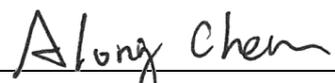


FCC Test Report

FCC ID : MXF-WRTM-331
Equipment : THINGS
Model No. : TH-GW10, VC-FLX1
(Marketing difference)
Brand Name : Toshiba, Onkyo
(Marketing difference)
Applicant : Gemtek Technology Co., Ltd.
Address : No. 15-1 Zhonghua Road, Hsinchu Industrial
Park, Hukou, Hsinchu, Taiwan, 30352.
Standard : 47 CFR FCC Part 15.247
Received Date : Apr. 12, 2017
Tested Date : Apr. 20 ~ May 03, 2017

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.

Reviewed by:


Along Chen / Assistant Manager

Approved by:

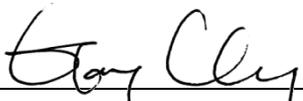

Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR741201ZB	Rev. 01	Initial issue	Aug. 08, 2017

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.348MHz 35.57 (Margin -13.43dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 4890.00MHz 53.63 (Margin -0.37dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 22.01	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)	Mode	Ch. Frequency (MHz)	Channel Number	Data Rate
2400~2483.5	ZigBee	2405~2480	11-26 [16]	250kbps
Note 1: ZigBee uses DSSS-O-QPSK modulation.				

1.1.2 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remarks
1	PIFA	UFL	2.61	---

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter
-------------------	--------------------

1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	AC adapter	Brand: APD Model: WA-36A12FU Power Rating: I/P: 100-240Vac, 50-60Hz, 0.9A Max. O/P: 12Vdc, 3A Power Line: 1.8m non-shielded without core

1.1.5 Channel List

Channel No.	Frequency (MHz)
11	2405
12	2410
13	2415
14	2420
15	2425
16	2430
17	2435
18	2440
19	2445
20	2450
21	2455
22	2460
23	2465
24	2470
25	2475
26	2480

1.1.6 Test Tool and Duty Cycle

Test Tool	Tera Term, 4.8
Duty Cycle Of Test Signal (%)	100%
Duty Factor (dB)	0

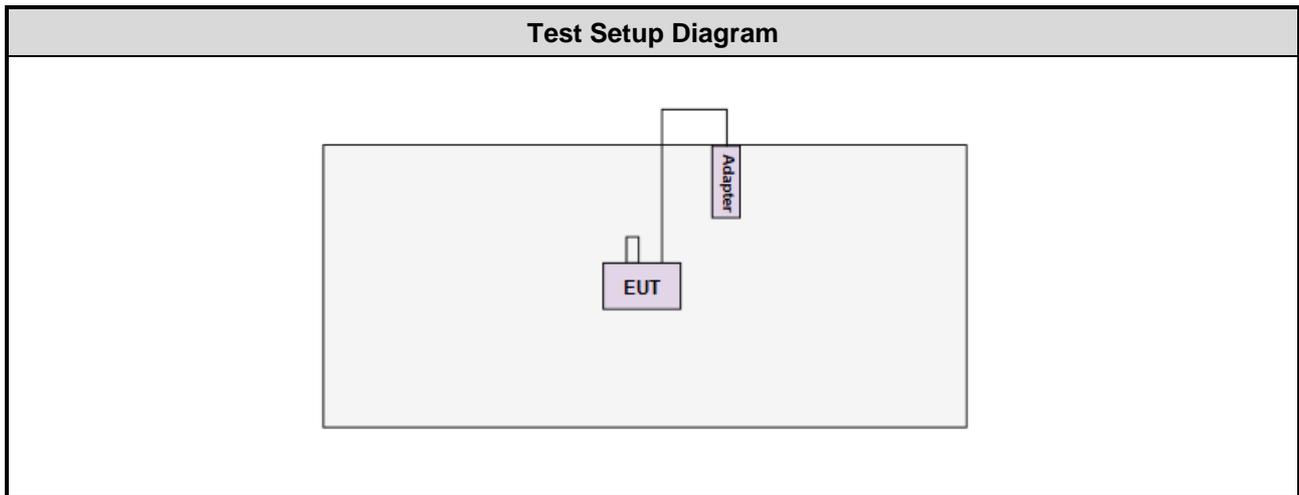
1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
DSSS	2405	F5
DSSS	2445	F5
DSSS	2475	F5
DSSS	2480	75

1.2 Local Support Equipment List

Support Equipment List						
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)
1	USB Flash	Kingston	DTSE9G2	TXVV6	---	---

1.3 Test Setup Chart



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
Receiver	R&S	ESR3	101657	Dec. 21, 2016	Dec. 20, 2017
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 20, 2016	Dec. 19, 2017
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 chamber1 / (03CH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Nov. 25, 2016	Nov. 24, 2017
Receiver	R&S	ESR3	101658	Nov. 24, 2016	Nov. 23, 2017
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 04, 2016	Aug. 03, 2017
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 21, 2016	Dec. 20, 2017
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 25, 2016	Oct. 24, 2017
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 10, 2016	Nov. 09, 2017
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 09, 2016	Dec. 08, 2017
Preamplifier	EMC	EMC02325	980225	Aug. 05, 2016	Aug. 04, 2017
Preamplifier	Agilent	83017A	MY39501308	Oct. 06, 2016	Oct. 05, 2017
Preamplifier	EMC	EMC184045B	980192	Aug. 24, 2016	Aug. 23, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 09, 2016	Dec. 08, 2017
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	16052	Dec. 09, 2016	Dec. 08, 2017
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 09, 2016	Dec. 08, 2017
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 09, 2016	Dec. 08, 2017
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	Mar. 15, 2017	Mar. 14, 2018
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 2017
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 28, 2016	Oct. 27, 2017
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 v04

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	±2.90 dB
Radiated emission ≤ 1GHz	±3.66 dB
Radiated emission > 1GHz	±5.63 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	20°C / 57%	Alex Tsai
Radiated Emissions	03CH01-WS	22-24°C / 62-64%	Vincent Yen Kevin Lee
RF Conducted	TH01-WS	22°C / 64%	Brad Wu

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate
Conducted Emissions	DSSS	2405	250kbps
Radiated Emissions ≤1GHz	DSSS	2405	250kbps
Radiated Emissions >1GHz Maximum Output Power 6dB bandwidth Power spectral density	DSSS	2405 / 2445 / 2475 / 2480	250kbps

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

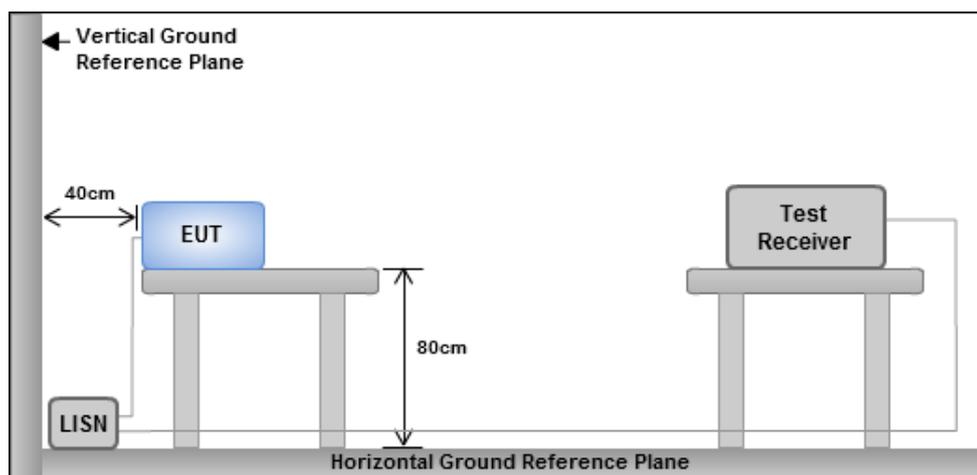
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

