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Report No.: GZEM120900372101
Page: 1 of 28
FCC ID: VS9FR1PS31EP

TEST REPORT

Application No.:	GZEM1209003721RF
Applicant:	Goodbetterbest Limited
FCC ID:	VS9FR1PS31EP
Product Name:	FR-1 Freedom Wheel For PS3
Product Description:	Radio controller and dongle with 2.4 GHz as carrier.
Model No.:	FR1PS3-11
Standards:	47 CFR PART 15 Subpart C: 2011 section 15.249
Date of Receipt:	2012-09-22
Date of Test:	2012-09-22 to 2012-10-30
Date of Issue:	2012-11-07
Test Result :	Pass*

* In the configuration tested, the EUT complied with the standards specified above.



Strong Yao
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.


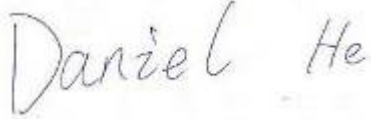

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2012-11-07		Original

Authorized for issue by:			
Tested By		(Daniel He) / Project Engineer	2012-09-22 to 2012-10-30 Date
Prepared By		(Daniel He) / Project Engineer	2012-11-02 Date
Checked By		Strong Yao/ Reviewer	2012-11-07 Date



3 Test Summary

TEST	TEST REQUIREMENT	TEST METHOD	RESULT
Field Strength of Fundamental	FCC PART 15 C section 15.249 (a)	ANSI C63.10: Clause 6.6	PASS
Field Strength of Unwanted Emissions	FCC PART 15 C section 15.249 (a) section 15.249 (d)	ANSI C63.10: Clause 6.4, 6.6 and 6.7	PASS**
Band Edges	FCC PART 15 C section 15.249 (d)	ANSI C63.10: Clause 6.9.2	PASS
Occupied Bandwidth	FCC PART 15 C section 15.215(c)	ANSI C63.10: Clause 6.9.1	PASS

Remark:

EUT: In this whole report EUT means Equipment Under Test.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radio Frequency.

ANSI C63.10: the detail version is ANSI C63.10:2009 in the whole report.

Remark: this report only record the controller test data, about the dongle test date can refer to the report GZEM120900372103.

** The EUT passed Spurious Emissions test after retest.



4 Contents

1 COVER PAGE 1

2 VERSION..... 2

3 TEST SUMMARY 3

4 CONTENTS..... 4

5 GENERAL INFORMATION 5

 5.1 Client Information 5

 5.2 General Description of E.U.T. 5

 5.3 Details of E.U.T. 5

 5.4 Description of Support Units 6

 5.5 Other Information Requested by the Customer 6

 5.6 Deviation from Standards 6

 5.7 Test Location 6

6 EQUIPMENT USED DURING TEST 8

7 TEST RESULTS 9

 7.1 E.U.T. Operation..... 9

 7.2 Antenna Requirement 11

 7.3 Field Strength of Fundamental& Field Strength of Unwanted Emissions& Band Edge 12

 7.4 Occupied Bandwidth 27



5 General Information

5.1 Client Information

Applicant: Goodbetterbest Limited
Address of Applicant: Suites 103-107 Oevonshire Business Centre Works Road, Letchworth
Herts SG8 1GJ United Kingdom

5.2 General Description of E.U.T.

Product Name: FR-1 Freedom Wheel For PS3
Model No.: FR1PS3-11

5.3 Details of E.U.T.

Operating Frequency: 2406MHz to 2476MHz
Type of Modulation: GFSK
Number of Channels: 71
Channel Separation: 1 MHz
Antenna Type: PCB Layout
Antenna gain: 2dBi
Power Supply: DC 3.0V size "AA" batteries x 2



5.4 Description of Support Units

The EUT has been tested as an independent unit for fixed frequency by testing lab.

5.5 Other Information Requested by the Customer

None.

5.6 Deviation from Standards

Biconical and log periodic antennas were used instead of dipole antennas.

5.7 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP (Lab Code: 200611-0)**
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.
- **ACMA**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**
Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAS (Lab Code: L0167)**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.
- **FCC (Registration No.: 282399)**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.
- **Industry Canada (Registration No.: 4620B-1)**
The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.
- **VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)**
The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460, C-2584, G-449 and T-1179 respectively.
- **CBTL (Lab Code: TL129)**
SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01:2006-10 and Rules of procedure IECEE 02:2006-10, and the relevant IECEE CB-Scheme Operational documents.



6 Equipment Used during Test

RE in Chamber						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date	Calibration Interval
					(YYYY-MM-DD)	
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2014-08-30	2Y
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2012-11-11	1Y
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2013-03-12	1Y
EMC0528	RI High frequency Cable	SGS	20 m	N/A	2013-06-01	1Y
EMC2025	Trilog Broadband Antenna 30-3000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9163	9163-450	2013-12-17	2Y
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2012-11-28	1Y
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2012-11-28	1Y
EMC2026	Horn Antenna 1-18GHz	R&S	BBHA 9120D	9120D-841	2013-11-28	2Y
EMC0518	Horn Antenna	Rohde & Schwarz	HF906	100096	2014-07-01	2Y
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2013-03-12	1Y
EMC0049	Amplifier	Agilent	8447D	2944A10862	2013-03-12	1Y
EMC0075	310N Amplifier	Sonoma	310N	272683	2013-03-12	1Y
EMC0523	Active Loop Antenna	EMCO	6502	42963	2012-11-17	1Y
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9170	9170-375	2014-06-01	3Y
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2014-04-27	2Y

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date	Calibration Interval
					(YYYY-MM-DD)	
EMC0006	DMM	Fluke	73	70681569	2012-11-14	1Y
EMC0007	DMM	Fluke	73	70671122	2012-11-14	1Y

