FCC Test Report

FCC ID	:	**I88EMG3425Q10A**
Equipment	:	**Simultaneous Dual-Band Wireless AC2200 Gigabit Ethernet Gateway**
Model No.	:	**EMG3425-Q10A**
Brand Name	:	**ZyXEL**
Applicant	:	**ZyXEL Communications Corporation**
Address	:	**No. 2, Gongye E. 9th Road, Hsinchu Science Park, Hsinchu, Taiwan.**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Jun. 16, 2015**
Tested Date	:	**Jul. 18 ~ Aug. 14, 2015**

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

Testing Laboratory
2732

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Release Record

Report No.	Version	Description	Issued Date
FR570601AC	Rev. 01	Initial issue	Sep. 09, 2015

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.437MHz 34.19 (Margin -12.92dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz 53.37 (Margin -0.63dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 29.92	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 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]	3	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	3	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	3	MCS 0-23
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	3	MCS 0-23
Note 1: RF output power specifies that Maximum Conducted (Average) 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.					

1.1.2 Antenna Details

Ant. No.	**Type**	**Operating Frequency / Gain (dBi)**		**Connector**
		2.4GHz	**5GHz**	
1	Dipole	1.53	1.92	UFL

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from AC adapter

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	AC adapter	Brand Name: APD Model Name: DA-48T12 Power Rating: I/P: 100-240Vac, 50-60Hz, 1.4A Max O/P: 12Vdc, 4A Power Line: AC 1.5m non-shielded cable w/o core DC 1.2m non-shielded cable w/o core
2	AC adapter	Brand Name: APD Model Name: WA-36A12FU Power Rating: I/P: 100-240Vac, 50-60Hz, 0.9A Max O/P: 12Vdc, 3A Power Line: DC 1.5m non-shielded cable with one core
3	RJ45 cable	1.0m non-shielded cable w/o core.

1.1.5 Channel List

Frequency band (MHz)		**2400~2483.5**	
802.11 b / g / n HT20		**802.11n HT40**	
Channel	**Frequency(MHz)**	**Channel**	**Frequency(MHz)**
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447	---	---
9	2452	---	---
10	2457	---	---
11	2462	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	ART2-GUI, V2.3		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	100.00%	0.00
	11g	98.26%	0.08
	HT20	98.87%	0.05
	HT40	97.31%	0.12

1.1.7 Power Setting

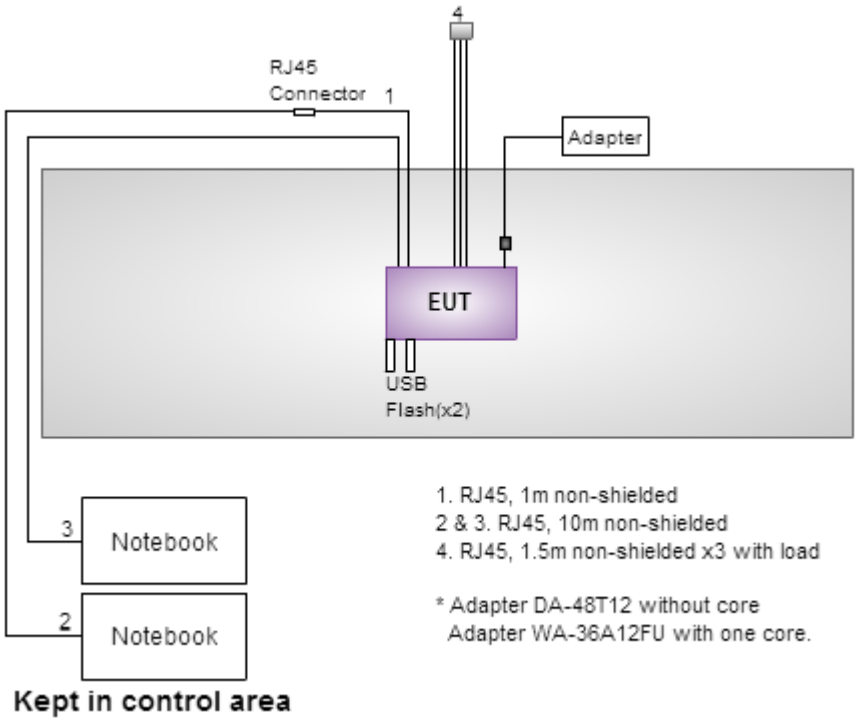
Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	25.5
11b	2437	25.5
11b	2462	25.5
11g	2412	20.5
11g	2437	26
11g	2462	20
HT20	2412	18.5
HT20	2437	26
HT20	2462	19
HT40	2422	14.5
HT40	2437	20
HT40	2452	15

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook	DELL	Latitude E6440	DoC	RJ45, 10m non-shielded.
2	Notebook	DELL	Latitude E6440	DoC	RJ45, 10m non-shielded.
3	USB Flash	Kingston	DTSE9	---	---
4	USB Flash	Kingston	DTSE9	---	---
5	Load	ICC	---	---	RJ45x3, 1.5m non-shielded.

1.3 Test Setup Chart

Test Setup Diagram



1.4 The Equipment List

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. 17, 2014	Oct. 16, 2015
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 17, 2014	Nov. 16, 2015
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Dec. 31, 2014	Dec. 30, 2015
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 3 / (03CH03-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 16, 2014	Sep. 15, 2015
Receiver	Agilent	N9038A	MY53290044	Oct. 21, 2014	Oct. 20, 2015
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-562	Jan. 19, 2015	Jan. 18, 2016
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 03, 2015	Feb. 02, 2016
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 10, 2014	Nov. 09, 2015
Loop Antenna	R&S	HFH2-Z2	11900	Nov. 10, 2014	Nov. 09, 2015
Preamplifier	EMC	EMC02325	980187	Sep. 26, 2014	Sep. 25, 2015
Preamplifier	Agilent	83017A	MY53270014	Sep. 17, 2014	Sep. 16, 2015
Preamplifier	EMC	EMC184045B	980192	Aug. 26, 2014	Aug. 25, 2015
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Feb. 09, 2015	Feb. 08, 2016
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22601/4	Feb. 09, 2015	Feb. 08, 2016
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Feb. 09, 2015	Feb. 08, 2016
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Feb. 09, 2015	Feb. 08, 2016
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Feb. 09, 2015	Feb. 08, 2016
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Feb. 09, 2015	Feb. 08, 2016
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Feb. 03, 2015	Feb. 02, 2016
Power Meter	Anritsu	ML2495A	1241002	Sep. 29, 2014	Sep. 28, 2015
Power Sensor	Anritsu	MA2411B	1207366	Sep. 29, 2014	Sep. 28, 2015
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
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 C63.10-2013
FCC KDB 558074 D01 DTS Meas Guidance v03r03
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

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	±34.134 Hz
Conducted power	±0.808 dB
Power density	±0.463 dB
Conducted emission	±2.670 dB
AC conducted emission	±2.92 dB
Radiated emission ≤ 1GHz	±3.99 dB
Radiated emission > 1GHz	±5.52 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 58%	Kevin Ma
Radiated Emissions	03CH03-WS	21-22°C / 63-67%	Anderson Hong
RF Conducted	TH01-WS	22°C / 62%	Brad Wu

- FCC site registration No.: 390588
- IC site registration No.: 10807C-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	2437	6 Mbps	2
Radiated Emissions ≤1GHz	11g	2437	6 Mbps	1
Radiated Emissions >1GHz Maximum Output Power 6dB bandwidth Power spectral density	11b 11g HT20 HT40	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462 2422 / 2437 / 2452	1 Mbps 6 Mbps MCS 0 MCS 0	1

NOTE:

1. Adapter 1 and Adapter 2 had been covered during pretest. Worst adapter was final testing as below test configuration. (Adapter 1: DA-48T12; Adapter 2: WA-36A12FU).
2. Test configurations are listed as below:
   1) Configuration 1: Adapter 1: DA-48T12
   2) Configuration 2: Adapter 2: WA-36A12FU

3 Transmitter Test Results

3.1 Conducted Emissions

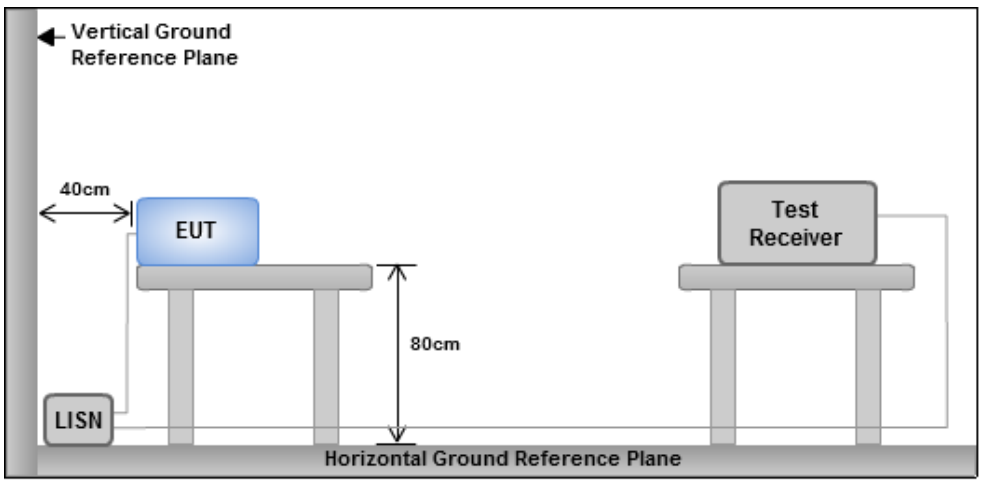
3.1.1 Limit of Conducted Emissions

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

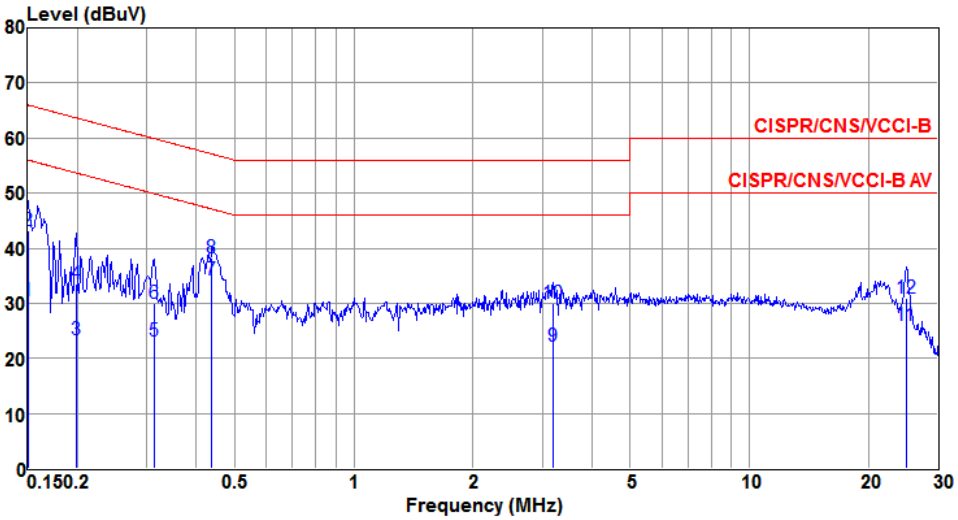


Note: 1. Support units were connected to second LISN.

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

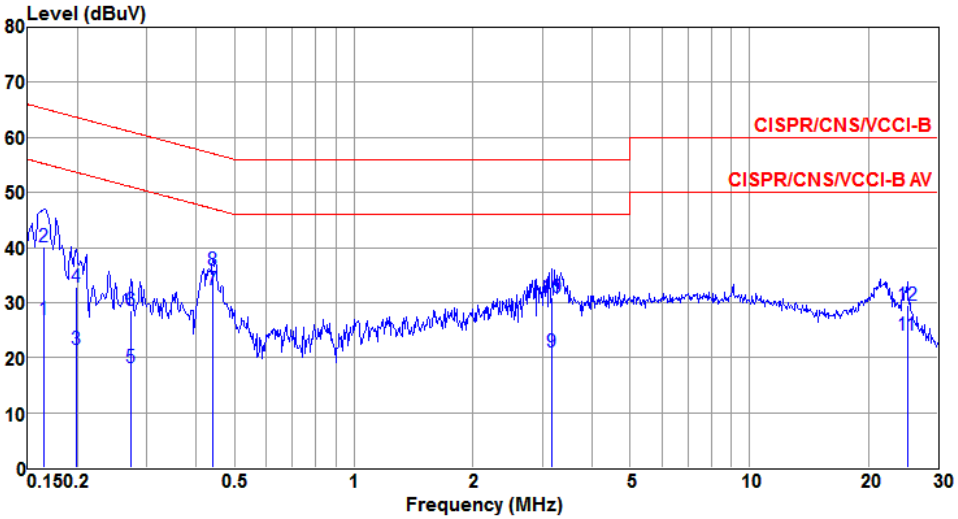
Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.150	30.48	56.00	-25.52	20.73	9.67	0.08	Average
2	0.150	43.14	66.00	-22.86	33.39	9.67	0.08	QP
3	0.199	23.27	53.67	-30.40	13.52	9.66	0.09	Average
4	0.199	33.62	63.67	-30.05	23.87	9.66	0.09	QP
5	0.313	23.11	49.88	-26.77	13.35	9.66	0.10	Average
6	0.313	30.01	59.88	-29.87	20.25	9.66	0.10	QP
7*	0.437	34.19	47.11	-12.92	24.42	9.66	0.11	Average
8	0.437	38.29	57.11	-18.82	28.52	9.66	0.11	QP
9	3.190	22.15	46.00	-23.85	12.18	9.68	0.29	Average
10	3.190	29.96	56.00	-26.04	19.99	9.68	0.29	QP
11	24.922	25.96	50.00	-24.04	16.21	9.66	0.09	Average
12	24.922	30.86	60.00	-29.14	21.11	9.66	0.09	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Neutral		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.165	26.94	55.21	-28.27	17.19	9.67	0.08	Average
2	0.165	40.24	65.21	-24.97	30.49	9.67	0.08	QP
3	0.199	21.52	53.67	-32.15	11.77	9.66	0.09	Average
4	0.199	32.79	63.67	-30.88	23.04	9.66	0.09	QP
5	0.273	18.25	51.03	-32.78	8.49	9.66	0.10	Average
6	0.273	28.46	61.03	-32.57	18.70	9.66	0.10	QP
7*	0.440	32.25	47.07	-14.82	22.48	9.66	0.11	Average
8	0.440	35.78	57.07	-21.29	26.01	9.66	0.11	QP
9	3.173	20.90	46.00	-25.10	10.93	9.68	0.29	Average
10	3.173	30.86	56.00	-25.14	20.89	9.68	0.29	QP
11	25.055	24.12	50.00	-25.88	14.26	9.77	0.09	Average
12	25.055	29.60	60.00	-30.40	19.74	9.77	0.09	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (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

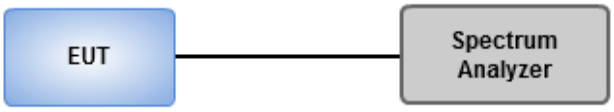
6dB Bandwidth

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.

Occupied Bandwidth

1. Set resolution bandwidth (RBW) = 1 MHz, Video bandwidth = 3 MHz.
2. Detector = Sample, Trace mode = max hold.
3 Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

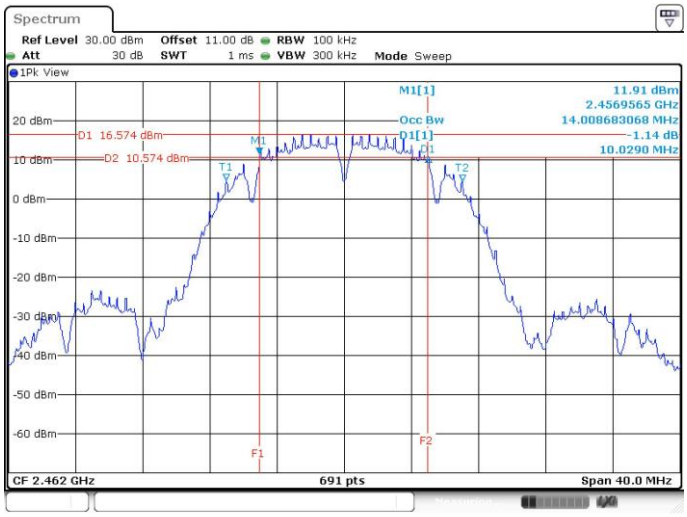
3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

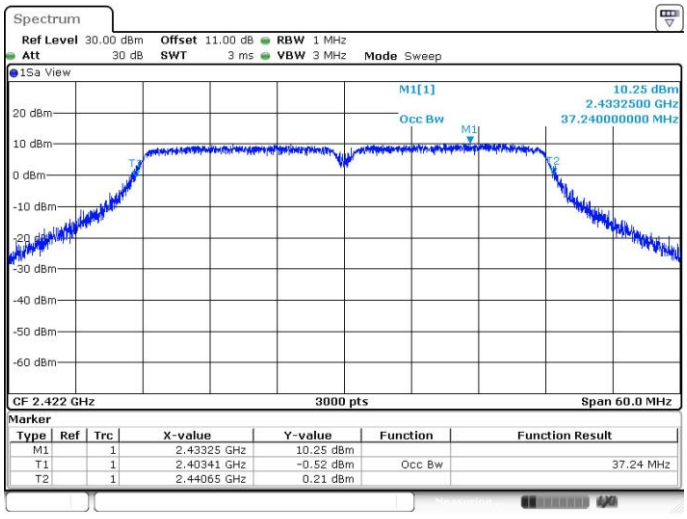
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	3	2412	10.09	10.09	10.09	---	500
11b	3	2437	10.09	10.09	10.09	---	500
11b	3	2462	10.09	10.03	10.09	---	500
11g	3	2412	16.35	16.35	16.35	---	500
11g	3	2437	16.35	16.23	16.35	---	500
11g	3	2462	16.35	16.35	16.35	---	500
HT20	3	2412	17.57	17.57	17.28	---	500
HT20	3	2437	17.51	17.57	17.51	---	500
HT20	3	2462	17.28	17.62	17.33	---	500
HT40	3	2422	35.94	35.48	36.29	---	500
HT40	3	2437	36.06	36.17	36.41	---	500
HT40	3	2452	36.06	35.48	36.29	---	500