3.1.2 Test Procedures

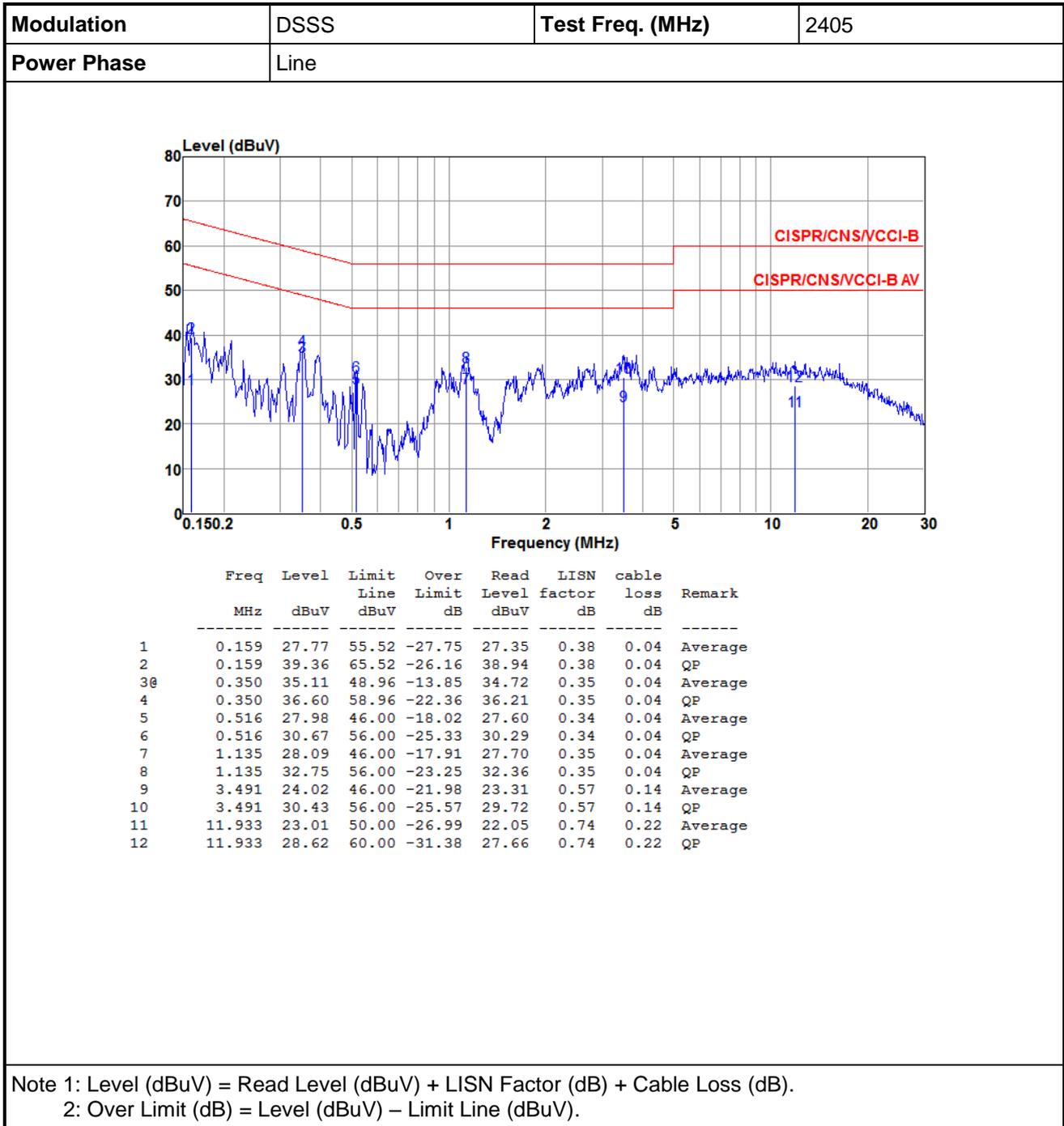
1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels 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

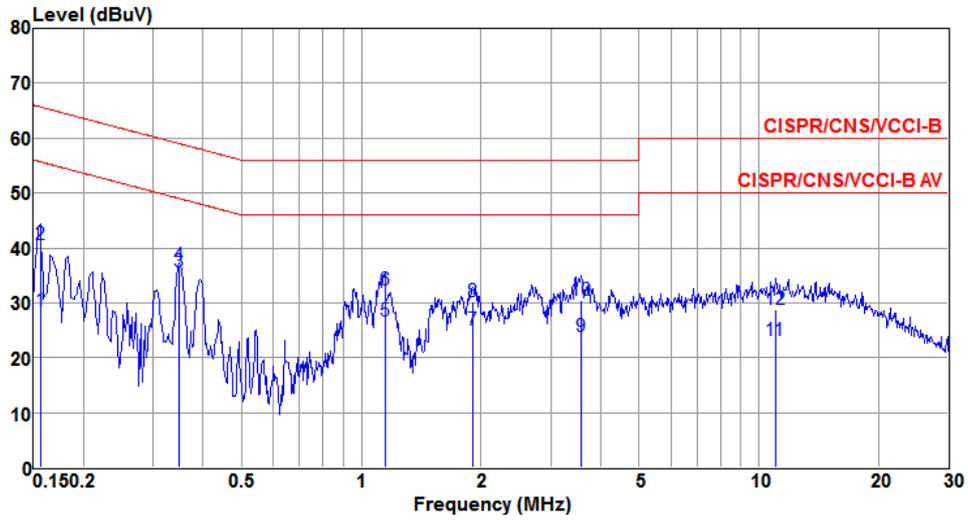


- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions



Modulation	DSSS	Test Freq. (MHz)	2405
Power Phase	Neutral		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	28.46	55.69	-27.23	28.08	0.34	0.04	Average
2	0.156	40.66	65.69	-25.03	40.28	0.34	0.04	QP
3	0.348	35.57	49.00	-13.43	35.16	0.37	0.04	Average
4	0.348	36.76	59.00	-22.24	36.35	0.37	0.04	QP
5	1.147	26.60	46.00	-19.40	26.18	0.38	0.04	Average
6	1.147	32.23	56.00	-23.77	31.81	0.38	0.04	QP
7	1.908	24.91	46.00	-21.09	24.41	0.46	0.04	Average
8	1.908	30.22	56.00	-25.78	29.72	0.46	0.04	QP
9	3.565	23.89	46.00	-22.11	23.21	0.54	0.14	Average
10	3.565	30.37	56.00	-25.63	29.69	0.54	0.14	QP
11	11.021	23.13	50.00	-26.87	22.34	0.57	0.22	Average
12	11.021	28.91	60.00	-31.09	28.12	0.57	0.22	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 Note 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

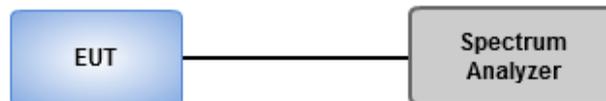
6dB Bandwidth

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

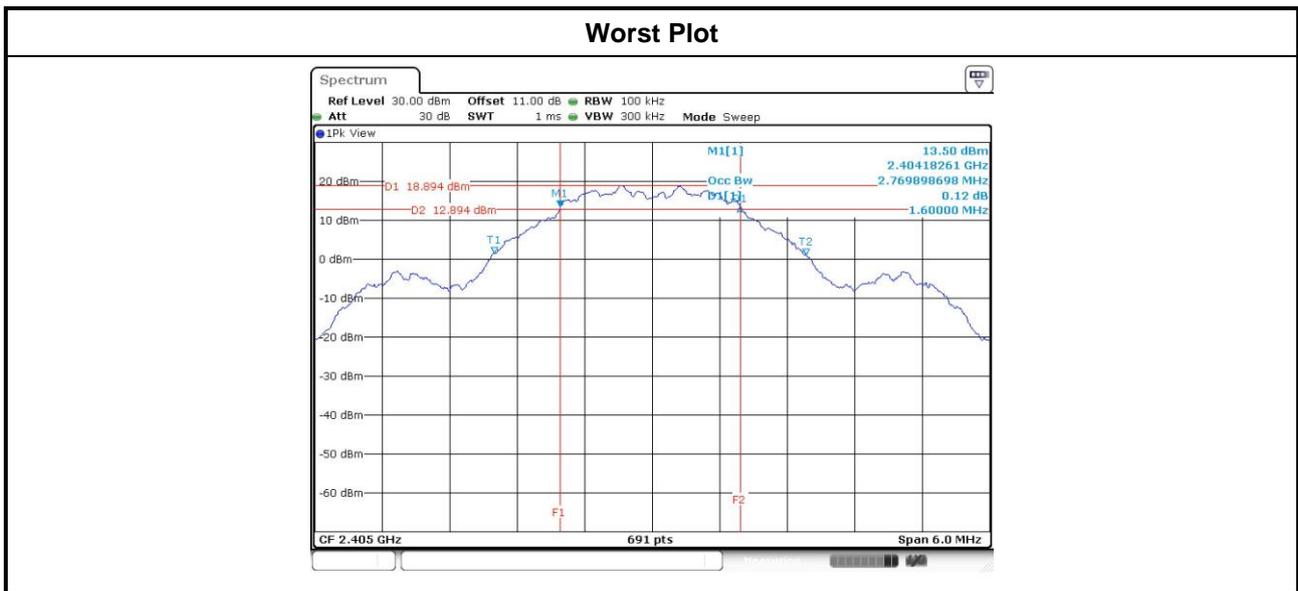
1. Set resolution bandwidth (RBW) = 1 MHz, Video bandwidth = 3 MHz.
2. Detector = Sample, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

