RADIO TEST REPORT

Applicant	:	AOpen Inc.
Address	:	5F., No.15, Ln. 128, Sinhu 1st Rd., Neihu District, Taipei City 114, Taiwan(R.O.C.)
Equipment	:	AOPEN Chromebox Commercial
Model No.	:	WT22M-FBG
Trade Name	:	AOPEN
FCC ID	:	YEW -22MFBG7260NGW
IC ID	:	20532-22MFBG7260N

I HEREBY CERTIFY THAT :

The sample was received on Aug. 18, 2015 and the testing was carried out on Sep. 01, 2015 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Steven Wang
Manager

Tested by:

Spree Yei
Engineer

Laboratory Accreditation:

☒ Cerpass Technology Corporation Test Laboratory

☐ Cerpass Technology(SuZhou) Co., Ltd.

Contents

History of this test report

■ ORIGINAL.

☐ Additional attachment as following record:

Attachment No.	Issue Date	Description
TEGQ1508142	Sep. 09, 2015	Original.

1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.4: 2009

FCC Rules and Regulations Part 15 Subpart C §15.247

KDB558074

RSS-247 issue 1

RSS-Gen issue 3

FCC Rule	IC Rule	. Description of Test	Result
15.203	RSS-GEN 6.7	. Antenna Requirement	Pass
15.207	RSS-GEN 8.8	. AC Power Line Conducted Emission	Pass
15.209 15.205	RSS-GEN Section 8.9 & 8.10	. Spurious Emission(Radiated)	Pass
15.247(d)	RSS-247 5.5	. Spurious Emission(Conducted)	Pass
15.247(a)(2)	RSS-247 5.2 (1)	. 6dB Bandwidth	Pass
15.247(b)	RSS-247 5.4 (4)	. Maximum Peak Output Power	Pass
15.247(e)	RSS-247 5.2 (2)	. Power Spectral Density	Pass

This EUT has been also tested and compiled with the requirement of FCC Part 15 Subpart B and ICE-003, and recorded in a separate test report.

2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Frequency Range	802.11a/an/ac: 5150-5250MHz/ 5250-5350MHz, 5470-5725MHz, 5725-5850MHz 802.11b/g/n: 2412-2462MHz Bluetooth: 2402-2480 MHz
Type of Modulation	OFDM, DSSS, FHSS, GFSK (Bluetooth low energy)
Channel of Bandwidth	802.11a/an/ac: 20MHz/ 40MHz/ 80MHz 802.11b/g/n: 5MHz Bluetooth: 1MHz Bluetooth Low Energy: 2MHz
Data Rate	802.11a/an/ac: up to 867Mbps 802.11b/g/n: up to 270Mbps Bluetooth: 1, 2, 3Mbps Bluetooth Low Energy: 1Mbps
Type of Antenna	Printed Antenna *2
Antenna Gain	2 dBi
Rating Input	I/P: 100-240Vac, 50-60Hz, 1.5A O/P: 19Vdc, 4.74A

2.2 Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
***00**	**2402**	14	2430	28	2458
01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	***19**	**2440**	33	2468
06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	***39**	**2480**
12	2426	26	2454	--	--
13	2428	27	2456	--	--

Note: Channels remarked * are selected to perform test.

2.3 Test Mode and Test Software

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
b. The complete test system included Mouse, Keyboard, Notebook and EUT for RF test.
c. The test program ”DRUT” under Chrome was executed to keep transmits and receives data via Bluetooth.
d. Test modes:
Mode 1: GFSK(1Mbps)

2.4 Description of Test System

Device	Manufacturer	Model No.	Description
Mouse	DELL	M-UV83	USB Cable, Shielding, 1.8m
Keyboard	DELL	SK-8175	USB Cable, Shielding, 1.8m
Notebook	HP	ProBook 5310m	Power Cable, Unshielding, 1.8m

Used cable

Cable	Quantity	Description
Network Cable	1	Unshielding, 1.2m

2.5 General Information of Test

☒	Test Site	**Cerpass Technology Corporation Test Laboratory** Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582
	FCC	TW1079, TW1061,390316, 228391, 641184
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-3428, R-4218 for Radiated emission test G-812, G-813 for radiated disturbance above 1GHz
☐	Test Site	**Cerpass Technology (Suzhou) Co.,Ltd** Address: No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China Tel: +86-512-6917-5888 Fax: +86-512-6917-5666
	FCC	916572, 331395
	IC	7290A-1, 7290A-2
	VCCI	T-343 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test G-227 for radiated disturbance above 1GHz
Frequency Range Investigated:		Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 25,000MHz
Test Distance:		The test distance of radiated emission from antenna to EUT is 3 M.

3. Test Equipment and Ancillaries Used for Tests

Instrument	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	R&S	FSP40	100047	2015/03/07	2016/03/06
PREAMPLIFIER	AGILENT	8449B	3008A01954	2015/03/05	2016/03/04
HORN ANTENNA	EMCO	3115	31589	2015/03/09	2016/03/08
HIGH PASS FILTER	HP	84300-80038	002	N/A	N/A
Bilog Antenna	SchwarzBeck	VULB 9168	275	2014/09/18	2015/09/17
SERIES POWER METER	ANRITSU	ML2495A	1224005	2015/03/05	2016/03/04
POWER SENSOR	ANRITSU	MA2411B	1207295	2015/03/05	2016/03/04
Bluetooth Tester	R&S	CBT	101133	2015/03/12	2016/03/11

4. Antenna Requirements

4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2 Antenna Construction and Directional Gain

No.	Antenna Type	Antenna Gain
A	Printed antenna	2 dBi

5. Test of AC Power Line Conducted Emission

5.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2009 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

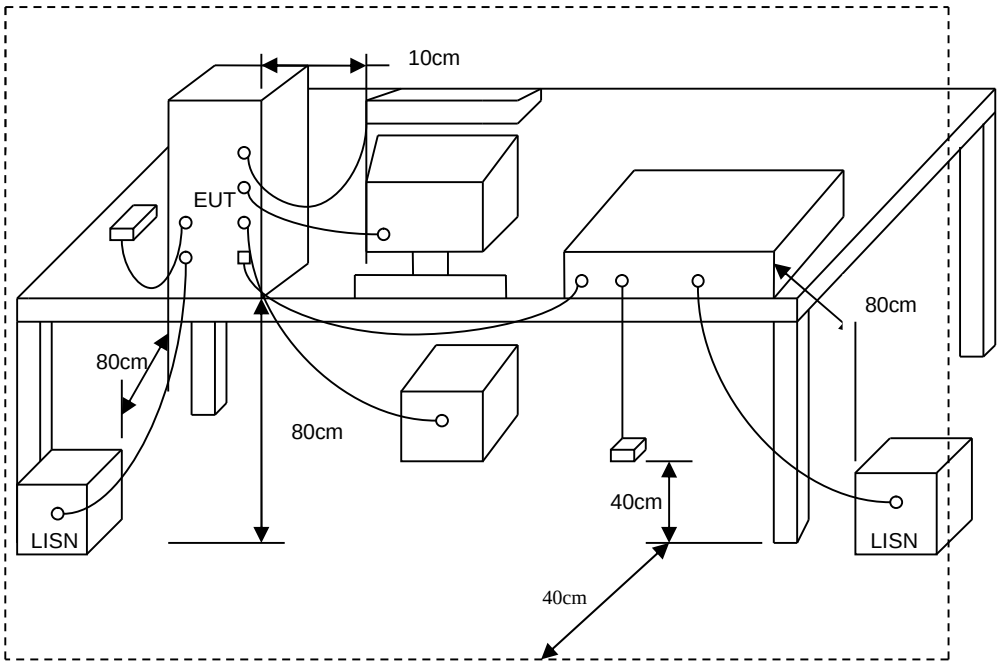
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

5.2 Test Procedures

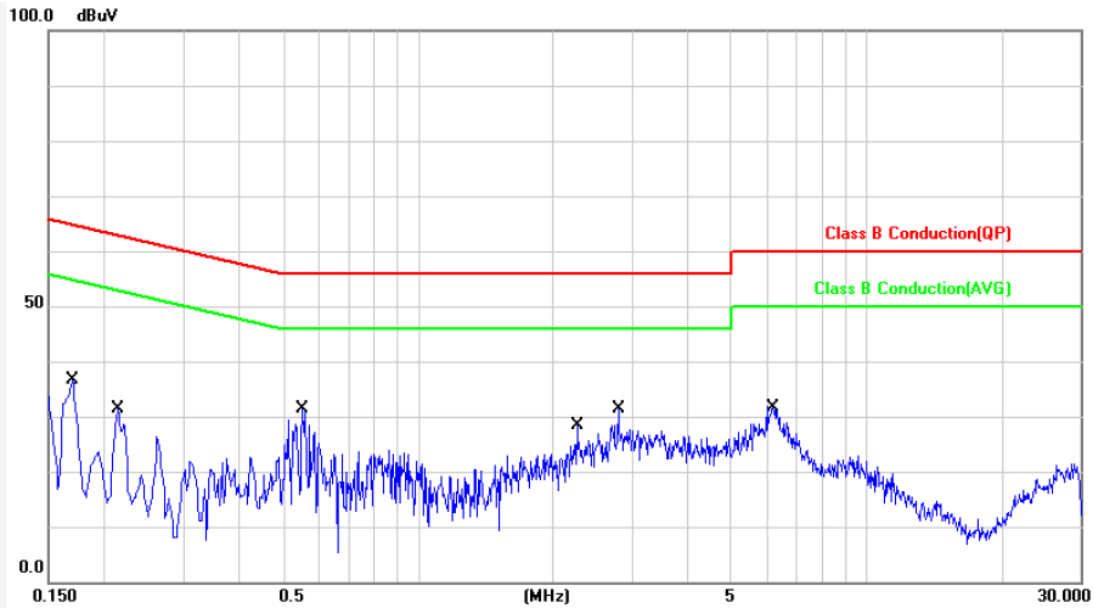
a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.3 Typical Test Setup



