SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technological Development District, Guangzhou, China 510663
Telephone: +86 (0) 20 82155555
Fax: +86 (0) 20 82075059
Email: ee.guangzhou@sgs.com

TEST REPORT

The following sample(s) was/were submitted and identified on behalf of the client as:

Application No.:	GZEM1605003363CR
Applicant:	TIANYI TOYS FACTORY
Manufacturer:	The same as applicant
FCC ID:	2AIRDTYH00000001
Product Description:	Remote control aircraft series
Model No.:	TY936, TY901, TY902, TY903, TY906, TY909, TY901T, TY902T, TY903T, TY906T, TY909T, TY913, TY913T, TY918, TY918T, TY919, TY920, TY921, TY922, TY923, TY925, TY926, TY928, TY929, TY930, TY931, TY932, TY933, TY934, TY935, TY938, TY939, TY940, TY941, TY942, TY943, TY944, TY945, TY946, TY948, TY949, TY950, TY951, TY952, TY953, TY954, TY955, TY956, TY958, TY959, TY-T1, TY-T2, TY-T3, TY-T4, TYT5, TY-T6, TY-T7, TY-T8, TY-T9, TYT10, , TY-T11, TY-T12, TY-T13, TY-T14, TY-T15, TY-T16, TY-T17, TY-T18, TYT19, TY-T20, TY-T21, TY-T22, TY-T23, TY-T24, TY-T25, TY-T26, TY-T27, TYT28, TY-T29, TY-T30, TY911 ♣
♣	Please refer to section 3 of this report for further details.
Standards:	CFR 47 PART 15 Subpart C: 2014 section 15.249
Date of Receipt:	2016-05-26
Date of Test:	2016-06-30 to 2016-07-05
Date of Issue:	2016-07-15
Test Result :	**Pass***

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

Jerry Chan
Manager

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		2016-07-15		Original Report

Authorized for issue by:				
Tested By		Vico.Cui **(Vico Cui) /Project Engineer**		2016-06-30 to 2016-07-05 **Date**
Prepared By		Sandy Zheng **(Sandy Zheng) / Clerk**		2016-07-12 **Date**
Checked By		Ricky Liu **(Ricky Liu) / Reviewer**		2016-07-15 **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, 6.5 and 6.6	PASS
Band Edges	FCC PART 15 C section 15.249 (d)	ANSI C63.10: Clause 6.10	PASS
Occupied Bandwidth	FCC PART 15 C section 15.215(c)	ANSI C63.10: Clause 6.9.	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 C63.10:2013 in the whole report.

♣ **Model No.:**

TY936, TY901, TY902, TY903, TY906, TY909, TY901T, TY902T, TY903T, TY906T, TY909T, TY913, TY913T, TY918, TY918T, TY919, TY920, TY921, TY922, TY923, TY925, TY926, TY928, TY929, TY930, TY931, TY932, TY933, TY934, TY935, TY938, TY939, TY940, TY941, TY942, TY943, TY944, TY945, TY946, TY948, TY949, TY950, TY951, TY952, TY953, TY954, TY955, TY956, TY958, TY959, TY-T1, TY-T2, TY-T3, TY-T4, TYT5, TY-T6, TY-T7, TY-T8, TY-T9, TYT10, TY-T11, TY-T12, TY-T13, TY-T14, TY-T15, TY-T16, TY-T17, TY-T18, TYT19, TY-T20, TY-T21, TY-T22, TY-T23, TY-T24, TY-T25, TY-T26, TY-T27, TYT28, TY-T29, TY-T30, TY911

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the color, appearance and packaging.

Therefore only one model **TY936** was tested in this report.

4 Contents

5 General Information

5.1 Client Information

Applicant:	TIANYI TOYS FACTORY
Address of Applicant:	CHENGHAI DISTRICT SHANTOU CITY GUANGDONG PROVINCE,CHINA
Manufacturer:	The same as applicant
Address of Manufacturer:	The same as applicant

5.2 General Description of E.U.T.

Product Description:	Remote control aircraft series
Model No.:	TY936

5.3 Details of E.U.T.

Operating Frequency	2415 MHz to 2465 MHz
Type of Modulation:	GFSK
Number of Channels	51
Antenna Type	The Tx is a narrow-band GFSK modulation by internal signal, no voice application and with an integral antenna.
Function:	Radio control plane with 2.4GHz as carrier
Power Supply:	DC 6.0 V size “AA” batteries x 4 for Tx. DC 3.7V by rechargeable battery for Rx
Power cord:	About 50cm long cable with USB connector for battery charging.

5.4 Description of Support Units

The EUT has been test as an independent unit.

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 Branch 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 accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

  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.

- **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 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

6 Equipment List

RE in Chamber						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2014-12-05	2016-12-04
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2016-02-01	2017-01-31
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2016-02-01	2017-01-31
EMC0528	RI High frequency Cable	SGS	20 m	N/A	2016-04-19	2018-04-18
EMC2025	Trilog Broadband Antenna 30-1000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3372	2014-07-14	2017-07-13
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2013-08-31	2016-08-30
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2014-05-04	2017-05-03
EMC2026	Horn Antenna 1-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	9120D-841	2013-08-31	2016-08-30
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2016-01-25	2017-01-24
EMC2065	Amplifier	HP	8447F	N/A	2016-07-04	2017-07-03
EMC2086	PRE AMPLIFIER MH648A	ANRITSU CORP	MH648A	N/A	2015-12-19	2016-12-18
EMC2063	Pre-amplifier 1GHz-26GHz	Compliance Direction Systems Lnc.	PAP-1G26-48	6279.628	2016-01-06	2017-01-05
EMC0523	Active Loop Antenna	EMCO	6502	42963	2016-02-27	2018-02-26
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS-ELEKTRONI	BBHA 9170	9170-375	2014-05-26	2017-05-25
EMC2079	High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	009	2016-01-25	2017-01-24
EMC2069	2.4GHz Filter	Micro-Tronics	BRM 50702	149	2016-01-25	2017-01-24
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2016-04-30	2018-04-29

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0006	DMM	Fluke	73	70681569	2015-09-17	2016-09-16
EMC0007	DMM	Fluke	73	70671122	2015-09-17	2016-09-16