3.2.3 Test Setup

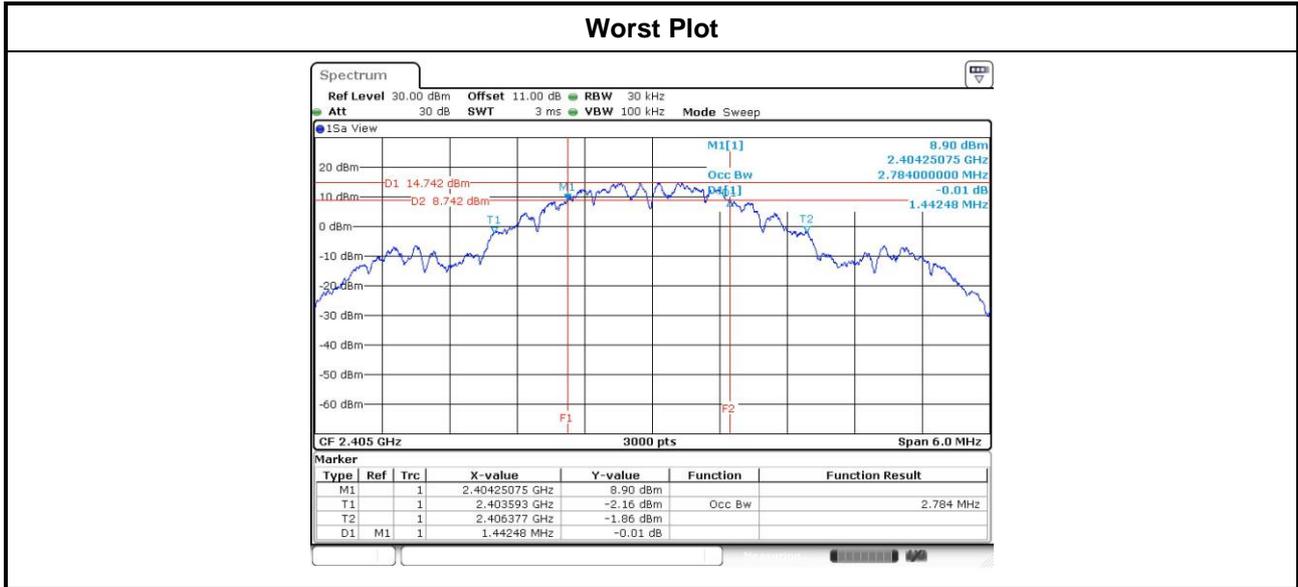


3.2.4 Test Result of 6dB and Occupied Bandwidth

Modulation Mode	Freq. (MHz)	6dB Bandwidth (MHz)	Limit (kHz)
DSSS	2405	1.600	500
DSSS	2445	1.600	500
DSSS	2475	1.600	500
DSSS	2480	1.609	500



Modulation Mode	Freq. (MHz)	99% Occupied Bandwidth (MHz)
DSSS	2405	2.784
DSSS	2445	2.760
DSSS	2475	2.746
DSSS	2480	2.588



3.3 RF Output Power

3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

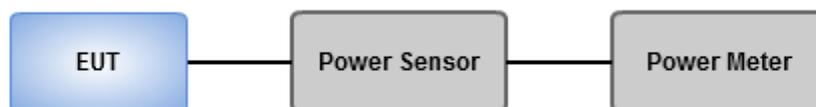
- Antenna gain \leq 6dBi, no any corresponding reduction is in output power limit.
- Antenna gain $>$ 6dBi
 - Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB
 - Fixed, 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)
 - 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

Peak conducted Output Power (dBm)							
Modulation Mode	Freq. (MHz)	Total Power (mW)	Total Power (dBm)	Limit (dBm)	Ant. Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)
DSSS	2405	158.855	22.01	30	2.61	24.62	36
DSSS	2445	149.279	21.74	30	2.61	24.35	36
DSSS	2475	139.316	21.44	30	2.61	24.05	36
DSSS	2480	14.928	11.74	30	2.61	14.35	36

Conducted (Average) Output Power (dBm)			
Modulation Mode	Freq. (MHz)	Total Power (mW)	Total Power (dBm)
DSSS	2405	152.405	21.83
DSSS	2445	143.219	21.56
DSSS	2475	132.739	21.23
DSSS	2480	13.521	11.31

Note: Conducted average output power is for reference only.

3.4 Power Spectral Density

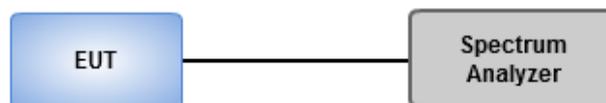
3.4.1 Limit of Power Spectral Density

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

3.4.2 Test Procedures

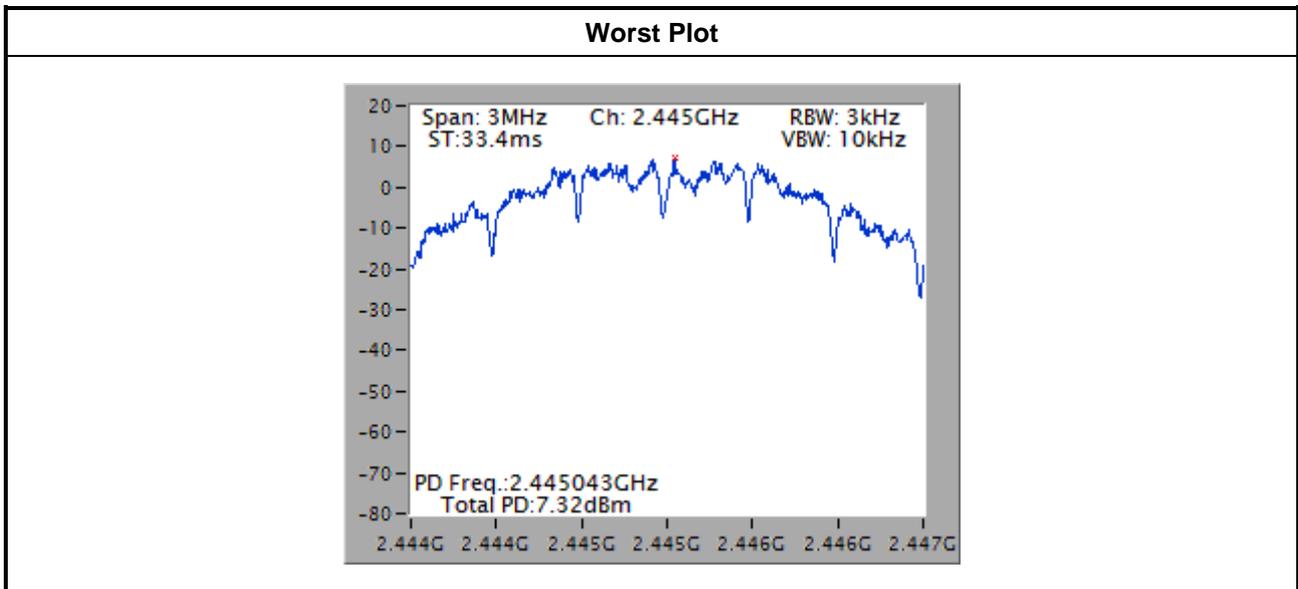
- Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.
 1. Set the RBW = 3kHz, VBW = 10kHz.
 2. Detector = Peak, Sweep time = auto couple.
 3. Trace mode = max hold, allow trace to fully stabilize.
 4. Use the peak marker function to determine 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)
DSSS	2405	7.20	8
DSSS	2445	7.32	8
DSSS	2475	7.19	8
DSSS	2480	-3.13	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

