Jan.05, 2019	1 Year
10.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100815	Jan.05, 2019	1 Year
11.	50Ω Coaxial Switch	Anritsu Corp	MP59B	6200283936	Jan.05, 2019	1 Year
12.	50Ω Coaxial Switch	Anritsu Corp	MP59B	6200283933	Jan.05, 2019	1 Year
13.	50Ω Coaxial Switch	Anritsu Corp	MP59B	6200506474	Jan.05, 2019	1 Year
14.	VOLTAGE PROBE	Schwarzbeck	TK9416	N/A	Jan.05, 2019	1 Year
15.	RF CURRENT PROBE	Rohde & Schwarz	EZ-17	100048	Jan.05, 2019	1 Year
16.	8-Wire Impedance Stabilisation Network	Schwarzbeck	CAT5 8158	8158-0035	Jan.05, 2019	1 Year
17.	RF Coaxial Cable	SUHNER	N-2m	No.2	Jan.05, 2019	1 Year
18.	RF Coaxial Cable	SUHNER	N-2m	No.3	Jan.05, 2019	1 Year
19.	RF Coaxial Cable	SUHNER	N-2m	No.14	Jan.05, 2019	1 Year
Conducted Emission Measurement Software: ES-K1 V1.71						

3. OPERATION OF EUT DURING TESTING

3.1.Test setups



3.2.Configuration and peripherals

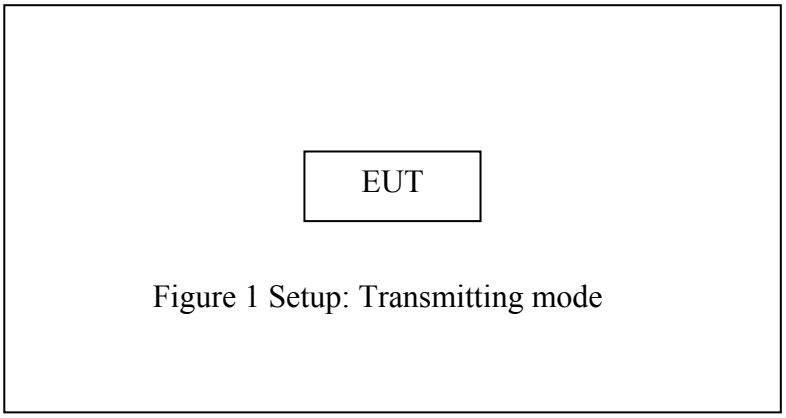


Figure 1 Setup: Transmitting mode

Note: The EUT have two antenna(1 and 2), They can transmit simultaneously

3.3.Test mode

Test Mode	Test Modes Description
11A	IEEE 802.11a with data rate of 6 Mbps using SISO mode.
11N20	IEEE 802.11n with data date of MCS0 and bandwidth of 20 MHz using SISO mode.
11N20m	IEEE 802.11n with data date of MCS8 and bandwidth of 20 MHz using MIMO mode.

NOTE: Worst cases for each IEEE 802.11 mode are selected to perform tests.

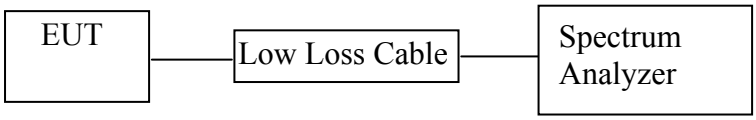
4. TEST PROCEDURES AND RESULTS

Description of Test	Band	FCC Rules	Requirements	Result
AC power Line Conducted Emission Test	5150-5250 5725-5850	15.207	N/A	Compliant
Emission Bandwidth	5150-5250	15.403(i), 15.407(a)(1)	No limit.	Compliant
	5725-5850	15.403(i), 15.407(e)	≥ 500 kHz.	
Occupied Bandwidth	5150-5250 5725-5850	KDB 789033 §D	No limit	Compliant
Duty Cycle	5150-5250 5725-5850	--	No limit	Compliant
Maximum Conducted Output Power	5150-5250	15.407(a)(1) 15.407(a)(4)	< 250mW (avg during transmission)	Compliant
	5725-5850	15.407(a)(3)	< 1W (avg during transmission)	
Peak Power Spectral Density	5150-5250	15.407(a)(1) 15.407(a)(4)	FCC: For client devices in the 5.15-5.25 GHz band <11dBm/MHz (avg during transmission)	Compliant
	5725-5850	15.407(a)(3) 15.407(a)(4)	<30dBm/500KHz (avg during transmission)	
Unwanted Emissions	5150-5250	15.407(b)(1) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: § 15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.15-5.35 GHz). F≥1GHz & in-restricted: § 15.209/§7.2.5 limit (AV&PK).	
	5725-5850	15.407(b)(4) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: § 15.209/§7.2.5 limit (QP). All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or	

			below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge F≥1GHz & in-restricted: § 15.209/§7.2.5 limit (AV&PK).	
Frequence Stability	5150-5250 5725-5850	15.407(g)	FCC Part 15.407(g)	Compliant
Antenna Requirement	N/A	15.203, 15.204(b), 15.204(c), 15.212(a), 2.929(b)	N/A	Compliant

5. 6DB OCCUPIED BANDWIDTH TEST

5.1.Block Diagram of Test Setup



(EUT: Vaxis wireless video system)

5.2.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725-5.85 GHz

5.3.Operating Condition of EUT

5.3.1.Setup the EUT and simulator as shown as Section 5.1.

5.3.2.Turn on the power of all equipment.

5.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 5725-5850MHz.

5.4.Test Procedure

5.4.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.4.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

5.4.3.The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

5.5.Test Result

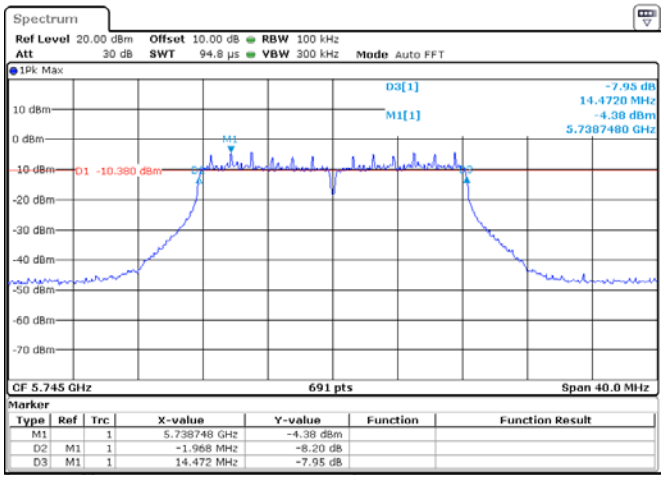
The test was performed with 802.11a				
Channel	Frequency (MHz)	6dB Bandwidth ANT 1 (MHz)	6dB Bandwidth ANT 2(MHz)	Limit (MHz)
149	5745	16.440	16.440	> 0.5MHz
165	5825	16.382	16.382	> 0.5MHz

The test was performed with 802.11n20				
Channel	Frequency (MHz)	6dB Bandwidth ANT 1 (MHz)	6dB Bandwidth ANT 2(MHz)	Limit (MHz)
149	5745	17.598	17.598	> 0.5MHz
165	5825	17.598	17.598	> 0.5MHz

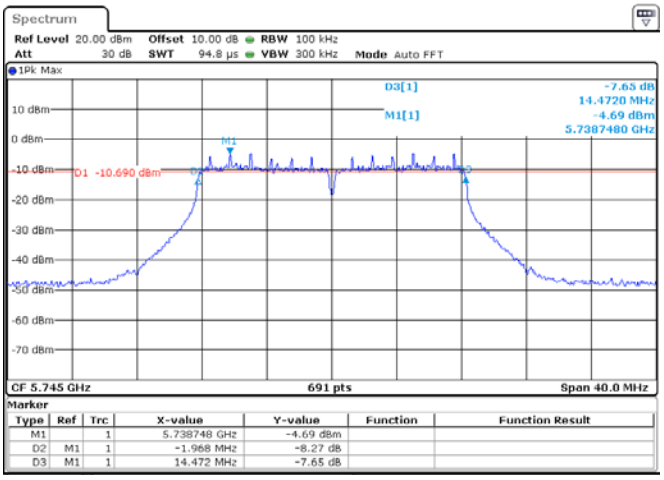
The spectrum analyzer plots are attached as below.

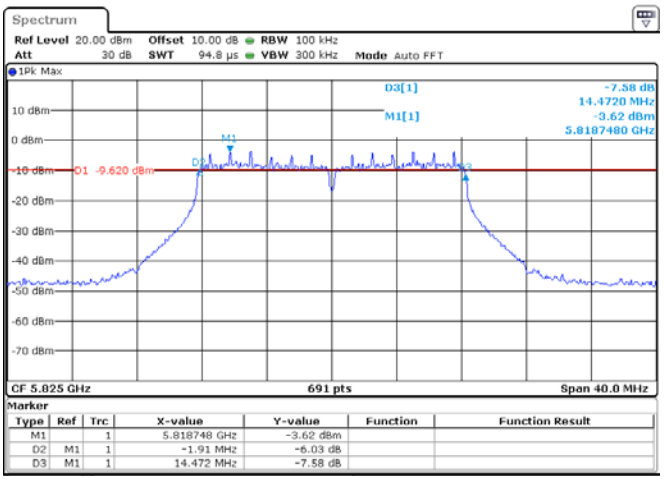
6dB Bandwidth

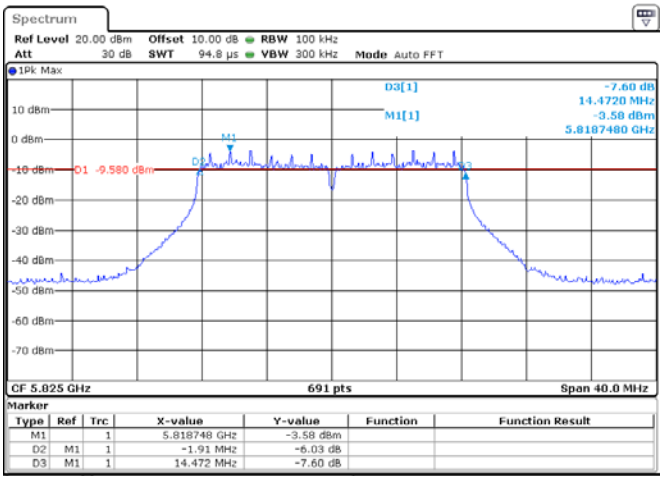
ANT 1(802.11A)



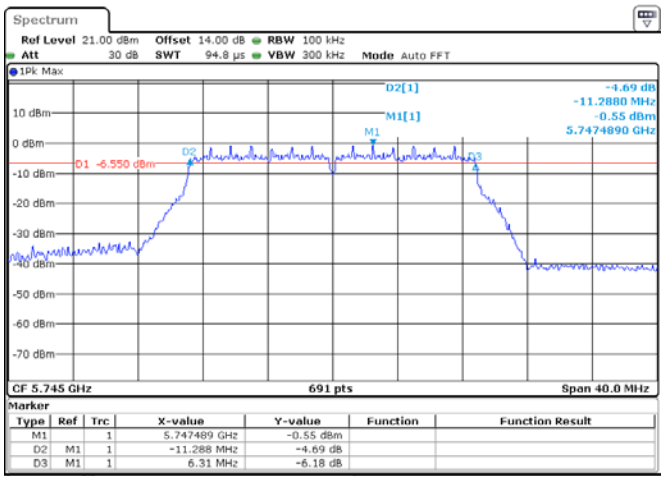
ANT 2(802.11A)



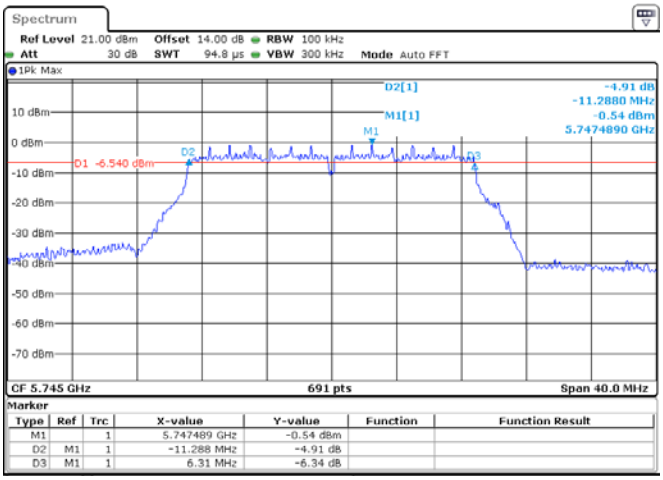


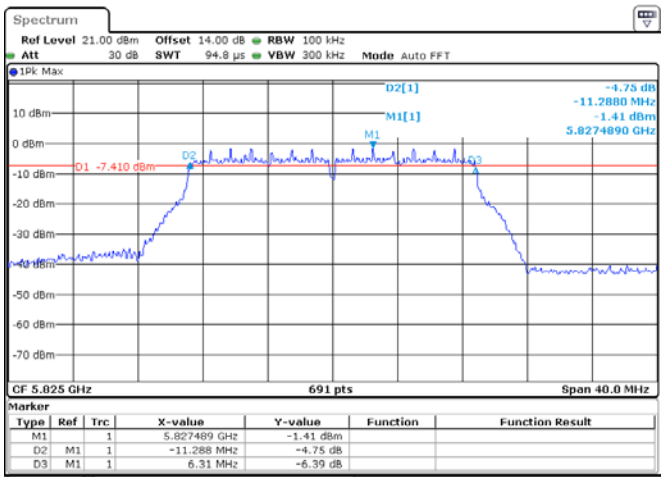


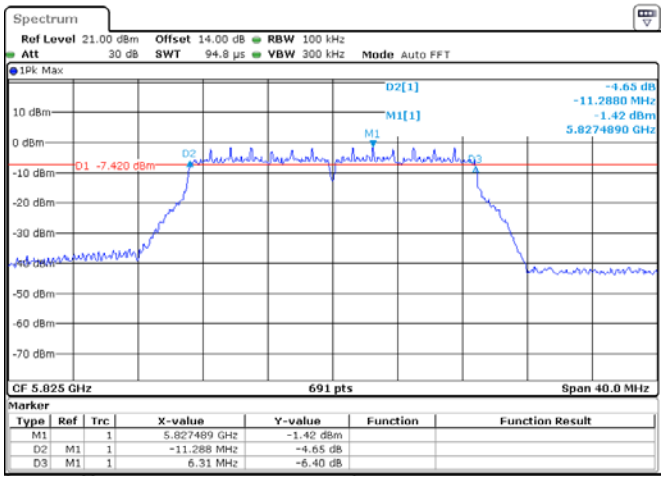
ANT 1(802.11n20)



ANT 2(802.11n20)

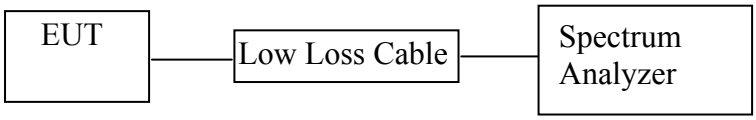






6. 26DB OCCUPIED BANDWIDTH TEST

6.1.Block Diagram of Test Setup



(EUT: Vaxis wireless video system)

6.2.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.3.Operating Condition of EUT

6.3.1.Setup the EUT and simulator as shown as Section 6.1.

6.3.2.Turn on the power of all equipment.

6.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 5150-5250MHz.

6.4.Test Procedure

6.4.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

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

6.4.3.Set the VBW > RBW.

6.4.4.Detector = Peak.

6.4.5.Trace mode = max hold.

6.4.6.Measure the maximum width of the emission that is 26 dB down from the maximum 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%.

6.5.Test Result

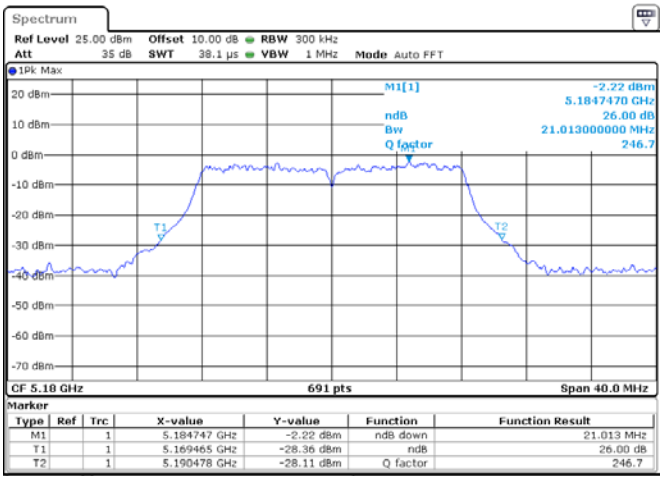
The test was performed with 802.11a			
Channel	Frequency (MHz)	26dB Bandwidth ANT 1 (MHz)	26dB Bandwidth ANT 2(MHz)
36	5180	21.013	21.360
48	5240	21.418	21.302

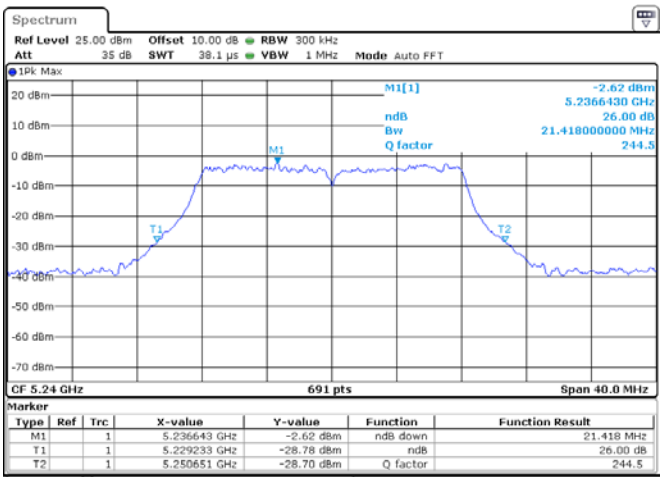
The test was performed with 802.11n20			
Channel	Frequency (MHz)	26dB Bandwidth ANT 1 (MHz)	26dB Bandwidth ANT 2(MHz)
36	5180	21.997	22.287
48	5240	22.055	21.997

The spectrum analyzer plots are attached as below.