5.4 Test Result and Data

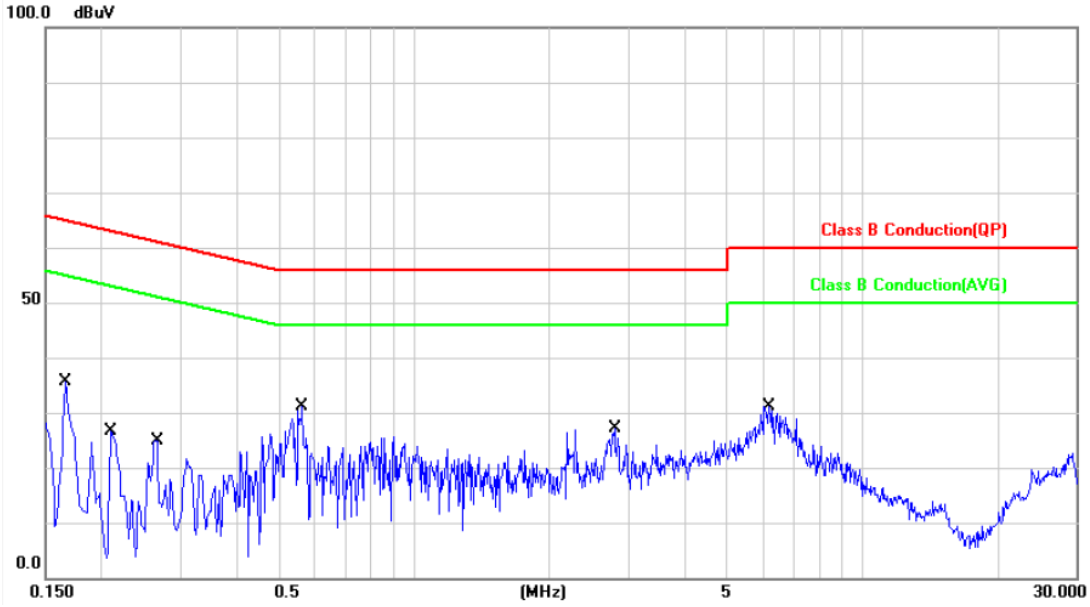
Power	:	AC 120V	Pol/Phase	:	LINE
Test Mode	:	Mode 1	Temperature	:	26 °C
Test date	:	Sep. 01, 2015	Humidity	:	48 %
Memo	:		Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1700	-0.02	29.08	29.06	64.96	-35.90	QP	P
2	0.1700	-0.02	13.41	13.39	54.96	-41.57	AVG	P
3	0.2140	-0.02	29.16	29.14	63.04	-33.90	QP	P
4	0.2140	-0.02	16.25	16.23	53.04	-36.81	AVG	P
5	0.5540	-0.04	28.22	28.18	56.00	-27.82	QP	P
6	0.5540	-0.04	17.73	17.69	46.00	-28.31	AVG	P
7	2.2700	-0.10	21.88	21.78	56.00	-34.22	QP	P
8	2.2700	-0.10	11.56	11.46	46.00	-34.54	AVG	P
9	2.8020	-0.11	29.62	29.51	56.00	-26.49	QP	P
10	2.8020	-0.11	19.25	19.14	46.00	-26.86	AVG	P
11	6.2140	-0.16	26.31	26.15	60.00	-33.85	QP	P
12	6.2140	-0.16	18.18	18.02	50.00	-31.98	AVG	P

Note: Level = Reading + Factor
Margin = Level – Limit

Power	:	AC 120V	Pol/Phase	:	NEUTRAL
Test Mode	:	Mode 1	Temperature	:	26 °C
Test date	:	Sep. 01, 2015	Humidity	:	48 %
Memo	:		Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1660	-0.02	28.41	28.39	65.15	-36.76	QP	P
2	0.1660	-0.02	11.78	11.76	55.15	-43.39	AVG	P
3	0.2100	-0.02	26.20	26.18	63.20	-37.02	QP	P
4	0.2100	-0.02	12.23	12.21	53.20	-40.99	AVG	P
5	0.2660	-0.02	23.14	23.12	61.24	-38.12	QP	P
6	0.2660	-0.02	11.29	11.27	51.24	-39.97	AVG	P
7	0.5620	-0.04	27.66	27.62	56.00	-28.38	QP	P
8	0.5620	-0.04	18.88	18.84	46.00	-27.16	AVG	P
9	2.8020	-0.11	27.22	27.11	56.00	-28.89	QP	P
10	2.8020	-0.11	15.32	15.21	46.00	-30.79	AVG	P
11	6.2100	-0.16	26.31	26.15	60.00	-33.85	QP	P
12	6.2100	-0.16	18.49	18.33	50.00	-31.67	AVG	P

Note: Level = Reading + Factor
Margin = Level – Limit

6. Test of Spurious Emission (Radiated)

6.1 Test Limit

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

6.2 Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.

b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.

c. The table was rotated 360 degrees to determine the position of the highest radiation.

d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.

f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.

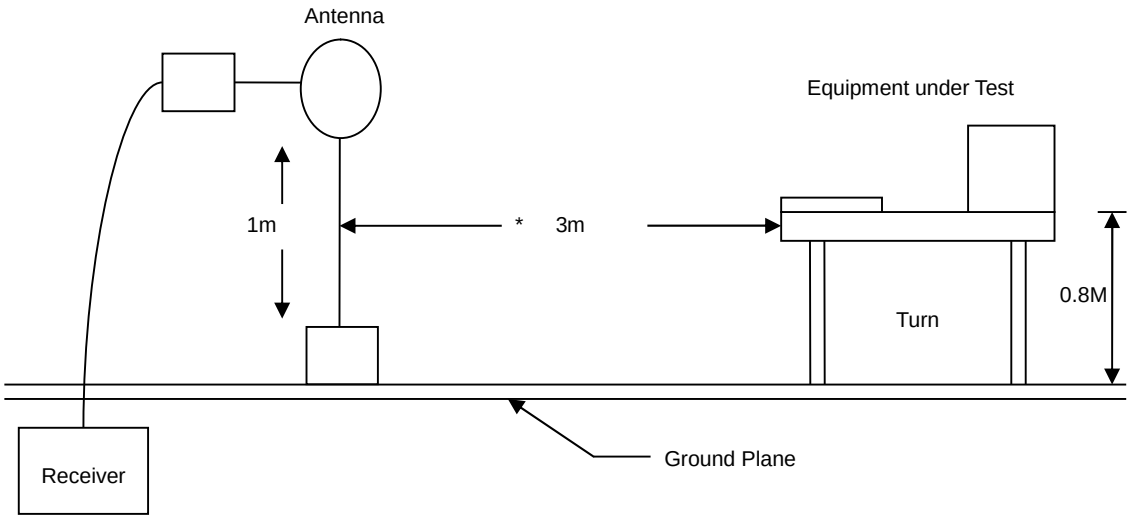
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

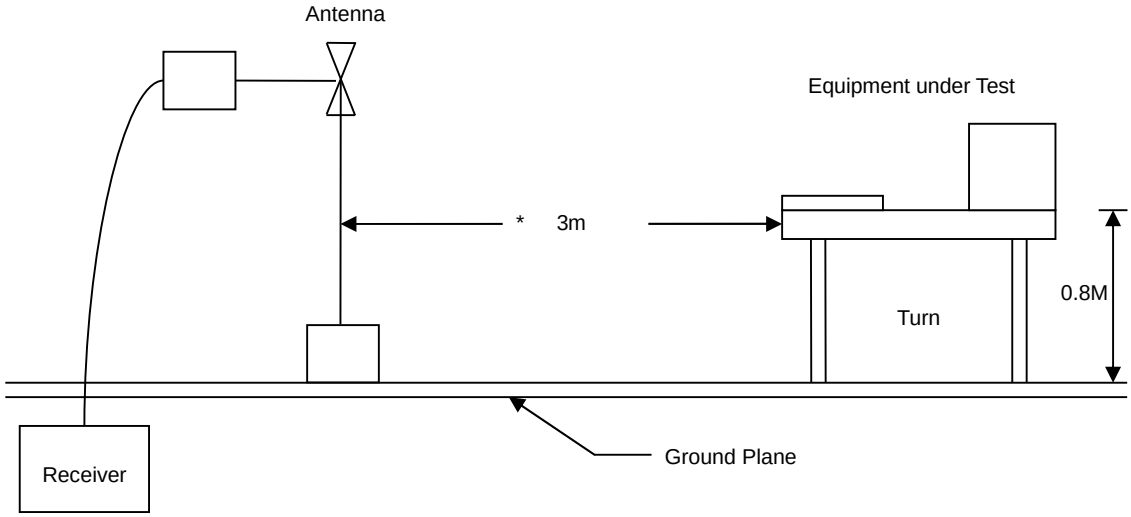
i. “Cone of radiation” has been considered to be 3dB bandwidth of the measurement antenna.