Worst Plots



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	3	2412	13.94	13.92	13.94	---
11b	3	2437	13.95	13.88	13.93	---
11b	3	2462	13.96	13.86	13.95	---
11g	3	2412	17.04	16.91	16.83	---
11g	3	2437	17.04	16.90	16.85	---
11g	3	2462	17.01	16.87	16.81	---
HT20	3	2412	18.15	18.04	17.99	---
HT20	3	2437	18.17	18.13	18.11	---
HT20	3	2462	18.18	18.07	18.03	---
HT40	3	2422	37.24	37.04	37.16	---
HT40	3	2437	37.16	37.04	37.10	---
HT40	3	2452	37.20	37.10	37.02	---

Worst Plots



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

- ☒ **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	N_{TX}	Freq. (MHz)	Conducted (average) output power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11b	3	2412	24.79	25.48	25.10	---	978.077	29.90	30.00
11b	3	2437	24.49	25.13	25.29	---	945.092	29.75	30.00
11b	3	2462	24.46	25.03	25.22	---	930.334	29.69	30.00
11g	3	2412	20.21	20.73	20.54	---	336.498	25.27	30.00
11g	3	2437	24.59	25.27	25.53	---	981.524	**29.92**	30.00
11g	3	2462	19.43	20.06	20.22	---	294.287	24.69	30.00
HT20	3	2412	18.11	18.65	18.62	---	210.775	23.24	30.00
HT20	3	2437	24.68	25.16	25.56	---	981.610	**29.92**	30.00
HT20	3	2462	18.76	19.23	19.12	---	240.573	23.81	30.00
HT40	3	2422	14.39	14.97	14.96	---	90.217	19.55	30.00
HT40	3	2437	19.89	20.17	20.06	---	302.882	24.81	30.00
HT40	3	2452	14.65	15.19	15.68	---	99.194	19.96	30.00

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

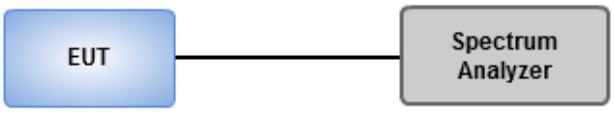
☒ Method AVGPSD-1(802.11b/g/n HT20)

1. Set the RBW = 30kHz, VBW = 100kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Employ trace averaging (RMS) mode over a minimum of 100 traces.
4. Use the peak marker function to determine the maximum amplitude level.

☒ Method AVGPSD-2 Alternative (802.11n HT40)

1. Set the RBW = 30kHz, VBW = 100 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Set the sweep time to: ≥ 10 x (number of measurement points in sweep) x (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.
6. Add 10 log (1/x), where x is the duty cycle.

3.4.3 Test Setup

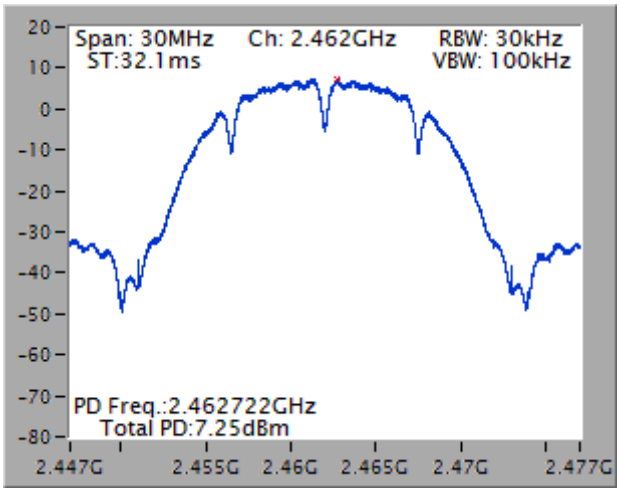


3.4.4 Test Result of Power Spectral Density

Modulation Mode	N_{TX}	Freq. (MHz)	PPSD w/o D.F (dBm/30kHz)	Duty Factor (dB)	PPSD with D.F (dBm/30kHz)	Limit (dBm/3kHz)
11b	3	2412	6.81	0.00	6.81	8.00
11b	3	2437	7.05	0.00	7.05	8.00
11b	3	2462	7.25	0.00	7.25	8.00
11g	3	2412	1.68	0.00	1.68	8.00
11g	3	2437	5.79	0.00	5.79	8.00
11g	3	2462	1.43	0.00	1.43	8.00
HT20	3	2412	-0.19	0.00	-0.19	8.00
HT20	3	2437	5.69	0.00	5.69	8.00
HT20	3	2462	0.10	0.00	0.10	8.00
HT40	3	2422	-2.73	0.12	-2.61	8.00
HT40	3	2437	-1.68	0.12	-1.56	8.00
HT40	3	2452	-6.54	0.12	-6.42	8.00

Note: Test result is bin-by-bin summing measured value of each TX port.

Worst Plots



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:
Qusai-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

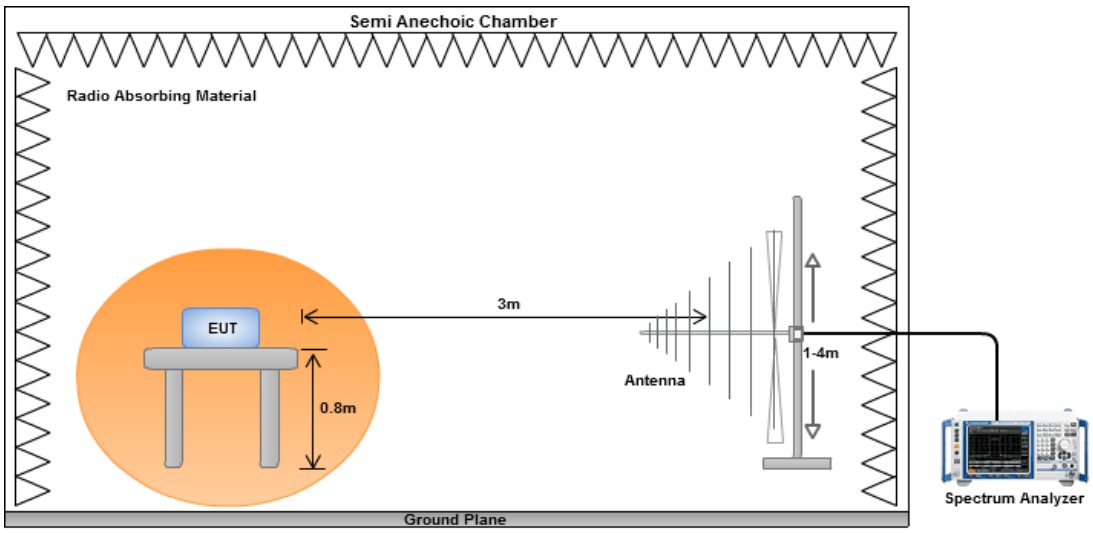
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
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:

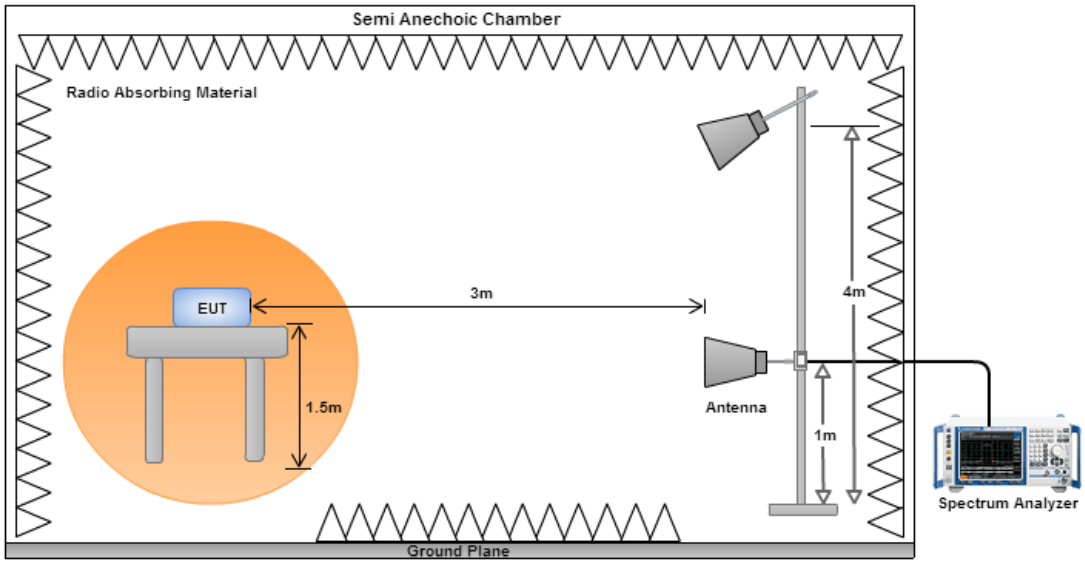
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

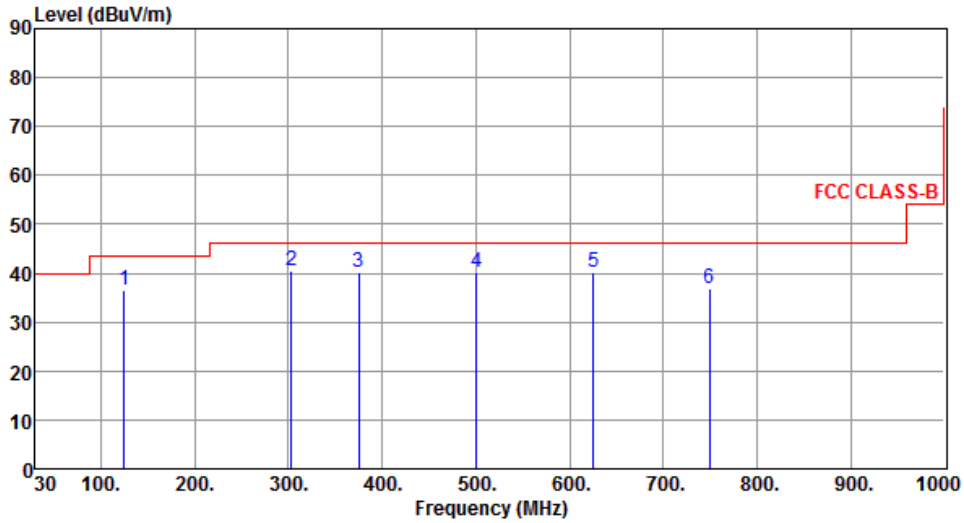


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

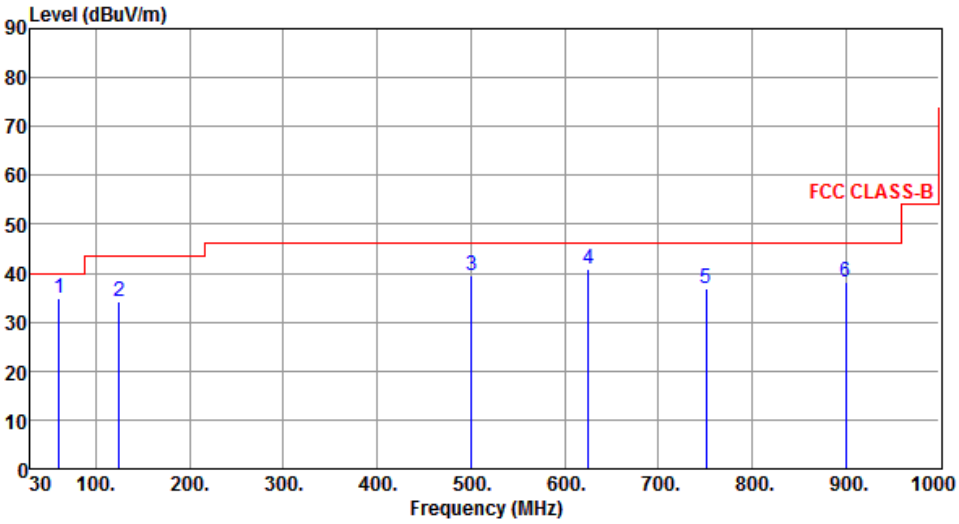
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	125.06	36.59	43.50	-6.91	51.69	-15.10	Peak	---	---
2	303.54	40.38	46.00	-5.62	52.94	-12.56	Peak	---	---
3	375.32	40.18	46.00	-5.82	50.91	-10.73	Peak	---	---
4	500.45	40.22	46.00	-5.78	47.86	-7.64	Peak	---	---
5	625.58	40.21	46.00	-5.79	45.53	-5.32	Peak	---	---
6	749.74	36.73	46.00	-9.27	39.92	-3.19	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).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		

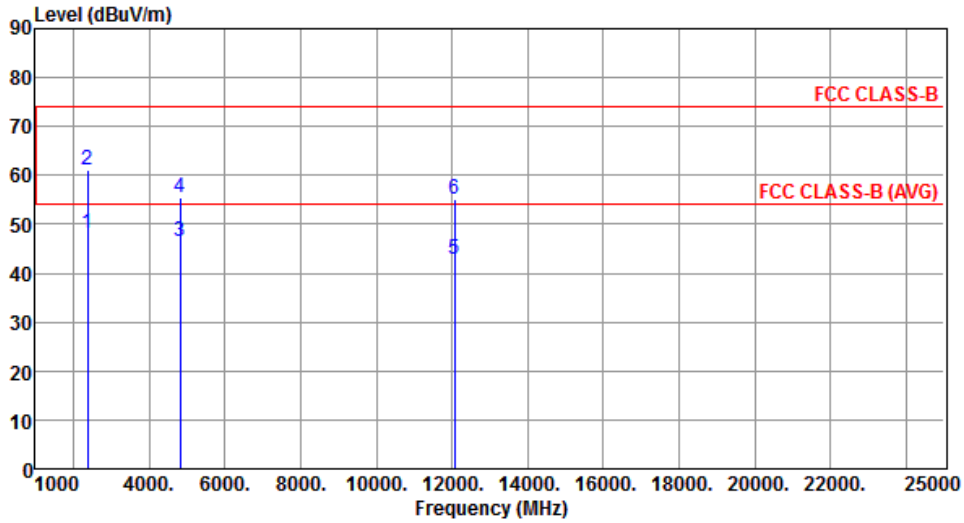


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	61.04	35.02	40.00	-4.98	49.44	-14.42	Peak	---	---
2	125.06	34.14	43.50	-9.36	49.24	-15.10	Peak	---	---
3	500.45	39.39	46.00	-6.61	47.03	-7.64	Peak	---	---
4	625.58	40.71	46.00	-5.29	46.03	-5.32	Peak	---	---
5	750.71	36.98	46.00	-9.02	40.16	-3.18	Peak	---	---
6	900.09	38.26	46.00	-7.74	38.93	-0.67	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).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11b

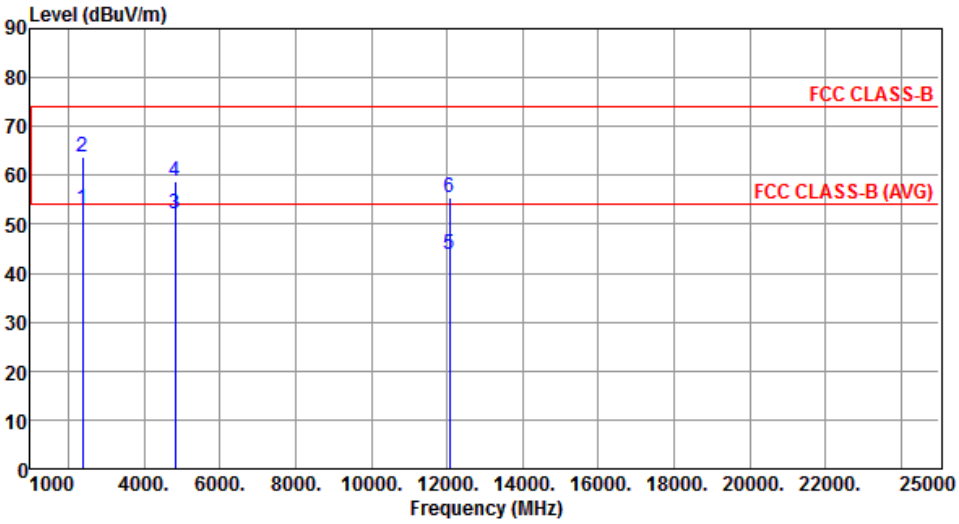
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2386.00	48.26	54.00	-5.74	49.50	-1.24	Average	173	318
2	2386.00	60.97	74.00	-13.03	62.21	-1.24	Peak	173	318
3	4824.00	46.36	54.00	-7.64	39.35	7.01	Average	370	293
4	4824.00	55.49	74.00	-18.51	48.48	7.01	Peak	370	293
5	12060.00	42.91	54.00	-11.09	26.44	16.47	Average	313	155
6	12060.00	55.06	74.00	-18.94	38.59	16.47	Peak	313	155

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).