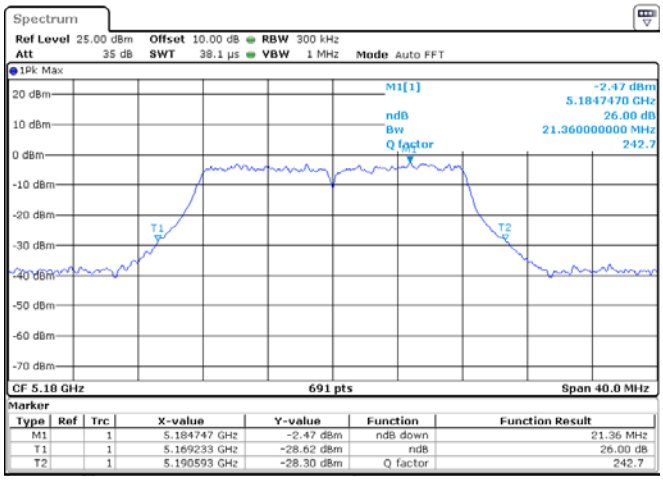
26dB Bandwidth

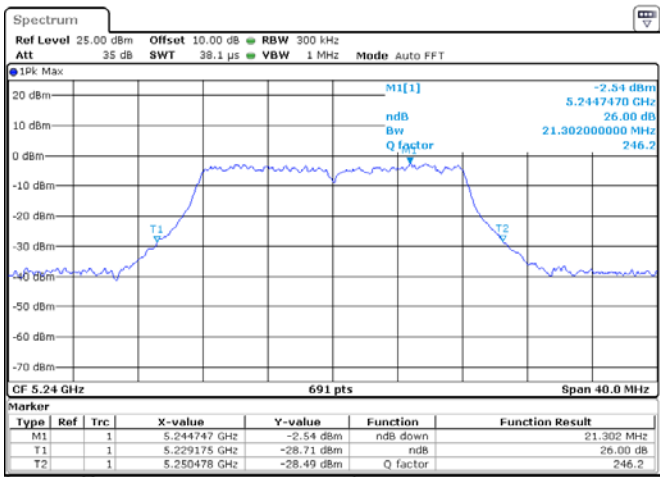
ANT 1(11A)



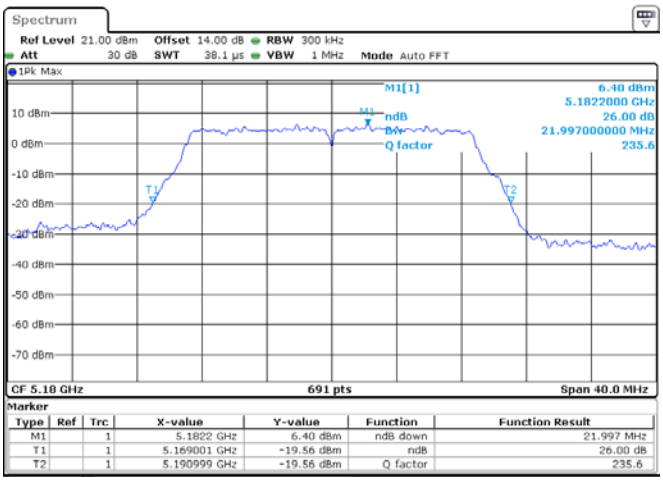


ANT 2(11A)

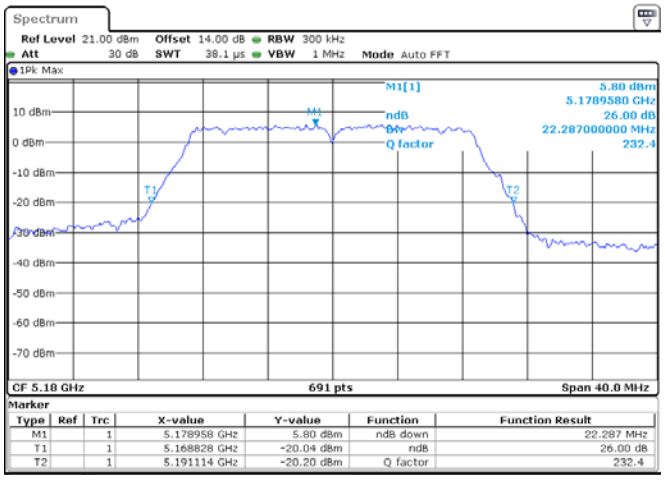


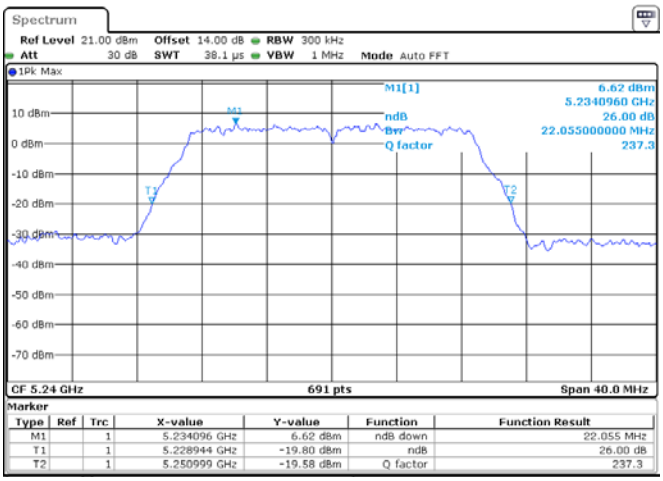


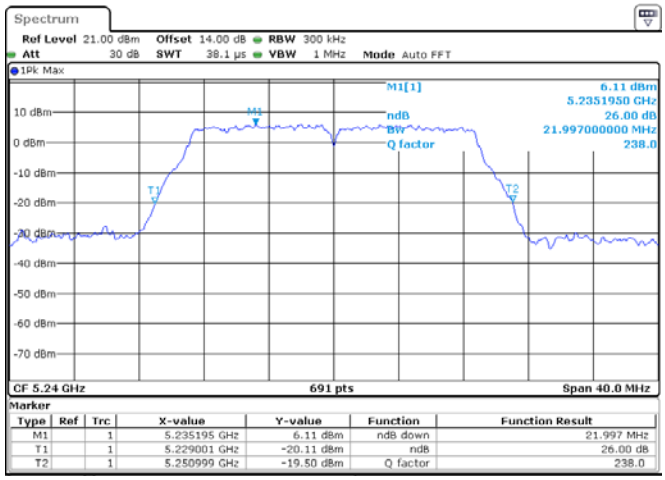
ANT 1(802.11n20)



ANT 2(802.11n20)

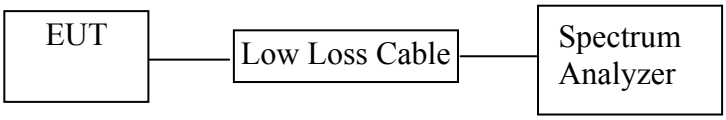






7. 99% BANDWIDTH MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. The Requirement For Section 15.407

The 99% occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99% occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99% occupied bandwidth may also optionally be used in lieu of the EBW to define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

7.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 5150-5250 and 5725-5850MHz.

7.5. Test Procedure

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW. Set VBW $\geqslant$ 3 * RBW
4. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
5. Use the 99 % power bandwidth function of the instrument.

6. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

7.6. Test Result

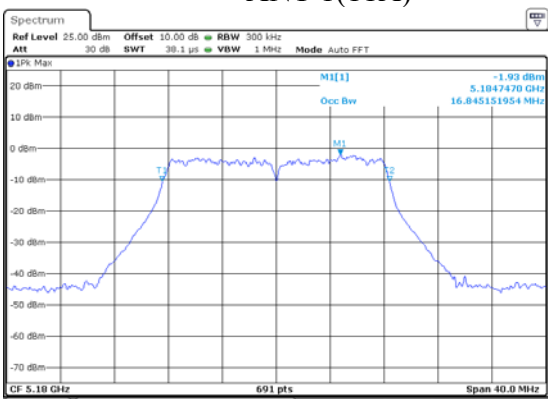
The test was performed with 802.11a				
Channel	Frequency (MHz)	99% Bandwidth ANT 1 (MHz)	99% Bandwidth ANT 2(MHz)	Verdict
36	5180	16.845	16.787	PASS
48	5240	16.787	16.729	PASS
149	5745	16.787	16.787	PASS
165	5825	16.845	16.787	PASS

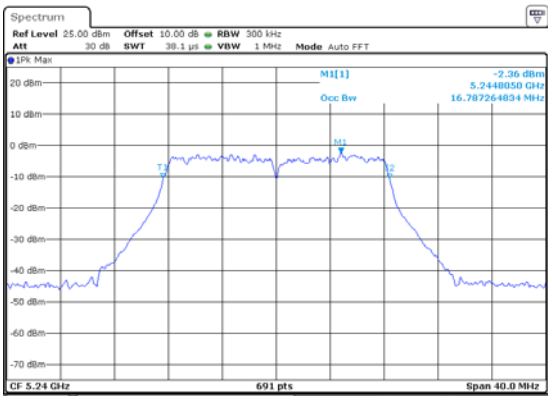
The test was performed with 802.11n20				
Channel	Frequency (MHz)	99% Bandwidth ANT 1 (MHz)	99% Bandwidth ANT 2(MHz)	Verdict
36	5180	18.234	18.177	PASS
48	5240	18.119	18.350	PASS
149	5745	18.177	18.234	PASS
165	5825	18.292	18.350	PASS

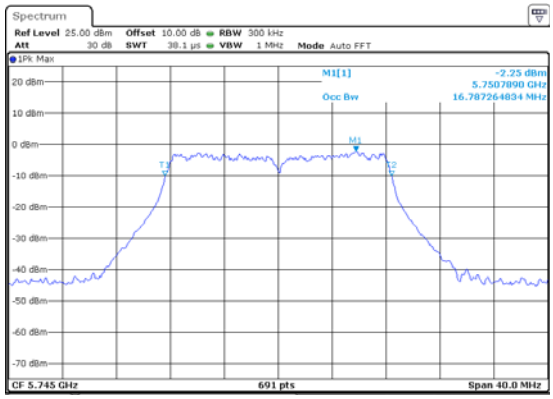
The spectrum analyzer plots are attached as below.

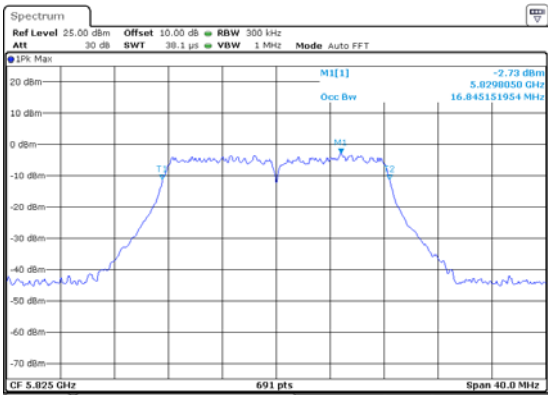
99% Bandwidth

ANT 1(11A)

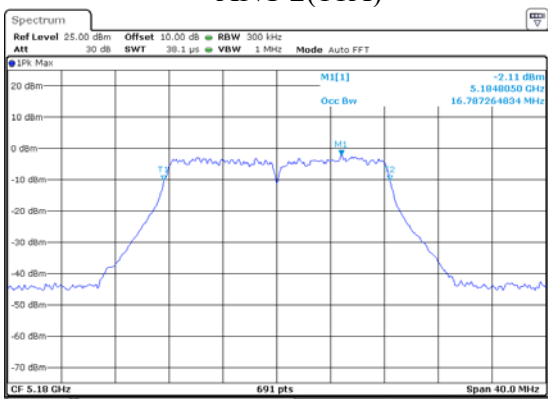


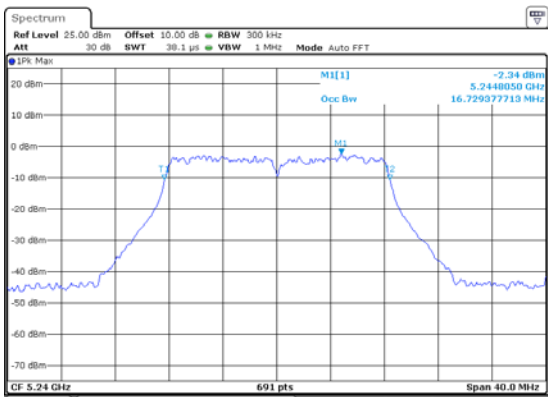


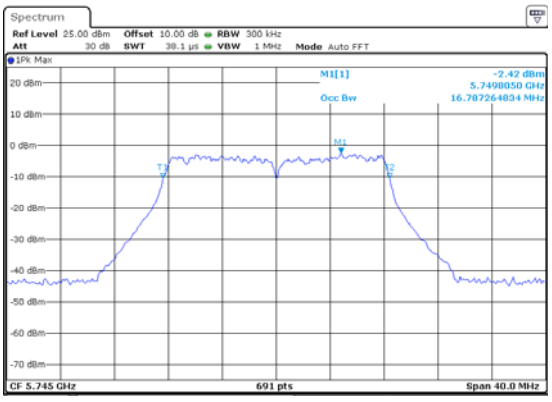


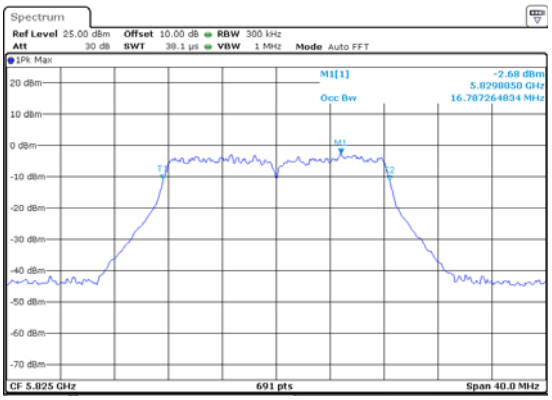


ANT 2(11A)

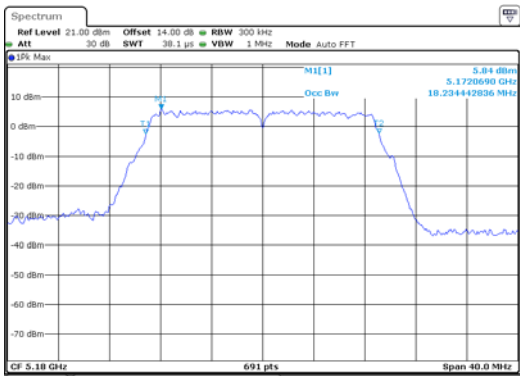


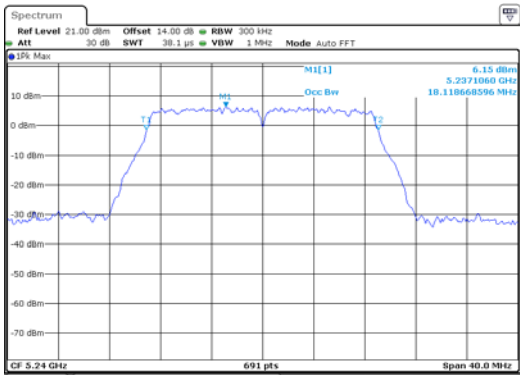


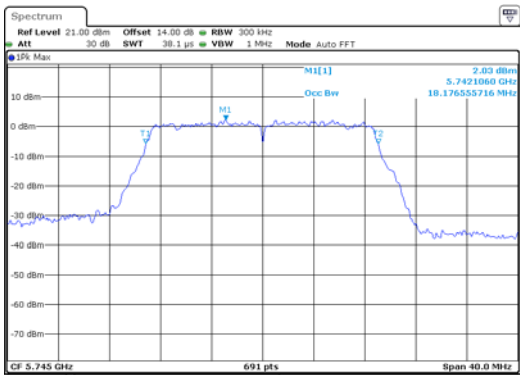


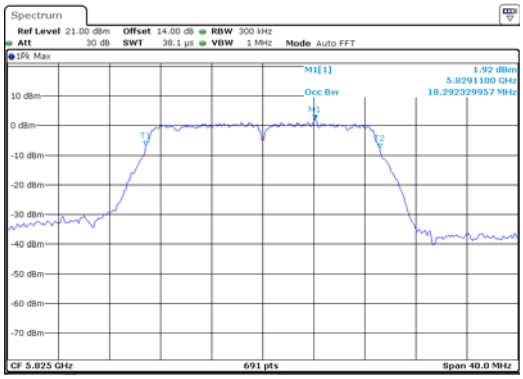


ANT 1(11n20)

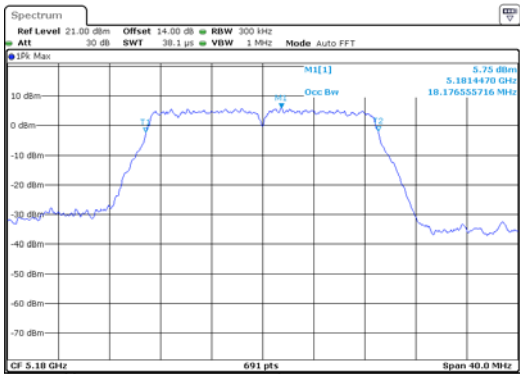


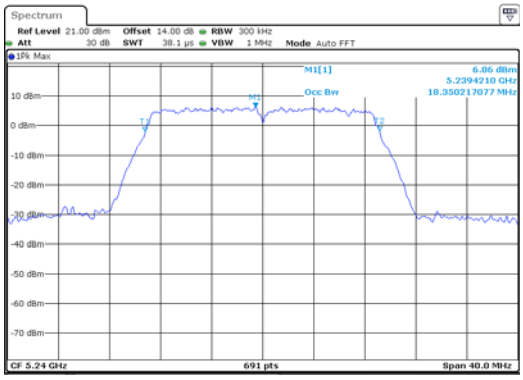


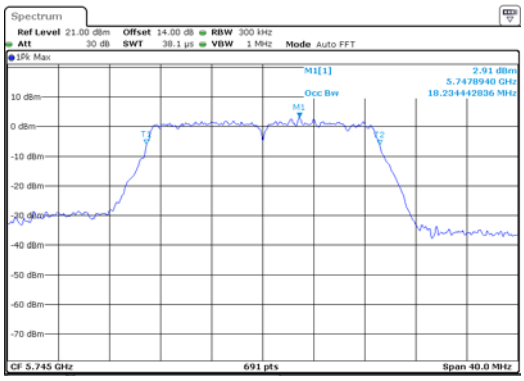


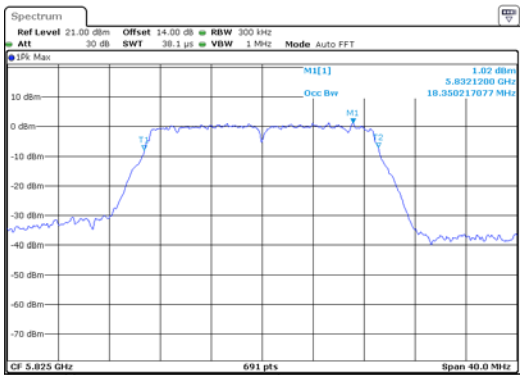


ANT 2(11n20)



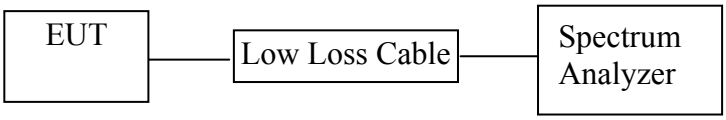






8. DUTY CYCLE MEASUREMENT

8.1. Block Diagram of Test Setup



8.2. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.3. Operating Condition of EUT

8.3.1. Setup the EUT and simulator as shown as Section 8.1.

8.3.2. Turn on the power of all equipment.

8.3.3. Let the EUT work in TX modes measure it. The transmit frequency are 5150-5250 and 5725-5850MHz.

8.4. Test Procedure

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:
1. A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on- and off-times of the transmitted signal.
2. The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on- and off-times of the transmitted signal
a. Set the center frequency of the instrument to the centre frequency of the transmission
b. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value(10MHz).
c. Set detector = Peak or average.
d. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100.
(For example, if VBW and/or RBW are limited to 3MHz, then the zero-span method of measuring duty cycle shall not be used if T≤16.7 microseconds.)