7 Test Results

7.1 E.U.T. Operation

Test Voltage: DC 3.0V
Temperature: 20.0 -25.0 °C
Humidity: 38-50 % RH
Atmospheric Pressure: 1000 -1010 mbar

Test frequencies and frequency range: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified



EUT channels and frequencies list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2406	27	2433	54	2460
1	2407	28	2434	55	2461
2	2408	29	2435	56	2462
3	2409	30	2436	57	2463
4	2410	31	2437	58	2464
5	2411	32	2438	59	2465
6	2412	33	2439	60	2466
7	2413	34	2440	61	2467
8	2414	35	2441	62	2468
9	2415	36	2442	63	2469
10	2416	37	2443	64	2470
11	2417	38	2444	65	2471
12	2418	39	2445	66	2472
13	2419	40	2446	67	2473
14	2420	41	2447	68	2474
15	2421	42	2448	69	2475
16	2422	43	2449	70	2476
17	2423	44	2450		
18	2424	45	2451		
19	2425	46	2452		
20	2426	47	2453		
21	2427	48	2454		
22	2428	49	2455		
23	2429	50	2456		
24	2430	51	2457		
25	2431	52	2458		
26	2432	53	2459		

Test frequencies are the lowest channel: 0 channel(2406 MHz), middle channel: 34 channel(2440 MHz) and highest channel: 70 channel(2476MHz)

7.2 Antenna Requirement

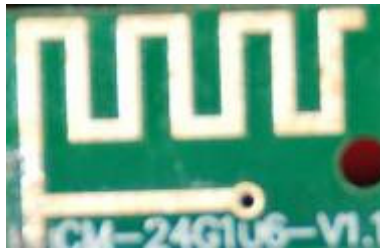
Standard requirement

15.203 requirement:

For intentional device. According to 15.203. an intentional radiator shall be designed to Ensure that no antenna other than that furnished by the responsible party shall be used with the device.

EUT Antenna

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2 dBi.



Test result: The unit does meet the FCC requirements.



7.3 Field Strength of Fundamental & Field Strength of Unwanted Emissions & Band Edge

Test Requirement: FCC Part 15 C section 15.249

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBµV/m @ 3m)	Field Strength of Harmonics (dBµV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Limits: The fundamental frequency rang in the frequency band of the EUT is 2406MHz ~ 2476MHz.

The limit for Average field strength dBµV/m for the fundamental frequency = 94.0 dBµV/m.

The limit for Peak field strength dBµV/m for the fundamental frequency = 114.0 dBµV/m.

No fundamental is allowed in the restricted bands.

The limit for average field strength dBµV/m for the harmonics = 54.0 dBµV/m.

The limit for peak field strength dBµV/m for the harmonics = 74.0 dBµV/m.

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or 54.0 dBµV/m in 15.209. Here the limit for the other emission is 54.0 dBµV/m.

Test Method: ANSI C63.10: Clause 6.4, 6.6 and 6.7 for Field Strength of Fundamental & Field Strength of Unwanted Emissions

ANSI C63.10: Clause 6.9.2 for Band Edge

Status Pre-test the EUT in continuous transmitting mode with setup as stand-alone in X, Y, Z threes axes, found the worst case is X axes and report the data.

Measurement Distance: 3m (Semi-Anechoic Chamber)

Frequency range 9 kHz – 25 GHz for transmitting mode.

Test instrumentation resolution bandwidth

9 kHz (9 kHz - 30 MHz), 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 MHz – 25 GHz)

Test Procedure:

1) 9 kHz to 30 MHz emissions:

For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.10. The centre of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT, During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2) 30 MHz to 1 GHz emissions:

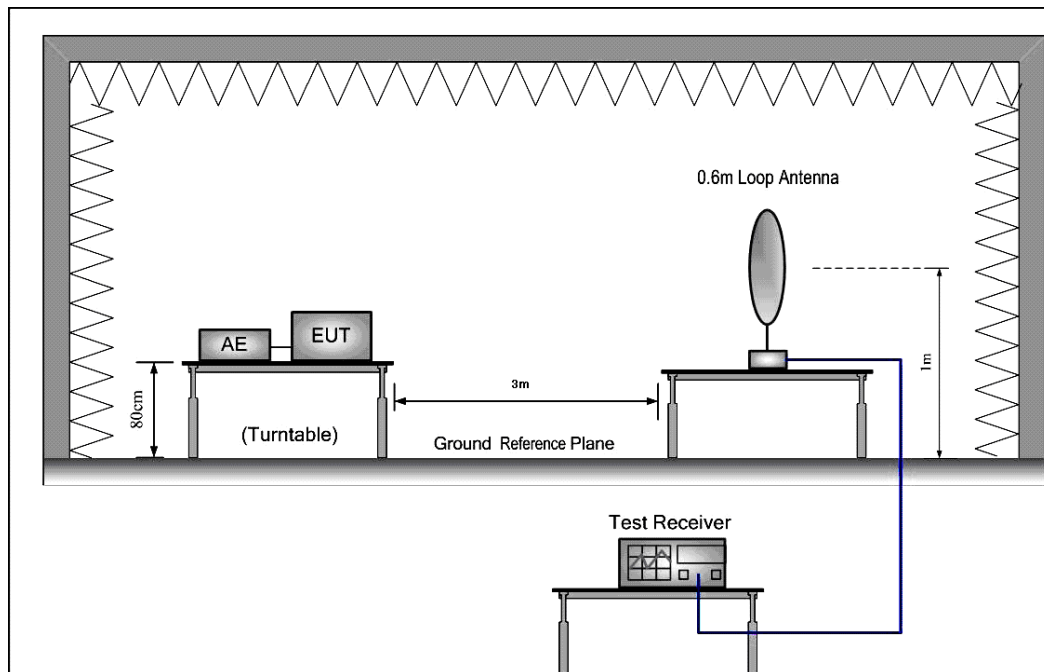
For testing performed with the bi-log type antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