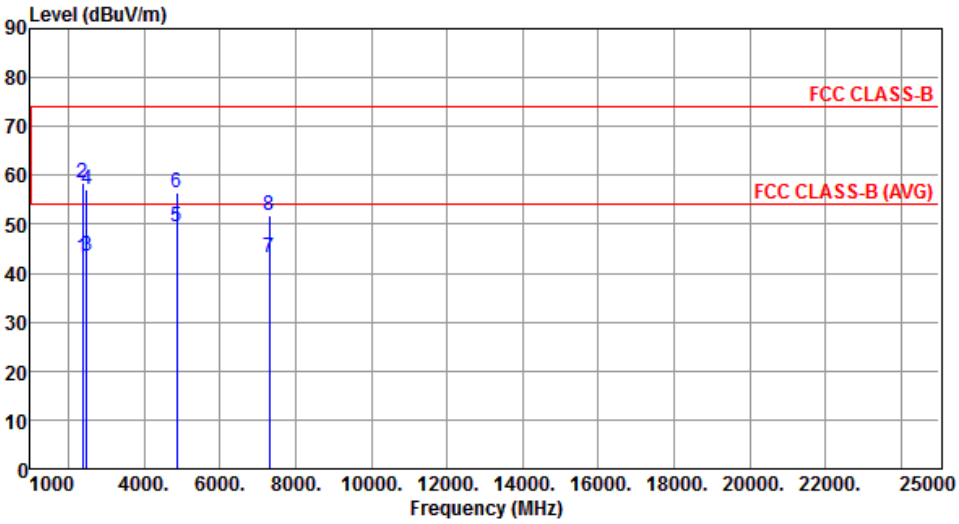
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2386.00	53.20	54.00	-0.80	54.44	-1.24	Average	177	184
2	2386.00	63.86	74.00	-10.14	65.10	-1.24	Peak	177	184
3	4824.00	52.04	54.00	-1.96	45.03	7.01	Average	155	161
4	4824.00	58.75	74.00	-15.25	51.74	7.01	Peak	155	161
5	12060.00	43.76	54.00	-10.24	27.29	16.47	Average	294	348
6	12060.00	55.50	74.00	-18.50	39.03	16.47	Peak	294	348

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).

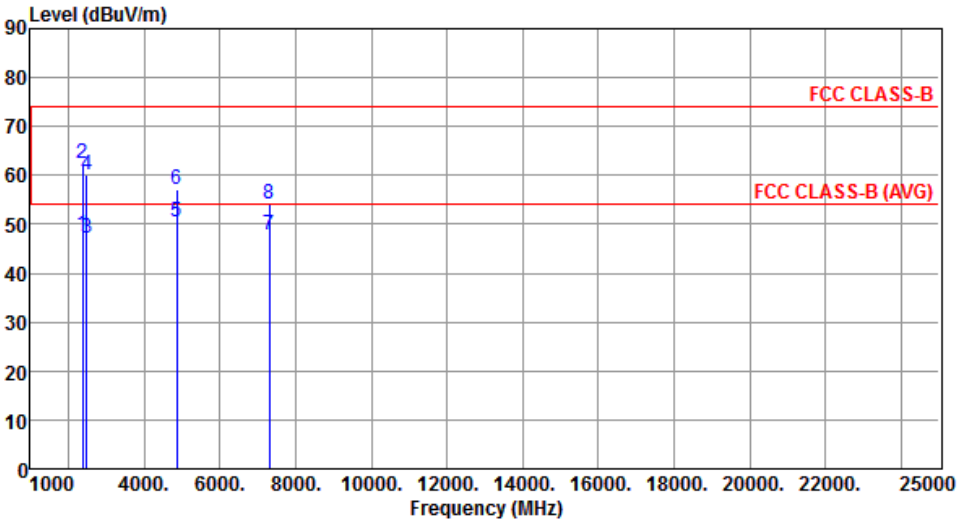
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.33	54.00	-10.67	44.55	-1.22	Average	283	359
2	2390.00	58.46	74.00	-15.54	59.68	-1.22	Peak	283	359
3	2483.50	43.65	54.00	-10.35	44.54	-0.89	Average	283	359
4	2483.50	57.19	74.00	-16.81	58.08	-0.89	Peak	283	359
5	4874.00	49.44	54.00	-4.56	42.63	6.81	Average	257	191
6	4874.00	56.40	74.00	-17.60	49.59	6.81	Peak	257	191
7	7311.00	43.03	54.00	-10.97	32.07	10.96	Average	185	233
8	7311.00	51.65	74.00	-22.35	40.69	10.96	Peak	185	233

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).

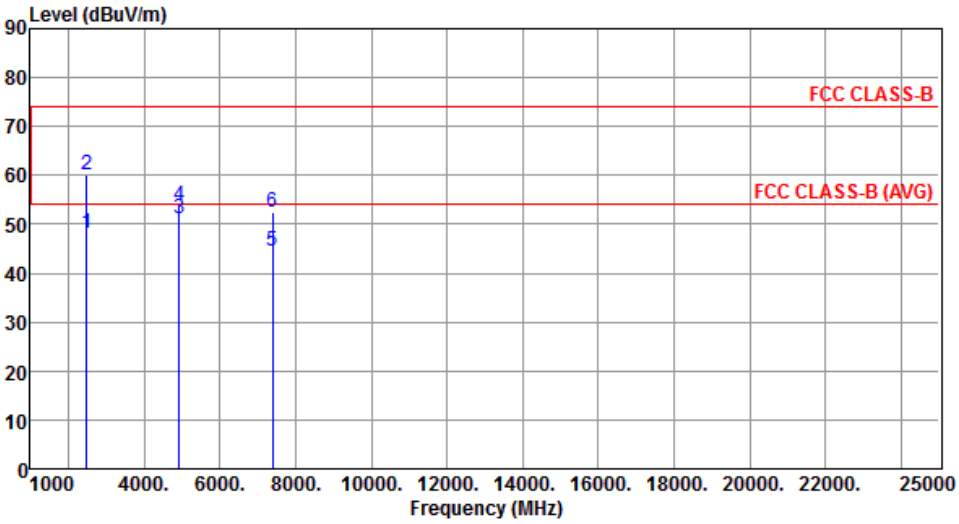
Modulation	11b	**Test Freq. (MHz)**	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	47.86	54.00	-6.14	49.08	-1.22	Average	246	60
2	2390.00	62.43	74.00	-11.57	63.65	-1.22	Peak	246	60
3	2483.50	47.06	54.00	-6.94	47.95	-0.89	Average	234	36
4	2483.50	60.23	74.00	-13.77	61.12	-0.89	Peak	234	36
5	4874.00	50.36	54.00	-3.64	43.55	6.81	Average	162	161
6	4874.00	57.16	74.00	-16.84	50.35	6.81	Peak	162	161
7	7311.00	47.76	54.00	-6.24	36.80	10.96	Average	283	188
8	7311.00	54.03	74.00	-19.97	43.07	10.96	Peak	283	188

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).

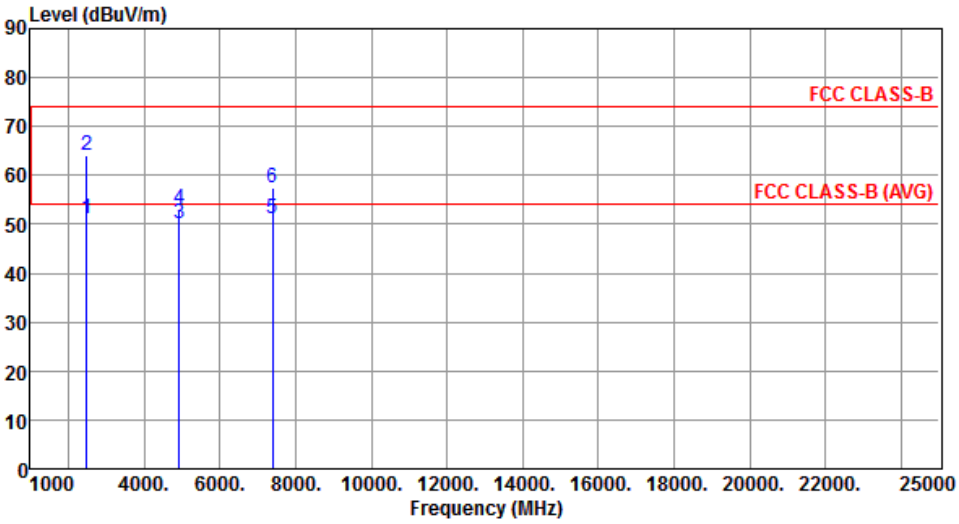
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	48.02	54.00	-5.98	48.91	-0.89	Average	212	317
2	2483.50	59.99	74.00	-14.01	60.88	-0.89	Peak	212	317
3	4924.00	50.98	54.00	-3.02	44.38	6.60	Average	342	189
4	4924.00	53.86	74.00	-20.14	47.26	6.60	Peak	342	189
5	7386.00	44.43	54.00	-9.57	33.31	11.12	Average	247	158
6	7386.00	52.49	74.00	-21.51	41.37	11.12	Peak	247	158

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	11b	Test Freq. (MHz)	2462
Polarization	Vertical		

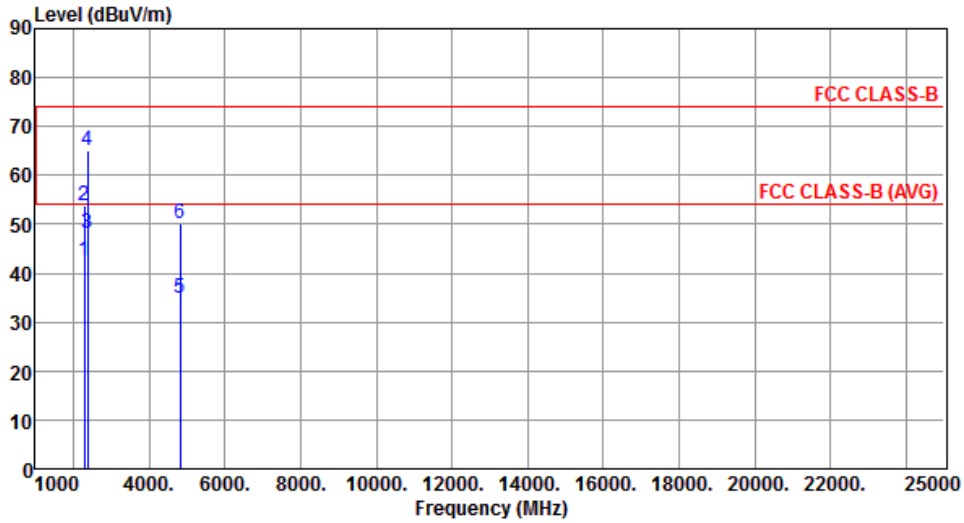


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	51.26	54.00	-2.74	52.15	-0.89	Average	218	193
2	2483.50	63.98	74.00	-10.02	64.87	-0.89	Peak	218	193
3	4924.00	50.25	54.00	-3.75	43.65	6.60	Average	168	182
4	4924.00	53.19	74.00	-20.81	46.59	6.60	Peak	168	182
5	7386.00	51.24	54.00	-2.76	40.12	11.12	Average	241	186
6	7386.00	57.39	74.00	-16.61	46.27	11.12	Peak	241	186

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).

3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g

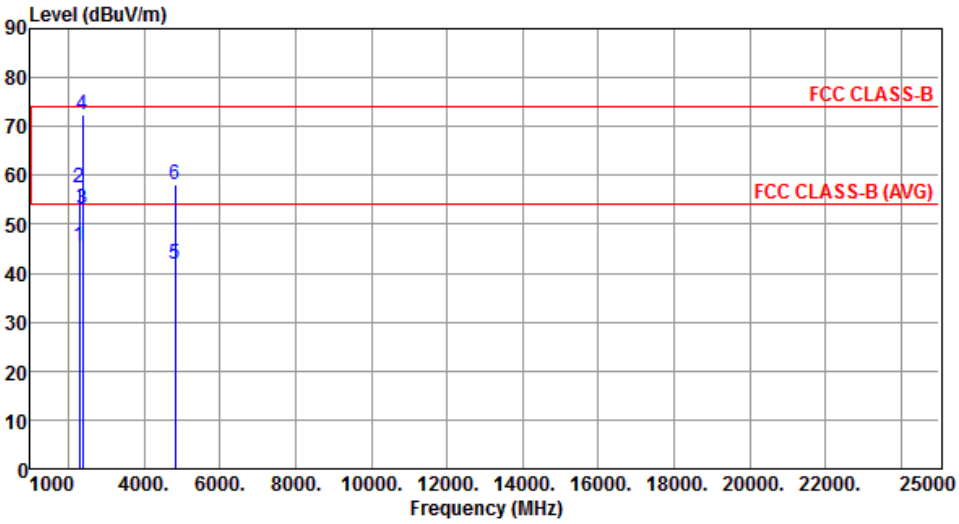
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2288.00	42.35	54.00	-11.65	44.02	-1.67	Average	168	56
2	2288.00	53.91	74.00	-20.09	55.58	-1.67	Peak	168	56
3	2390.00	48.00	54.00	-6.00	49.22	-1.22	Average	168	56
4	2390.00	65.00	74.00	-9.00	66.22	-1.22	Peak	168	56
5	4824.00	34.87	54.00	-19.13	27.86	7.01	Average	258	65
6	4824.00	50.03	74.00	-23.97	43.02	7.01	Peak	258	65

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).

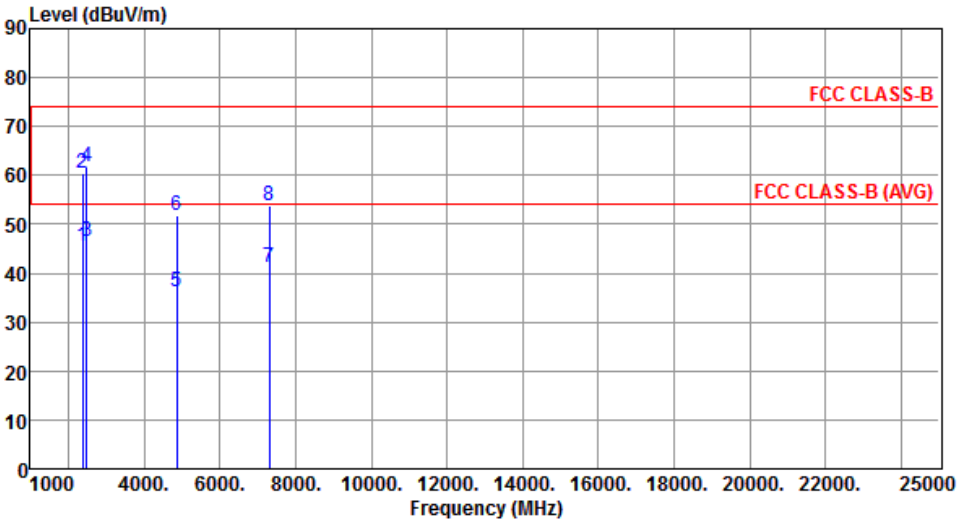
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2288.00	45.41	54.00	-8.59	47.08	-1.67	Average	220	68
2	2288.00	57.45	74.00	-16.55	59.12	-1.67	Peak	220	68
3	2390.00	53.25	54.00	-0.75	54.47	-1.22	Average	220	68
4	2390.00	72.50	74.00	-1.50	73.72	-1.22	Peak	220	68
5	4824.00	41.82	54.00	-12.18	34.81	7.01	Average	150	159
6	4824.00	58.28	74.00	-15.72	51.27	7.01	Peak	150	159

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).

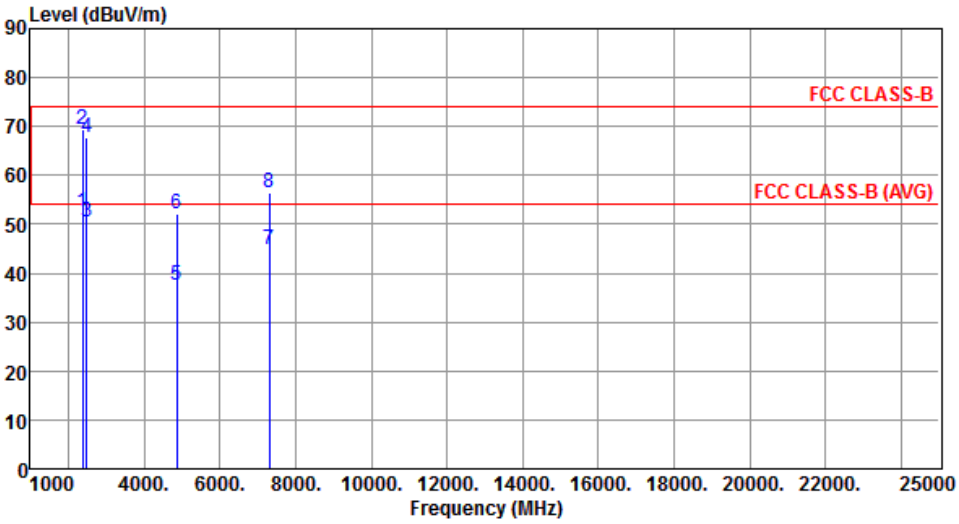
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	45.37	54.00	-8.63	46.59	-1.22	Average	188	320
2	2390.00	60.40	74.00	-13.60	61.62	-1.22	Peak	188	320
3	2483.50	46.38	54.00	-7.62	47.27	-0.89	Average	188	320
4	2483.50	61.64	74.00	-12.36	62.53	-0.89	Peak	188	320
5	4874.00	36.08	54.00	-17.92	29.27	6.81	Average	194	100
6	4874.00	51.64	74.00	-22.36	44.83	6.81	Peak	194	100
7	7311.00	41.02	54.00	-12.98	30.06	10.96	Average	206	233
8	7311.00	53.95	74.00	-20.05	42.99	10.96	Peak	206	233

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).

