



FCC RADIO TEST REPORT

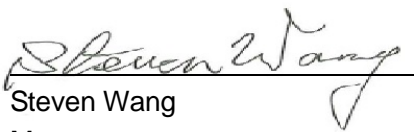
Applicant : Rosonix Technology, Inc.
Address : 10F, No.235, Section 4, Chengde Road,
Shihlin District, Taipei, Taiwan
Equipment : Wireless Smart Gateway
Model No. : RSG-3000
Trade Name : Rosonix
FCC ID : YUDRSG3000


I HEREBY CERTIFY THAT :

The sample was received on Mar. 19, 2015 and the testing was carried out on Jul. 29, 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:

Tested by:


Steven Wang
Manager


Aiden Lu
Engineer

Laboratory Accreditation:

☒ Cerpass Technology Corporation Test Laboratory



☐ Cerpass Technology(SuZhou) Co., Ltd.





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☐ Additional attachment as following record:

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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

FCC Rule	Description of Test	Result
15.203	. Antenna Requirement	Pass
15.207	. AC Power Line Conducted Emission	Pass
15.209 15.205	. Spurious Emission(Radiated)	Pass
15.247(d)	. Spurious Emission(Conducted)	Pass
15.247(a)(2)	. 6dB Bandwidth	Pass
15.247(b)	. Maximum Peak Output Power	Pass
15.247(e)	. Power Spectral Density	Pass

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



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Memory	FLASH: 8MB DRAM: 64MB
Operating system	Embedded Linux
I/O Interface	USB: USB 2.0 port Ethernet: 10/10Mbps Auto-MDI/MDI-X RJ-45 ethernet port Reset button MicroSD eject button Application button Power jack MicroSD LED indicator WLAN LED indicator ZigBee LED indicator Application 7 color LED ring indicator
ZigBee	Fully IEEE 802.15.4 / ZigBee PRO compliant Frequency range: 2400 ~ 2483GHz Support 16 channels in 2.4GHz ISM band Support AES-128bit hardware encryption Antenna Type: Printed Antenna Antenna Gain: 3.74dBi
Wireless LAN	Compliant with IEEE 802.11 b/g/n standards Frequency range: 2400 ~ 2483GHz Up to 300Mbps wireless transmission rate Wireless security with WPA2-PSK support 2T2R internal antenna Antenna Type: PIFA Antenna Antenna Gain: ANT 0: 2.37dBi ; ANT 1: 2.15dBi Support both AP mode and CLIENT mode
Power	Brand: TOPCOM Model: TC-92 Input: AC 100-240V 50/60Hz 0.3A Output: DC 5V 2.1A
Dimension	120mm (W) x 120mm (D) x 36mm (H)



2.2 Carrier Frequency of Channels

Channel	Frequency(MHz)	Channel	Frequency(MHz)
*0b	2405	*13	2445
0c	2410	14	2450
0d	2415	15	2455
0e	2420	16	2460
0f	2425	17	2465
10	2430	18	2470
11	2435	19	2475
12	2440	*1a	2480

Note: Channels remarked * are selected to perform test.

2.3 Test Mode and Test Software

- During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- The complete test system included Notebook and EUT for RF test.
- An executive program, "picocom" under WIN XP was executed to transmit and receive data via WLAN.
- The following test mode was performed for conduction and radiation test:
O-QPSK: CH0b: 2405MHz, CH13: 2445MHz, CH1a: 2480MHz

2.4 Description of Test System

Device	Manufacturer	Model No.	Description
Notebook	DELL	VSTRO3560	Power Cable, Unshielding, 1.8m

Used cable

Cable	Quantity	Description
RJ45	1	Unshielding, 2.0m



2.5 General Information of Test

<input checked="" type="checkbox"/>	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	4934B-1, 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
<input type="checkbox"/>	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 25000MHz
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
EMI RECEIVER	R&S	ESCI 3	101423	2015/04/09	2016/04/08
LISN	Schwarzbeck	NSLK 8127	8127-740	2014/08/14	2015/08/13
LISN	Schwarzbeck	NSLK 8127	8127-516	2015/03/09	2016/03/08
PULSE LIMITER	R&S	ESH3-Z2	101934	2015/03/05	2016/03/04
EMI RECEIVER	R&S	ESCI 3	100443	2015/03/30	2016/03/29
BILOG ANTENNA	Schwarzbeck	VULB 9168	275	2014/09/18	2015/09/17
AMPLIFIER	QuieTek	AP/0100A	CHM0906075	2014/09/17	2015/09/16
SPECTRUM ANALYZER	R&S	FSP40	100219	2014/09/03	2015/09/02
HORN ANTENNA	EMCO	3115	31589	2015/03/09	2016/03/08
PREAMPLIFIER	AGILENT	8449B	3008A01954	2015/03/05	2016/03/04
HORN ANTENNA	EMCO	3116	31970	2015/03/05	2016/03/04
HORN ANTENNA	EMCO	3116	31974	2014/09/03	2015/09/02
SPECTRUM ANALYZER	R&S	FSP40	100047	2015/03/07	2016/03/06
PREAMPLIFIER	AGILENT	8449B	3008A01954	2015/03/05	2016/03/04
HIGH PASS FILTER	HP	84300-80038	002	N/A	N/A
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

Antenna Type	Antenna Gain
Printed Antenna	3.74dBi



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

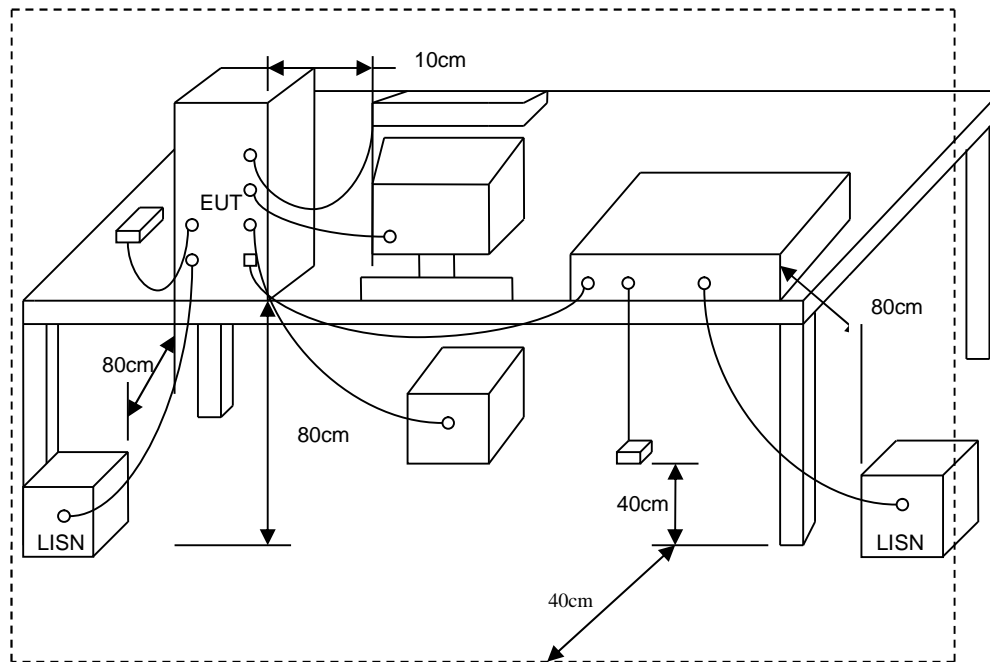
*Decreases with the logarithm of the frequency.

