



TEST REPORT

Report Reference No...... : **TRE1709017503** R/C.....: 49459
FCC ID..... : **ZSW-30-048**
Applicant's name..... : **b mobile HK Limited**
Address..... : Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong.
Manufacturer..... : b mobile HK Limited
Address..... : Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong.
Test item description : **Mobile Phone**
Trade Mark : Bmobile
Model/Type reference..... : AX1015
Listed Model(s) : -
Standard : **FCC CFR Title 47 Part 15 Subpart C Section 15.247**
Date of receipt of test sample..... : Sep.20, 2017
Date of testing..... : Sep.21, 2017 - Oct.10, 2017
Date of issue..... : Oct.11, 2017
Result..... : **PASS**

Compiled by
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Testing Laboratory Name : **Shenzhen Huatongwei International Inspection Co., Ltd.**
Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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The test report merely correspond to the test sample.

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1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

[ANSI C63.10:2013](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB 558074 D01 DTS Meas Guidance v04](#): Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating under §15.247

1.2. Report version

Version No.	Date of issue	Description
00	Oct.11, 2017	Original

2. TEST DESCRIPTION

Test Item	FCC Rule	Result	Test Engineer
Antenna requirement	15.203/15.247(c)	Pass	William Wang
Line Conducted Emissions (AC Main)	15.207	Pass	William Wang
Conducted Peak Output Power	15.247(b)(3)	Pass	William Wang
Power Spectral Density	15.247(e)	Pass	William Wang
6dB Bandwidth	15.247(a)(2)	Pass	William Wang
Restricted band	15.247(d)/15.205	Pass	William Wang
Spurious Emissions	15.247(d)/15.209	Pass	William Wang

Note: The measurement uncertainty is not included in the test result.

3. SUMMARY

3.1. Client Information

Applicant:	b mobile HK Limited
Address:	Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong.
Manufacturer:	b mobile HK Limited
Address:	Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong.

3.2. Product Description

Name of EUT:	Mobile Phone
Trade Mark:	Bmobile
Model No.:	AX1015
Listed Model(s):	-
IMEI 1:	861638031655405
IMEI 2:	861638031655413
Power supply:	DC 3.8V From exchange battery
Adapter information:	Input: 100-240Va.c., 50/60Hz, 0.2A Output: 5Vd.c., 500mA
Hardware version:	SPR_S3215_V4.0
Software version:	Bmobile_AX1015_TIGO_V004
WIFI	
Supported type:	802.11b/802.11g/802.11n(HT20)
Modulation:	DSSS for 802.11b OFDM for 802.11g/802.11n(HT20)
Operation frequency:	2412MHz~2462MHz
Channel number:	11
Channel separation:	5MHz
Antenna type:	PIFA Antenna
Antenna gain:	0.8 dBi

3.3. Operation state

➤ Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

802.11b/g/n(HT20)	
Channel	Frequency (MHz)
01	2412
02	2417
03	2422
04	2427
05	2432
06	2437
07	2442
08	2447
09	2452
10	2457
11	2462

➤ Test mode

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%).
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.
For RF test axis
EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report.

3.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

○ /	Manufacturer:	/
	Model No.:	/
○ /	Manufacturer:	/
	Model No.:	/

3.5. Modifications

No modifications were implemented to meet testing criteria.

4. TEST ENVIRONMENT

4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

4.2. Test Facility

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files.

IC-Registration No.:5377B-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377B-1.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

4.3. Environmental conditions

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

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

4.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd. quality system according to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei International Inspection Co., Ltd. is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.39 dB	(1)
Radiated Emissions 30~1000MHz	4.24 dB	(1)
Radiated Emissions 1~18GHz	5.16 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

4.5. Equipments Used during the Test

Conducted Emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Artificial Mains	Rohde&Schwarz	ESH2-Z5	100028	2016/11/13
2	EMI Test Receiver	Rohde&Schwarz	ESCI3	100038	2016/11/13
3	Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	2016/11/13
4	EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	-	-

Radiated Emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI test receiver	Rohde&Schwarz	ESI 26	100009	2016/11/13
2	Loop Antenna	Rohde&Schwarz	HFH2-Z2	100020	2016/11/13
3	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2016/11/13
4	Horn antenna	ShwarzBeck	9120D	1011	2016/11/13
5	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2016/11/13
6	Amplifier	Sonoma	310N	E009-13	2016/11/13
7	JS Amplifier	Rohde&Schwarz	JS4-00101800-28-5A	F201504	2016/11/13
8	Amplifier	Compliance Direction systems	PAP1-4060	120	2016/11/13
9	High pass filter	Compliance Direction systems	BSU-6	34202	2016/11/13
10	EMI test Software	Rohde&Schwarz	ESK1	-	-
11	EMI test Software	Audix	E3	-	-
12	TURNTABLE	MATURO	TT2.0	-	-
13	ANTENNA MAST	MATURO	TAM-4.0-P	-	-

RF Conducted methods					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	2016/11/13
2	MXA Signal Analyzer	Agilent Technologies	N9020A	MY5050187	2016/11/13

The Cal.Interval was one year.

5. TEST CONDITIONS AND RESULTS

5.1. Antenna requirement

REQUIREMENT:

FCC CFR Title 47 Part 15 Subpart C Section 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

TEST RESULTS

Passed Not Applicable

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



5.2. Conducted Emissions (AC Main)

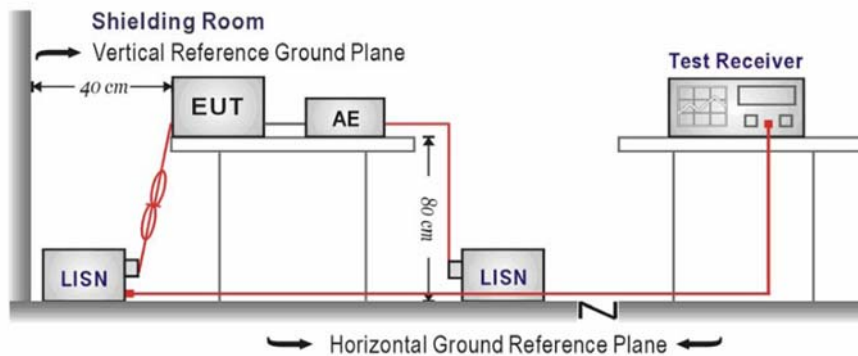
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

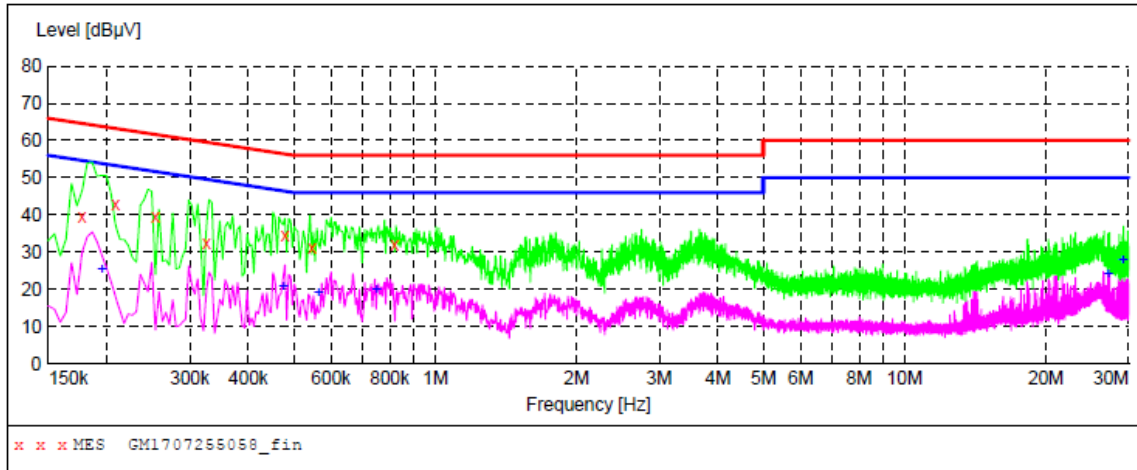
Passed Not Applicable

Note:

- 1) Transd=Cable lose+ Pulse Limiter Factor + Artificial Mains Factor
- 2) Margin= Limit -Level

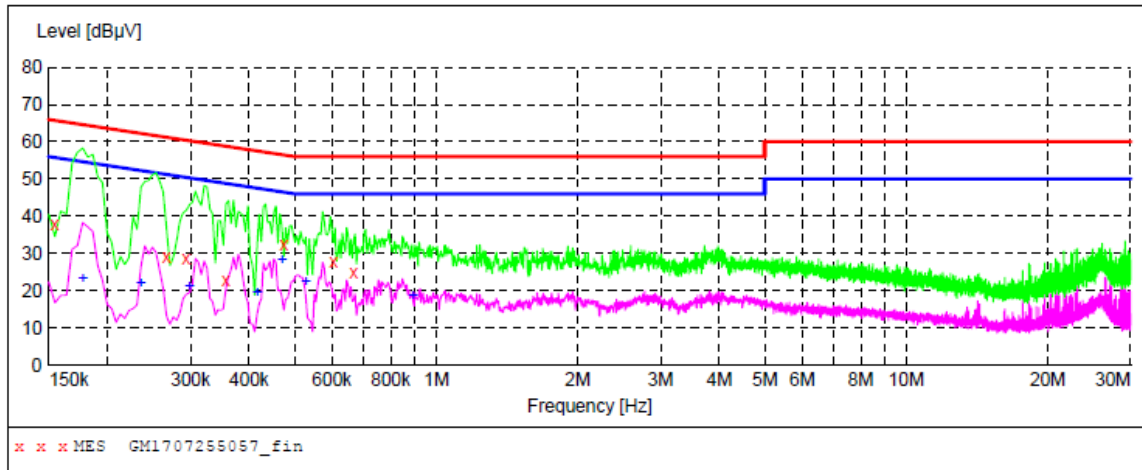
Test Line:

L



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	39.60	10.4	65	25.0	QP	L1	GND
0.208500	42.70	10.3	63	20.6	QP	L1	GND
0.253500	39.40	10.3	62	22.2	QP	L1	GND
0.325500	32.30	10.2	60	27.3	QP	L1	GND
0.478500	34.50	10.2	56	21.9	QP	L1	GND
0.546000	31.00	10.2	56	25.0	QP	L1	GND
0.820500	31.90	10.2	56	24.1	QP	L1	GND
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	25.50	10.3	54	28.3	AV	L1	GND
0.474000	20.90	10.2	46	25.5	AV	L1	GND
0.564000	19.10	10.2	46	26.9	AV	L1	GND
0.748500	19.80	10.2	46	26.2	AV	L1	GND
27.159000	24.10	10.7	50	25.9	AV	L1	GND
29.233500	27.80	10.8	50	22.2	AV	L1	GND

Test Line: N



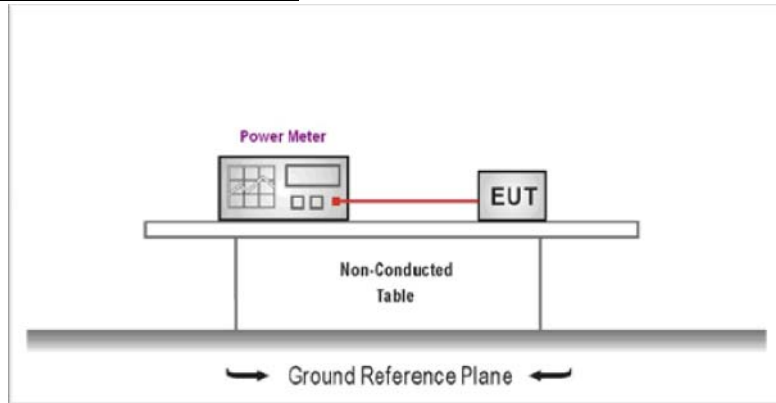
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	38.00	10.4	66	27.8	QP	N	GND
0.267000	29.00	10.3	61	32.2	QP	N	GND
0.294000	28.70	10.2	60	31.7	QP	N	GND
0.357000	22.70	10.2	59	36.1	QP	N	GND
0.474000	32.40	10.2	56	24.0	QP	N	GND
0.604500	28.00	10.2	56	28.0	QP	N	GND
0.667500	24.80	10.2	56	31.2	QP	N	GND
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	23.40	10.4	55	31.2	AV	N	GND
0.235500	22.00	10.3	52	30.3	AV	N	GND
0.298500	21.20	10.2	50	29.1	AV	N	GND
0.415500	19.40	10.2	48	28.1	AV	N	GND
0.469500	28.30	10.2	47	18.2	AV	N	GND
0.528000	22.40	10.2	46	23.6	AV	N	GND
0.892500	18.60	10.1	46	27.4	AV	N	GND

5.3. Conducted Peak Output Power

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3): **30dBm**:

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10: 2013 and KDB 558074 D01 for compliance to FCC 47 CFR 15.247 requirements.
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
3. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector
4. Record the measurement data.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

Passed Not Applicable

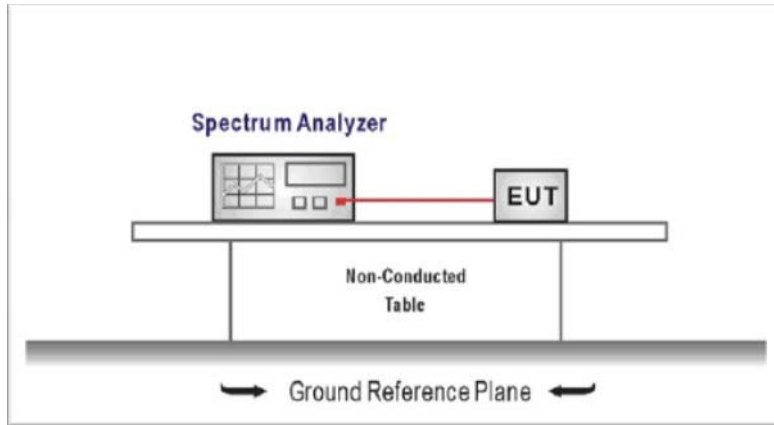
Type	Channel	Output power (dBm)	Limit (dBm)	Result
802.11b	01	17.81	≤30.00	Pass
	06	17.63		
	11	17.92		
802.11g	01	16.56	≤30.00	Pass
	06	15.09		
	11	16.48		
802.11n(HT20)	01	15.44	≤30.00	Pass
	06	14.56		
	11	14.92		

5.4. Power Spectral Density

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e):For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input,
2. Configure the spectrum analyzer as shown below:
 Center frequency=DTS channel center frequency
 Span =1.5 times the DTS bandwidth
 RBW = 3 kHz ≤ RBW ≤ 100 kHz, VBW ≥ 3 × RBW
 Sweep time = auto couple
 Detector = peak
 Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Use the peak marker function to determine the maximum amplitude level within the RBW.
5. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST MODE:




Please refer to the clause 3.3




TEST RESULTS

Passed Not Applicable

Type	Channel	Power Spectral Density (dBm/RBW)	Limit (dBm/RBW)	Result
802.11b	01	4.448	≤8.00	Pass
	06	-0.211		
	11	4.695		
802.11g	01	-7.043	≤8.00	Pass
	06	-8.475		
	11	-6.129		
802.11n(HT20)	01	-8.297	≤8.00	Pass
	06	-10.787		
	11	-8.135		

Test plot as follows:

Type:		802.11 b	
CH01		<p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq 2.41200000 GHz</p> <p>Mkr1 2.411 251 9 GHz 4.448 dBm</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.404500000 GHz</p> <p>Stop Freq 2.419500000 GHz</p> <p>CF Step 1.500000 MHz</p> <p>Freq Offset 0 Hz</p> <p>Center 2.412000 GHz</p> <p>Span 15.00 MHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Sweep 16.00 ms (8001 pts)</p>	
CH06		<p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq 2.43700000 GHz</p> <p>Mkr1 2.436 251 9 GHz -0.211 dBm</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.429500000 GHz</p> <p>Stop Freq 2.444500000 GHz</p> <p>CF Step 1.500000 MHz</p> <p>Freq Offset 0 Hz</p> <p>Center 2.437000 GHz</p> <p>Span 15.00 MHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Sweep 16.00 ms (8001 pts)</p>	
CH11		<p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq 2.46200000 GHz</p> <p>Mkr1 2.461 251 9 GHz 4.695 dBm</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.454500000 GHz</p> <p>Stop Freq 2.469500000 GHz</p> <p>CF Step 1.500000 MHz</p> <p>Freq Offset 0 Hz</p> <p>Center 2.462000 GHz</p> <p>Span 15.00 MHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Sweep 16.00 ms (8001 pts)</p>	

Type:		802.11 g	
CH01		<p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq 2.41200000 GHz</p> <p>Ref Offset 1 dB Ref 7.00 dBm</p> <p>Mkr1 2.411 375 GHz -7.043 dBm</p> <p>Center 2.41200 GHz #Res BW 30 kHz</p> <p>Span 25.00 MHz #VBW 100 kHz Sweep 26.67 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39950000 GHz</p> <p>Stop Freq 2.42450000 GHz</p> <p>CF Step Auto 2.500000 MHz Man</p> <p>Freq Offset 0 Hz</p>
CH06		<p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq 2.43700000 GHz</p> <p>Ref Offset 1 dB Ref 7.00 dBm</p> <p>Mkr1 2.439 488 GHz -8.475 dBm</p> <p>Center 2.43700 GHz #Res BW 30 kHz</p> <p>Span 25.00 MHz #VBW 100 kHz Sweep 26.67 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42450000 GHz</p> <p>Stop Freq 2.44950000 GHz</p> <p>CF Step Auto 2.500000 MHz Man</p> <p>Freq Offset 0 Hz</p>
CH11		<p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq 2.46200000 GHz</p> <p>Ref Offset 1 dB Ref 7.00 dBm</p> <p>Mkr1 2.464 494 GHz -6.129 dBm</p> <p>Center 2.46200 GHz #Res BW 30 kHz</p> <p>Span 25.00 MHz #VBW 100 kHz Sweep 26.67 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44950000 GHz</p> <p>Stop Freq 2.47450000 GHz</p> <p>CF Step Auto 2.500000 MHz Man</p> <p>Freq Offset 0 Hz</p>

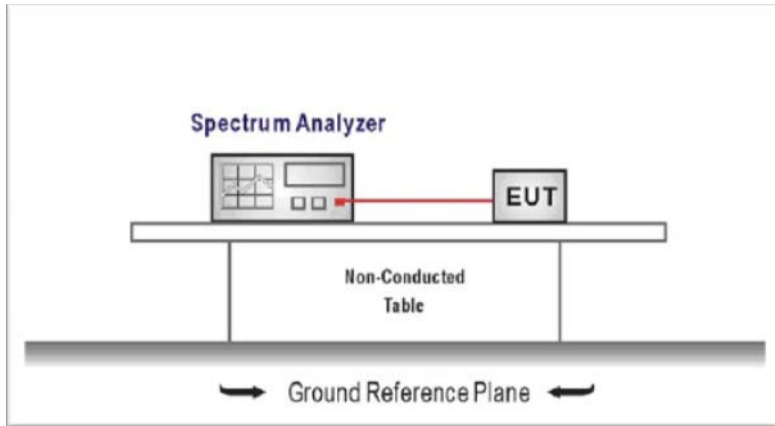
Type:		802.11n(HT20)	
CH01		<p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.412000000 GHz Ref Offset 1 dB Ref 7.00 dBm Mkr1 2.409 778 GHz -9.297 dBm Center 2.41200 GHz #Res BW 30 kHz #VBW 100 kHz Span 25.00 MHz Sweep 26.67 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.399500000 GHz</p> <p>Stop Freq 2.424500000 GHz</p> <p>CF Step Auto 2.500000 MHz Man</p> <p>Freq Offset 0 Hz</p>
CH06		<p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.437000000 GHz Ref Offset 1 dB Ref 20.00 dBm Mkr1 2.430 744 GHz -10.787 dBm Center 2.43700 GHz #Res BW 30 kHz #VBW 100 kHz Span 25.00 MHz Sweep 26.67 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.437000000 GHz</p> <p>Start Freq 2.424500000 GHz</p> <p>Stop Freq 2.449500000 GHz</p> <p>CF Step Auto 2.500000 MHz Man</p> <p>Freq Offset 0 Hz</p>
CH11		<p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.462000000 GHz Ref Offset 1 dB Ref 20.00 dBm Mkr1 2.460 725 GHz -9.135 dBm Center 2.46200 GHz #Res BW 30 kHz #VBW 100 kHz Span 25.00 MHz Sweep 26.67 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.462000000 GHz</p> <p>Start Freq 2.449500000 GHz</p> <p>Stop Freq 2.474500000 GHz</p> <p>CF Step Auto 2.500000 MHz Man</p> <p>Freq Offset 0 Hz</p>

5.5. 6dB bandwidth

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2):For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
 Center Frequency =DTS channel center frequency
 Span=2 x DTS bandwidth
 RBW = 100 kHz, VBW ≥ 3 × RBW
 Sweep time= auto couple
 Detector = Peak
 Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. 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, and record the pertinent measurements.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

Passed **Not Applicable**

Type	Channel	6dB Bandwidth (MHz)	Limit (kHz)	Result
802.11b	01	8.005	≥500	Pass
	06	8.592		
	11	7.683		
802.11g	01	15.06	≥500	Pass
	06	16.42		
	11	13.05		
802.11n(HT20)	01	14.58	≥500	Pass
	06	16.44		
	11	13.38		

Test plot as follows:

Type:		802.11 b	
CH01		<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Center 2.412 GHz #Res BW 100 kHz</p> <p>Occupied Bandwidth 10.883 MHz</p> <p>Total Power 19.6 dBm</p> <p>Transmit Freq Error -306.82 kHz</p> <p>x dB Bandwidth 8.005 MHz</p>	<p>Frequency</p> <p>Center Freq 2.412000000 GHz</p> <p>CF Step 2.500000 MHz</p> <p>Freq Offset 0 Hz</p>
CH06		<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Center 2.437 GHz #Res BW 100 kHz</p> <p>Occupied Bandwidth 11.702 MHz</p> <p>Total Power 15.3 dBm</p> <p>Transmit Freq Error -41.246 kHz</p> <p>x dB Bandwidth 8.592 MHz</p>	<p>Frequency</p> <p>Center Freq 2.437000000 GHz</p> <p>CF Step 2.500000 MHz</p> <p>Freq Offset 0 Hz</p>
CH11		<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Center 2.462 GHz #Res BW 100 kHz</p> <p>Occupied Bandwidth 10.979 MHz</p> <p>Total Power 20.0 dBm</p> <p>Transmit Freq Error 455.67 kHz</p> <p>x dB Bandwidth 7.683 MHz</p>	<p>Frequency</p> <p>Center Freq 2.462000000 GHz</p> <p>CF Step 2.500000 MHz</p> <p>Freq Offset 0 Hz</p>

Type:		802.11 g
CH01	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 10/10</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Center 2.412 GHz Span 40 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms</p> <p>Occupied Bandwidth 16.257 MHz Total Power 12.9 dBm</p> <p>Transmit Freq Error -15.204 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 15.06 MHz x dB -6.00 dB</p> <p>Frequency 2.412000000 GHz</p> <p>CF Step 4.000000 MHz</p> <p>Freq Offset 0 Hz</p>	
CH06	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 10/10</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Center 2.437 GHz Span 40 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms</p> <p>Occupied Bandwidth 16.427 MHz Total Power 9.27 dBm</p> <p>Transmit Freq Error -3.066 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 16.42 MHz x dB -6.00 dB</p> <p>Mkr1 2.43451 GHz -9.2420 dBm</p> <p>Frequency 2.437000000 GHz</p> <p>CF Step 4.000000 MHz</p> <p>Freq Offset 0 Hz</p>	
CH11	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 10/10</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Center 2.462 GHz Span 40 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms</p> <p>Occupied Bandwidth 16.203 MHz Total Power 13.8 dBm</p> <p>Transmit Freq Error 5.435 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 13.05 MHz x dB -6.00 dB</p> <p>Frequency 2.462000000 GHz</p> <p>CF Step 4.000000 MHz</p> <p>Freq Offset 0 Hz</p>	

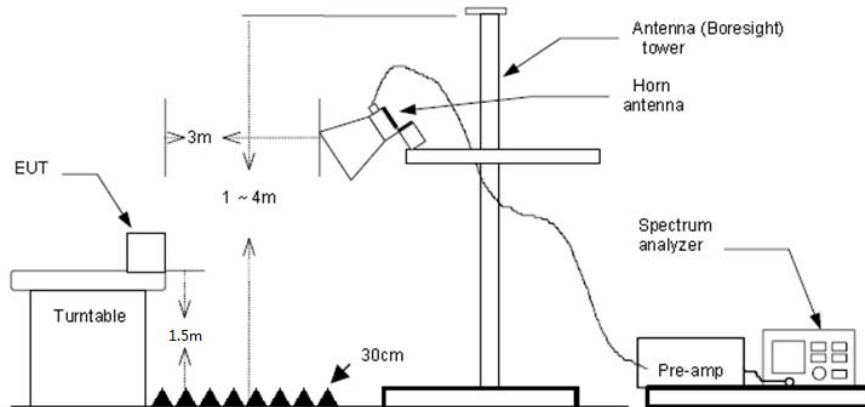
Type:		802.11n(HT20)	
CH01		<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Occupied Bandwidth: 17.337 MHz</p> <p>Total Power: 11.3 dBm</p> <p>Transmit Freq Error: -8.153 kHz</p> <p>x dB Bandwidth: 14.58 MHz</p>	<p>Frequency</p> <p>Center Freq 2.412000000 GHz</p> <p>CF Step 4.000000 MHz</p> <p>Freq Offset 0 Hz</p>
CH06		<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Occupied Bandwidth: 17.590 MHz</p> <p>Total Power: 9.96 dBm</p> <p>Transmit Freq Error: -6.756 kHz</p> <p>x dB Bandwidth: 16.44 MHz</p>	<p>Frequency</p> <p>Center Freq 2.437000000 GHz</p> <p>CF Step 4.000000 MHz</p> <p>Freq Offset 0 Hz</p>
CH11		<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Occupied Bandwidth: 17.297 MHz</p> <p>Total Power: 13.6 dBm</p> <p>Transmit Freq Error: 20.004 kHz</p> <p>x dB Bandwidth: 13.38 MHz</p>	<p>Frequency</p> <p>Center Freq 2.462000000 GHz</p> <p>CF Step 4.000000 MHz</p> <p>Freq Offset 0 Hz</p>

5.6. Restricted band

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

TEST CONFIGURATION



TEST PROCEDURE

- 1) The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2) The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3) The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- 4) The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- 5) The receiver set as follow:
 RBW=1MHz, VBW=3MHz PEAK detector for Peak value.
 RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

Passed Not Applicable

Note:

- 1) Final level= Read level + Antenna Factor+ Cable Loss- Preamp Factor

802.11b					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2310.00	12.33	28.05	6.62	0.00	47.00	74.00	-27.00	Vertical	Peak
2390.01	12.38	27.65	6.75	0.00	46.78	74.00	-27.22	Vertical	Peak
2310.00	13.49	28.05	6.62	0.00	48.16	74.00	-25.84	Horizontal	Peak
2390.01	13.60	27.65	6.75	0.00	48.00	74.00	-26.00	Horizontal	Peak

802.11b					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2483.49	13.78	27.26	6.83	0.00	47.87	74.00	-26.13	Vertical	Peak
2500.00	13.43	27.20	6.84	0.00	47.47	74.00	-26.53	Vertical	Peak
2483.49	12.65	27.26	6.83	0.00	46.74	74.00	-27.26	Horizontal	Peak
2500.00	13.97	27.20	6.84	0.00	48.01	74.00	-25.99	Horizontal	Peak

