

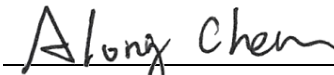
FCC Test Report

FCC ID : I88WSQ60
Equipment : Multy X AC3000 Tri-Band WiFi System
Model No. : WSQ50
Multiple Listing : Refer to item 1.1.1 for more details
Brand Name : ZYXEL
Applicant : Zyxel Communications Corporation
Address : No.2, Industry East Road IX, Hsinchu Science
Park, Hsinchu, 30075, Taiwan, R.O.C.
Standard : 47 CFR FCC Part 15.247
Received Date : Jan. 31, 2018
Tested Date : Mar. 07 ~ Mar. 31, 2018

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:

Approved by:



Along Chen / Assistant Manager



Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR760801-02AE	Rev. 01	Initial issue	Jun. 15, 2018

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emissions	[dBuV]: 0.484MHz 28.55 (Margin -17.72dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 46.52MHz 36.91 (Margin -3.09dB) - QP	Pass
15.247(b)(3)	Maximum Output Power	Refer to FR760801AE	Pass
15.247(a)(2)	6dB Bandwidth	Refer to FR760801AE	Pass
15.247(e)	Power Spectral Density	Refer to FR760801AE	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT..

Brand Name	Model Name	Product Name	Description
ZYLXEL	WSQ50	Multy X AC3000 Tri-Band WiFi System	For marketing different
	WSQ60	Multy Plus AC3000 Tri-Band WiFi System	
<p>✦ All models are electrically identical, different model names are for marketing purpose.</p> <p>✦ The above models, model WSQ50 was selected as a representative one for the final test and only its data was recorded in this report.</p>			

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	Bluetooth Mode	Ch. Freq. (MHz)	Channel Number	Data Rate
2400-2483.5	V4.1 LE	2402-2480	0-39 [40]	1 Mbps
Note 1: Bluetooth LE (Low energy) uses GFSK modulation.				

1.1.3 Main Chipset / RF Chipset

Function	Model No.
Main Chipset	IPQ4019
2.4G	IPQ4019
5G 2T2R	IPQ4019
5G 4T4R	QCA9984
Bluetooth LE	CSR8811

1.1.4 Antenna Details

Ant. No.	Model	Type	Connector	Gain (dBi)
1	ALX17P-051XXD-00	PCB dipole	UFL	3.41

1.1.5 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter
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1.1.6 Accessories

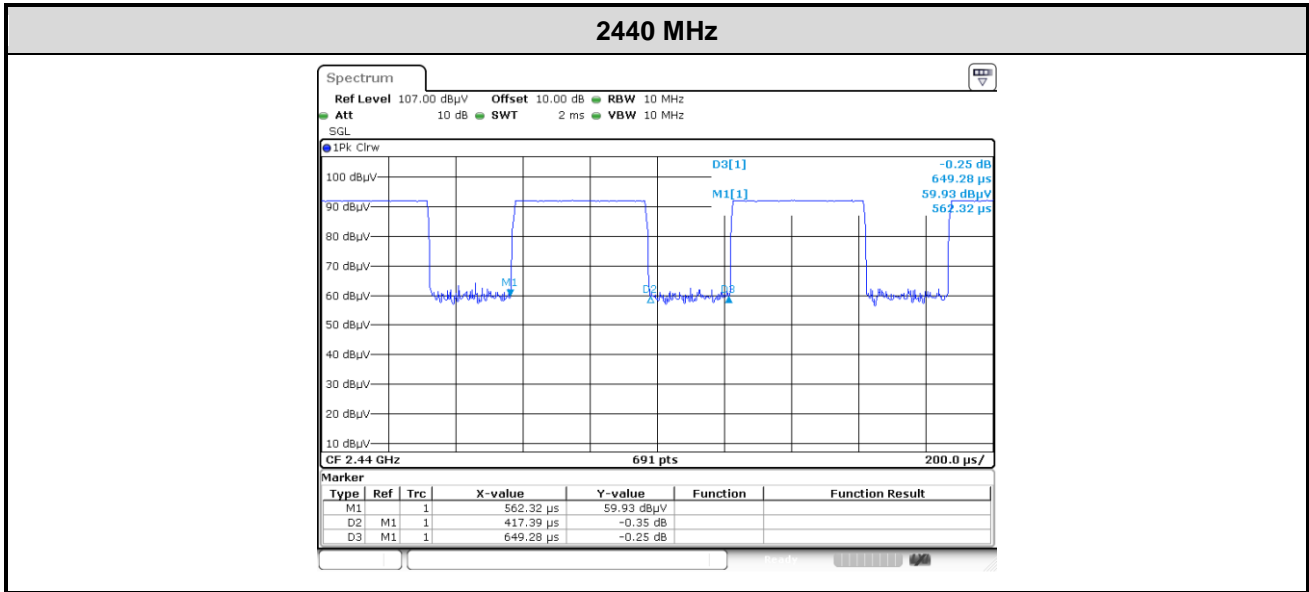
Accessories		
No.	Equipment	Description
1	AC adapter	Brand Name: APD Model Name: WA-36A12FU I/P: 100-240Vac, 50-60Hz 0.9 Max O/P: 12Vdc, 3A Power line: 1.75m non-shielded without core
2	AC adapter	Brand Name: APD Model Name: WA-36A12R I/P: 100-240Vac, 50-60Hz 0.9 Max O/P: 12Vdc, 3A Power line: 1.75m non-shielded without core
3	RJ45 cable	1.9m non-shielded without core

1.1.7 Channel List

Frequency band (MHz)				2400~2483.5			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