5.2 Test Procedures

- 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.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



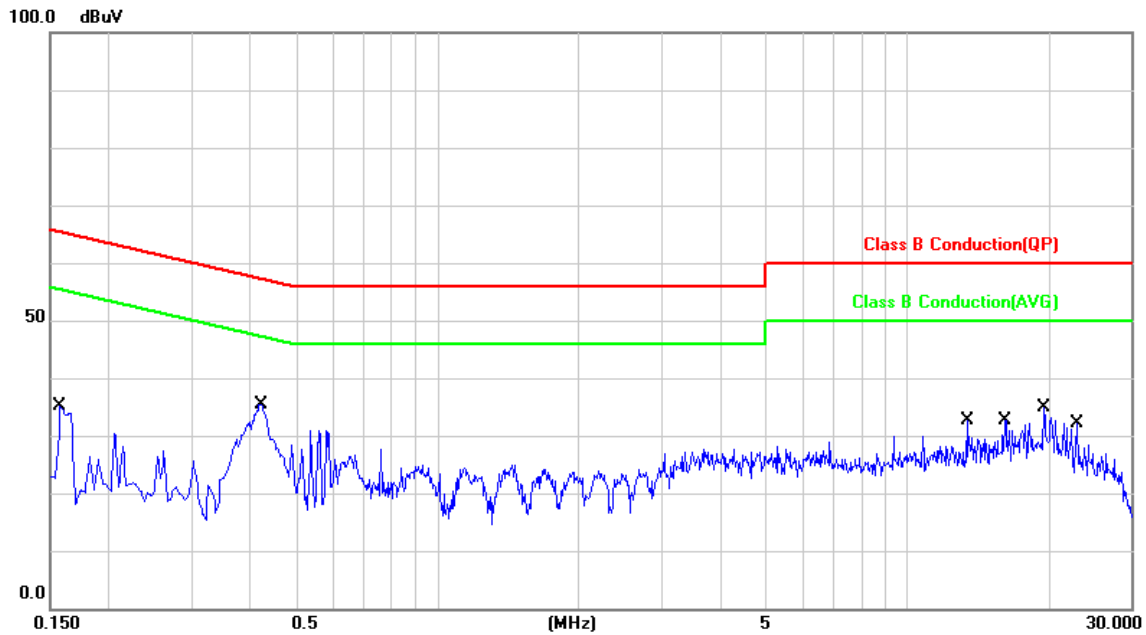
5.3 Typical Test Setup





5.4 Test Result and Data

Power	: AC 120V	Pol/Phase	: LINE
Test Mode 1	: O-QPSK, CH0b	Temperature	: 26 °C
Test Date	: Jul. 30, 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	0.1580	9.92	22.25	32.17	65.56	-33.39	QP	P
2	0.1580	9.92	8.49	18.41	55.56	-37.15	AVG	P
3	0.4220	9.91	24.24	34.15	57.41	-23.26	QP	P
4	0.4220	9.91	20.99	30.90	47.41	-16.51	AVG	P
5	13.4180	10.03	18.81	28.84	60.00	-31.16	QP	P
6	13.4180	10.03	13.77	23.80	50.00	-26.20	AVG	P
7	16.1700	10.07	18.93	29.00	60.00	-31.00	QP	P
8	16.1700	10.07	13.69	23.76	50.00	-26.24	AVG	P
9	19.5860	10.12	19.77	29.89	60.00	-30.11	QP	P
10	19.5860	10.12	14.92	25.04	50.00	-24.96	AVG	P
11	23.1259	10.19	20.76	30.95	60.00	-29.05	QP	P
12	23.1259	10.19	17.35	27.54	50.00	-22.46	AVG	P

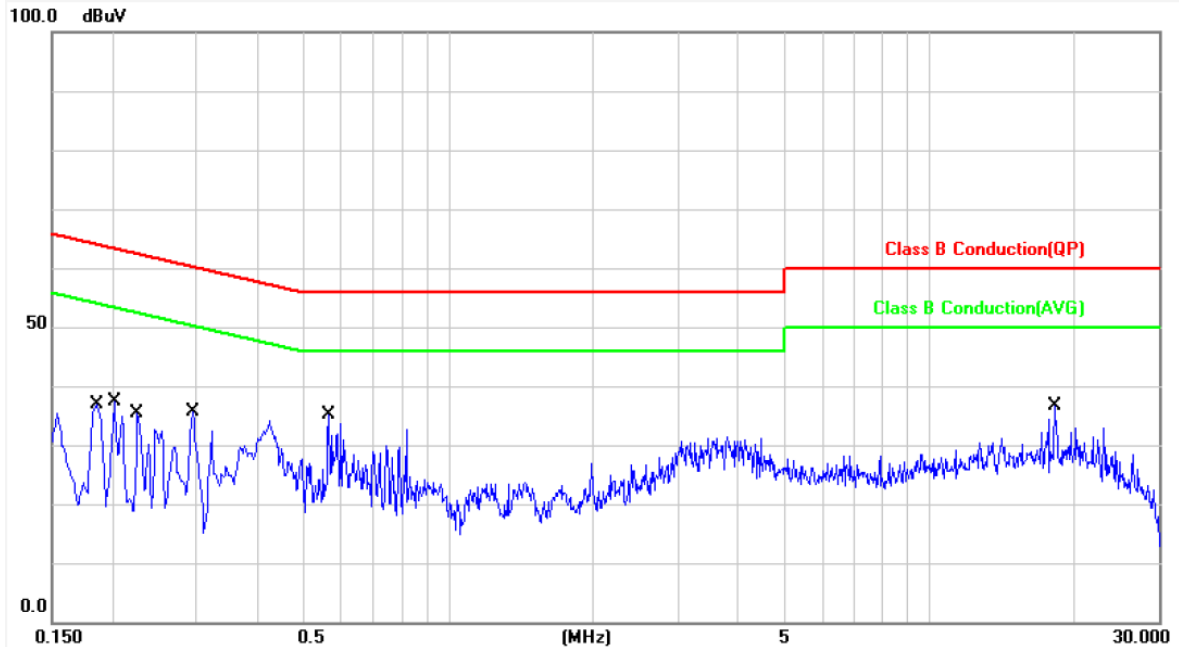
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode 1	: O-QPSK, CH0b	Temperature	: 26 °C
Test Date	: Jul. 30, 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	0.1860	9.91	25.17	35.08	64.21	-29.13	QP	P
2	0.1860	9.91	10.37	20.28	54.21	-33.93	AVG	P
3	0.2020	9.91	21.19	31.10	63.52	-32.42	QP	P
4	0.2020	9.91	7.96	17.87	53.52	-35.65	AVG	P
5	0.2260	9.91	19.24	29.15	62.59	-33.44	QP	P
6	0.2260	9.91	6.98	16.89	52.59	-35.70	AVG	P
7	0.2940	9.90	9.98	19.88	60.41	-40.53	QP	P
8	0.2940	9.90	5.07	14.97	50.41	-35.44	AVG	P
9	0.5660	9.89	21.86	31.75	56.00	-24.25	QP	P
10	0.5660	9.89	9.96	19.85	46.00	-26.15	AVG	P
11	18.2420	10.13	24.32	34.45	60.00	-25.55	QP	P
12	18.2420	10.13	19.41	29.54	50.00	-20.46	AVG	P