3) 1 GHz to 25 GHz emissions:

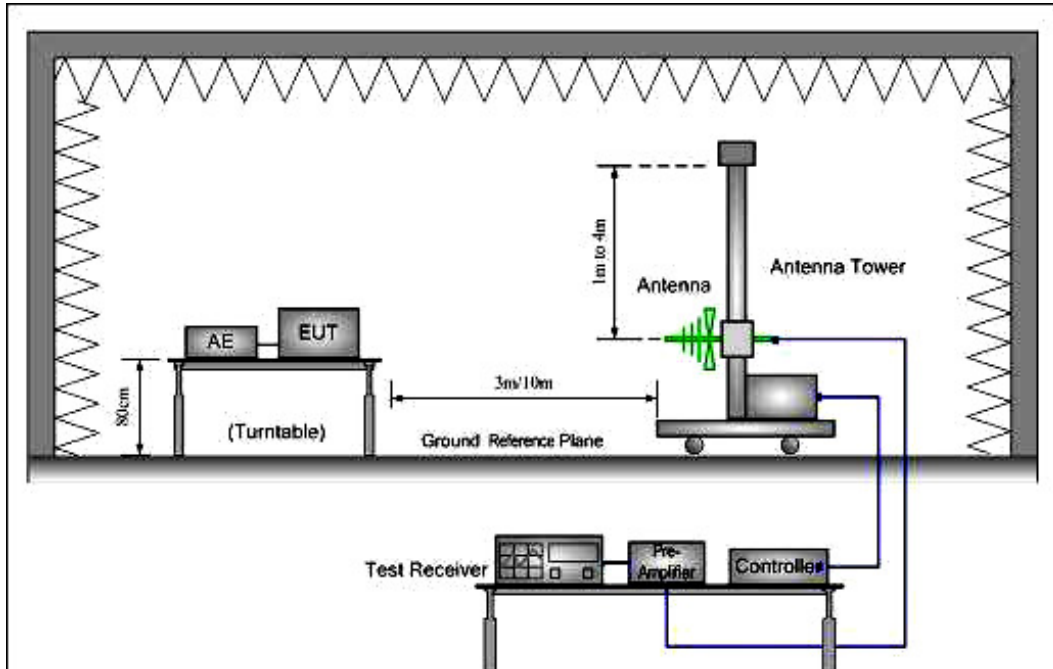
For testing performed with the horn antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360°, the antenna height scan between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

Test Configuration:

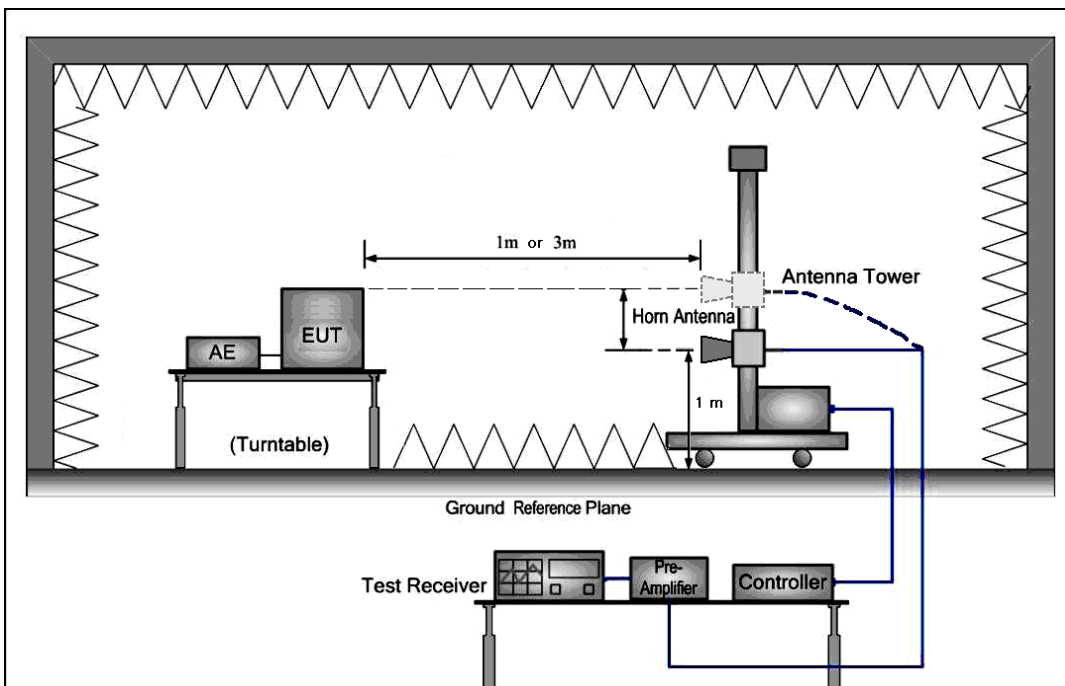
1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 25 GHz emissions:



The field strength is calculated by adding the Antenna Factor, Cable Loss & Pre-amplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-amplifier Factor}$$