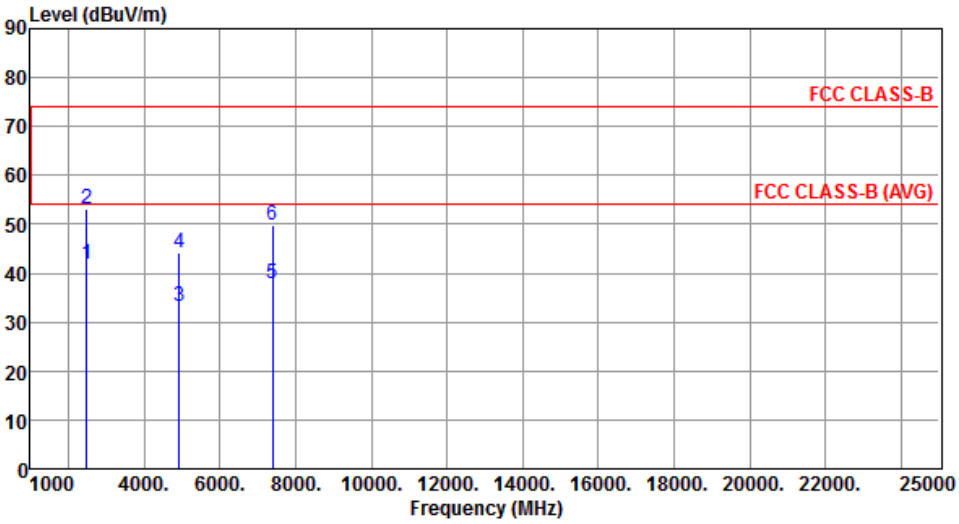
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.37	54.00	-1.63	53.59	-1.22	Average	150	175
2	2390.00	69.37	74.00	-4.63	70.59	-1.22	Peak	150	175
3	2483.50	50.51	54.00	-3.49	51.40	-0.89	Average	150	257
4	2483.50	67.62	74.00	-6.38	68.51	-0.89	Peak	150	257
5	4874.00	37.59	54.00	-16.41	30.78	6.81	Average	150	175
6	4874.00	52.04	74.00	-21.96	45.23	6.81	Peak	150	175
7	7311.00	44.87	54.00	-9.13	33.91	10.96	Average	202	190
8	7311.00	56.58	74.00	-17.42	45.62	10.96	Peak	202	190

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).

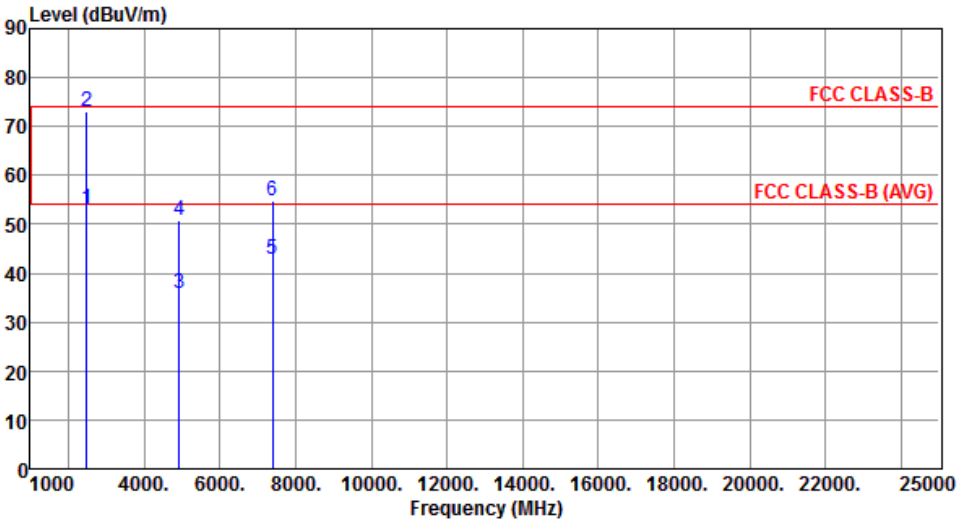
Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	41.97	54.00	-12.03	42.86	-0.89	Average	200	321
2	2483.50	52.99	74.00	-21.01	53.88	-0.89	Peak	200	321
3	4924.00	33.25	54.00	-20.75	26.65	6.60	Average	160	305
4	4924.00	44.15	74.00	-29.85	37.55	6.60	Peak	160	305
5	7386.00	37.89	54.00	-16.11	26.77	11.12	Average	160	305
6	7386.00	49.98	74.00	-24.02	38.86	11.12	Peak	160	305

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)	2462
Polarization	Vertical		

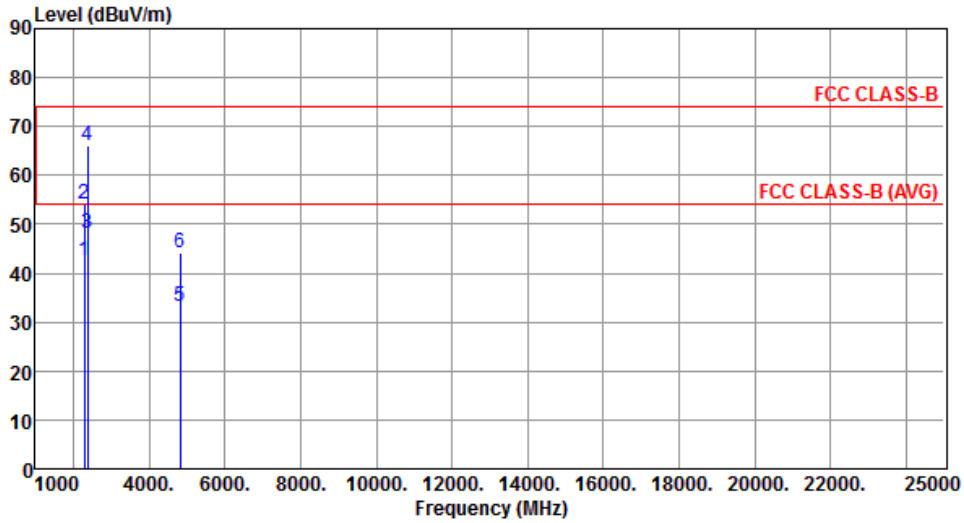


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.25	54.00	-0.75	54.14	-0.89	Average	150	196
2	2483.50	72.91	74.00	-1.09	73.80	-0.89	Peak	150	196
3	4924.00	35.96	54.00	-18.04	29.36	6.60	Average	200	329
4	4924.00	50.78	74.00	-23.22	44.18	6.60	Peak	200	329
5	7386.00	43.00	54.00	-11.00	31.88	11.12	Average	185	311
6	7386.00	54.91	74.00	-19.09	43.79	11.12	Peak	185	311

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).

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

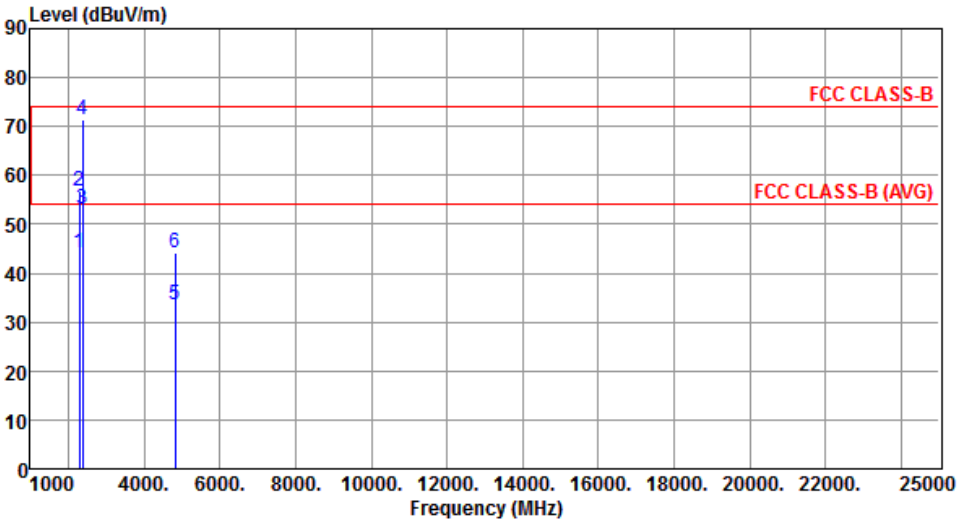
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2288.00	42.41	54.00	-11.59	44.08	-1.67	Average	170	69
2	2288.00	54.02	74.00	-19.98	55.69	-1.67	Peak	170	69
3	2390.00	48.12	54.00	-5.88	49.34	-1.22	Average	170	69
4	2390.00	66.25	74.00	-7.75	67.47	-1.22	Peak	170	69
5	4824.00	33.13	54.00	-20.87	26.12	7.01	Average	189	345
6	4824.00	44.03	74.00	-29.97	37.02	7.01	Peak	189	345

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).

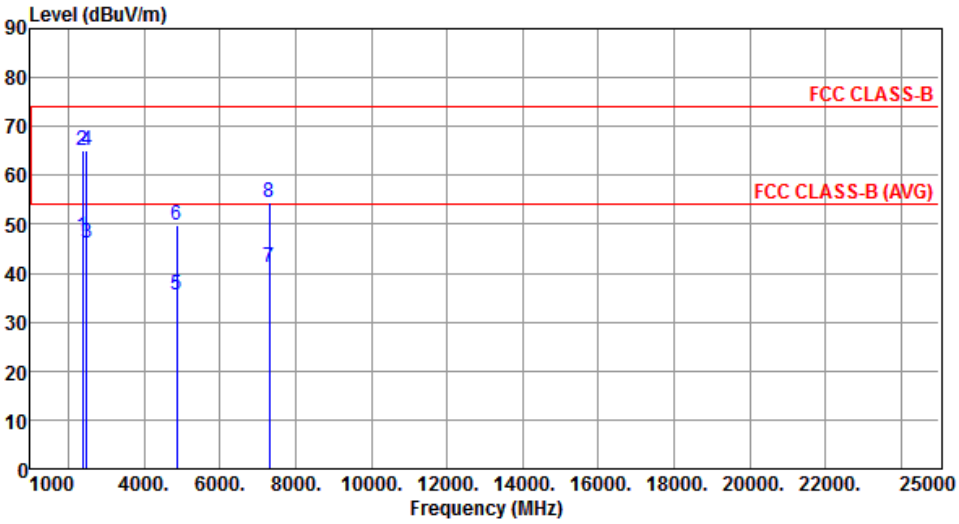
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2288.00	44.22	54.00	-9.78	45.89	-1.67	Average	150	186
2	2288.00	56.91	74.00	-17.09	58.58	-1.67	Peak	150	186
3	2390.00	53.22	54.00	-0.78	54.44	-1.22	Average	150	186
4	2390.00	71.41	74.00	-2.59	72.63	-1.22	Peak	150	186
5	4824.00	33.58	54.00	-20.42	26.57	7.01	Average	220	135
6	4824.00	44.25	74.00	-29.75	37.24	7.01	Peak	220	135

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).

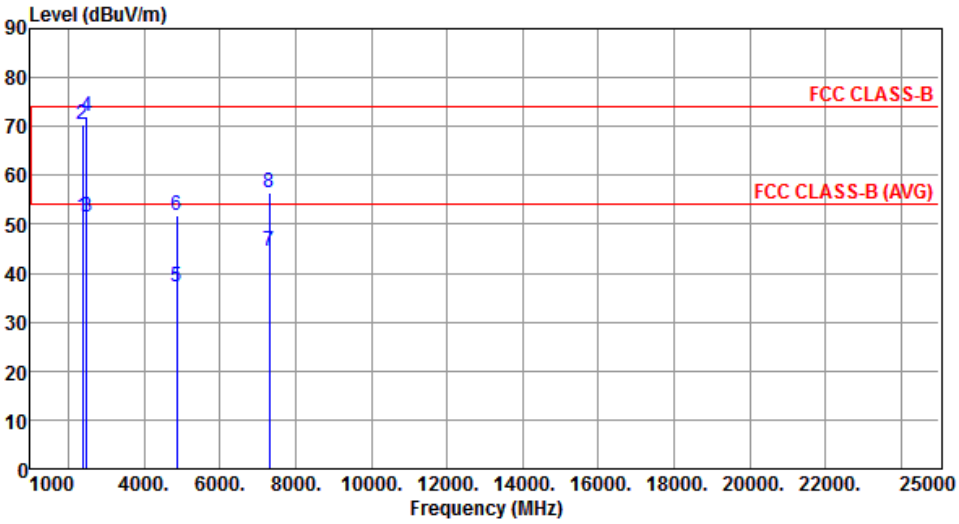
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	47.56	54.00	-6.44	48.78	-1.22	Average	205	338
2	2390.00	65.15	74.00	-8.85	66.37	-1.22	Peak	205	338
3	2483.50	46.10	54.00	-7.90	46.99	-0.89	Average	205	338
4	2483.50	64.98	74.00	-9.02	65.87	-0.89	Peak	205	338
5	4874.00	35.66	54.00	-18.34	28.85	6.81	Average	189	177
6	4874.00	49.93	74.00	-24.07	43.12	6.81	Peak	189	177
7	7311.00	41.29	54.00	-12.71	30.33	10.96	Average	185	165
8	7311.00	54.51	74.00	-19.49	43.55	10.96	Peak	185	165

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).

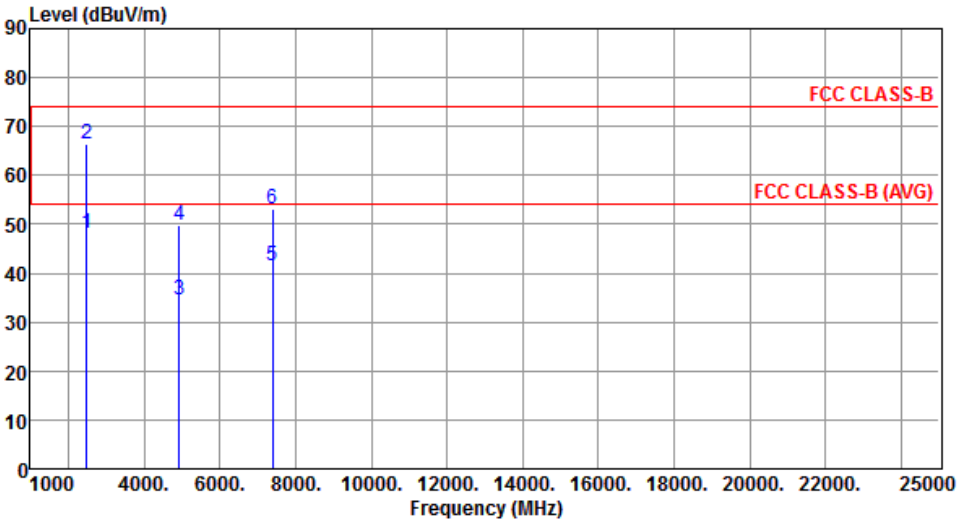
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	51.63	54.00	-2.37	52.85	-1.22	Average	165	264
2	2390.00	70.55	74.00	-3.45	71.77	-1.22	Peak	165	264
3	2483.50	51.58	54.00	-2.42	52.47	-0.89	Average	167	190
4	2483.50	72.22	74.00	-1.78	73.11	-0.89	Peak	167	190
5	4874.00	37.15	54.00	-16.85	30.34	6.81	Average	150	166
6	4874.00	51.68	74.00	-22.32	44.87	6.81	Peak	150	166
7	7311.00	44.53	54.00	-9.47	33.57	10.96	Average	196	183
8	7311.00	56.34	74.00	-17.66	45.38	10.96	Peak	196	183

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).

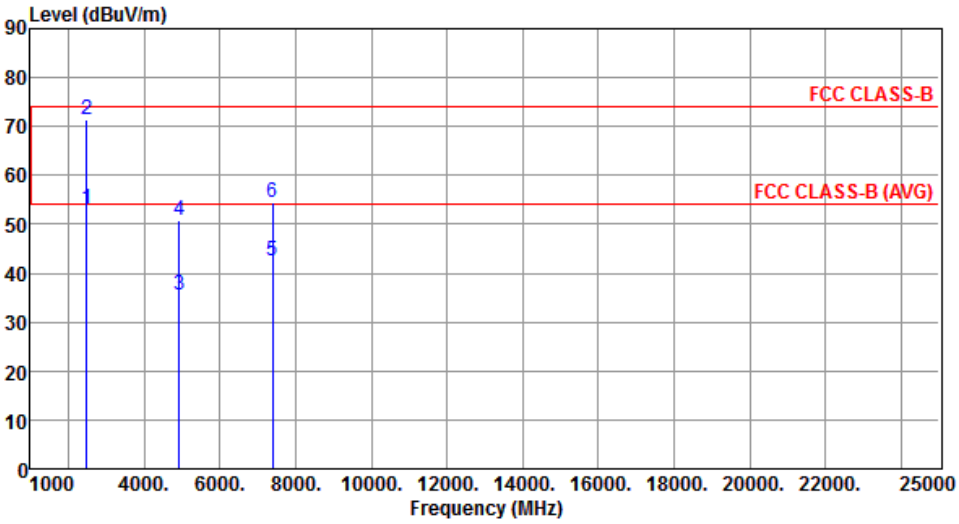
Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	48.22	54.00	-5.78	49.11	-0.89	Average	186	352
2	2483.50	66.37	74.00	-7.63	67.26	-0.89	Peak	186	352
3	4924.00	34.62	54.00	-19.38	28.02	6.60	Average	179	165
4	4924.00	49.72	74.00	-24.28	43.12	6.60	Peak	179	165
5	7386.00	41.35	54.00	-12.65	30.23	11.12	Average	177	252
6	7386.00	53.27	74.00	-20.73	42.15	11.12	Peak	205	18

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	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		

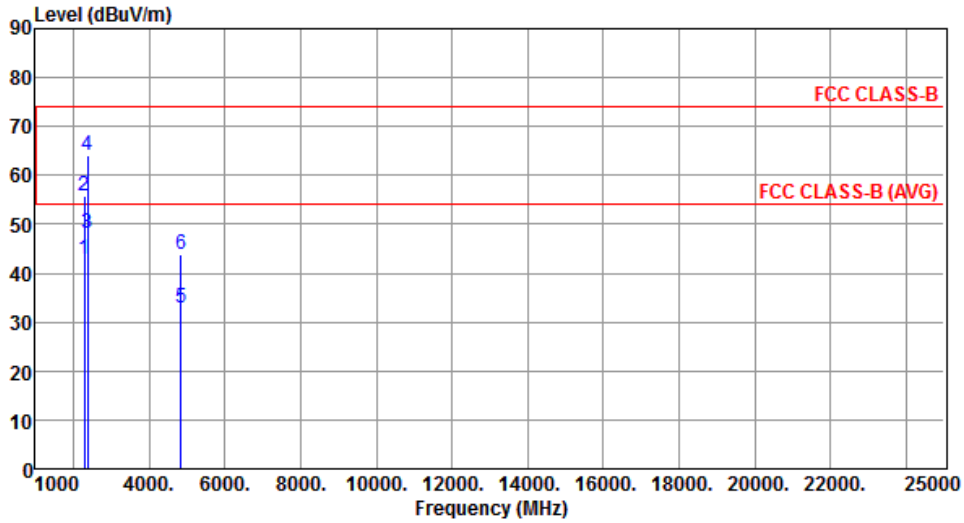


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.12	54.00	-0.88	54.01	-0.89	Average	150	171
2	2483.50	71.45	74.00	-2.55	72.34	-0.89	Peak	150	171
3	4924.00	35.62	54.00	-18.38	29.02	6.60	Average	188	177
4	4924.00	50.69	74.00	-23.31	44.09	6.60	Peak	188	177
5	7386.00	42.58	54.00	-11.42	31.46	11.12	Average	200	222
6	7386.00	54.45	74.00	-19.55	43.33	11.12	Peak	200	222

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).