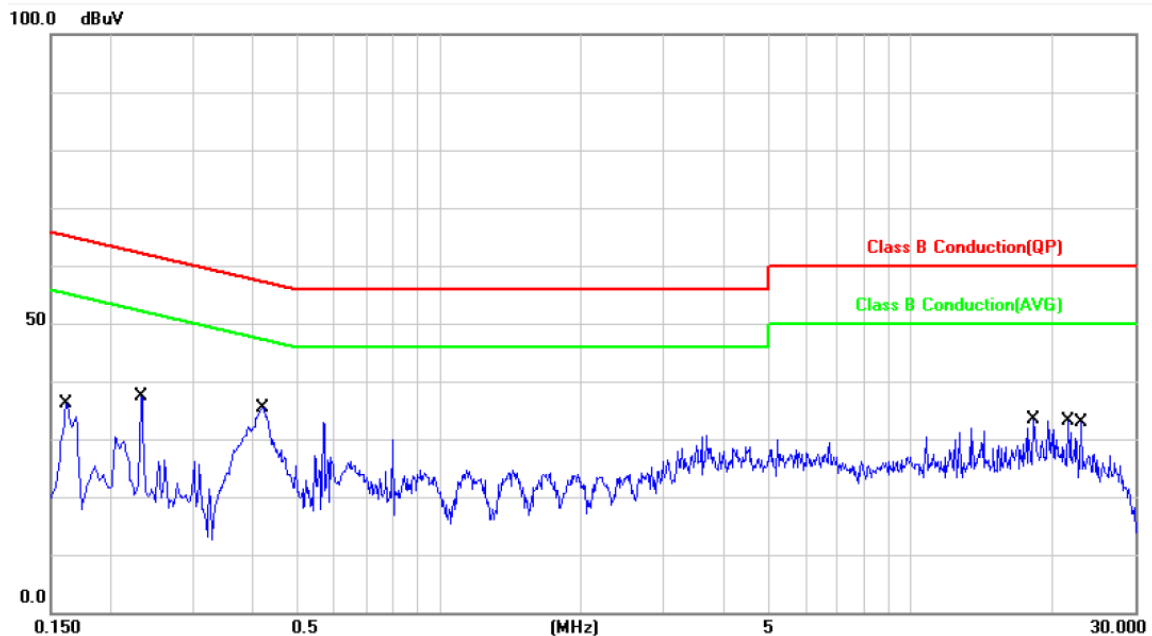
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



Power	: AC 120V	Pol/Phase	: LINE
Test Mode 2	: O-QPSK, CH13	Temperature	: 26 °C
Test Date	: Jul. 30, 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	0.1620	9.92	20.85	30.77	65.36	-34.59	QP	P
2	0.1620	9.92	7.14	17.06	55.36	-38.30	AVG	P
3	0.2340	9.92	14.36	24.28	62.30	-38.02	QP	P
4	0.2340	9.92	6.60	16.52	52.30	-35.78	AVG	P
5	0.4220	9.91	24.37	34.28	57.41	-23.13	QP	P
6	0.4220	9.91	21.12	31.03	47.41	-16.38	AVG	P
7	18.2460	10.10	21.51	31.61	60.00	-28.39	QP	P
8	18.2460	10.10	16.65	26.75	50.00	-23.25	AVG	P
9	21.6620	10.16	21.59	31.75	60.00	-28.25	QP	P
10	21.6620	10.16	17.71	27.87	50.00	-22.13	AVG	P
11	23.1299	10.19	21.27	31.46	60.00	-28.54	QP	P
12	23.1299	10.19	17.78	27.97	50.00	-22.03	AVG	P

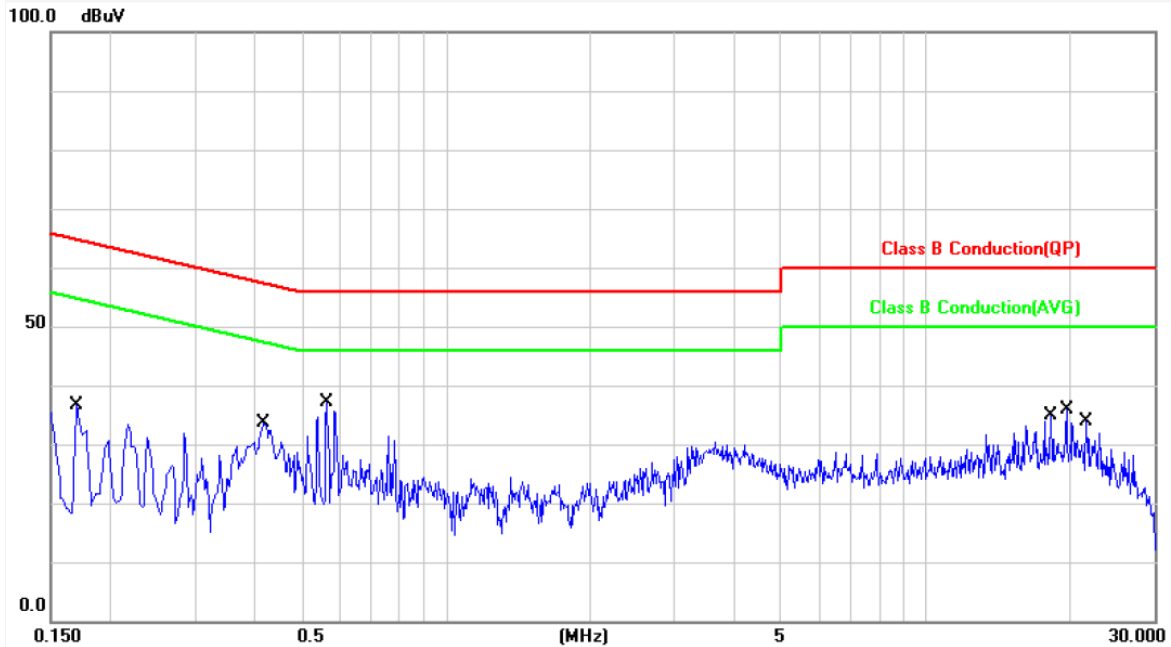
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode 2	: O-QPSK, CH13	Temperature	: 26 °C
Test Date	: Jul. 30, 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	9.92	23.39	33.31	64.96	-31.65	QP	P
2	0.1700	9.92	9.44	19.36	54.96	-35.60	AVG	P
3	0.4180	9.90	22.10	32.00	57.49	-25.49	QP	P
4	0.4180	9.90	17.42	27.32	47.49	-20.17	AVG	P
5	0.5660	9.89	17.40	27.29	56.00	-28.71	QP	P
6	0.5660	9.89	7.82	17.71	46.00	-28.29	AVG	P
7	18.3060	10.13	22.47	32.60	60.00	-27.40	QP	P
8	18.3060	10.13	17.33	27.46	50.00	-22.54	AVG	P
9	19.7099	10.15	23.18	33.33	60.00	-26.67	QP	P
10	19.7099	10.15	18.53	28.68	50.00	-21.32	AVG	P
11	21.6620	10.19	22.42	32.61	60.00	-27.39	QP	P
12	21.6620	10.19	18.43	28.62	50.00	-21.38	AVG	P