6.3 Typical Test Setup

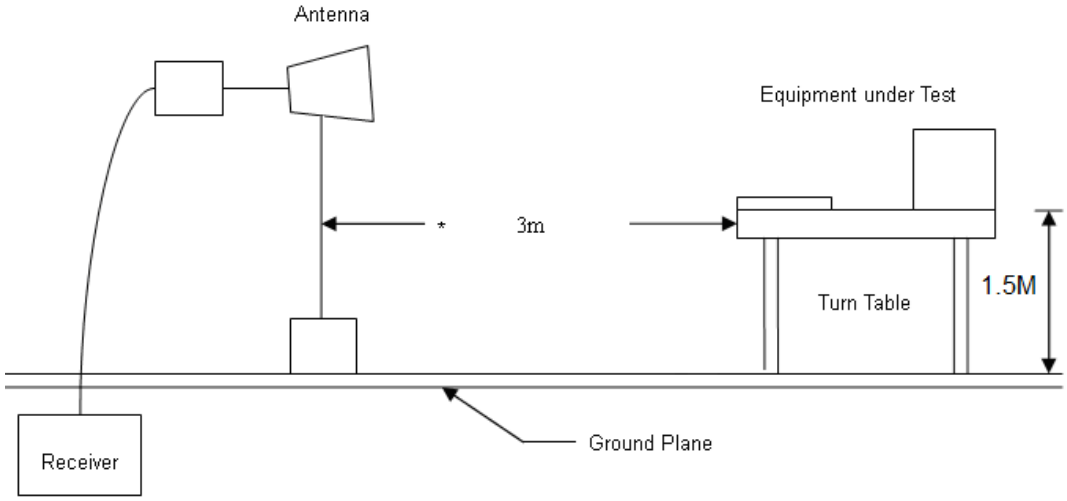
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



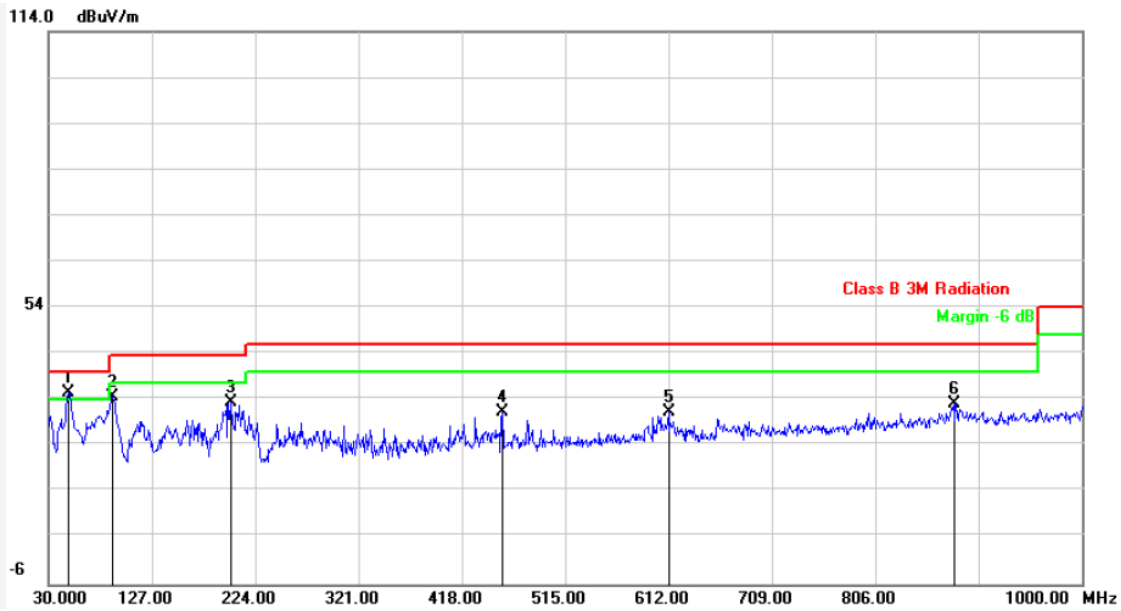
6.4 Test Result and Data (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

6.5 Test Result and Data (30MHz ~ 1GHz)

6.5.1 Test Result and Data of Transmitter

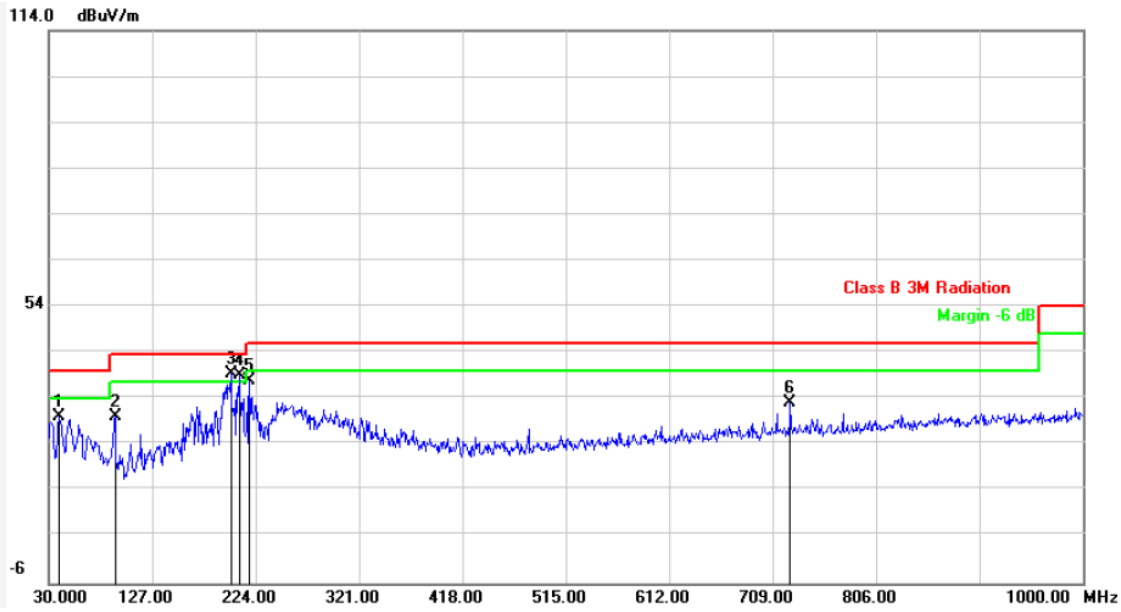
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test Date	:	Aug. 31, 2015	Humidity	:	49 %
Memo	:	CH 00	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	48.4300	-7.17	42.84	35.67	40.00	-4.33	peak	102	177	P
2	90.1400	-14.00	48.79	34.79	43.50	-8.71	peak	102	177	P
3	200.7200	-10.20	43.70	33.50	43.50	-10.00	peak	102	177	P
4	455.8300	-2.30	33.63	31.33	46.00	-14.67	peak	102	177	P
5	612.0000	0.92	30.44	31.36	46.00	-14.64	peak	102	177	P
6	879.7200	4.75	28.32	33.07	46.00	-12.93	peak	102	177	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test Date	:	Aug. 31, 2015	Humidity	:	49 %
Memo	:	CH 00	Atmospheric Pressure	:	1008 hpa

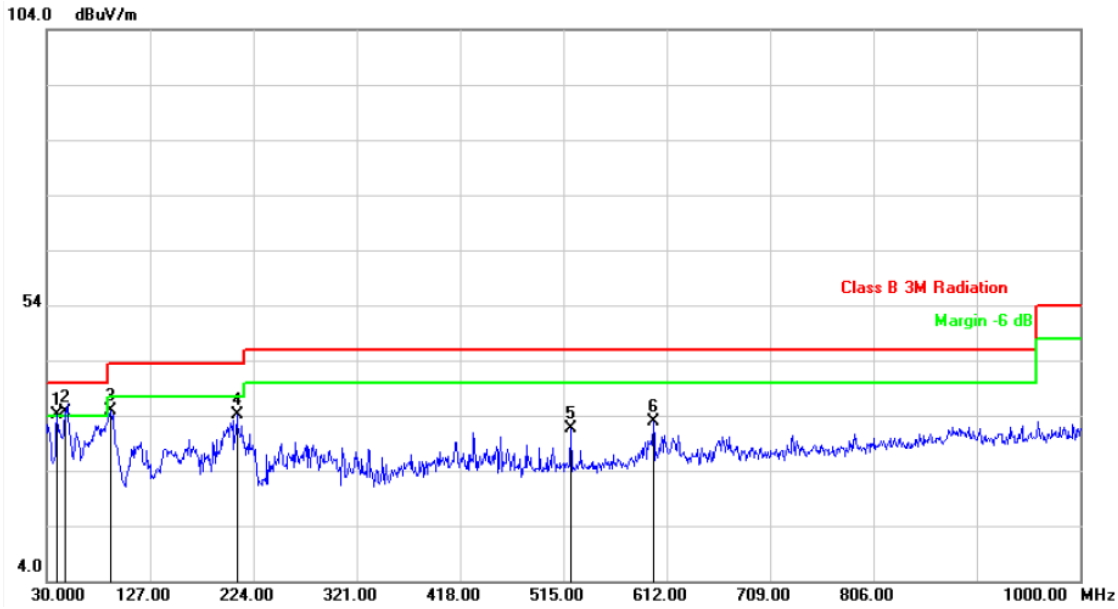


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	39.7000	-7.53	37.74	30.21	40.00	-9.79	peak	102	177	P
2	92.0800	-13.70	43.88	30.18	43.50	-13.32	peak	102	177	P
3	200.7200	-10.20	49.57	39.37	43.50	-4.13	peak	102	177	P
4	208.4800	-10.15	49.32	39.17	43.50	-4.33	peak	102	177	P
5	218.1800	-10.03	48.02	37.99	46.00	-8.01	peak	102	177	P
6	725.4900	2.42	30.87	33.29	46.00	-12.71	peak	102	177	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