7 Test Results

7.1 E.U.T. Operation

Test Voltage: DC 6.0 V size “AA” batteries x 4

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	2415	27	2442		
1	2416	28	2443		
2	2417	29	2444		
3	2418	30	2445		
4	2419	31	2446		
5	2420	32	2447		
6	2421	33	2448		
7	2422	34	2449		
8	2423	35	2450		
9	2424	36	2451		
10	2425	37	2452		
11	2426	38	2453		
12	2427	39	2454		
13	2428	40	2455		
14	2429	41	2456		
15	2430	42	2457		
16	2431	43	2458		
17	2432	44	2459		
18	2433	45	2460		
19	2434	46	2461		
20	2435	47	2462		
21	2436	48	2463		
22	2437	49	2464		
23	2438	50	2465		
24	2439	51			
25	2440	52			
26	2441	53			

Test frequencies are the lowest channel: 0 channel(2415 MHz), middle channel: 25 channel(2440 MHz) and highest channel: 50 channel(2465 MHz)

7.2 Antenna Requirement

Standard requirement

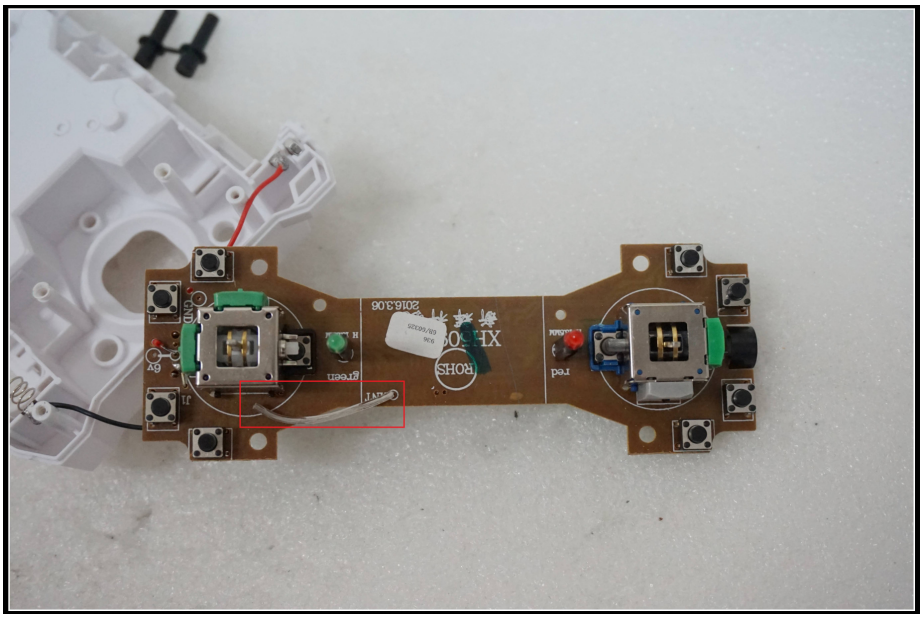
15.203 requirement:

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 0 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 Part15 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 is in the frequency band of the EUT is 2415MHz ~ 2465MHz.

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, 6.5 and 6.6 for Field Strength of Fundamental& Field Strength of Unwanted Emissions

ANSI C63.10: Clause 6.10 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 360º, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

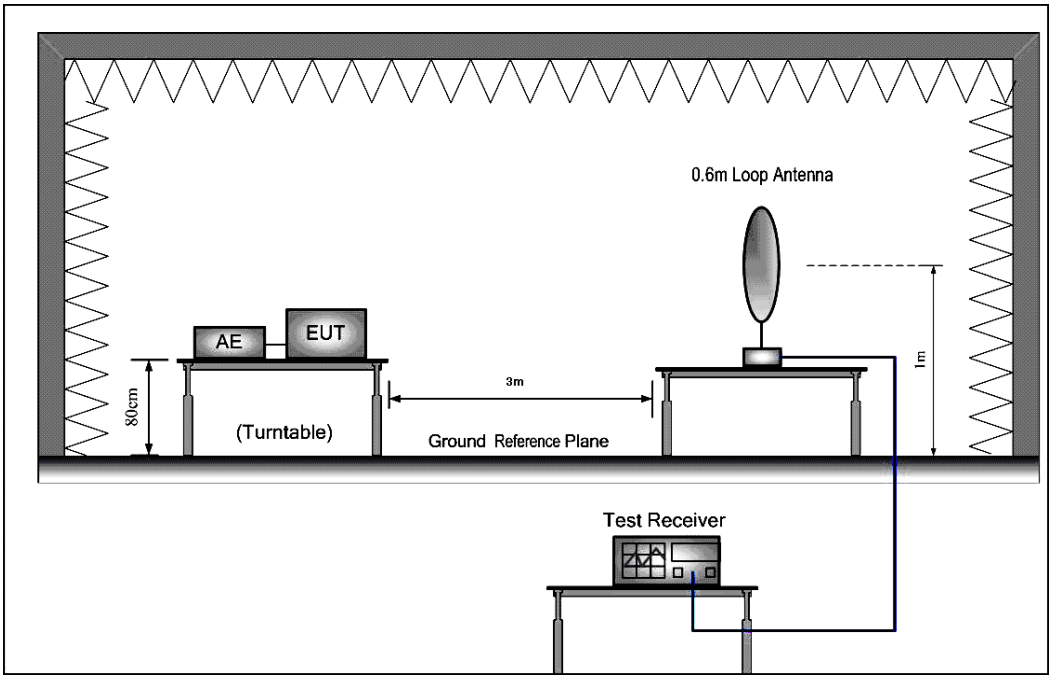
3)1 GHz to 25 GHz emissions:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2010 was used to perform radiated emission test above 1 GHz.