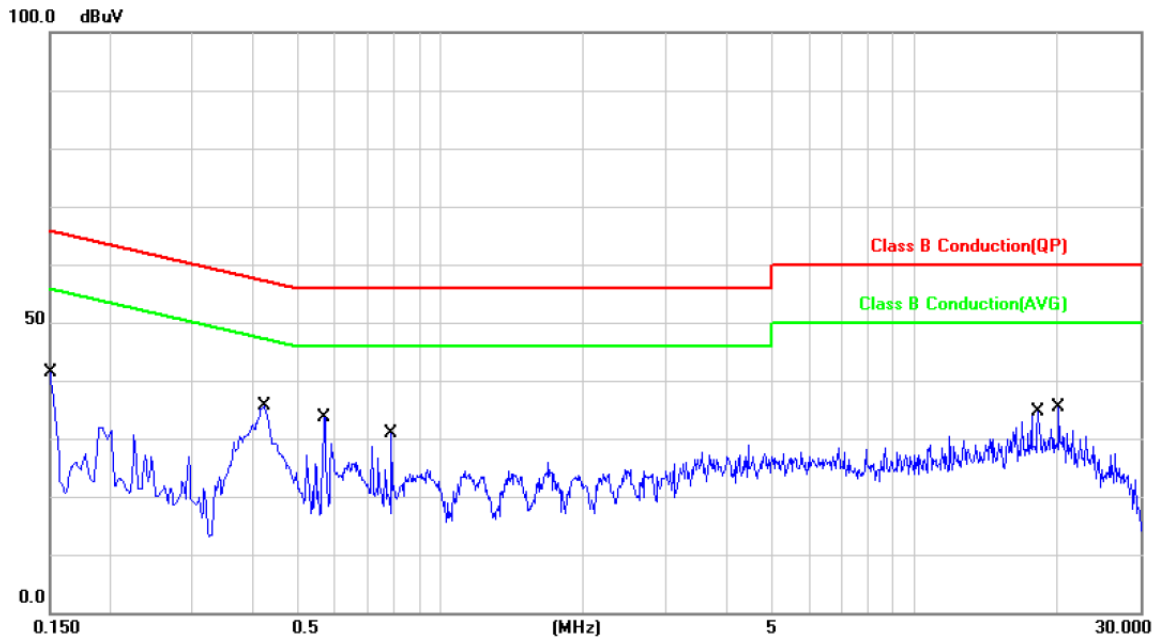
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



Power	: AC 120V	Pol/Phase	: LINE
Test Mode 3	: O-QPSK, CH1a	Temperature	: 26 °C
Test Date	: Jul. 30, 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	0.1500	9.92	21.85	31.77	65.99	-34.22	QP	P
2	0.1500	9.92	8.18	18.10	55.99	-37.89	AVG	P
3	0.4260	9.90	24.22	34.12	57.33	-23.21	QP	P
4	0.4260	9.90	21.21	31.11	47.33	-16.22	AVG	P
5	0.5700	9.91	10.35	20.26	56.00	-35.74	QP	P
6	0.5700	9.91	4.33	14.24	46.00	-31.76	AVG	P
7	0.7900	9.90	8.39	18.29	56.00	-37.71	QP	P
8	0.7900	9.90	4.45	14.35	46.00	-31.65	AVG	P
9	18.3060	10.10	21.74	31.84	60.00	-28.16	QP	P
10	18.3060	10.10	16.60	26.70	50.00	-23.30	AVG	P
11	20.2580	10.13	22.61	32.74	60.00	-27.26	QP	P
12	20.2580	10.13	18.03	28.16	50.00	-21.84	AVG	P