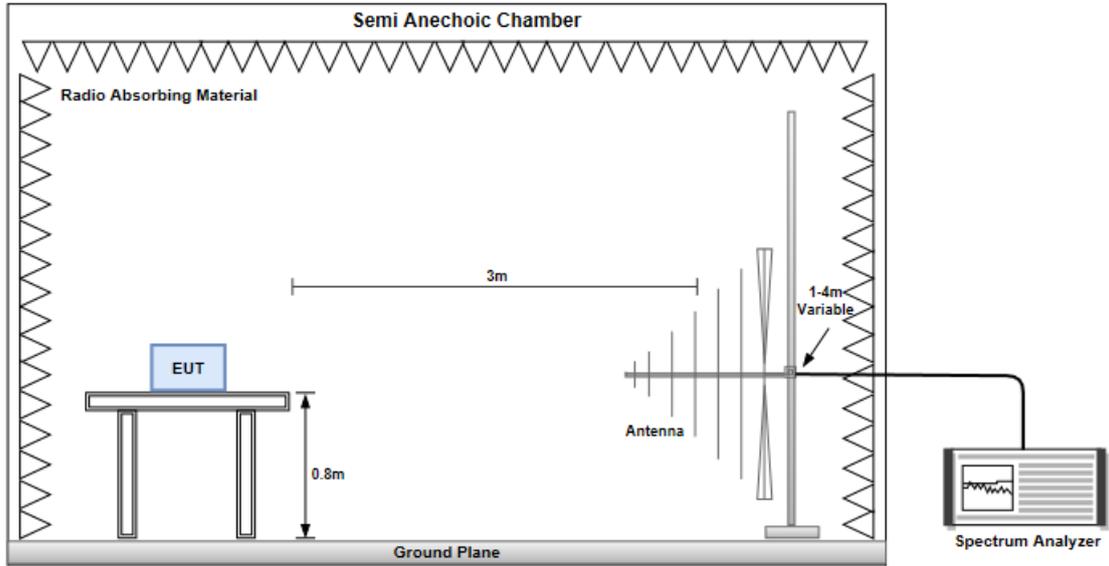
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at 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:

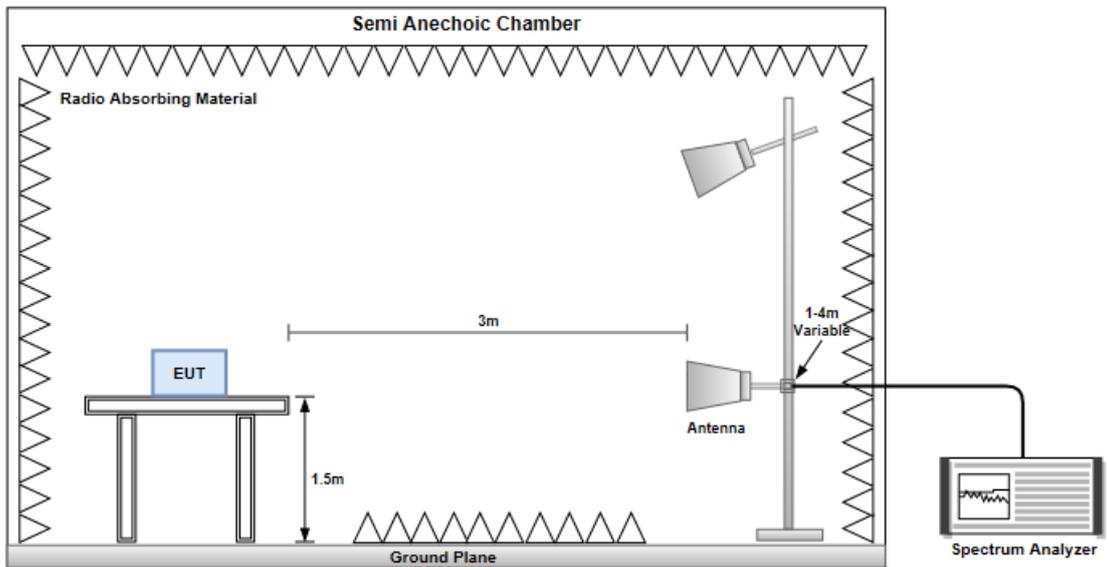
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

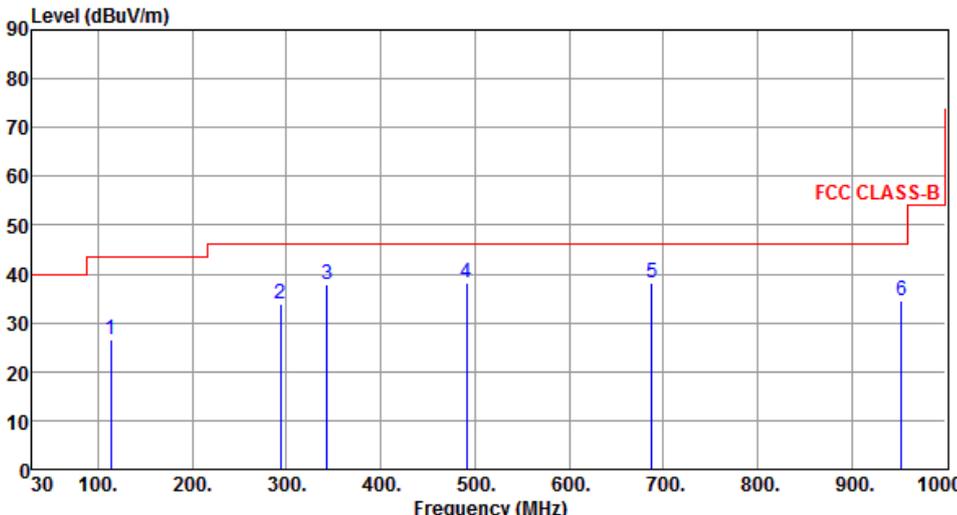
Radiated Emissions below 1 GHz



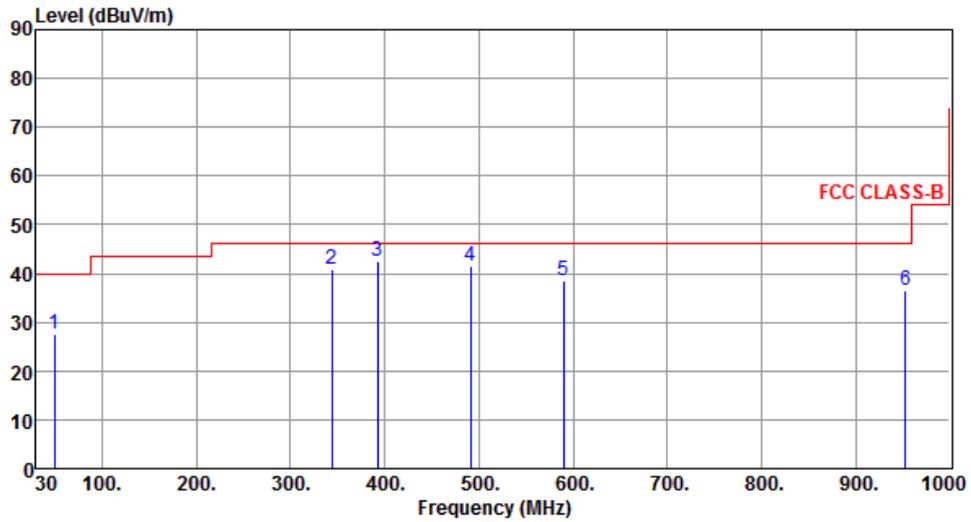
Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	DSSS	Test Freq. (MHz)	2405																																																													
Polarization	Horizontal																																																															
																																																																