3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40

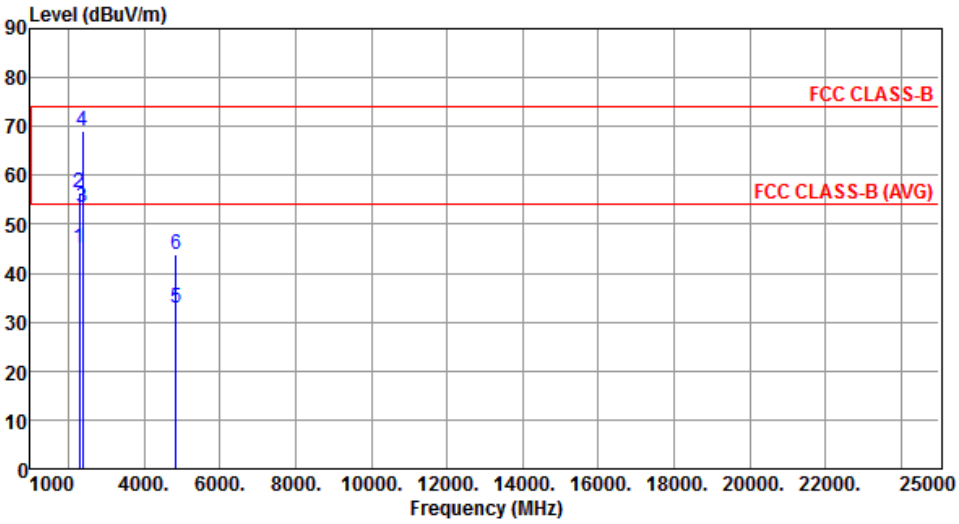
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2288.00	42.91	54.00	-11.09	44.58	-1.67	Average	150	49
2	2288.00	55.63	74.00	-18.37	57.30	-1.67	Peak	150	49
3	2390.00	48.07	54.00	-5.93	49.29	-1.22	Average	150	49
4	2390.00	64.02	74.00	-9.98	65.24	-1.22	Peak	150	49
5	4844.00	32.95	54.00	-21.05	26.01	6.94	Average	226	174
6	4844.00	43.94	74.00	-30.06	37.00	6.94	Peak	226	174

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).

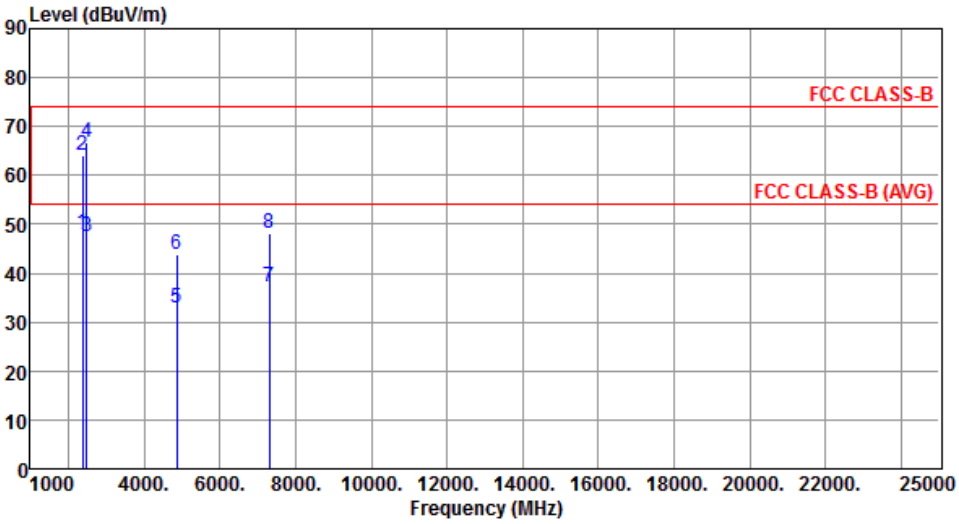
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2288.00	45.10	54.00	-8.90	46.77	-1.67	Average	215	115
2	2288.00	56.48	74.00	-17.52	58.15	-1.67	Peak	215	115
3	2390.00	53.37	54.00	-0.63	54.59	-1.22	Average	151	185
4	2390.00	69.21	74.00	-4.79	70.43	-1.22	Peak	151	185
5	4844.00	33.02	54.00	-20.98	26.08	6.94	Average	185	155
6	4844.00	43.96	74.00	-30.04	37.02	6.94	Peak	185	155

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).

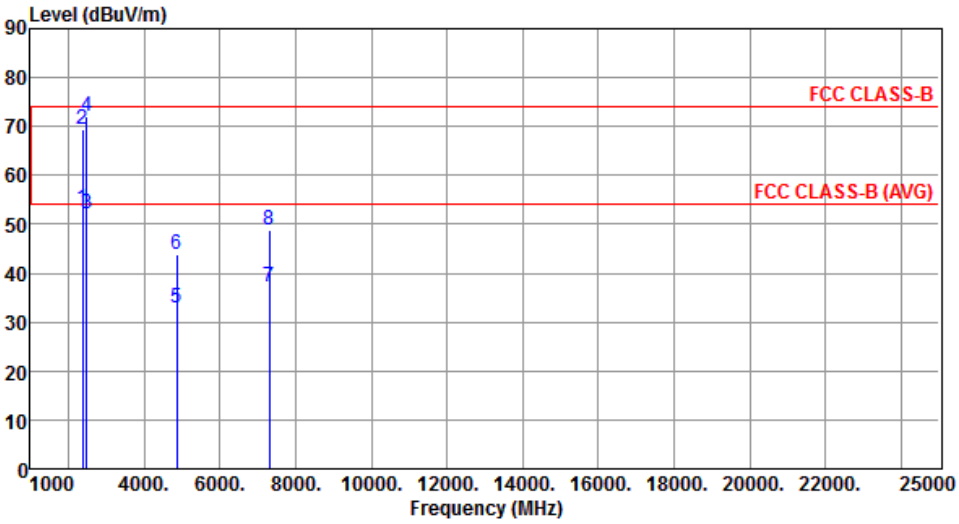
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	48.19	54.00	-5.81	49.41	-1.22	Average	156	344
2	2390.00	64.25	74.00	-9.75	65.47	-1.22	Peak	156	344
3	2483.50	47.36	54.00	-6.64	48.25	-0.89	Average	156	344
4	2483.50	66.80	74.00	-7.20	67.69	-0.89	Peak	156	344
5	4874.00	32.79	54.00	-21.21	25.98	6.81	Average	200	322
6	4874.00	43.84	74.00	-30.16	37.03	6.81	Peak	200	322
7	7311.00	37.08	54.00	-16.92	26.12	10.96	Average	193	355
8	7311.00	48.21	74.00	-25.79	37.25	10.96	Peak	193	355

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).

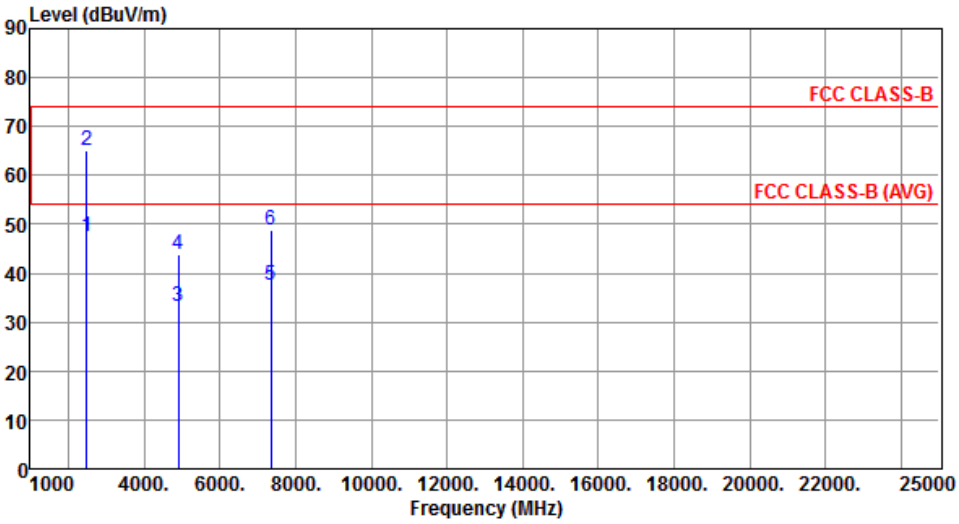
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	53.27	54.00	-0.73	54.49	-1.22	Average	217	116
2	2390.00	69.37	74.00	-4.63	70.59	-1.22	Peak	217	116
3	2483.50	52.18	54.00	-1.82	53.07	-0.89	Average	210	308
4	2483.50	71.96	74.00	-2.04	72.85	-0.89	Peak	210	308
5	4874.00	32.91	54.00	-21.09	26.10	6.81	Average	190	144
6	4874.00	43.93	74.00	-30.07	37.12	6.81	Peak	190	144
7	7311.00	37.31	54.00	-16.69	26.35	10.96	Average	287	66
8	7311.00	48.75	74.00	-25.25	37.79	10.96	Peak	287	66

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).

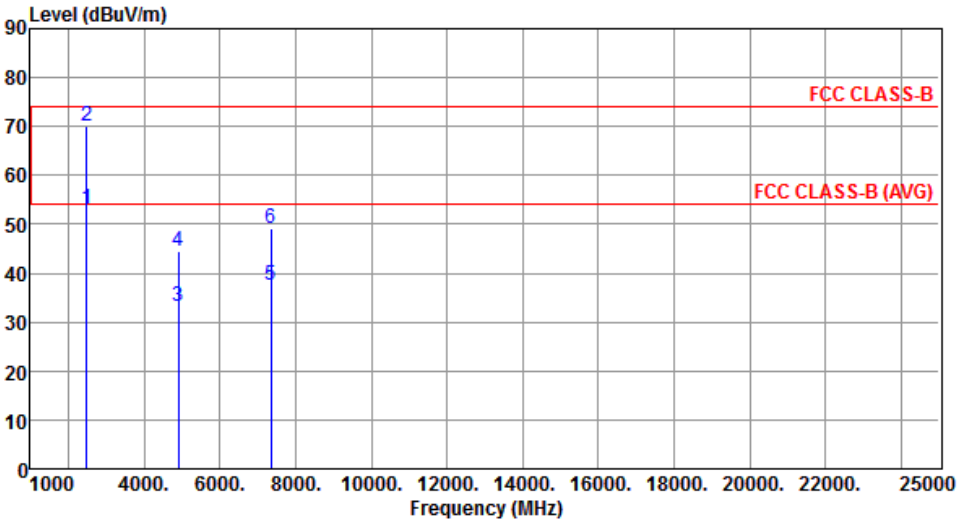
Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	47.33	54.00	-6.67	48.22	-0.89	Average	160	165
2	2483.50	65.19	74.00	-8.81	66.08	-0.89	Peak	160	165
3	4904.00	33.15	54.00	-20.85	26.45	6.70	Average	184	43
4	4904.00	43.99	74.00	-30.01	37.29	6.70	Peak	184	43
5	7356.00	37.45	54.00	-16.55	26.39	11.06	Average	175	358
6	7356.00	48.86	74.00	-25.14	37.80	11.06	Peak	175	358

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	HT40	Test Freq. (MHz)	2452
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.22	54.00	-0.78	54.11	-0.89	Average	168	188
2	2483.50	70.02	74.00	-3.98	70.91	-0.89	Peak	168	188
3	4904.00	33.24	54.00	-20.76	26.54	6.70	Average	200	325
4	4904.00	44.44	74.00	-29.56	37.74	6.70	Peak	200	325
5	7356.00	37.55	54.00	-16.45	26.80	10.75	Average	185	354
6	7356.00	49.08	74.00	-24.92	38.33	10.75	Peak	185	354

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).

3.6 Emissions in Non-Restricted Frequency Bands

3.6.1 Emissions in Non-Restricted Frequency Bands Limit

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 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Reference level measurement

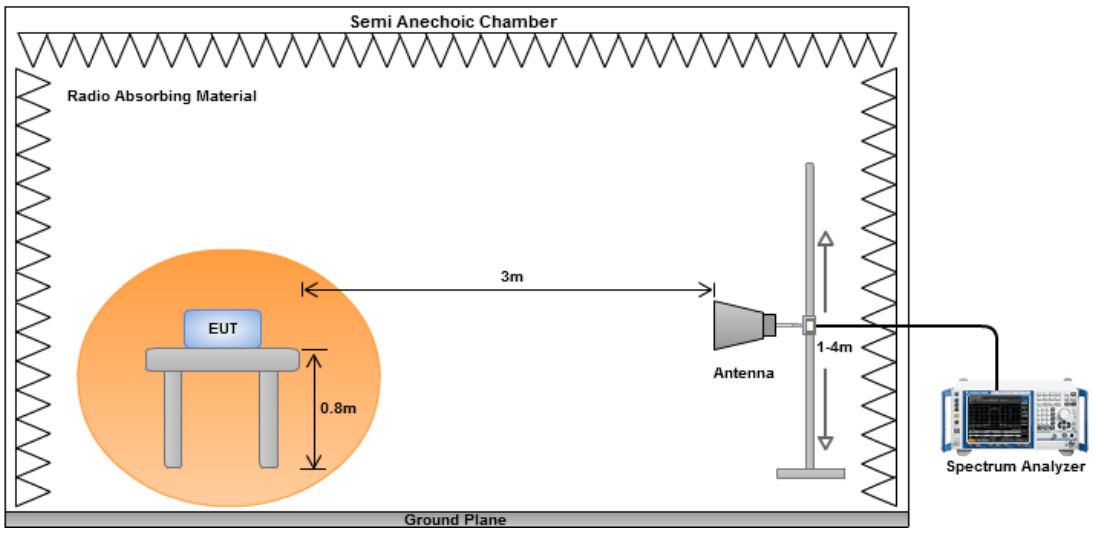
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.6.4 Test Setup

Transmitter Radiated Bandedge Emissions



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Unwanted Emissions into Non-Restricted Frequency Bands								
Modulation	11b			**N_{TX}**	3			
Non-restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
2390-2400	2412	115.82	2397.00	73.31	42.51	30	PK	V
2390-2400	2437	114.42	2400.00	54.19	60.23	30	PK	V
2390-2400	2462	115.10	2400.00	52.34	62.76	30	PK	V

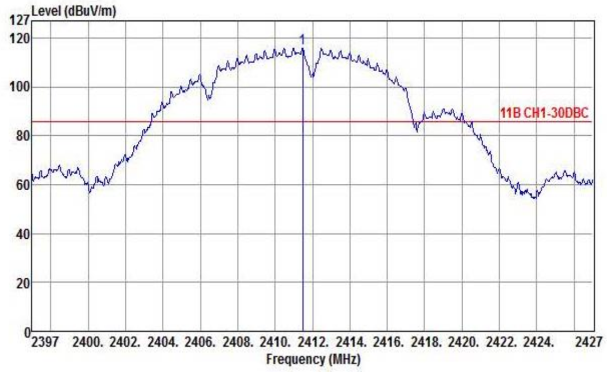
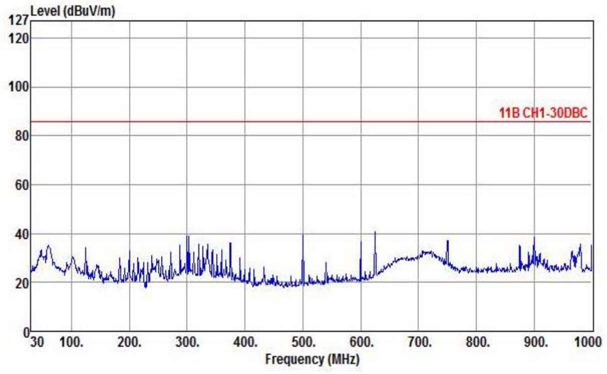
Unwanted Emissions into Non-Restricted Frequency Bands								
Modulation	11g			**N_{TX}**	3			
Non-restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
2390-2400	2412	106.66	2399.81	73.46	33.20	30	PK	V
2390-2400	2437	112.08	2399.51	58.20	53.88	30	PK	V
2390-2400	2462	105.75	2399.20	53.35	52.40	30	PK	V

Unwanted Emissions into Non-Restricted Frequency Bands								
Modulation	HT20			**N_{TX}**	3			
Non-restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
2390-2400	2412	105.01	2399.87	71.22	33.79	30	PK	V
2390-2400	2437	111.77	2397.91	60.05	51.72	30	PK	V
2390-2400	2462	106.05	2399.97	53.37	52.68	30	PK	V

Unwanted Emissions into Non-Restricted Frequency Bands								
Modulation	HT40			**N_{TX}**	3			
Non-restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
2390-2400	2412	99.70	2399.87	68.65	31.05	30	PK	V
2390-2400	2437	104.87	2399.51	63.35	41.52	30	PK	V
2390-2400	2462	100.74	2399.97	51.91	48.83	30	PK	V

Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).