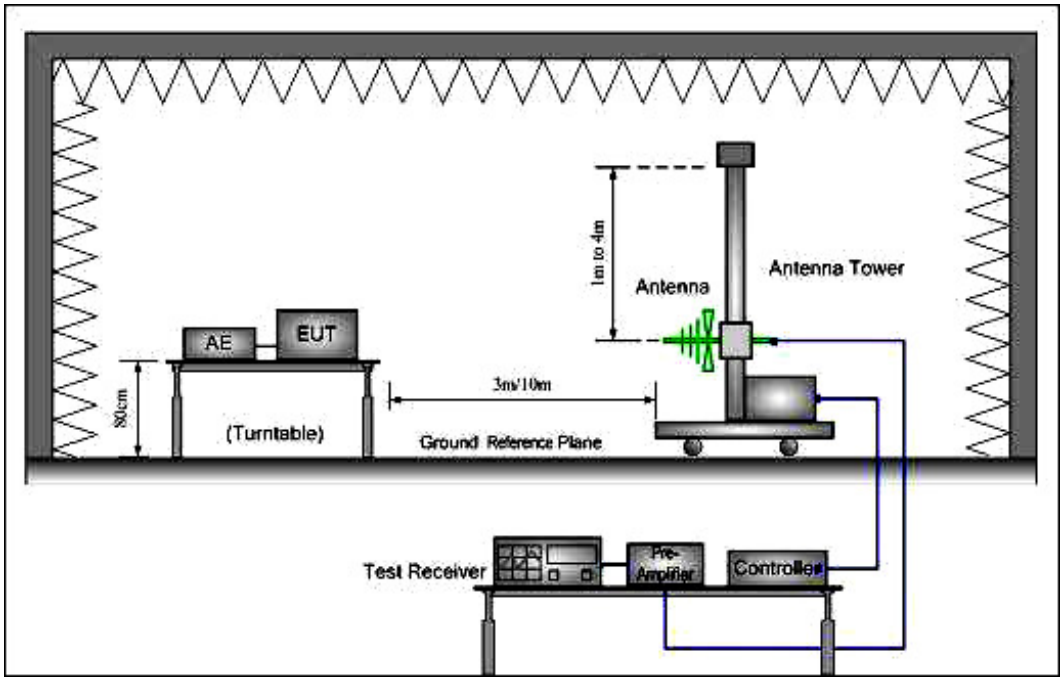
For testing performed with the horn antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360º, the antenna height scan between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

Test Configuration:

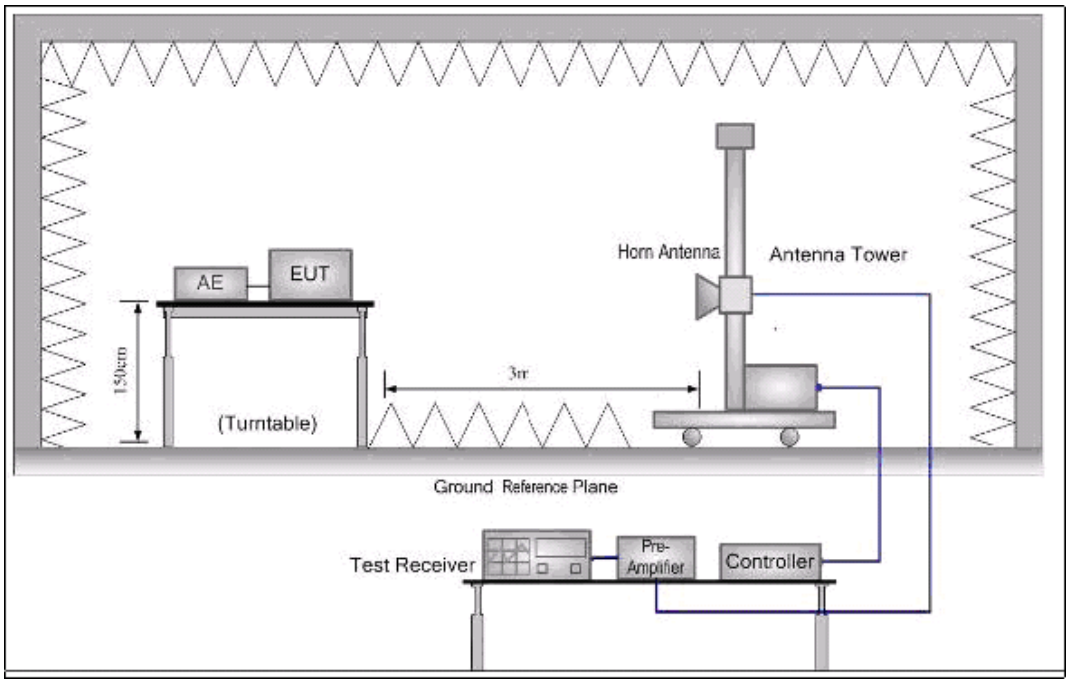
1) 9 kHz to 30 MHz emissions:



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 & Per-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Loss – Preamplifier Factor

Test at low Channel in transmitting status

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

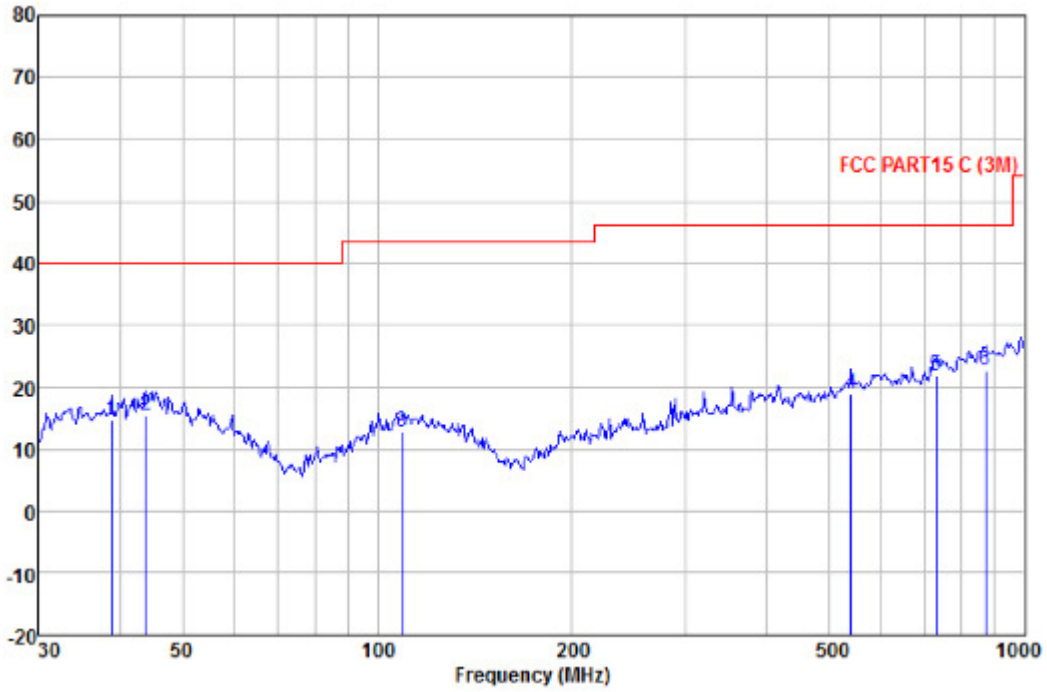
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