6.5.2 Test Result and Data of Receiver

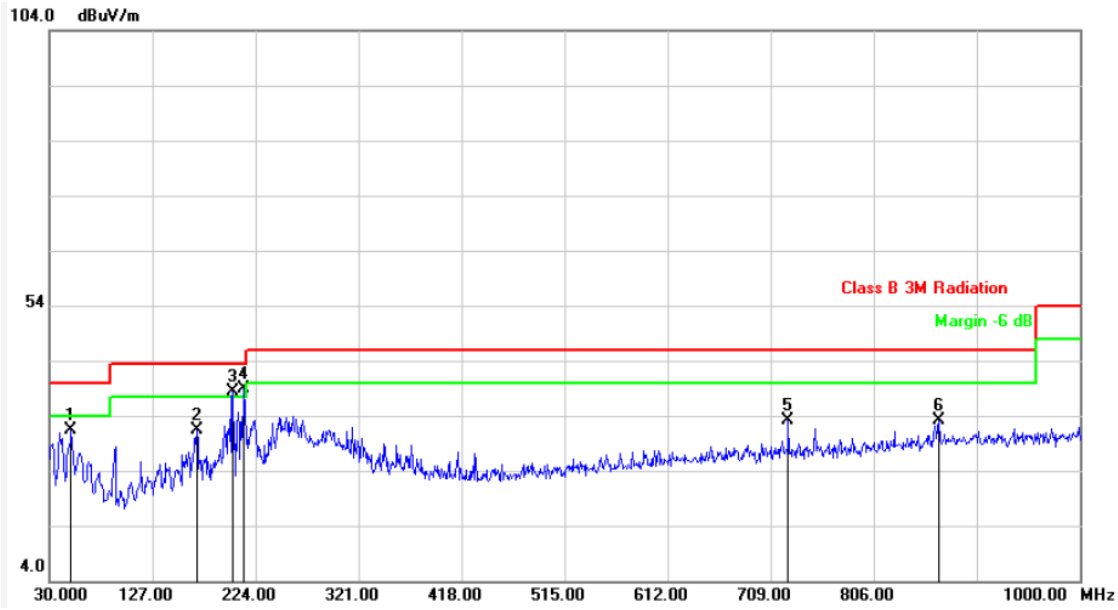
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test Date	:	Aug. 31, 2015	Humidity	:	49 %
Memo	:	CH 00	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	39.7000	-7.53	41.72	34.19	40.00	-5.81	peak	100	178	P
2	47.4600	-7.14	41.81	34.67	40.00	-5.33	peak	100	178	P
3	90.1400	-14.00	48.88	34.88	43.50	-8.62	peak	100	178	P
4	208.4800	-10.15	44.31	34.16	43.50	-9.34	peak	100	178	P
5	521.7900	-0.97	32.48	31.51	46.00	-14.49	peak	100	178	P
6	599.3900	0.80	32.17	32.97	46.00	-13.03	peak	100	178	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test Date	:	Aug. 31, 2015	Humidity	:	49 %
Memo	:	CH 00	Atmospheric Pressure	:	1008 hpa



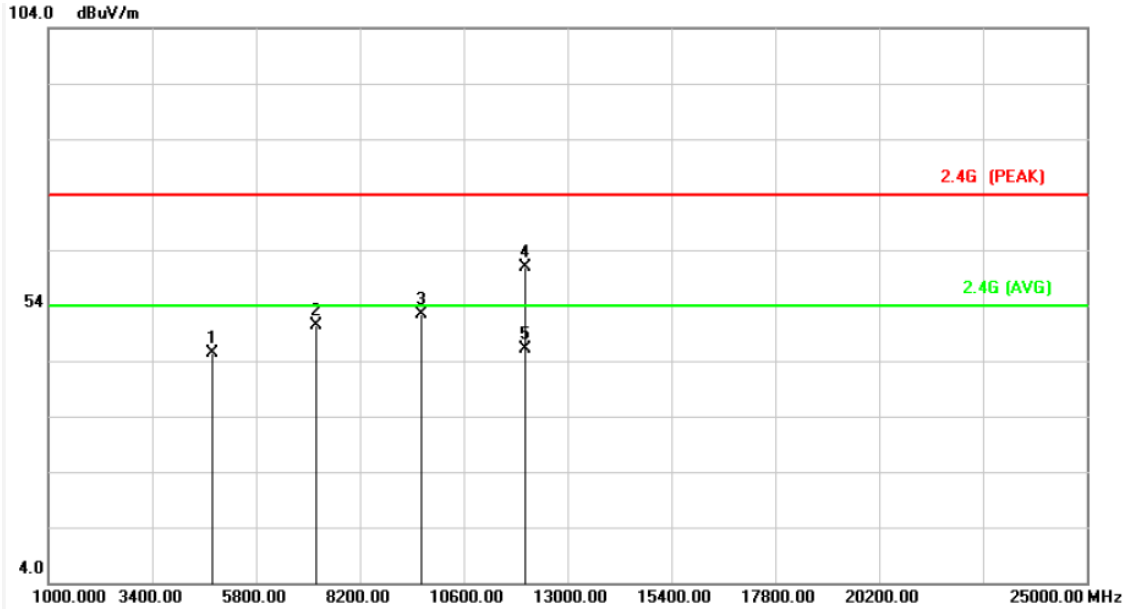
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	50.3700	-7.26	38.75	31.49	40.00	-8.51	peak	100	178	P
2	168.7100	-7.65	39.08	31.43	43.50	-12.07	peak	100	178	P
3	202.6600	-10.19	48.57	38.38	43.50	-5.12	peak	100	178	P
4	213.3300	-10.11	48.96	38.85	43.50	-4.65	peak	100	178	P
5	725.4900	2.42	30.62	33.04	46.00	-12.96	peak	100	178	P
6	867.1100	4.57	28.59	33.16	46.00	-12.84	peak	100	178	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

6.6 Test Result and Data (1GHz ~ 25GHz)

6.6.1 Test Result and Data of Transmitter

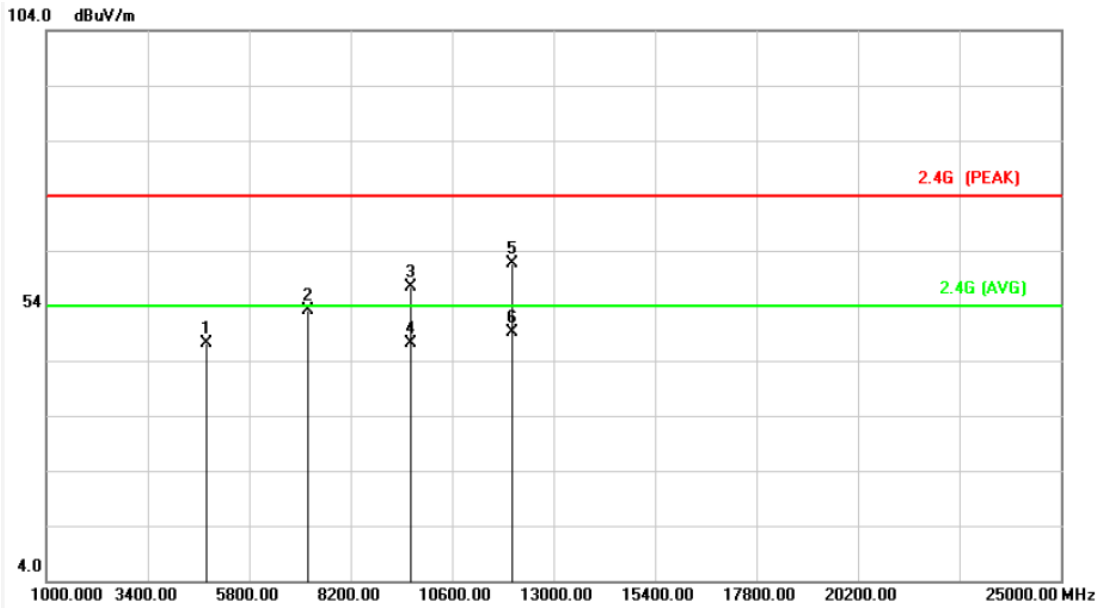
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 00	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4804.000	7.85	37.60	45.45	74.00	-28.55	peak	100	179	P
2	7206.000	13.01	37.39	50.40	74.00	-23.60	peak	100	179	P
3	9608.000	16.37	35.99	52.36	74.00	-21.64	peak	100	179	P
4	12010.000	20.20	40.61	60.81	74.00	-13.19	peak	100	179	P
5	12010.000	20.20	25.86	46.06	54.00	-7.94	AVG	100	179	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

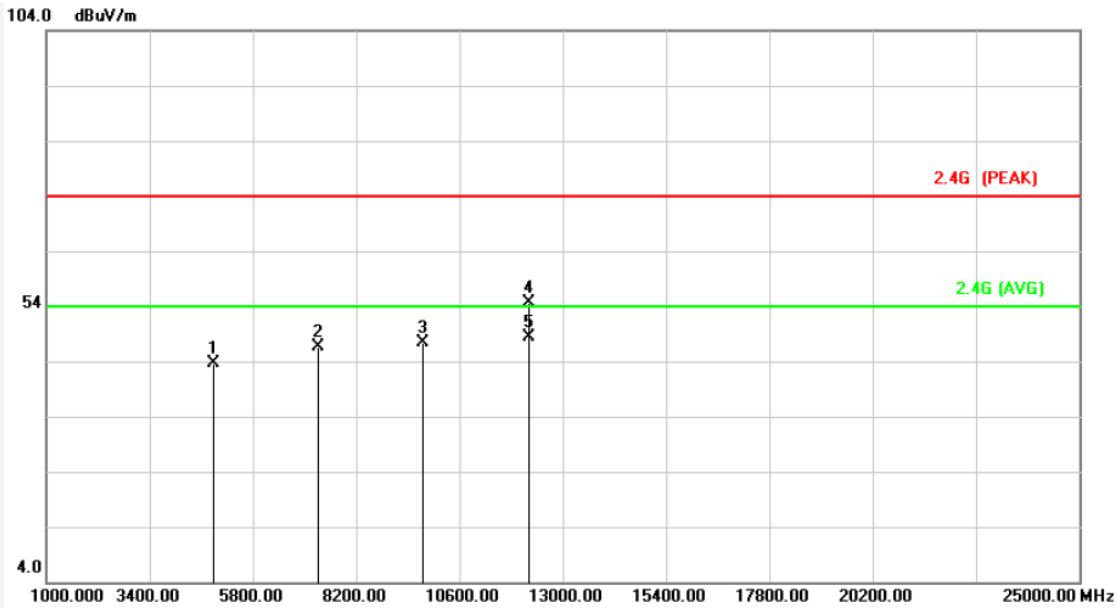
Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 00	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4804.000	7.85	39.35	47.20	74.00	-26.80	peak	100	179	P
2	7206.000	13.01	40.01	53.02	74.00	-20.98	peak	100	179	P
3	9608.000	16.37	41.08	57.45	74.00	-16.55	peak	100	179	P
4	9608.000	16.37	30.88	47.25	54.00	-6.75	AVG	100	179	P
5	12010.000	20.20	41.46	61.66	74.00	-12.34	peak	100	179	P
6	12010.000	20.20	29.01	49.21	54.00	-4.79	AVG	100	179	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor.