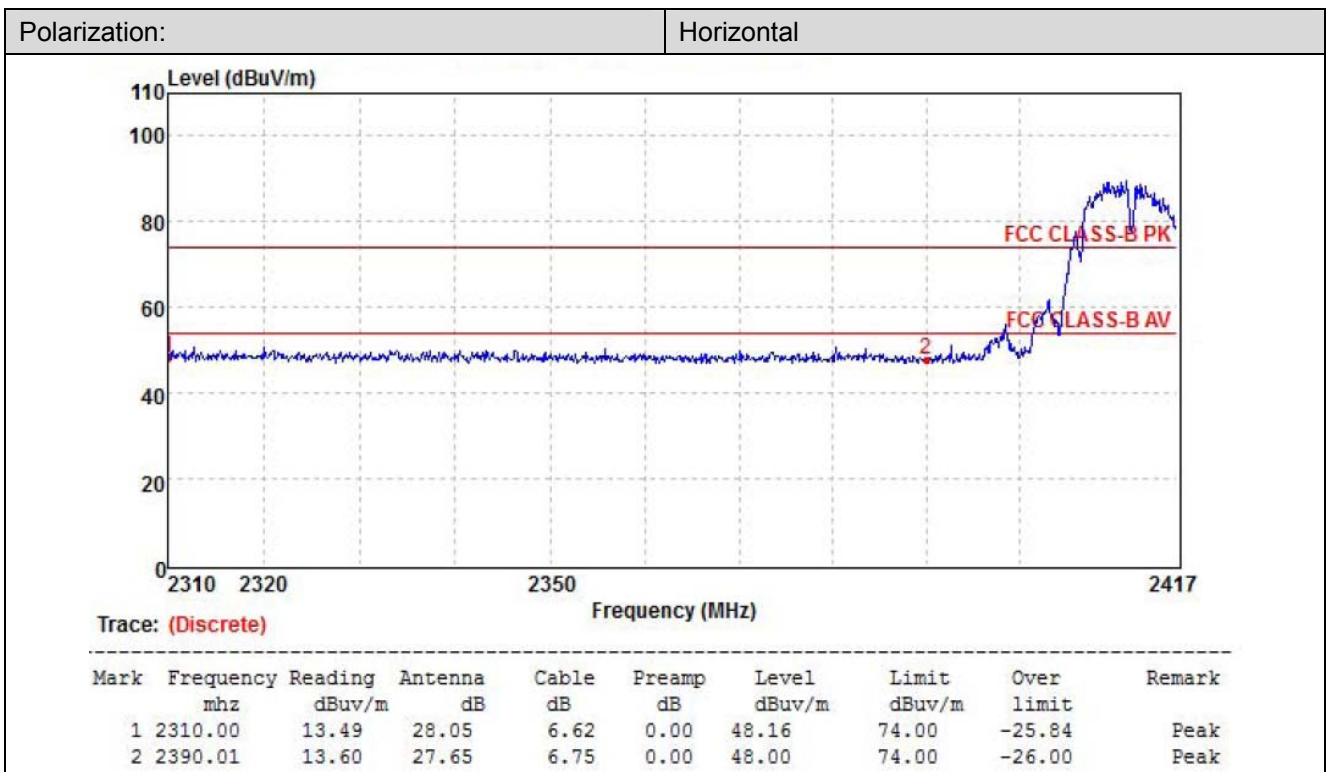
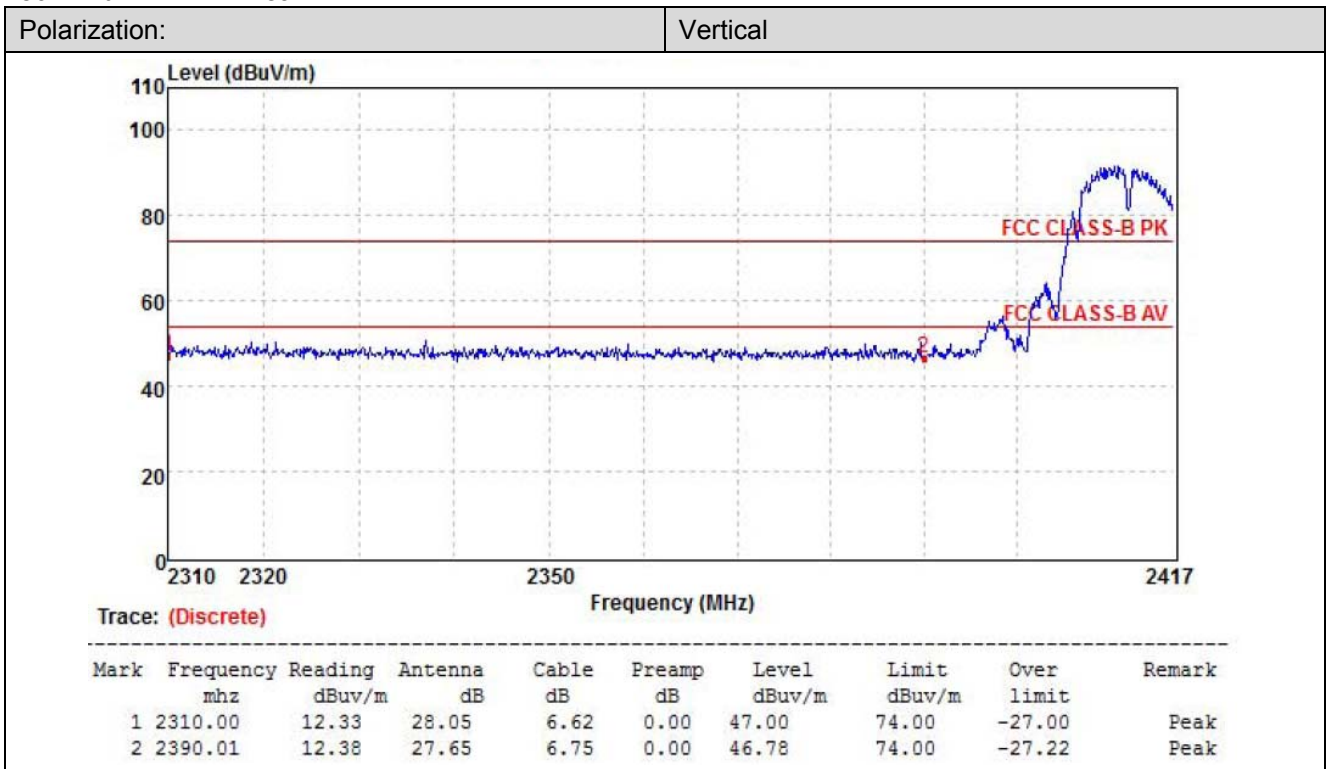
802.11g					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2310.00	13.70	28.05	6.62	0.00	48.37	74.00	-25.63	Vertical	Peak
2390.01	13.32	27.65	6.75	0.00	47.72	74.00	-26.28	Vertical	Peak
2310.00	15.38	28.05	6.62	0.00	50.05	74.00	-23.95	Horizontal	Peak
2390.01	12.71	27.65	6.75	0.00	47.11	74.00	-26.89	Horizontal	Peak

802.11g					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2483.49	13.65	27.26	6.83	0.00	47.74	74.00	-26.26	Vertical	Peak
2500.00	14.35	27.20	6.84	0.00	48.39	74.00	-25.61	Vertical	Peak
2483.49	14.72	27.26	6.83	0.00	48.81	74.00	-25.19	Horizontal	Peak
2500.00	14.32	27.20	6.84	0.00	48.36	74.00	-25.64	Horizontal	Peak

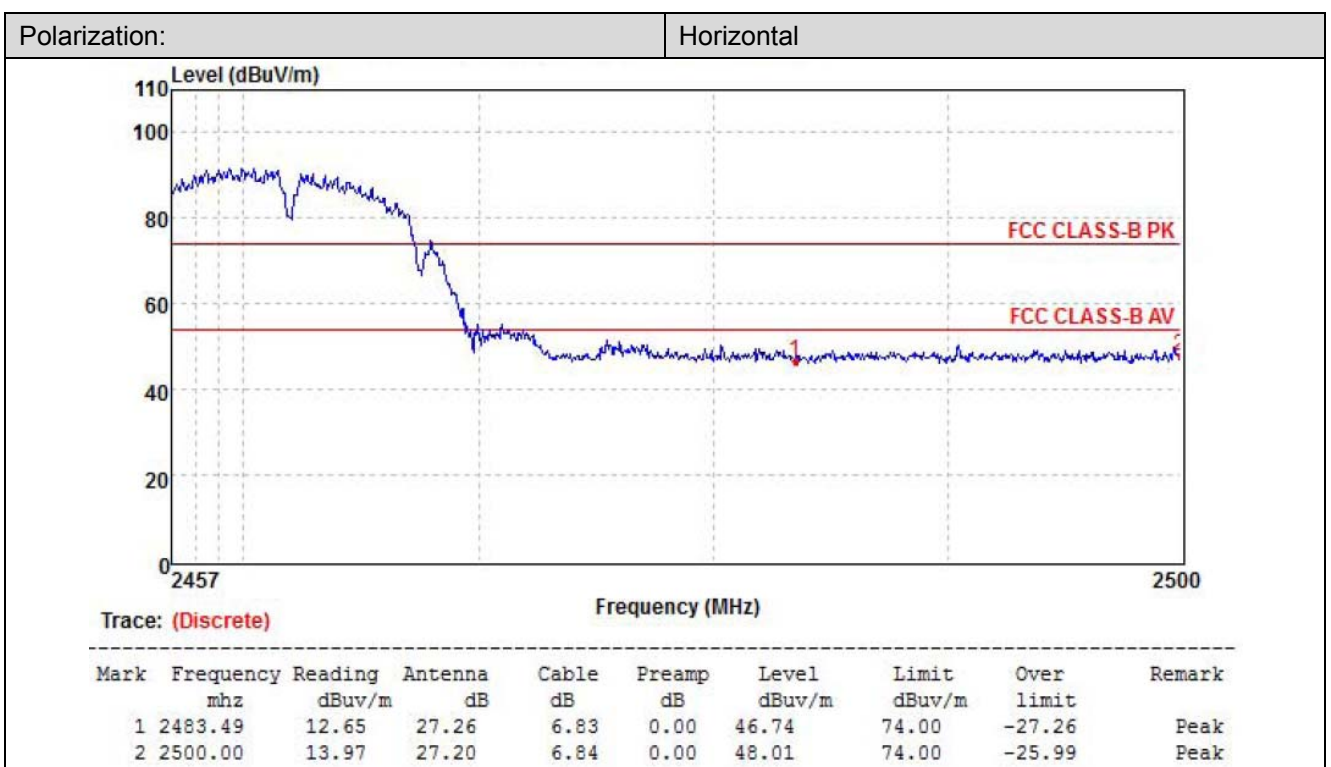
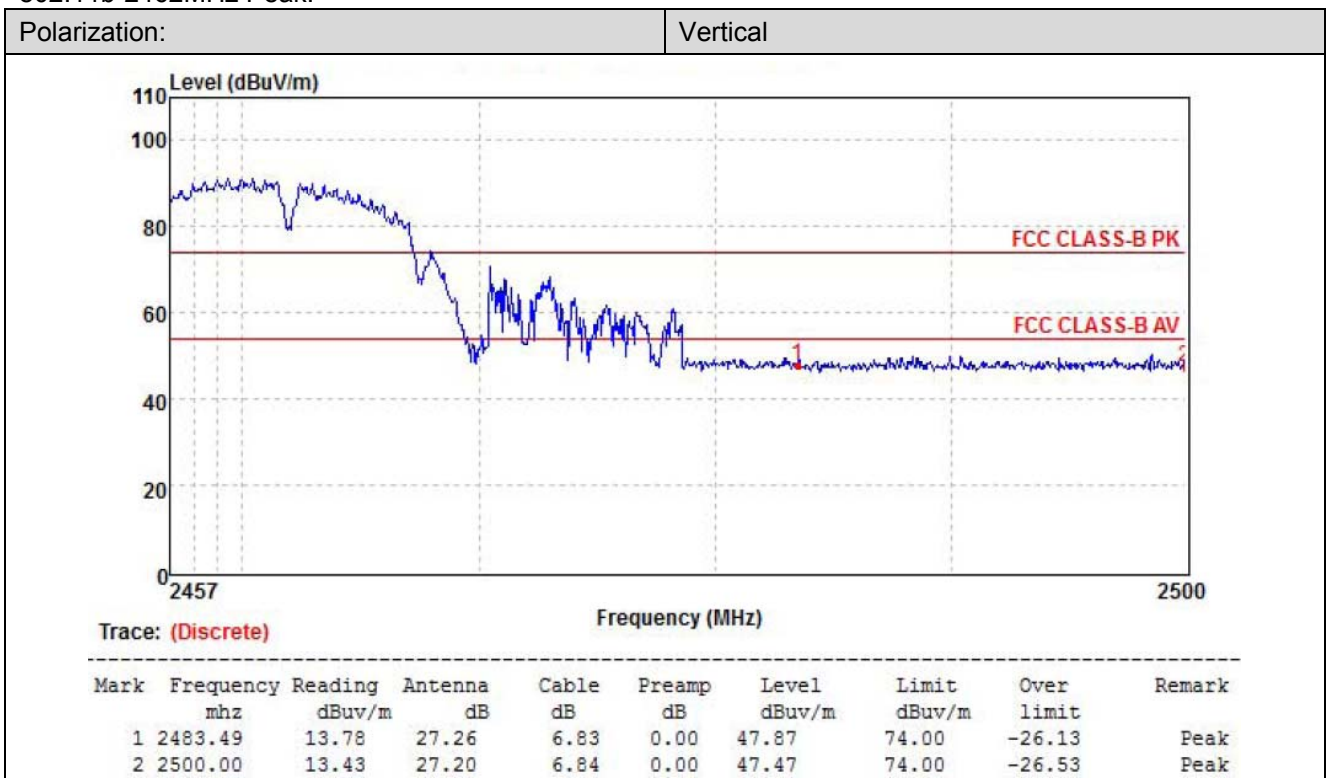
802.11n(HT20)					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2310.00	13.87	28.05	6.62	0.00	48.54	74.00	-25.46	Vertical	Peak
2390.01	14.64	27.65	6.75	0.00	49.04	74.00	-24.96	Vertical	Peak
2310.00	14.09	28.05	6.62	0.00	48.76	74.00	-25.24	Horizontal	Peak
2390.01	13.61	27.65	6.75	0.00	48.01	74.00	-25.99	Horizontal	Peak

802.11n(HT20)					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2483.49	13.80	27.26	6.83	0.00	47.89	74.00	-26.11	Vertical	Peak
2500.00	11.93	27.20	6.84	0.00	45.97	74.00	-28.03	Vertical	Peak
2483.49	13.56	27.26	6.83	0.00	47.65	74.00	-26.35	Horizontal	Peak
2500.00	14.27	27.20	6.84	0.00	48.31	74.00	-25.69	Horizontal	Peak