1.1.8 Test Tool and Duty Cycle

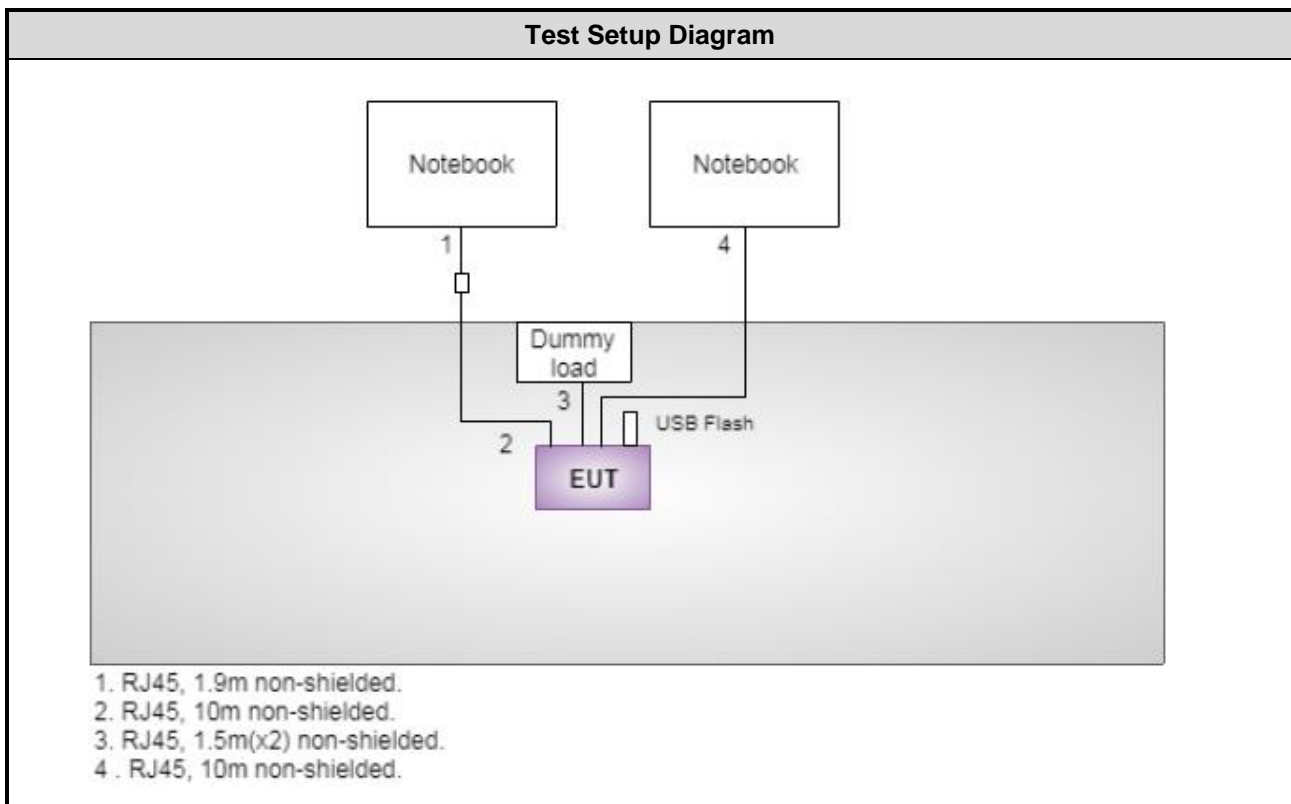
Test tool	putty, ver. 0.6
Duty cycle of test signal (%)	64.29%
Duty Factor (dB)	1.92



1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E6430	DoC	RJ45, 10m non-shielded.
2	Notebook	DELL	Latitude E5420	DoC	RJ45, 1.9m non-shielded.
3	USB Flash	Kingston	DTSE9	---	---
4	Dummy Load	---	---	---	RJ45, 1m(x2) non-shielded.

1.3 Test Setup Chart



1.4 Test Equipment List and Calibration Data

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Mar. 31, 2018				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	Agilent	N9038A	MY53290044	Sep. 26, 2017	Sep. 25, 2018
LISN	R&S	ENV216	101579	Feb. 13, 2018	Feb. 12, 2019
RF Cable-CON	EMC	EMCCFD300-BM-B M-6000	50821	Dec. 18, 2017	Dec. 17, 2018
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)				
Tested Date	Mar. 07 ~ Mar. 17, 2018				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Dec. 04, 2017	Dec. 03, 2018
Receiver	R&S	ESR3	101658	Nov. 20, 2017	Nov. 19, 2018
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 25, 2017	Jul. 24, 2018
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 20, 2017	Dec. 19, 2018
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 23, 2017	Nov. 22, 2018
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 13, 2017	Nov. 12, 2018
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 07, 2017	Dec. 06, 2018
Preamplifier	EMC	EMC02325	980225	Jul. 28, 2017	Jul. 27, 2018
Preamplifier	Agilent	83017A	MY39501308	Oct. 06, 2017	Oct. 05, 2018
Preamplifier	EMC	EMC184045B	980192	Aug. 22, 2017	Aug. 21, 2018
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 07, 2017	Dec. 06, 2018
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 07, 2017	Dec. 06, 2018
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 07, 2017	Dec. 06, 2018
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	16052	Dec. 07, 2017	Dec. 06, 2018
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 07, 2017	Dec. 06, 2018
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 07, 2017	Dec. 06, 2018
Measurement Software	AUDIX	e3	6.120210g	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

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

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	24°C / 57%	Alex Tsai
Radiated Emissions	03CH01-WS	22-26°C / 62-63%	Akun Chung Roger Lu

- 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	Mode	Test Frequency (MHz)	Data Rate	Test Configuration
AC Power Line Conducted Emissions Radiated Emissions ≤ 1GHz	BT LE	2480	1Mbps	---
Radiated Emissions > 1GHz	BT LE	2402, 2440, 2480	1Mbps	---

Note:

1. Two adapters (WA-36A12FU and WA-36A12R) had been covered during the pretest, and found that **WA-36A12FU adapter** was the worst case and was selected for final test.
2. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **X-plane** results were found as the worst case and were shown in this report.