8.5.Test Result

Test mode	Frequency (MHz)	Duty cycle(%) ANT 1	Duty cycle(%) ANT 2	10log(1/x) ANT 1	10log(1/x) ANT 2
802.11a20	5180	96.86	96.86	0.14	0.14
802.11n20	5180	96.69	96.68	0.15	0.15

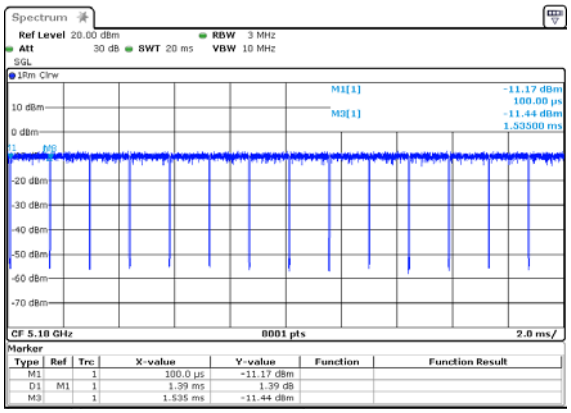
Note: The duty cycle of other frequency points in the same mode is the same, so we select a frequency point to test for each mode.

Duty cycle=x

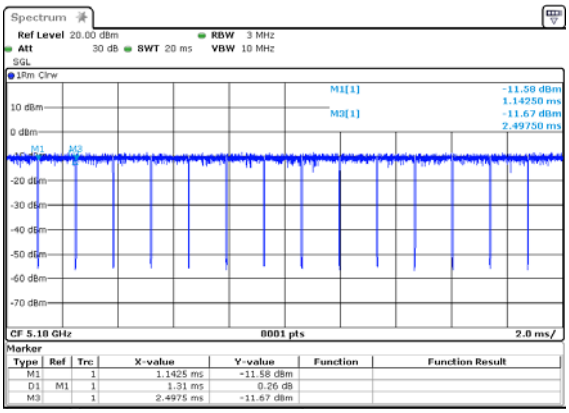
The spectrum analyzer plots are attached as below.

802.11a20 5180MHz

ANT 1

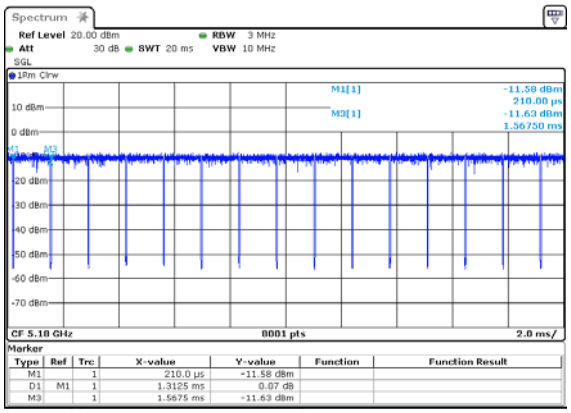


ANT 2

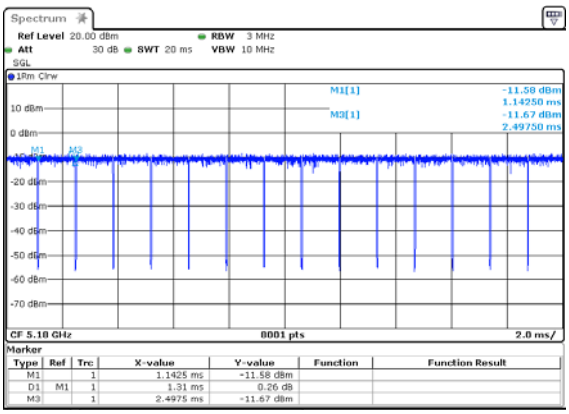


802.11n20 5180MHz

ANT 1

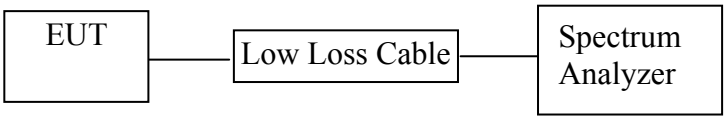


ANT 2



9. MAXIMUM POWER SPECTRAL DENSITY TEST

9.1. Block Diagram of Test Setup



9.2. The Requirement For Section 15.407

Section 15.407: 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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.

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. 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.

9.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 9.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 5150-5250 and 5725-5850MHz.

9.5. Test Procedure

9.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2. Measurement Procedure PKPSD:

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

1. Set RBW≥1/T, where T is defined in section II.B.l.a). Set VBW ≥ 3 RBW.
2. If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
3. If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
4. Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.
5. Detector = RMS.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.

9.5.3. Measurement the maximum power spectral density.

9.6.Test Result

The test was performed with 802.11a(SISO)							
Channel	Frequency (MHz)	Power Spectral Density ANT 1 (dBm)	Power Spectral Density ANT 2 (dBm)	Final Power Spectral Density ANT 1 (dBm)	Final Power Spectral Density ANT 2 (dBm)	Limit (dBm)	Verdict
36	5180	-2.61	-2.67	-2.47	-2.53	11	PASS
48	5240	-1.54	-1.12	-1.40	-0.98	11	PASS
149	5745	-3.08	-3.10	-2.94	-2.96	30	PASS
165	5825	-2.60	-2.61	-2.46	-2.47	30	PASS

The test was performed with 802.11 n20 (SISO)							
Channel	Frequency (MHz)	Power Spectral Density ANT 1 (dBm)	Power Spectral Density ANT 2 (dBm)	Final Power Spectral Density ANT 1 (dBm)	Final Power Spectral Density ANT 2 (dBm)	Limit (dBm)	Verdict
36	5180	2.60	2.66	2.75	2.81	11	PASS
48	5240	2.81	2.69	2.96	2.84	11	PASS
149	5745	-2.82	-2.90	-2.67	-2.75	30	PASS
165	5825	-3.50	-3.92	-3.35	-3.77	30	PASS

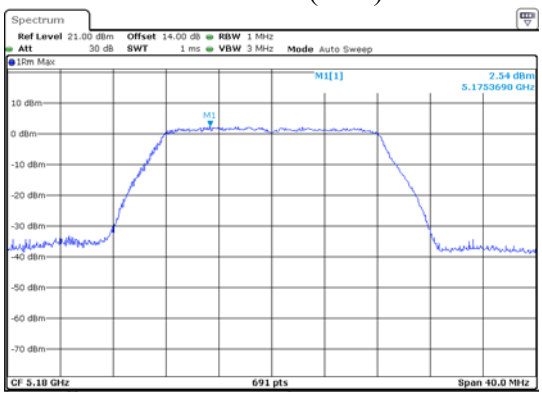
The test was performed with 802.11 n20 (MIMO)							
Channel	Frequency (MHz)	Power Spectral Density ANT 1 (dBm)	Power Spectral Density ANT 2 (dBm)	Final Power Spectral Density ANT 1 (dBm)	Final Power Spectral Density ANT 2 (dBm)	Final Power Spectral Density Total(dBm)	Limit (dBm)
36	5180	2.99	2.57	3.14	2.72	5.95	11
48	5240	2.70	2.90	2.85	3.05	5.96	11
149	5745	-2.57	-2.82	-2.42	-2.67	0.47	30
165	5825	-3.40	-3.72	-3.25	-3.57	-0.40	30

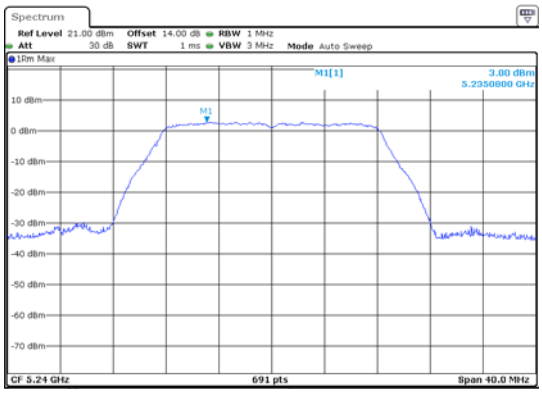
Note: Final Power Spectral Density ANT 1= Power Spectral Density ANT 1+10log(1/x) ANT 1
Final Power Spectral Density ANT 2= Power Spectral Density ANT 2+10log(1/x) ANT 2

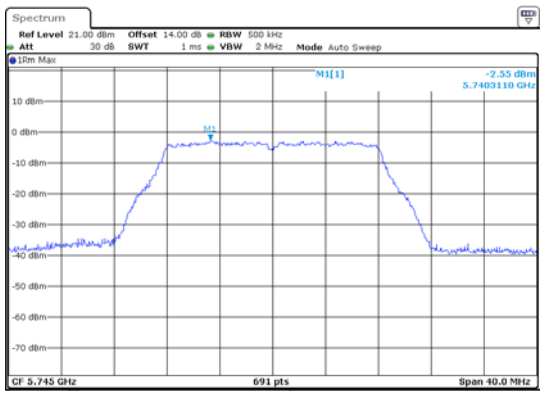
The spectrum analyzer plots are attached as below.

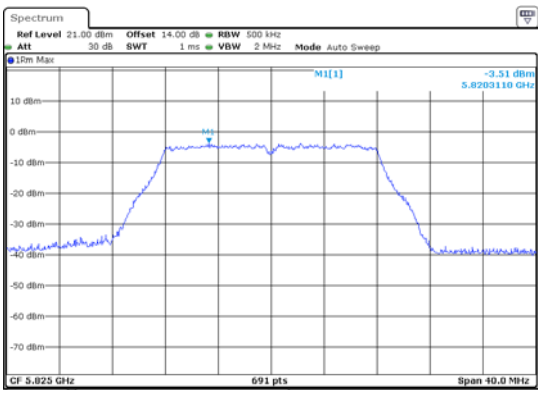
TEST MODE:SISO

ANT 1(11A)

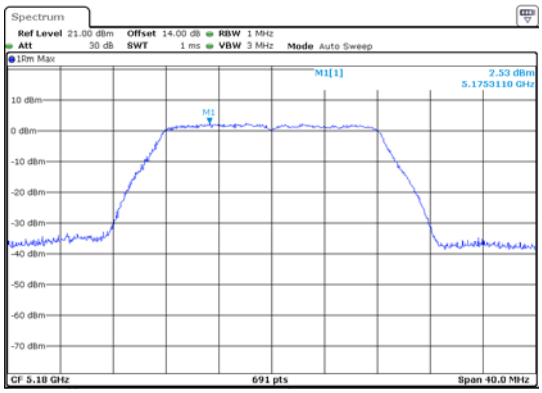


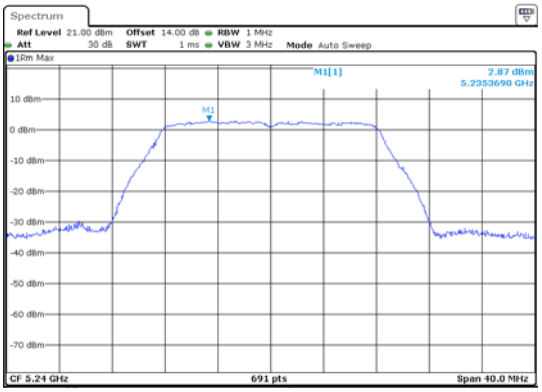


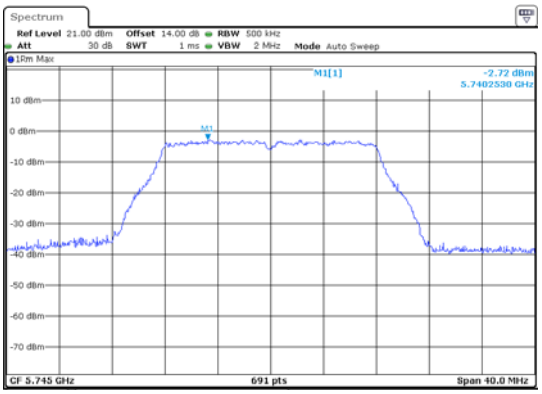


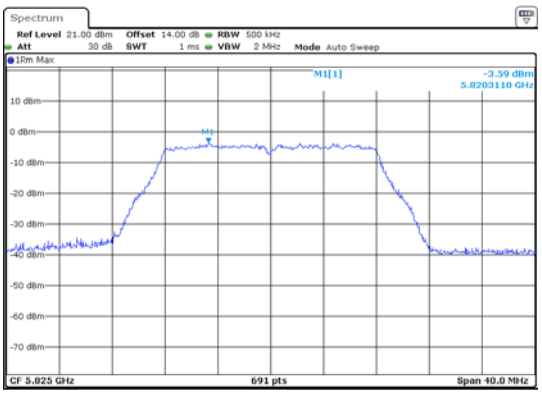


ANT 2(11A)

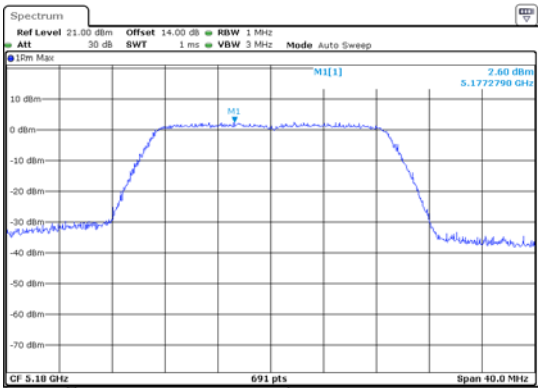


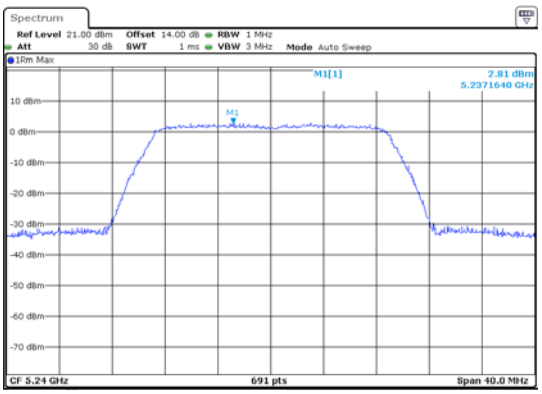


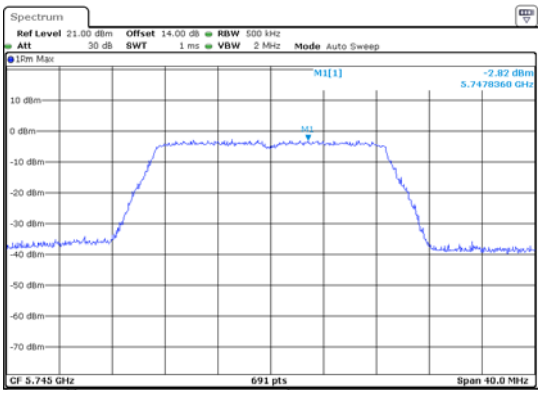


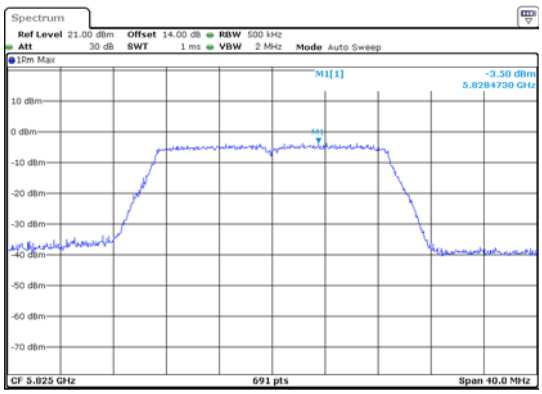


ANT 1(11n20)