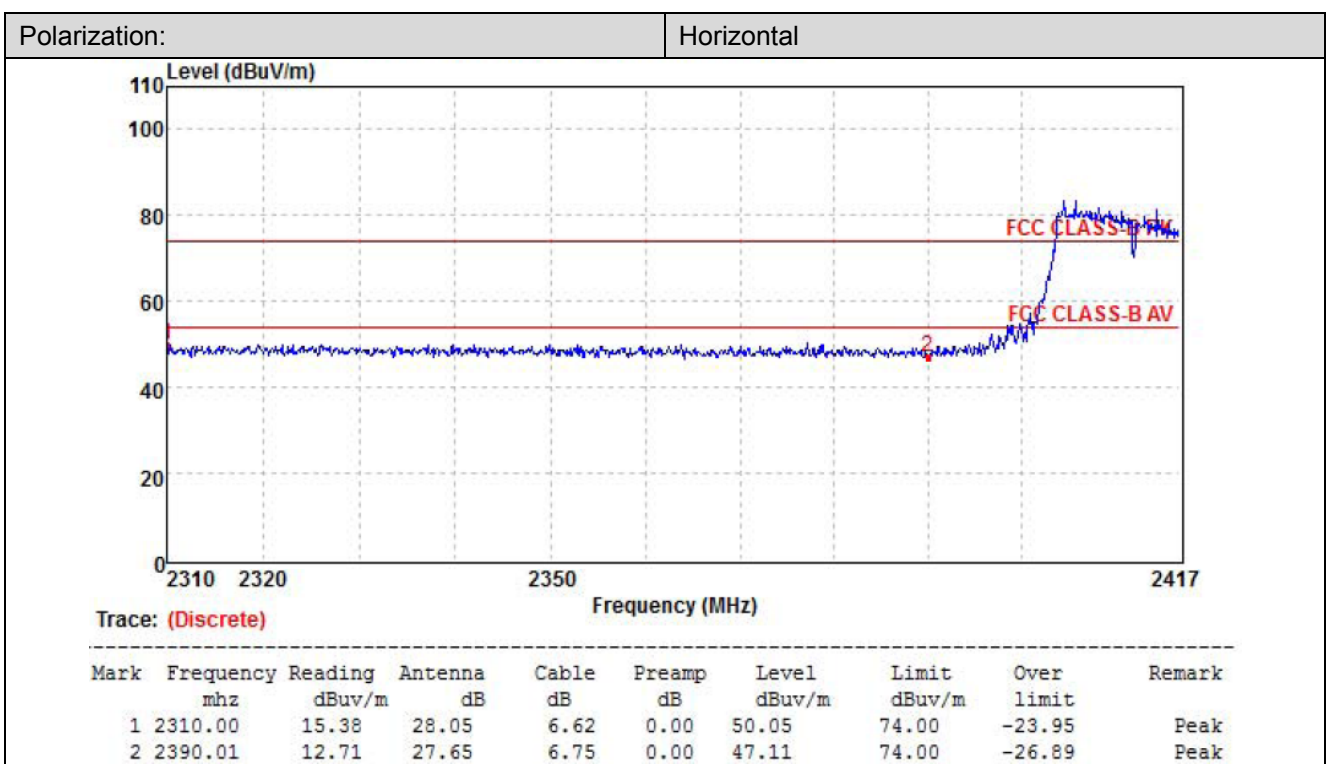
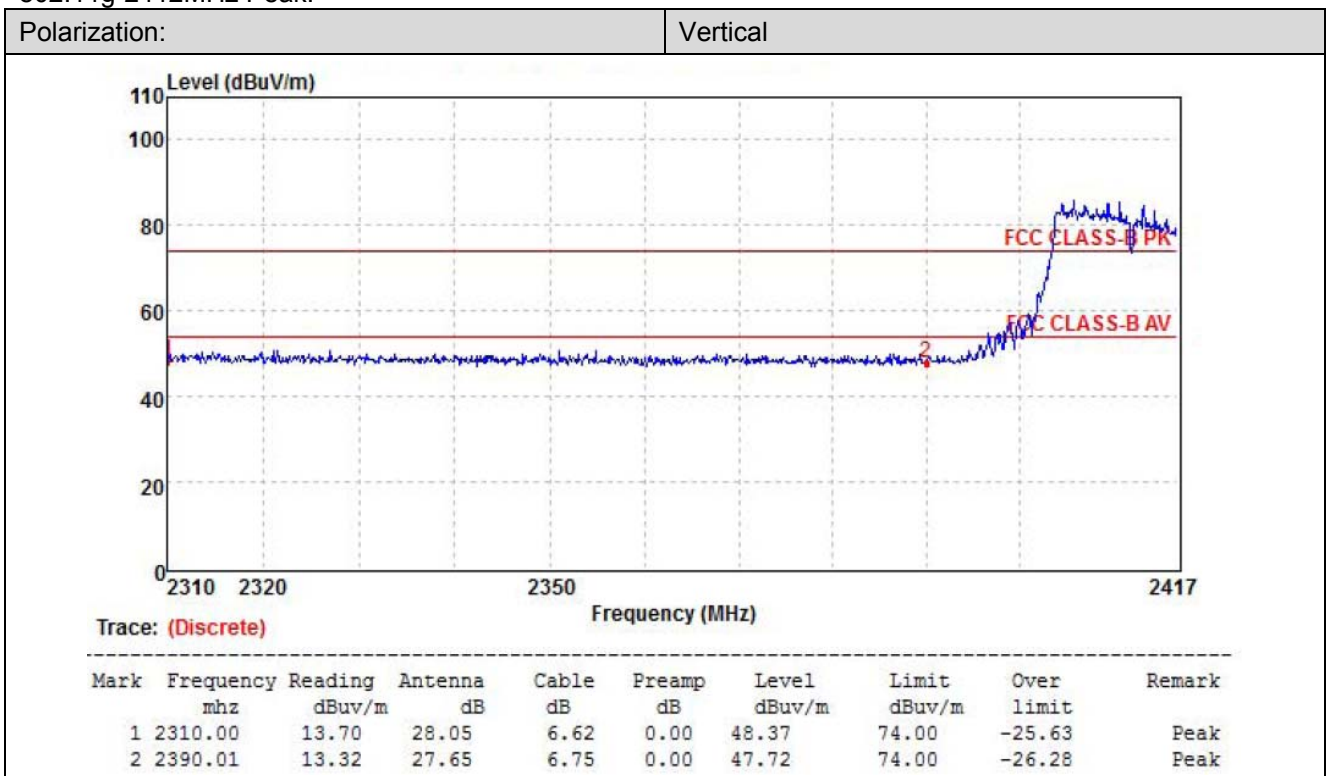
802.11b-2412MHz Peak:



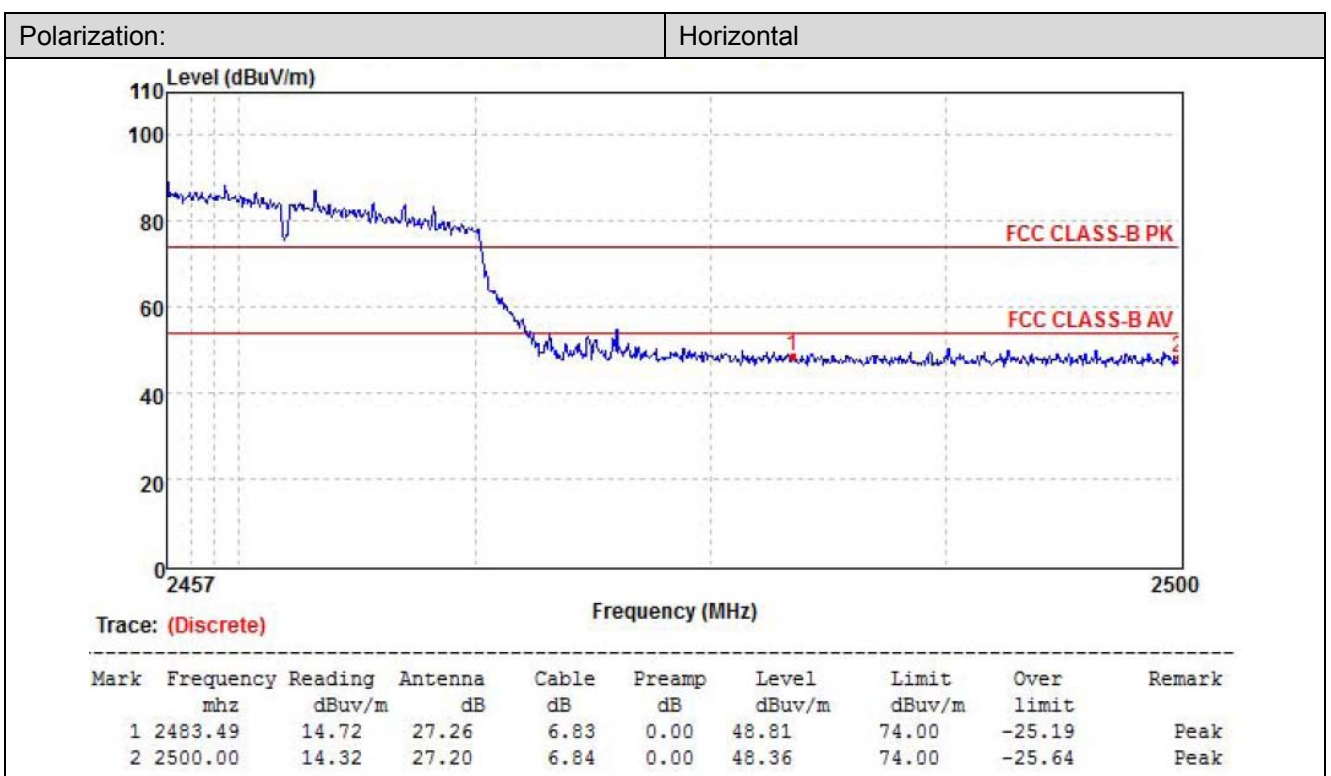
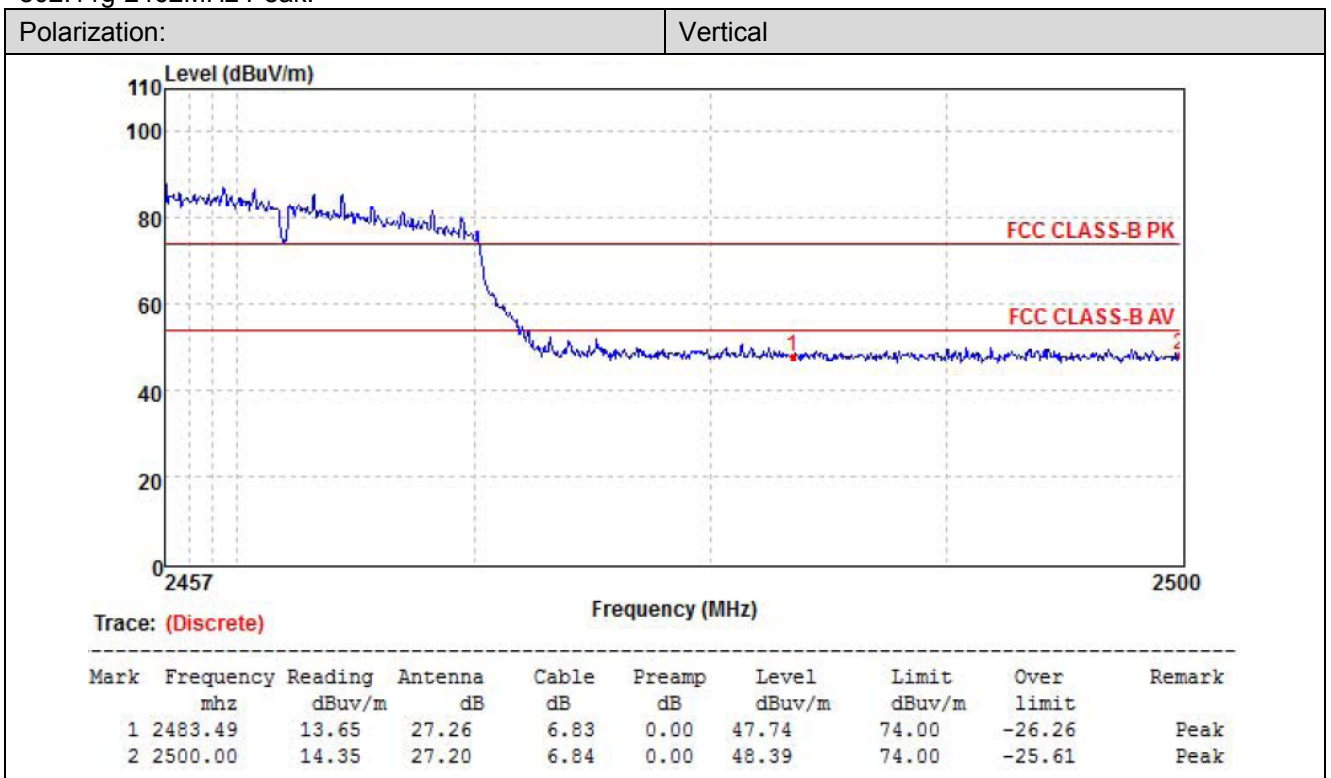
802.11b-2462MHz Peak:



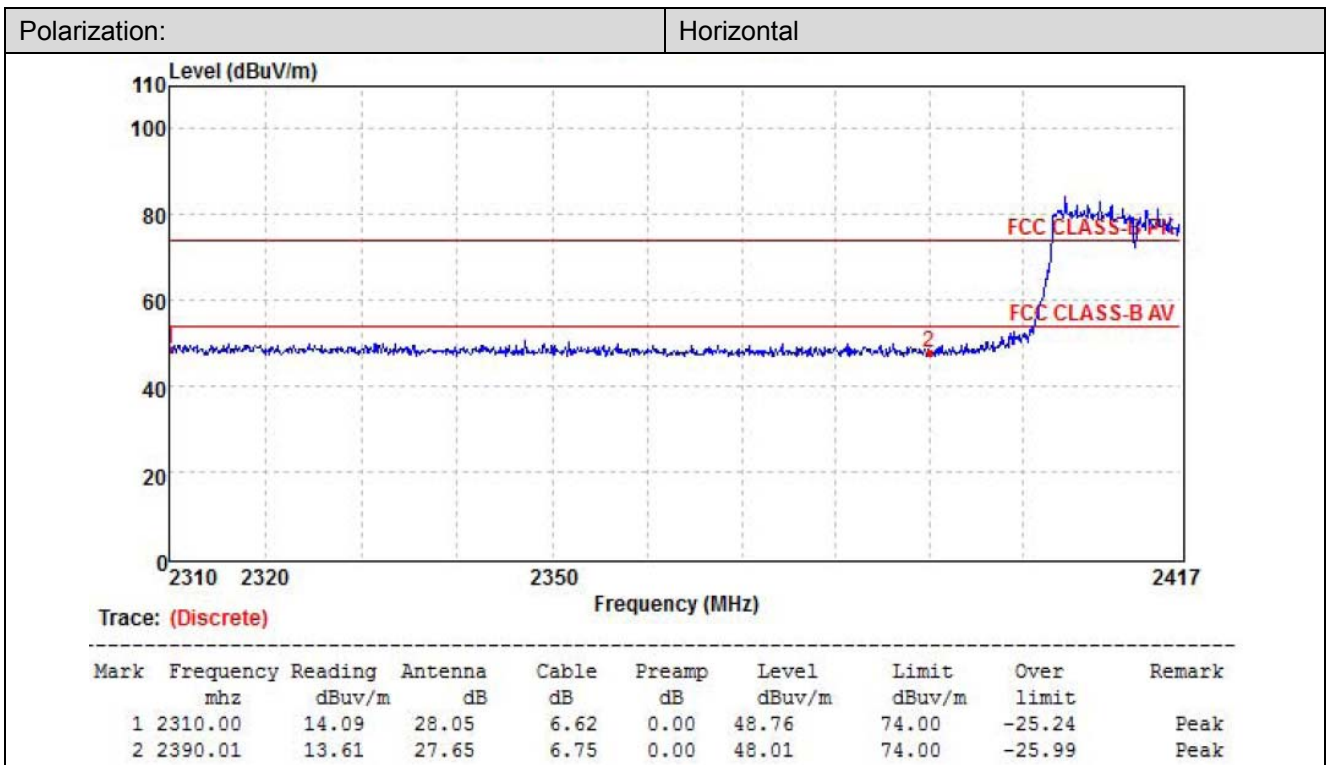
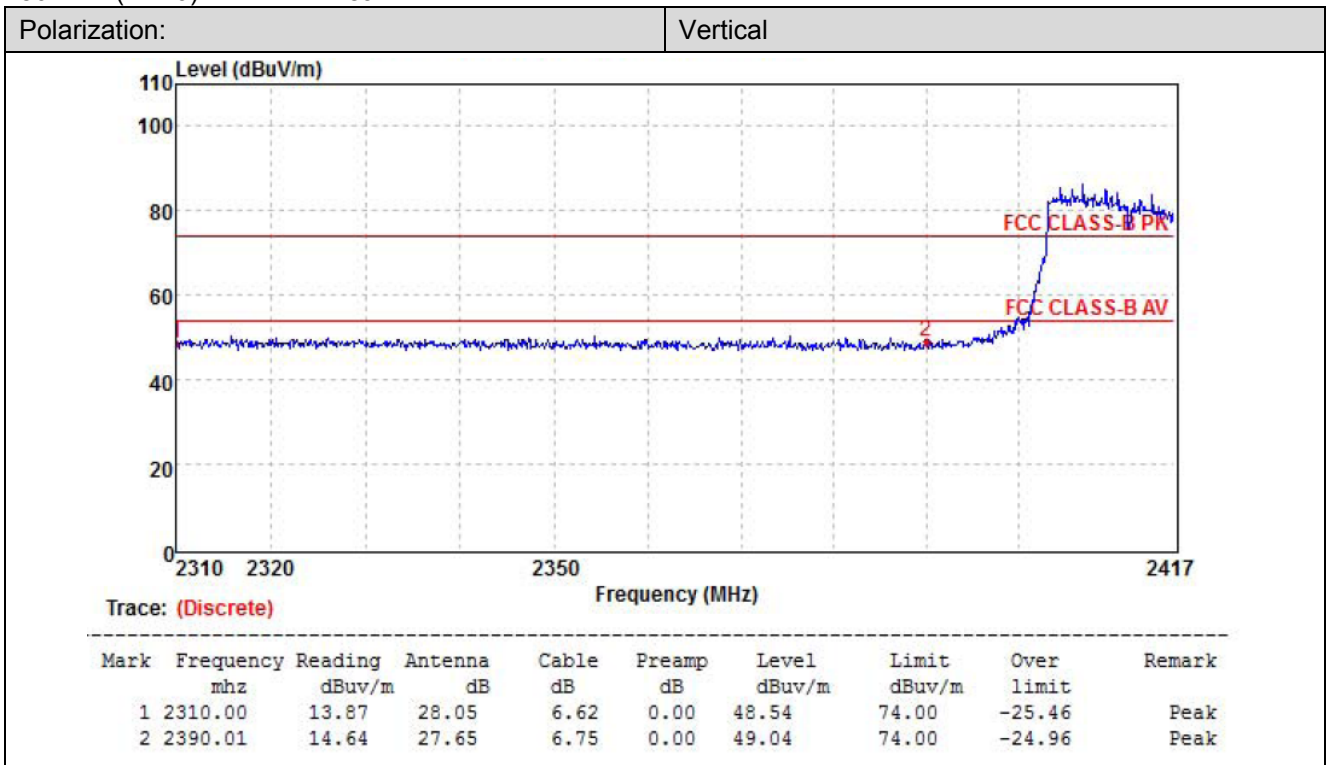
802.11g-2412MHz Peak:



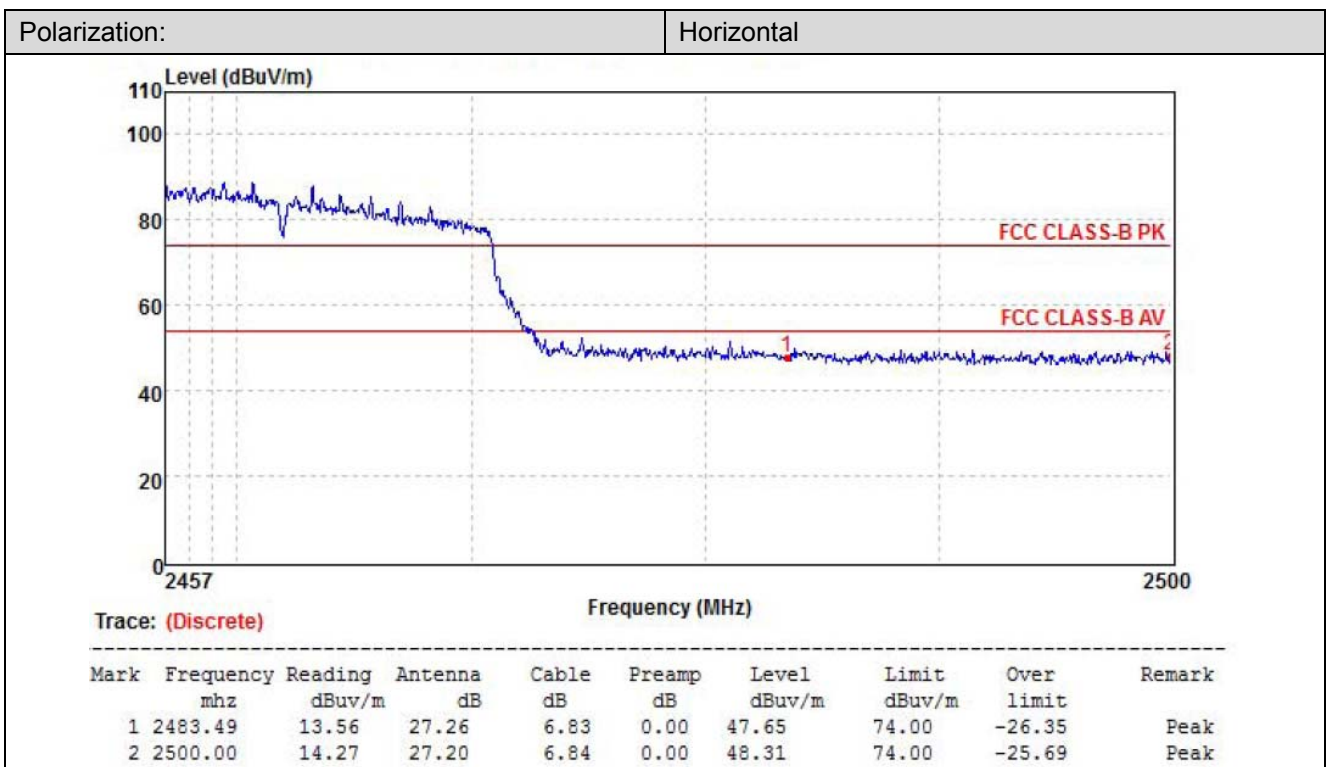
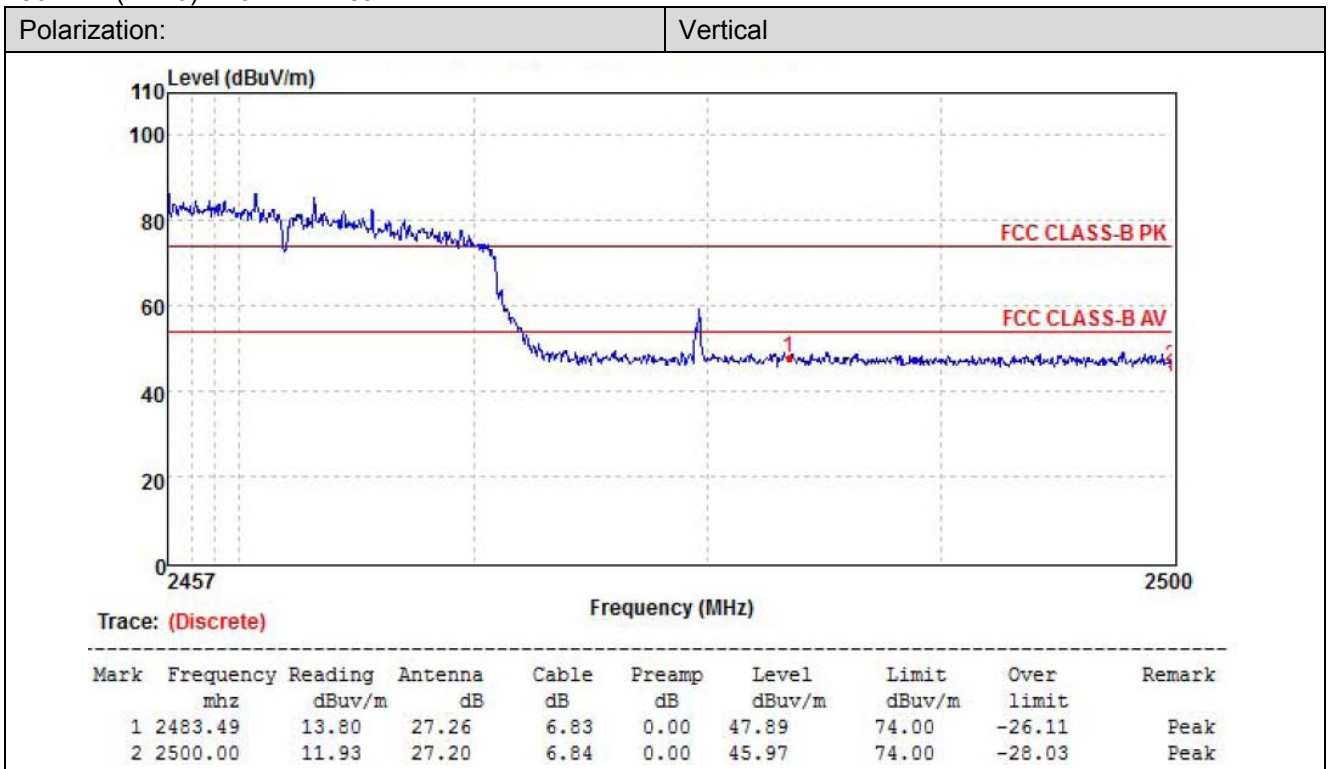
802.11g-2462MHz Peak:



802.11n(HT20)-2412MHz Peak:



802.11n(HT20)-2462MHz Peak:

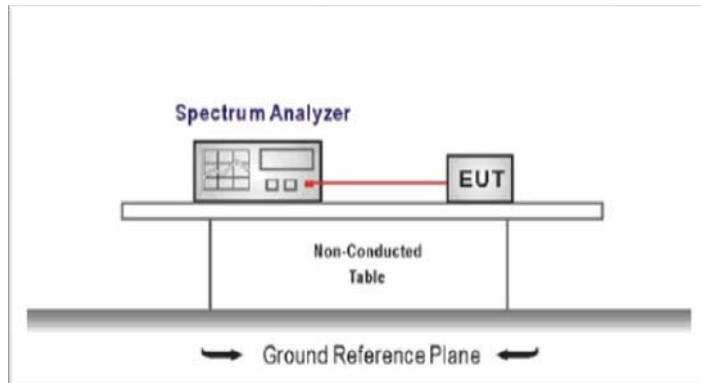


5.7. Band edge and Spurious Emissions (conducted)

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Establish a reference level by using the following procedure
Center frequency=DTS channel center frequency
The span = 1.5 times the DTS bandwidth.
RBW = 100 kHz, VBW \geq 3 x RBW
Detector = peak, Sweep time = auto couple, Trace mode = max hold
Allow trace to fully stabilize
Use the peak marker function to determine the maximum PSD level



Note: the channel found to contain the maximum PSD level can be used to establish the reference level.
3. Emission level measurement
Set the center frequency and span to encompass frequency range to be measured
RBW = 100 kHz, VBW \geq 3 x RBW
Detector = peak, Sweep time = auto couple, Trace mode = max hold
Allow trace to fully stabilize
Use the peak marker function to determine the maximum amplitude level.
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
5. Ensure that the amplitude of all unwanted emission outside of the authorized frequency band excluding restricted frequency bands) are attenuated by at least the minimum requirements specified (at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz). Report the three highest emission relative to the limit.

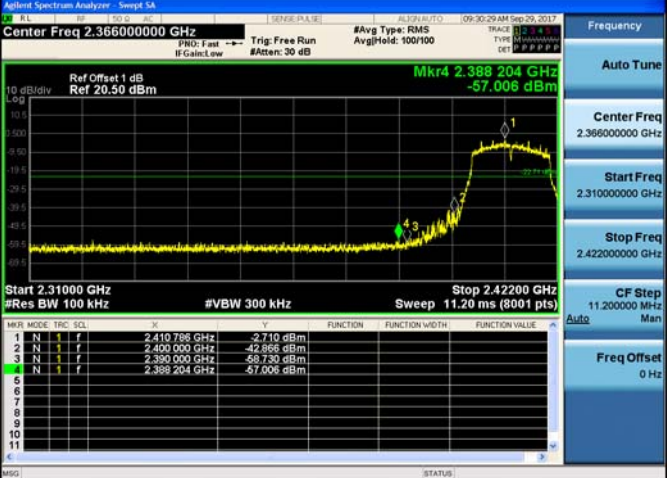

TEST MODE:

Please refer to the clause 3.3


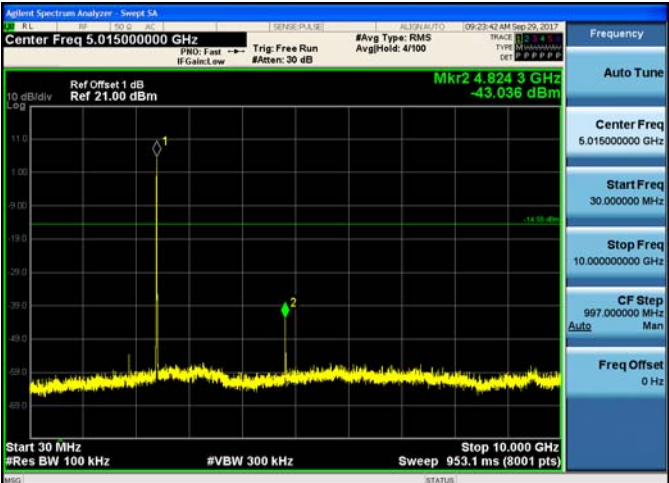

TEST RESULTS


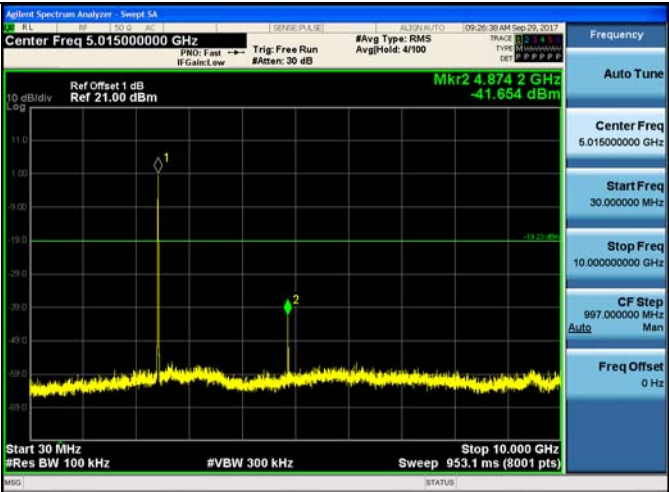


Passed Not Applicable

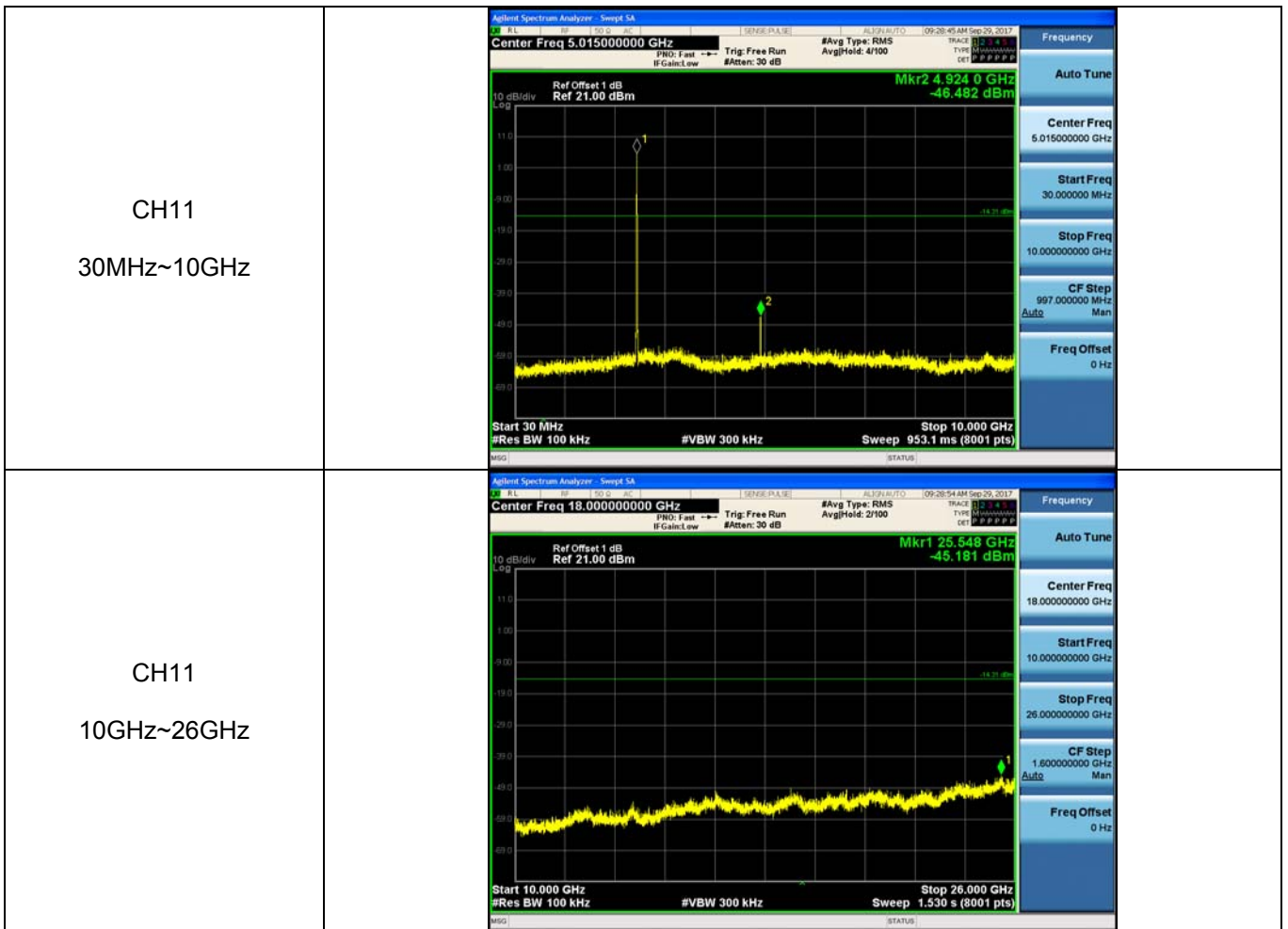
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CH01	 <table border="1" data-bbox="678 548 1236 683"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRF</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>2.411 010 GHz</td> <td>-6.555 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>2.400 000 GHz</td> <td>-44.019 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>N</td> <td>1</td> <td>f</td> <td>2.389 000 GHz</td> <td>-59.892 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>N</td> <td>1</td> <td>f</td> <td>2.389 058 GHz</td> <td>-57.261 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			MKR	MODE	TRF	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.411 010 GHz	-6.555 dBm				2	N	1	f	2.400 000 GHz	-44.019 dBm				3	N	1	f	2.389 000 GHz	-59.892 dBm				4	N	1	f	2.389 058 GHz	-57.261 dBm			
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CH11	 <table border="1" data-bbox="678 1041 1236 1176"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRF</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>2.488 010 GHz</td> <td>0.509 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>2.483 500 GHz</td> <td>-55.968 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>N</td> <td>1</td> <td>f</td> <td>2.500 000 GHz</td> <td>-60.871 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>N</td> <td>1</td> <td>f</td> <td>2.484 922 GHz</td> <td>-56.046 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			MKR	MODE	TRF	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.488 010 GHz	0.509 dBm				2	N	1	f	2.483 500 GHz	-55.968 dBm				3	N	1	f	2.500 000 GHz	-60.871 dBm				4	N	1	f	2.484 922 GHz	-56.046 dBm			
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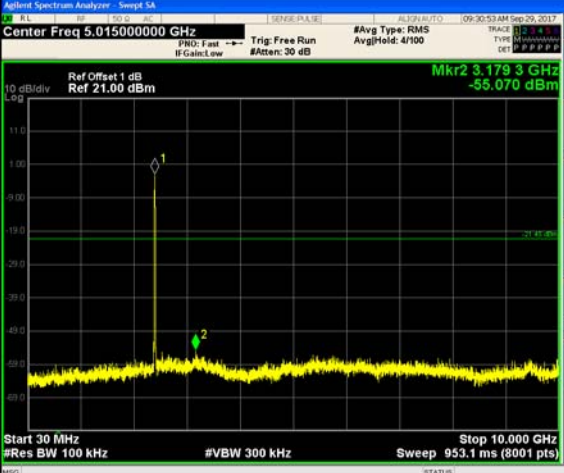
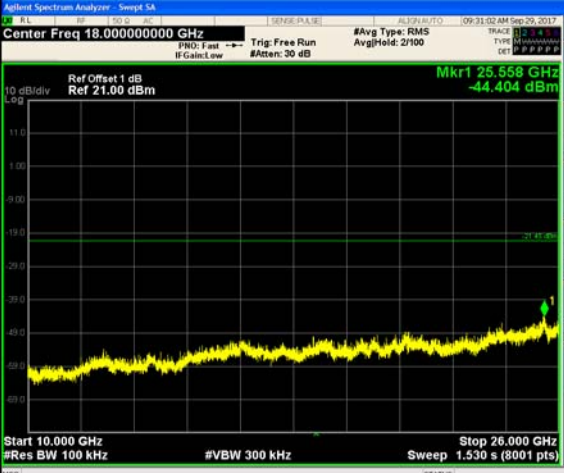
Test Item:	Bandedge	Type:	802.11 g																																								
CH01	 <table border="1" data-bbox="678 548 1236 683"> <thead> <tr> <th>MKR MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>2.410796 GHz</td> <td></td> <td></td> <td>-2.710 dBm</td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>2.400000 GHz</td> <td></td> <td></td> <td>-42.998 dBm</td> </tr> <tr> <td>3</td> <td>N</td> <td>1</td> <td>f</td> <td>2.390000 GHz</td> <td></td> <td></td> <td>-59.733 dBm</td> </tr> <tr> <td>4</td> <td>N</td> <td>1</td> <td>f</td> <td>2.388204 GHz</td> <td></td> <td></td> <td>-57.008 dBm</td> </tr> </tbody> </table>			MKR MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.410796 GHz			-2.710 dBm	2	N	1	f	2.400000 GHz			-42.998 dBm	3	N	1	f	2.390000 GHz			-59.733 dBm	4	N	1	f	2.388204 GHz			-57.008 dBm
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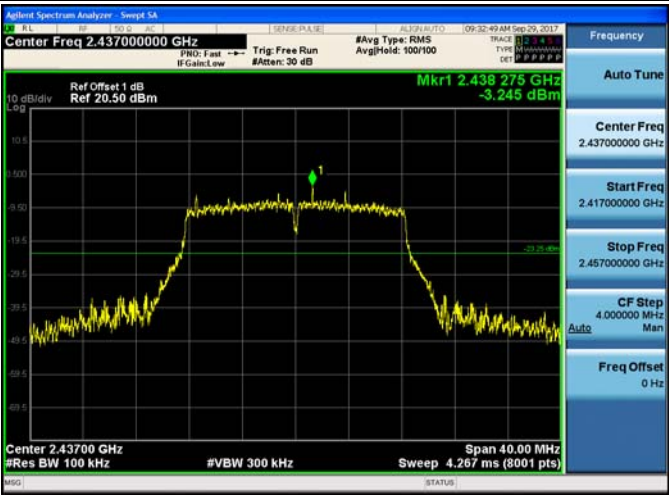
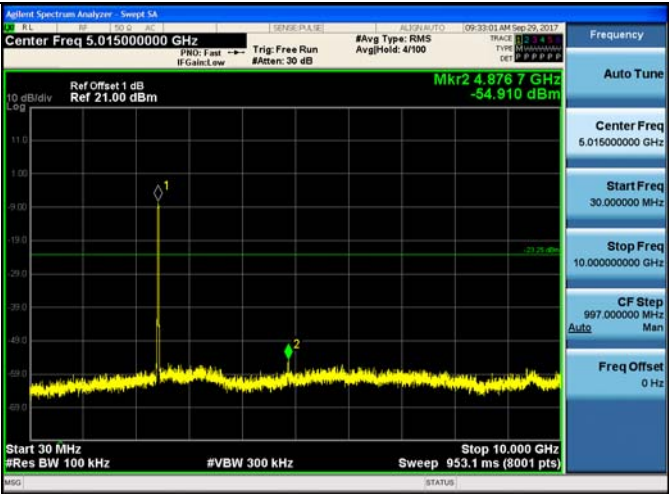


Test Item:	Bandedge	Type:	802.11 n(HT20)																																								
CH01	<p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq 2.366000000 GHz</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Mkr4 2.389 506 GHz -56.880 dBm</p> <p>Start 2.31000 GHz #Res BW 100 kHz</p> <p>Stop 2.42200 GHz #VBW 300 kHz Sweep 11.20 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>f</td> <td>2.410 772 GHz</td> <td>-3.630 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>f</td> <td>2.400 000 GHz</td> <td>-48.765 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>N</td> <td>f</td> <td>2.390 000 GHz</td> <td>-69.856 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>N</td> <td>f</td> <td>2.389 506 GHz</td> <td>-56.880 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			MKR MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f	2.410 772 GHz	-3.630 dBm				2	N	f	2.400 000 GHz	-48.765 dBm				3	N	f	2.390 000 GHz	-69.856 dBm				4	N	f	2.389 506 GHz	-56.880 dBm			
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CH11	<p>Agilent Spectrum Analyzer - Sweep SA</p> <p>Center Freq 2.476000000 GHz</p> <p>Ref Offset 1 dB Ref 20.50 dBm</p> <p>Mkr4 2.484 844 GHz -55.000 dBm</p> <p>Start 2.45200 GHz #Res BW 100 kHz</p> <p>Stop 2.50000 GHz #VBW 300 kHz Sweep 4.800 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>f</td> <td>2.484 516 GHz</td> <td>-3.293 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>f</td> <td>2.483 500 GHz</td> <td>-49.360 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>N</td> <td>f</td> <td>2.500 000 GHz</td> <td>-68.751 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>N</td> <td>f</td> <td>2.484 844 GHz</td> <td>-55.000 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			MKR MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f	2.484 516 GHz	-3.293 dBm				2	N	f	2.483 500 GHz	-49.360 dBm				3	N	f	2.500 000 GHz	-68.751 dBm				4	N	f	2.484 844 GHz	-55.000 dBm			
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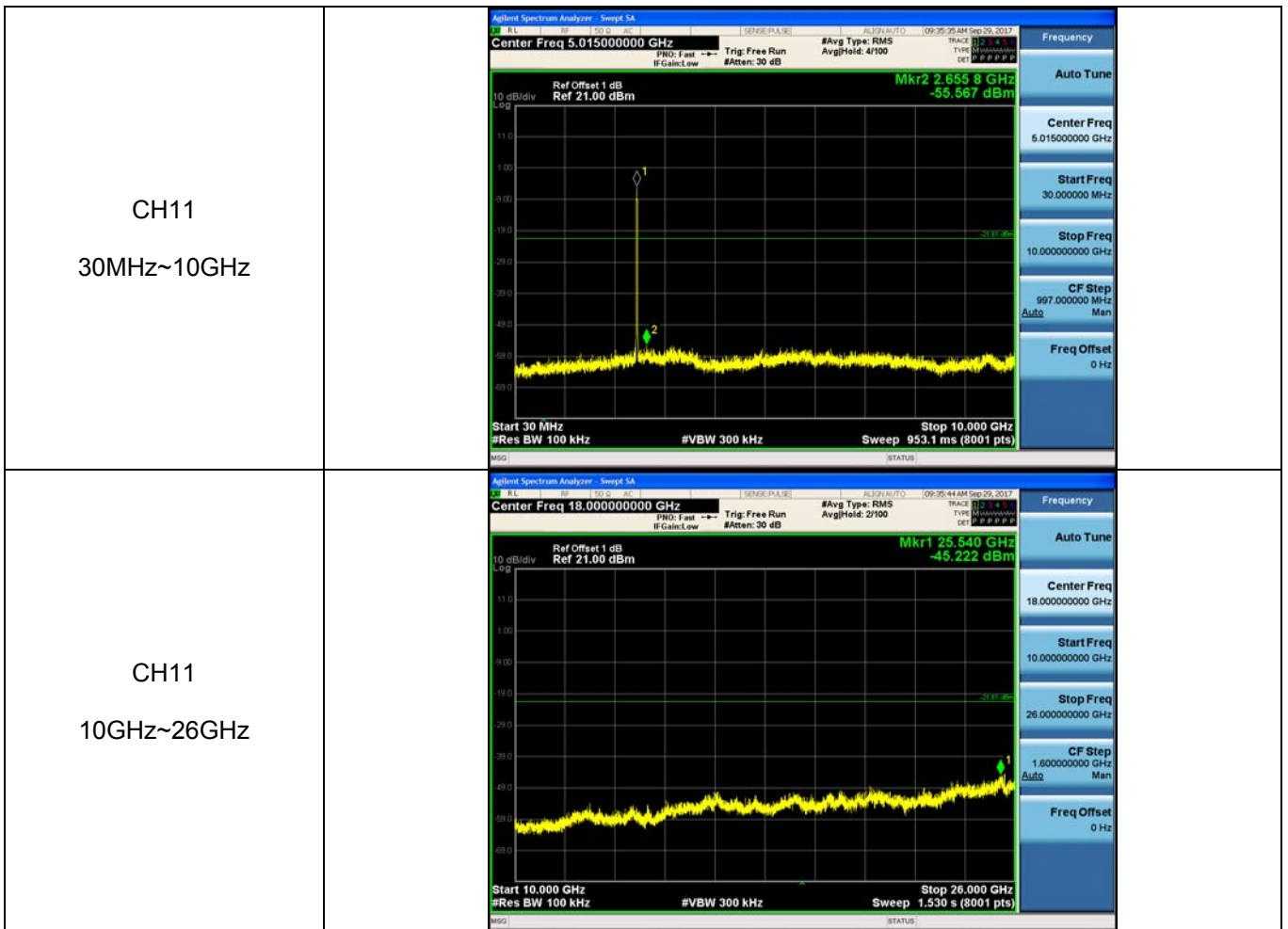
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<p>CH01 30MHz~10GHz</p>			
<p>CH01 10GHz~26GHz</p>			