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

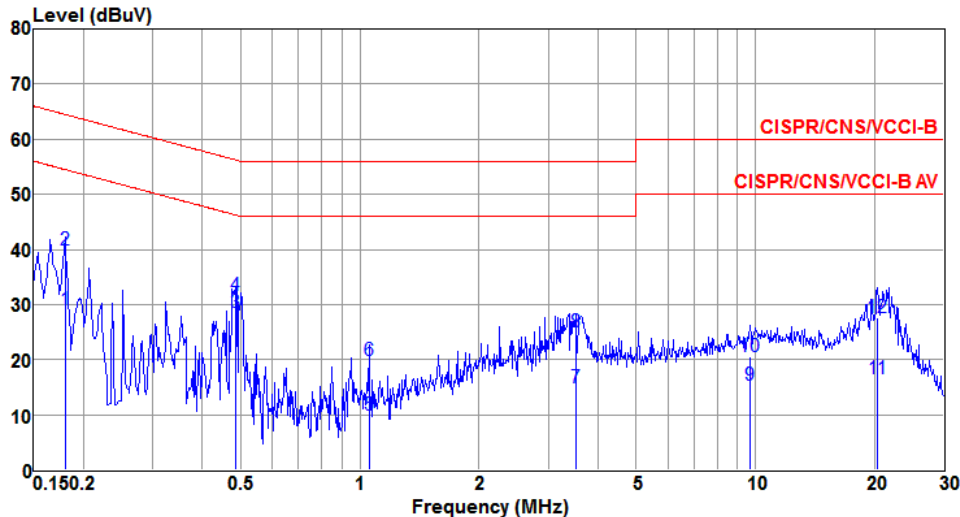


Note: 1. Support units were connected to second LISN.

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

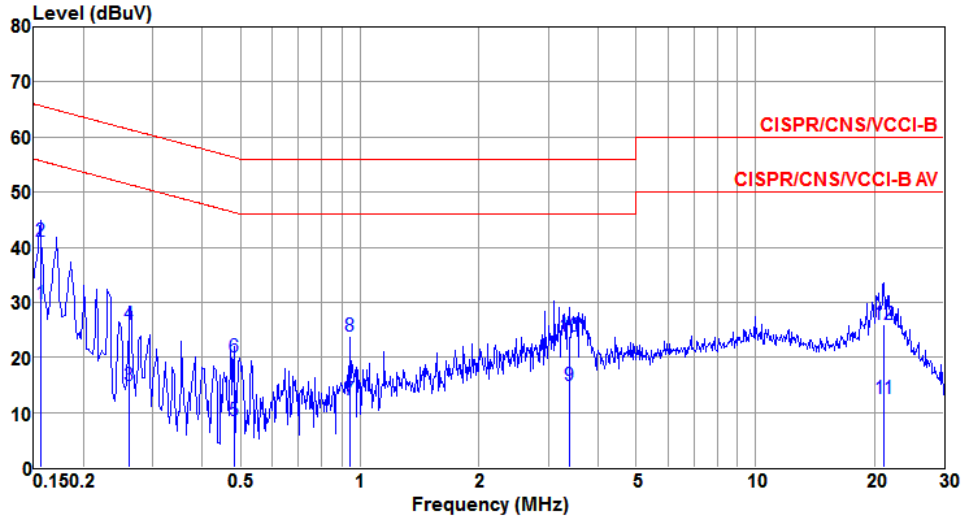
Modulation Mode	GFSK	Test Freq. (MHz)	2480
Power Phase	Line		



	Freq	Level	Limit	Over	Read	LISN	cable	Remark
	MHz	dBuV	Line	Limit	Level	factor	loss	
			dBuV	dB	dBuV	dB	dB	
1	0.180	29.10	54.50	-25.40	19.35	9.73	0.02	Average
2	0.180	39.90	64.50	-24.60	30.15	9.73	0.02	QP
3	0.484	28.55	46.27	-17.72	18.80	9.73	0.02	Average
4	0.484	31.66	56.27	-24.61	21.91	9.73	0.02	QP
5	1.054	9.80	46.00	-36.20	0.04	9.73	0.03	Average
6	1.054	19.94	56.00	-36.06	10.18	9.73	0.03	QP
7	3.509	14.98	46.00	-31.02	5.03	9.75	0.20	Average
8	3.509	24.95	56.00	-31.05	15.00	9.75	0.20	QP
9	9.705	15.30	50.00	-34.70	5.20	9.78	0.32	Average
10	9.705	20.57	60.00	-39.43	10.47	9.78	0.32	QP
11	20.377	16.48	50.00	-33.52	6.42	9.72	0.34	Average
12	20.377	27.66	60.00	-32.34	17.60	9.72	0.34	QP

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

Modulation Mode	GFSK	Test Freq. (MHz)	2480
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	29.75	55.69	-25.94	20.06	9.68	0.01	Average
2@	0.156	41.11	65.69	-24.58	31.42	9.68	0.01	QP
3	0.262	14.81	51.38	-36.57	5.11	9.67	0.03	Average
4	0.262	26.08	61.38	-35.30	16.38	9.67	0.03	QP
5	0.481	8.52	46.32	-37.80	-1.17	9.67	0.02	Average
6	0.481	20.11	56.32	-36.21	10.42	9.67	0.02	QP
7	0.943	12.39	46.00	-33.61	2.69	9.67	0.03	Average
8	0.943	23.88	56.00	-32.12	14.18	9.67	0.03	QP
9	3.381	14.94	46.00	-31.06	5.06	9.69	0.19	Average
10	3.381	23.91	56.00	-32.09	14.03	9.69	0.19	QP
11	21.147	12.41	50.00	-37.59	2.23	9.83	0.35	Average
12	21.147	26.05	60.00	-33.95	15.87	9.83	0.35	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 Emissions in Restricted Frequency Bands