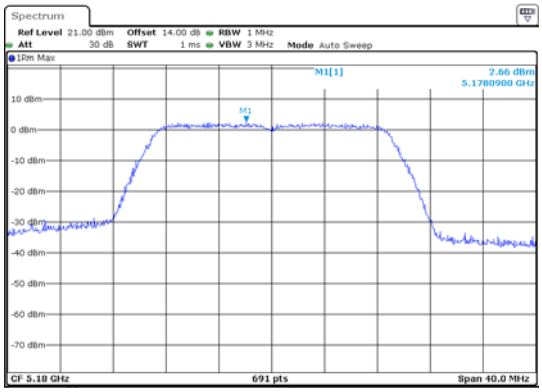


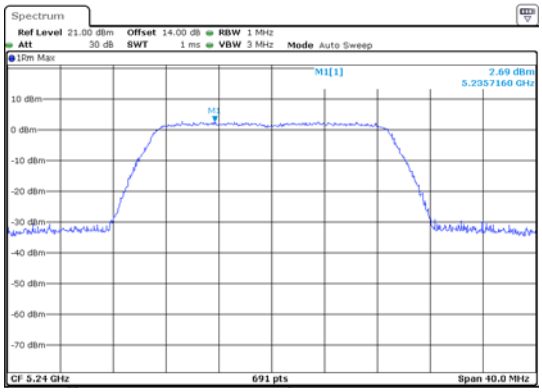


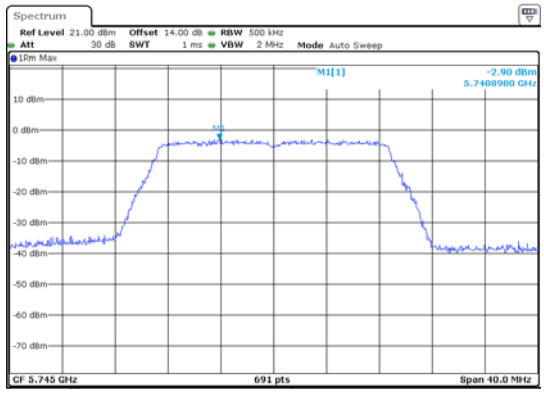


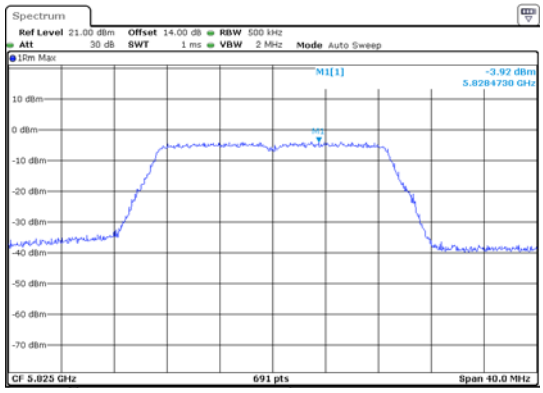


ANT 2(11n20)



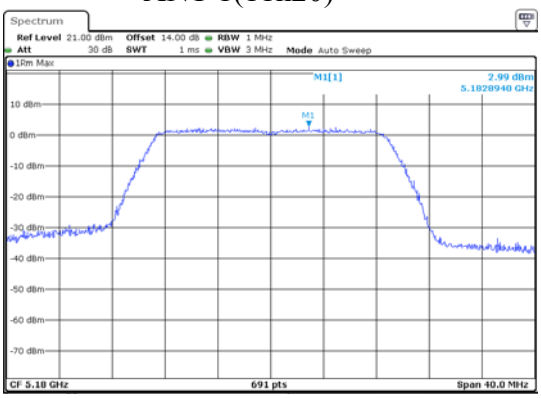


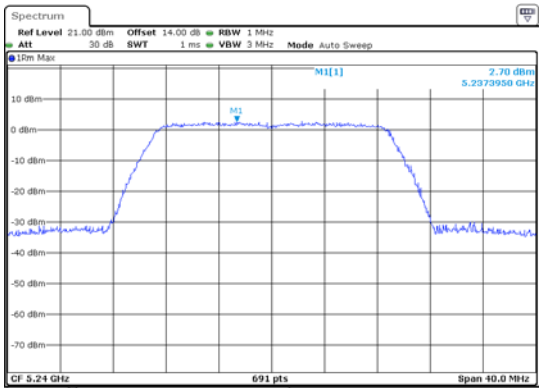


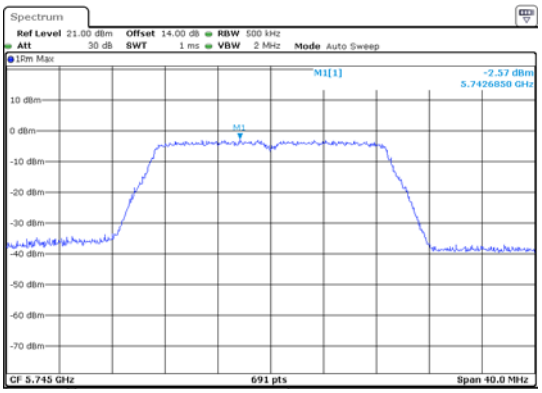


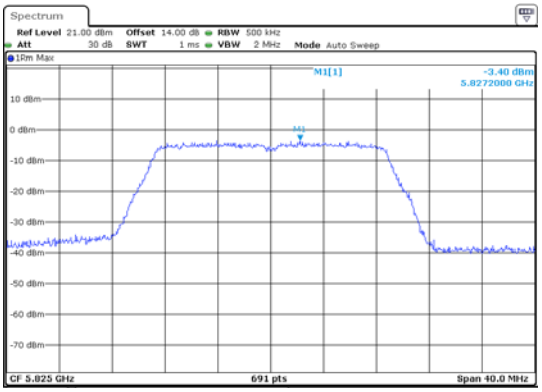
TEST MODE:MIMO

ANT 1(11n20)

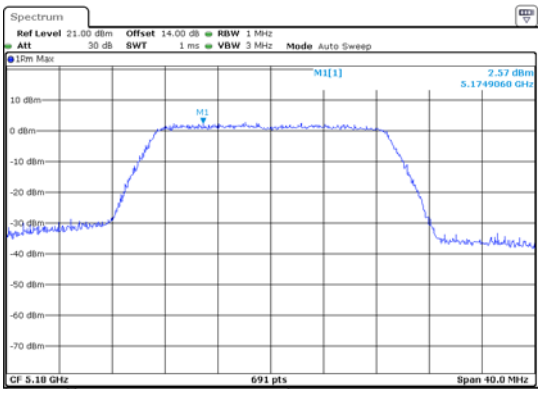


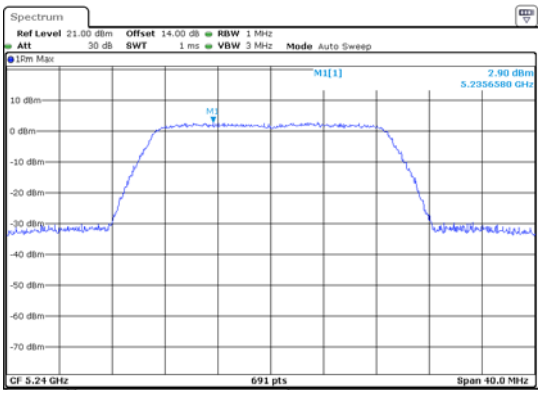


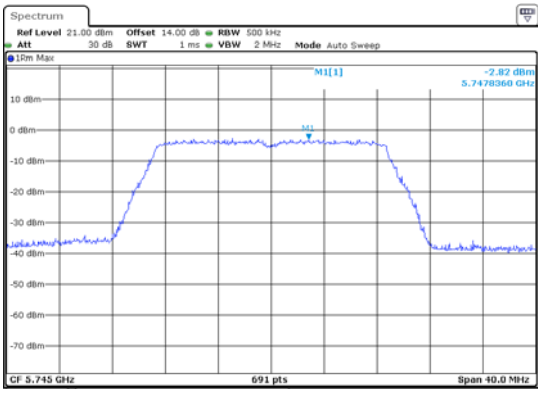


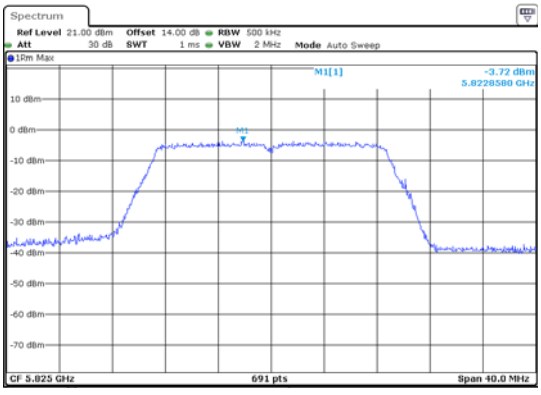


ANT 2(11n20)



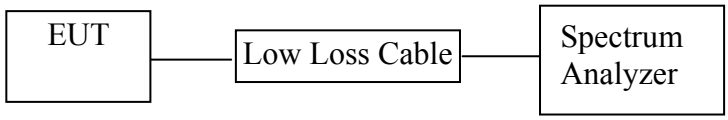






10.MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER

10.1.Block Diagram of Test Setup



10.2.The Requirement For Section 15.407

Section 15.407: For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz.
For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emis-sion bandwidth in MHz.

10.3.EUT Configuration on Measurement

The equipment is installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.4.Operating Condition of EUT

10.4.1.Setup the EUT and simulator as shown as Section 10.1.

10.4.2.Turn on the power of all equipment.

10.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 5150-5250 and 5725-5850MHz.

10.5.Test Procedure

10.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

10.5.2.Set RBW = 1-5% of the OBW, VBW ≥ 3 x RBW, Sweep time = auto, Set span to at least 1.5 times the OBW, Detector = RMS.

10.5.3.Measurement the Maximum conducted (average) output power.

10.6.Test Result

Final Ave output power ANT 1= Ave output power ANT 1+10log(1/x) ANT 1
Final Ave output power ANT 2= Ave output power ANT 2+10log(1/x) ANT 2

The test was performed with 802.11A					
Channel	Frequency (MHz)	Ave output power ANT 1(dBm)	Ave output power ANT 2 (dBm)	10log(1/x) ANT 1	10log(1/x) ANT 2
Low	5180	13.15	13.05	0.14	0.14
High	5240	13.46	13.25	0.14	0.14
Low	5745	12.12	12.02	0.14	0.14
High	5825	12.88	12.95	0.14	0.14

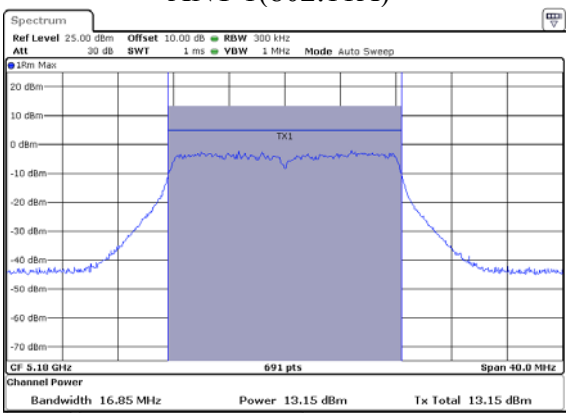
The test was performed with 802.11A						
Channel	Frequency (MHz)	Final Ave output power ANT 1(dBm)	Final Ave output power ANT 2 (dBm)	Final Ave output power ANT 1(mW)	Final Ave output power ANT 2 (mW)	Limits dBm
Low	5180	13.29	13.19	21.33	20.84	24 dBm
High	5240	13.60	13.39	22.91	21.83	24 dBm
Low	5745	12.26	12.16	16.83	16.44	30 dBm
High	5825	13.02	13.09	20.04	20.37	30 dBm

The test was performed with 802.11 N20					
Channel	Frequency (MHz)	Ave output power ANT 1(dBm)	Ave output power ANT 2 (dBm)	10log(1/x) ANT 1	10log(1/x) ANT 2
Low	5180	16.48	16.46	0.15	0.15
High	5240	16.64	16.72	0.15	0.15
Low	5745	12.78	12.84	0.15	0.15
High	5825	11.57	11.67	0.15	0.15

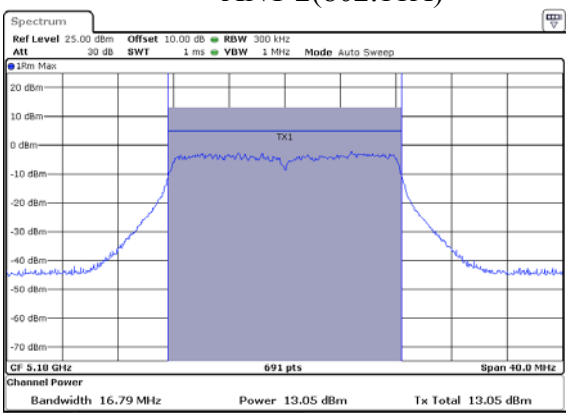
The test was performed with 802.11 N20						
Channel	Frequency (MHz)	Final Ave output power ANT 1(dBm)	Final Ave output power ANT 2 (dBm)	Ave output Total power (dBm)	Ave output Total power (mW)	Limits dBm
Low	5180	16.63	16.61	19.63	91.84	24 dBm
High	5240	16.79	16.87	19.84	96.39	24 dBm
Low	5745	12.93	12.99	15.97	39.54	30 dBm
High	5825	11.72	11.82	14.78	30.06	30 dBm

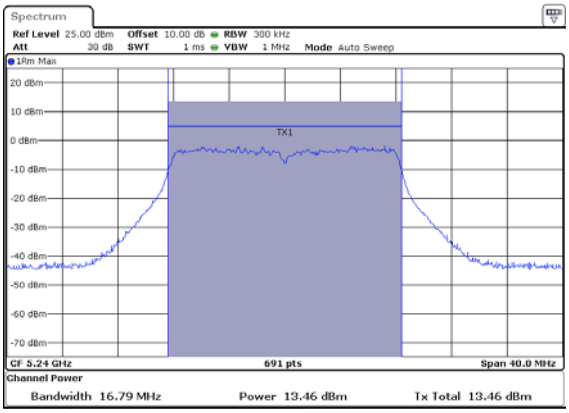
The spectrum analyzer plots are attached as below.

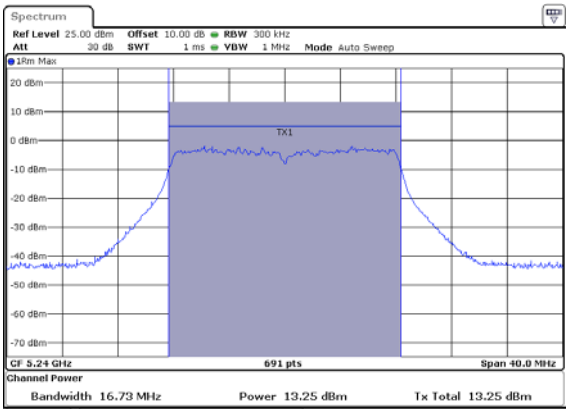
ANT 1(802.11A)

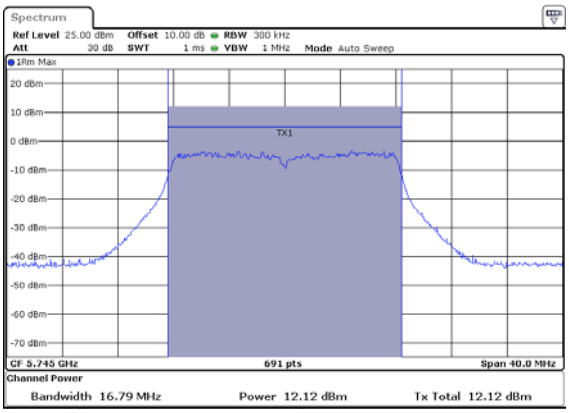


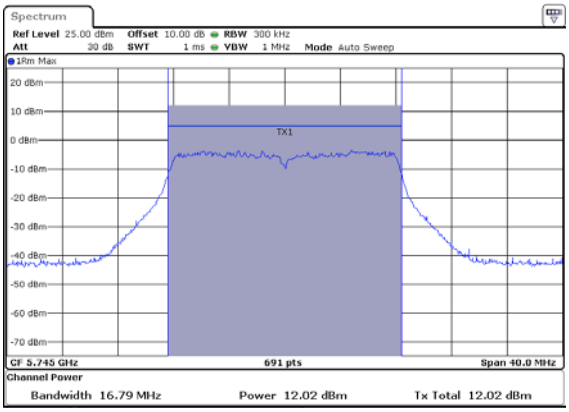
ANT 2(802.11A)