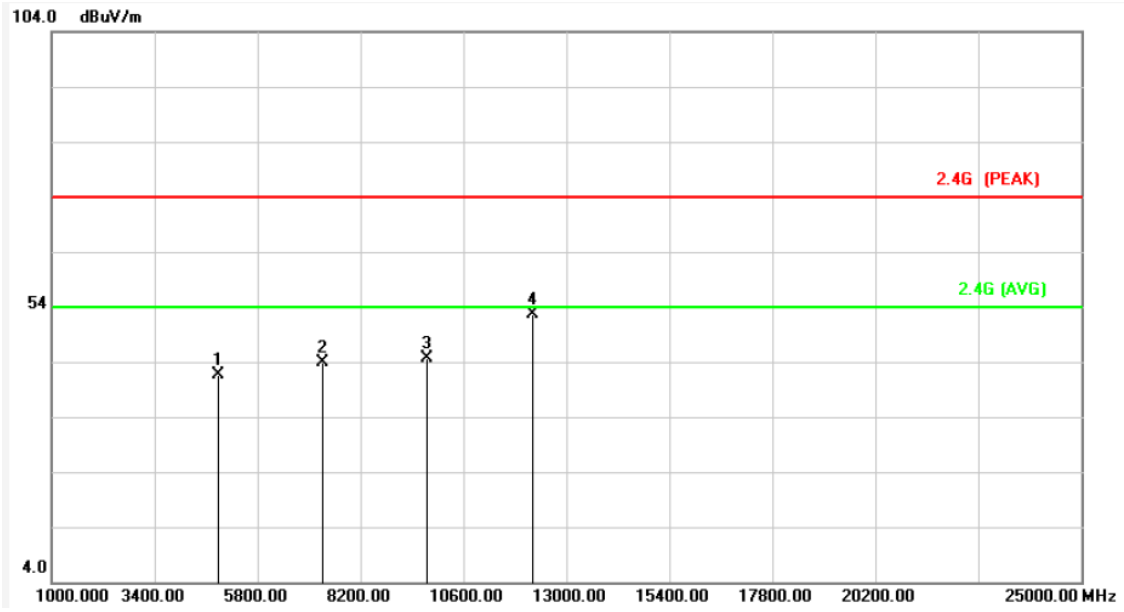
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 19	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4880.000	8.09	35.56	43.65	74.00	-30.35	peak	103	183	P
2	7320.000	13.41	33.20	46.61	74.00	-27.39	peak	103	183	P
3	9760.000	16.60	30.77	47.37	74.00	-26.63	peak	103	183	P
4	12200.000	20.22	34.40	54.62	74.00	-19.38	peak	103	183	P
5	12200.000	20.22	28.10	48.32	54.00	-5.68	AVG	103	183	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

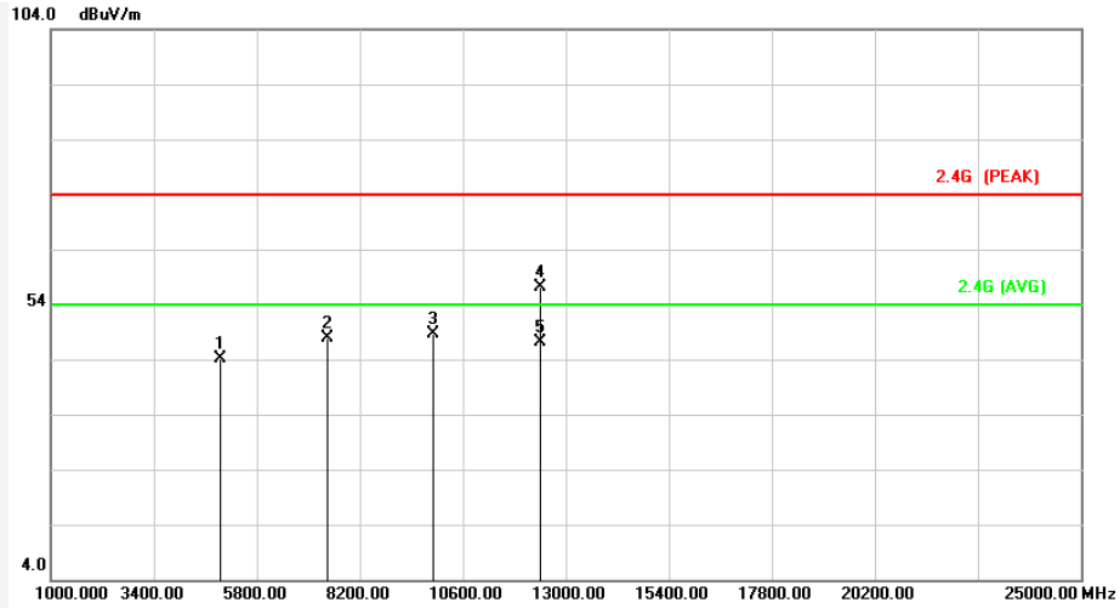
Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 19	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4880.000	8.09	33.42	41.51	74.00	-32.49	peak	105	183	P
2	7320.000	13.41	30.41	43.82	74.00	-30.18	peak	105	183	P
3	9760.000	16.60	28.14	44.74	74.00	-29.26	peak	105	183	P
4	12200.000	20.22	32.48	52.70	74.00	-21.30	peak	105	183	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor.

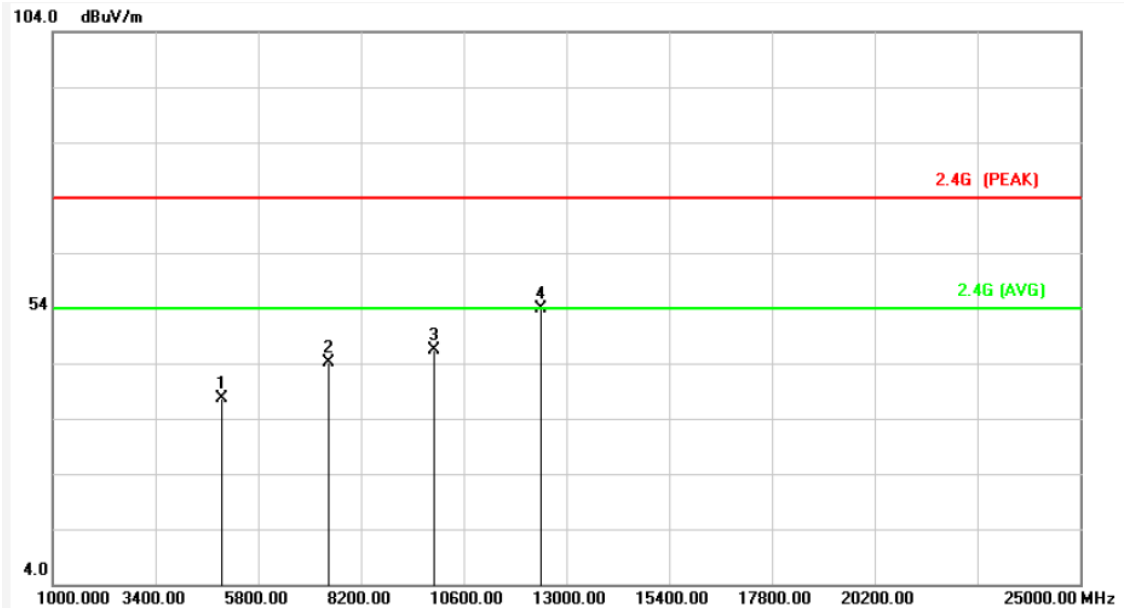
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 39	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4960.000	8.34	35.90	44.24	74.00	-29.76	peak	104	176	P
2	7440.000	13.84	34.11	47.95	74.00	-26.05	peak	104	176	P
3	9920.000	16.84	31.86	48.70	74.00	-25.30	peak	104	176	P
4	12400.000	20.25	36.89	57.14	74.00	-16.86	peak	104	176	P
5	12400.000	20.25	26.91	47.16	54.00	-6.84	AVG	104	176	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 39	Atmospheric Pressure	:	1008 hpa

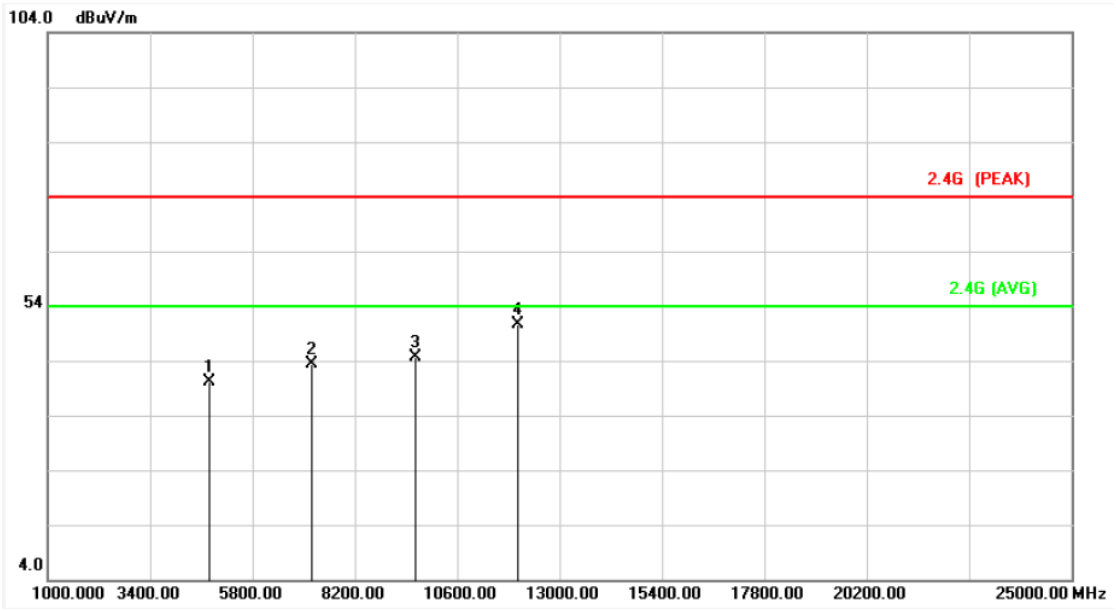


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4960.000	8.34	29.40	37.74	74.00	-36.26	peak	104	176	P
2	7440.000	13.84	30.38	44.22	74.00	-29.78	peak	104	176	P
3	9920.000	16.84	29.56	46.40	74.00	-27.60	peak	104	176	P
4	12400.000	20.25	33.62	53.87	74.00	-20.13	peak	104	176	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor.

