

FCC Test Report

FCC ID : YUW-301F
Equipment : Mobile Phone
Model No. : 301F
Brand Name : FUJITSU
Applicant : Fujitsu Mobile Communications Ltd.
Address : 1-1, Kamikodanaka 4-chome, Nakahara-ku,
Kawasaki 211-8588, Japan
Standard : 47 CFR FCC Part 15.247
Received Date : Sep. 13, 2013
Tested Date : Oct. 01 ~ Oct. 22, 2013

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:



Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR391306AC	Rev. 01	Initial issue	Nov. 01, 2013

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 2.581MHz 41.13 (Margin -14.87dB) - QP	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 74.62 36.27 (Margin -3.73dB) - PK	Pass
15.247(b)(3)	Fundamental Emission Output Power	Power [dBm]: 11b: 16.41 11g: 20.46 HT20: 19.43	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Product Details

Product Name	Mobile Phone
Brand Name	FUJITSU
Model Name	301F
IMEI Code	357613050018539, 357613050017572
H/W Version	V2.1.0
S/W Version	R25.1e

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
2400-2483.5	b	2412-2462	1-11 [11]	1	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	1	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	1	MCS 0-7

Note 1: RF output power specifies that Maximum Peak Conducted Output Power.
 Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
 Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

1.1.3 Antenna Details

Ant. No.	Type	Gain (dBi)	Connector	Remark
1	$\lambda/4$ Monopole	-3	---	---

1.1.4 EUT Operational Condition

Supply Voltage	<input checked="" type="checkbox"/> AC mains	<input checked="" type="checkbox"/> DC	
Type of DC Source	<input type="checkbox"/> Internal DC supply	<input checked="" type="checkbox"/> External DC adapter	<input checked="" type="checkbox"/> Battery

1.1.5 Accessories

Accessories		
No.	Equipment	Description
1	Battery	Brand Name: Fujitsu limited Model Name: CA54310-0053 Power Rating: O/P: 3.75Vdc, 2600mA
2	Cradle	Brand Name: SOFTBANK MOBILE Corp. Model Name: CA50601-1881 Power Rating: O/P: 12.0Vdc, 1.5A
3	Adapter for cradle	Brand Name: SOFTBANK MOBILE Corp. Model Name: TA08017-B330 I/P: 100-240Vac, 1000mA O/P: 12.0Vdc, 3000mA DC 1.1m non-shielded cable with one core AC 0.9m non-shielded cable without core

1.1.6 Channel List

Frequency band (MHz)	
802.11 b / g / n HT20	
Channel	Frequency(MHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

1.1.7 Test Tool and Duty Cycle

Test Tool	QRCT, Ver 3.0.6.0		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	98.28%	0.08
	11g	88.43%	0.53
	HT20	87.75%	0.57

1.1.8 Power Setting

Channel	Frequency(MHz)	11b	11g	HT20
1	2412	12	11.5	10
6	2437	12	11.5	10
11	2462	12	11.5	10

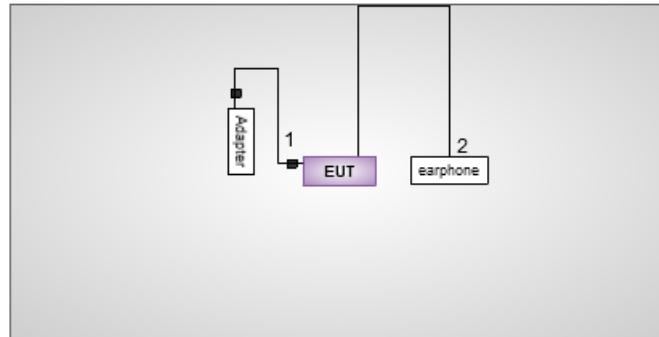
1.2 Local Support Equipment List

Support Equipment List						
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)
1	Adapter	NTT docomo	AC Adaptor 04	---	---	1m non-shielded with 2 cores
2	Earphone	Apple	MD827FE/A	---	---	1.2m non-shielded w/o core

Note: Item 1 was provided by client.

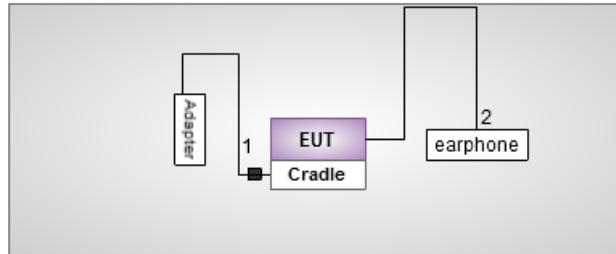
1.3 Test Setup Chart

Test Setup Diagram (Adapter mode)



1. 1m non-shielded with 2 cores
2. 1.2m non-shielded w/o core

Test Setup Diagram (Cradle mode)



1. 1.1m non-shielded cable with one core
2. 1.2m non-shielded w/o core

1.4 The Equipment List

Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
3m semi-anechoic chamber	CHAMPRO	SAC-03	03CH01-WS	Jan. 04, 2013	Jan. 03, 2014
Spectrum Analyzer	R&S	FSV40	101498	Jan. 24, 2013	Jan. 23, 2014
Receiver	R&S	ESR3	101658	Jan. 28, 2013	Jan. 27, 2014
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jan. 11, 2013	Jan. 10, 2014
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Feb. 18, 2013	Feb. 17, 2014
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014
Amplifier	Burgeon	BPA-530	100219	Nov. 28, 2012	Nov. 27, 2013
Amplifier	Agilent	83017A	MY39501308	Dec. 18, 2012	Dec. 17, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-001	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-002	Dec. 25, 2012	Dec. 24, 2013
control	EM Electronics	EM1000	60612	N/A	N/A

Note: Calibration Interval of instruments listed above is one year.

Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014
Amplifier	MITEQ	AMF-6F-260400	9121372	Apr. 19, 2013	Apr. 18, 2015
Note: Calibration Interval of instruments listed above is two year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV 40	101063	Feb. 18, 2013	Feb. 17, 2014
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 29, 2012	Nov. 28, 2013
Power Meter	Anritsu	ML2495A	1241001	Oct. 08, 2013	Oct. 07, 2014
Power Sensor	Anritsu	MA2411B	1207362	Oct. 08, 2013	Oct. 07, 2014

Note: Calibration Interval of instruments listed above is one year.

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
EMC Receiver	R&S	ESCS 30	100169	Oct. 15, 2013	Oct. 14, 2014
LISN	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-667	Dec. 04, 2012	Dec. 03, 2013
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-666	Dec. 04, 2012	Dec. 03, 2013
ISN	TESEQ	ISN T800	34406	Apr. 08, 2013	Apr. 07, 2014
ISN	TESEQ	ISN T200A	30494	Apr. 09, 2013	Apr. 08, 2014
ISN	TESEQ	ISN ST08	22589	Jan. 24, 2013	Jan. 23, 2014
RF Current Probe	FCC	F-33-4	121630	Dec. 04, 2012	Dec. 03, 2013
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Dec. 25, 2012	Dec. 24, 2013
ESH3-Z6 V-Network(+)	R&S	ESH3-Z6	100920	Nov. 21, 2012	Nov. 20, 2013
ESH3-Z6 V-Network(-)	R&S	ESH3-Z6	100951	Jan. 30, 2013	Jan. 29, 2014
Two-Line V-Network	R&S	ENV216	101579	Jan. 07, 2013	Jan. 06, 2014
50 ohm terminal	NA	50	01	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal (Support Unit)	NA	50	04	Apr. 22, 2013	Apr. 21, 2014
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247

ANSI C63.10-2009

FCC KDB 558074 D01 DTS Meas Guidance v03r01

Note: The EUT has been tested and complied with FCC part 15B requirement. FCC Part 15B test results are issued to another report.

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±35.286 Hz
Conducted power	±0.536 dB
Frequency error	±35.286 Hz
Temperature	±0.3 °C
Conducted emission	±2.946 dB
AC conducted emission	±2.43 dB
Radiated emission	±2.49 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By	Tested Date
AC Conduction	CO01-WS	21°C / 55%	Skys Huang	Oct. 22, 2013
Radiated Emissions	03CH01-WS	23°C / 64%	Aska Huang Haru Yang	Oct. 01~ Oct. 11, 2013
RF Conducted	TH01-WS	24°C / 61%	Brad Wu	Oct. 09, 2013

➤ FCC site registration No.: 657002

➤ IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data rate (Mbps) / MCS	Test Configuration
Conducted Emissions	11g	2412	6 Mbps	1, 2
Radiated Emissions < 1GHz	11g	2412	6 Mbps	1, 2
Radiated Emissions > 1GHz	11b 11g HT20	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462	1 Mbps 6 Mbps MCS 0	1
Fundamental Emission Output Power	11b 11g HT20	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462	1 Mbps 6 Mbps MCS 0	1
6dB bandwidth				
Power spectral density				

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **X-plane** results were found as the worst case and were shown in this report.
2. The EUT had been tested by following test configurations for radiated emission below 1GHz.
 - 1) Configuration 1 : Adapter mode
 - 2) Configuration 2 : Cradle mode
3. Adapter and cradle mode had been pretested for radiated emission above 1GHz and found that the adapter mode was the worst case and was selected for final test.

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

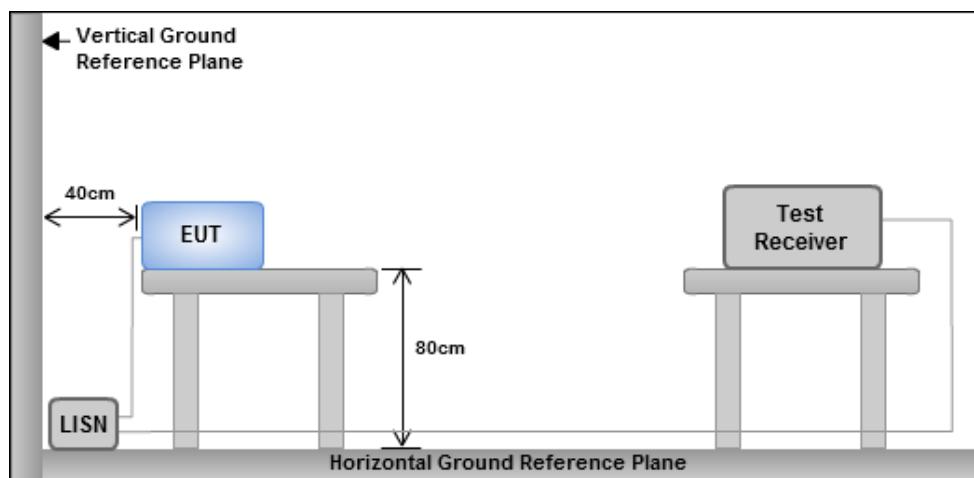
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.1.2 Test Procedures

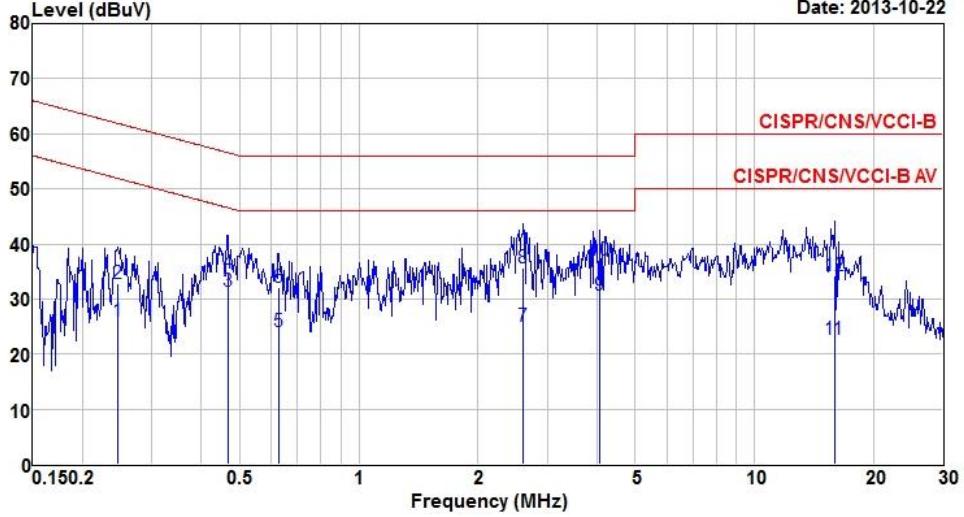
1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