3.2.1 Limit of Emissions in 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.

3.2.2 Test Procedures

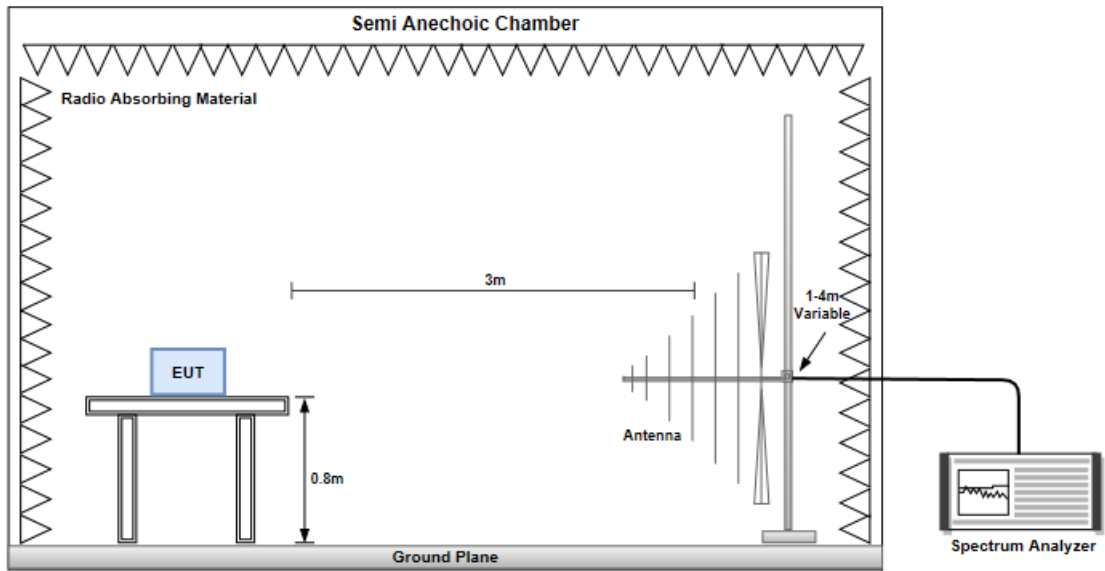
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

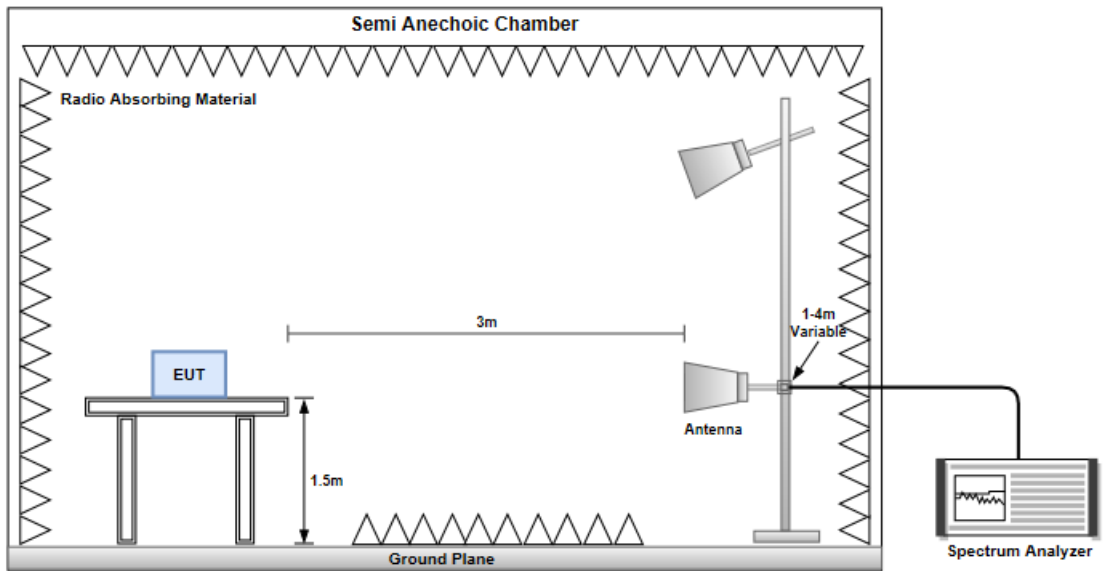
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.2.3 Test Setup