6.6.2 Test Result and Data of Receiver

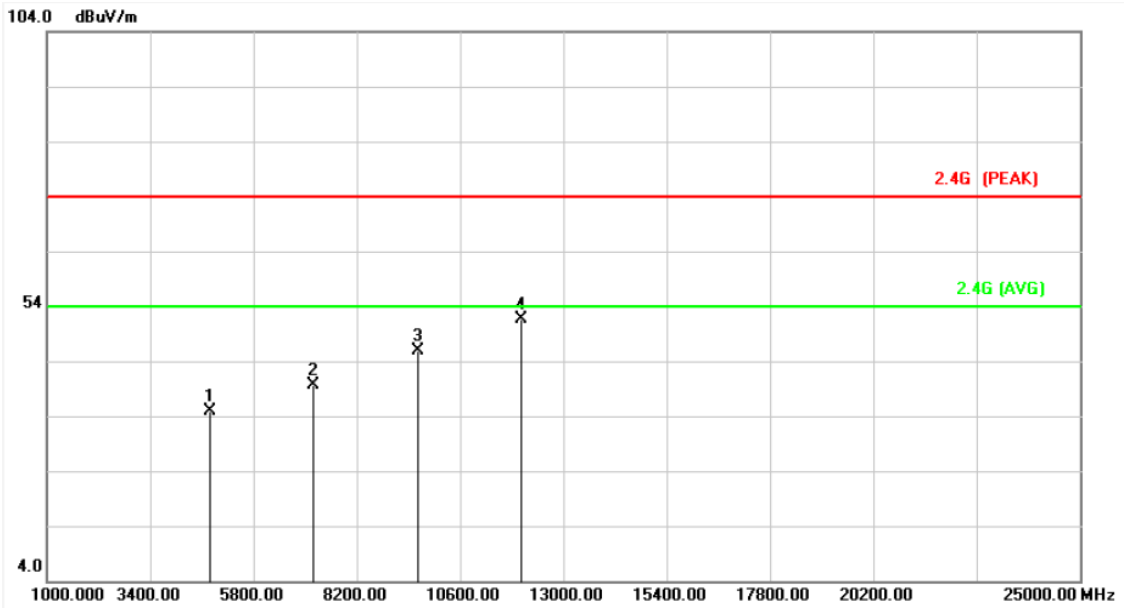
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 00	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4804.000	7.85	32.24	40.09	74.00	-33.91	peak	102	175	P
2	7206.000	13.01	30.41	43.42	74.00	-30.58	peak	102	175	P
3	9608.000	16.37	28.32	44.69	74.00	-29.31	peak	102	175	P
4	12010.000	20.20	30.45	50.65	74.00	-23.35	peak	102	175	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 00	Atmospheric Pressure	:	1008 hpa

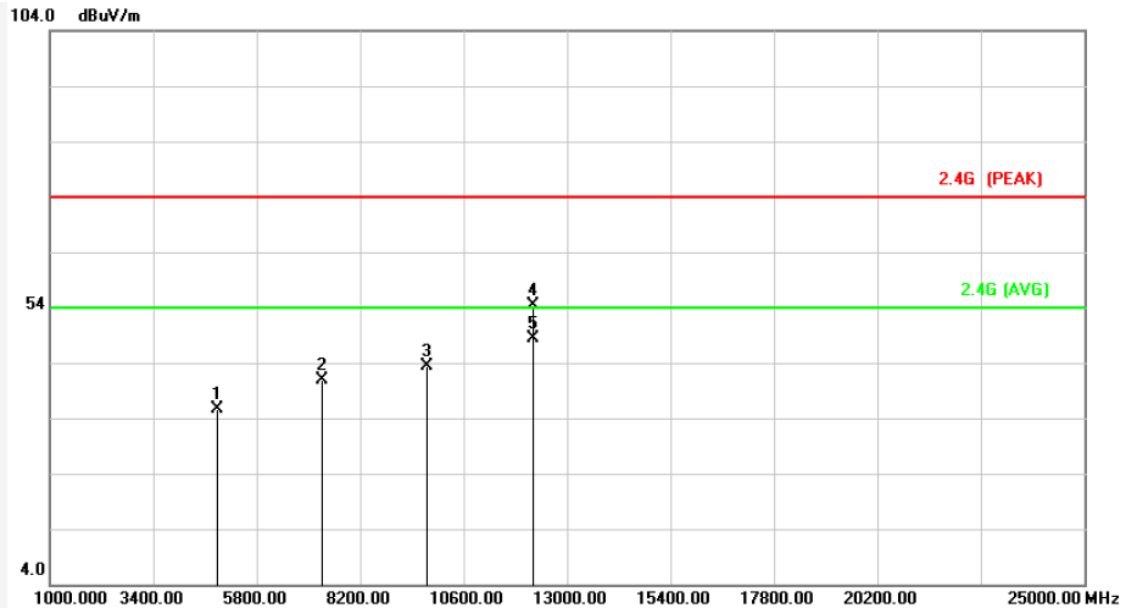


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4804.000	7.85	27.02	34.87	74.00	-39.13	peak	102	175	P
2	7206.000	13.01	26.70	39.71	74.00	-34.29	peak	102	175	P
3	9608.000	16.37	29.61	45.98	74.00	-28.02	peak	102	175	P
4	12010.000	20.20	31.51	51.71	74.00	-22.29	peak	102	175	P

Note: Level = Reading + Factor
Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor.

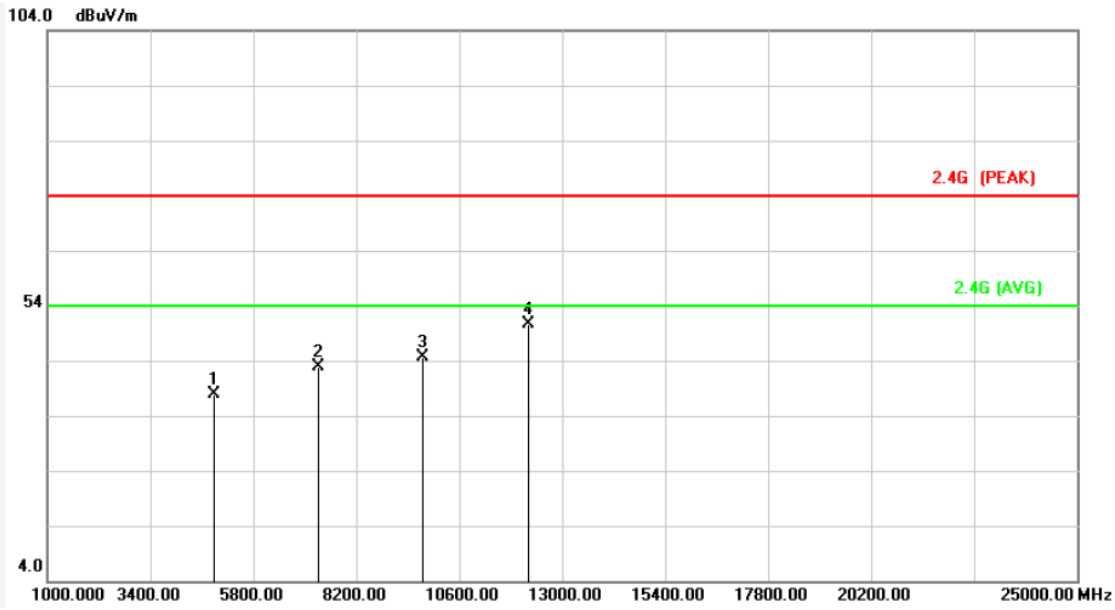
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 19	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4880.000	8.09	27.54	35.63	74.00	-38.37	peak	100	186	P
2	7320.000	13.41	27.57	40.98	74.00	-33.02	peak	100	186	P
3	9760.000	16.60	26.86	43.46	74.00	-30.54	peak	100	186	P
4	12200.000	20.22	34.27	54.49	74.00	-19.51	peak	100	186	P
5	12200.000	20.22	28.10	48.32	54.00	-5.68	AVG	100	186	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

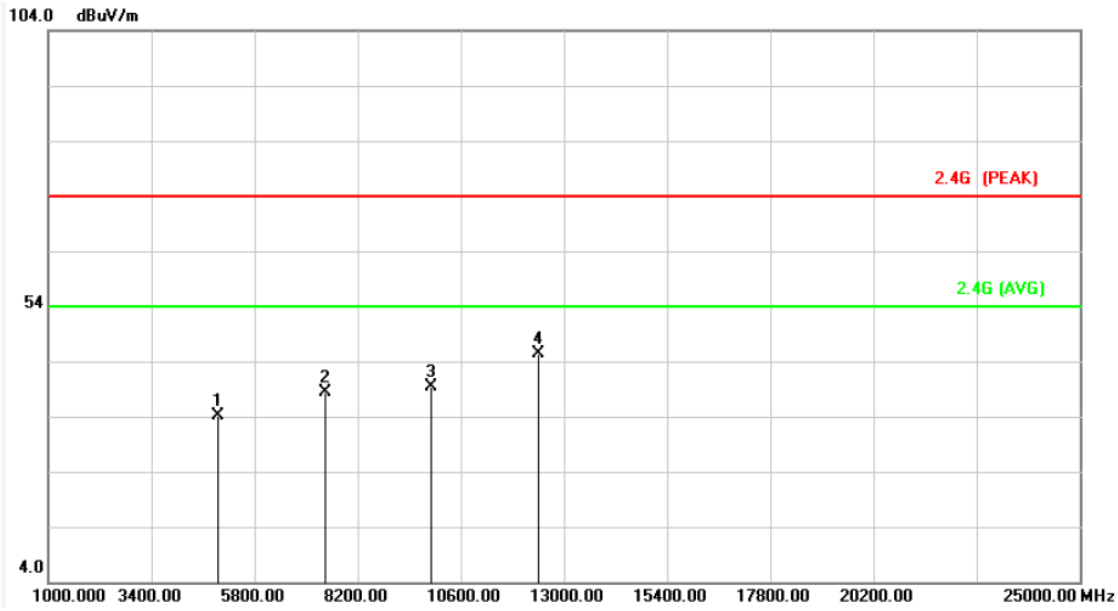
Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 19	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4880.000	8.09	29.79	37.88	74.00	-36.12	peak	100	186	P
2	7320.000	13.41	29.49	42.90	74.00	-31.10	peak	100	186	P
3	9760.000	16.60	27.96	44.56	74.00	-29.44	peak	100	186	P
4	12200.000	20.22	30.50	50.72	74.00	-23.28	peak	100	186	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor.