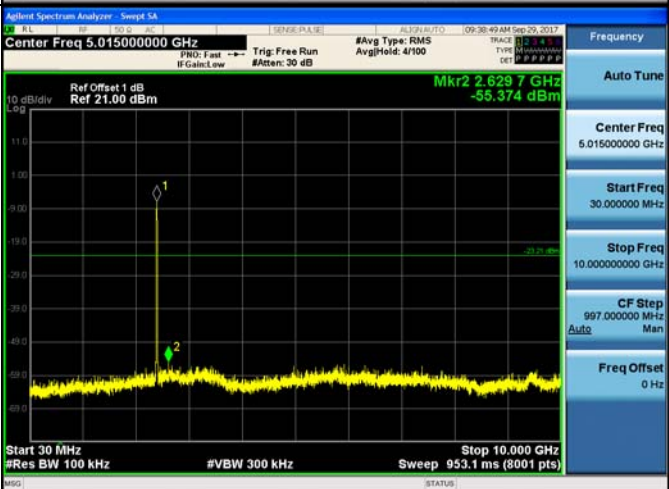

<p>CH06 Reference Level</p>	
<p>CH06 30MHz~10GHz</p>	
<p>CH06 10GHz~26GHz</p>	
<p>CH11 Reference Level</p>	


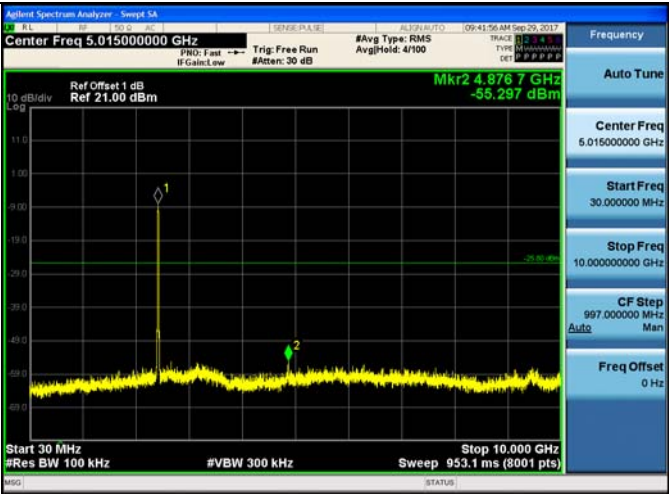




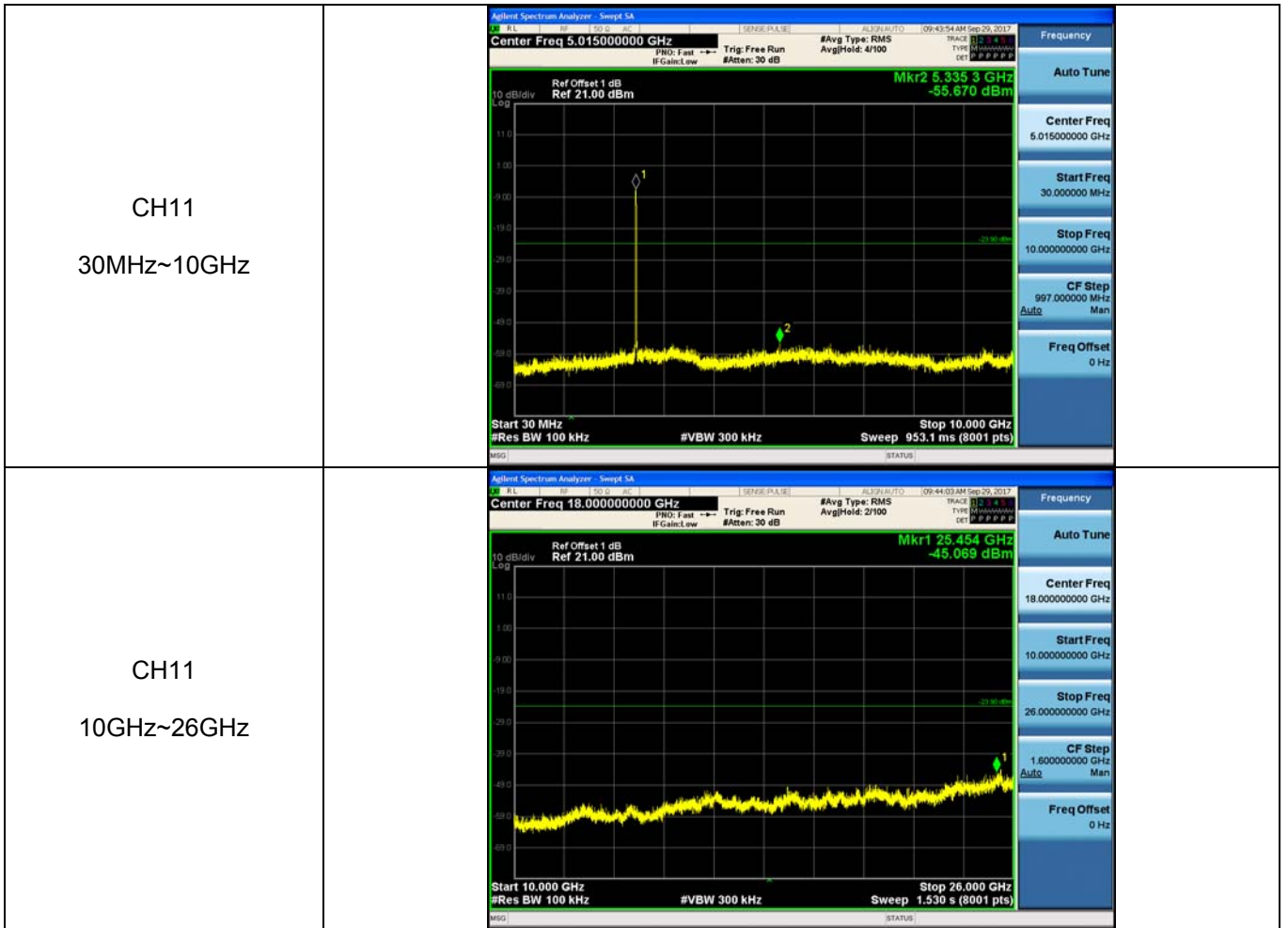
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<p>CH01 Reference Level</p>			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.392000000 GHz</p> <p>Stop Freq 2.432000000 GHz</p> <p>CF Step 4.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>CH01 30MHz~10GHz</p>			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 5.015000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 10.000000000 GHz</p> <p>CF Step 997.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>CH01 10GHz~26GHz</p>			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 18.000000000 GHz</p> <p>Start Freq 10.000000000 GHz</p> <p>Stop Freq 26.000000000 GHz</p> <p>CF Step 1.600000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>

<p>CH06 Reference Level</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.437000000 GHz Ref Offset 1 dB Ref 20.50 dBm Mkr1 2.438 275 GHz -3.245 dBm Span 40.00 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms (8001 pts)</p>
<p>CH06 30MHz~10GHz</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 1 dB Ref 21.00 dBm Mkr2 4.876 7 GHz -54.910 dBm Stop 10.000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 953.1 ms (8001 pts)</p>
<p>CH06 10GHz~26GHz</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 18.000000000 GHz Ref Offset 1 dB Ref 21.00 dBm Mkr1 25.564 GHz -45.201 dBm Stop 26.000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.530 s (8001 pts)</p>
<p>CH11 Reference Level</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.462000000 GHz Ref Offset 1 dB Ref 20.50 dBm Mkr1 2.463 315 GHz -1.606 dBm Span 40.00 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.267 ms (8001 pts)</p>



Test Item:	SE	Type:	802.11 n(HT20)
<p>CH01 Reference Level</p>			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.392000000 GHz</p> <p>Stop Freq 2.432000000 GHz</p> <p>CF Step 4.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>CH01 30MHz~10GHz</p>			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 5.015000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 10.000000000 GHz</p> <p>CF Step 997.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>CH01 10GHz~26GHz</p>			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 18.000000000 GHz</p> <p>Start Freq 10.000000000 GHz</p> <p>Stop Freq 26.000000000 GHz</p> <p>CF Step 1.600000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>

<p>CH06 Reference Level</p>	
<p>CH06 30MHz~10GHz</p>	
<p>CH06 10GHz~26GHz</p>	
<p>CH11 Reference Level</p>	



5.8. Spurious Emissions (radiated)

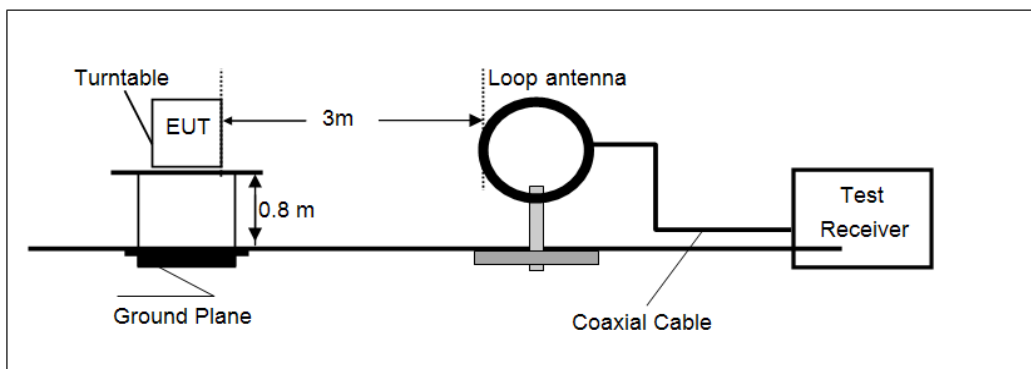
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209

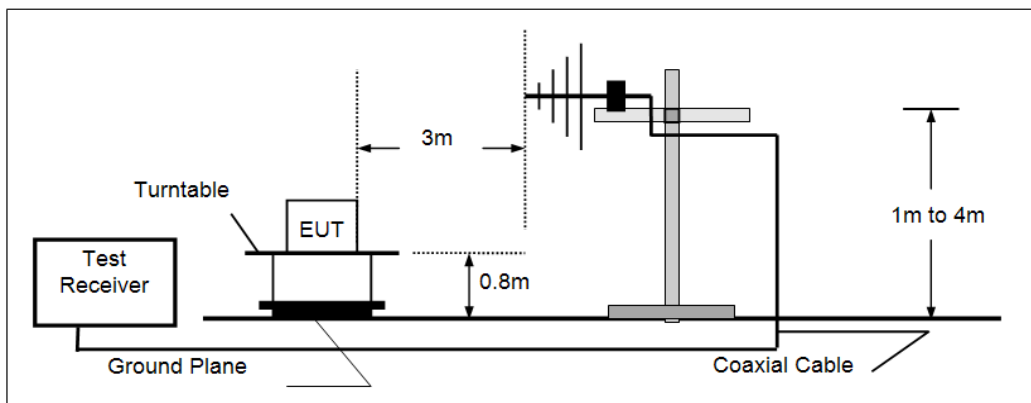
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

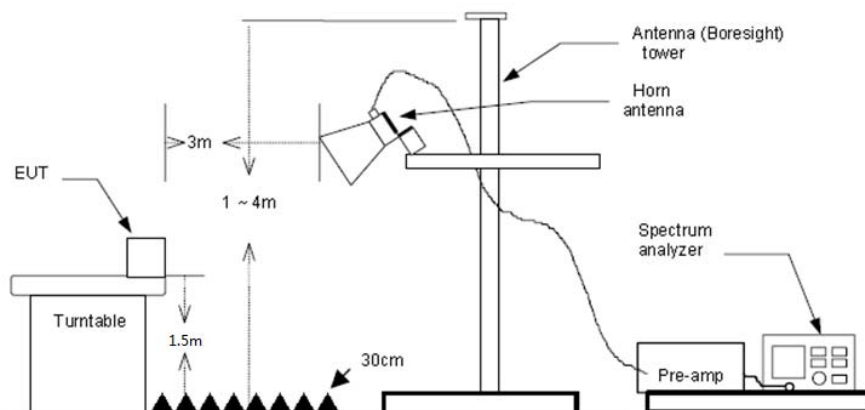
- 9kHz ~30MHz



- 30MHz ~ 1GHz



- Above 1GHz



TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna.
5. Use the following spectrum analyzer settings
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Below 1GHz, RBW=120kHz, VBW=300kHz, Sweep=auto, Detector function=peak, Trace=max hold;
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
 - (3) Above 1GHz, RBW=1MHz, VBW=3MHz PEAK detector for Peak value.
RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

Passed **Not Applicable**

Note:

- 1) Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2) The emission levels of other frequencies are very lower than the limit and not show in test report.