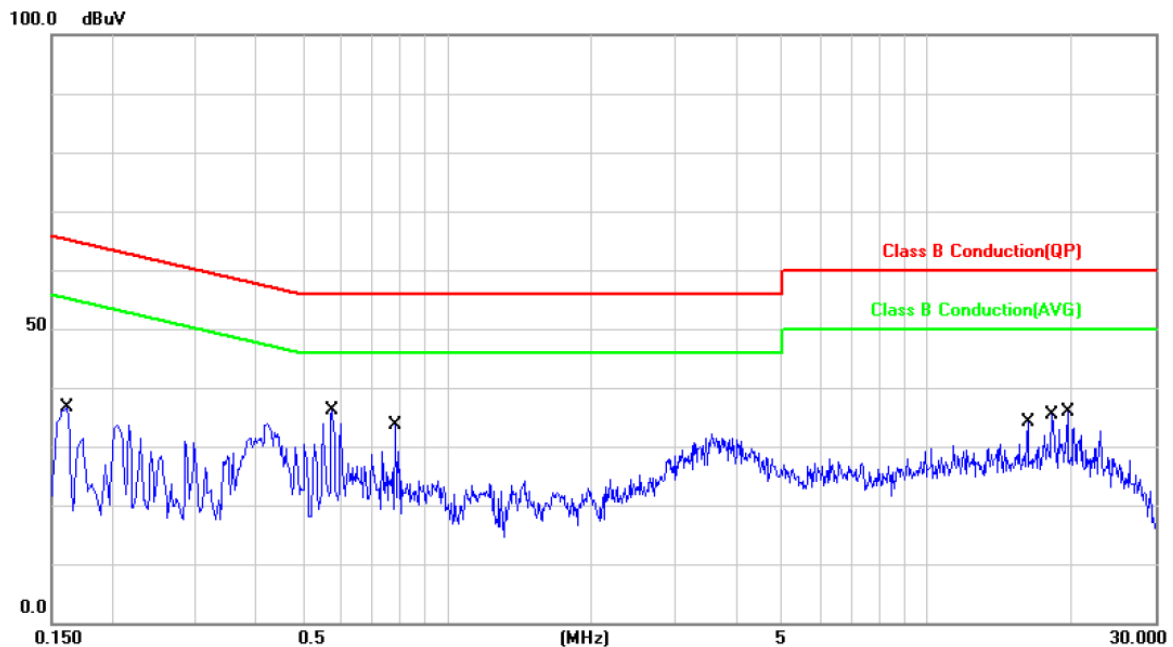
Note: Level = Reading + Factor

Margin = Level - Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode 3	: O-QPSK, CH1a	Temperature	: 26 °C
Test Date	: Jul. 30, 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	0.1620	9.92	25.72	35.64	65.36	-29.72	QP	P
2	0.1620	9.92	9.50	19.42	55.36	-35.94	AVG	P
3	0.5780	9.89	24.82	34.71	56.00	-21.29	QP	P
4	0.5780	9.89	13.58	23.47	46.00	-22.53	AVG	P
5	0.7820	9.89	9.58	19.47	56.00	-36.53	QP	P
6	0.7820	9.89	4.94	14.83	46.00	-31.17	AVG	P
7	16.2260	10.09	22.09	32.18	60.00	-27.82	QP	P
8	16.2260	10.09	17.34	27.43	50.00	-22.57	AVG	P
9	18.2420	10.13	24.26	34.39	60.00	-25.61	QP	P
10	18.2420	10.13	19.47	29.60	50.00	-20.40	AVG	P
11	19.7099	10.15	23.10	33.25	60.00	-26.75	QP	P
12	19.7099	10.15	18.66	28.81	50.00	-21.19	AVG	P

Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



6. Test of Spurious Emission (Radiated)

6.1 Test Limit

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2009. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions for unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance Meters	Radiated (μ V / M)	Radiated (dB μ V / M)
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the below table.

Frequency (MHz)	Distance Meters	Radiated (dB μ V / M)
30-230	10	30
230-1000	10	37

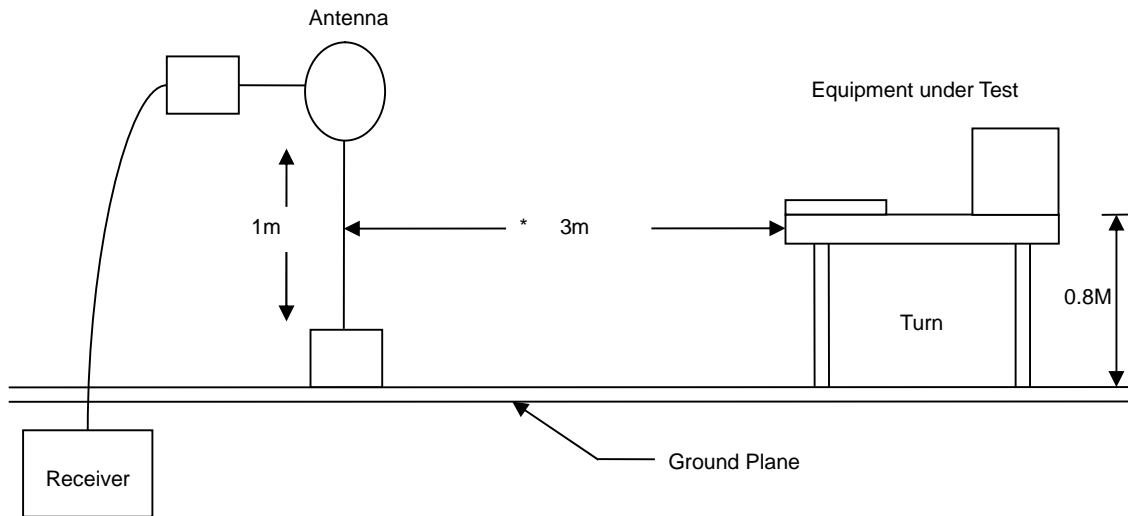
6.2 Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.
- 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.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- 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.
- 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.
- "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

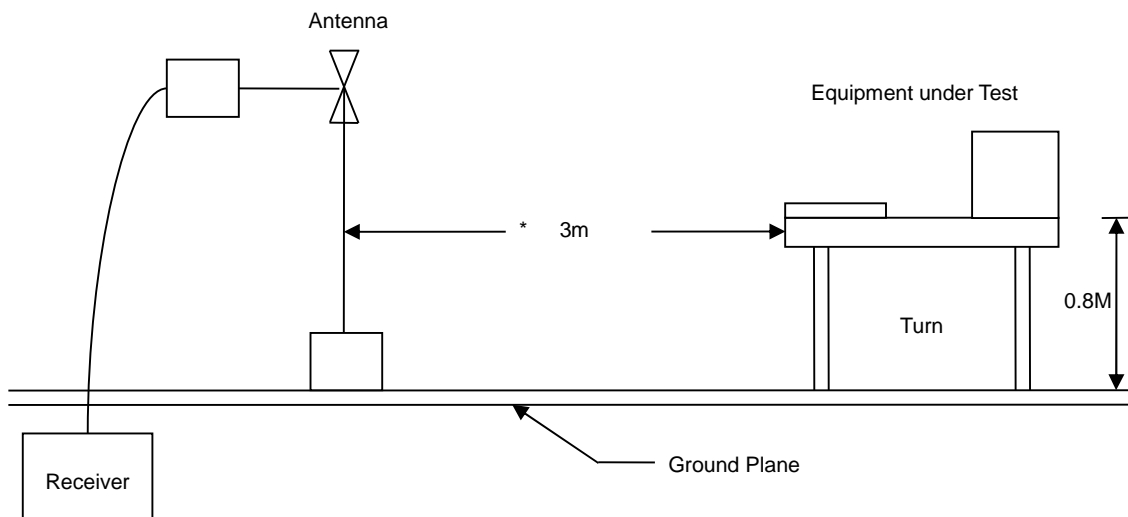


6.3 Typical Test Setup

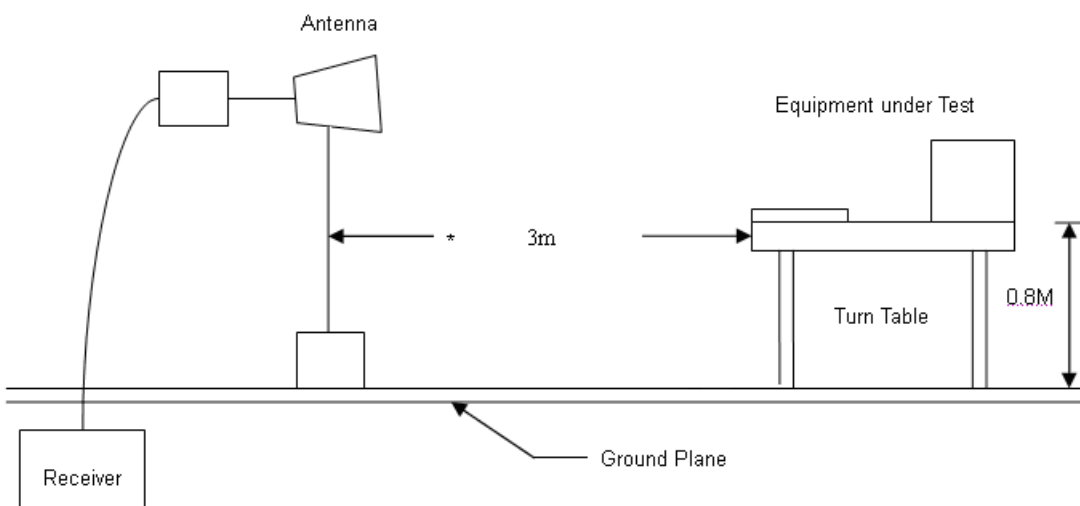
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