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

Vertical:

Peak scan

Level (dBμV/m)



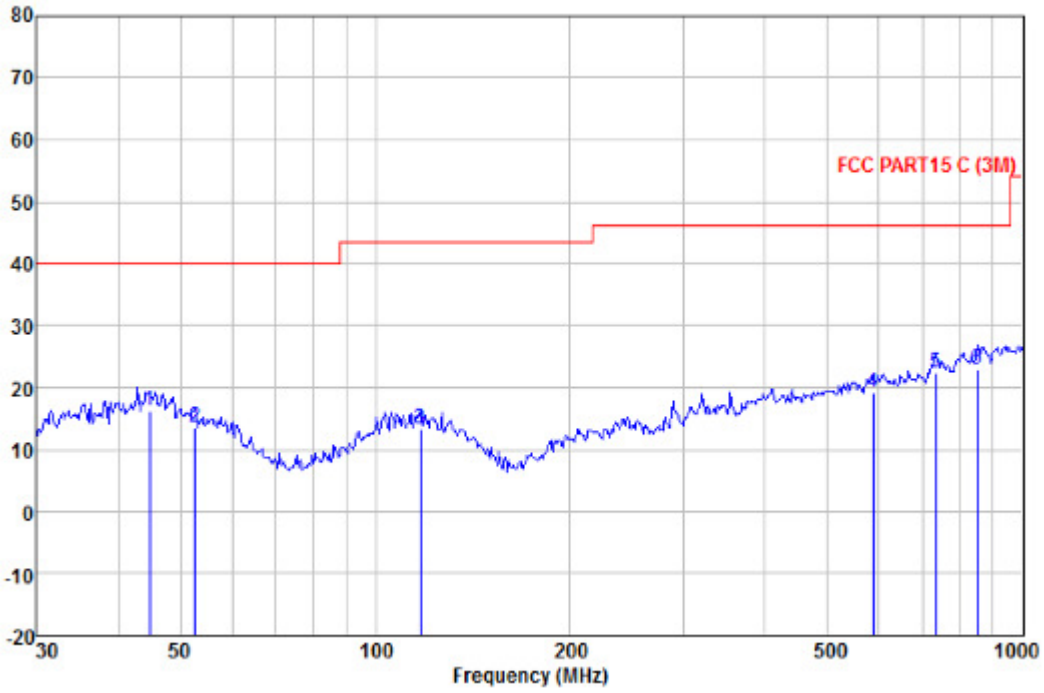
Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
38.888	21.96	18.60	1.10	14.66	40.00	-25.34	QP
43.812	21.99	19.27	1.18	15.44	40.00	-24.56	QP
109.412	22.31	15.40	1.95	12.76	43.50	-30.74	QP
539.478	25.14	17.28	4.57	19.01	46.00	-26.99	QP
729.358	24.57	20.10	5.30	21.97	46.00	-24.03	QP
869.130	23.37	21.20	5.87	22.62	46.00	-23.38	QP

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
44.743	22.98	19.15	1.20	16.33	40.00	-23.67	QP
52.575	22.06	17.13	1.30	13.49	40.00	-26.51	QP
117.360	23.04	15.10	2.07	13.31	43.50	-30.19	QP
586.844	24.36	18.10	4.75	19.21	46.00	-26.79	QP
734.491	24.93	20.10	5.30	22.33	46.00	-23.67	QP
851.035	25.31	19.60	5.80	22.85	46.00	-23.15	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)**	**Over limit**	**Antenna polarization**
2414.717	27.58	6.93	35.20	92.39	91.70	114.00	-22.30	V
4830.977	31.55	9.97	36.42	40.72	45.82	74.00	-28.18	V
7245.019	36.48	12.80	37.05	45.66	57.89	74.00	-16.11	V
9660.380	38.19	14.47	36.02	35.17	51.81	74.00	-22.19	V
2414.717	27.58	6.93	35.20	87.15	86.46	114.00	-27.54	H
4830.662	31.55	9.97	36.42	51.89	56.99	31.55	-17.01	H
7245.999	36.48	12.80	37.05	39.55	51.78	36.48	-22.22	H
9660.925	38.19	14.47	36.02	32.88	49.52	38.19	-24.48	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)**	**Over limit**	**Antenna polarization**
2414.717	27.58	6.93	35.20	70.67	69.98	94.00	-24.02	V
4830.997	31.55	9.97	36.42	25.74	30.84	54.00	-23.16	V
7245.019	36.48	12.80	37.05	21.57	33.80	54.00	-20.20	V
9660.380	38.19	14.47	36.02	16.64	33.28	54.00	-20.72	V
2414.717	27.58	6.93	35.20	81.64	80.95	94.00	-13.05	H
4830.662	31.55	9.97	36.42	31.97	37.07	31.55	-16.93	H
7245.999	36.48	12.80	37.05	20.65	32.88	36.48	-21.12	H
9660.925	38.19	14.47	36.02	17.91	34.55	38.19	-19.45	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)	Over limit	Antenna polarization
2400.000	27.58	6.90	35.20	54.56	53.84	74.00	-20.16	V
2483.500	27.55	7.07	35.27	40.76	40.11	74.00	-33.89	V
2400.000	27.58	6.90	35.20	43.83	43.11	74.00	-30.89	H
2483.500	27.55	7.07	35.27	40.74	40.09	74.00	-33.91	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)	Over limit	Antenna polarization
2400.000	27.58	6.90	35.20	32.56	31.84	54.00	-22.16	V
2483.500	27.55	7.07	35.27	27.21	26.56	54.00	-27.44	V
2400.000	27.58	6.90	35.20	28.17	27.45	54.00	-26.55	H
2483.500	27.55	7.07	35.27	28.89	28.24	54.00	-25.76	H