1. Test at low Channel in transmitting status

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

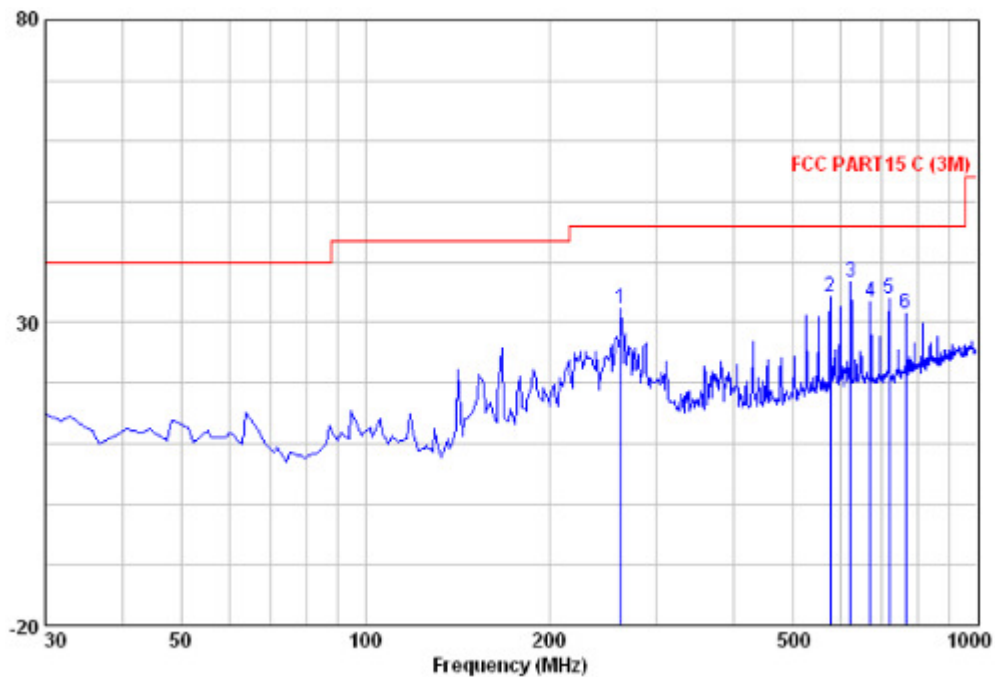
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBμV/m)

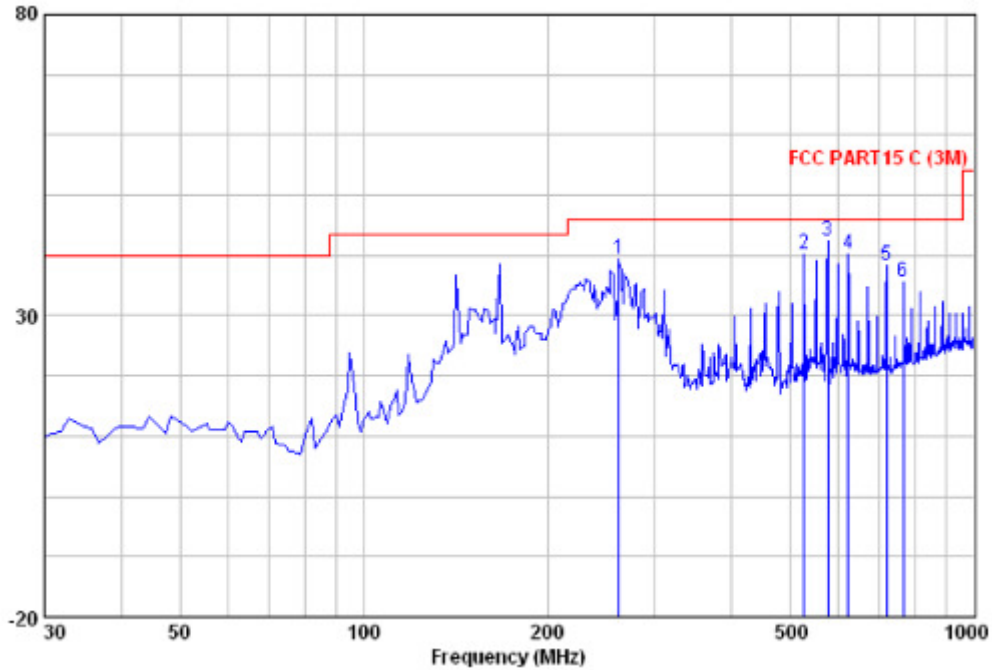


Quasi-peak measurement

Freq MHz	ReadAntenna Level dBuV	Factor dB/m	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Remark
261.830	49.71	12.13	0.00	29.57	32.28	46.00	-13.72	QP
575.140	45.71	18.03	0.00	29.42	34.32	46.00	-11.68	QP
622.670	47.59	18.54	0.00	29.38	36.76	46.00	-9.24	QP
669.230	43.97	18.71	0.00	29.33	33.35	46.00	-12.65	QP
718.700	44.22	19.05	0.00	29.28	33.99	46.00	-12.01	QP
766.230	41.09	19.63	0.00	29.23	31.48	46.00	-14.52	QP

Horizontal:

Peak scan
Level (dBµV/m)



Quasi-peak measurement

Freq	ReadAntenna	Cable Preamp	Limit	Over	Remark			
MHz	Level	Factor	Loss	Factor	Level	Line	Limit	dB
	dBµV	dB/m	dB	dB	dBµV/m	dBµV/m		
261.830	56.82	12.13	0.00	29.57	39.39	46.00	-6.61	QP
525.670	52.64	17.10	0.00	29.47	40.26	46.00	-5.74	QP
575.140	53.72	18.03	0.00	29.42	42.33	46.00	-3.67	QP
622.670	51.15	18.54	0.00	29.38	40.32	46.00	-5.68	QP
718.700	48.54	19.05	0.00	29.28	38.31	46.00	-7.69	QP
766.230	45.13	19.63	0.00	29.23	35.53	46.00	-10.47	QP



1~25 GHz Field Strength of Fundamental & Field Strength of Unwanted Emissions.

Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
2406.000	27.58	6.60	49.44	99.47	84.21	114.00	V
4812.000	31.54	11.14	49.30	54.91	48.29	74.00	V
7218.000	36.47	13.09	32.71	40.89	57.74	74.00	V
2406.000	27.58	6.60	49.44	95.99	80.73	114.00	H
4812.000	31.54	11.14	49.30	53.53	46.91	74.00	H
7218.000	36.47	13.09	32.71	40.48	57.33	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
2406.000	27.58	6.60	49.44	86.47	71.21	94.00	V
4812.000	31.54	11.14	49.30	47.65	41.03	54.00	V
7218.000	36.47	13.09	32.71	31.28	48.13	54.00	V
2406.000	27.58	6.60	49.44	84.99	69.73	94.00	H
4812.000	31.54	11.14	49.30	45.32	38.70	54.00	H
7218.000	36.47	13.09	32.71	31.89	48.74	54.00	H



Band Edge:

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Antenna polarization
2400.000	27.58	6.56	49.44	53.91	38.61	74.00	V
2483.500	27.55	6.99	49.42	54.06	39.18	74.00	V
2400.000	27.58	6.56	49.44	53.74	38.44	74.00	H
2483.500	27.55	6.99	49.42	54.12	39.24	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Antenna polarization
2400.000	27.58	6.56	49.44	42.91	27.61	54.00	V
2483.500	27.55	6.99	49.42	42.87	27.99	54.00	V
2400.000	27.58	6.56	49.44	43.74	28.44	54.00	H
2483.500	27.55	6.99	49.42	43.05	28.17	54.00	H



2. Test at middle Channel in transmitting status

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

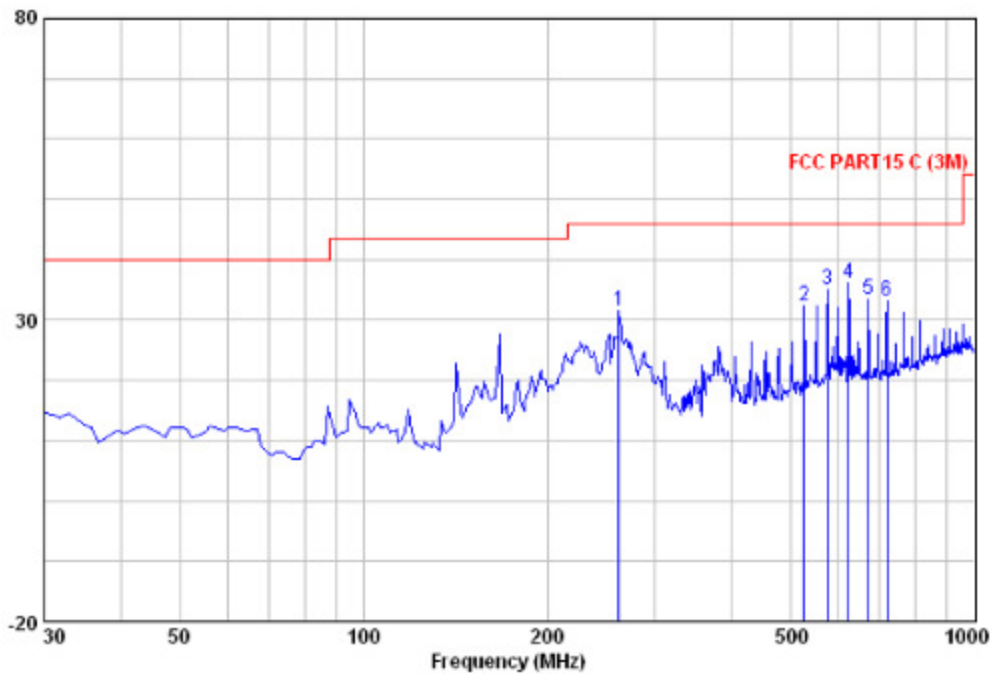
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBµV/m)



Quasi-peak measurement

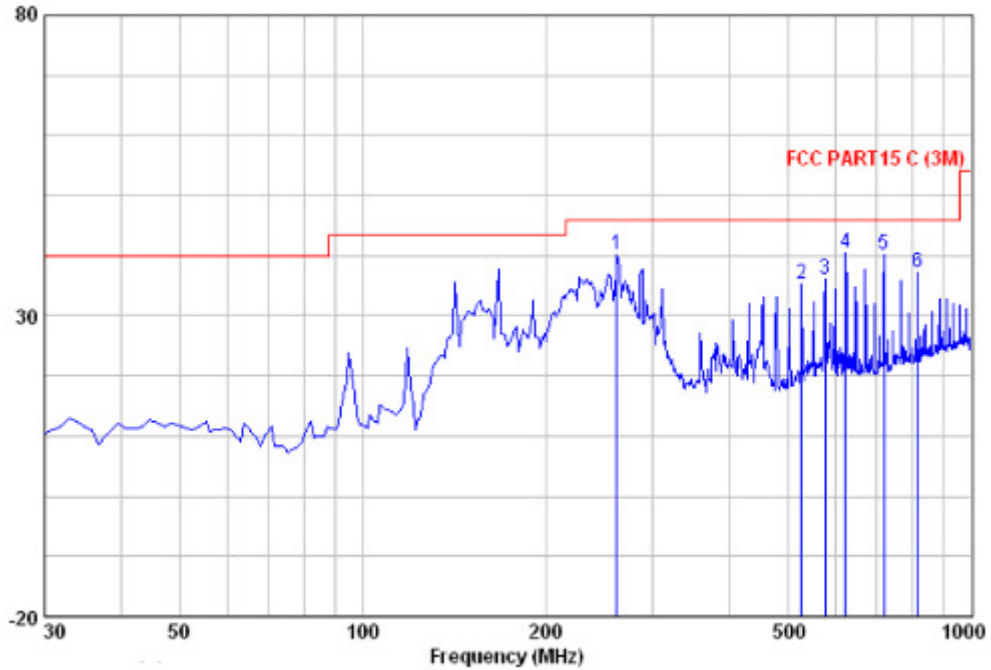
Freq	ReadAntenna	Cable Preamp	Limit	Over	Remark			
MHz	Level	Factor	Line	Limit				
	dBµV	dB/m	dB	dB				
261.830	48.83	12.13	0.00	29.57	31.40	46.00	-14.60	QP
525.670	44.56	17.10	0.00	29.47	32.19	46.00	-13.81	QP
575.140	46.41	18.03	0.00	29.42	35.03	46.00	-10.97	QP
622.670	47.04	18.54	0.00	29.38	36.20	46.00	-9.80	QP
669.230	44.14	18.71	0.00	29.33	33.52	46.00	-12.48	QP
718.700	43.33	19.05	0.00	29.28	33.10	46.00	-12.90	QP