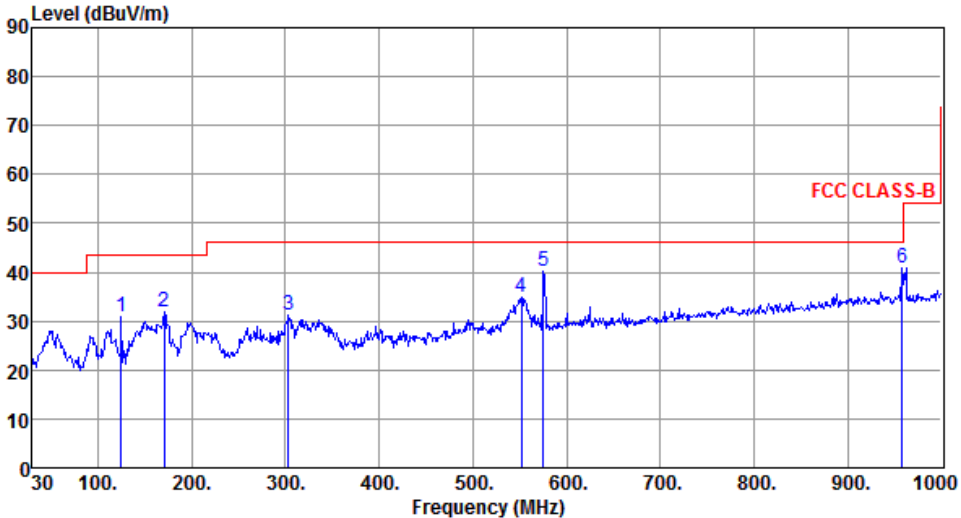
Radiated Emissions below 1 GHz



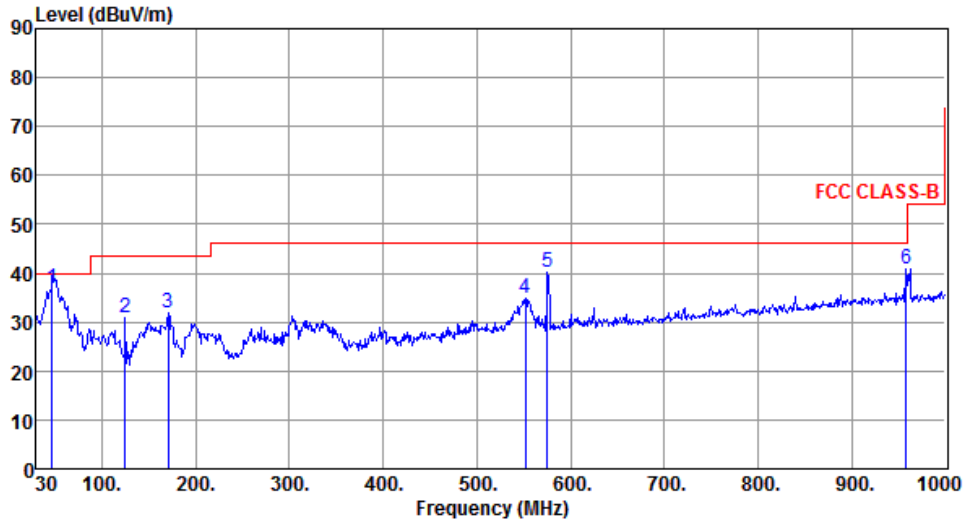
Radiated Emissions above 1 GHz



3.2.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	GFSK	Test Freq. (MHz)	2480																																																																								
Polarization	Horizontal																																																																										
 <p>The graph displays the radiated unwanted emissions of a transmitter below 1 GHz. The y-axis represents the emission level in dBuV/m, ranging from 0 to 90. The x-axis represents the frequency in MHz, ranging from 30 to 1000. A red line indicates the FCC CLASS-B limit, which is constant at 46 dBuV/m from 30 MHz to 1000 MHz. A blue line shows the measured emission level, which fluctuates around 30 dBuV/m. Six specific peaks are identified and numbered 1 through 6. The peak at 958.29 MHz (Peak 6) is the highest, reaching 40.99 dBuV/m, which is 5.01 dB below the 46 dBuV/m limit.</p>																																																																											
	<table border="1"> <thead> <tr> <th>Freq.</th> <th>Emission level</th> <th>Limit</th> <th>Margin</th> <th>SA reading</th> <th>Factor</th> <th>Remark</th> <th>ANT High</th> <th>Turn Table</th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB</th> <th></th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>30.81</td> <td>43.50</td> <td>-12.69</td> <td>40.88</td> <td>-10.07</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>2</td> <td>32.01</td> <td>43.50</td> <td>-11.49</td> <td>40.65</td> <td>-8.64</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>3</td> <td>31.38</td> <td>46.00</td> <td>-14.62</td> <td>38.93</td> <td>-7.55</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>4</td> <td>34.94</td> <td>46.00</td> <td>-11.06</td> <td>36.64</td> <td>-1.70</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>5</td> <td>40.11</td> <td>46.00</td> <td>-5.89</td> <td>41.31</td> <td>-1.20</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>6</td> <td>40.99</td> <td>46.00</td> <td>-5.01</td> <td>36.00</td> <td>4.99</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> </tbody> </table>	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg	1	30.81	43.50	-12.69	40.88	-10.07	Peak	---	---	2	32.01	43.50	-11.49	40.65	-8.64	Peak	---	---	3	31.38	46.00	-14.62	38.93	-7.55	Peak	---	---	4	34.94	46.00	-11.06	36.64	-1.70	Peak	---	---	5	40.11	46.00	-5.89	41.31	-1.20	Peak	---	---	6	40.99	46.00	-5.01	36.00	4.99	Peak	---	---		
Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table																																																																			
MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg																																																																			
1	30.81	43.50	-12.69	40.88	-10.07	Peak	---	---																																																																			
2	32.01	43.50	-11.49	40.65	-8.64	Peak	---	---																																																																			
3	31.38	46.00	-14.62	38.93	-7.55	Peak	---	---																																																																			
4	34.94	46.00	-11.06	36.64	-1.70	Peak	---	---																																																																			
5	40.11	46.00	-5.89	41.31	-1.20	Peak	---	---																																																																			
6	40.99	46.00	-5.01	36.00	4.99	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	GFSK	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	46.52	36.91	40.00	-3.09	44.64	-7.73	QP	100	203
2	125.06	30.81	43.50	-12.69	40.88	-10.07	Peak	---	---
3	170.65	32.01	43.50	-11.49	40.65	-8.64	Peak	---	---
4	551.86	34.94	46.00	-11.06	36.64	-1.70	Peak	---	---
5	575.14	40.11	46.00	-5.89	41.31	-1.20	Peak	---	---
6	958.29	40.99	46.00	-5.01	36.00	4.99	Peak	---	---