802.11b

<table>
<tr><th>Reference Level</th><th>Tx 2412MHz / 30MHz~25GHz (down 30dBc)</th></tr>
<tr><td> 
</td><td> 
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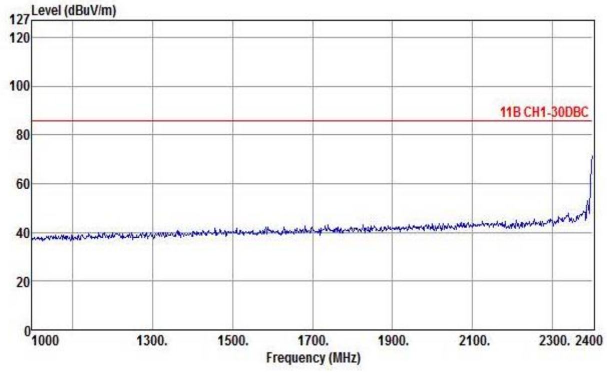
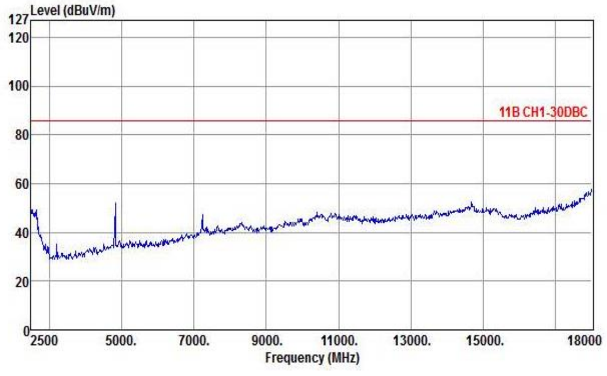
<tr><td> 
</td><td> 
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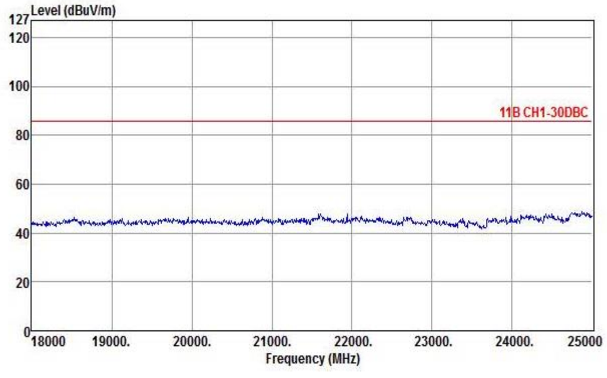
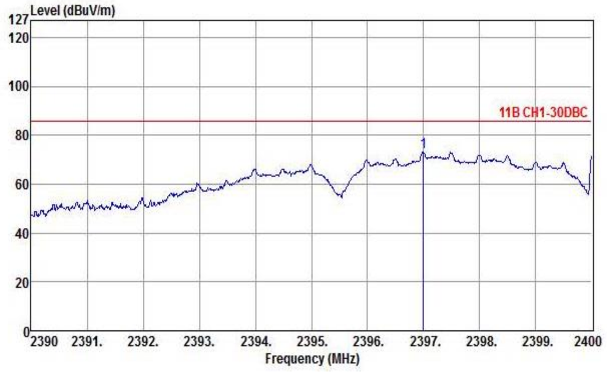
<tr><td> 
</td><td> 
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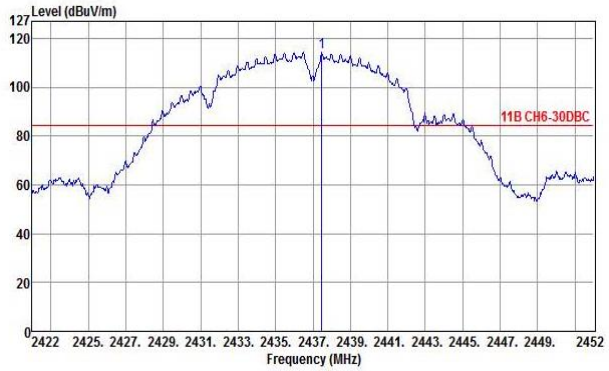
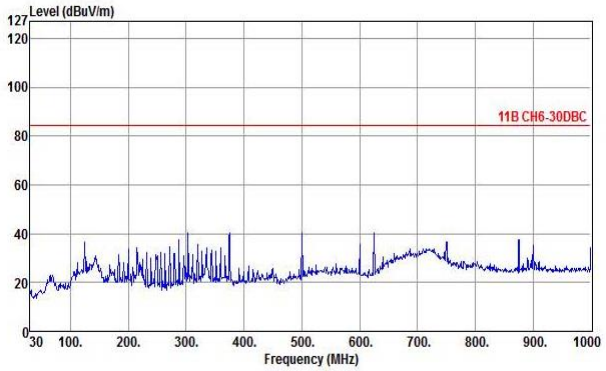
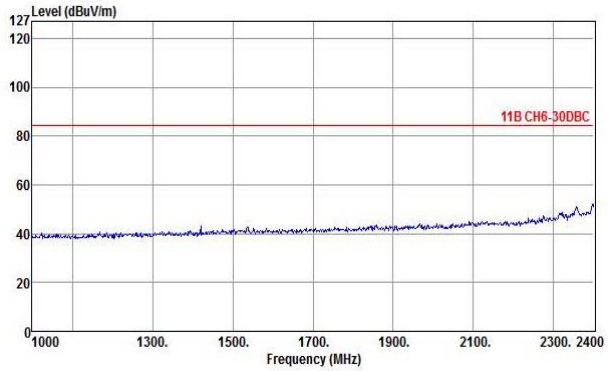
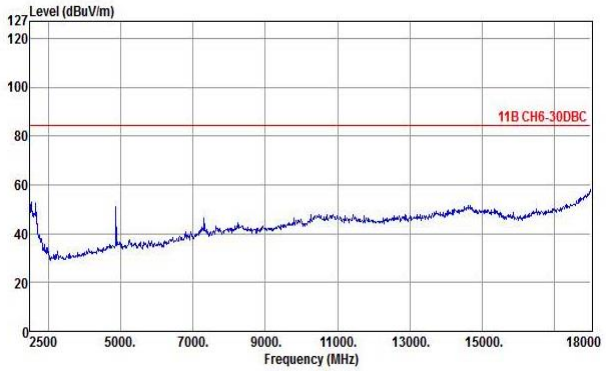
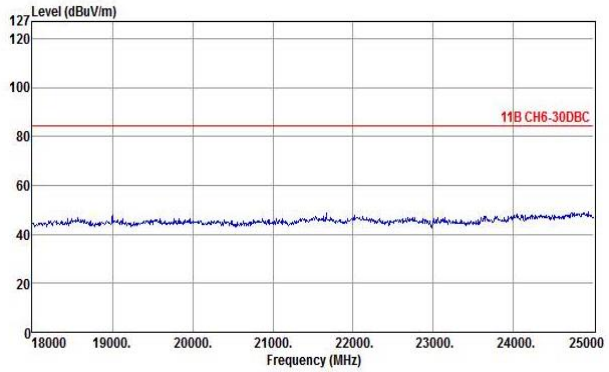
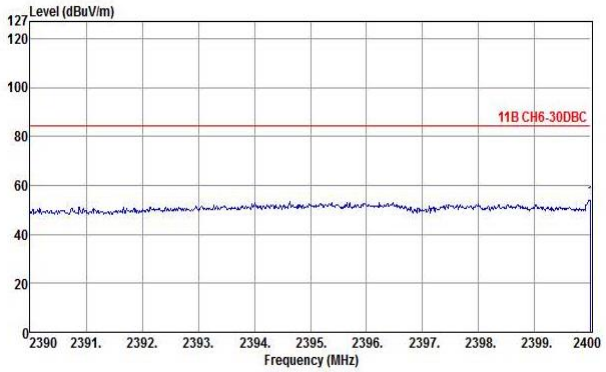
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 30dBc)
	
	
	

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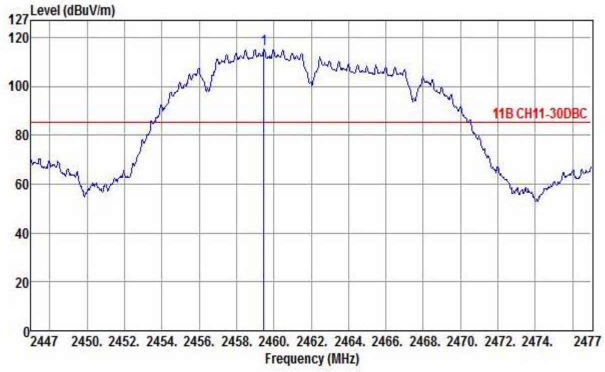
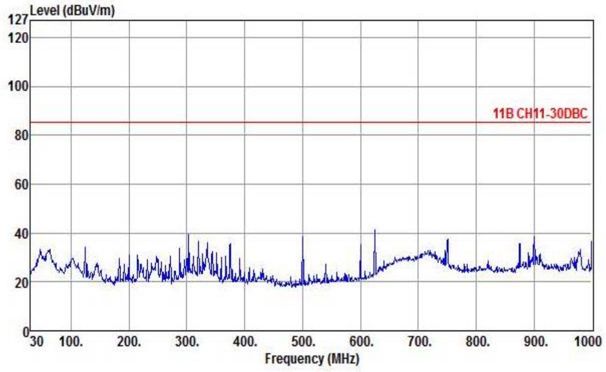
<tr><td> 
</td><td> 
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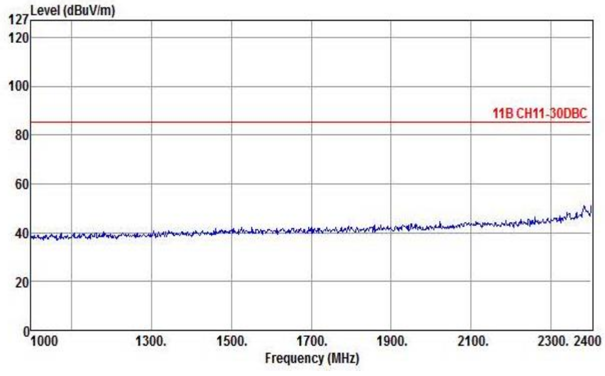
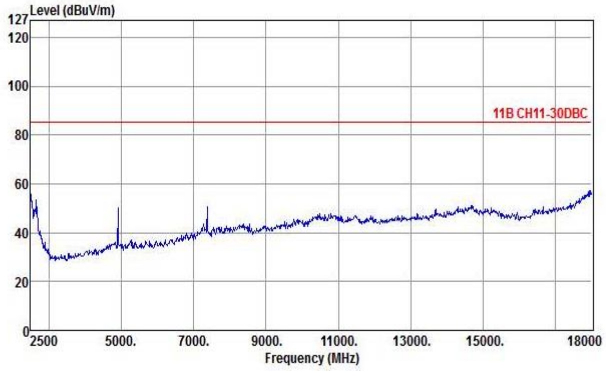
<tr><td> 
</td><td> 
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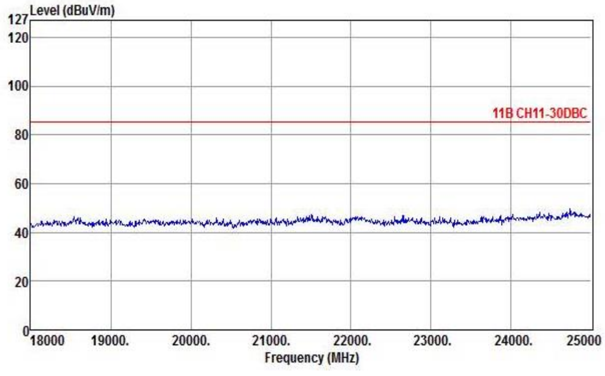
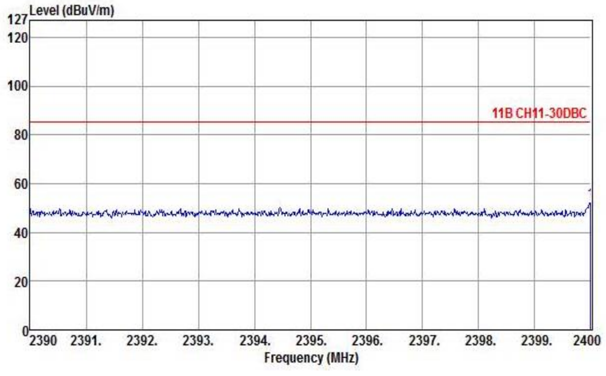
<tr><td> 
</td><td> 
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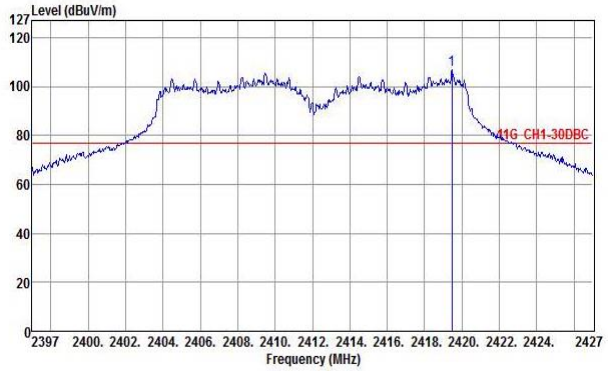
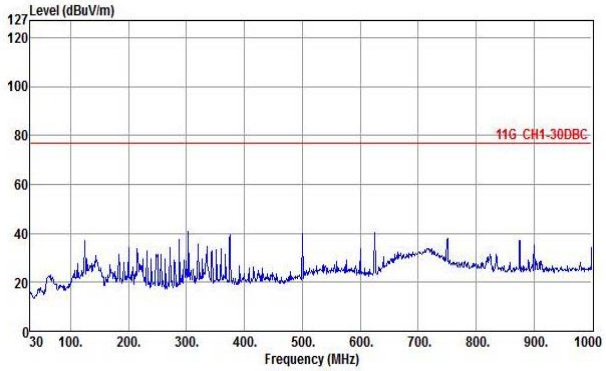
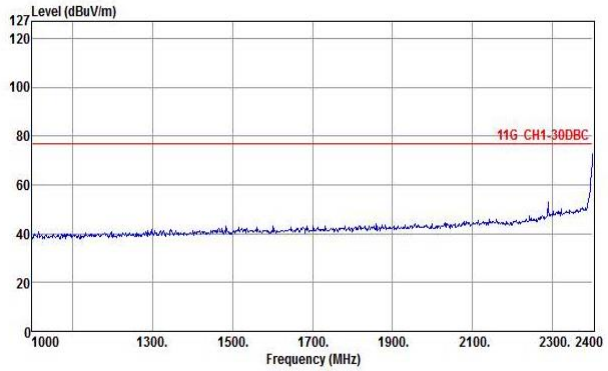
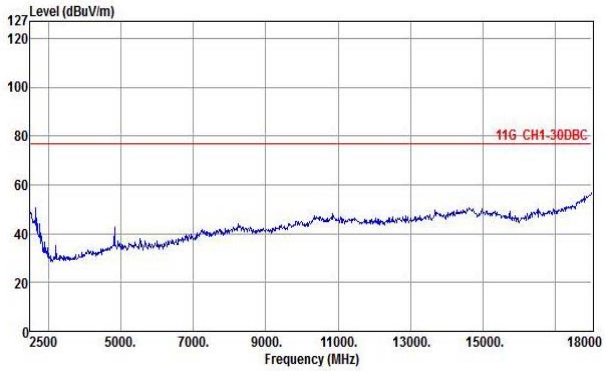
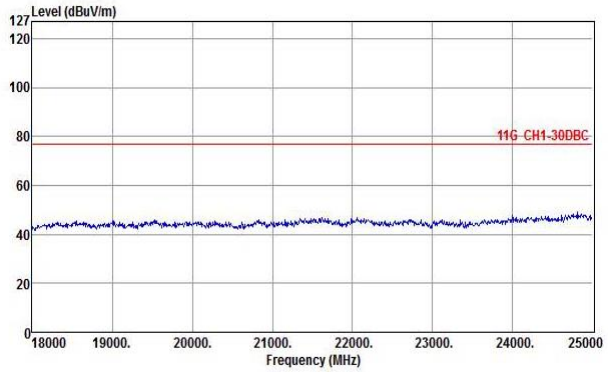
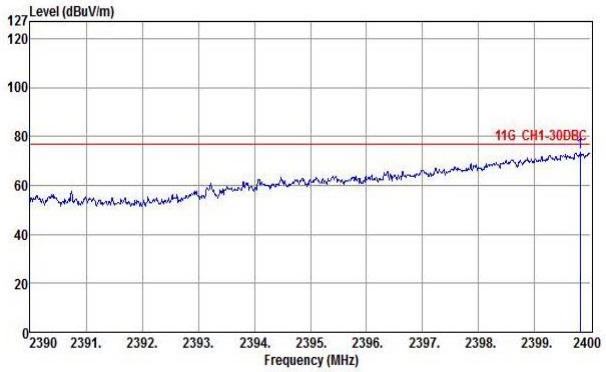
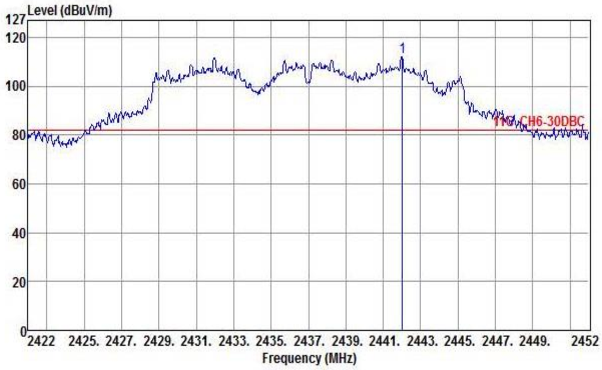
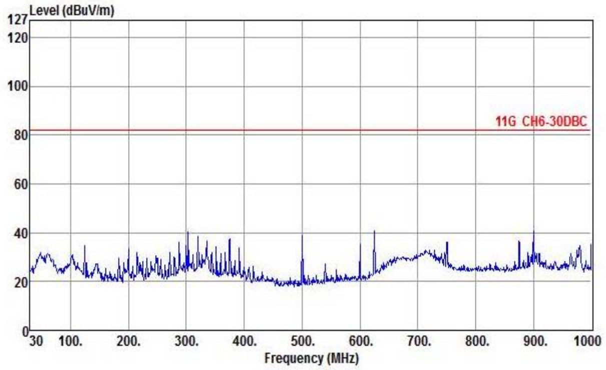
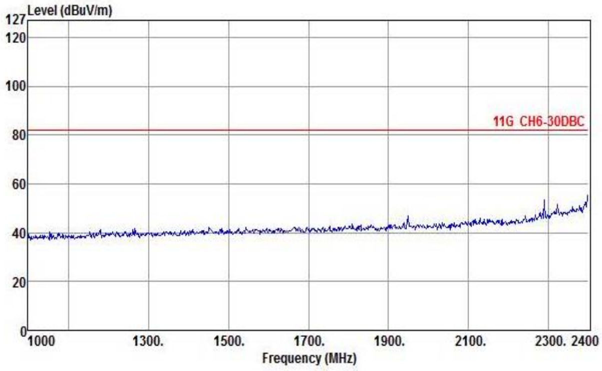
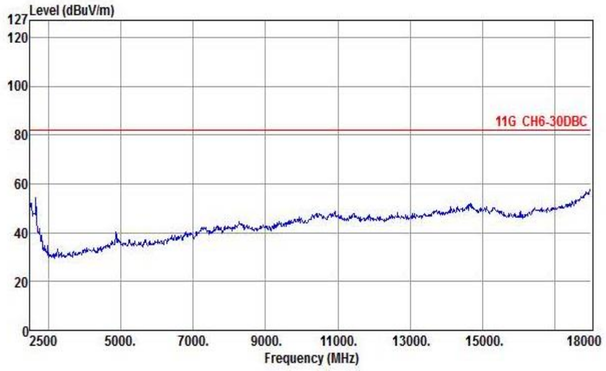
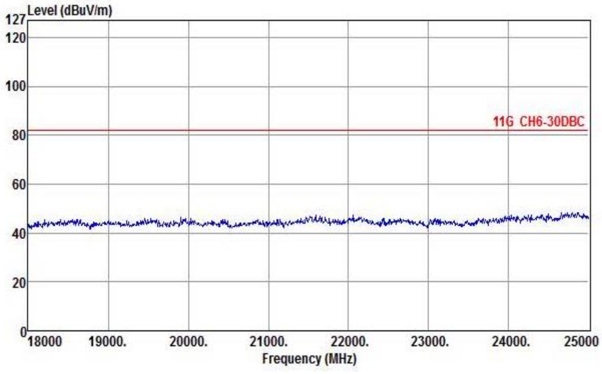
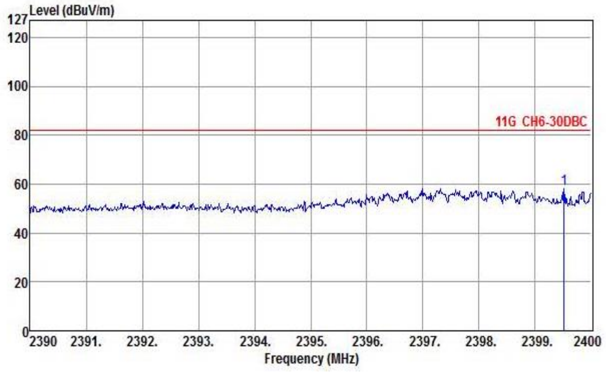
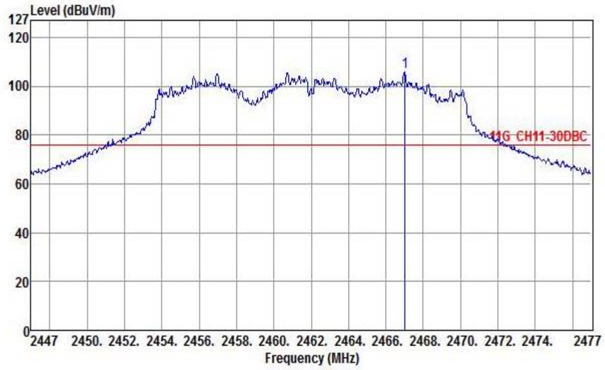
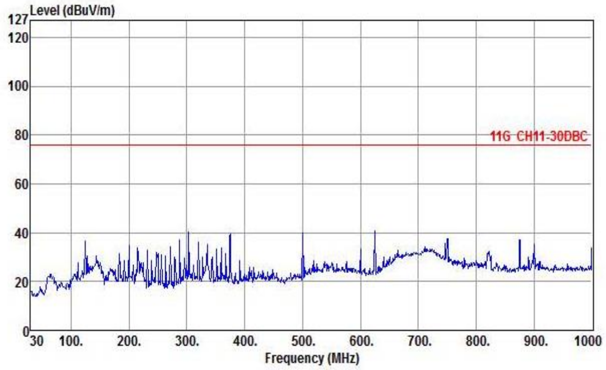
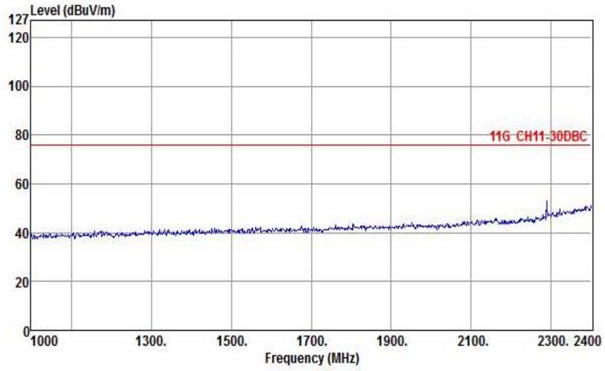
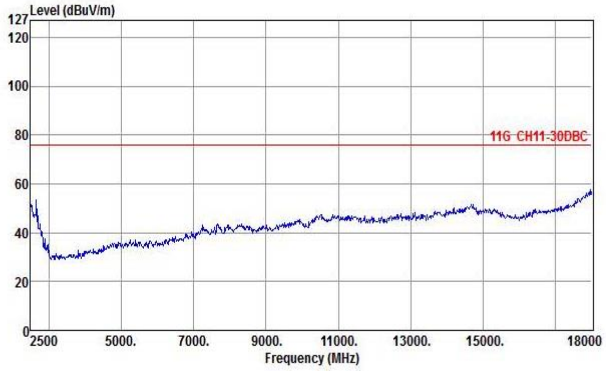
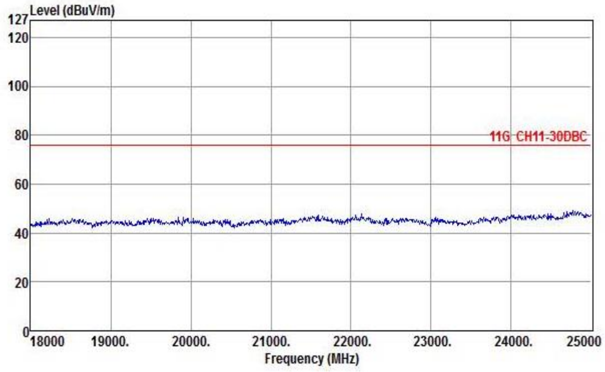
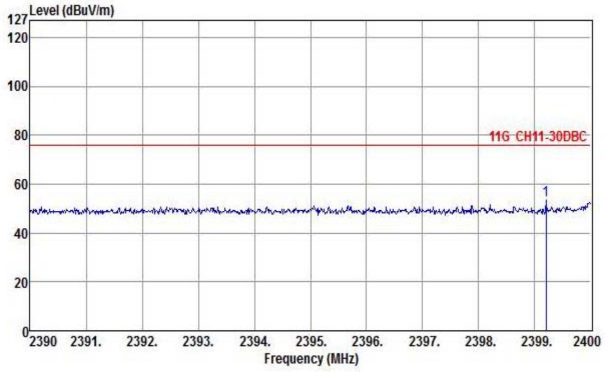
802.11g