Horizontal:

Peak scan

Level (dBµV/m)



Quasi-peak measurement

Freq	ReadAntenna	Cable Preamp	Limit	Over	Remark
MHz	Level	Factor	Line	Limit	
	dBµV	dB/m	dB	dB	
261.830	57.78	12.13	0.00	29.57	40.35 46.00 -5.65 QP
525.670	47.56	17.10	0.00	29.47	35.19 46.00 -10.81 QP
575.140	47.51	18.03	0.00	29.42	36.12 46.00 -9.88 QP
622.670	51.29	18.54	0.00	29.38	40.45 46.00 -5.55 QP
718.700	50.54	19.05	0.00	29.28	40.31 46.00 -5.69 QP
815.700	45.91	20.24	0.00	29.04	37.11 46.00 -8.89 QP



1~25 GHz Field Strength of Fundamental & Field Strength of Unwanted Emissions.

Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
2440.000	27.57	6.81	49.43	98.12	83.07	114.00	V
4880.000	31.57	11.24	49.30	56.14	49.65	74.00	V
7320.000	36.50	13.11	32.60	40.25	57.26	74.00	V
2440.000	27.57	6.81	49.43	93.40	78.35	114.00	H
4880.000	31.57	11.24	49.30	56.23	49.74	74.00	H
7320.000	36.50	13.11	32.60	40.29	57.30	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
2440.000	27.57	6.81	49.43	84.12	69.07	94.00	V
4880.000	31.57	11.24	49.30	48.71	42.22	54.00	V
7320.000	36.50	13.11	32.60	31.32	48.33	54.00	V
2440.000	27.57	6.81	49.43	81.40	66.35	94.00	H
4880.000	31.57	11.24	49.30	47.69	41.20	54.00	H
7320.000	36.50	13.11	32.60	32.34	49.35	54.00	H



Band Edge:

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Antenna polarization
2400.000	27.58	6.56	49.44	52.84	37.54	74.00	V
2483.500	27.55	6.99	49.42	53.79	38.91	74.00	V
2400.000	27.58	6.56	49.44	53.36	38.06	74.00	H
2483.500	27.55	6.99	49.42	54.12	39.24	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Antenna polarization
2400.000	27.58	6.56	49.44	42.76	27.46	54.00	V
2483.500	27.55	6.99	49.42	42.39	27.51	54.00	V
2400.000	27.58	6.56	49.44	43.34	28.04	54.00	H
2483.500	27.55	6.99	49.42	43.22	28.34	54.00	H



3. Test at high Channel in transmitting status

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

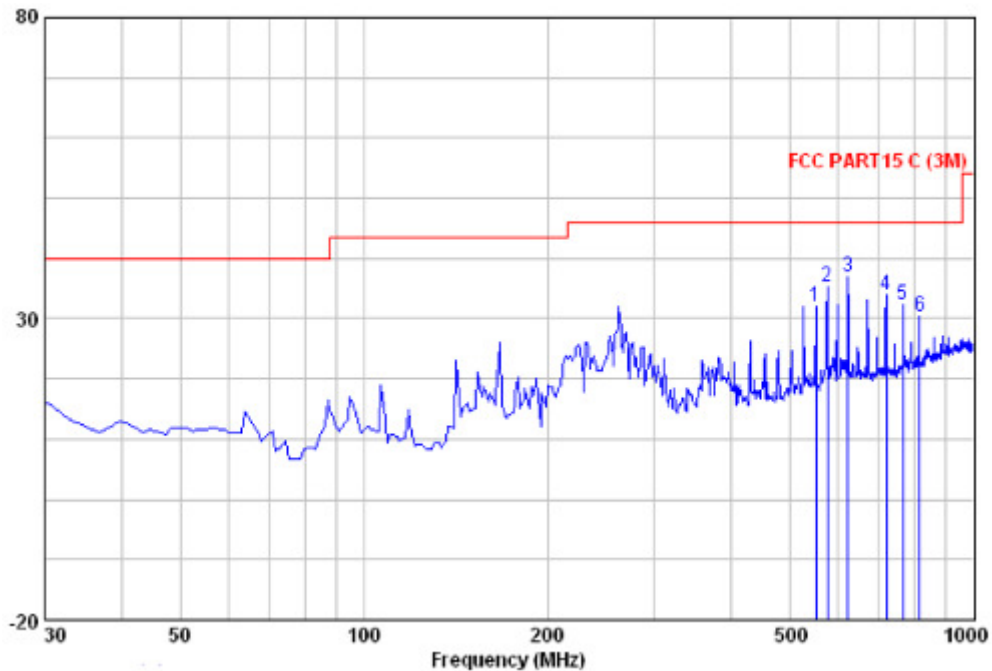
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBμV/m)