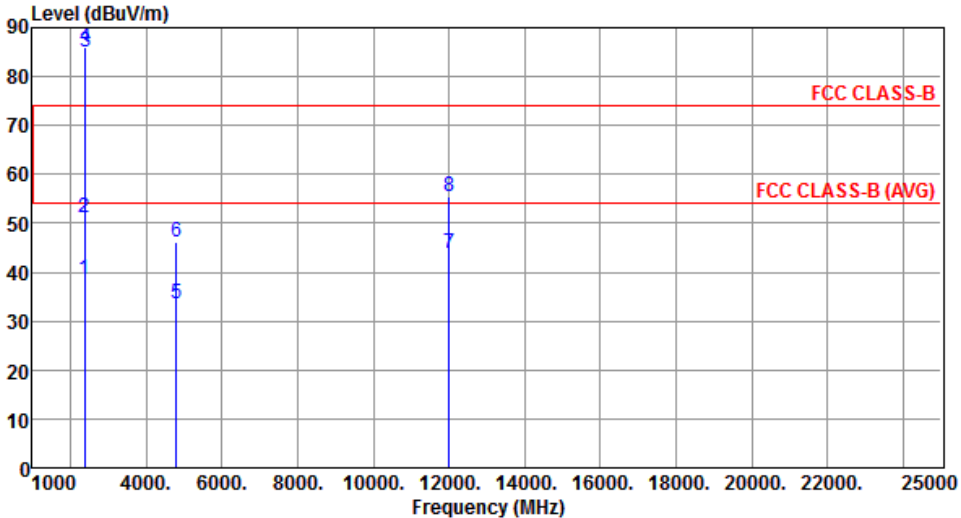
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

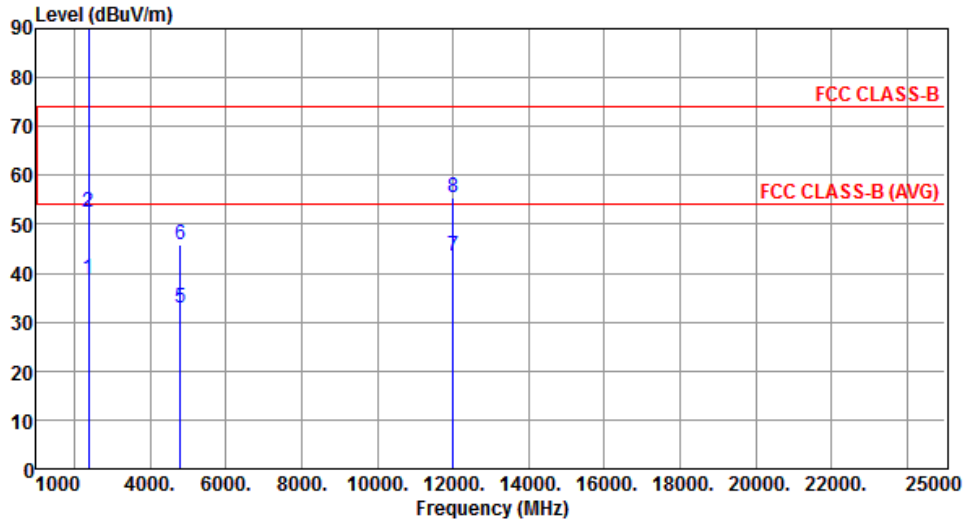
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.2.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for GFSK

Modulation	GFSK	Test Freq. (MHz)	2402																																																																																															
Polarization	Horizontal																																																																																																	
																																																																																																		
	<table border="1"> <thead> <tr> <th>Freq.</th> <th>Emission level</th> <th>Limit</th> <th>Margin</th> <th>SA reading</th> <th>Factor</th> <th>Remark</th> <th>ANT High</th> <th>Turn Table</th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB</th> <th></th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2390.00</td> <td>38.44</td> <td>54.00</td> <td>-15.56</td> <td>42.04</td> <td>-3.60</td> <td>Average</td> <td>100 186</td> </tr> <tr> <td>2</td> <td>2390.00</td> <td>51.18</td> <td>74.00</td> <td>-22.82</td> <td>54.78</td> <td>-3.60</td> <td>Peak</td> <td>100 186</td> </tr> <tr> <td>3 *</td> <td>2402.00</td> <td>85.03</td> <td></td> <td></td> <td>88.58</td> <td>-3.55</td> <td>Average</td> <td>100 186</td> </tr> <tr> <td>4 *</td> <td>2402.00</td> <td>86.07</td> <td></td> <td></td> <td>89.62</td> <td>-3.55</td> <td>Peak</td> <td>100 186</td> </tr> <tr> <td>5</td> <td>4804.00</td> <td>33.60</td> <td>54.00</td> <td>-20.40</td> <td>30.06</td> <td>3.54</td> <td>Average</td> <td>100 141</td> </tr> <tr> <td>6</td> <td>4804.00</td> <td>46.28</td> <td>74.00</td> <td>-27.72</td> <td>42.74</td> <td>3.54</td> <td>Peak</td> <td>100 141</td> </tr> <tr> <td>7</td> <td>12010.00</td> <td>43.67</td> <td>54.00</td> <td>-10.33</td> <td>30.50</td> <td>13.17</td> <td>Average</td> <td>100 110</td> </tr> <tr> <td>8</td> <td>12010.00</td> <td>55.48</td> <td>74.00</td> <td>-18.52</td> <td>42.31</td> <td>13.17</td> <td>Peak</td> <td>100 110</td> </tr> </tbody> </table>	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg	1	2390.00	38.44	54.00	-15.56	42.04	-3.60	Average	100 186	2	2390.00	51.18	74.00	-22.82	54.78	-3.60	Peak	100 186	3 *	2402.00	85.03			88.58	-3.55	Average	100 186	4 *	2402.00	86.07			89.62	-3.55	Peak	100 186	5	4804.00	33.60	54.00	-20.40	30.06	3.54	Average	100 141	6	4804.00	46.28	74.00	-27.72	42.74	3.54	Peak	100 141	7	12010.00	43.67	54.00	-10.33	30.50	13.17	Average	100 110	8	12010.00	55.48	74.00	-18.52	42.31	13.17	Peak	100 110							
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<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: "*" is Peak / Average value of fundamental frequency</p>																																																																																																		