Reference Level	Tx 2412MHz / 30MHz~25GHz (down 30dBc)
	
	
	

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

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

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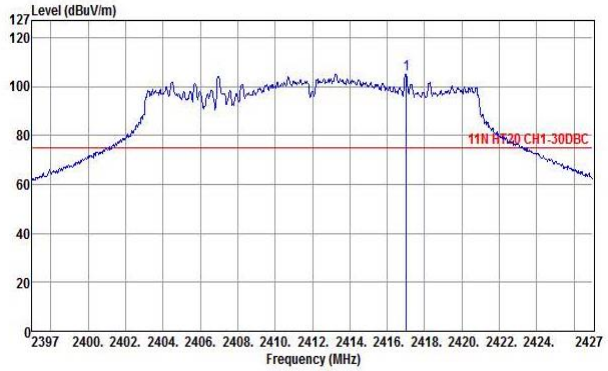
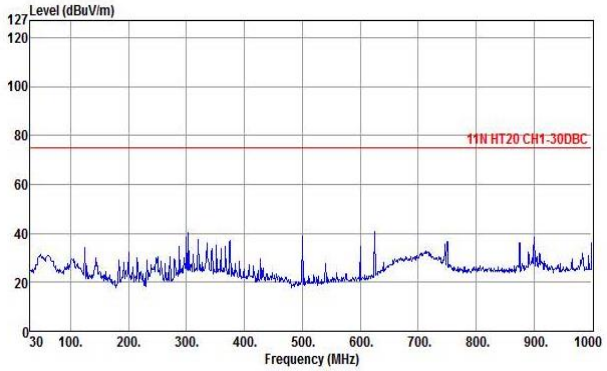
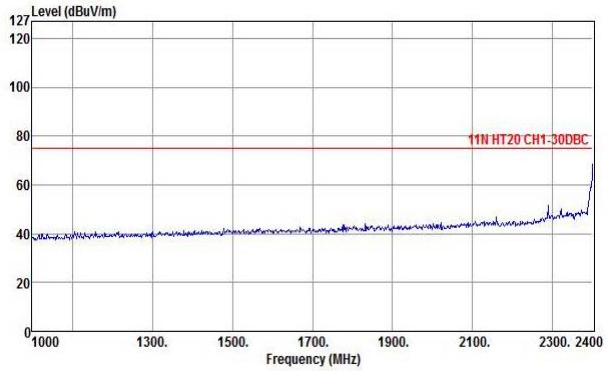
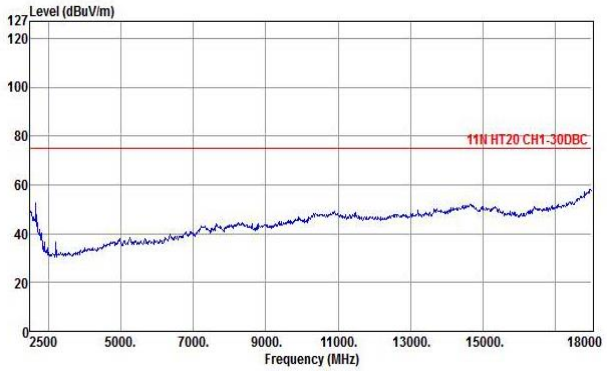
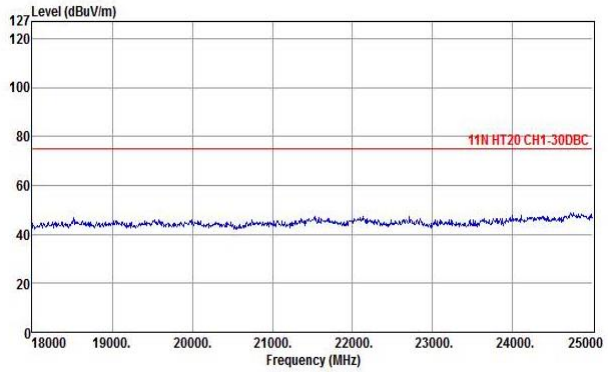
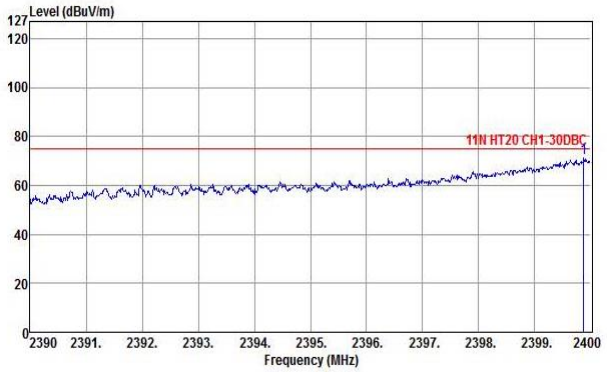
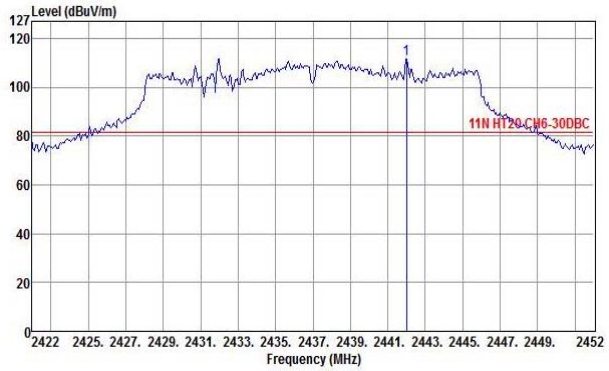
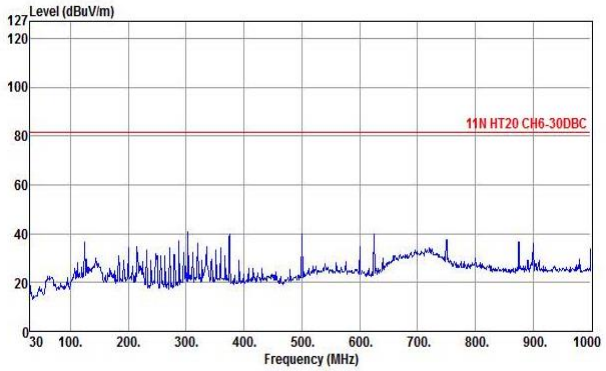
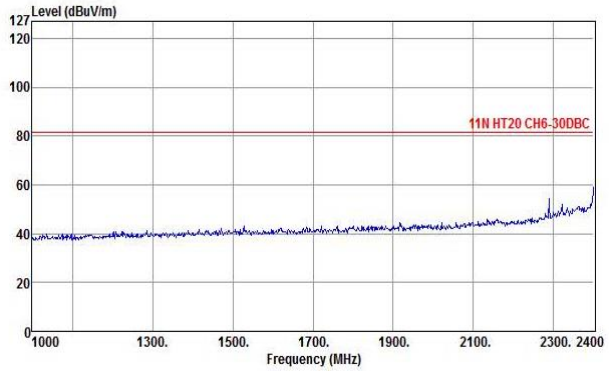
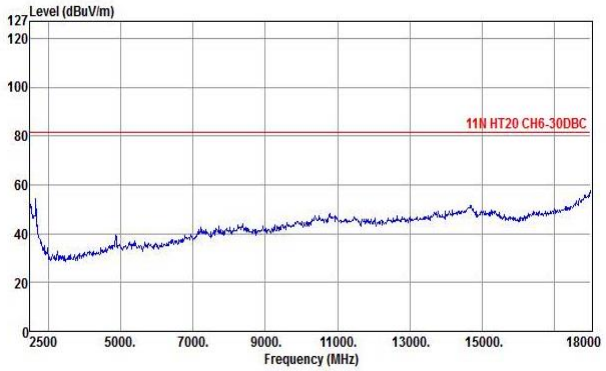
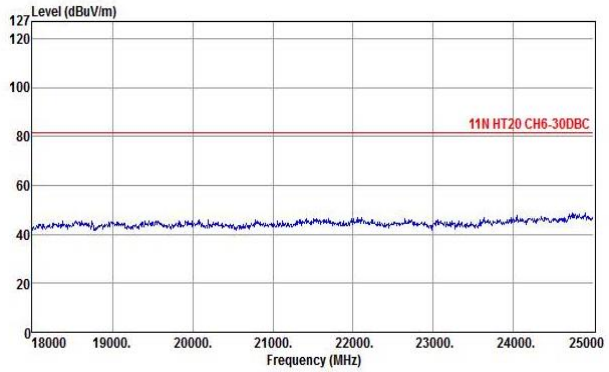
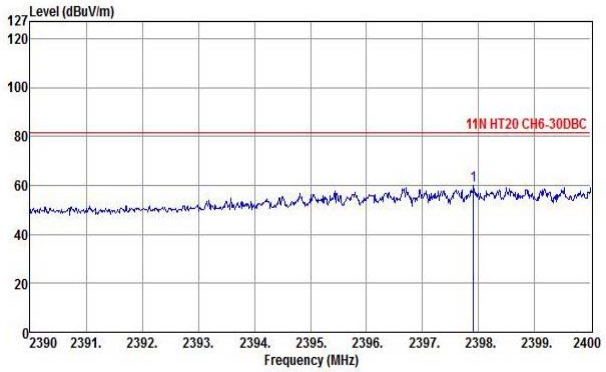
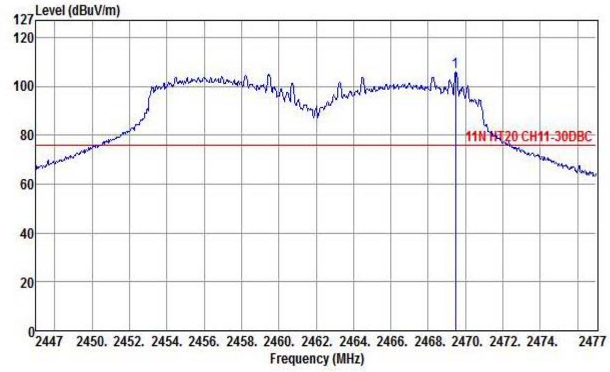
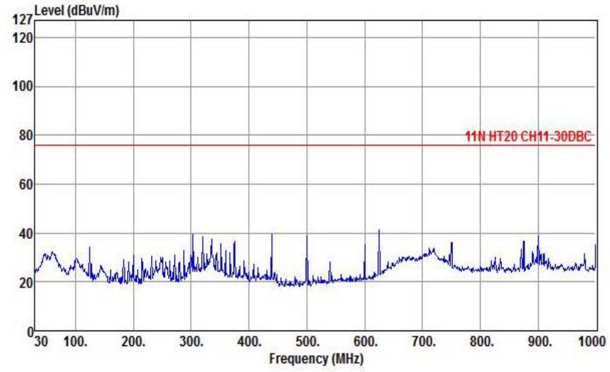
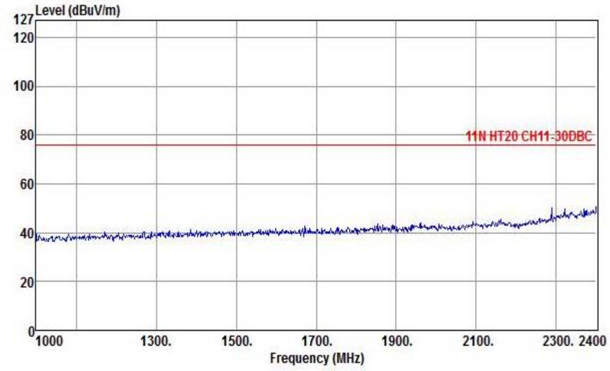
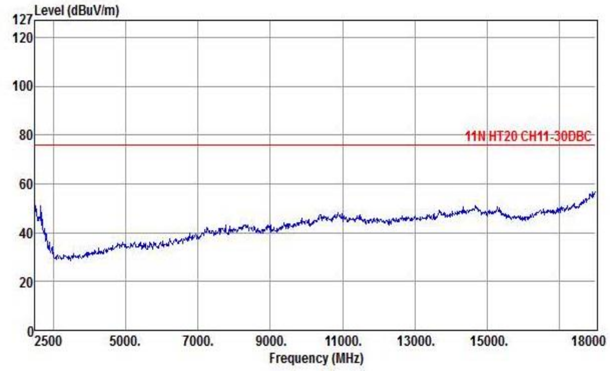
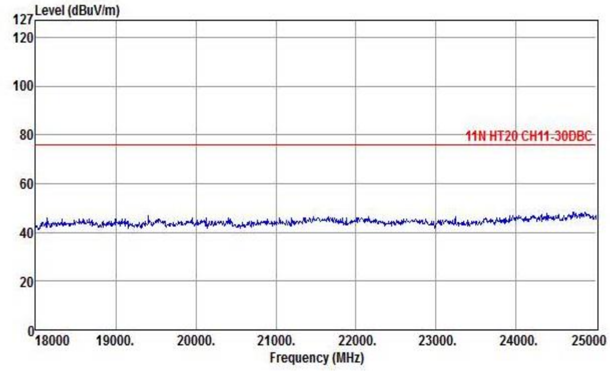
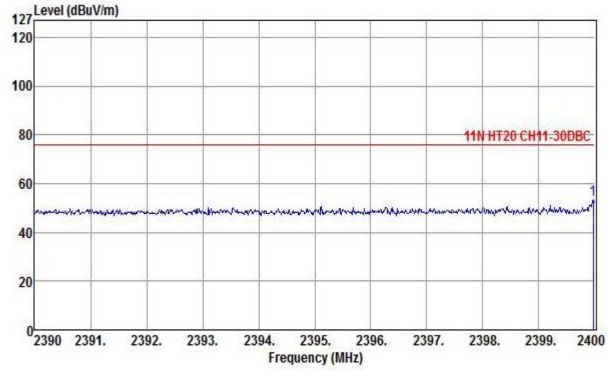
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 30dBc)
	