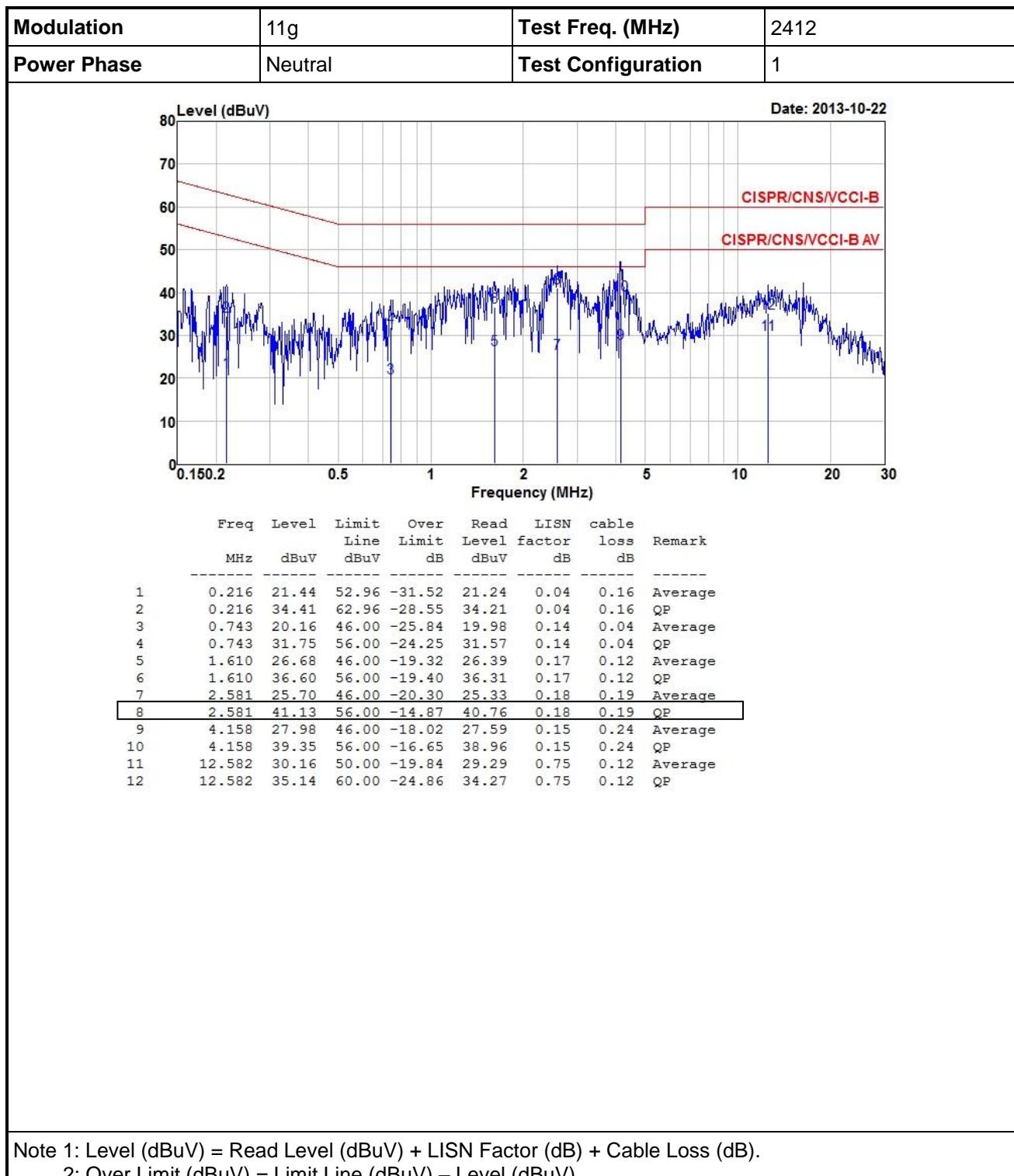
3.1.3 Test Setup

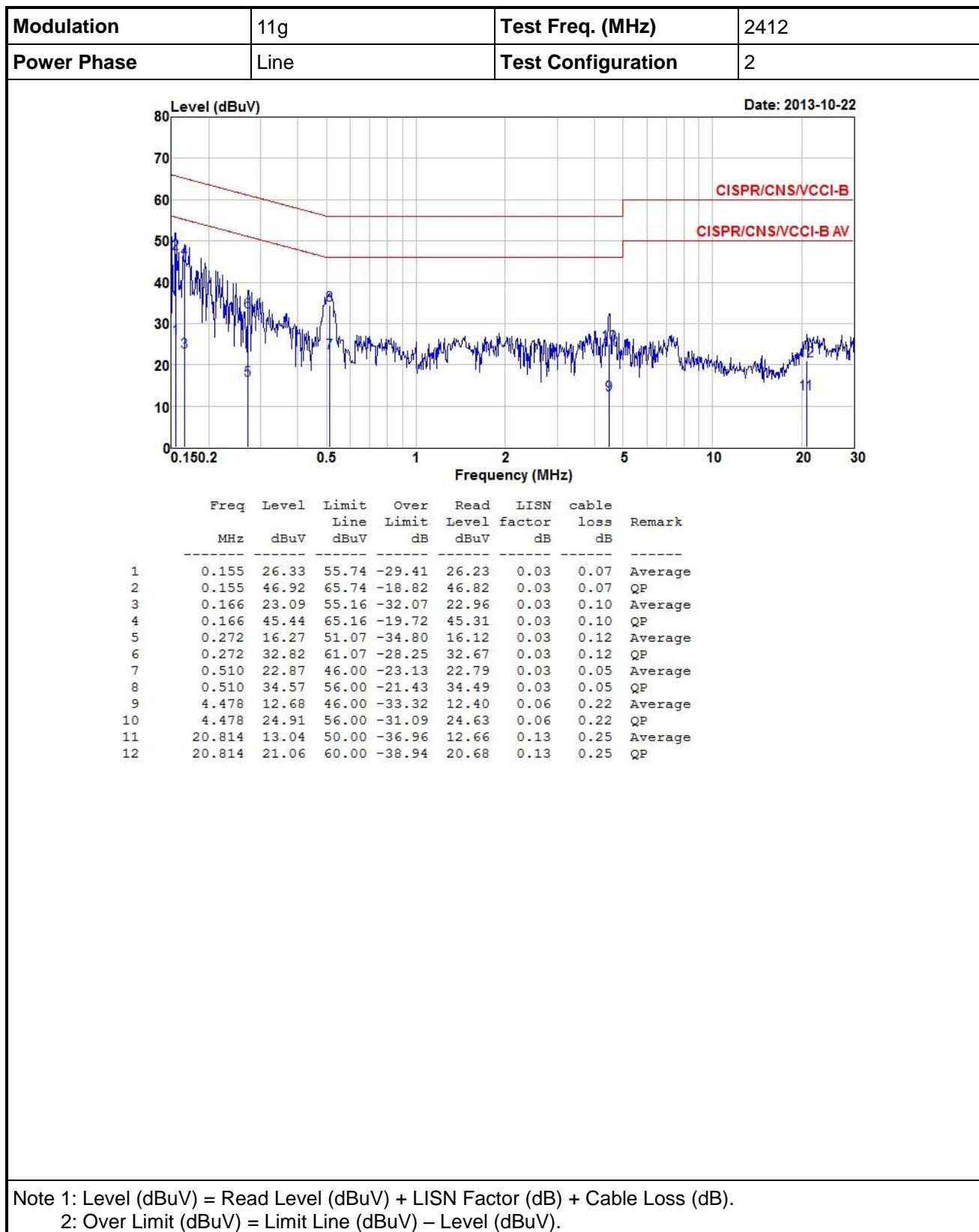


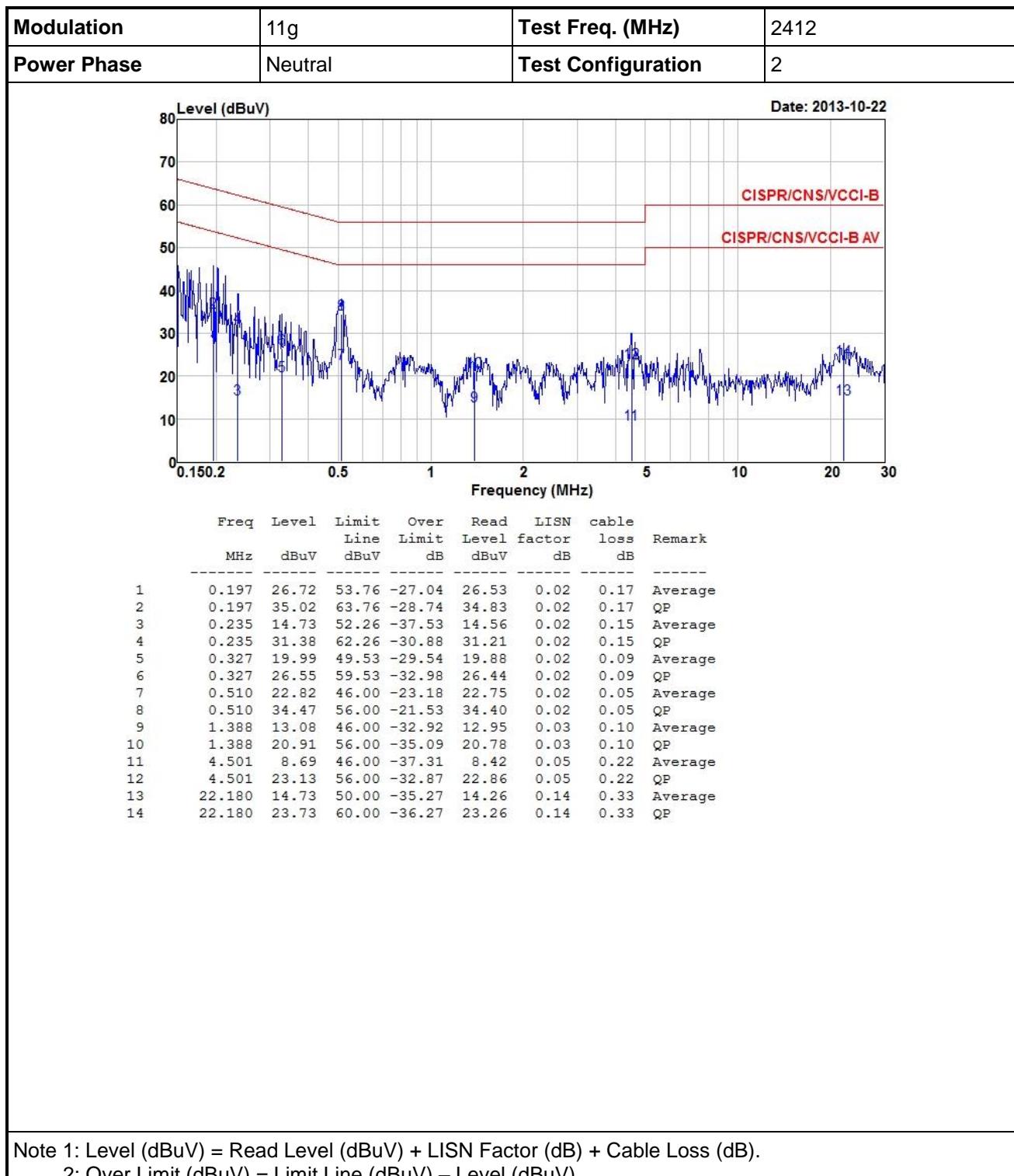
Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

Modulation	11g	Test Freq. (MHz)	2412																																																																																																																
Power Phase	Line	Test Configuration	1																																																																																																																
																																																																																																																			
<table border="1"> <thead> <tr> <th>Freq</th> <th>Level</th> <th>Limit</th> <th>Over</th> <th>Read</th> <th>LISN</th> <th>cable</th> <th>Remark</th> </tr> <tr> <th>MHz</th> <th>dBuV</th> <th>Line</th> <th>Limit</th> <th>Level</th> <th>factor</th> <th>loss</th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>0.246</td><td>26.05</td><td>51.91</td><td>-25.86</td><td>25.86</td><td>0.05</td><td>0.14</td></tr> <tr><td>2</td><td>0.246</td><td>32.91</td><td>61.91</td><td>-29.00</td><td>32.72</td><td>0.05</td><td>0.14</td></tr> <tr><td>3</td><td>0.466</td><td>31.34</td><td>46.58</td><td>-15.24</td><td>31.21</td><td>0.08</td><td>0.05</td></tr> <tr><td>4</td><td>0.466</td><td>34.59</td><td>56.58</td><td>-21.99</td><td>34.46</td><td>0.08</td><td>0.05</td></tr> <tr><td>5</td><td>0.627</td><td>23.99</td><td>46.00</td><td>-22.01</td><td>23.84</td><td>0.10</td><td>0.05</td></tr> <tr><td>6</td><td>0.627</td><td>32.13</td><td>56.00</td><td>-23.87</td><td>31.98</td><td>0.10</td><td>0.05</td></tr> <tr><td>7</td><td>2.608</td><td>25.01</td><td>46.00</td><td>-20.99</td><td>24.62</td><td>0.20</td><td>0.19</td></tr> <tr><td>8</td><td>2.608</td><td>35.74</td><td>56.00</td><td>-20.26</td><td>35.35</td><td>0.20</td><td>0.19</td></tr> <tr><td>9</td><td>4.070</td><td>30.63</td><td>46.00</td><td>-15.37</td><td>30.22</td><td>0.17</td><td>0.24</td></tr> <tr><td>10</td><td>4.070</td><td>37.07</td><td>56.00</td><td>-18.93</td><td>36.66</td><td>0.17</td><td>0.24</td></tr> <tr><td>11</td><td>15.970</td><td>22.57</td><td>50.00</td><td>-27.43</td><td>21.33</td><td>1.10</td><td>0.14</td></tr> <tr><td>12</td><td>15.970</td><td>34.13</td><td>60.00</td><td>-25.87</td><td>32.89</td><td>1.10</td><td>0.14</td></tr> </tbody> </table>				Freq	Level	Limit	Over	Read	LISN	cable	Remark	MHz	dBuV	Line	Limit	Level	factor	loss		1	0.246	26.05	51.91	-25.86	25.86	0.05	0.14	2	0.246	32.91	61.91	-29.00	32.72	0.05	0.14	3	0.466	31.34	46.58	-15.24	31.21	0.08	0.05	4	0.466	34.59	56.58	-21.99	34.46	0.08	0.05	5	0.627	23.99	46.00	-22.01	23.84	0.10	0.05	6	0.627	32.13	56.00	-23.87	31.98	0.10	0.05	7	2.608	25.01	46.00	-20.99	24.62	0.20	0.19	8	2.608	35.74	56.00	-20.26	35.35	0.20	0.19	9	4.070	30.63	46.00	-15.37	30.22	0.17	0.24	10	4.070	37.07	56.00	-18.93	36.66	0.17	0.24	11	15.970	22.57	50.00	-27.43	21.33	1.10	0.14	12	15.970	34.13	60.00	-25.87	32.89	1.10	0.14
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Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB). 2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).																																																																																																																			







3.2 6dB and Occupied Bandwidth

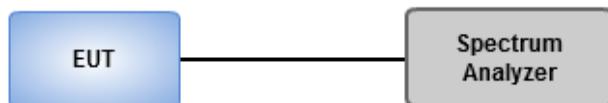
3.2.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