Modulation	GFSK	Test Freq. (MHz)	2402
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	38.99	54.00	-15.01	42.59	-3.60	Average	100	85
2	2390.00	52.41	74.00	-21.59	56.01	-3.60	Peak	100	85
3 *	2402.00	94.44			97.99	-3.55	Average	107	85
4 *	2402.00	95.68			99.23	-3.55	Peak	107	85
5	4804.00	32.85	54.00	-21.15	29.31	3.54	Average	100	144
6	4804.00	45.93	74.00	-28.07	42.39	3.54	Peak	100	144
7	12010.00	43.57	54.00	-10.43	30.40	13.17	Average	100	112
8	12010.00	55.40	74.00	-18.60	42.23	13.17	Peak	100	112

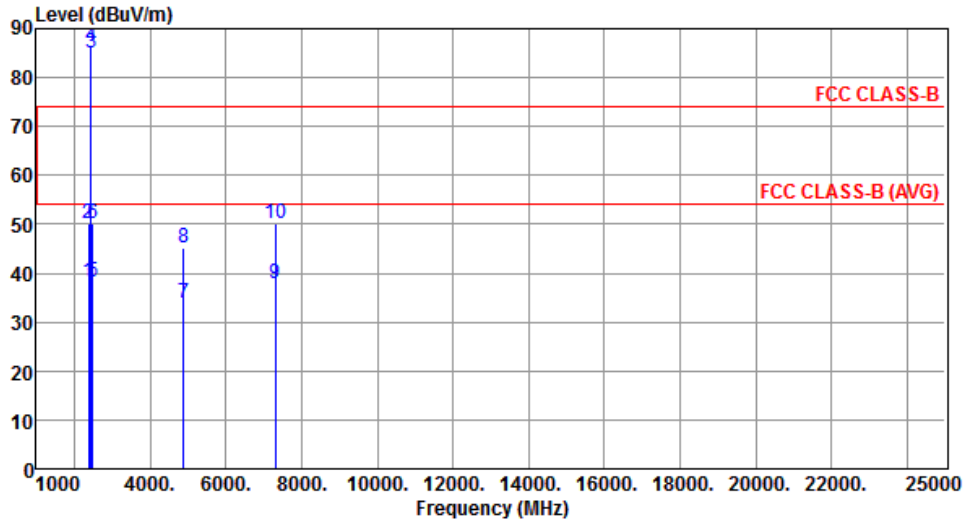
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	GFSK	Test Freq. (MHz)	2440
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	38.08	54.00	-15.92	41.68	-3.60	Average	100	187
2	2390.00	50.17	74.00	-23.83	53.77	-3.60	Peak	100	187
3 *	2440.00	84.89			88.27	-3.38	Average	100	187
4 *	2440.00	86.20			89.58	-3.38	Peak	100	187
5	2483.50	38.22	54.00	-15.78	41.41	-3.19	Average	100	187
6	2483.50	50.24	74.00	-23.76	53.43	-3.19	Peak	100	187
7	4880.00	33.75	54.00	-20.25	29.97	3.78	Average	100	200
8	4880.00	45.22	74.00	-28.78	41.44	3.78	Peak	100	200
9	7320.00	37.81	54.00	-16.19	29.67	8.14	Average	100	211
10	7320.00	50.13	74.00	-23.87	41.99	8.14	Peak	100	211

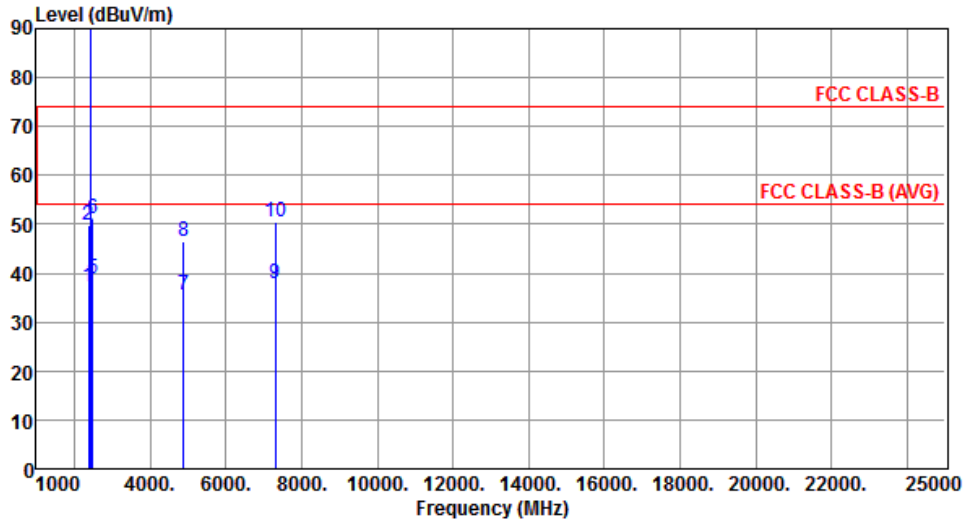
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	GFSK	Test Freq. (MHz)	2440
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	37.31	54.00	-16.69	40.91	-3.60	Average	105	85
2	2390.00	49.89	74.00	-24.11	53.49	-3.60	Peak	105	85
3 *	2440.00	96.04			99.42	-3.38	Average	105	85
4 *	2440.00	97.26			100.64	-3.38	Peak	105	85
5	2483.50	39.01	54.00	-14.99	42.20	-3.19	Average	105	85
6	2483.50	51.01	74.00	-22.99	54.20	-3.19	Peak	105	85
7	4880.00	35.44	54.00	-18.56	31.66	3.78	Average	100	133
8	4880.00	46.55	74.00	-27.45	42.77	3.78	Peak	100	133
9	7320.00	37.70	54.00	-16.30	29.56	8.14	Average	100	102
10	7320.00	50.32	74.00	-23.68	42.18	8.14	Peak	100	102