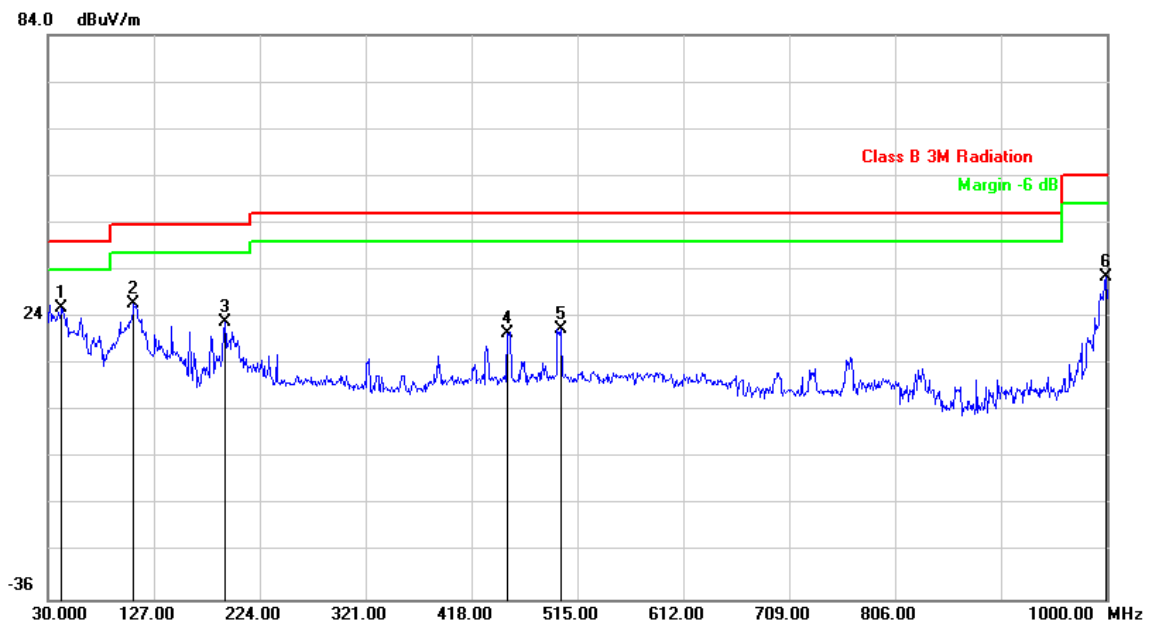


6.4 Test Result and Data (9kHz ~ 30MHz)

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

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

Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode 1	: O-QPSK, CH0b	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	42.6100	-32.41	58.50	26.09	40.00	-13.91	peak	102	176	P
2	108.5700	-32.58	59.32	26.74	43.50	-16.76	peak	102	176	P
3	191.9900	-32.25	55.24	22.99	43.50	-20.51	peak	102	176	P
4	450.9800	-31.06	51.56	20.50	46.00	-25.50	peak	102	176	P
5	499.4800	-30.85	52.45	21.60	46.00	-24.40	peak	102	176	P
6	999.0300	-27.68	60.30	32.62	54.00	-21.38	peak	102	176	P

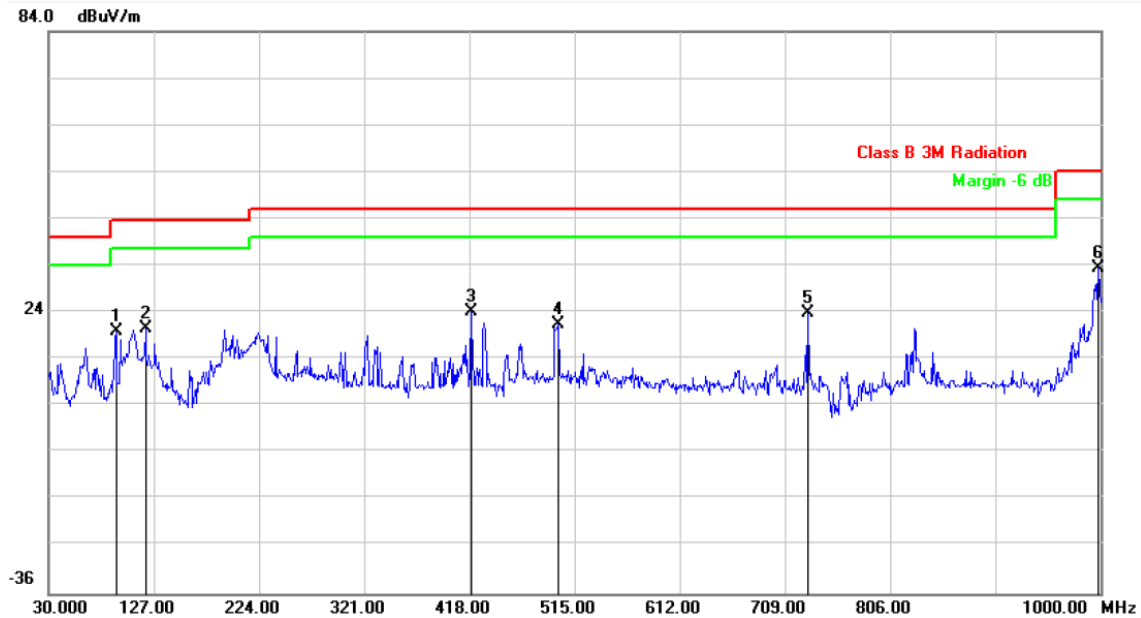
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode 1	: O-QPSK, CH0b	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	92.0800	-32.62	52.71	20.09	43.50	-23.41	peak	102	176	P
2	119.2400	-32.53	52.99	20.46	43.50	-23.04	peak	102	176	P
3	419.9400	-31.19	55.49	24.30	46.00	-21.70	peak	102	176	P
4	500.4500	-30.85	52.27	21.42	46.00	-24.58	peak	102	176	P
5	730.3400	-29.67	53.39	23.72	46.00	-22.28	peak	102	176	P
6	998.0600	-27.68	61.17	33.49	54.00	-20.51	peak	102	176	P