3.2.2 Test Procedures

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

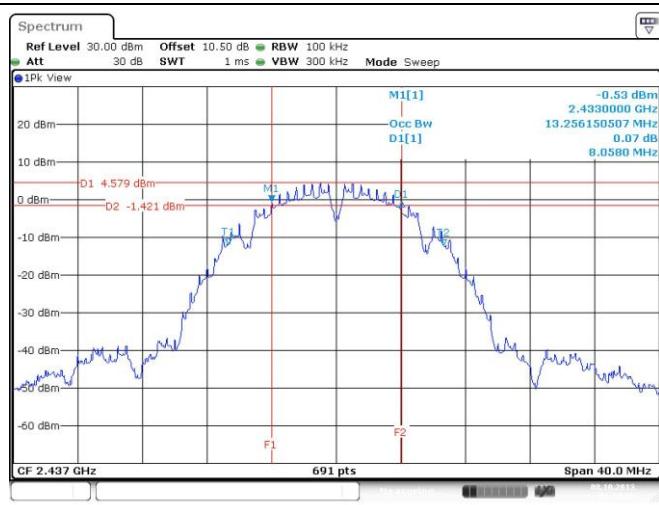
3.2.3 Test Setup



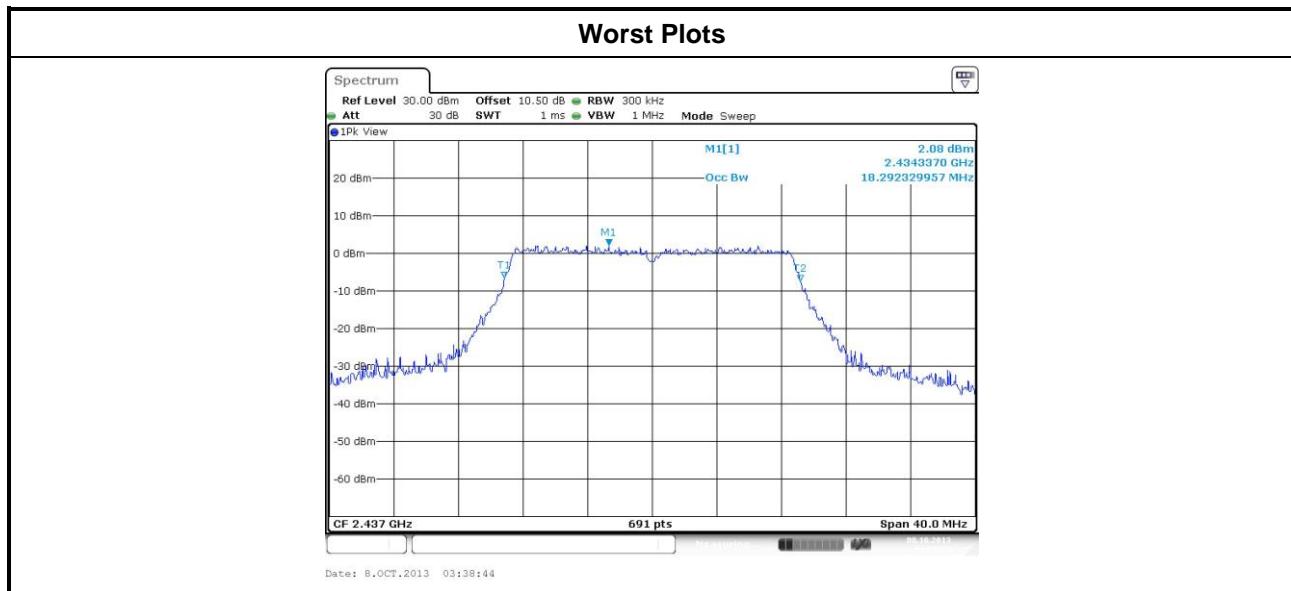
3.2.4 Test Result of 6dB and Occupied Bandwidth

Modulation Mode	Freq. (MHz)	6dB Bandwidth (MHz)	Limit (kHz)
11b	2412	8.58	500
11b	2437	8.06	500
11b	2462	8.58	500
11g	2412	16.35	500
11g	2437	16.35	500
11g	2462	16.35	500
HT20	2412	17.68	500
HT20	2437	17.62	500
HT20	2462	17.57	500

Worst Plots



Modulation Mode	Freq. (MHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)
11b	2412	13.37	-
11b	2437	13.26	-
11b	2462	13.20	-
11g	2412	17.13	-
11g	2437	17.37	-
11g	2462	17.13	-
HT20	2412	18.06	-
HT20	2437	18.29	-
HT20	2462	18.12	-



3.3 RF Output Power

3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

- Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.
- Antenna gain > 6dBi
 - Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB
 - Fixed, point to point operations
Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak 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.
Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations ,no any corresponding reduction is in transmitter peak output power

3.3.2 Test Procedures

- Maximum Peak Conducted Output Power
 - Spectrum analyzer**
 1. Set RBW = 1MHz, VBW = 3MHz, Detector = Peak.
 2. Sweep time = auto, Trace mode = max hold, Allow trace to fully stabilize.
 3. Use the spectrum analyzer channel power measurement function with the band limits set equal to the DTS bandwidth edges.
 - Power meter**
 1. A broadband Peak RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.
- Maximum Conducted Output Power (For reference only)
 - Spectrum analyzer**
 1. Set RBW = 1MHz, VBW = 3MHz, Detector = RMS.
 2. Set the sweep time to: $\geq 10 \times (\text{number of measurement points in sweep}) \times (\text{maximum data rate per stream})$.
 3. Perform the measurement over a single sweep.
 4. Use the spectrum analyzer's band power measurement function with band limits set equal to the EBW(26dBc) band edges.
 - Power meter**
 1. A broadband Average RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.3.3 Test Setup



3.3.4 Test Result of Maximum Output Power

Modulation Mode	Freq. (MHz)	Peak Power (dBm)	Total Power (mW)	Total Power (dBm)	Limit (dBm)
11b	2412	16.41	43.752	16.41	30
11b	2437	16.17	41.400	16.17	30
11b	2462	15.99	39.719	15.99	30
11g	2412	20.46	111.173	20.46	30
11g	2437	20.13	103.039	20.13	30
11g	2462	20.01	100.231	20.01	30
HT20	2412	19.43	87.700	19.43	30
HT20	2437	18.98	79.068	18.98	30
HT20	2462	18.82	76.208	18.82	30

Modulation Mode	Freq. (MHz)	Average Power (dBm)	Total Power (mW)	Total Power (dBm)	Limit (dBm)
11b	2412	13.61	22.961	13.61	30
11b	2437	13.42	21.979	13.42	30
11b	2462	13.32	21.478	13.32	30
11g	2412	12.71	18.664	12.71	30
11g	2437	12.46	17.620	12.46	30
11g	2462	12.33	17.100	12.33	30
HT20	2412	11.19	13.152	11.19	30
HT20	2437	10.88	12.246	10.88	30
HT20	2462	10.65	11.614	10.65	30

Note: Average power is for reference only

3.4 Power Spectral Density

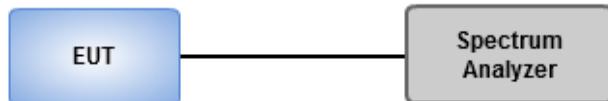
3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.4.2 Test Procedures

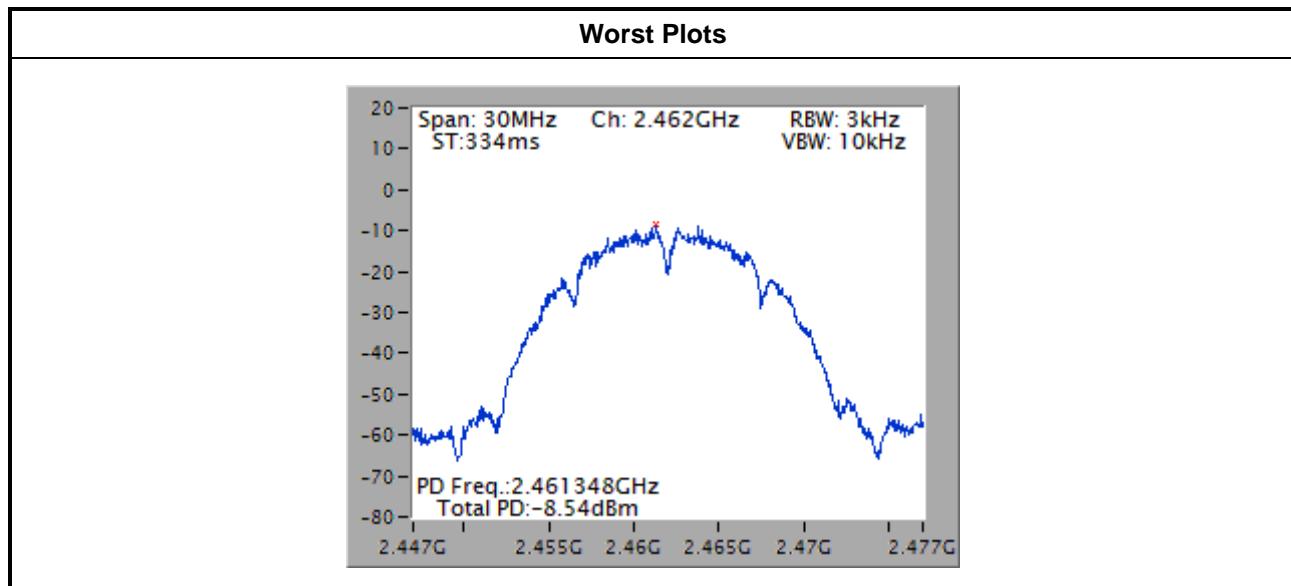
- Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.
 1. Set the RBW = 3kHz, VBW = 10kHz.
 2. Detector = Peak, Sweep time = auto couple.
 3. Trace mode = max hold, allow trace to fully stabilize.
 4. Use the peak marker function to determine the maximum amplitude level.
- Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit.
 1. Set the RBW = 100kHz, VBW = 300 kHz.
 2. Detector = RMS, Sweep time = auto couple.
 3. Set the sweep time to: $\geq 10 \times (\text{number of measurement points in sweep}) \times (\text{maximum data rate per stream})$.
 4. Perform the measurement over a single sweep.
 5. Use the peak marker function to determine the maximum amplitude level.\

3.4.3 Test Setup



3.4.4 Test Result of Power Spectral Density

Modulation Mode	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	2412	-9.76	8
11b	2437	-9.14	8
11b	2462	-8.54	8
11g	2412	-11.80	8
11g	2437	-13.00	8
11g	2462	-12.54	8
HT20	2412	-12.92	8
HT20	2437	-14.30	8
HT20	2462	-15.03	8



3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Quasi-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.5.2 Test Procedures

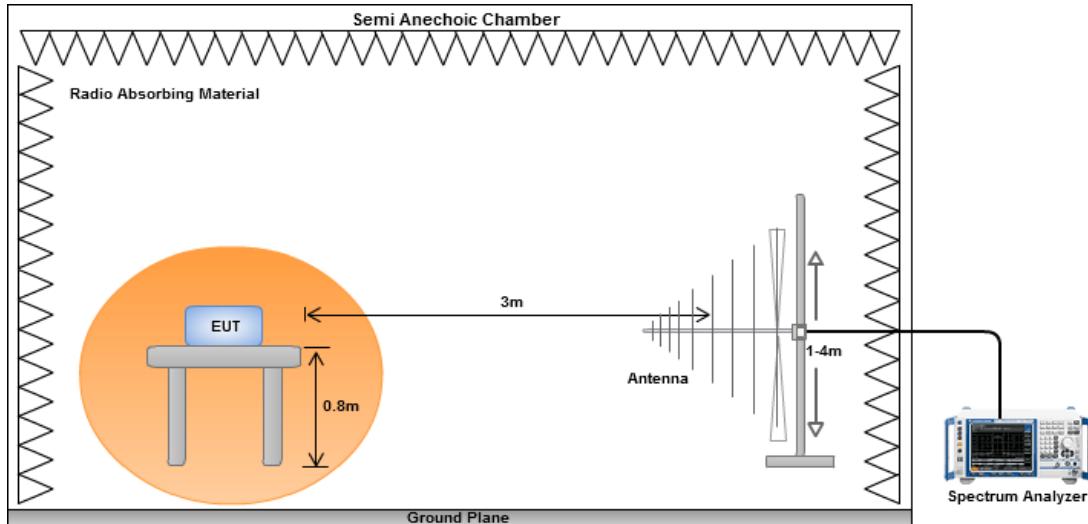
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

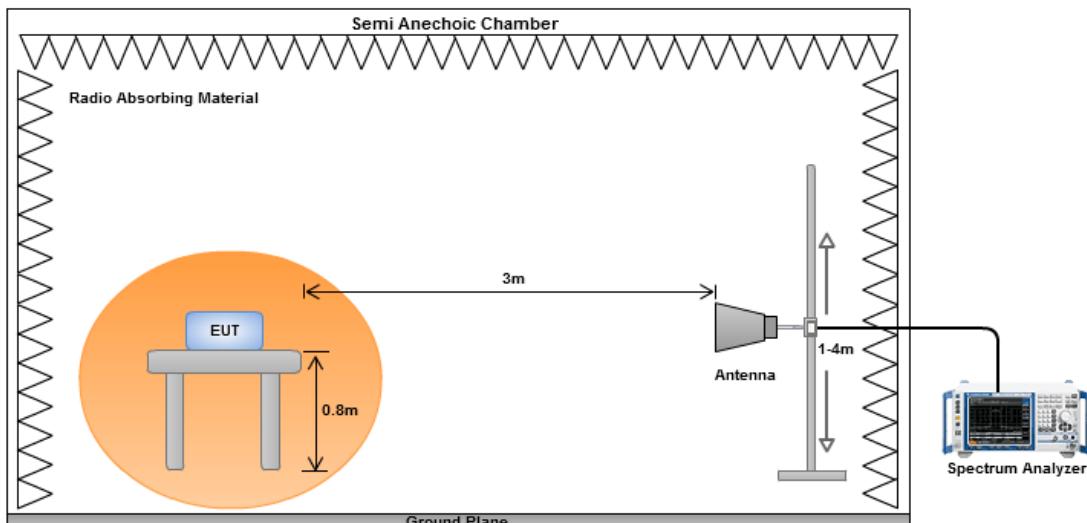
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.5.3 Test Setup

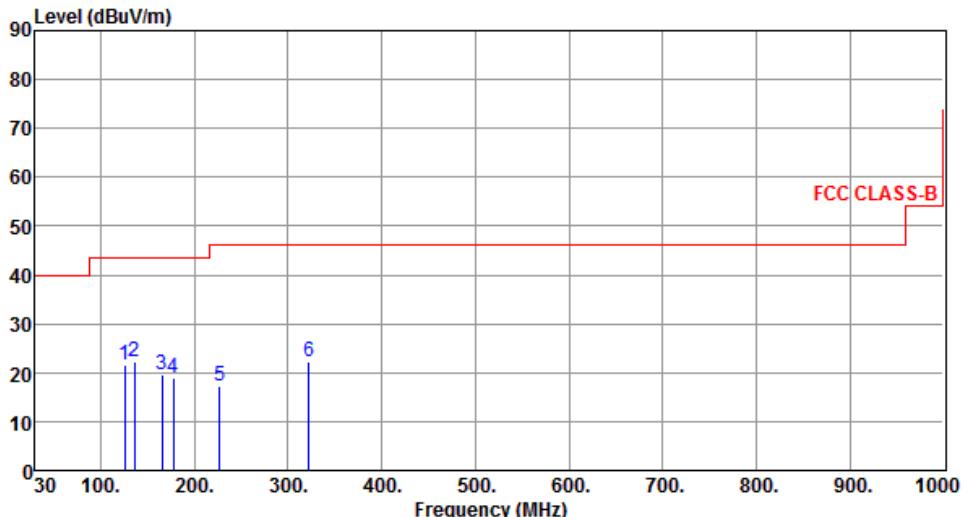
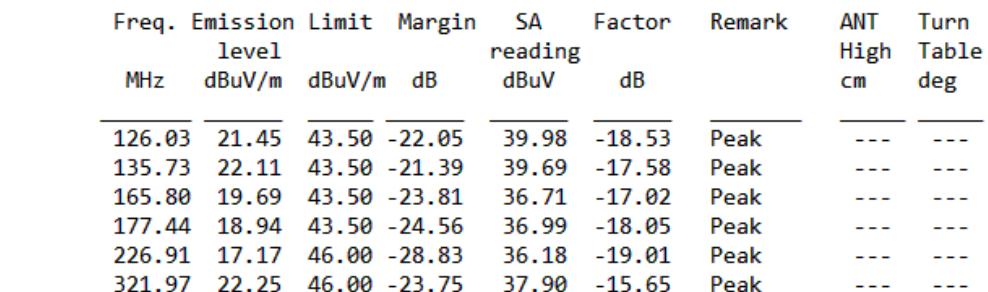
Radiated Emissions below 1 GHz