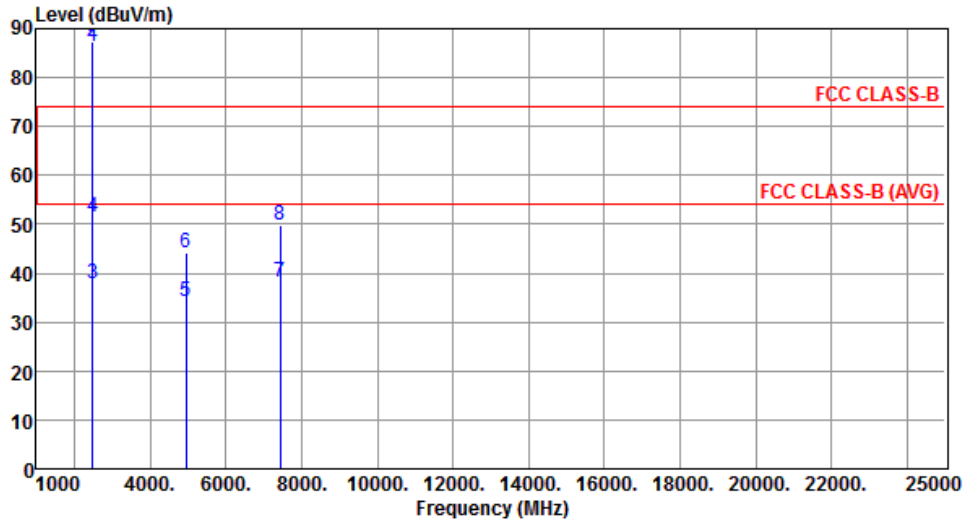
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	GFSK	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	*	2480.00	86.31			89.52	-3.21	Average	100	184
2	*	2480.00	87.27			90.48	-3.21	Peak	100	184
3		2483.50	37.98	54.00	-16.02	41.17	-3.19	Average	100	184
4		2483.50	51.50	74.00	-22.50	54.69	-3.19	Peak	100	184
5		4960.00	34.15	54.00	-19.85	30.12	4.03	Average	100	211
6		4960.00	44.29	74.00	-29.71	40.26	4.03	Peak	100	211
7		7440.00	38.19	54.00	-15.81	29.88	8.31	Average	100	203
8		7440.00	49.82	74.00	-24.18	41.51	8.31	Peak	100	203

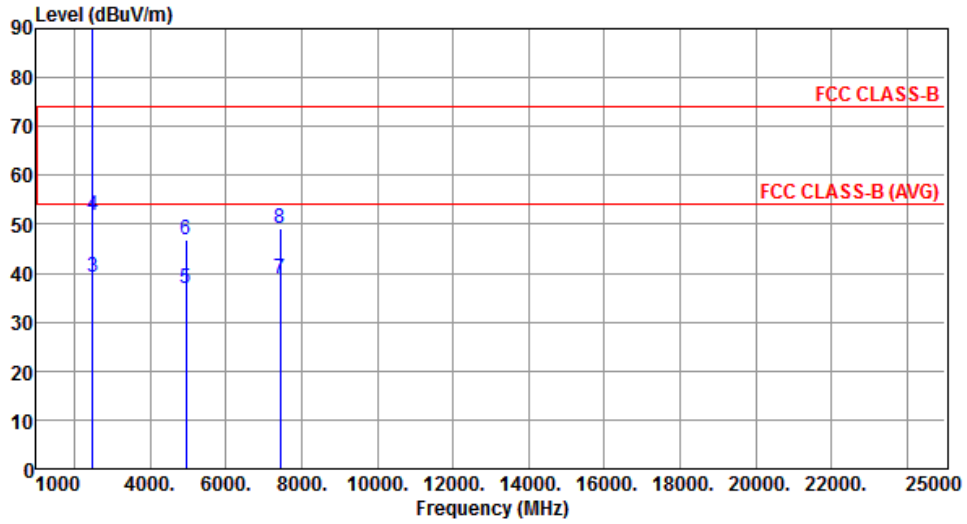
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	GFSK	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	*	2480.00	96.88			100.09	-3.21	Average	100	86
2	*	2480.00	98.13			101.34	-3.21	Peak	100	86
3		2483.50	39.24	54.00	-14.76	42.43	-3.19	Average	100	86
4		2483.50	51.91	74.00	-22.09	55.10	-3.19	Peak	100	86
5		4960.00	36.77	54.00	-17.23	32.74	4.03	Average	100	145
6		4960.00	46.94	74.00	-27.06	42.91	4.03	Peak	100	145
7		7440.00	39.02	54.00	-14.98	30.71	8.31	Average	100	105
8		7440.00	49.13	74.00	-24.87	40.82	8.31	Peak	100	105

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: "*" is Peak / Average value of fundamental frequency

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

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin
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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
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If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

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Email: ICC_Service@icertifi.com.tw

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