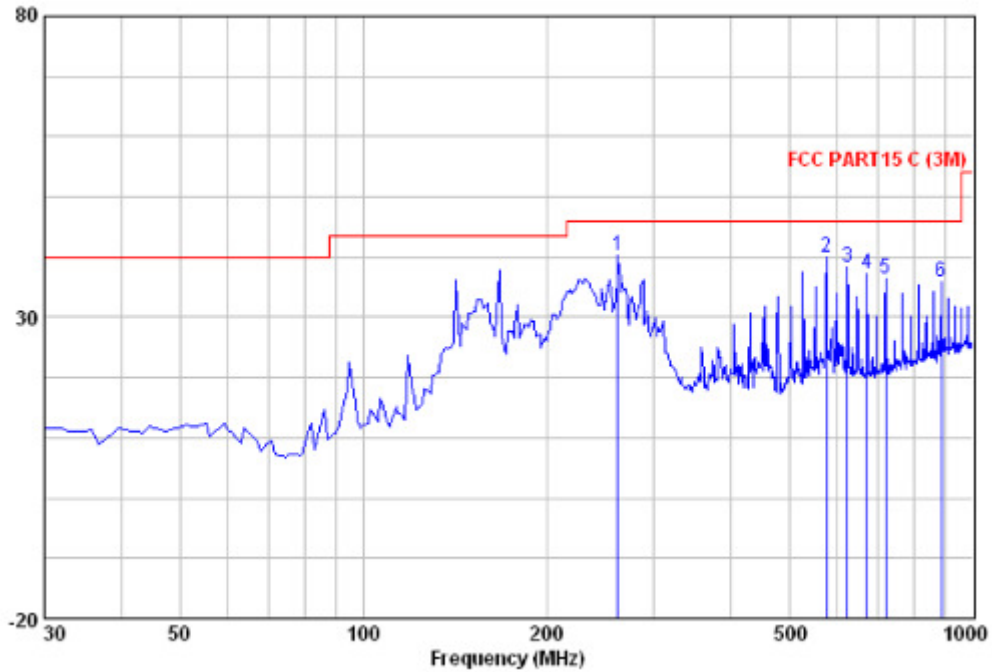
Quasi-peak measurement

Freq MHz	ReadAntenna Level Factor dBμV	Cable Preamp Loss Factor dB/m	Preamp Loss Factor dB	Level dB	dBμV/m	Limit Line dBμV/m	Over Limit dB	Remark
551.860	43.89	17.62	0.00	29.45	32.06	46.00	-13.94	QP
575.140	46.63	18.03	0.00	29.42	35.24	46.00	-10.76	QP
622.670	47.84	18.54	0.00	29.38	37.01	46.00	-8.99	QP
718.700	44.27	19.05	0.00	29.28	34.04	46.00	-11.96	QP
766.230	41.86	19.63	0.00	29.23	32.25	46.00	-13.75	QP
815.700	39.24	20.24	0.00	29.04	30.44	46.00	-15.56	QP

Horizontal:

Peak scan

Level (dB μ V/m)



Quasi-peak measurement

Freq MHz	Read Level dB μ V	Antenna Factor dB/m	Cable Loss dB	Preamp Factor dB	Level dB μ V/m	Limit Line dB μ V/m	Over Limit dB	Remark
261.830	57.60	12.13	0.00	29.57	40.16	46.00	-5.84	QP
575.140	51.34	18.03	0.00	29.42	39.95	46.00	-6.05	QP
622.670	49.14	18.54	0.00	29.38	38.31	46.00	-7.69	QP
669.230	47.84	18.71	0.00	29.33	37.22	46.00	-8.78	QP
718.700	46.66	19.05	0.00	29.28	36.43	46.00	-9.57	QP
886.510	43.39	20.96	0.00	28.40	35.94	46.00	-10.06	QP



1~25 GHz Field Strength of Fundamental & Field Strength of Unwanted Emissions.

Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
2476.00	27.56	6.98	49.42	99.64	84.76	114.00	V
4952.00	31.68	11.37	49.30	56.31	50.06	74.00	V
7428.00	36.60	13.60	49.72	40.19	40.67	74.00	V
2476.00	27.56	6.98	49.42	91.80	76.92	114.00	H
4952.00	31.68	11.37	49.30	55.49	49.24	74.00	H
7428.00	36.60	13.60	49.72	40.23	40.71	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
2476.00	27.56	6.98	49.42	82.64	67.76	94.00	V
4952.00	31.68	11.37	49.30	47.99	41.74	54.00	V
7428.00	36.60	13.60	49.72	31.18	31.66	54.00	V
2476.00	27.56	6.98	49.42	79.80	64.92	94.00	H
4952.00	31.68	11.37	49.30	48.56	42.31	54.00	H
7428.00	36.60	13.60	49.72	30.65	31.13	54.00	H



Band Edge:

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
2400.000	27.58	6.56	49.44	52.64	37.34	74.00	V
2483.500	27.55	6.99	49.42	53.52	38.64	74.00	V
2400.000	27.58	6.56	49.44	53.37	38.07	74.00	H
2483.500	27.55	6.99	49.42	54.15	39.27	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
2400.000	27.58	6.56	49.44	42.74	27.44	54.00	V
2483.500	27.55	6.99	49.42	42.18	27.30	54.00	V
2400.000	27.58	6.56	49.44	43.39	28.09	54.00	H
2483.500	27.55	6.99	49.42	43.08	28.20	54.00	H

Remark:

- 1). The field strength is calculated by adding the Antenna Factor. Cable Factor & Pre-amplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Loss – Pre-amplifier Factor.
- 2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

Test result: The unit does meet the FCC requirements.