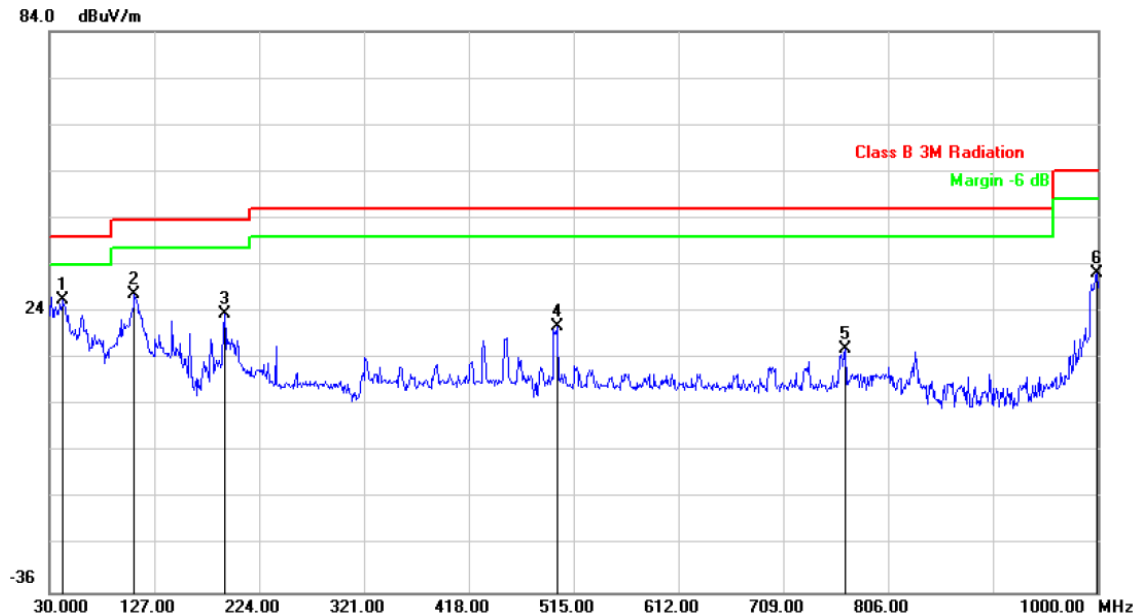
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode 2	: O-QPSK, CH13	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	42.6100	-32.41	58.83	26.42	40.00	-13.58	peak	104	185	P
2	108.5700	-32.58	60.36	27.78	43.50	-15.72	peak	104	185	P
3	191.9900	-32.25	55.74	23.49	43.50	-20.01	peak	104	185	P
4	499.4800	-30.85	51.84	20.99	46.00	-25.01	peak	104	185	P
5	766.2300	-29.42	45.48	16.06	46.00	-29.94	peak	104	185	P
6	999.0300	-27.68	59.89	32.21	54.00	-21.79	peak	104	185	P

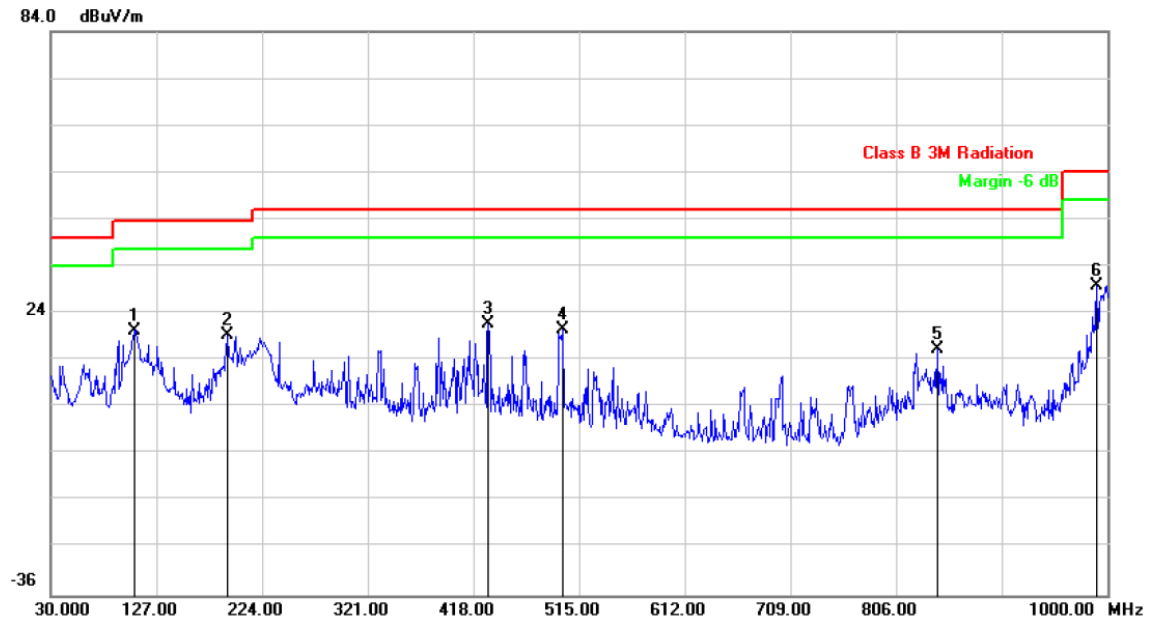
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode 2	: O-QPSK, CH13	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	106.6300	-32.59	52.74	20.15	43.50	-23.35	peak	104	185	P
2	191.9900	-32.25	51.71	19.46	43.50	-24.04	peak	104	185	P
3	431.5800	-31.14	52.84	21.70	46.00	-24.30	peak	104	185	P
4	500.4500	-30.85	51.33	20.48	46.00	-25.52	peak	104	185	P
5	843.8300	-28.89	45.17	16.28	46.00	-29.72	peak	104	185	P
6	990.3000	-27.76	57.67	29.91	54.00	-24.09	peak	104	185	P

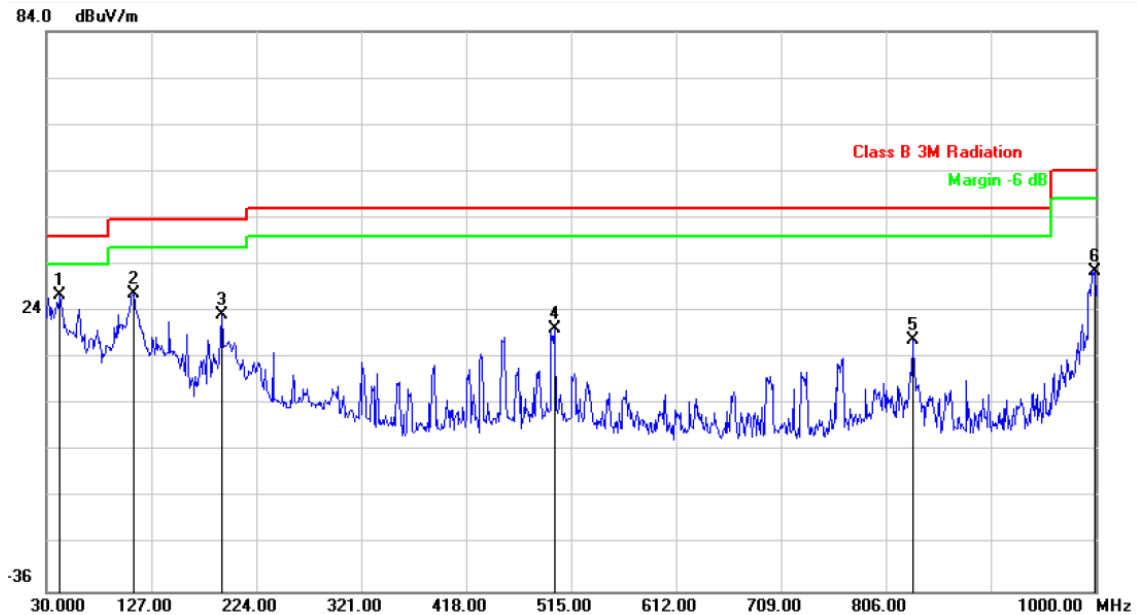
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode 3	: O-QPSK, CH1a	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	42.6100	-32.41	59.90	27.49	40.00	-12.51	peak	103	178	P
2	110.5100	-32.57	60.22	27.65	43.50	-15.85	peak	103	178	P
3	191.9900	-32.25	55.47	23.22	43.50	-20.28	peak	103	178	P
4	499.4800	-30.85	51.12	20.27	46.00	-25.73	peak	103	178	P
5	831.2199	-28.98	46.71	17.73	46.00	-28.27	peak	103	178	P
6	999.0300	-27.68	60.35	32.67	54.00	-21.33	peak	103	178	P