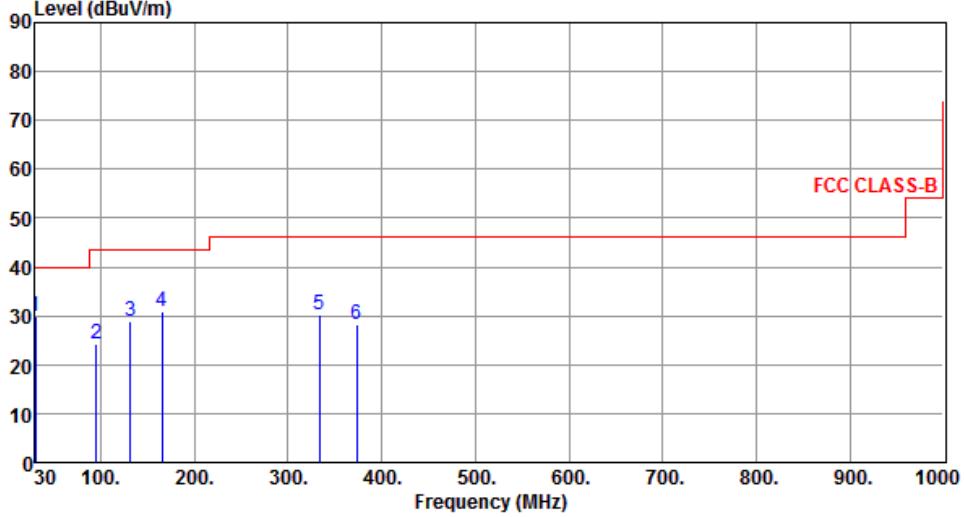
Radiated Emissions above 1 GHz

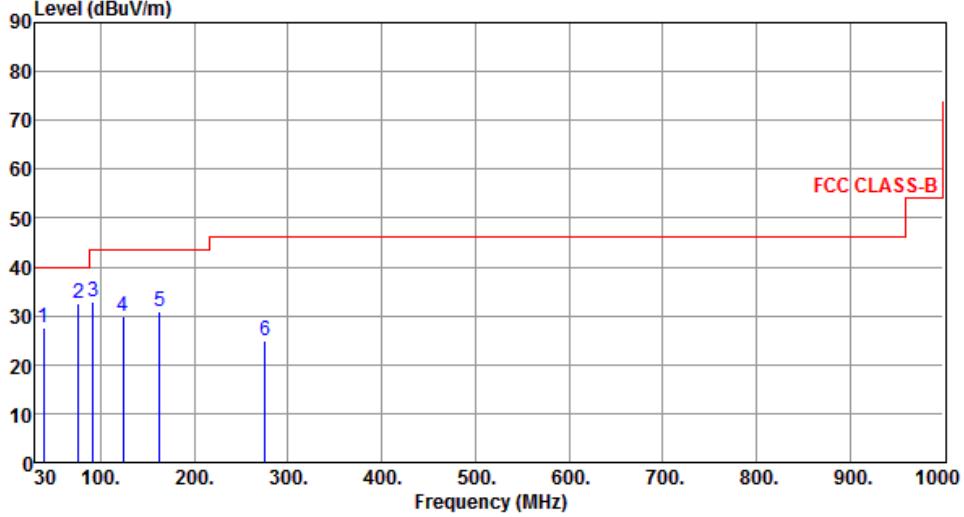


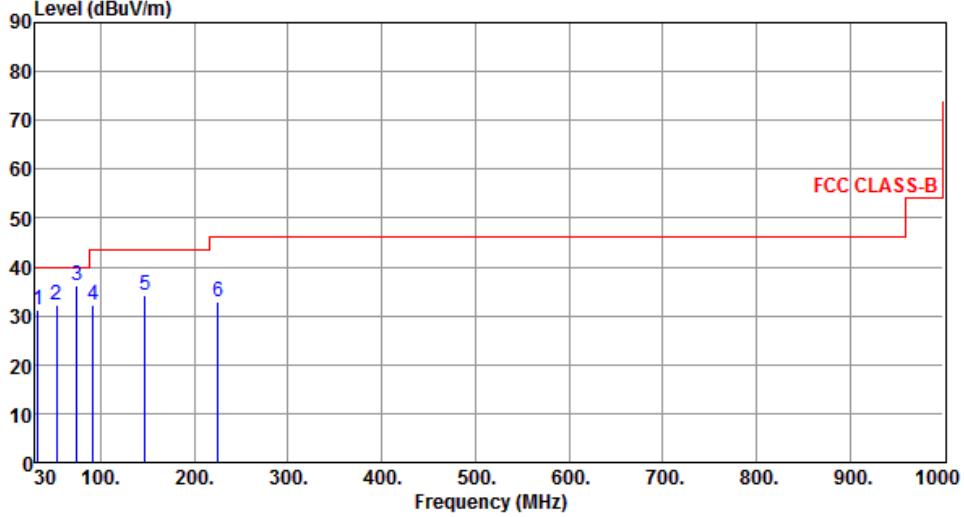
3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	11g	Test Freq. (MHz)	2412						
Polarization	Horizontal	Test Configuration	1						
									
									
1	126.03	21.45	43.50	-22.05	39.98	-18.53	Peak	---	---
2	135.73	22.11	43.50	-21.39	39.69	-17.58	Peak	---	---
3	165.80	19.69	43.50	-23.81	36.71	-17.02	Peak	---	---
4	177.44	18.94	43.50	-24.56	36.99	-18.05	Peak	---	---
5	226.91	17.17	46.00	-28.83	36.18	-19.01	Peak	---	---
6	321.97	22.25	46.00	-23.75	37.90	-15.65	Peak	---	---

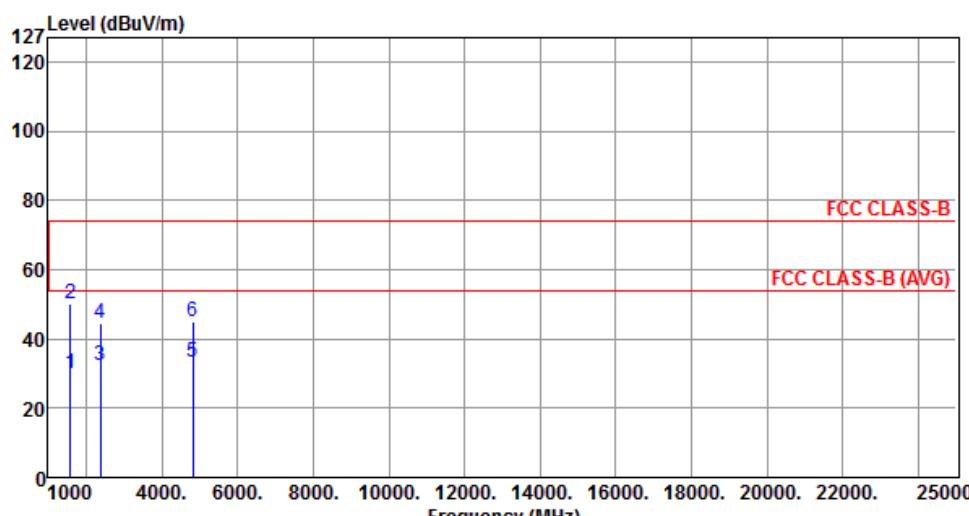
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor, cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

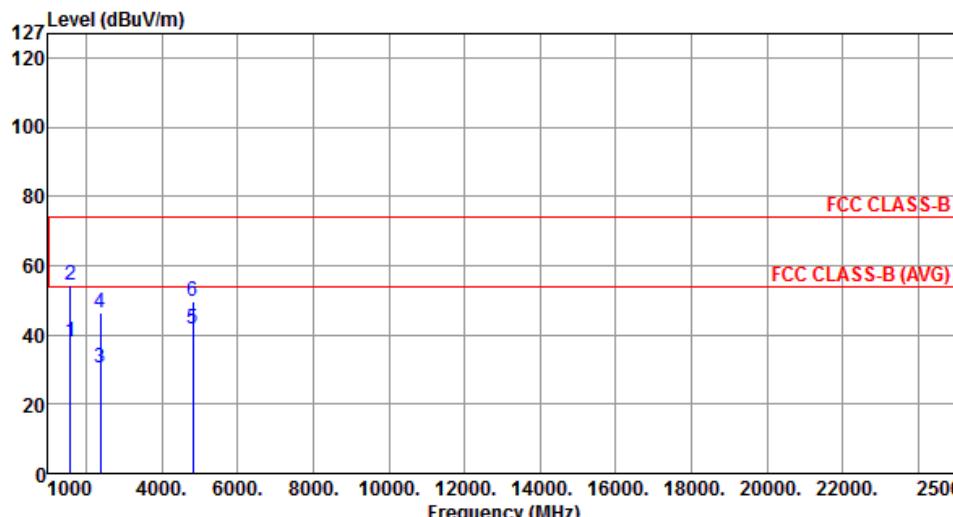
Modulation	11g	Test Freq. (MHz)	2412																																																															
Polarization	Vertical	Test Configuration	1																																																															
																																																																		
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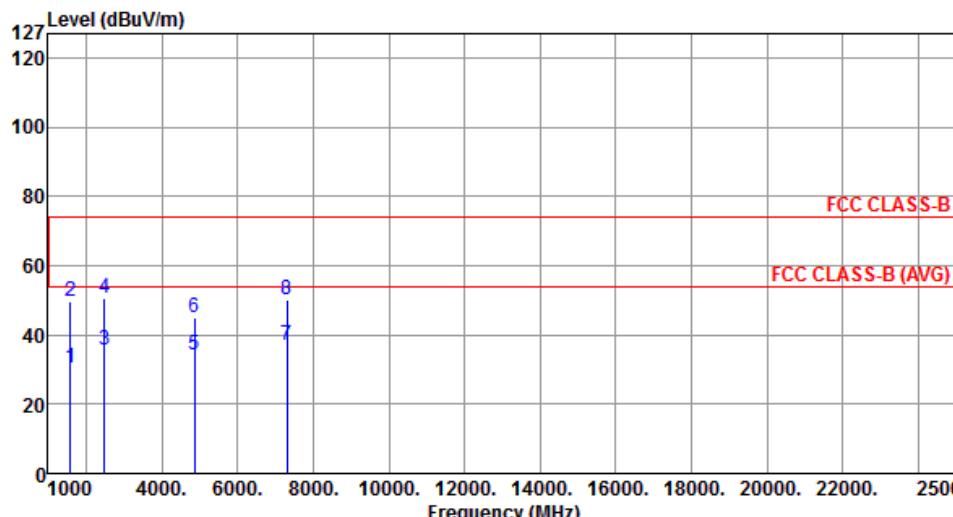
Modulation	11g	Test Freq. (MHz)	2412																																																																
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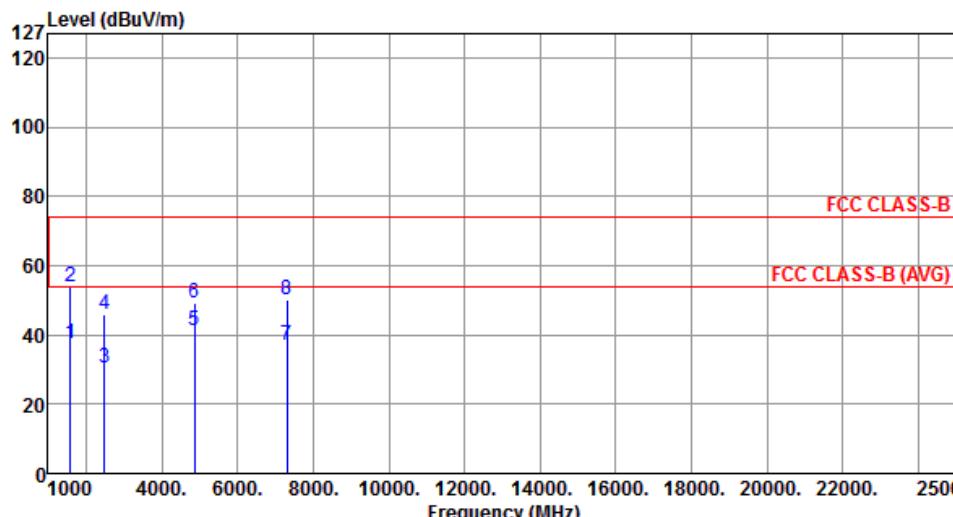
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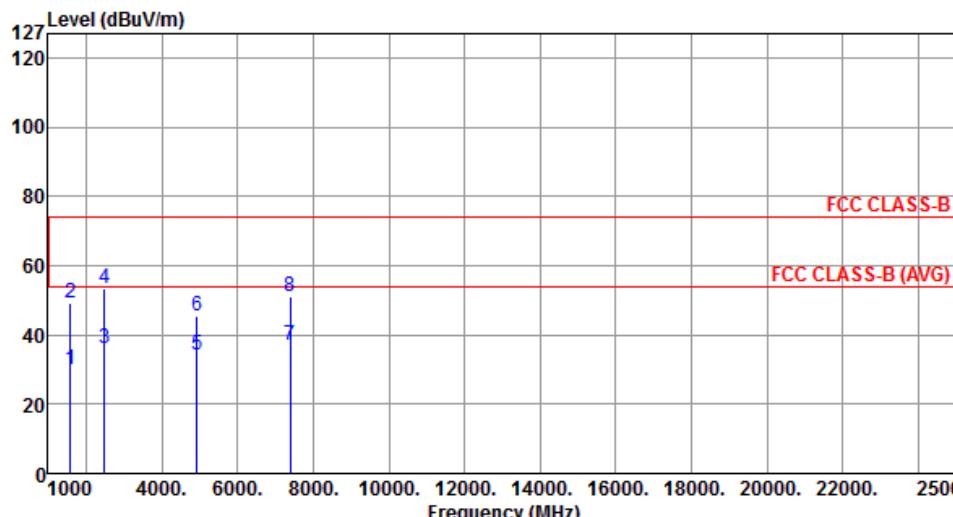
3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11b