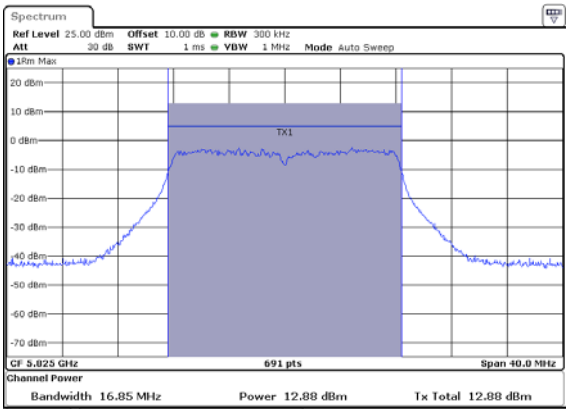


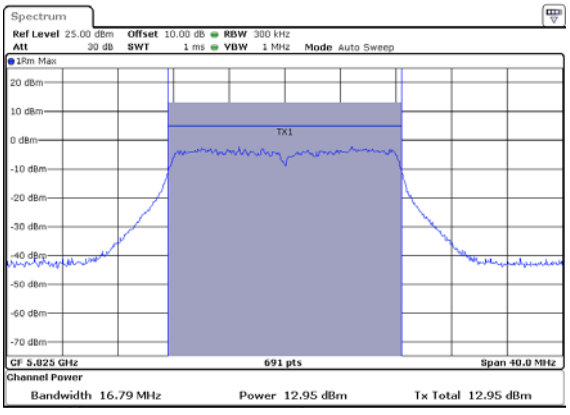




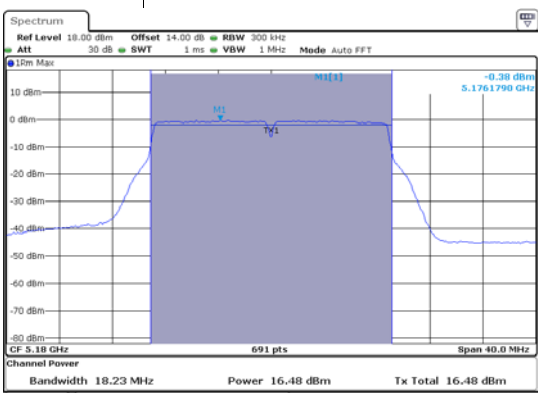


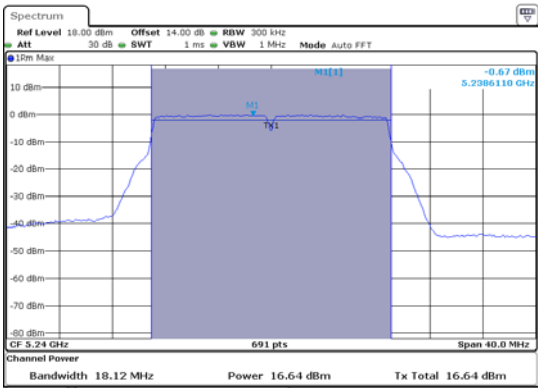


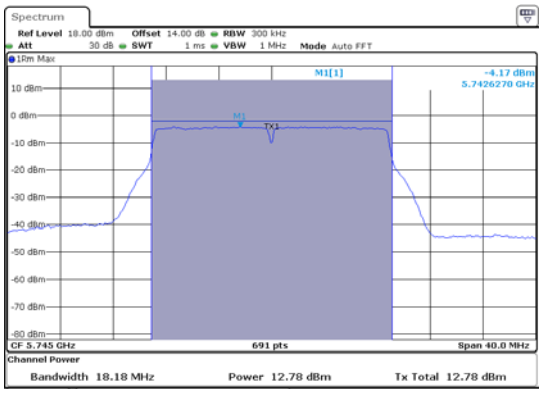


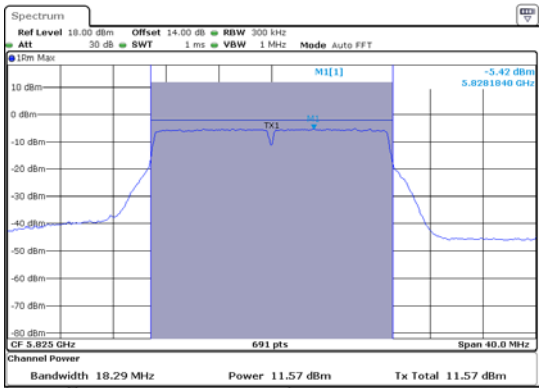


ANT 1(802.11 N 20MHz)

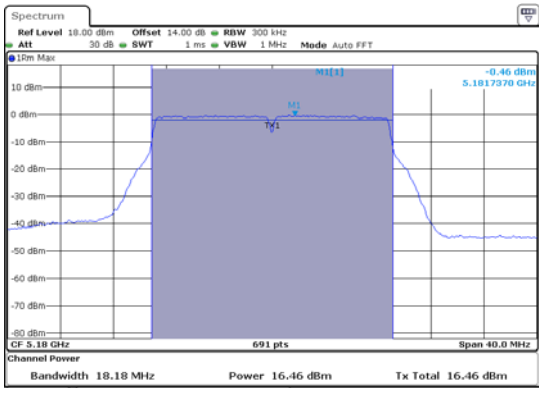


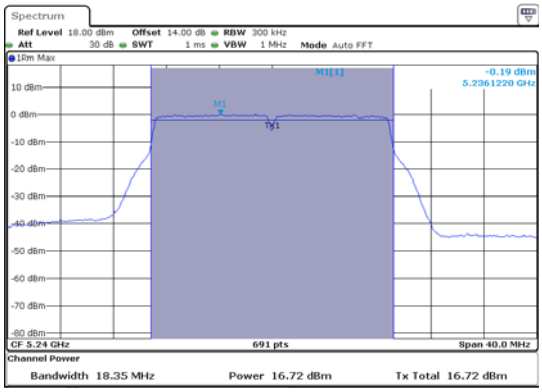


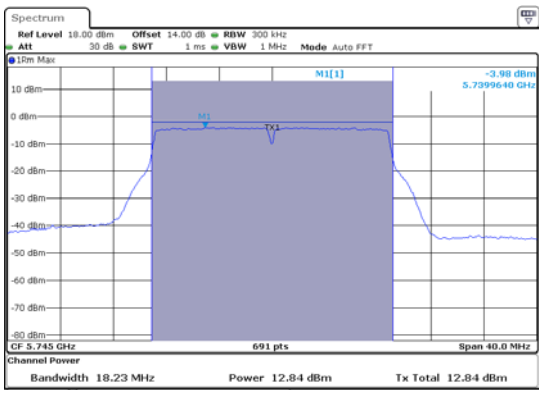


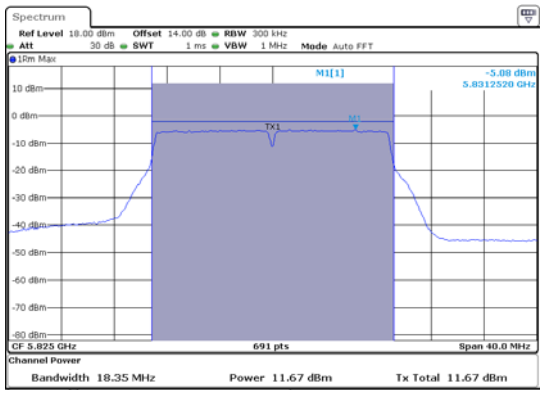


ANT 2(802.11 N 20MHz)









11.RADIATED SPURIOUS EMISSION TEST

11.1.Block Diagram of Test Setup

11.1.1.Block diagram of connection between the EUT and peripherals

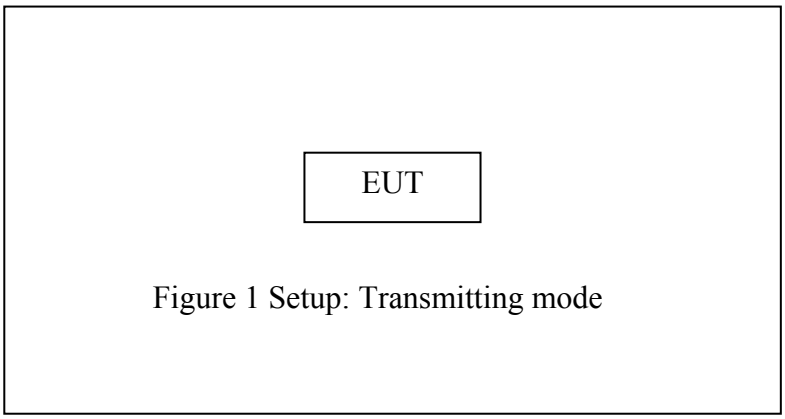
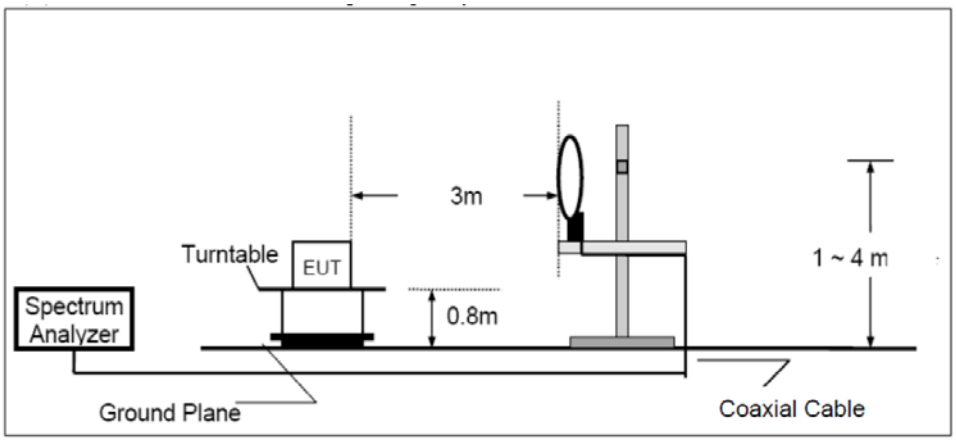


Figure 1 Setup: Transmitting mode

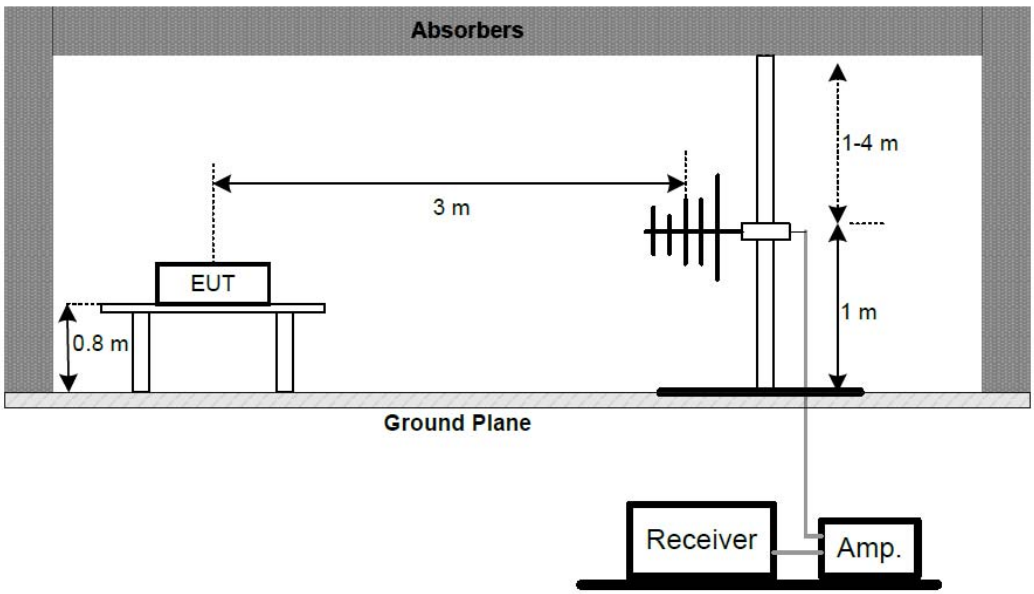
(EUT: Vaxis wireless video system)

11.1.2.Semi-Anechoic Chamber Test Setup Diagram

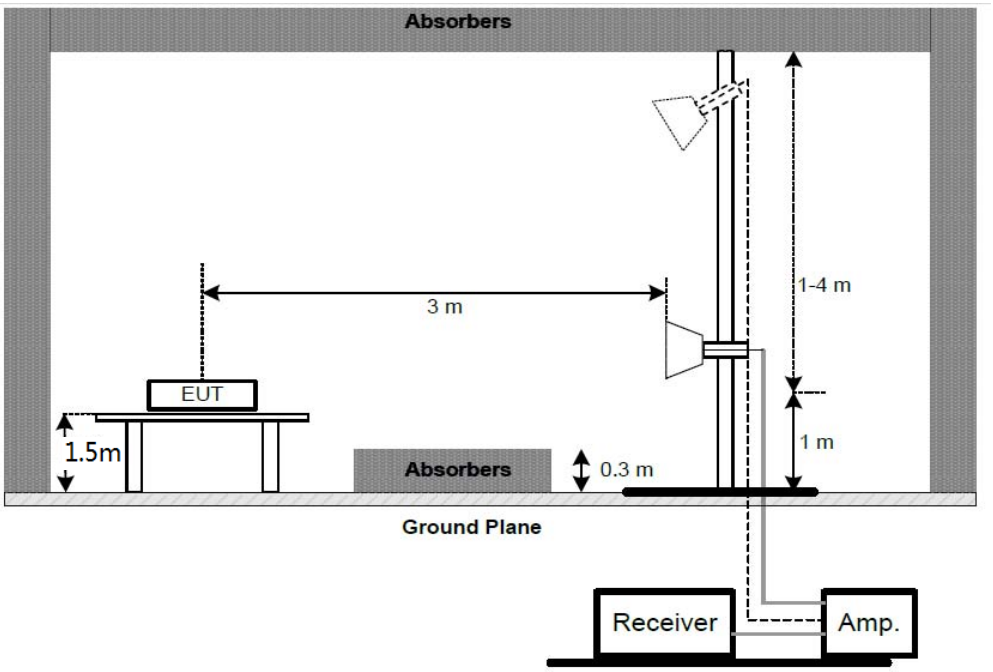
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1GHz



Above 1GHz:



11.2.Restricted bands of operation

11.2.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209.
At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated

based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

11.3.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.4.The Limit For Section 15.407

Section 15.247(d): For transmitters operating in the 5.15–5.25 GHz band: all emissions out-side of the 5.15–5.35 GHz band shall not exceed an EIRP of –27dBm/MHz.
For transmitters operating in the 5.725–5.825 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 EIRP of –17dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of –27dBm/MHz.

11.5.Operating Condition of EUT

11.5.1.Setup the EUT and simulator as shown as Section 11.1.

11.5.2.Turn on the power of all equipment.

11.5.3.Let the EUT work in TX modes measure it. The transmit frequency are 5150-5250 and 5725-5850MHz.

11.6.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground(Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The frequency range from 9KHz to 40000MHz is checked.
Result = Reading + Corrected Factor
Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

11.7.DATA SAMPLE

Frequency (MHz)	Reading (dBμv)	Factor (dB/m)	Result (dBμv/m)	Limit (dBμv/m)	Margin (dB)	Remark
X.XX	49.83	-22.03	27.80	43.50	-15.70	QP

Frequency(MHz) = Emission frequency in MHz
Reading(dBμv) = Uncorrected Analyzer/Receiver reading
Factor (dB/m)= Antenna factor + Cable Loss – Amplifier gain
Result(dBμv/m) = Reading + Factor
Limit (dBμv/m)= Limit stated in standard

Margin (dB) = Result(dBμv/m) - Limit (dBμv/m)

Calculation Formula:

Margin(dB) = Result (dBμv/m)–Limit(dBμv/m)
Result(dBμv/m)= Reading(dBμv)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

11.8.The Field Strength of Radiation Emission Measurement Results

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. *: Denotes restricted band of operation.

3. The fundamental radiated emissions were reduced by Band Reject Filter in the attached plots.

4. The EUT is tested radiation emission at each test mode (802.11a/n) in three axes. Besides, We have tested the single antenna transmit mode and the dual antenna emission mode. The worst emissions are reflected in the following plots.

5. The radiation emissions from 9kHz-30MHz is not reported, because the test values lower than the limits of 20dB.

6. The average measurement was not performed when peak measured data under the limit of average detection.

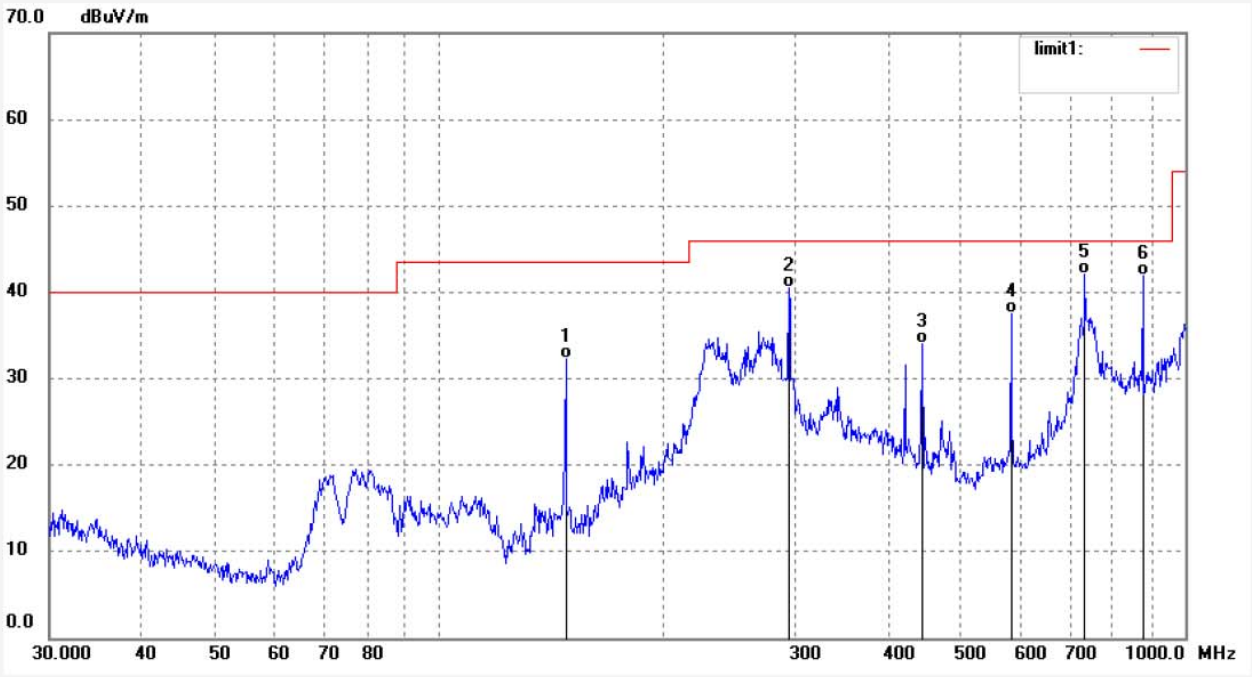
Below 1G

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: FRANK2019-W #461
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Vaxis wireless video system
Mode: TX Channel 36(802.11N)
Model: Vaxis Atom 500
Manufacturer: Hunan GM innovation technology Co., Ltd.