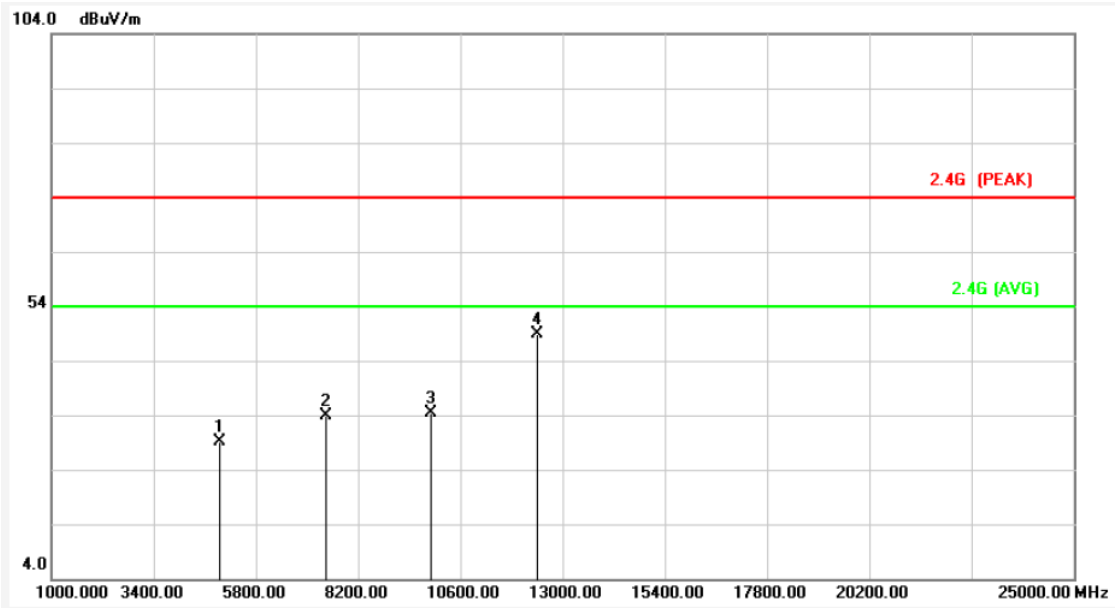
Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 39	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4960.000	8.34	25.68	34.02	74.00	-39.98	peak	104	178	P
2	7440.000	13.84	24.46	38.30	74.00	-35.70	peak	104	178	P
3	9920.000	16.84	22.59	39.43	74.00	-34.57	peak	104	178	P
4	12400.000	20.25	25.06	45.31	74.00	-28.69	peak	104	178	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1	Temperature	:	21.5 °C
Test date	:	Sep. 01, 2015	Humidity	:	49 %
Memo	:	CH 39	Atmospheric Pressure	:	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	4960.000	8.34	20.80	29.14	74.00	-44.86	peak	104	178	P
2	7440.000	13.84	19.95	33.79	74.00	-40.21	peak	104	178	P
3	9920.000	16.84	17.55	34.39	74.00	-39.61	peak	104	178	P
4	12400.000	20.25	28.52	48.77	74.00	-25.23	peak	104	178	P

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor.

6.7 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.250
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

**: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

6.8 Restrict Band Emission Measurement Data

Test Date: Sep. 01, 2015 Temperature: 21.5 ℃

Atmospheric pressure: 1008 hPa Humidity: 49 %

Modulation Standard: GFSK

Channel 00						Fundamental Frequency: 2402 MHz				
Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV)	Corrected Factor (dB)	Result (dBuV/m)	Remark	Limit (dBuV/m)		Margin (dB)	Table Deg.	Ant High (m)
						Peak	Ave			
2496.836	V	47.41	-1.14	46.27	Peak	74	54	-27.73	187	1.00
---	V	---	---	---	Ave	74	54	---	---	---
2362.268	H	46.96	-1.09	45.87	Peak	74	54	-28.13	187	1.00
---	H	---	---	---	Ave	74	54	---	---	---
Channel 39						Fundamental Frequency: 2480 MHz				
Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV)	Corrected Factor (dB)	Result (dBuV/m)	Remark	Limit (dBuV/m)		Margin (dB)	Table Deg.	Ant High (m)
						Peak	Ave			
2492.480	V	50.40	-0.58	49.82	Peak	74	54	-24.18	181	1.02
---	V	---	---	---	Ave	74	54	---	---	---
2560.160	V	51.05	-0.26	50.79	Peak	74	54	-23.21	181	1.02
---	V	---	---	---	Ave	74	54	---	---	---
2580.200	V	51.40	-0.16	51.24	Peak	74	54	-22.76	181	1.02
---	V	---	---	---	Ave	74	54	---	---	---
2600.000	V	51.96	-0.05	51.91	Peak	74	54	-22.09	181	1.02
---	V	---	---	---	Ave	74	54	---	---	---
2515.880	H	47.09	-0.48	46.61	Peak	74	54	-27.39	181	1.02
---	H	---	---	---	Ave	74	54	---	---	---

Notes:

1. Result = Meter Reading + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3 MHz (detector peak mode) for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3 MHz (detector sample mode) for Average detection at frequency above 1GHz

7. Test of Spurious Emission (Conducted)

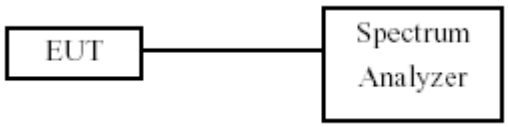
7.1 Test Limit

Below –20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

7.2 Test Procedure

a. The transmitter output was connected to the spectrum analyzer via a low lose cable.
b. Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
c. Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20dB relative to the maximum measured in-band peak PSD level.
d. The band edges was measured and recorded.

7.3 Test Setup Layout



7.4 Test Result and Data

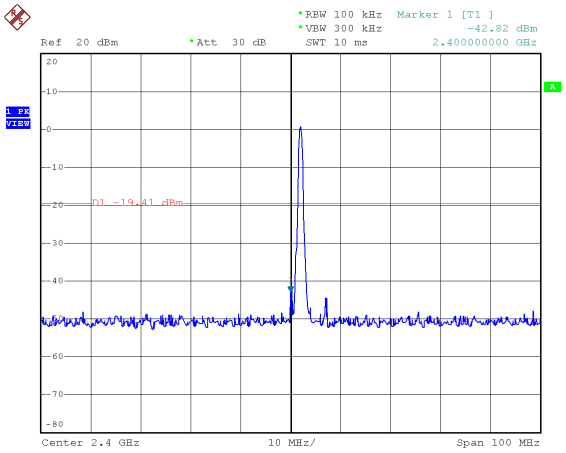
Test Date: Aug. 12, 2015 Temperature: 23℃

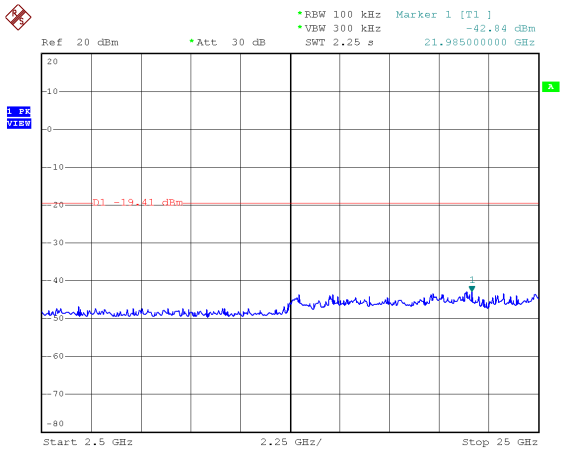
Atmospheric pressure: 1051hPa Humidity: 53%

Test Result: PASS

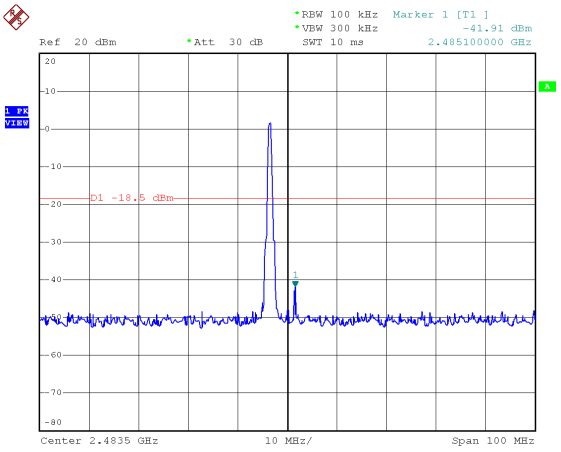
Note: Test plots refers to the following pages

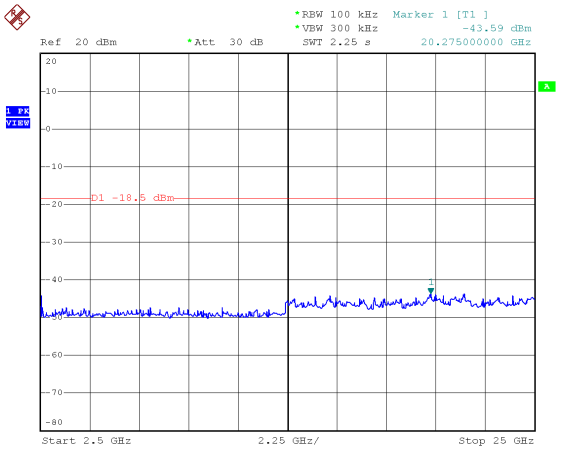
Modulation Type: GFSK(1Mbps)
CH0





CH39





8. Occupied Bandwidth Measurement Data

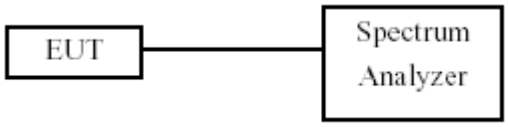
8.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

8.2 Test Procedures

a. The transmitter output was connected to the spectrum analyzer.
b. Set RBW of spectrum analyzer to 1~5% of the emission bandwidth and VBW ≥ 3x RBW.
c. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.
d. The 6dB Bandwidth was measured and recorded.