7.4 Occupied Bandwidth

Test Requirement: FCC Part 15 C section 15.249

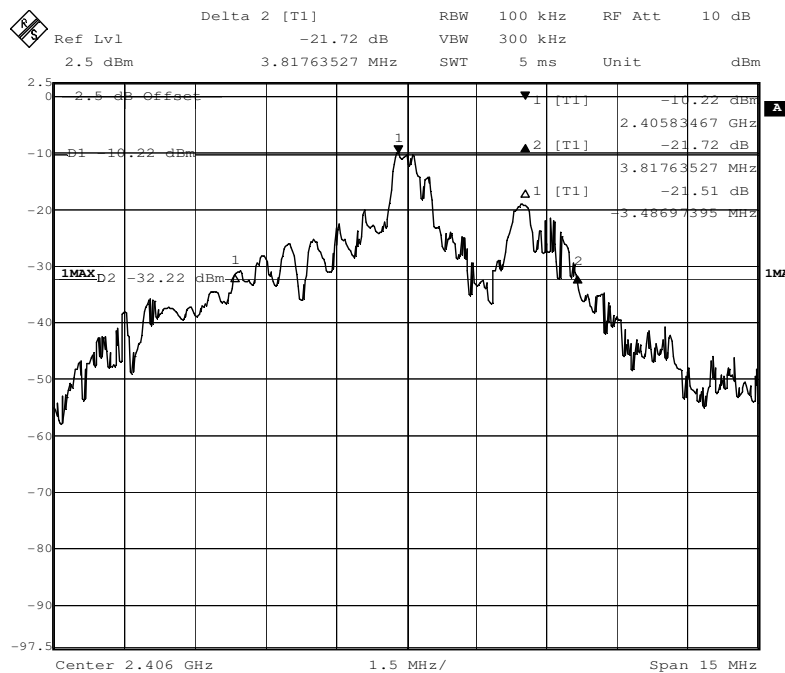
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Test Method: ANSI C63.10: Clause 6.9.1

Operation within the band 2.400 to 2.4835 GHz

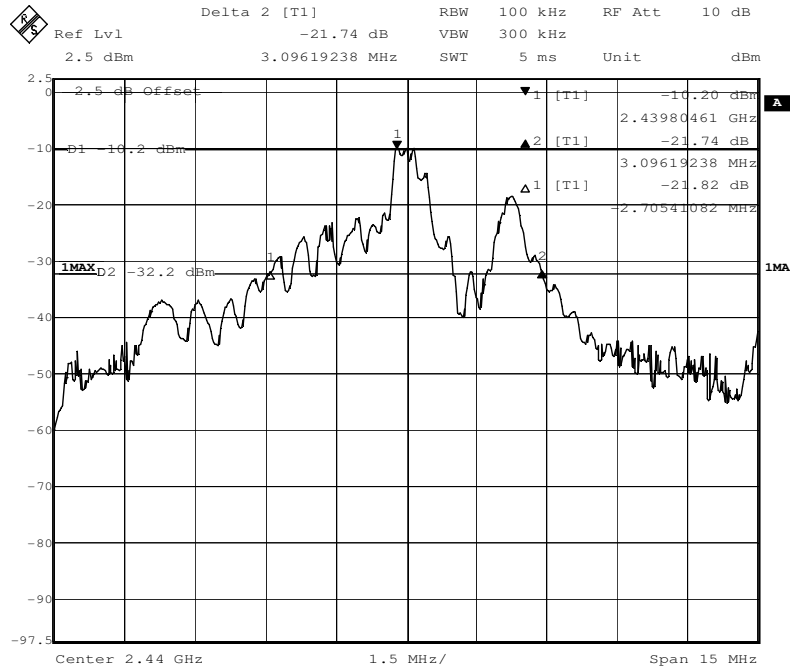
Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken.

1. Test in the lowest frequency 2.406GHz

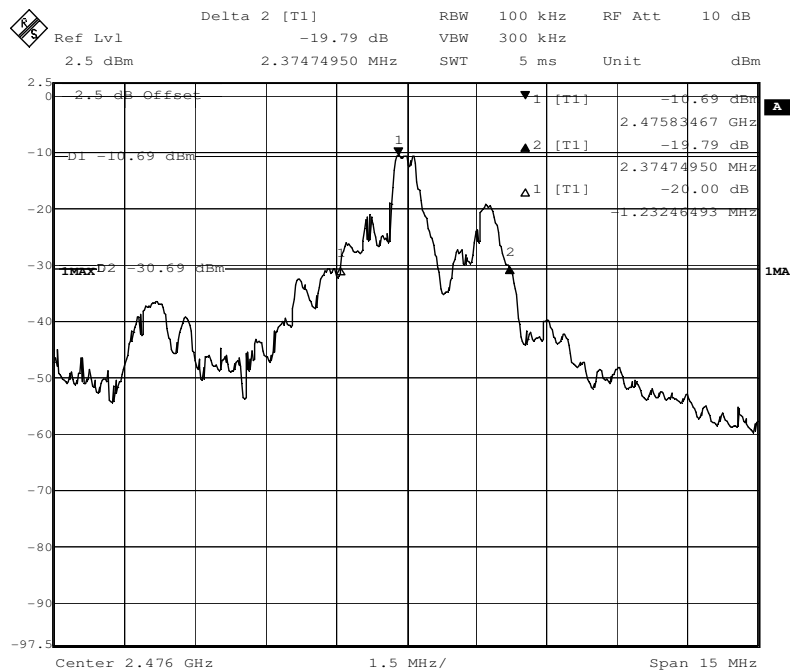




2. Test in the middle frequency 2.440GHz



3. Test in the highest frequency 2.476 GHz



The results: The unit does meet the FCC requirements.

--End of the report--