	<table border="1"> <thead> <tr> <th>Freq. MHz</th> <th>Emission level dBuV/m</th> <th>Limit dBuV/m</th> <th>Margin dB</th> <th>SA reading dBuV</th> <th>Factor dB</th> <th>Remark</th> <th>ANT High cm</th> <th>Turn Table deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>113.55</td> <td>26.48</td> <td>43.50</td> <td>-17.02</td> <td>37.28</td> <td>-10.80</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>2</td> <td>293.84</td> <td>33.78</td> <td>46.00</td> <td>-12.22</td> <td>41.42</td> <td>-7.64</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>3</td> <td>343.26</td> <td>37.81</td> <td>46.00</td> <td>-8.19</td> <td>44.22</td> <td>-6.41</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>4</td> <td>490.81</td> <td>38.17</td> <td>46.00</td> <td>-7.83</td> <td>41.16</td> <td>-2.99</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>5</td> <td>687.66</td> <td>38.14</td> <td>46.00</td> <td>-7.86</td> <td>37.54</td> <td>0.60</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>6</td> <td>952.74</td> <td>34.63</td> <td>46.00</td> <td>-11.37</td> <td>29.73</td> <td>4.90</td> <td>Peak</td> <td>---</td> </tr> </tbody> </table>	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	113.55	26.48	43.50	-17.02	37.28	-10.80	Peak	---	2	293.84	33.78	46.00	-12.22	41.42	-7.64	Peak	---	3	343.26	37.81	46.00	-8.19	44.22	-6.41	Peak	---	4	490.81	38.17	46.00	-7.83	41.16	-2.99	Peak	---	5	687.66	38.14	46.00	-7.86	37.54	0.60	Peak	---	6	952.74	34.63	46.00	-11.37	29.73	4.90	Peak	---
Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg																																																								
1	113.55	26.48	43.50	-17.02	37.28	-10.80	Peak	---																																																								
2	293.84	33.78	46.00	-12.22	41.42	-7.64	Peak	---																																																								
3	343.26	37.81	46.00	-8.19	44.22	-6.41	Peak	---																																																								
4	490.81	38.17	46.00	-7.83	41.16	-2.99	Peak	---																																																								
5	687.66	38.14	46.00	-7.86	37.54	0.60	Peak	---																																																								
6	952.74	34.63	46.00	-11.37	29.73	4.90	Peak	---																																																								
<p>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.</p>																																																																

Modulation	DSSS	Test Freq. (MHz)	2405
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	49.36	27.49	40.00	-12.51	35.12	-7.63	Peak	---	---
2	343.68	40.77	46.00	-5.23	47.17	-6.40	Peak	---	---
3	392.78	42.36	46.00	-3.64	47.53	-5.17	QP	124	119
4	490.83	41.59	46.00	-4.41	44.58	-2.99	Peak	---	---
5	589.82	38.51	46.00	-7.49	39.40	-0.89	Peak	---	---
6	952.75	36.45	46.00	-9.55	31.55	4.90	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

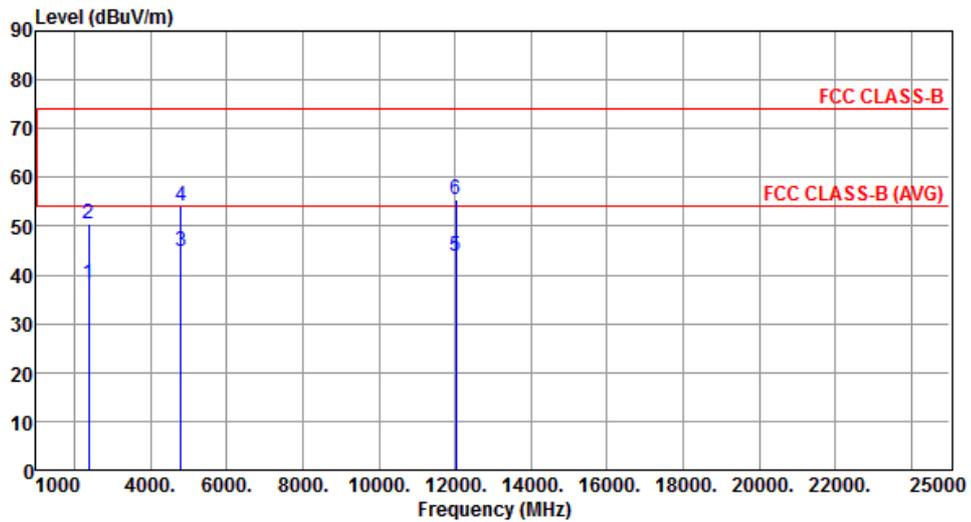
*Factor includes antenna factor , cable loss and amplifier gain

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)

Modulation	DSSS	Test Freq. (MHz)	2405
Polarization	Horizontal		



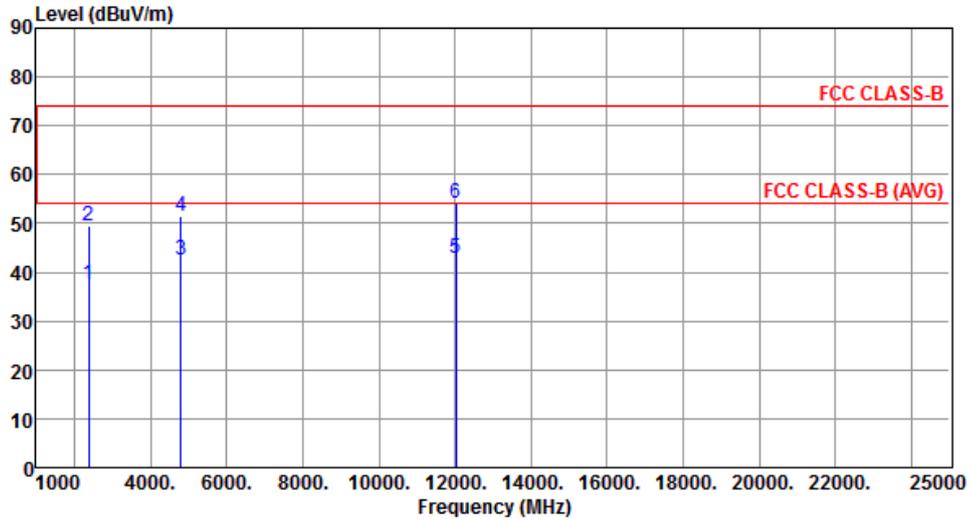
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.09	54.00	-15.91	41.27	-3.18	Average	115	186
2	2390.00	50.54	74.00	-23.46	53.72	-3.18	Peak	115	186
3	4810.00	45.00	54.00	-9.00	41.26	3.74	Average	259	234
4	4810.00	54.22	74.00	-19.78	50.48	3.74	Peak	259	234
5	12025.00	43.92	54.00	-10.08	30.36	13.56	Average	100	252
6	12025.00	55.47	74.00	-18.53	41.91	13.56	Peak	100	252

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	DSSS	Test Freq. (MHz)	2405
Polarization	Vertical		