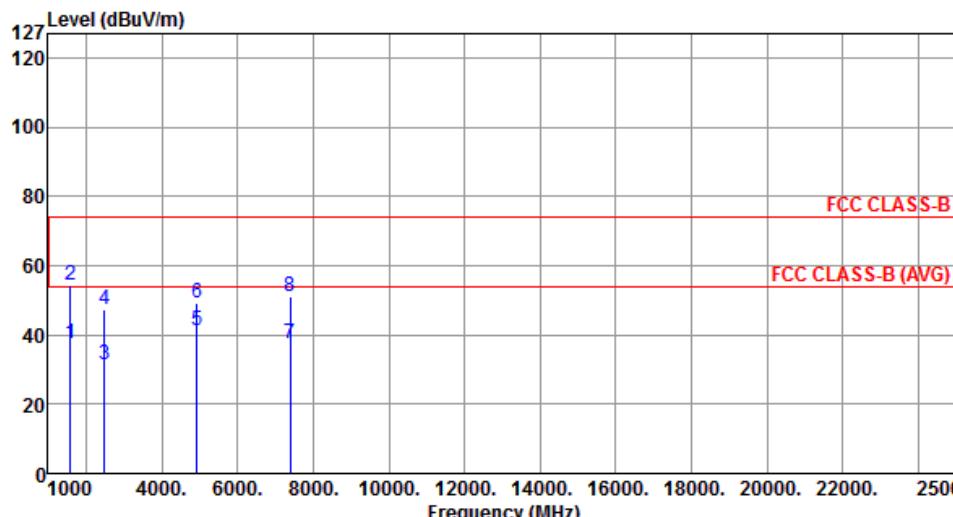
Modulation	11b	Test Freq. (MHz)	2412																																																															
Polarization	Horizontal																																																																	
 <p>The graph plots Emission Level (dBuV/m) on the y-axis (0 to 127) against Frequency (MHz) on the x-axis (1000 to 25000). Six data points are plotted: 1 (1594.00 MHz, 30.01 dBuV/m), 2 (1594.00 MHz, 49.93 dBuV/m), 3 (2390.00 MHz, 32.42 dBuV/m), 4 (2390.00 MHz, 44.57 dBuV/m), 5 (4824.00 MHz, 33.28 dBuV/m), and 6 (4824.00 MHz, 44.84 dBuV/m). Two horizontal red lines represent the FCC CLASS-B limit (around 70 dBuV/m) and the FCC CLASS-B (AVG) limit (around 55 dBuV/m).</p>																																																																		
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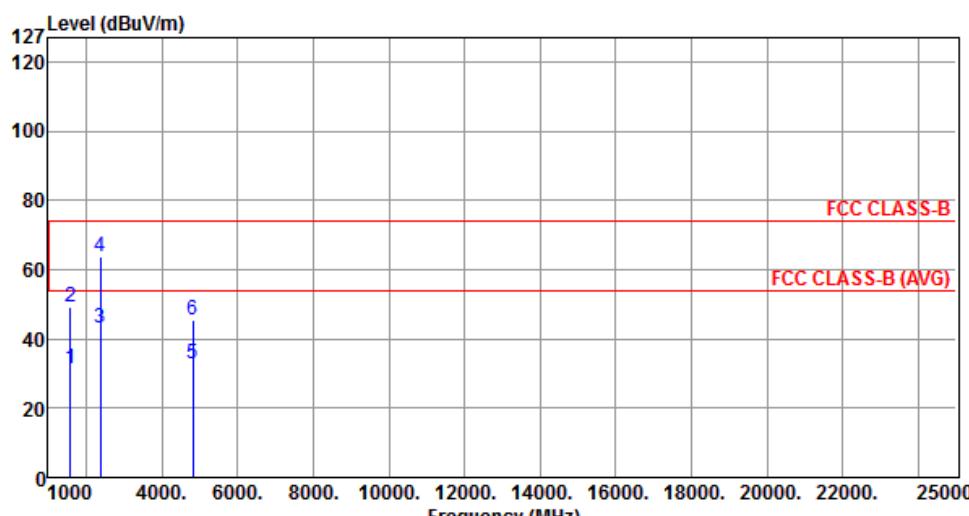
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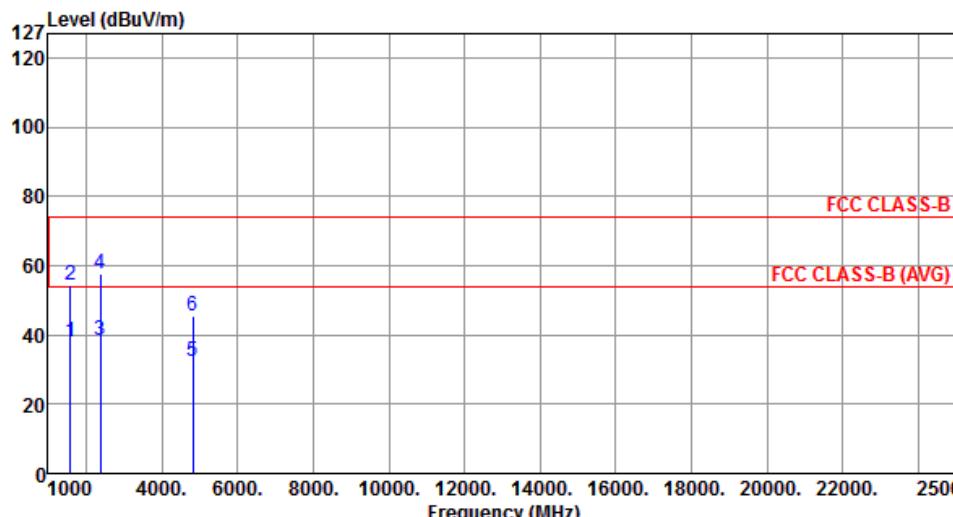
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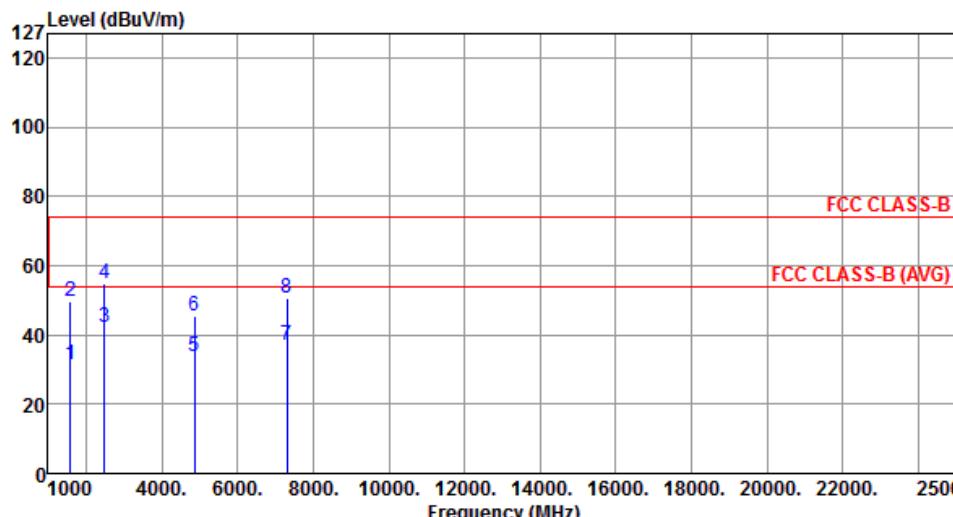
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1	1594.00	29.87	54.00	-24.13	36.17	-6.30	Average	---																																																																																					
2	1594.00	49.15	74.00	-24.85	55.45	-6.30	Peak	---																																																																																					
3	2483.50	35.96	54.00	-18.04	38.79	-2.83	Average	---																																																																																					
4	2483.50	53.21	74.00	-20.79	56.04	-2.83	Peak	---																																																																																					
5	4924.00	34.01	54.00	-19.99	29.53	4.48	Average	---																																																																																					
6	4924.00	45.29	74.00	-28.71	40.81	4.48	Peak	---																																																																																					
7	7386.00	37.09	54.00	-16.91	28.11	8.98	Average	---																																																																																					
8	7386.00	50.92	74.00	-23.08	41.94	8.98	Peak	---																																																																																					
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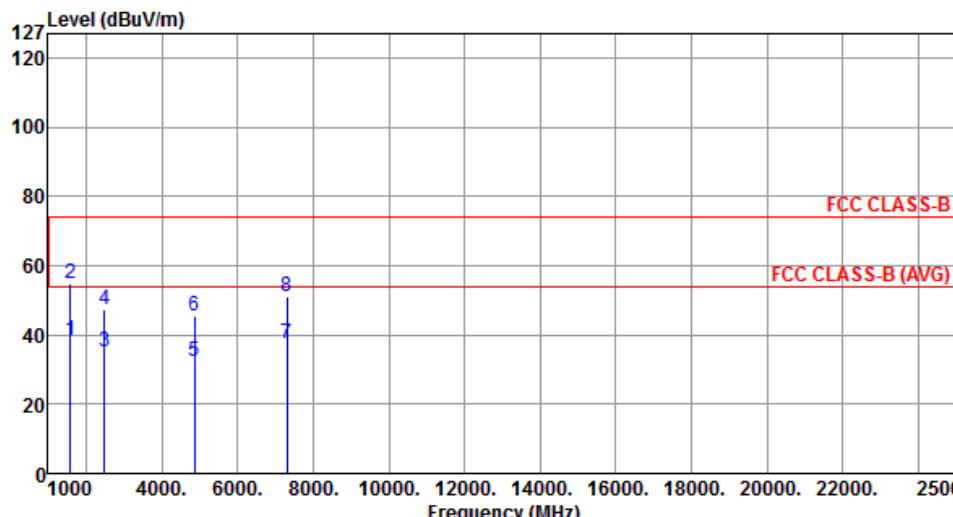
Modulation	11b	Test Freq. (MHz)	2462																																																																																										
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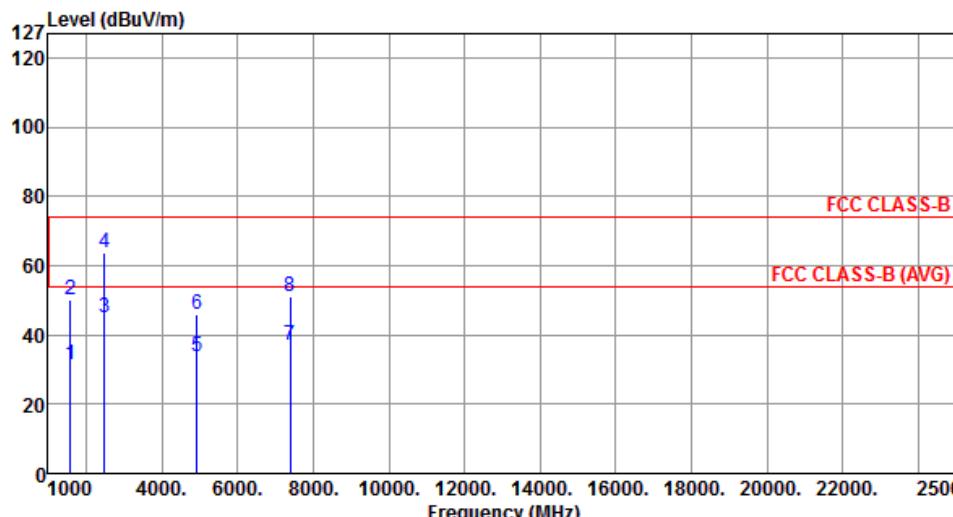
3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g