Test at middle Channel in transmitting status

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

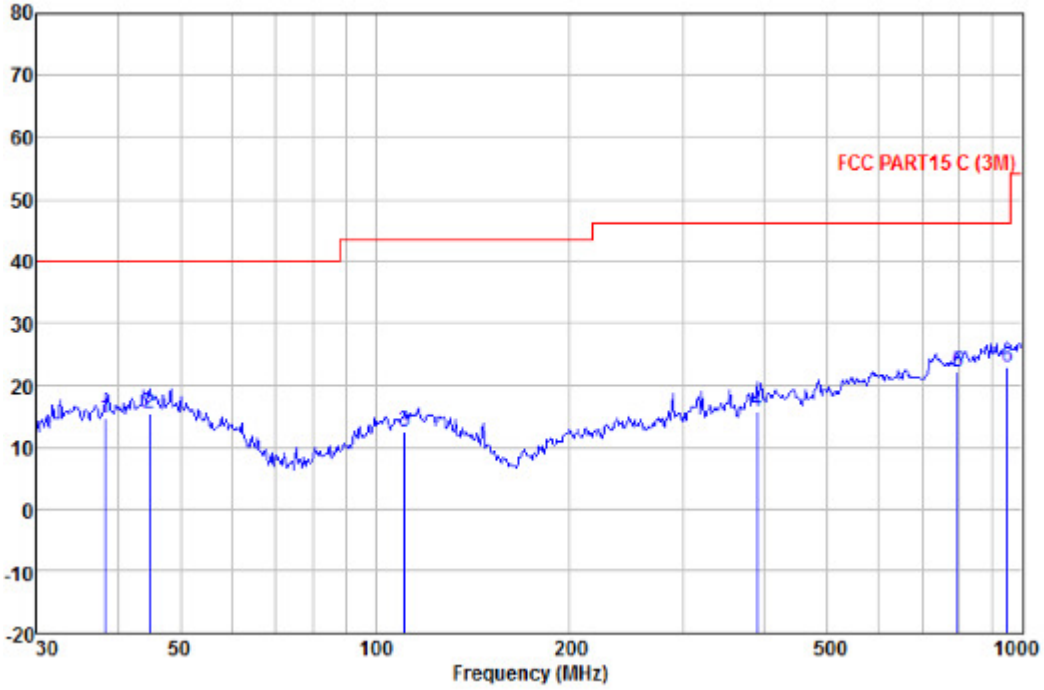
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

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

Vertical:

Peak scan

Level (dBμV/m)



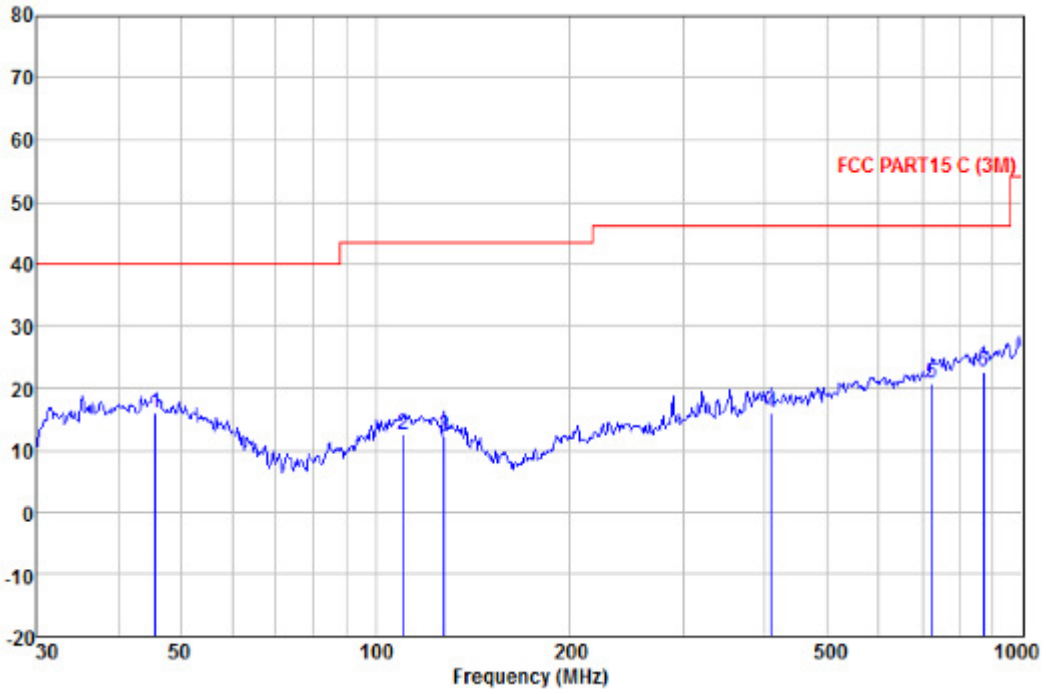
Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
38.346	22.07	18.54	1.10	14.71	40.00	-25.29	QP
44.743	22.18	19.15	1.20	15.53	40.00	-24.47	QP
110.957	22.10	15.46	1.97	12.63	43.50	-30.87	QP
389.355	22.75	16.10	3.85	15.62	46.00	-30.38	QP
793.396	24.80	19.70	5.57	22.16	46.00	-23.84	QP
948.761	23.43	21.10	6.05	22.94	46.00	-23.06	QP

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	ReadLevel	Antenna Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
45.695	22.69	18.97	1.21	15.87	40.00	-24.13	QP
110.182	21.99	15.50	1.95	12.54	43.50	-30.96	QP
127.665	22.83	14.05	2.14	12.14	43.50	-31.36	QP
408.946	22.94	16.35	3.95	16.00	46.00	-30.00	QP
724.261	24.27	19.37	5.25	20.89	46.00	-25.11	QP
869.130	23.34	21.20	5.87	22.59	46.00	-23.41	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)	Over limit	Antenna polarization
2444.804	27.57	6.99	35.20	86.42	85.78	114.00	-28.22	V
4880.345	31.57	10.01	36.45	54.52	59.65	74.00	-14.35	V
7320.436	36.50	12.93	37.07	43.38	55.74	74.00	-18.26	V
9760.140	38.51	14.45	35.90	33.81	50.87	74.00	-23.13	V
2443.606	27.57	6.99	35.20	89.94	89.30	114.00	-24.70	H
4880.661	31.57	10.01	36.45	48.78	53.91	74.00	-20.09	H
7320.396	36.50	12.93	37.07	39.29	51.65	74.00	-22.35	H
9760.432	38.51	14.45	35.90	33.99	51.05	74.00	-22.95	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)	Over limit	Antenna polarization
2444.804	27.57	6.99	35.20	81.20	80.56	94.00	-13.44	V
4880.345	31.57	10.01	36.45	32.07	37.20	54.00	-16.80	V
7320.436	36.50	12.93	37.07	23.84	36.20	54.00	-17.80	V
9760.140	38.51	14.45	35.90	18.14	35.20	54.00	-18.80	V
2443.606	27.57	6.99	35.20	84.66	84.02	94.00	-9.98	H
4880.661	31.57	10.01	36.45	24.16	29.29	54.00	-24.71	H
7320.396	36.50	12.93	37.07	22.28	34.64	54.00	-19.36	H
9760.432	38.51	14.45	35.90	18.08	35.14	54.00	-18.86	H