Polarization: Horizontal
Power Source: DC 7.4V
Date: 2019/12/06
Time: 16:39:03
Engineer Signature: CHARLEY
Distance: 3m

Note: Report NO.:ATE20191740



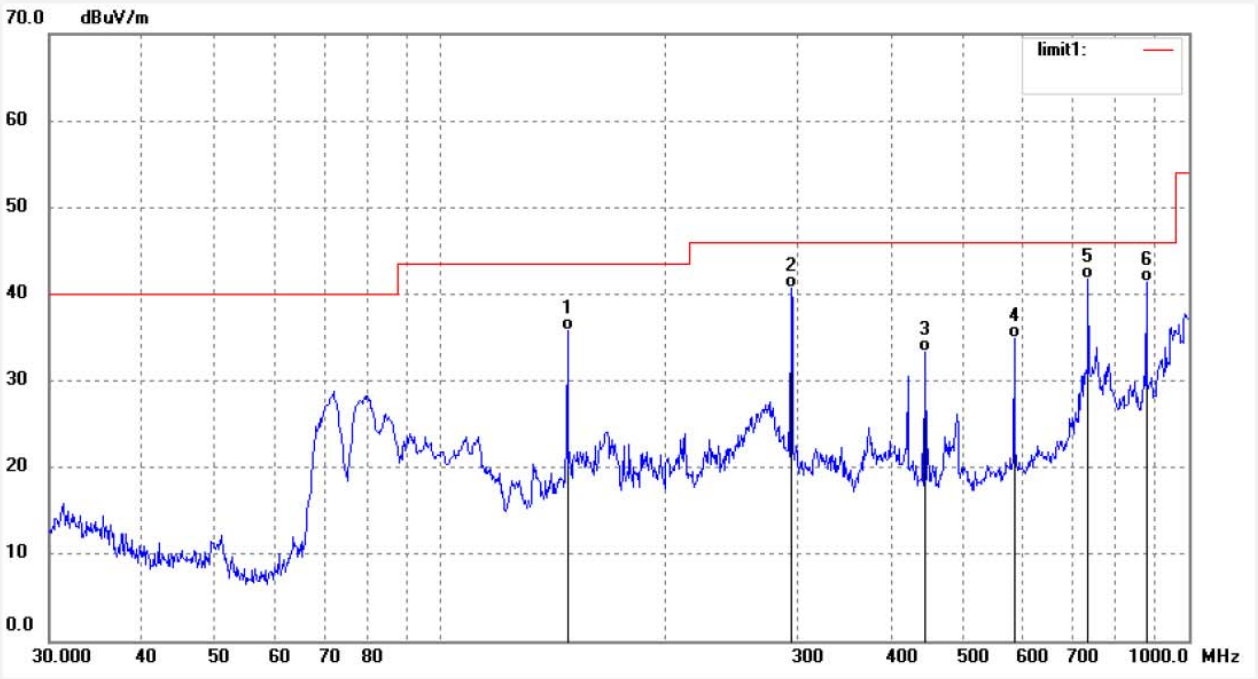
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	147.8745	60.28	-28.05	32.23	43.50	-11.27	QP	200	224	
2	294.4259	61.90	-21.45	40.45	46.00	-5.55	QP	200	331	
3	444.1299	51.38	-17.39	33.99	46.00	-12.01	QP	200	82	
4	584.1611	51.57	-14.02	37.55	46.00	-8.45	QP	200	221	
5	734.0371	52.78	-10.69	42.09	46.00	-3.91	QP	200	315	
6	878.0931	49.53	-7.56	41.97	46.00	-4.03	QP	200	109	

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: FRANK2019-W #462
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Vaxis wireless video system
Mode: TX Channel 36(802.11N)
Model: Vaxis Atom 500
Manufacturer: Hunan GM innovation technology Co., Ltd.

Polarization: Vertical
Power Source: DC 7.4V
Date: 2019/12/06
Time: 16:42:06
Engineer Signature: CHARLEY
Distance: 3m

Note: Report NO.:ATE20191740



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	147.8745	63.76	-28.05	35.71	43.50	-7.79	QP	100	93	
2	294.4259	62.18	-21.45	40.73	46.00	-5.27	QP	100	211	
3	444.1299	50.67	-17.39	33.28	46.00	-12.72	QP	100	63	
4	584.1611	48.85	-14.02	34.83	46.00	-11.17	QP	100	210	
5	734.0371	52.38	-10.69	41.69	46.00	-4.31	QP	100	31	
6	878.0931	48.99	-7.56	41.43	46.00	-4.57	QP	100	103	

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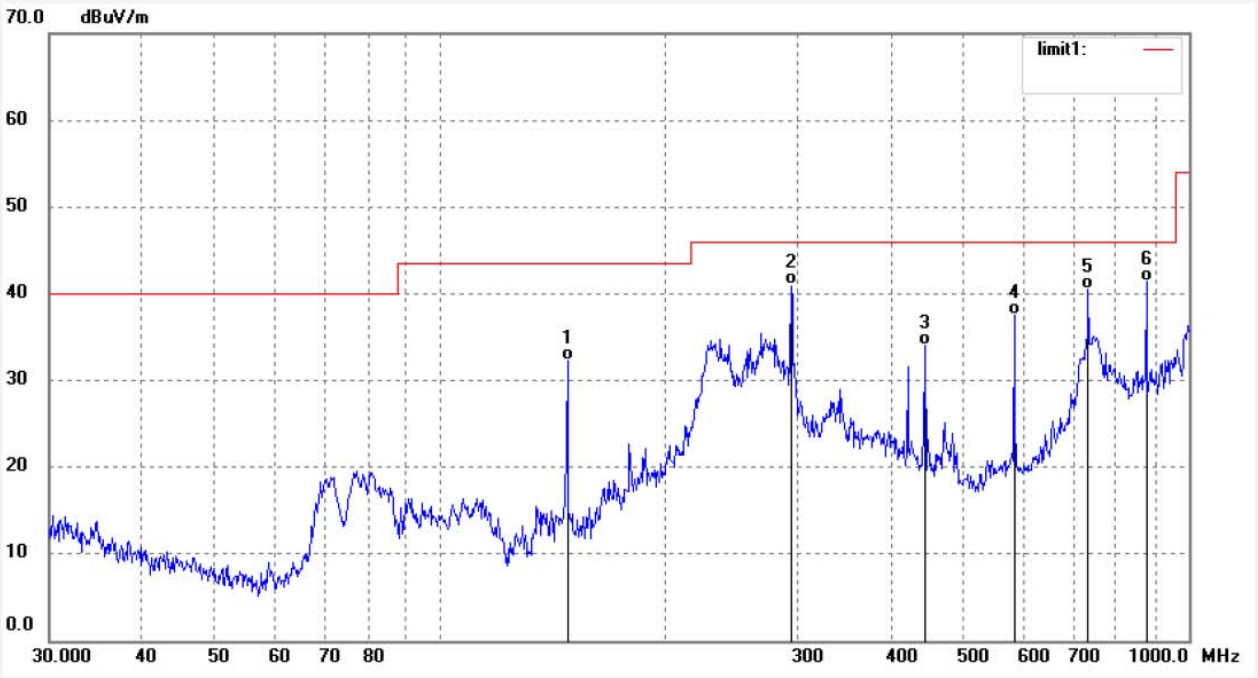
Job No.: FRANK2019-W #460
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Vaxis wireless video system
Mode: TX Channel 48(802.11N)
Model: Vaxis Atom 500
Manufacturer: Hunan GM innovation technology Co., Ltd.

Polarization: Horizontal
Power Source: DC 7.4V
Date: 2019/12/06
Time: 16:38:30
Engineer Signature: CHARLEY
Distance: 3m

Note: Report NO.:ATE20191740



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	147.8745	60.28	-28.05	32.23	43.50	-11.27	QP	200	306	
2	294.4259	62.40	-21.45	40.95	46.00	-5.05	QP	200	149	
3	444.1299	51.38	-17.39	33.99	46.00	-12.01	QP	200	52	
4	584.1611	51.57	-14.02	37.55	46.00	-8.45	QP	200	331	
5	734.0371	51.28	-10.69	40.59	46.00	-5.41	QP	200	63	
6	878.0931	49.03	-7.56	41.47	46.00	-4.53	QP	200	221	

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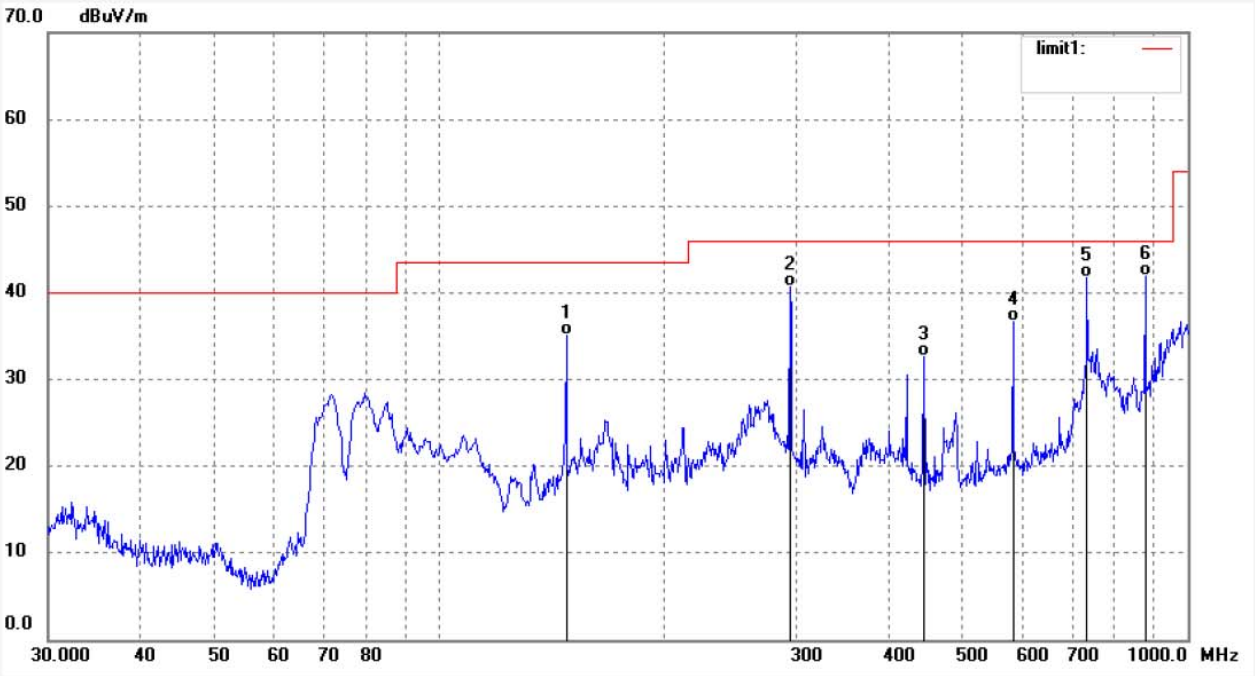
Job No.: FRANK2019-W #459
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Vaxis wireless video system
Mode: TX Channel 48(802.11N)
Model: Vaxis Atom 500
Manufacturer: Hunan GM innovation technology Co., Ltd.

Polarization: Vertical
Power Source: DC 7.4V
Date: 2019/12/06
Time: 16:36:40
Engineer Signature: CHARLEY
Distance: 3m

Note: Report NO.:ATE20191740



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	147.8745	63.14	-28.05	35.09	43.50	-8.41	QP	100	200	
2	294.4259	62.13	-21.45	40.68	46.00	-5.32	QP	100	55	
3	444.1299	50.02	-17.39	32.63	46.00	-13.37	QP	100	215	
4	584.1611	50.75	-14.02	36.73	46.00	-9.27	QP	100	93	
5	734.0371	52.39	-10.69	41.70	46.00	-4.30	QP	100	221	
6	878.0931	49.42	-7.56	41.86	46.00	-4.14	QP	100	332	

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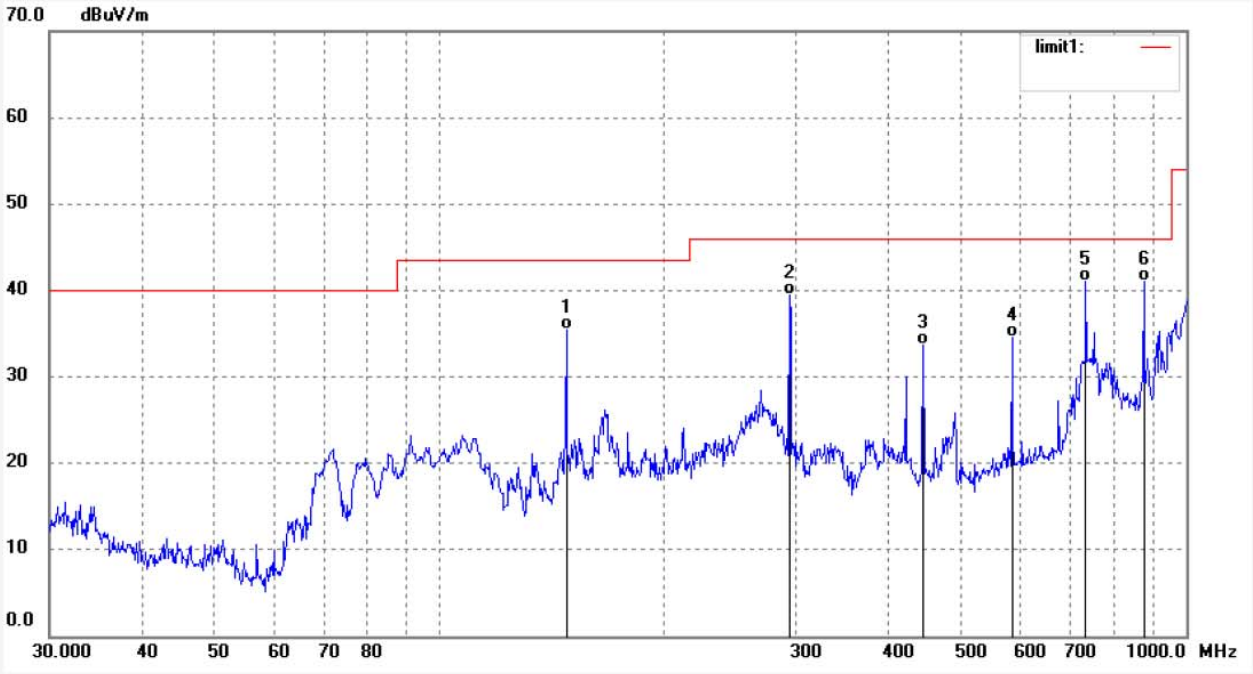
Job No.: FRANK2019-W #457
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Vaxis wireless video system
Mode: TX Channel 149(802.11N)
Model: Vaxis Atom 500
Manufacturer: Hunan GM innovation technology Co., Ltd.

Polarization: Horizontal
Power Source: DC 7.4V
Date: 2019/12/06
Time: 16:34:47
Engineer Signature: CHARLEY
Distance: 3m

Note: Report NO.:ATE20191740



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	147.8745	63.45	-28.05	35.40	43.50	-8.10	QP	200	210	
2	294.4259	60.89	-21.45	39.44	46.00	-6.56	QP	200	69	
3	444.1299	51.07	-17.39	33.68	46.00	-12.32	QP	200	156	
4	584.1611	48.52	-14.02	34.50	46.00	-11.50	QP	200	93	
5	734.0371	51.76	-10.69	41.07	46.00	-4.93	QP	200	115	
6	878.0931	48.63	-7.56	41.07	46.00	-4.93	QP	200	302	

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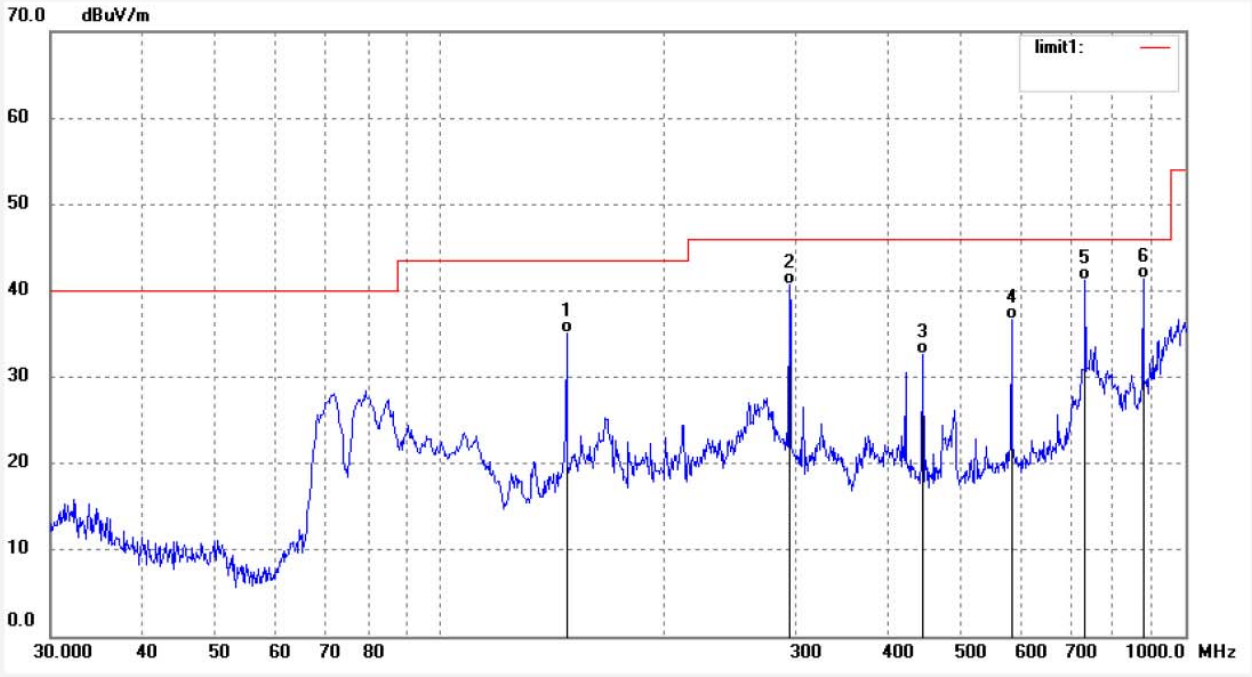
Job No.: FRANK2019-W #458
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Vaxis wireless video system
Mode: TX Channel 149(802.11N)
Model: Vaxis Atom 500
Manufacturer: Hunan GM innovation technology Co., Ltd.