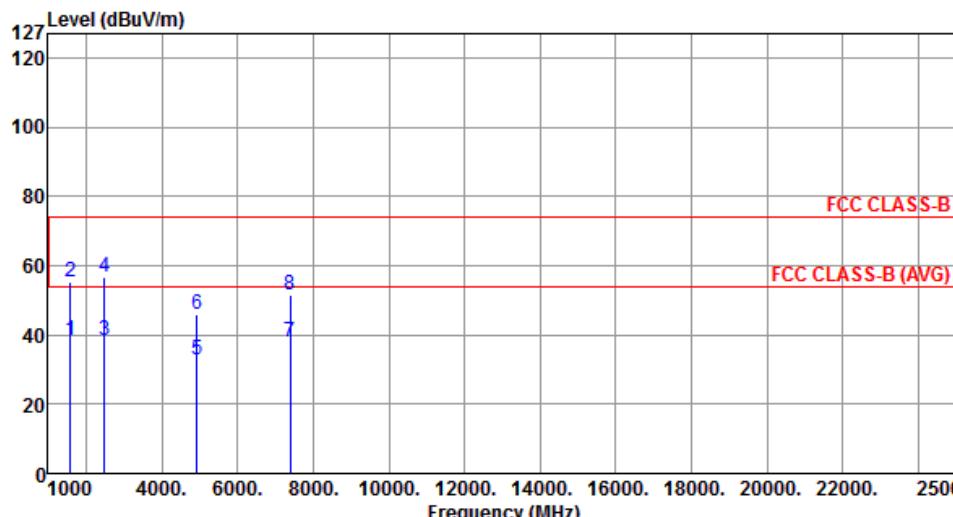
Modulation	11g	Test Freq. (MHz)	2412																																																																														
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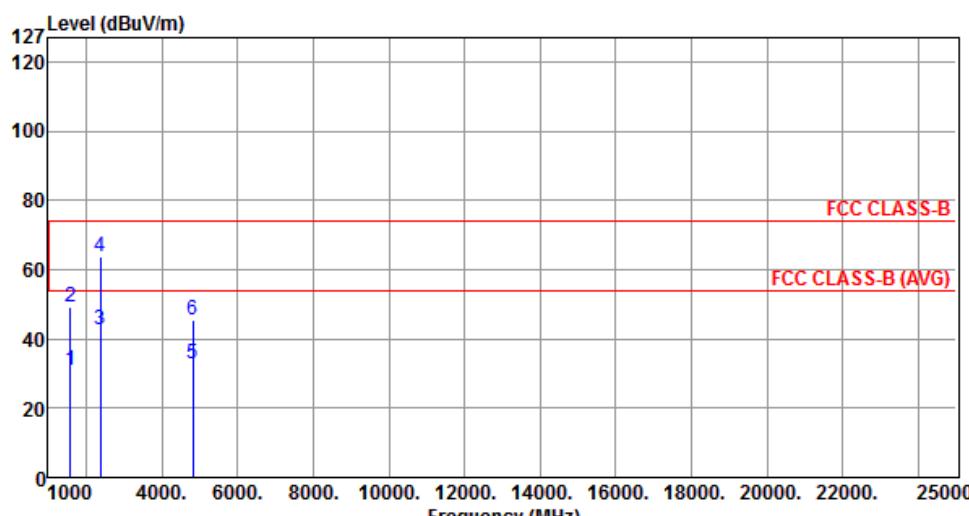
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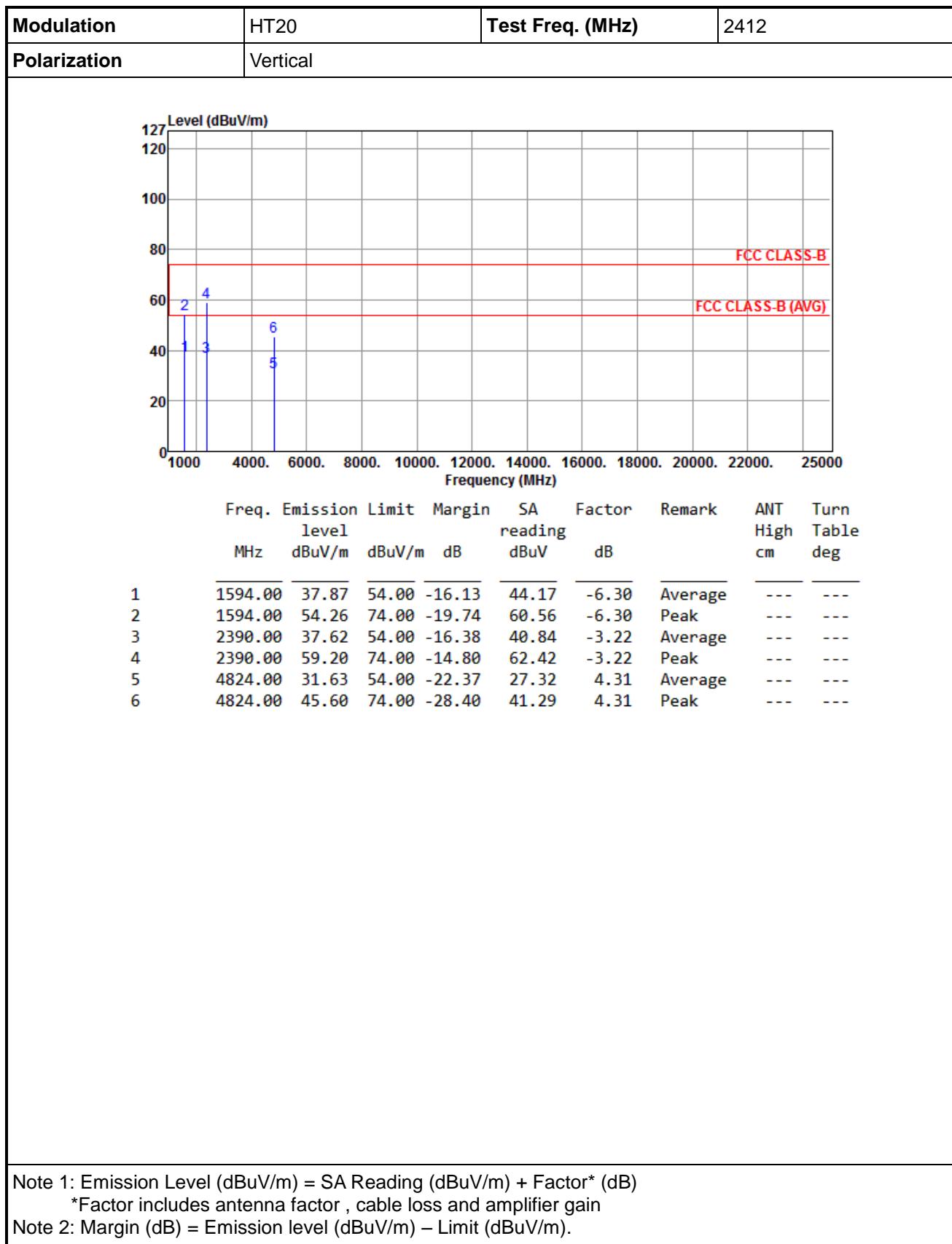
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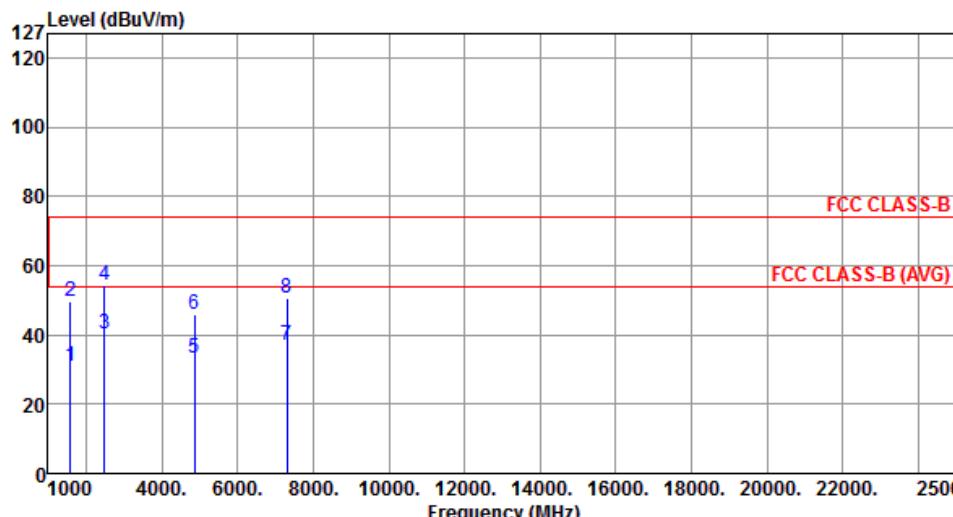
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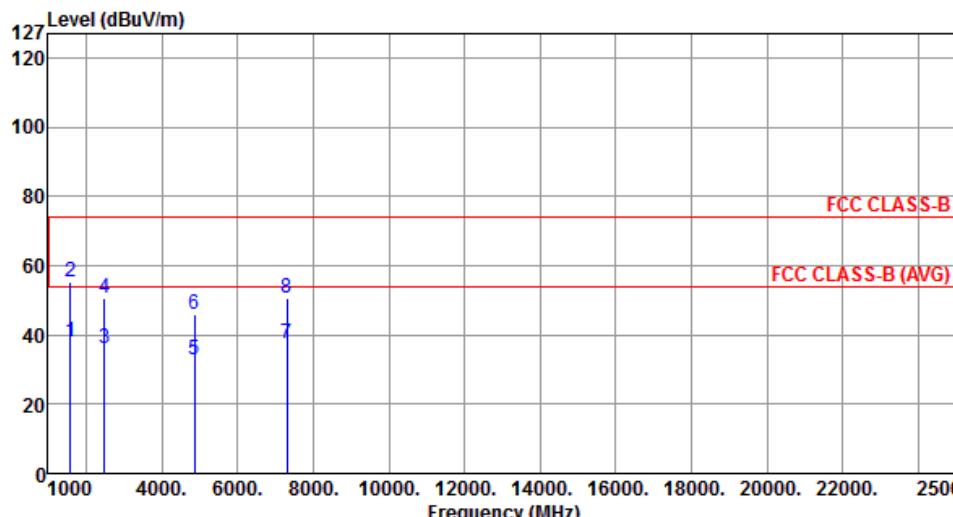
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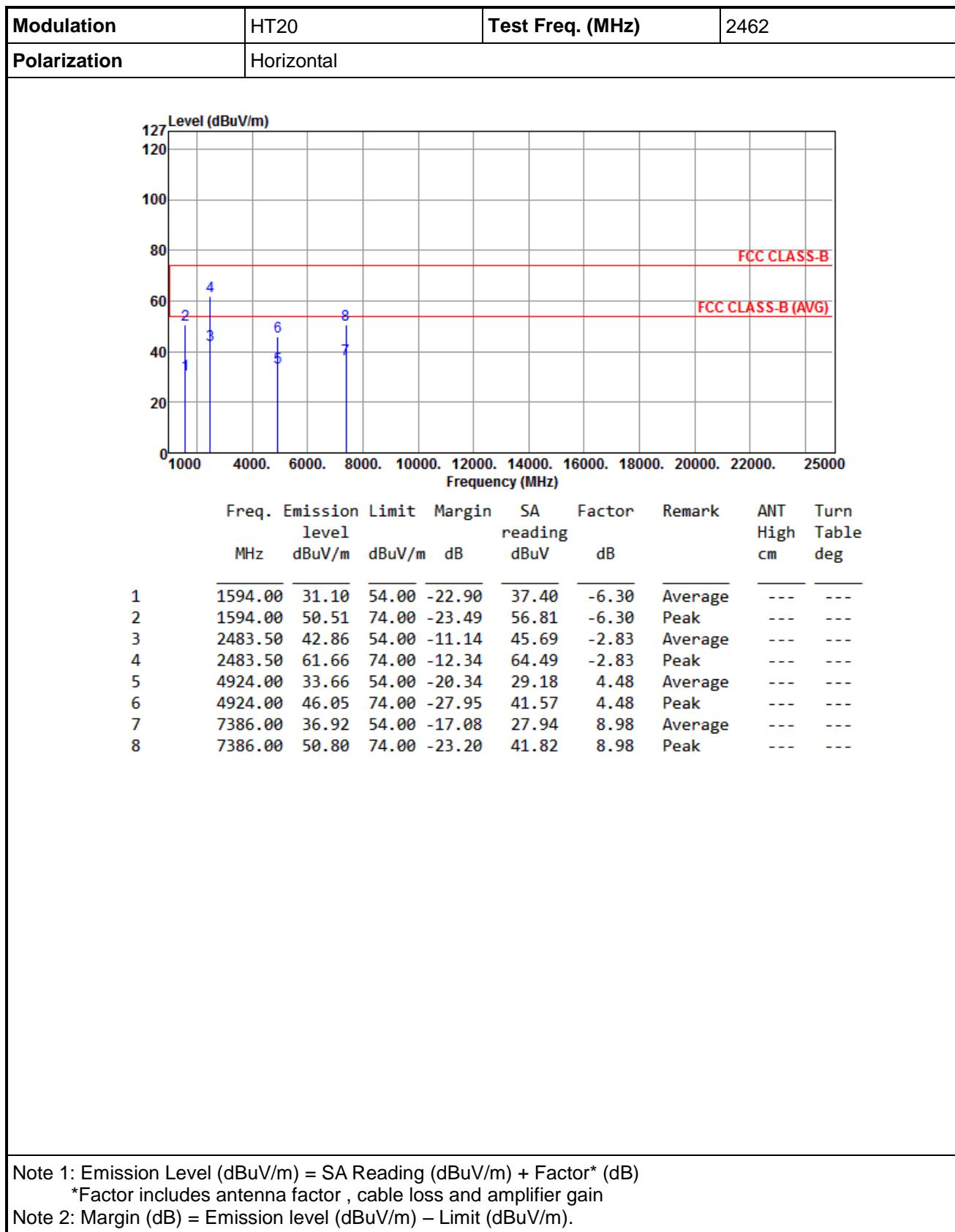
3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

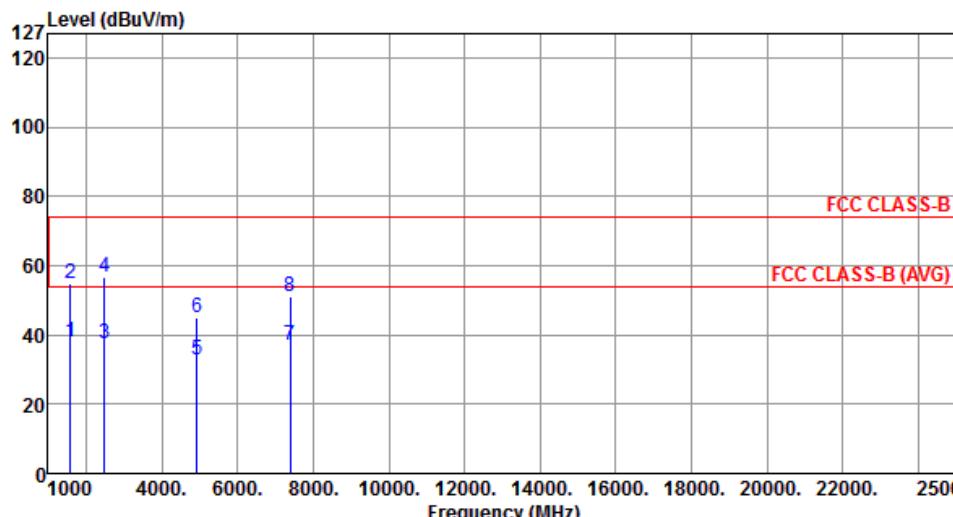
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3.6 Unwanted Emissions into Non-Restricted Frequency Bands

3.6.1 Limit of Unwanted Emissions into Non-Restricted Frequency Bands

- The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.
- The peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.6.2 Test Procedures

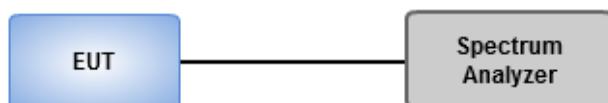
Reference Level Measurement

1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Set Sweep time = auto couple, Trace mode = max hold.
3. Allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