Test at high Channel in transmitting status

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

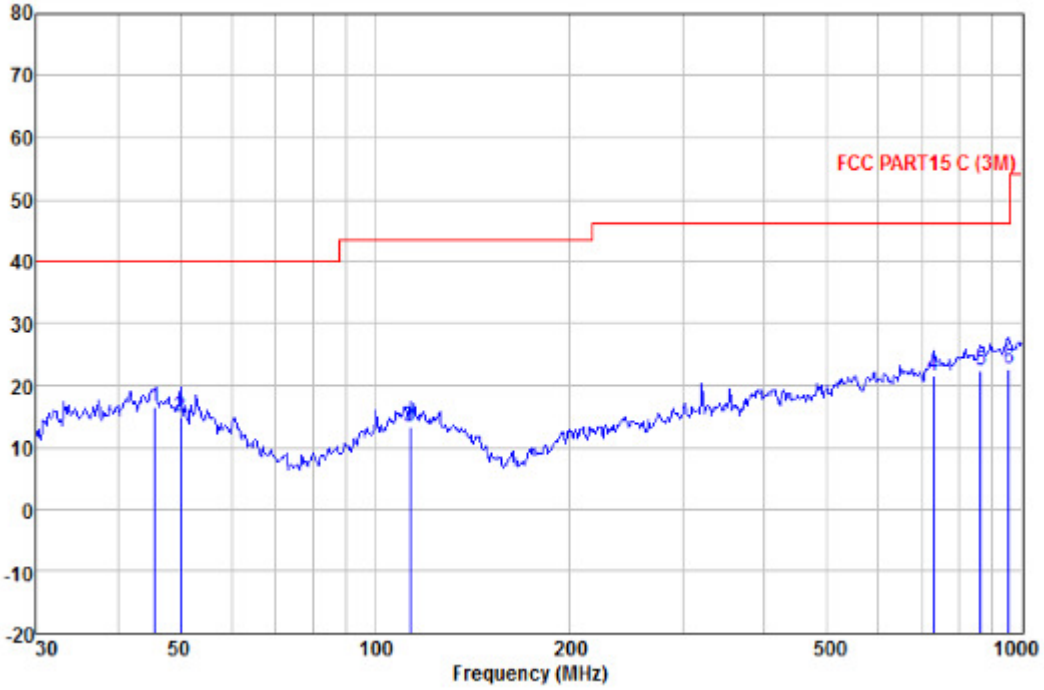
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

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

Vertical:

Peak scan

Level (dBμV/m)



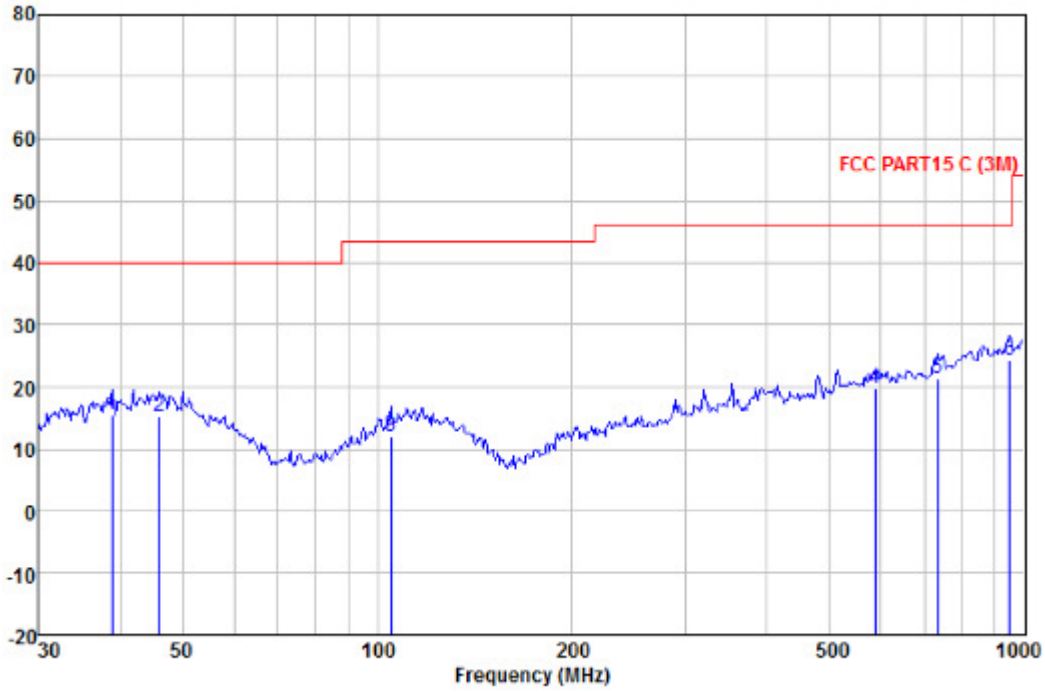
Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
45.695	23.26	18.97	1.21	16.44	40.00	-23.56	QP
50.057	22.72	17.80	1.30	14.82	40.00	-25.18	QP
113.316	22.90	15.36	2.02	13.38	43.50	-30.12	QP
729.358	24.32	20.10	5.30	21.72	46.00	-24.28	QP
863.056	23.49	20.80	5.84	22.30	46.00	-23.70	QP
952.094	23.46	20.77	6.10	22.71	46.00	-23.29	QP