Polarization: Vertical
Power Source: DC 7.4V
Date: 2019/12/06
Time: 16:36:28
Engineer Signature: CHARLEY
Distance: 3m

Note: Report NO.:ATE20191740



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	147.8745	63.14	-28.05	35.09	43.50	-8.41	QP	100	302	
2	294.4259	62.13	-21.45	40.68	46.00	-5.32	QP	100	201	
3	444.1299	50.02	-17.39	32.63	46.00	-13.37	QP	100	221	
4	584.1611	50.75	-14.02	36.73	46.00	-9.27	QP	100	31	
5	734.0371	51.89	-10.69	41.20	46.00	-4.80	QP	100	15	
6	878.0931	48.92	-7.56	41.36	46.00	-4.64	QP	100	302	

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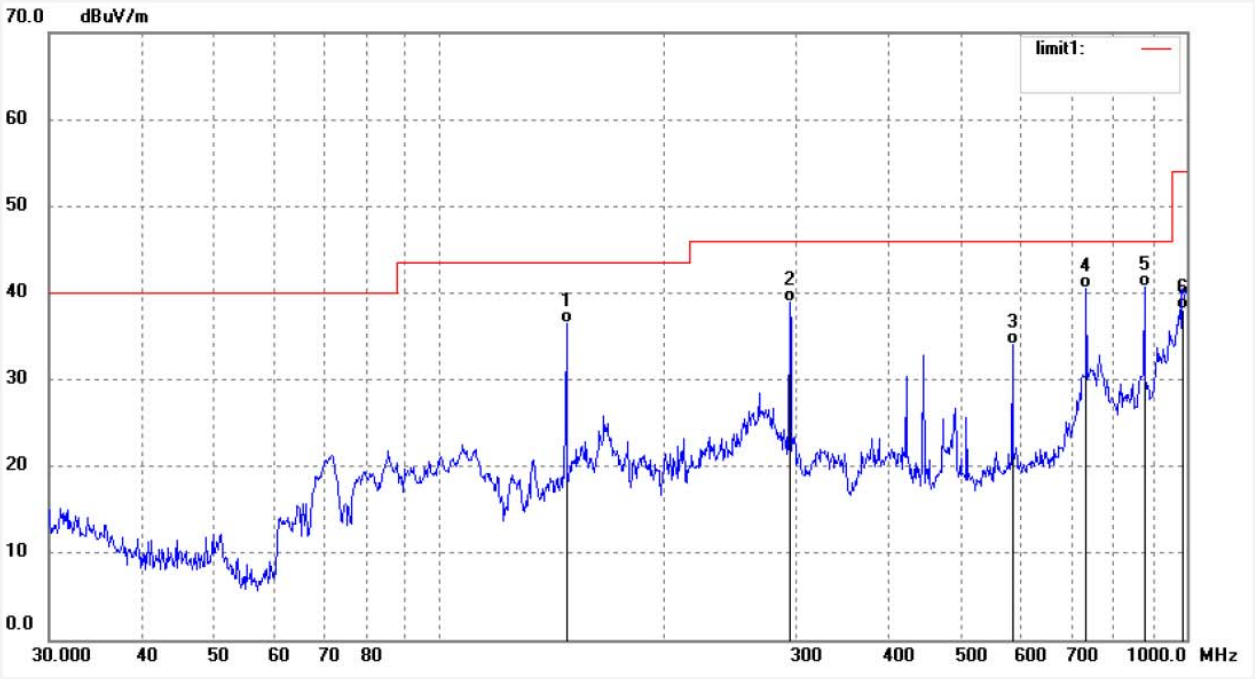
Job No.: FRANK2019-W #456
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Vaxis wireless video system
Mode: TX Channel 165(802.11N)
Model: Vaxis Atom 500
Manufacturer: Hunan GM innovation technology Co., Ltd.

Polarization: Horizontal
Power Source: DC 7.4V
Date: 2019/12/06
Time: 16:33:40
Engineer Signature: CHARLEY
Distance: 3m

Note: Report NO.:ATE20191740



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	147.8745	64.53	-28.05	36.48	43.50	-7.02	QP	200	334	
2	294.4259	60.45	-21.45	39.00	46.00	-7.00	QP	200	64	
3	584.1611	48.07	-14.02	34.05	46.00	-11.95	QP	200	216	
4	734.0371	51.18	-10.69	40.49	46.00	-5.51	QP	200	58	
5	878.0931	48.32	-7.56	40.76	46.00	-5.24	QP	200	321	
6	989.5144	43.35	-5.28	38.07	54.00	-15.93	QP	200	219	

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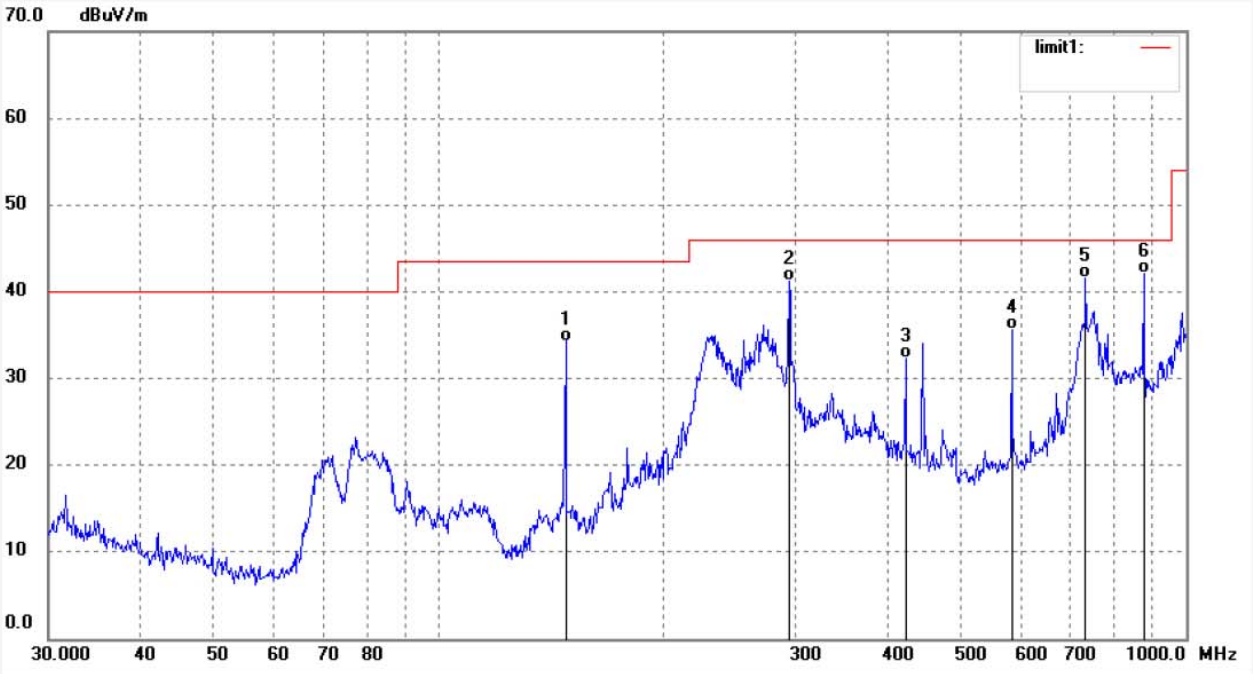
Job No.: FRANK2019-W #454
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Vaxis wireless video system
Mode: TX Channel 165(802.11N)
Model: Vaxis Atom 500
Manufacturer: Hunan GM innovation technology Co., Ltd.

Polarization: Vertical
Power Source: DC 7.4V
Date: 2019/12/06
Time: 16:32:16
Engineer Signature: CHARLEY
Distance: 3m

Note: Report NO.:ATE20191740



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	147.8745	62.35	-28.05	34.30	43.50	-9.20	QP	100	92	
2	294.4259	62.61	-21.45	41.16	46.00	-4.84	QP	100	211	
3	421.3287	50.33	-17.98	32.35	46.00	-13.65	QP	100	93	
4	584.1611	49.55	-14.02	35.53	46.00	-10.47	QP	100	16	
5	734.0371	52.30	-10.69	41.61	46.00	-4.39	QP	100	302	
6	878.0931	49.70	-7.56	42.14	46.00	-3.86	QP	100	22	

Above 1G(1G-26.5GHz)

802.11A(20MHz) TX Mode:

Indicated		Detector (PK/AV)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.407			
Frequency (MHz)	Receiver Reading (dBμV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Channel 36 (5180 MHz)												
10360	39.41	AV	318	1.5	V	31.2	4.3	26.7	48.21	54	5.79	harmonic
10360	37.78	AV	179	1.5	H	31.2	4.3	26.7	46.58	54	7.42	harmonic
10360	52.47	PK	318	1.5	V	31.2	4.3	26.7	61.27	74	12.73	harmonic
10360	51.64	PK	179	1.5	H	31.2	4.3	26.7	60.44	74	13.56	harmonic
Channel 48 (5240 MHz)												
10480	39.38	AV	216	1.5	V	31.2	4.3	26.7	48.18	54	5.82	harmonic
10480	36.81	AV	105	1.5	H	31.2	4.3	26.7	45.61	54	8.39	harmonic
10480	51.79	PK	216	1.5	V	31.2	4.3	26.7	60.59	74	13.41	harmonic
10480	51.19	PK	105	1.5	H	31.2	4.3	26.7	59.99	74	14.01	harmonic
Channel 149 (5745 MHz)												
11490	36.24	AV	220	1.5	V	31.9	4.4	26.6	45.94	54	8.06	harmonic
11490	36.07	AV	139	1.5	H	31.9	4.4	26.6	45.77	54	8.23	harmonic
11490	50.05	PK	220	1.5	V	31.9	4.4	26.6	59.75	74	14.25	harmonic
11490	49.25	PK	139	1.5	H	31.9	4.4	26.6	58.95	74	15.05	harmonic
Channel 165 (5825 MHz)												
11650	37.24	AV	121	1.5	V	31.9	4.4	26.6	46.94	54	7.06	harmonic
11650	37.07	AV	267	1.5	H	31.9	4.4	26.6	46.77	54	7.23	harmonic
11650	51.05	PK	121	1.5	V	31.9	4.4	26.6	60.75	74	13.25	harmonic
11650	50.25	PK	267	1.5	H	31.9	4.4	26.6	59.95	74	14.05	harmonic

802.11N(20MHz) TX Mode:

Indicated		Detector (PK/AV)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.407			
Frequency (MHz)	Receiver Reading (dBμV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Channel 36 (5180 MHz)												
10360	37.96	AV	198	1.5	V	31.2	4.3	26.7	46.76	54	7.24	harmonic
10360	37.47	AV	154	1.5	H	31.2	4.3	26.7	46.27	54	7.73	harmonic
10360	50.89	PK	198	1.5	V	31.2	4.3	26.7	59.69	74	14.31	harmonic
10360	50.31	PK	154	1.5	H	31.2	4.3	26.7	59.11	74	14.89	harmonic
Channel 48 (5240 MHz)												
10480	36.96	AV	185	1.5	V	31.2	4.3	26.7	45.76	54	8.24	harmonic
10480	36.70	AV	219	1.5	H	31.2	4.3	26.7	45.50	54	8.50	harmonic
10480	50.01	PK	185	1.5	V	31.2	4.3	26.7	58.81	74	15.19	harmonic
10480	49.15	PK	219	1.5	H	31.2	4.3	26.7	57.95	74	16.05	harmonic
Channel 149 (5745 MHz)												
11490	35.22	AV	24	1.5	V	31.9	4.4	26.6	44.92	54	9.08	harmonic
11490	36.76	AV	98	1.5	H	31.9	4.4	26.6	46.46	54	7.54	harmonic
11490	49.22	PK	24	1.5	V	31.9	4.4	26.6	58.92	74	15.08	harmonic
11490	48.11	PK	98	1.5	H	31.9	4.4	26.6	57.81	74	16.19	harmonic
Channel 165 (5825 MHz)												
11650	35.83	AV	311	1.5	V	31.9	4.4	26.6	45.53	54	8.47	harmonic
11650	36.44	AV	107	1.5	H	31.9	4.4	26.6	46.14	54	7.86	harmonic
11650	50.49	PK	311	1.5	V	31.9	4.4	26.6	60.19	74	13.81	harmonic
11650	50.68	PK	107	1.5	H	31.9	4.4	26.6	60.38	74	13.62	harmonic

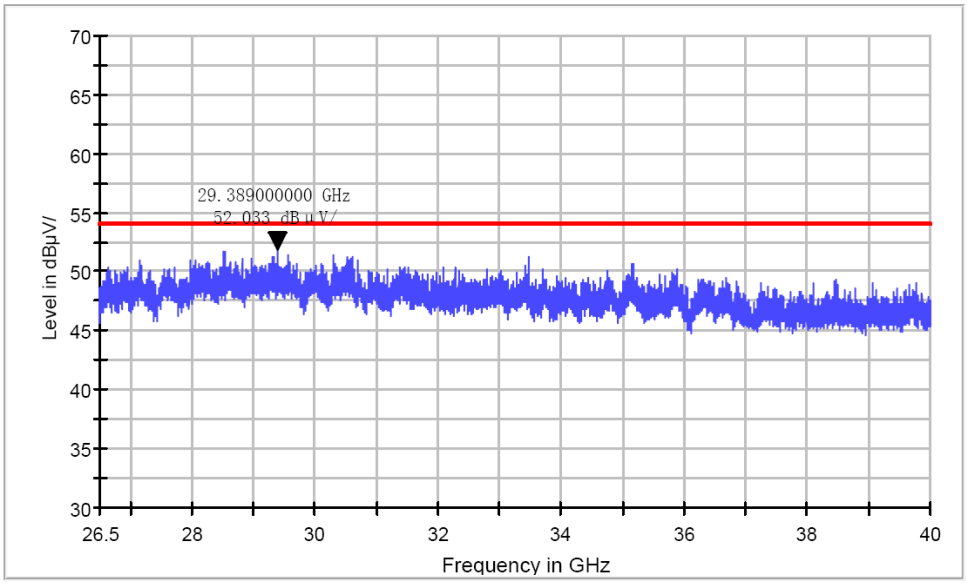
Test mode: 802.11a, N20 TX Frequency: 5180MHz, 5240MHz

The EUT is tested radiation emission at each test mode in three axes. Besides, We have tested the single antenna transmit mode and the dual antenna emission mode. The worst emissions are reflected in the following plots

Common Information

Test Site:	SMQ EMC Lab.
Environment Conditions:	
Antenna Polarization:	Horizontal
Operator Name:	
Comment:	

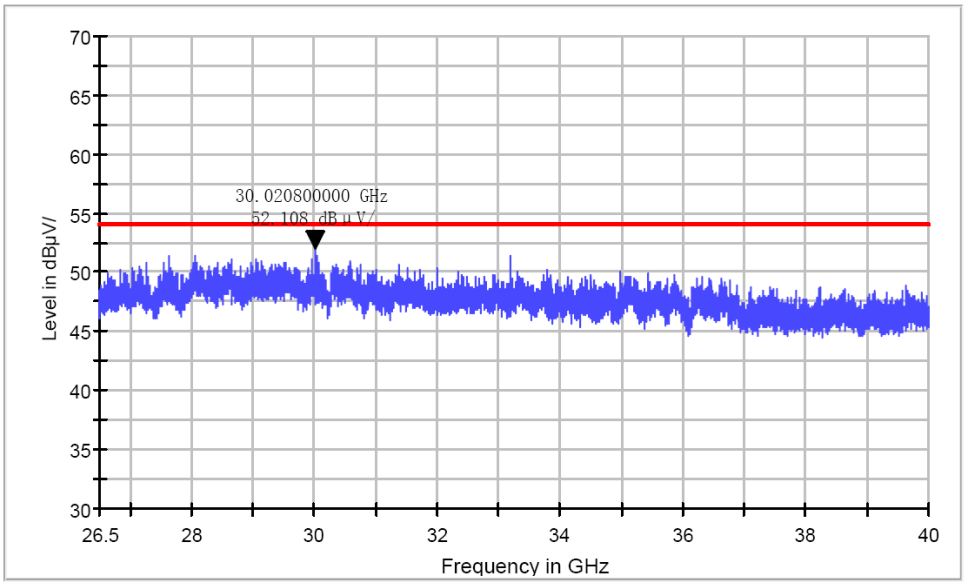
Copy of FCC Electric Field Strength 26.5-40GHz



Common Information

Test Site:	SMQ EMC Lab.
Environment Conditions:	
Antenna Polarization:	Vertical
Operator Name:	
Comment:	