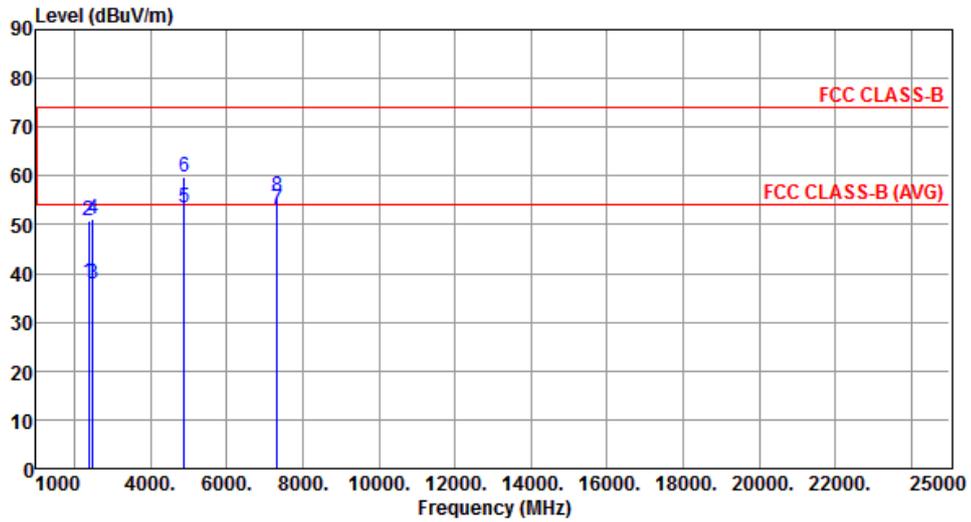
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.69	54.00	-16.31	40.87	-3.18	Average	115	148
2	2390.00	49.51	74.00	-24.49	52.69	-3.18	Peak	115	148
3	4810.00	42.40	54.00	-11.60	38.66	3.74	Average	154	199
4	4810.00	51.46	74.00	-22.54	47.72	3.74	Peak	154	199
5	12025.00	42.91	54.00	-11.09	29.35	13.56	Average	164	151
6	12025.00	54.24	74.00	-19.76	40.68	13.56	Peak	164	151

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	DSSS	Test Freq. (MHz)	2445
Polarization	Horizontal		



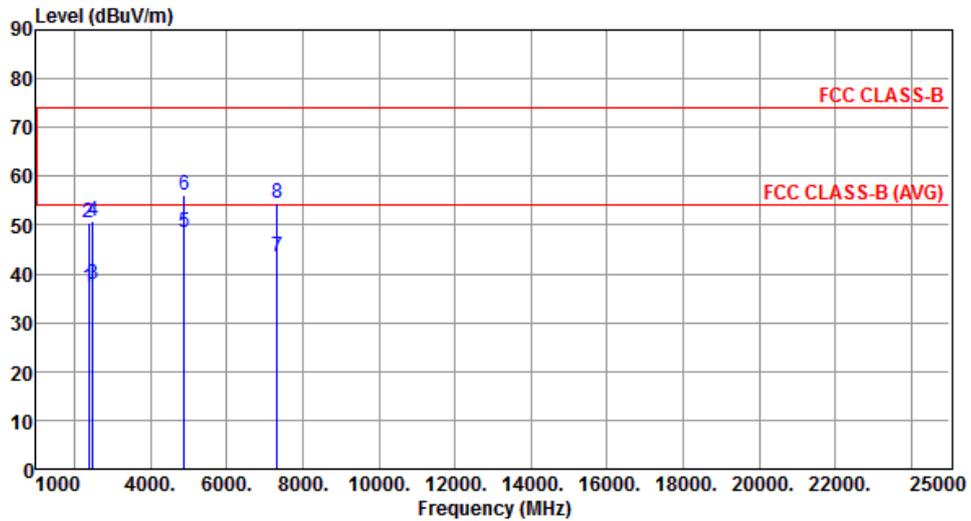
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.03	54.00	-15.97	41.21	-3.18	Average	194	183
2	2390.00	50.67	74.00	-23.33	53.85	-3.18	Peak	194	183
3	2483.50	37.91	54.00	-16.09	40.71	-2.80	Average	194	183
4	2483.50	51.16	74.00	-22.84	53.96	-2.80	Peak	194	183
5	4890.00	53.63	54.00	-0.37	49.63	4.00	Average	251	236
6	4890.00	59.65	74.00	-14.35	55.65	4.00	Peak	251	236
7	7335.00	53.18	54.00	-0.82	44.76	8.42	Average	100	216
8	7335.00	55.73	74.00	-18.27	47.31	8.42	Peak	100	216

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	DSSS	Test Freq. (MHz)	2445
Polarization	Vertical		



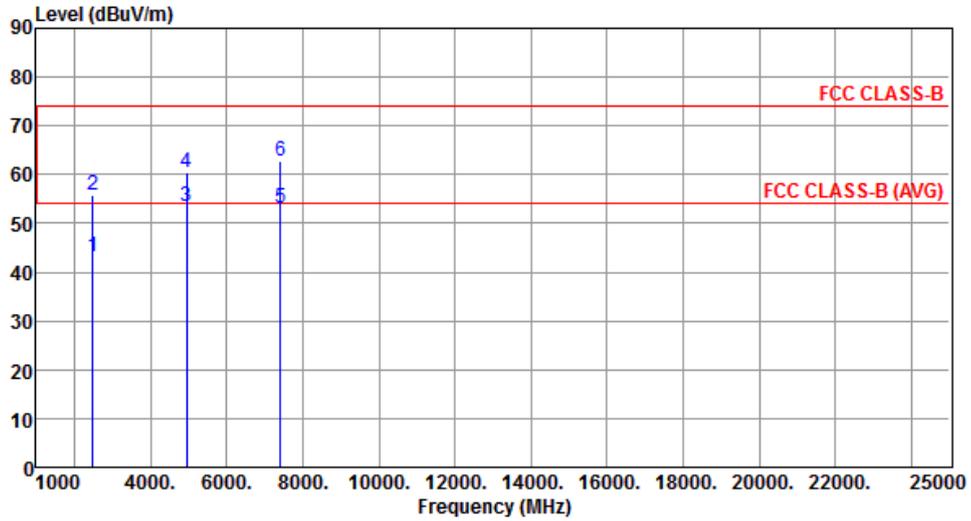
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.13	54.00	-16.87	40.31	-3.18	Average	230	225
2	2390.00	50.39	74.00	-23.61	53.57	-3.18	Peak	230	225
3	2483.50	37.95	54.00	-16.05	40.75	-2.80	Average	230	225
4	2483.50	50.92	74.00	-23.08	53.72	-2.80	Peak	230	225
5	4890.00	48.38	54.00	-5.62	44.38	4.00	Average	100	299
6	4890.00	56.06	74.00	-17.94	52.06	4.00	Peak	100	299
7	7335.00	43.36	54.00	-10.64	34.94	8.42	Average	321	315
8	7335.00	54.60	74.00	-19.40	46.18	8.42	Peak	321	315

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	DSSS	Test Freq. (MHz)	2475
Polarization	Horizontal		



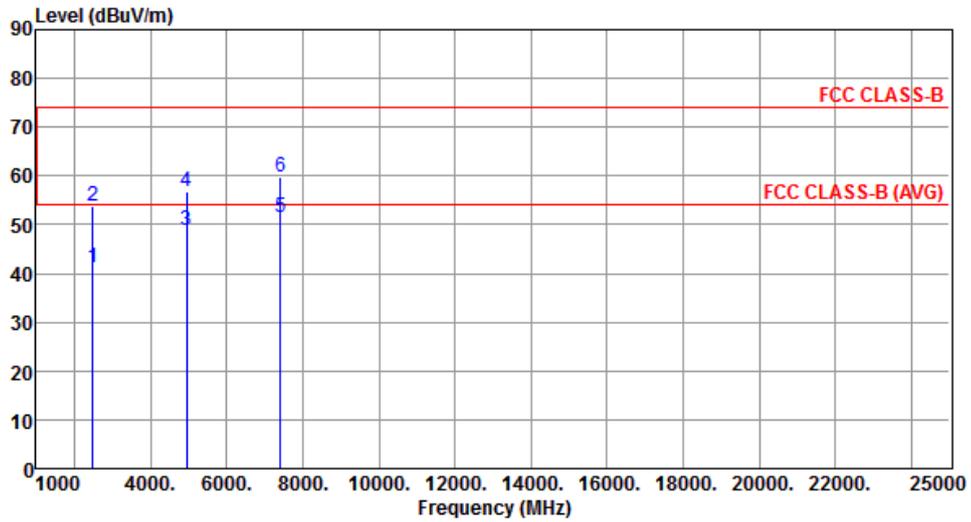
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	43.13	54.00	-10.87	45.93	-2.80	Average	352	227
2	2483.50	55.71	74.00	-18.29	58.51	-2.80	Peak	352	227
3	4950.00	53.44	54.00	-0.56	49.26	4.18	Average	254	236
4	4950.00	60.47	74.00	-13.53	56.29	4.18	Peak	254	236
5	7425.00	53.12	54.00	-0.88	44.63	8.49	Average	100	211
6	7425.00	62.84	74.00	-11.16	54.35	8.49	Peak	100	211