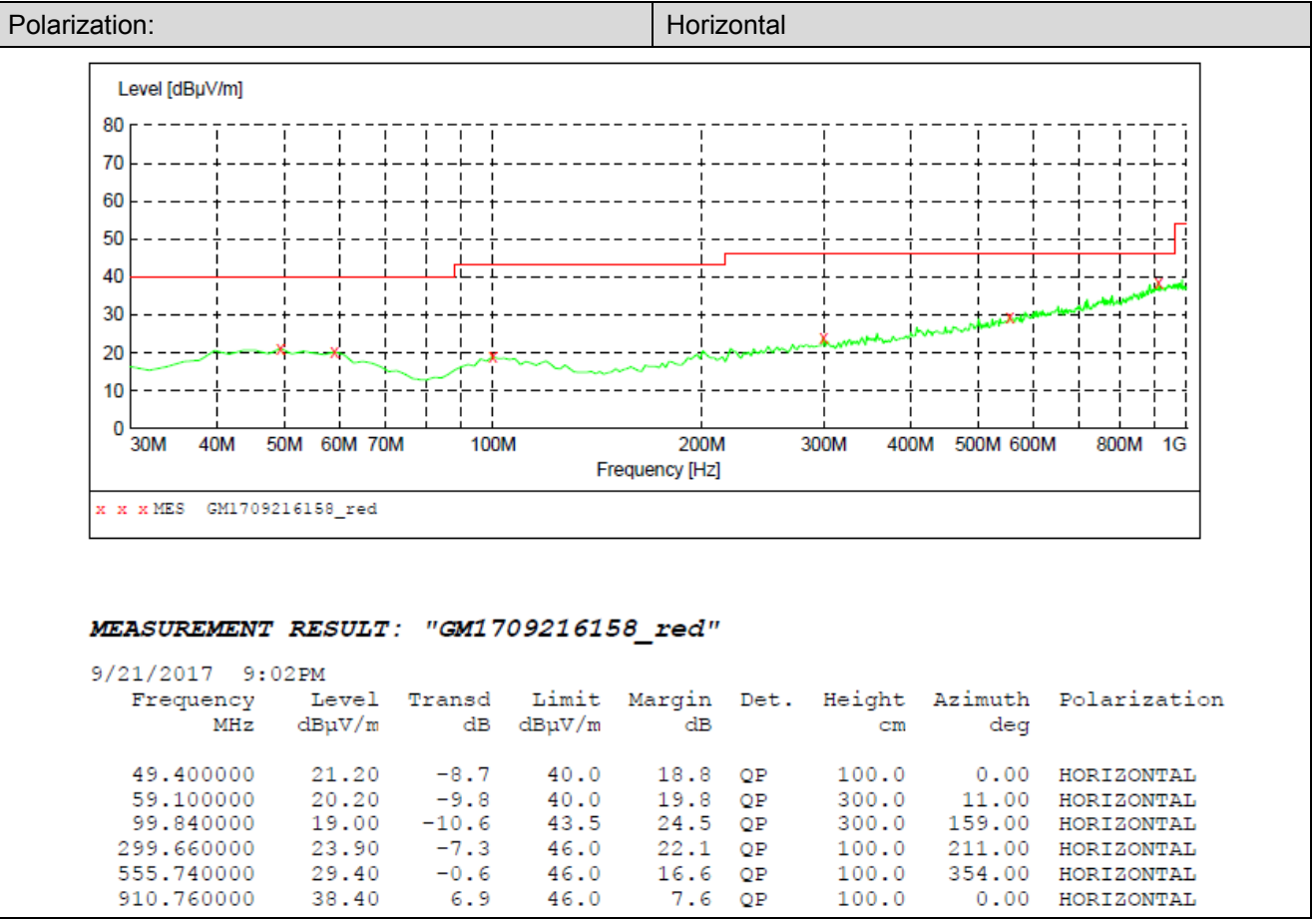
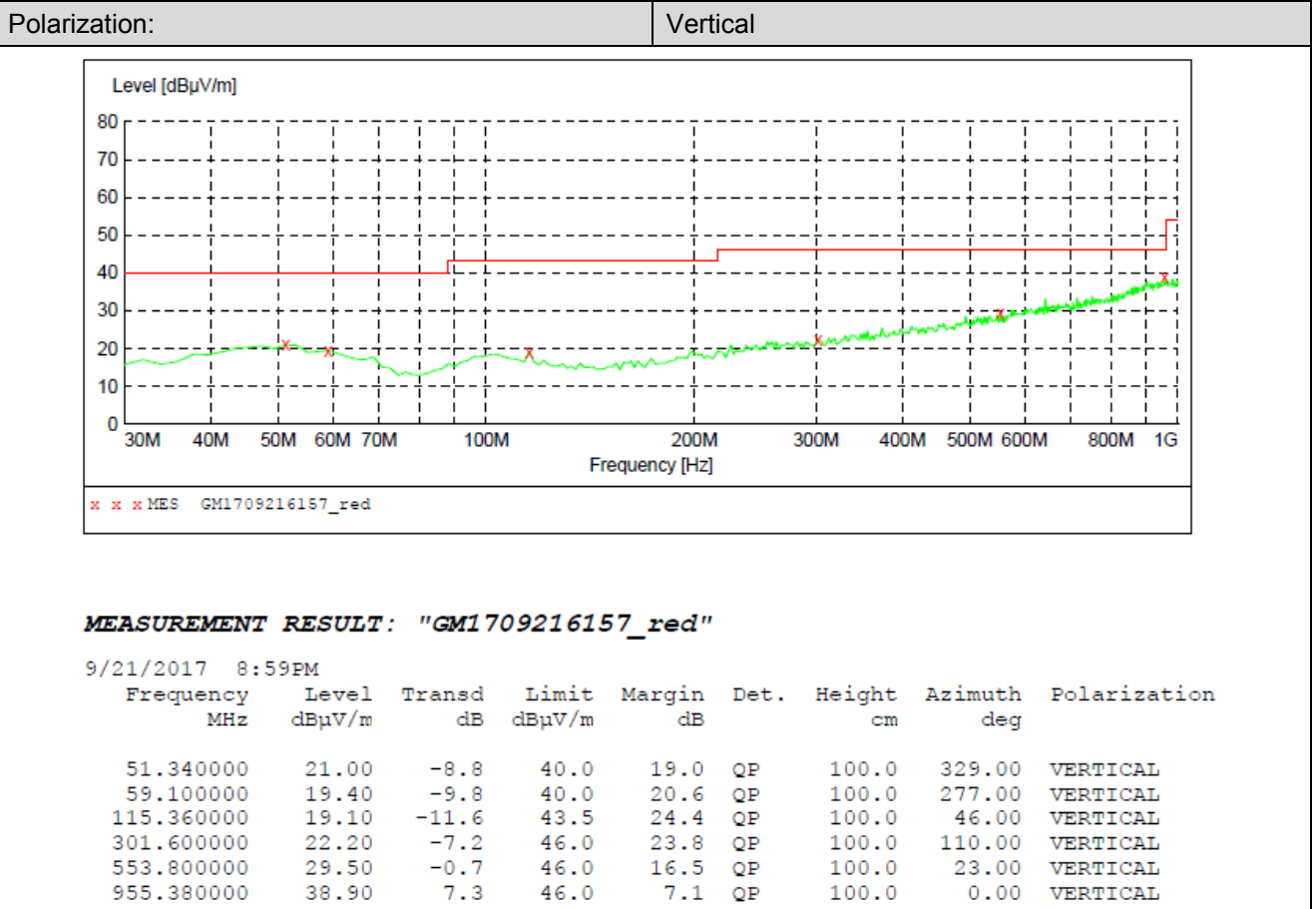
➤ **9kHz ~ 30MHz**

The EUT was pre-scanned the frequency band (9kHz~30MHz), found the radiated level lower than the limit, so don't show on the report.

➤ **30MHz ~1000MHz**

Have pre-scan all modulation mode, found the 802.11b mode CH01 which it was worst case, so only the worst case's data on the test report.

➤ 30MHz ~ 1GHz



➤ Above 1 GHz

802.11b					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1953.21	42.94	25.84	6.20	37.26	37.72	74.00	-36.28	Vertical	Peak
3844.28	36.79	29.64	8.56	38.20	36.79	74.00	-37.21	Vertical	Peak
4821.76	38.47	31.56	9.55	36.90	42.68	74.00	-31.32	Vertical	Peak
6561.03	34.19	34.12	11.29	35.35	44.25	74.00	-29.75	Vertical	Peak
1953.21	42.94	25.84	6.20	37.26	37.72	74.00	-36.28	Horizontal	Peak
3844.28	36.79	29.64	8.56	38.20	36.79	74.00	-37.21	Horizontal	Peak
4821.76	38.47	31.56	9.55	36.90	42.68	74.00	-31.32	Horizontal	Peak
7338.62	33.15	36.30	12.01	34.90	46.56	74.00	-27.44	Horizontal	Peak

802.11b					CH06				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1943.29	46.73	25.74	6.18	37.25	41.40	74.00	-32.60	Vertical	Peak
3824.76	37.12	29.62	8.53	38.22	37.05	74.00	-36.95	Vertical	Peak
4871.10	36.54	31.46	9.59	36.76	40.83	74.00	-33.17	Vertical	Peak
6379.86	32.28	33.26	10.99	35.31	41.22	74.00	-32.78	Vertical	Peak
1943.29	46.73	25.74	6.18	37.25	41.40	74.00	-32.60	Horizontal	Peak
3128.01	37.24	28.80	7.63	38.21	35.46	74.00	-38.54	Horizontal	Peak
4871.10	34.76	31.46	9.59	36.76	39.05	74.00	-34.95	Horizontal	Peak
6379.86	32.28	33.26	10.99	35.31	41.22	74.00	-32.78	Horizontal	Peak

802.11b					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1244.73	36.54	26.25	4.74	36.55	30.98	74.00	-43.02	Vertical	Peak
2328.25	42.84	27.96	6.65	37.70	39.75	74.00	-34.25	Vertical	Peak
4871.10	38.47	31.46	9.59	36.76	42.76	74.00	-31.24	Vertical	Peak
7451.57	31.99	36.20	12.24	34.86	45.57	74.00	-28.43	Vertical	Peak
2328.25	42.84	27.96	6.65	37.70	39.75	74.00	-34.25	Horizontal	Peak
3634.91	37.28	29.30	8.31	38.26	36.63	74.00	-37.37	Horizontal	Peak
4871.10	38.47	31.46	9.59	36.76	42.76	74.00	-31.24	Horizontal	Peak
7027.82	32.07	35.38	11.85	34.83	44.47	74.00	-29.53	Horizontal	Peak

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

802.11g					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1948.25	41.51	25.79	6.19	37.26	36.23	74.00	-37.77	Vertical	Peak
3644.18	37.14	29.30	8.32	38.26	36.50	74.00	-37.50	Vertical	Peak
6172.20	32.57	32.79	10.96	35.31	41.01	74.00	-32.99	Vertical	Peak
6903.71	32.31	34.72	11.73	34.89	43.87	74.00	-30.13	Vertical	Peak
1343.51	35.64	26.07	4.90	36.49	30.12	74.00	-43.88	Horizontal	Peak
3933.37	35.94	29.70	8.69	38.15	36.18	74.00	-37.82	Horizontal	Peak
5560.50	32.68	31.84	10.24	36.05	38.71	74.00	-35.29	Horizontal	Peak
7376.08	31.36	36.30	12.04	34.85	44.85	74.00	-29.15	Horizontal	Peak

802.11g					CH06				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1353.80	36.36	26.04	4.92	36.49	30.83	74.00	-43.17	Vertical	Peak
3525.56	36.91	29.08	8.15	38.37	35.77	74.00	-38.23	Vertical	Peak
5151.68	33.86	31.69	9.79	36.25	39.09	74.00	-34.91	Vertical	Peak
6938.94	32.61	34.93	11.77	34.85	44.46	74.00	-29.54	Vertical	Peak
1659.57	38.00	25.08	5.69	36.85	31.92	74.00	-42.08	Horizontal	Peak
3525.56	36.91	29.08	8.15	38.37	35.77	74.00	-38.23	Horizontal	Peak
4971.32	33.38	31.47	9.65	36.48	38.02	74.00	-35.98	Horizontal	Peak
6544.35	33.32	34.09	11.26	35.35	43.32	74.00	-30.68	Horizontal	Peak

802.11g					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1943.29	44.32	25.74	6.18	37.25	38.99	74.00	-35.01	Vertical	Peak
3192.37	38.95	28.80	7.71	38.20	37.26	74.00	-36.74	Vertical	Peak
4920.96	35.56	31.42	9.62	36.62	39.98	74.00	-34.02	Vertical	Peak
7045.74	32.41	35.44	11.85	34.86	44.84	74.00	-29.16	Vertical	Peak
1746.25	36.48	25.29	5.86	37.03	30.60	74.00	-43.40	Horizontal	Peak
3033.91	37.05	28.67	7.52	38.22	35.02	74.00	-38.98	Horizontal	Peak
4045.06	35.61	29.79	8.82	38.01	36.21	74.00	-37.79	Horizontal	Peak
6267.19	32.25	33.03	11.00	35.30	40.98	74.00	-33.02	Horizontal	Peak

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. The peak level is lower than average limit (54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

802.11n(HT20)					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2252.46	37.28	27.82	6.53	37.49	34.14	74.00	-39.86	Vertical	Peak
3672.11	36.42	29.30	8.35	38.26	35.81	74.00	-38.19	Vertical	Peak
5125.52	33.51	31.80	9.77	36.27	38.81	74.00	-35.19	Vertical	Peak
7432.62	31.98	36.23	12.18	34.85	45.54	74.00	-28.46	Vertical	Peak
2252.46	35.44	27.82	6.53	37.49	32.30	74.00	-41.70	Horizontal	Peak
3738.13	35.35	29.42	8.43	38.24	34.96	74.00	-39.04	Horizontal	Peak
4920.96	33.86	31.42	9.62	36.62	38.28	74.00	-35.72	Horizontal	Peak
7527.83	32.57	36.13	12.49	34.92	46.27	74.00	-27.73	Horizontal	Peak

802.11n(HT20)					CH06				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1768.62	36.92	25.34	5.90	37.07	31.09	74.00	-42.91	Vertical	Peak
4045.06	36.59	29.79	8.82	38.01	37.19	74.00	-36.81	Vertical	Peak
4871.10	38.89	31.46	9.59	36.76	43.18	74.00	-30.82	Vertical	Peak
7527.83	32.57	36.13	12.49	34.92	46.27	74.00	-27.73	Vertical	Peak
1728.56	36.62	25.26	5.82	36.99	30.71	74.00	-43.29	Horizontal	Peak
3049.39	37.16	28.70	7.54	38.22	35.18	74.00	-38.82	Horizontal	Peak
4920.96	35.10	31.42	9.62	36.62	39.52	74.00	-34.48	Horizontal	Peak
7721.91	32.78	36.10	13.05	35.03	46.90	74.00	-27.10	Horizontal	Peak

802.11n(HT20)					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1795.84	36.33	25.39	5.95	37.13	30.54	74.00	-43.46	Vertical	Peak
3049.39	37.09	28.70	7.54	38.22	35.11	74.00	-38.89	Vertical	Peak
5560.50	33.42	31.84	10.24	36.05	39.45	74.00	-34.55	Vertical	Peak
7081.70	32.11	35.55	11.85	34.91	44.60	74.00	-29.40	Vertical	Peak
1346.93	36.35	26.06	4.91	36.49	30.83	74.00	-43.17	Horizontal	Peak
2965.19	36.57	28.57	7.46	38.25	34.35	74.00	-39.65	Horizontal	Peak
4501.49	34.60	30.70	9.30	37.39	37.21	74.00	-36.79	Horizontal	Peak
5747.59	33.73	31.84	10.51	35.46	40.62	74.00	-33.38	Horizontal	Peak

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

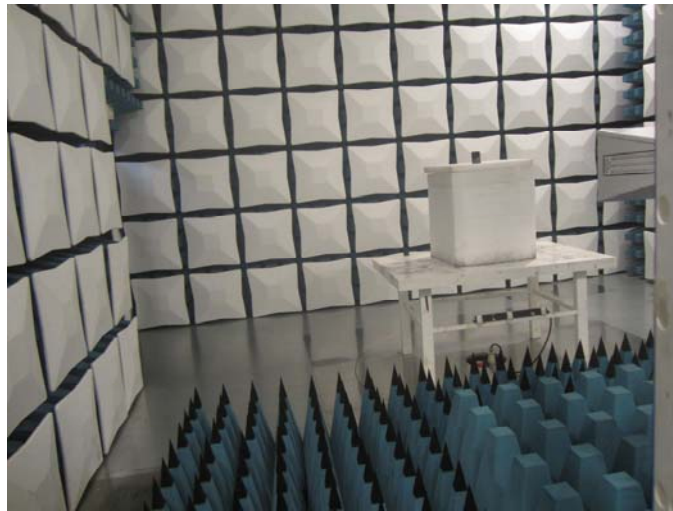
6. TEST SETUP PHOTOS

Conducted Emissions



Radiated Emissions





7. EXTERANAL AND INTERNAL PHOTOS

Reference to the test report No.: TRE1709017501.

.....**End of Report**.....