Unwanted Emissions Level Measurement

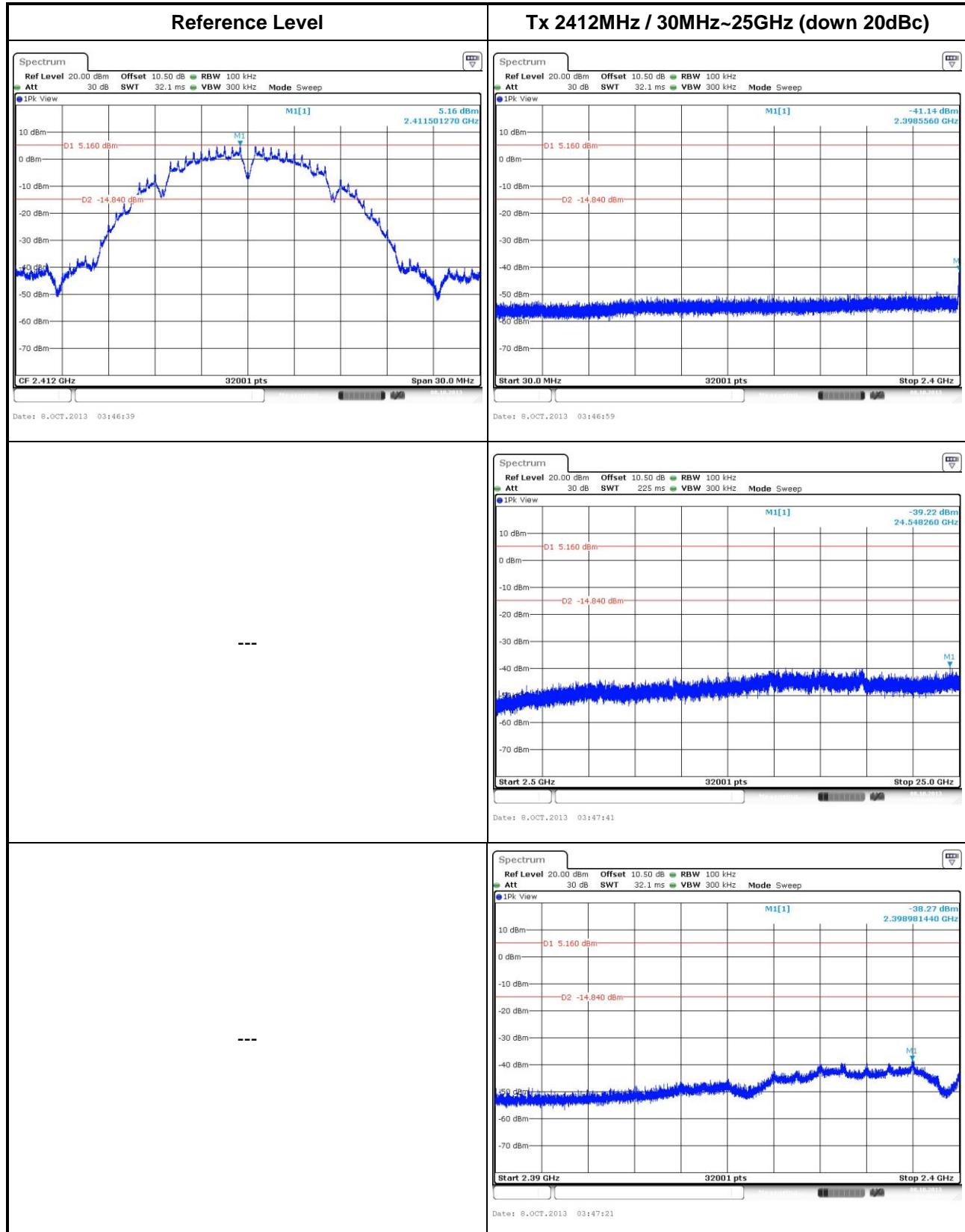
1. Set RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Trace Mode = max hold, Sweep = auto couple.
3. Allow the trace to stabilize.
4. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

3.6.3 Test Setup

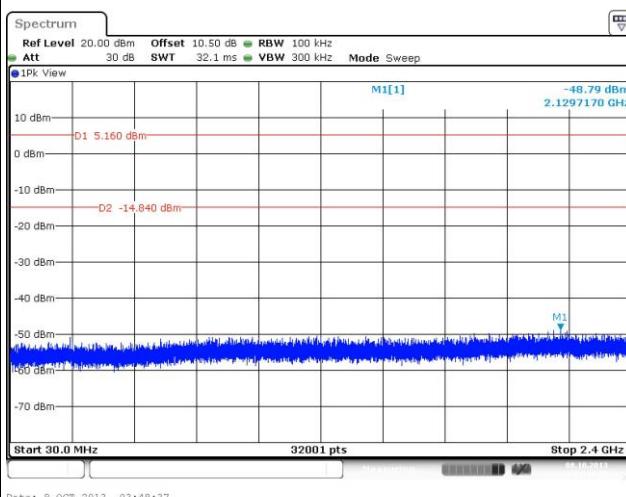


3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands

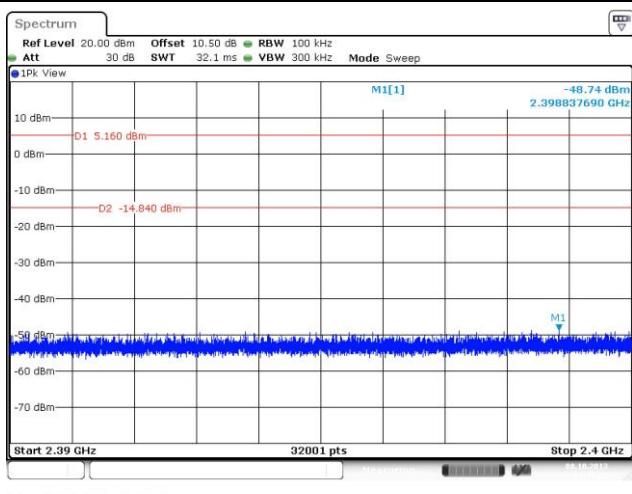
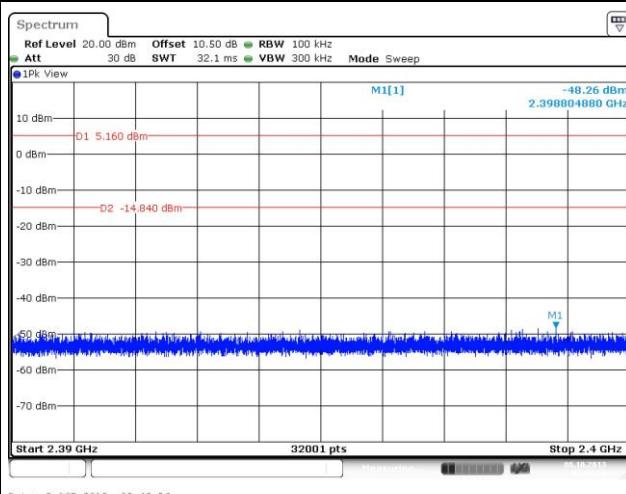
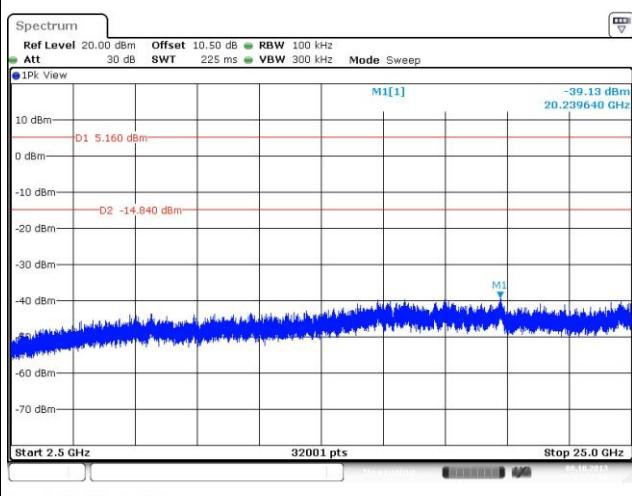
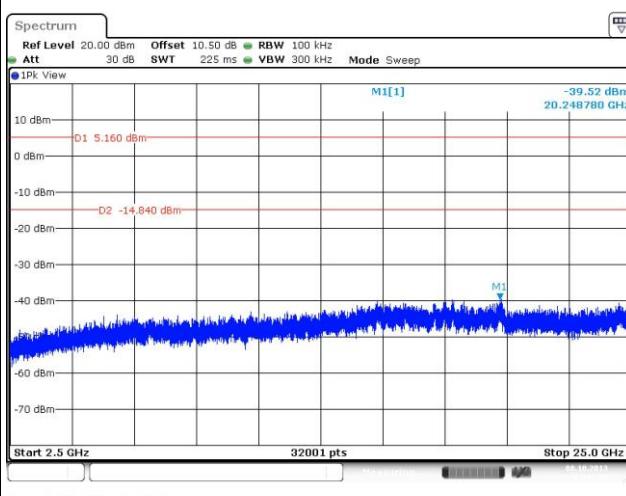
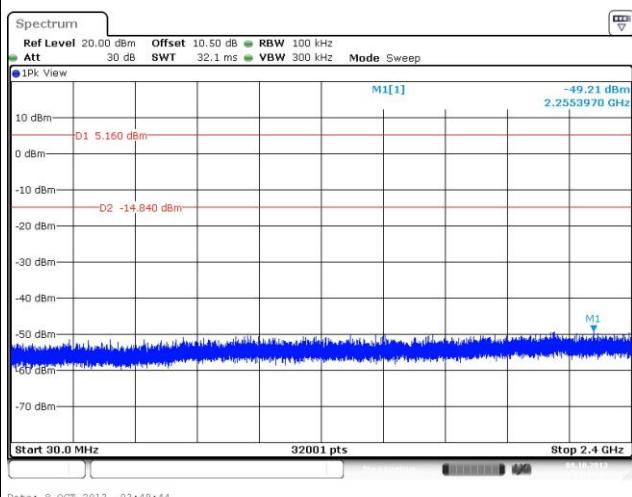
802.11b



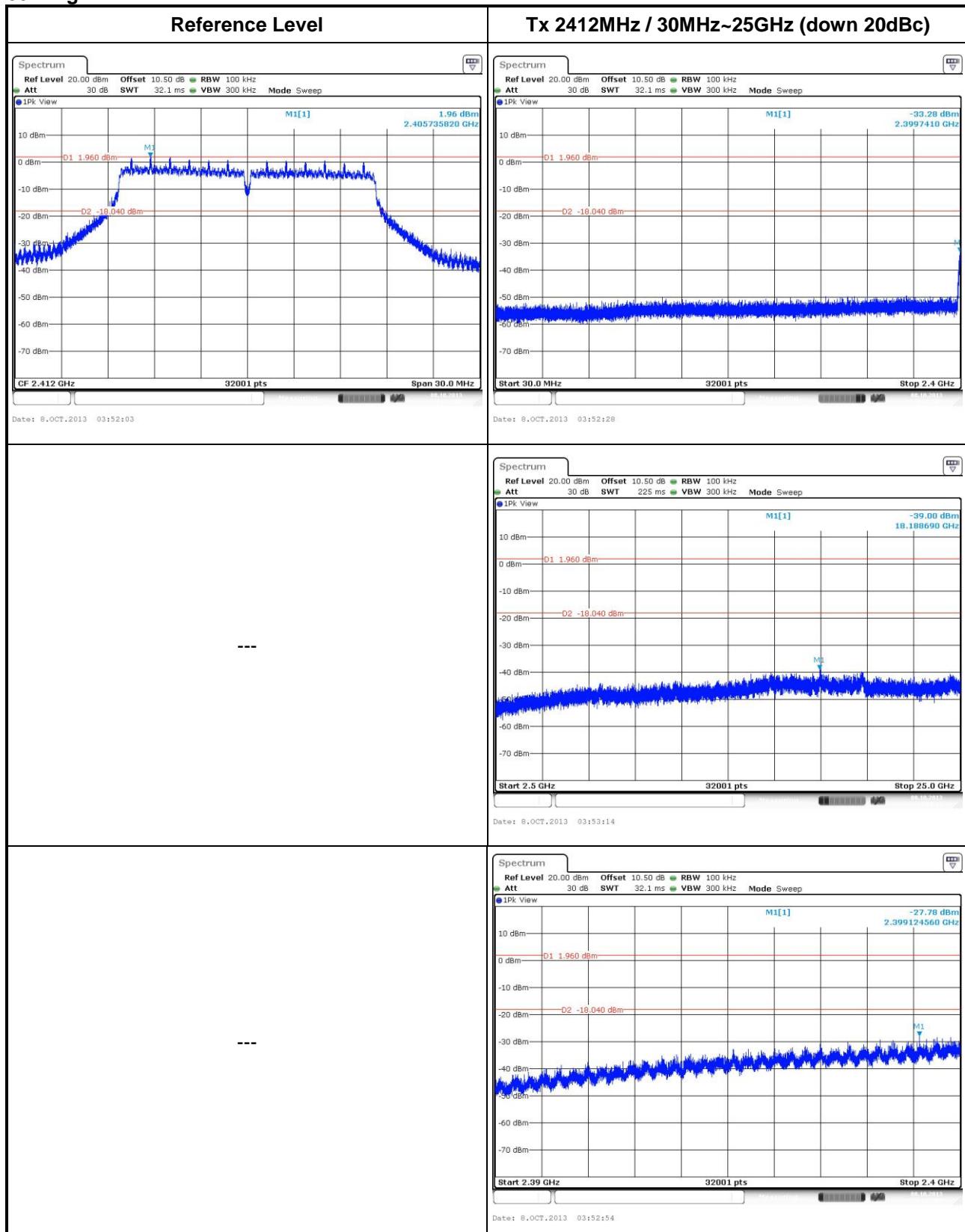
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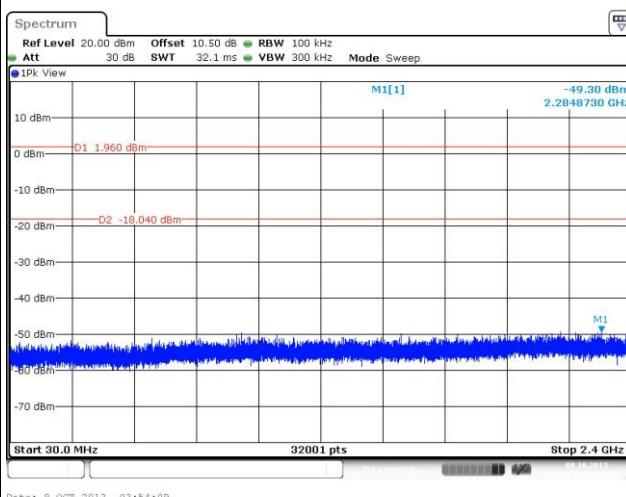
Tx 2462MHz / 30MHz~25GHz (down 20dBc)