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
38.888	22.73	18.60	1.10	15.43	40.00	-24.57	QP
46.016	22.08	18.90	1.22	15.20	40.00	-24.80	QP
104.903	22.66	14.30	1.86	11.92	43.50	-31.58	QP
586.844	24.88	18.10	4.75	19.73	46.00	-26.27	QP
734.491	23.86	20.10	5.30	21.26	46.00	-24.74	QP
948.761	24.77	21.10	6.05	24.28	46.00	-21.72	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)	Over limit	Antenna polarization
2465.876	27.56	7.02	35.22	88.07	87.43	114.00	-26.57	V
4930.603	31.65	10.06	36.47	50.50	55.74	74.00	-18.26	V
7395.038	36.54	13.00	37.08	38.59	51.05	74.00	-22.95	V
9860.670	38.65	14.42	35.74	33.08	50.41	74.00	-23.59	V
2464.667	27.56	7.02	35.22	87.11	86.47	114.00	-27.53	H
4930.590	31.65	10.06	36.47	50.22	55.46	74.00	-18.54	H
7395.516	36.54	13.00	37.08	40.98	53.44	74.00	-20.56	H
9860.670	38.65	14.42	35.74	33.63	50.96	74.00	-23.04	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)	Over limit	Antenna polarization
2465.876	27.56	7.02	35.22	83.50	82.86	94.00	-11.14	V
4930.603	31.65	10.06	36.47	30.87	36.11	54.00	-17.89	V
7395.038	36.54	13.00	37.08	22.06	34.52	54.00	-19.48	V
9860.670	38.65	14.42	35.74	16.99	34.32	54.00	-19.68	V
2464.667	27.56	7.02	35.22	81.28	80.64	94.00	-13.36	H
4930.590	31.65	10.06	36.47	30.12	35.36	54.00	-18.64	H
7395.516	36.54	13.00	37.08	28.62	41.08	54.00	-12.92	H
9860.670	38.65	14.42	35.74	20.55	37.88	54.00	-16.12	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)**	**Over limit**	**Antenna polarization**
2400.000	27.58	6.90	35.20	40.78	40.06	74.00	-33.94	V
2483.500	27.55	7.07	35.27	41.07	40.42	74.00	-33.58	V
2400.000	27.58	6.90	35.20	41.15	40.43	74.00	-33.57	H
2483.500	27.55	7.07	35.27	48.87	48.22	74.00	-25.78	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)**	**Over limit**	**Antenna polarization**
2400.000	27.58	6.90	35.20	28.10	27.38	54.00	-26.62	V
2483.500	27.55	7.07	35.27	29.39	28.74	54.00	-25.26	V
2400.000	27.58	6.90	35.20	29.57	28.85	54.00	-25.15	H
2483.500	27.55	7.07	35.27	34.11	33.46	54.00	-20.54	H

Remark:

1). The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Loss –Preamplifier 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.

4). For Radiated Emissions fall in the restricted bands (2400MHz is worse case than 2390MHz and report it as above), which set out in Section 15.205 Restricted bands.

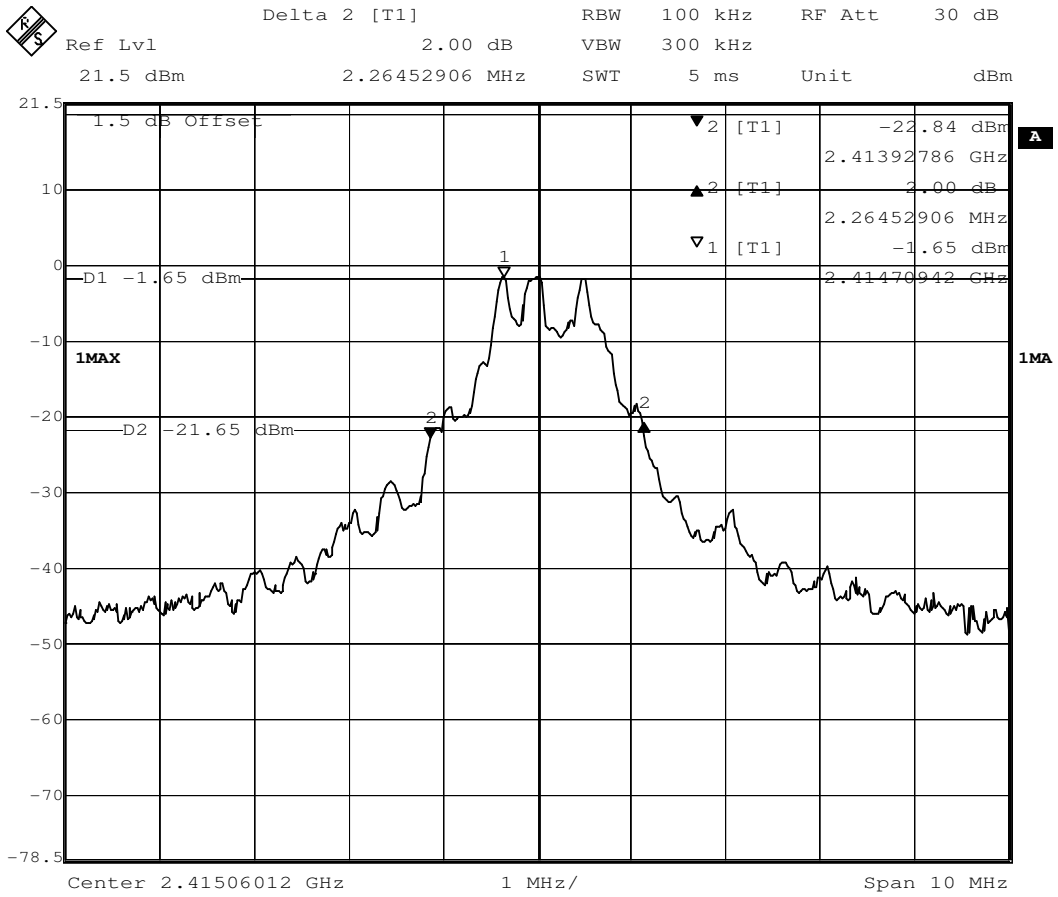
Also there is not any other emission which falls in restricted bands can be detected and reported.

Test result: The unit does meet the FCC requirements.