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	DSSS	Test Freq. (MHz)	2475
Polarization	Vertical		



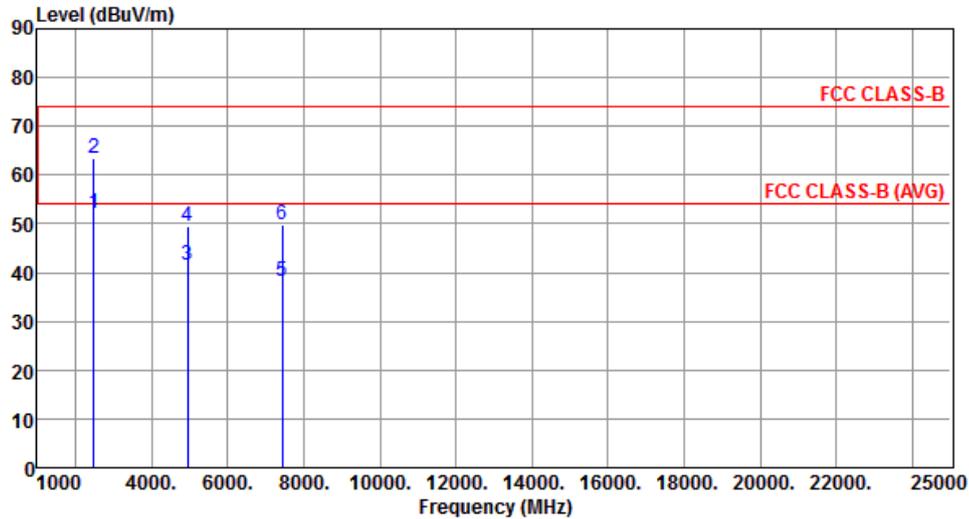
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	41.32	54.00	-12.68	44.12	-2.80	Average	324	211
2	2483.50	53.89	74.00	-20.11	56.69	-2.80	Peak	324	211
3	4950.00	48.84	54.00	-5.16	44.66	4.18	Average	275	312
4	4950.00	56.75	74.00	-17.25	52.57	4.18	Peak	275	312
5	7425.00	51.43	54.00	-2.57	42.94	8.49	Average	100	216
6	7425.00	59.73	74.00	-14.27	51.24	8.49	Peak	100	216

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	DSSS	Test Freq. (MHz)	2480
Polarization	Horizontal		



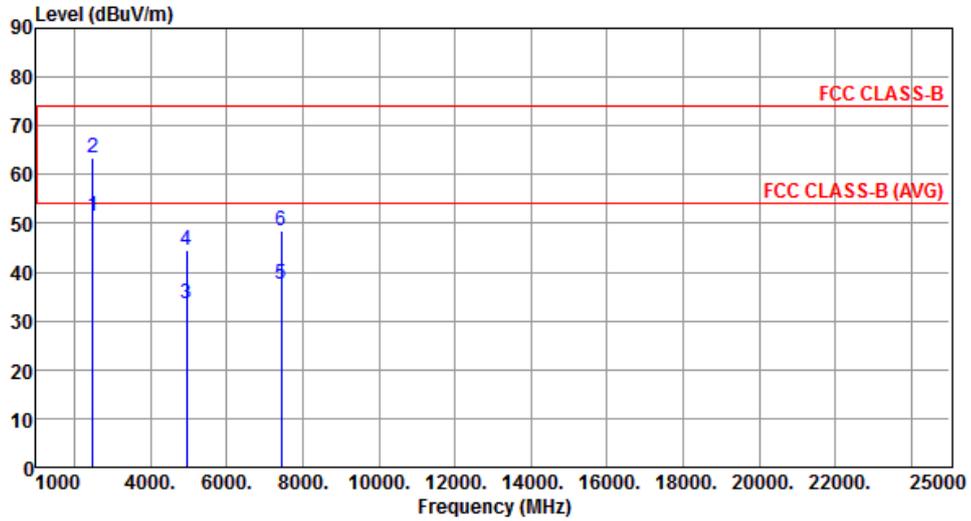
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.30	54.00	-1.70	55.10	-2.80	Average	368	179
2	2483.50	63.30	74.00	-10.70	66.10	-2.80	Peak	368	179
3	4960.00	41.37	54.00	-12.63	37.16	4.21	Average	175	143
4	4960.00	49.52	74.00	-24.48	45.31	4.21	Peak	175	143
5	7440.00	38.27	54.00	-15.73	29.74	8.53	Average	134	161
6	7440.00	49.81	74.00	-24.19	41.28	8.53	Peak	134	161

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	DSSS	Test Freq. (MHz)	2480
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	51.33	54.00	-2.67	54.13	-2.80	Average	141	167
2	2483.50	63.45	74.00	-10.55	66.25	-2.80	Peak	141	167
3	4960.00	33.53	54.00	-20.47	29.32	4.21	Average	286	242
4	4960.00	44.43	74.00	-29.57	40.22	4.21	Peak	286	242
5	7440.00	37.69	54.00	-16.31	29.16	8.53	Average	236	308
6	7440.00	48.34	74.00	-25.66	39.81	8.53	Peak	236	308

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 20 dB relative to the maximum in-band peak PSD level in 100 kHz