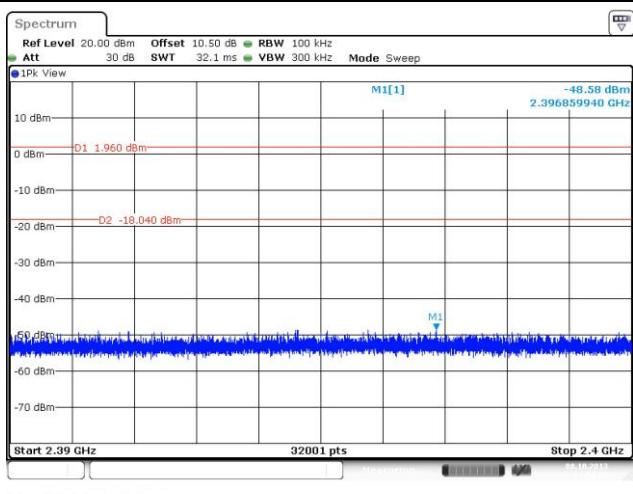
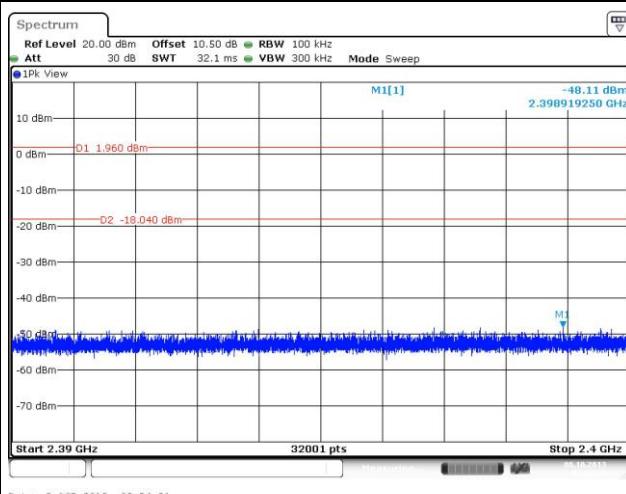
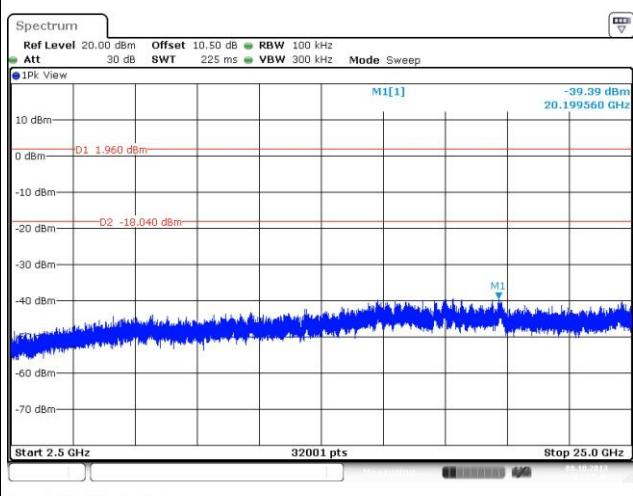
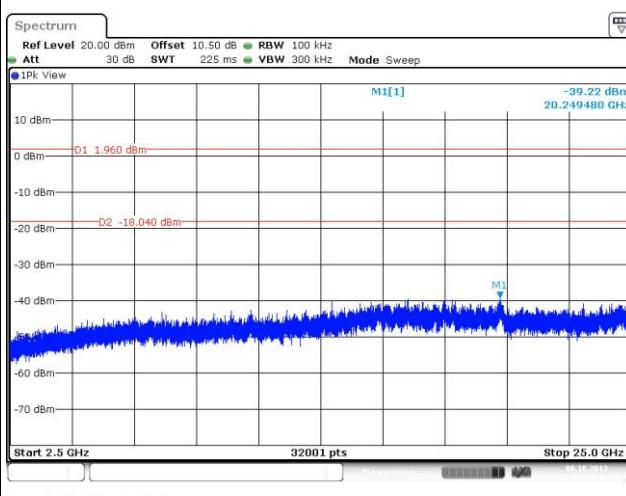
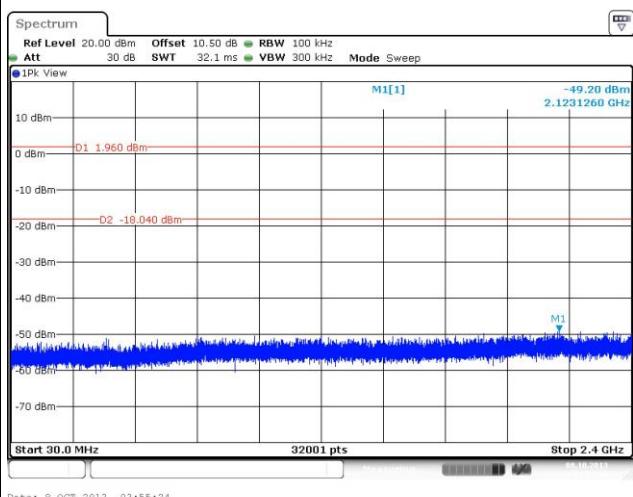
802.11g



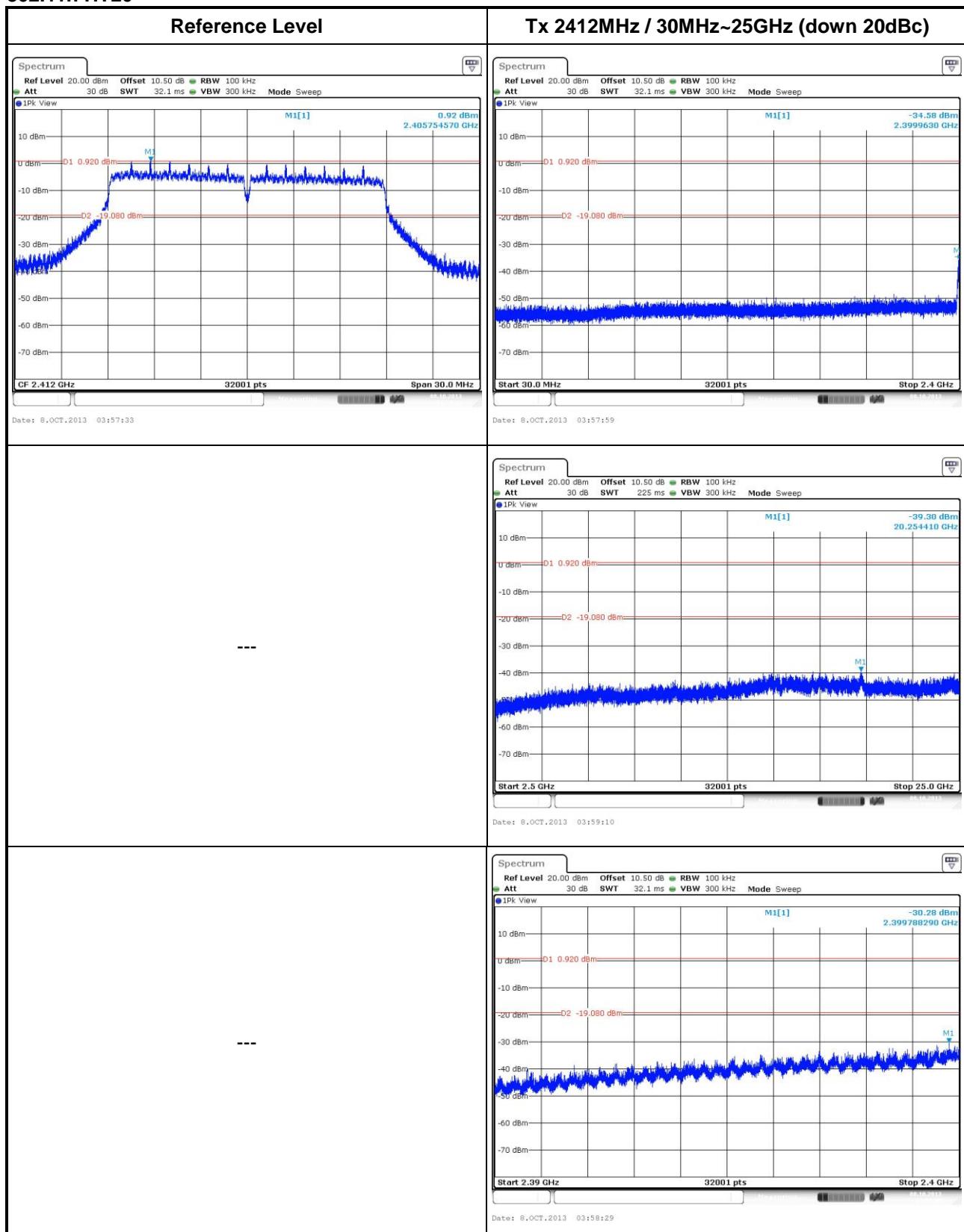
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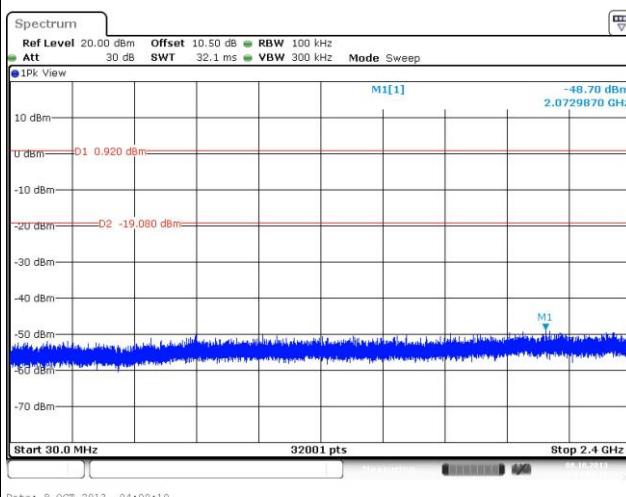
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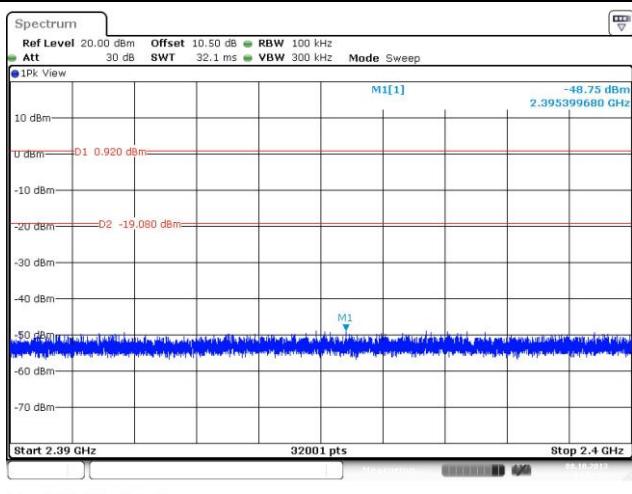
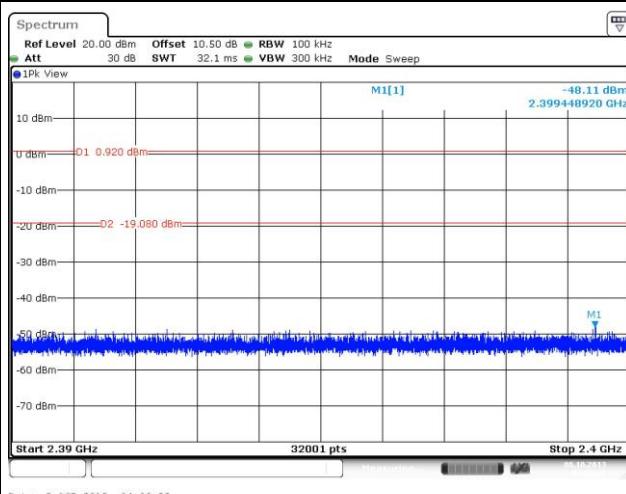
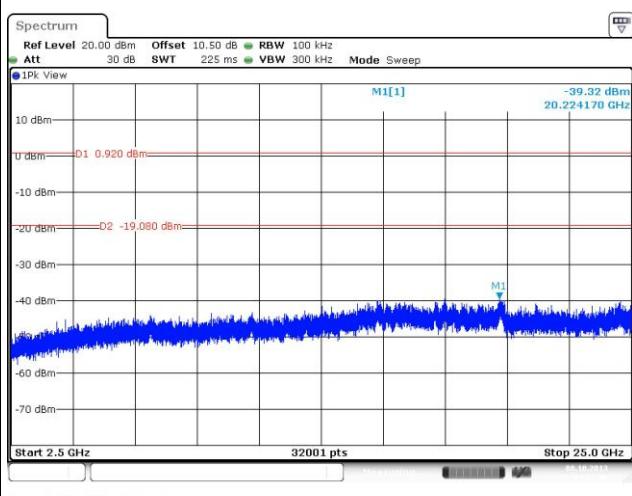
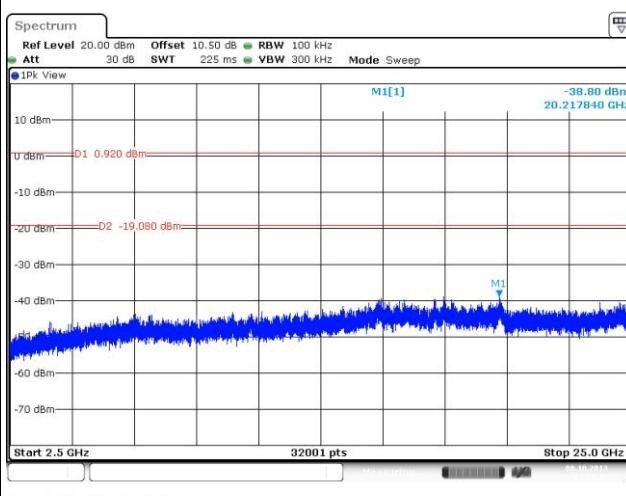
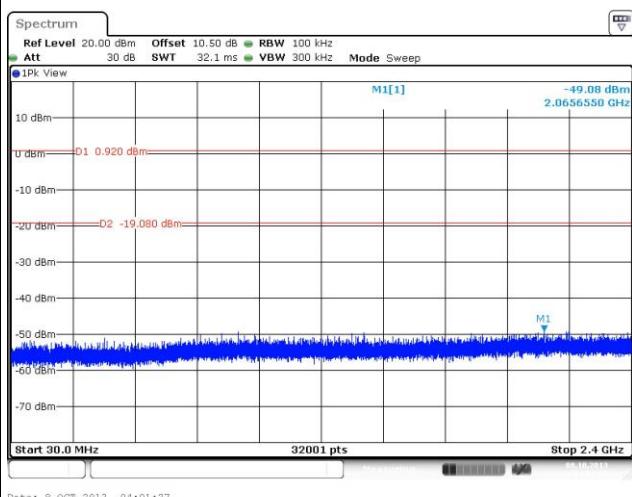
802.11n HT20



Tx 2437MHz / 30MHz~25GHz (down 20dBc)



Tx 2462MHz / 30MHz~25GHz (down 20dBc)



4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==