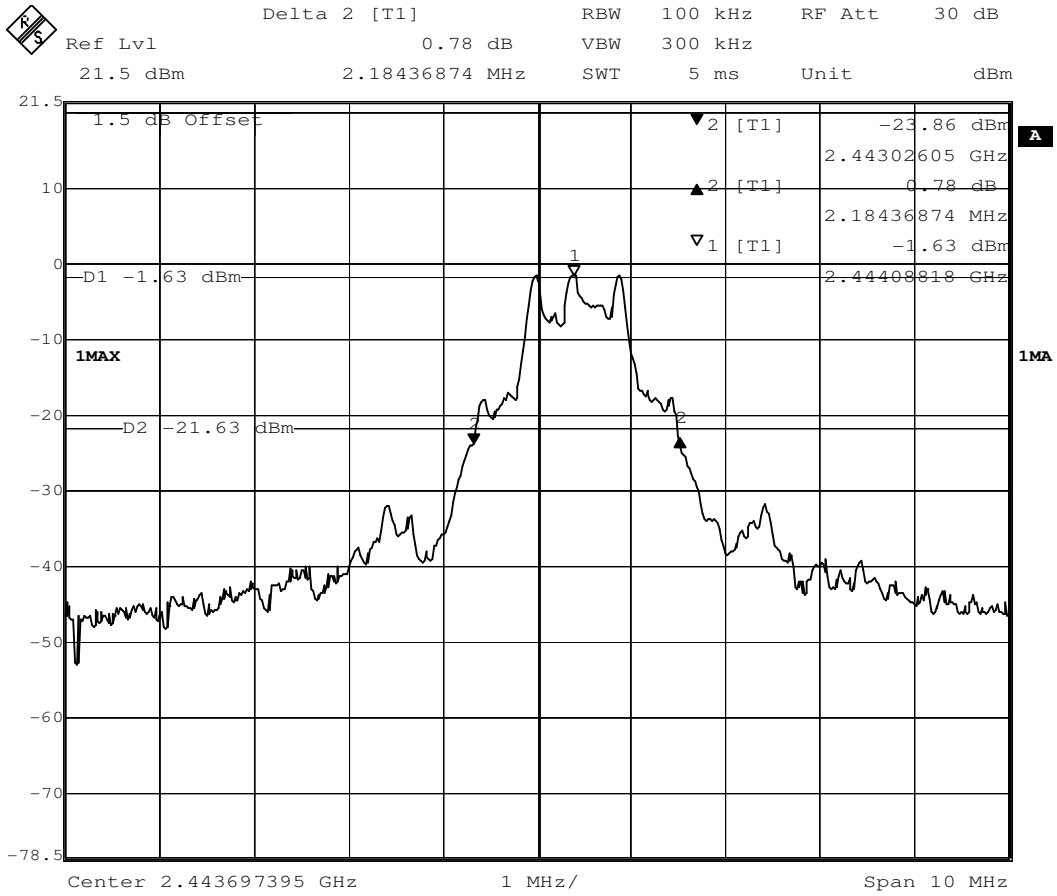
7.4 Occupied Bandwidth

Test Requirement:	FCC Part 15 C section 15.215(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.
Test Method:	ANSI C63.10: Clause 6.9. 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.

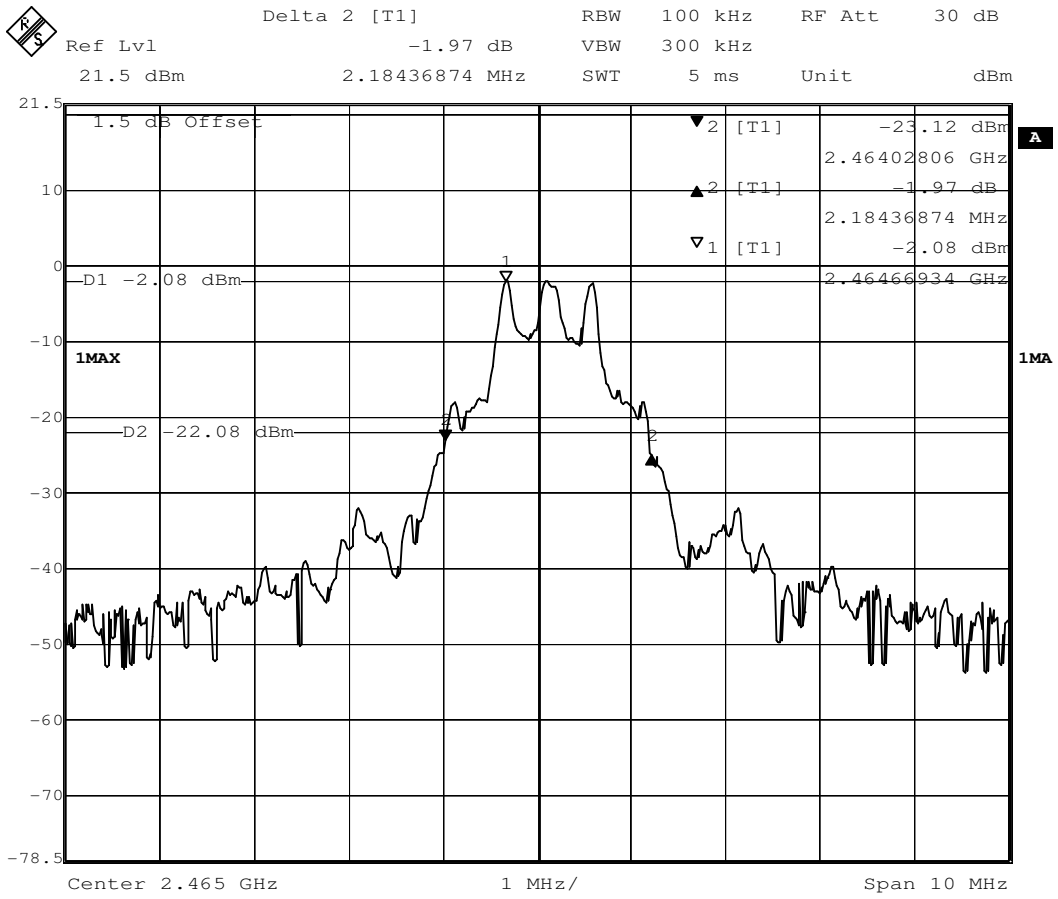
1.Test in the lowest frequency 2.415 GHz



2.Test in the middle frequency 2.440 GHz



3.Test in the highest frequency 2.465 GHz



The results: The unit does meet the FCC requirements.

--End of the report--