Copy of FCC Electric Field Strength 26.5-40GHz



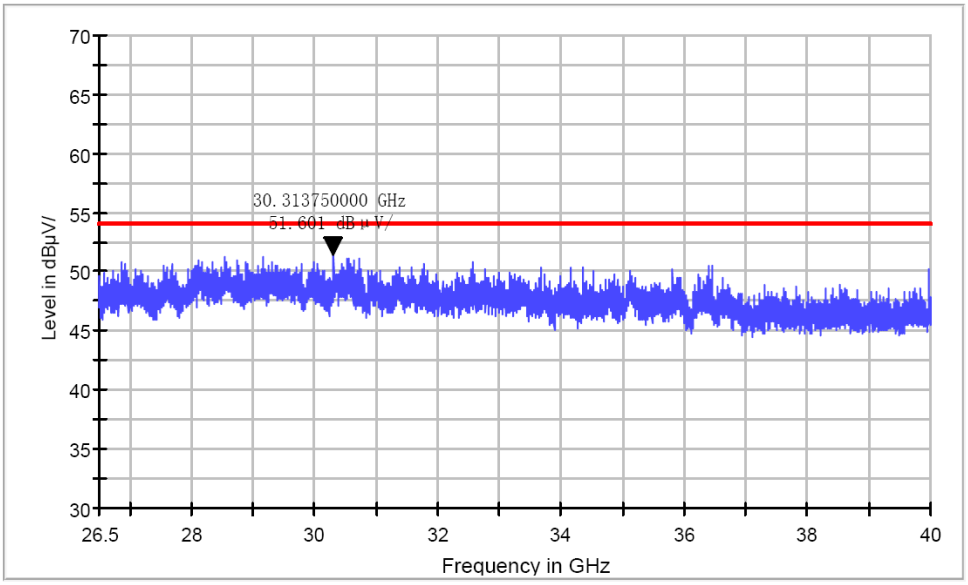
Test mode: 802.11a,N20 TX Frequency: 5745MHz, 5825MHz

The EUT is tested radiation emission at each test mode in three axes. Besides, We have tested the single antenna transmit mode and the dual antenna emission mode. The worst emissions are reflected in the following plots

Common Information

Test Site: SMQ EMC Lab.
Environment Conditions:
Antenna Polarization: Horizontal
Operator Name:
Comment:

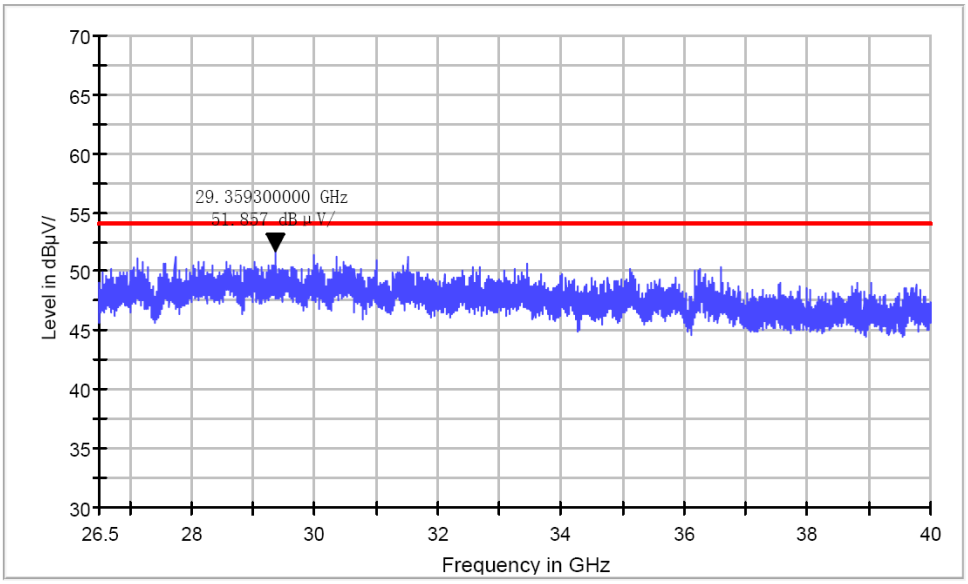
Copy of FCC Electric Field Strength 26.5-40GHz



Common Information

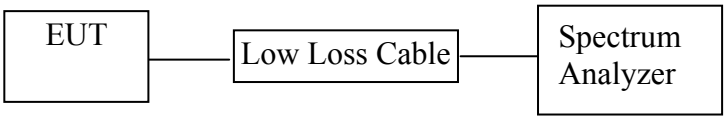
Test Site: SMQ EMC Lab.
Environment Conditions:
Antenna Polarization: Vertical
Operator Name:
Comment:

Copy of FCC Electric Field Strength 26.5-40GHz



12.BAND EDGE COMPLIANCE TEST

12.1.Block Diagram of Test Setup



12.2.The Requirement For Unwanted Emissions in the Restricted Bands

1. For all measurements, follow the requirements in section II.G.3., "General Requirements for Unwanted Emissions Measurements.
2. At frequencies below 1000 MHz, use the procedure described in section II.G.4., "Procedure for Unwanted Emissions Measurements Below 1000 MHz."
3. At frequencies above 1000 MHz, measurements performed using the peak and average measurement procedures described in sections II.G.5. and II.G.6, respectively, must satisfy the respective peak and average limits.
If all peak measurements satisfy the average limit, then average measurements are not required.
4. For conducted measurements above 1000 MHz, EIRP shall be computed as specified in section II.G.3.b) and then field strength shall be computed as follows (see KDB Publication 412172):
E[dBμV/m] = EIRP[dBm] - 20 log (d[meters]) + 104.77,
where E = field strength and d = distance at which field strength limit is specified in the rules;
E[dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

12.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 12.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 5150-5250 and 5725-5825MHz .

12.5.Test Procedure

Conducted Band Edge:

12.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.

12.5.2.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.

Radiate Band Edge:

12.5.3.The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.

12.5.4.The turntable was rotated for 360 degrees to determine the position of maximum emission level.

12.5.5.EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

12.5.6.Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

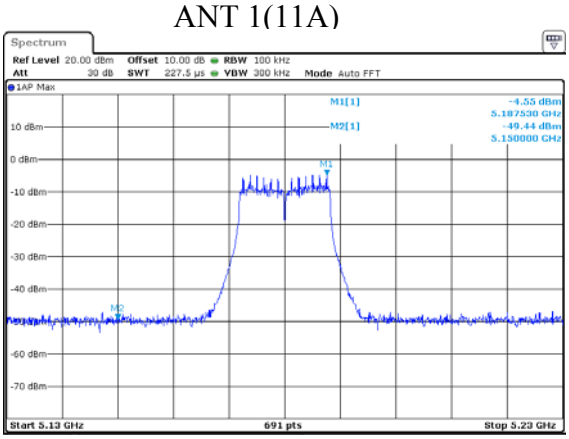
12.5.7.RBW=1MHz, VBW=1MHz

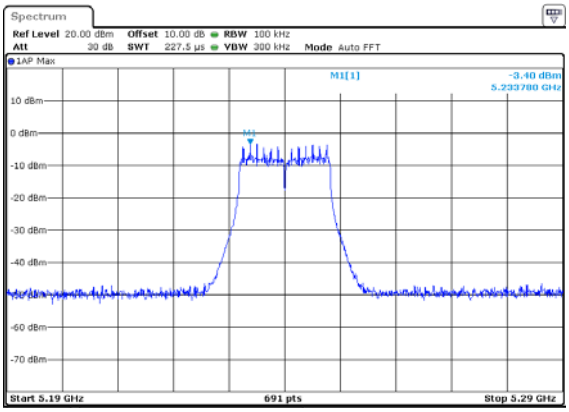
12.5.8.The band edges was measured and recorded.

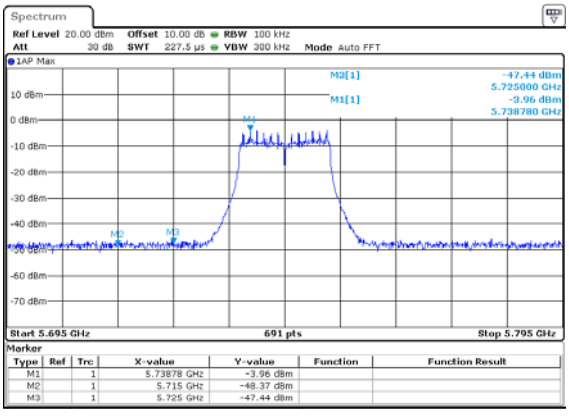
12.6.Test Result

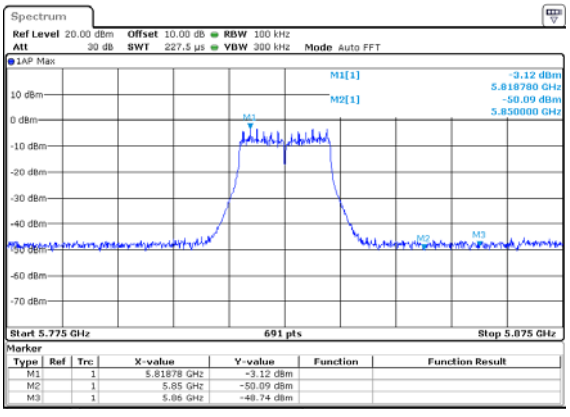
PASS

ANT 1(11A)

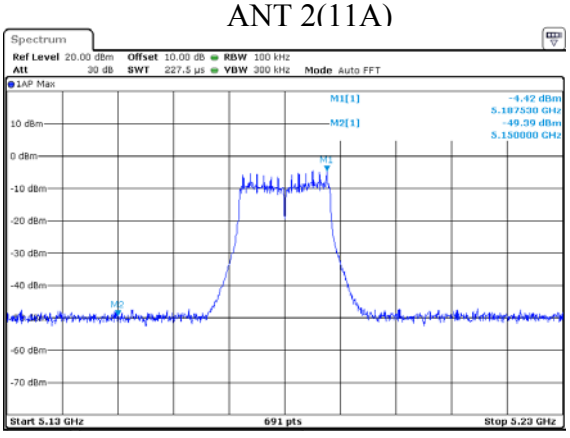


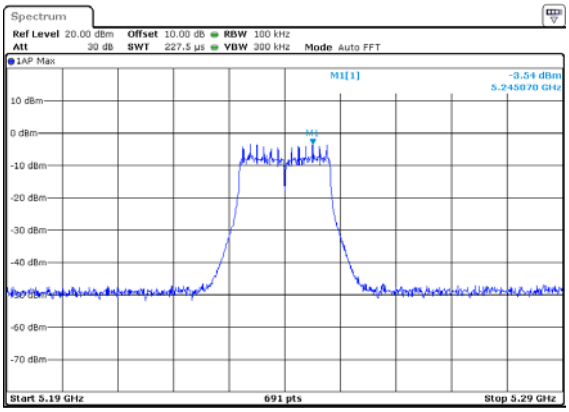


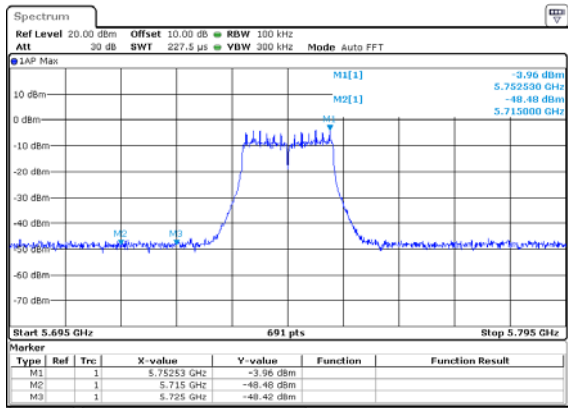


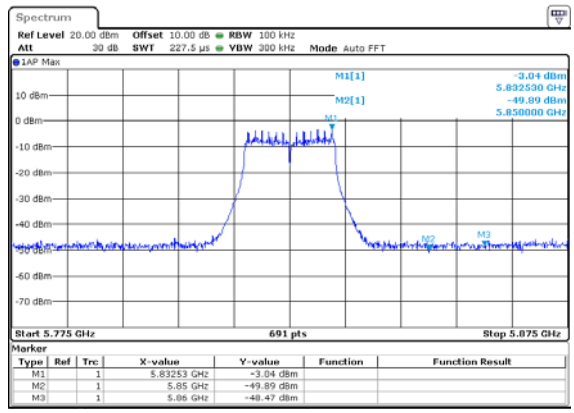


ANT 2(11A)

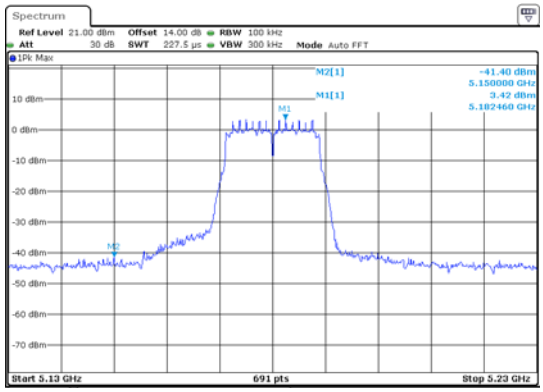


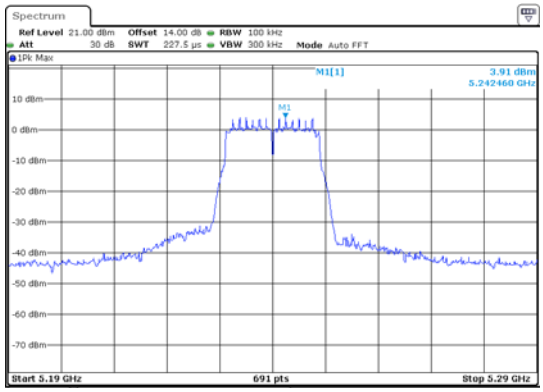


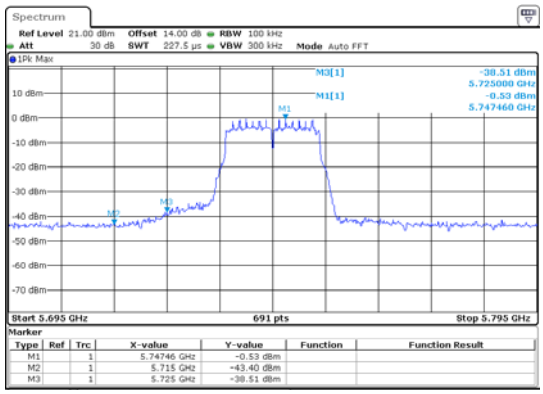


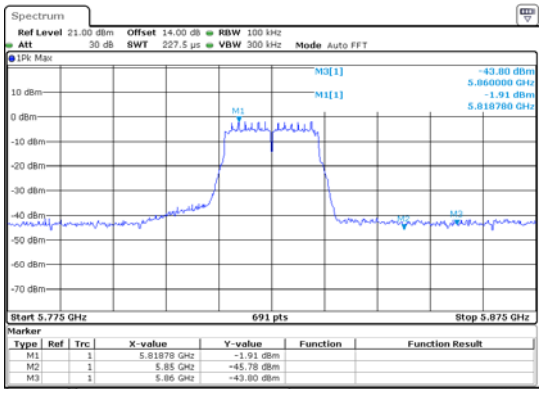


ANT 1(11N20)









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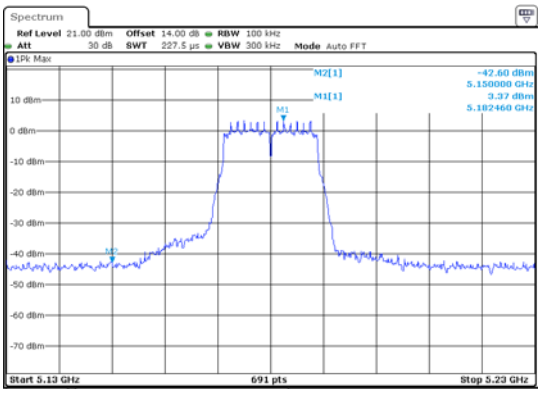

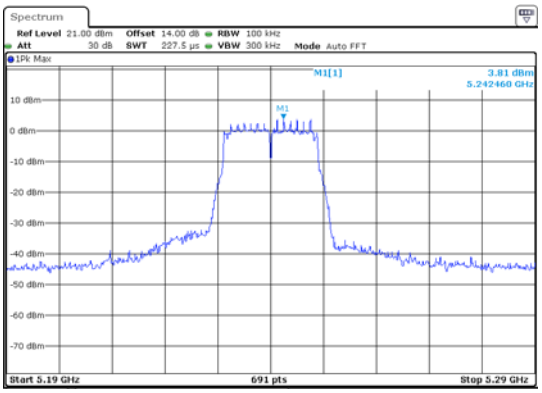

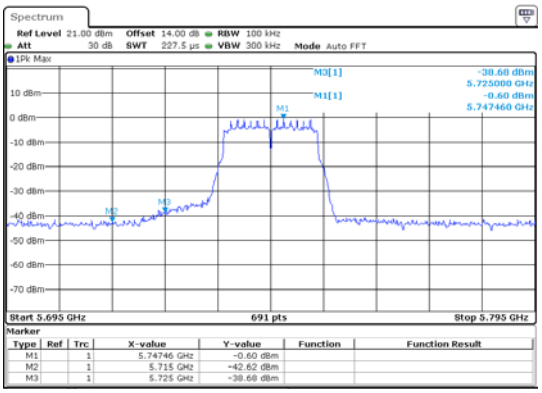

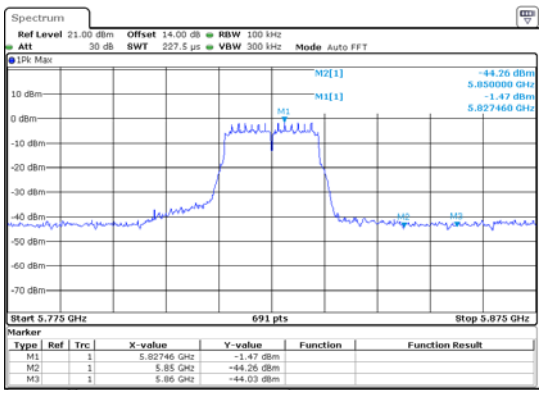

Radiated Band Edge Result

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

   Result = Reading + Corrected Factor
3. Display the measurement of peak values.
4. The EUT is tested radiation emission at each test mode (802.11a/n) in three axes. Besides, We have tested the single antenna transmit mode and the dual antenna emission mode. The worst emissions are reflected in the following plots.
5. The average measurement was not performed when peak measured data under the limit of average detection.