8.3 Test Setup Layout



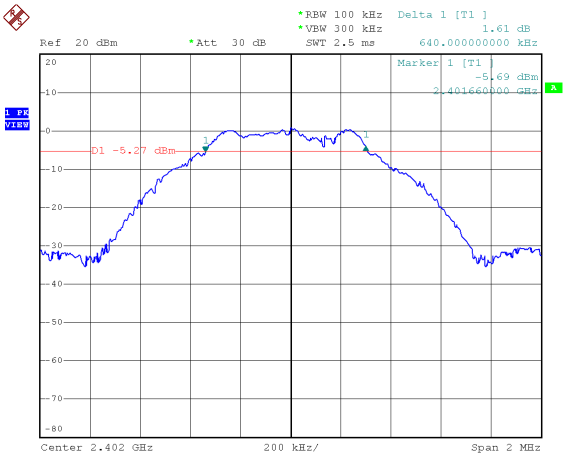
8.4 Test Result and Data

Test Date: Aug. 12, 2015 Temperature: 23℃

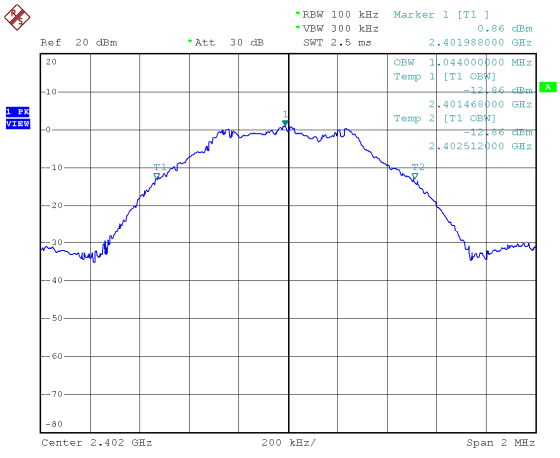
Atmospheric pressure: 1051hPa Humidity: 53%

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (KHz)	Occupied Bandwidth (kHz)
GFSK	00	2402	640.000	1044.000
	19	2441	648.000	1052.000
	39	2480	652.000	1052.000

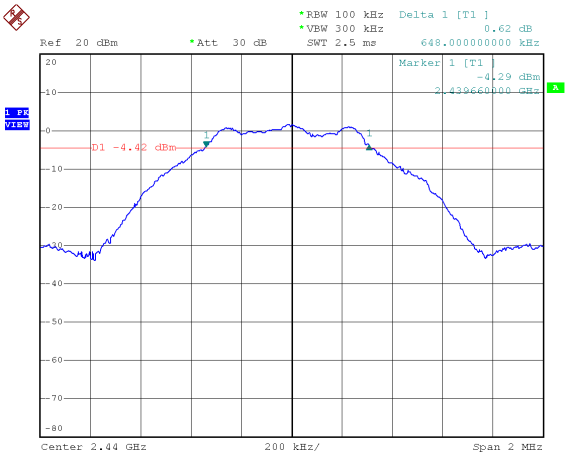
6dB Bandwidth:
Modulation Type: GFSK(1Mbps), CH0



99% Occupied Bandwidth:
Modulation Type: GFSK(1Mbps), CH0



CH19



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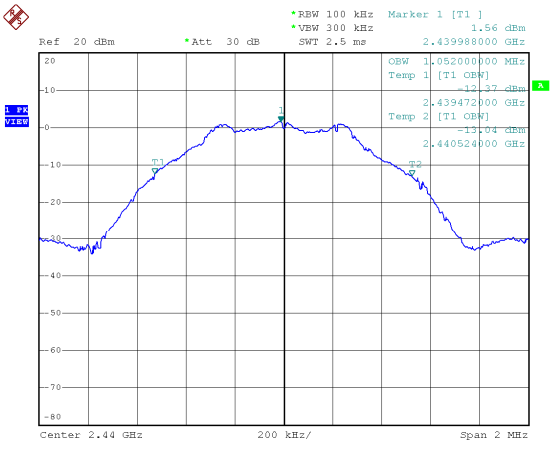
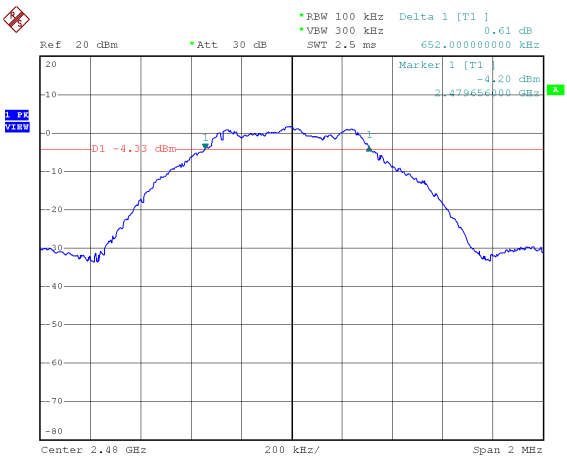


CH39



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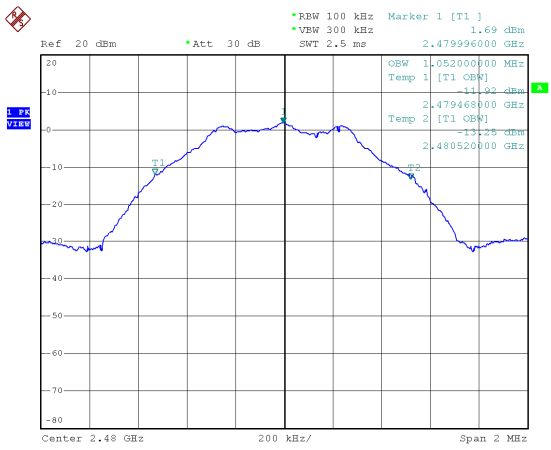


9. Maximum Peak and Average Output Power

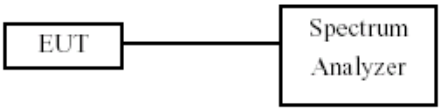
9.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

9.2 Test Procedures

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

9.3 Test Setup Layout



9.4 Test Result and Data

Test Date: Aug. 12, 2015 Temperature: 23℃

Atmospheric pressure: 1051hPa Humidity: 53%

Modulation Standard	Channel	Frequency (MHz)	Power Output (dBm)		Peak Power Output (mW)	
			Peak	AVG.	Peak	AVG.
GFSK	00	2402	1.84	-0.22	1.528	0.951
	19	2440	2.53	0.48	1.791	1.117
	39	2480	2.77	0.72	1.892	1.180

10. Power Spectral Density

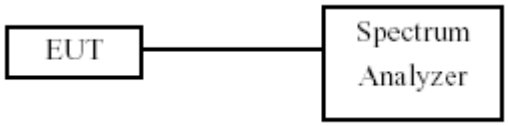
10.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm.

10.2 Test Procedures

a. The transmitter output was connected to spectrum analyzer.
b. The spectrum analyzer's resolution bandwidth were set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
c. The power spectral density was measured and recorded.

10.3 Test Setup Layout



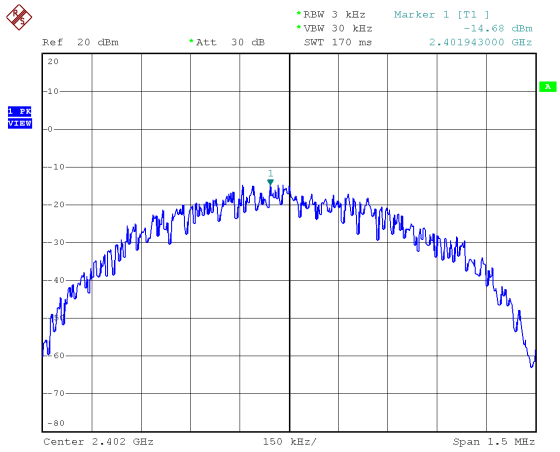
10.4 Test Result and Data

Test Date: Aug. 12, 2015 Temperature: 23℃

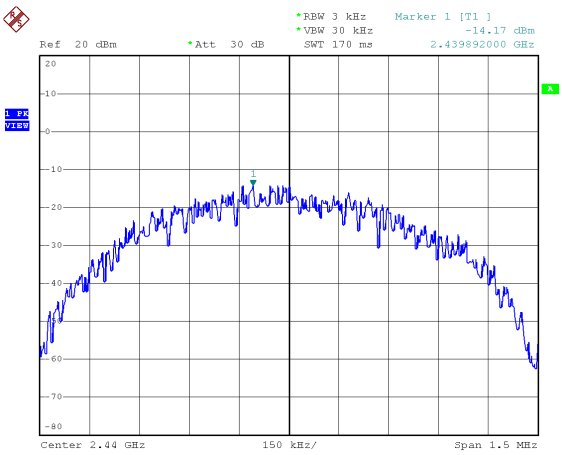
Atmospheric pressure: 1051hPa Humidity: 53%

Modulation Standard	Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)
GFSK	00	2402	-14.68
	19	2440	-14.17
	39	2480	-13.84

Modulation Type: GFSK(1Mbps), CH0



CH19



CH39