3.6.2 Test Procedures

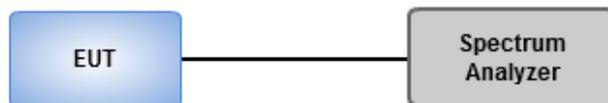
Reference level measurement

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

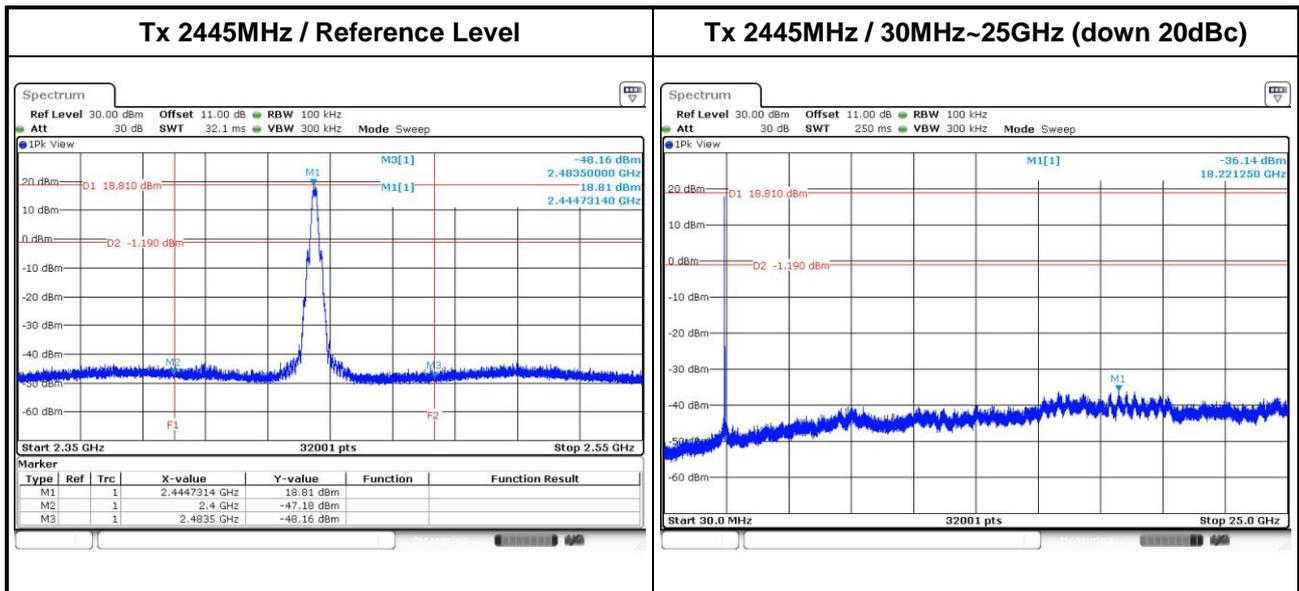
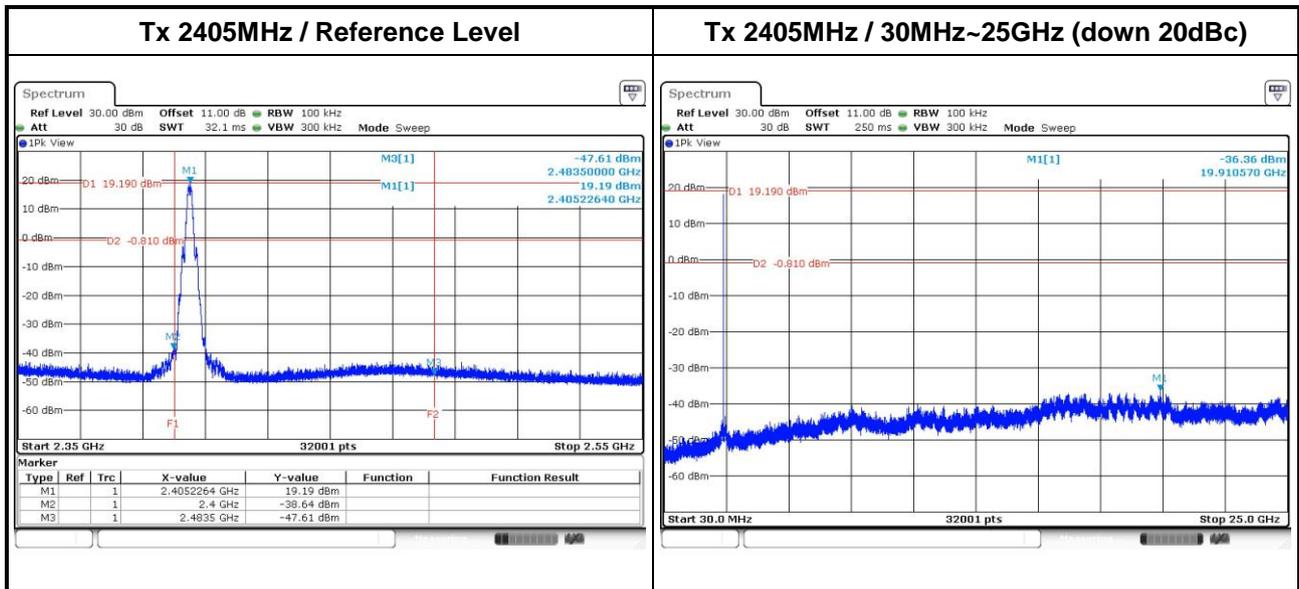
Emission level measurement

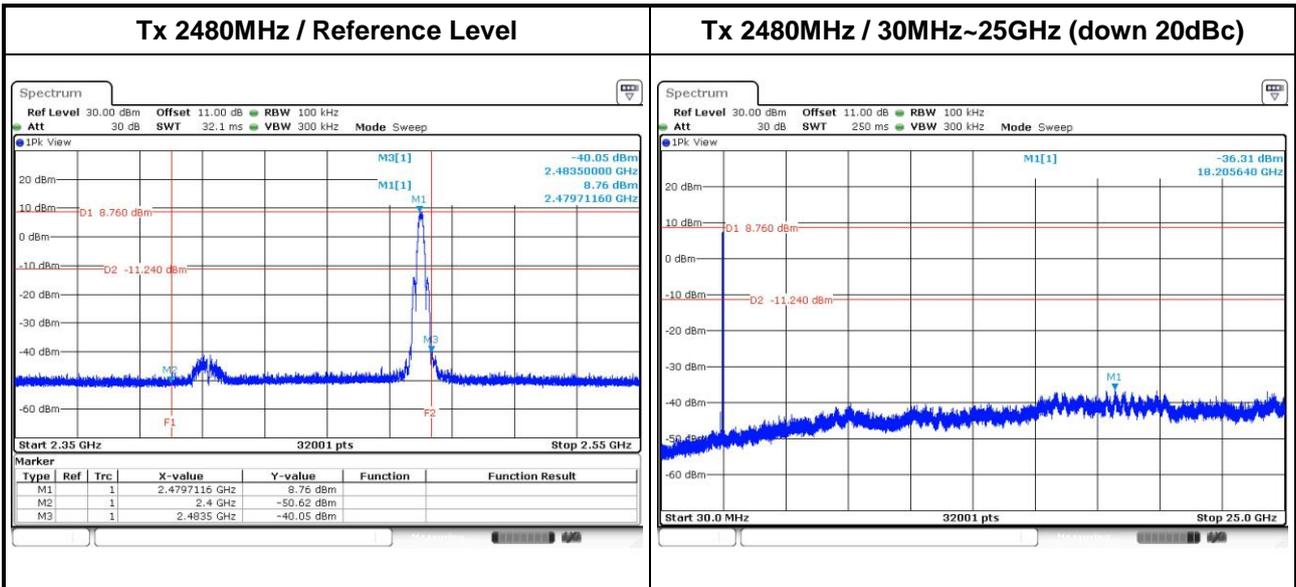
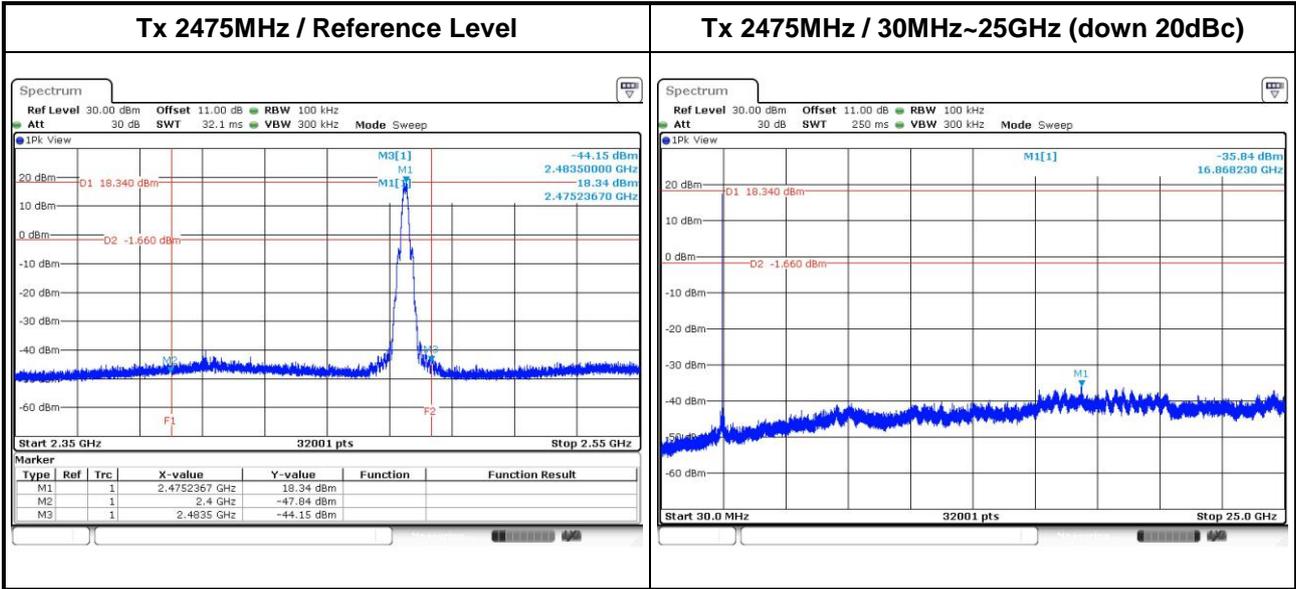
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.6.3 Test Setup



3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands





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 (EMC and Wireless Communication Laboratory), 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 District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

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Taiwan, R.O.C.

Kwei Shan

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

Kwei Shan Site II

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd
St., Kwei Shan District, Tao Yuan
City 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==