	
	

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

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

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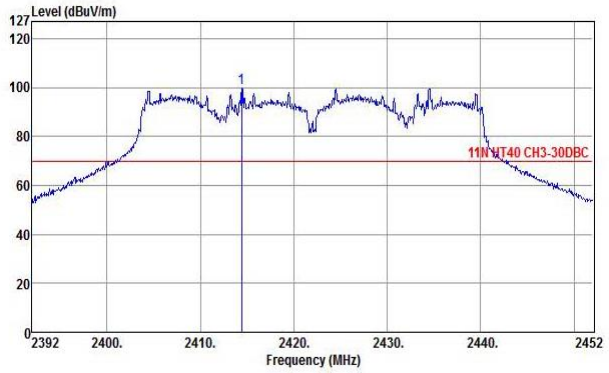
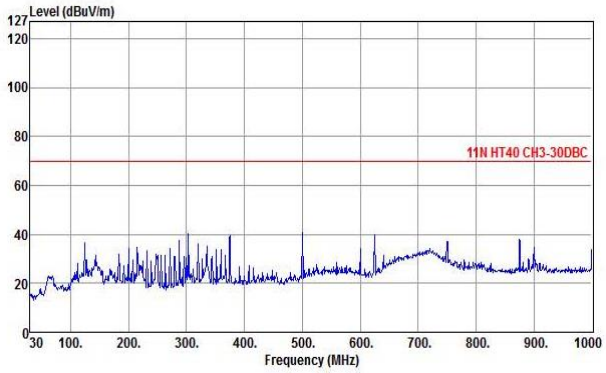
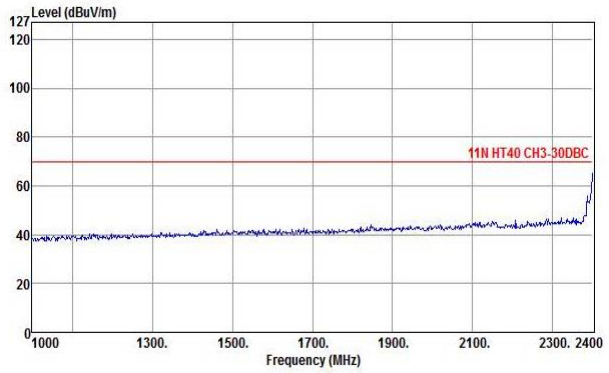
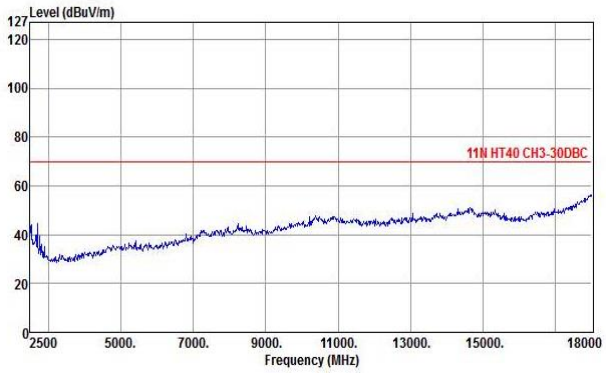
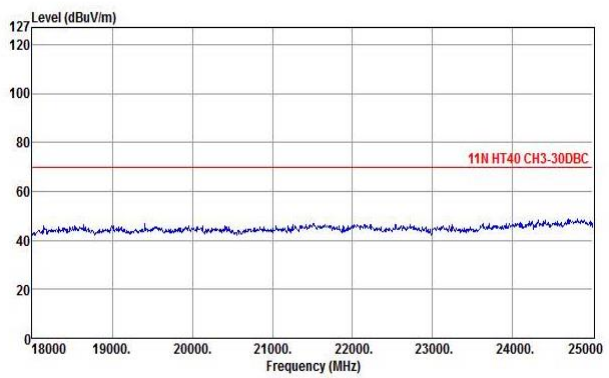
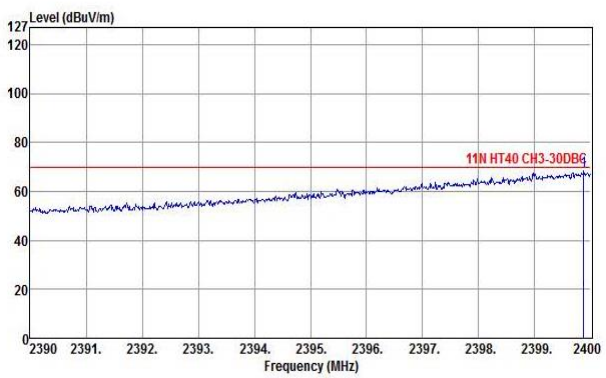
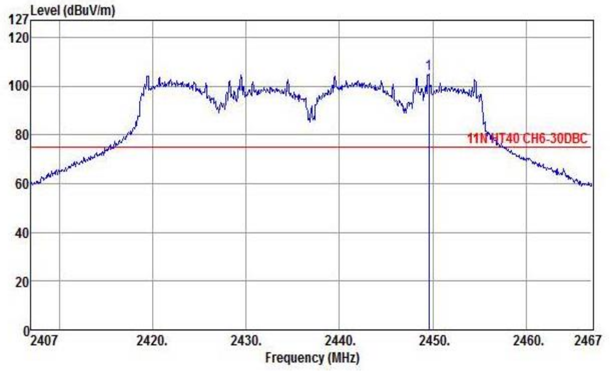
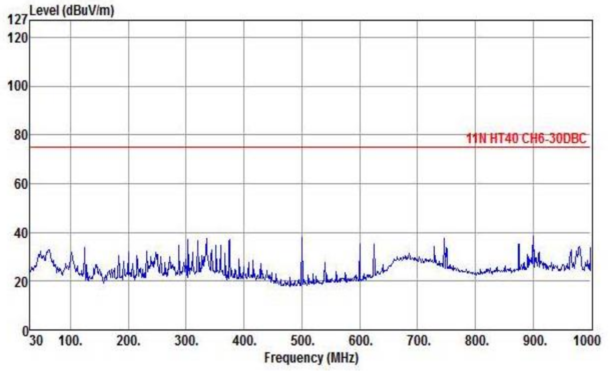
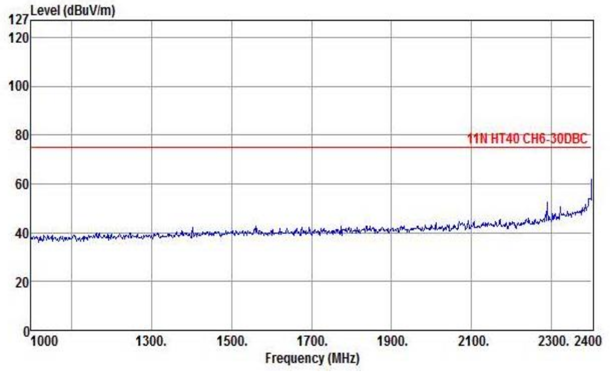
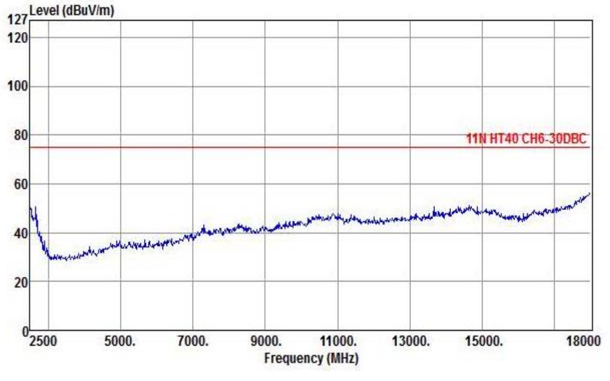
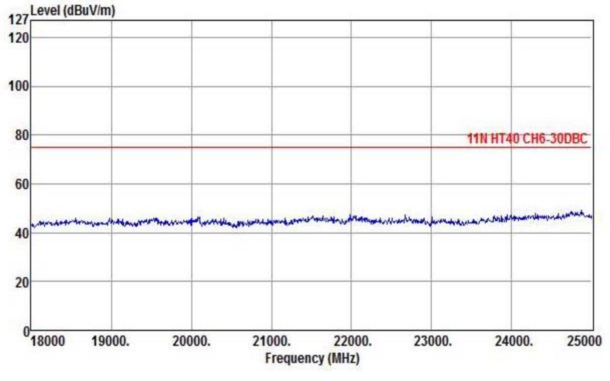
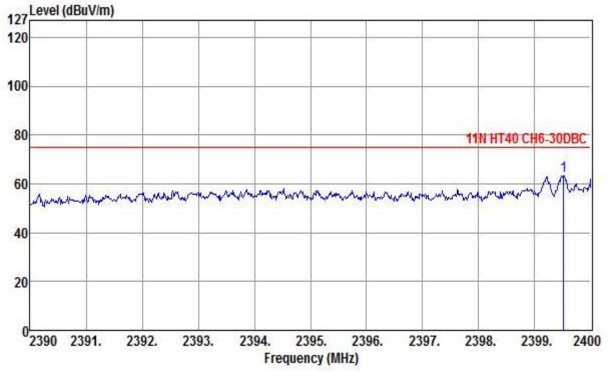
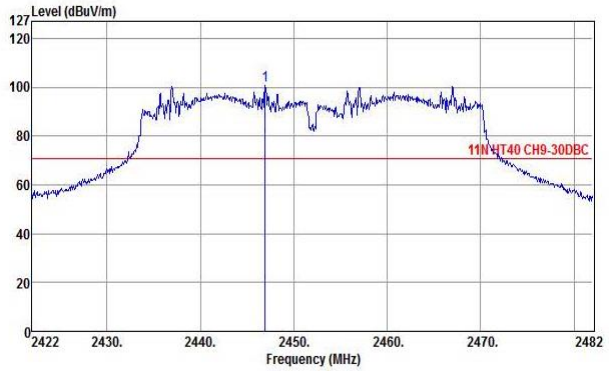
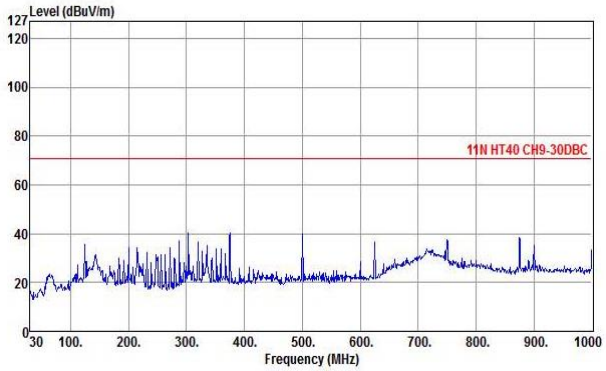
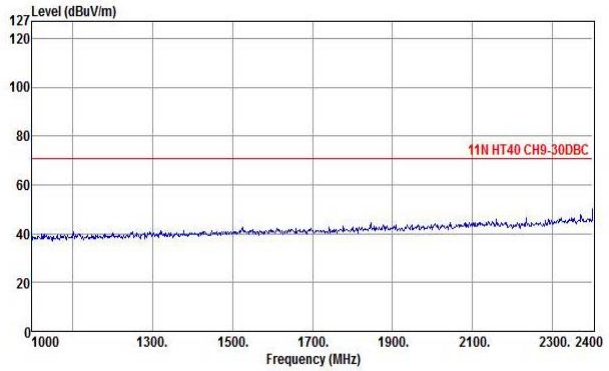
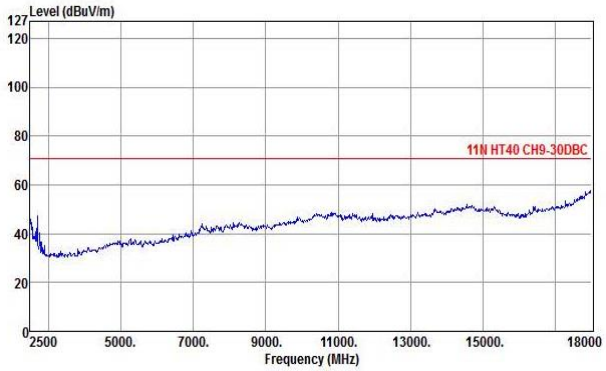
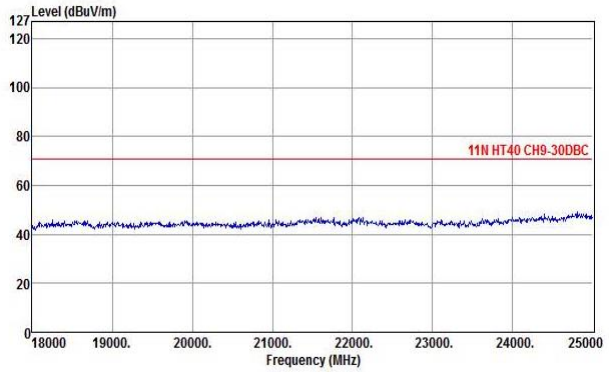
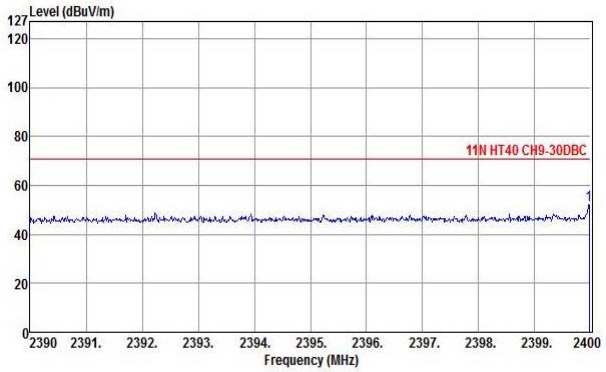
Reference Level	Tx 2422MHz / 30MHz~25GHz (down 30dBc)
	
	
	

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

Reference Level	Tx 2452MHz / 30MHz~25GHz (down 30dBc)
	
	
	

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	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.	No. 14-1, Lane 19, 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

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