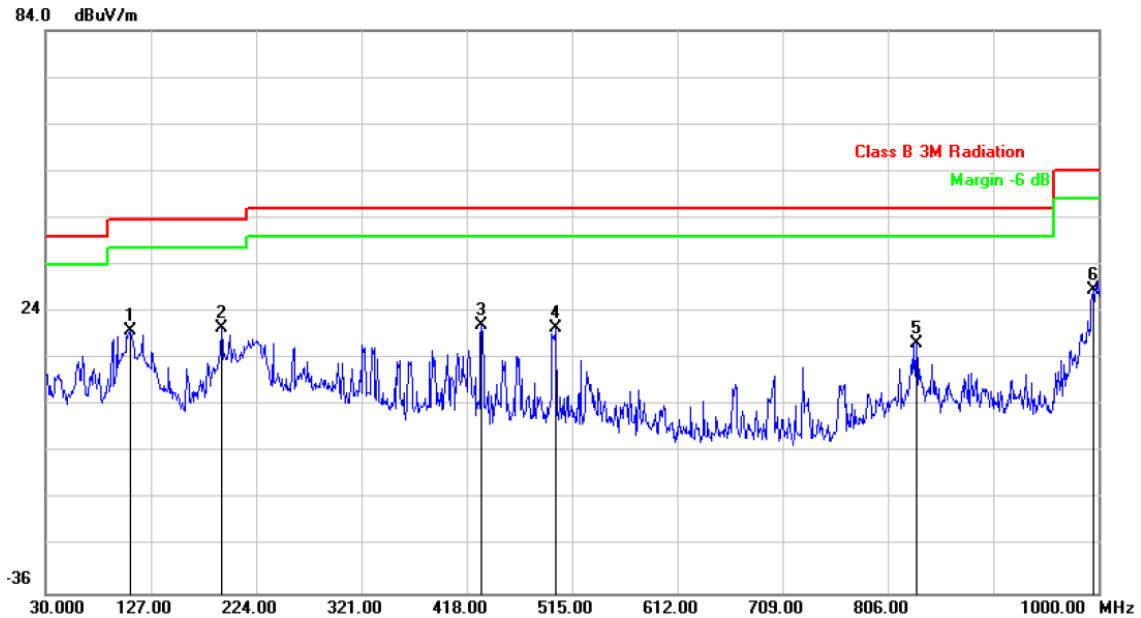
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode 3	: O-QPSK, CH1a	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	108.5700	-32.58	52.64	20.06	43.50	-23.44	peak	103	178	P
2	191.9900	-32.25	52.86	20.61	43.50	-22.89	peak	103	178	P
3	431.5800	-31.14	52.31	21.17	46.00	-24.83	peak	103	178	P
4	500.4500	-30.85	51.48	20.63	46.00	-25.37	peak	103	178	P
5	832.1900	-28.97	46.34	17.37	46.00	-28.63	peak	103	178	P
6	995.1500	-27.71	56.44	28.73	54.00	-25.27	peak	103	178	P

Note: Level = Reading + Factor

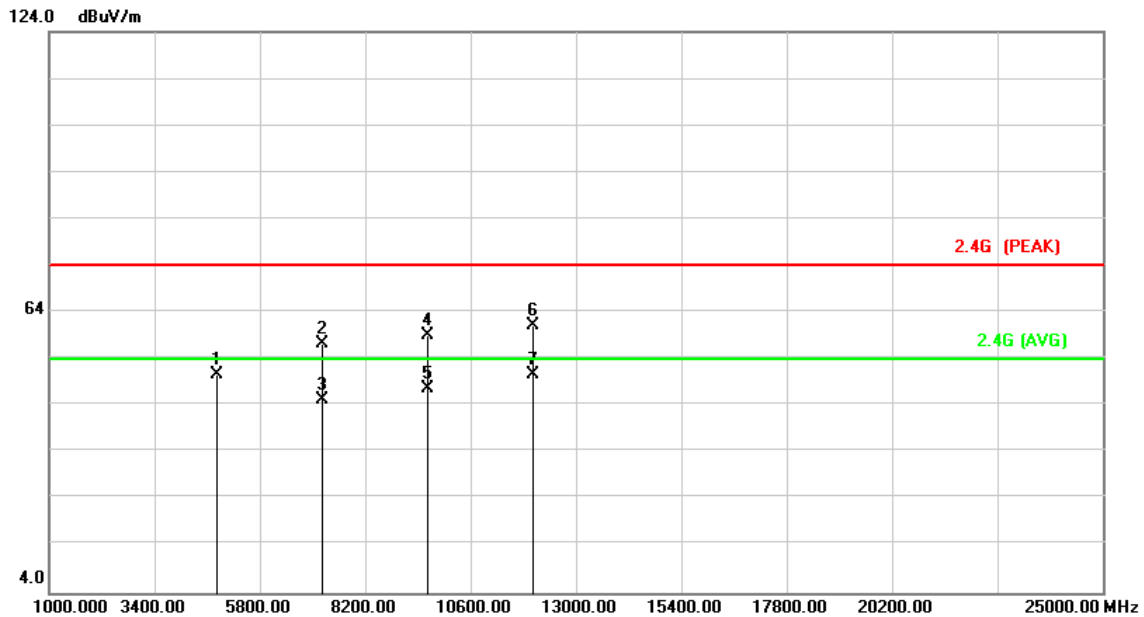
Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



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

Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode 1	: O-QPSK, CH0b	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	4810.000	7.32	43.37	50.69	74.00	-23.31	peak	100	182	P
2	7215.000	12.34	44.79	57.13	74.00	-16.87	peak	100	182	P
3	7215.000	12.34	32.99	45.33	54.00	-8.67	AVG	100	182	P
4	9620.000	16.10	42.91	59.01	74.00	-14.99	peak	100	182	P
5	9620.000	16.10	31.68	47.78	54.00	-6.22	AVG	100	182	P
6	12025.000	19.75	41.36	61.11	74.00	-12.89	peak	100	182	P
7	12025.000	19.75	30.90	50.65	54.00	-3.35	AVG	100	182	P

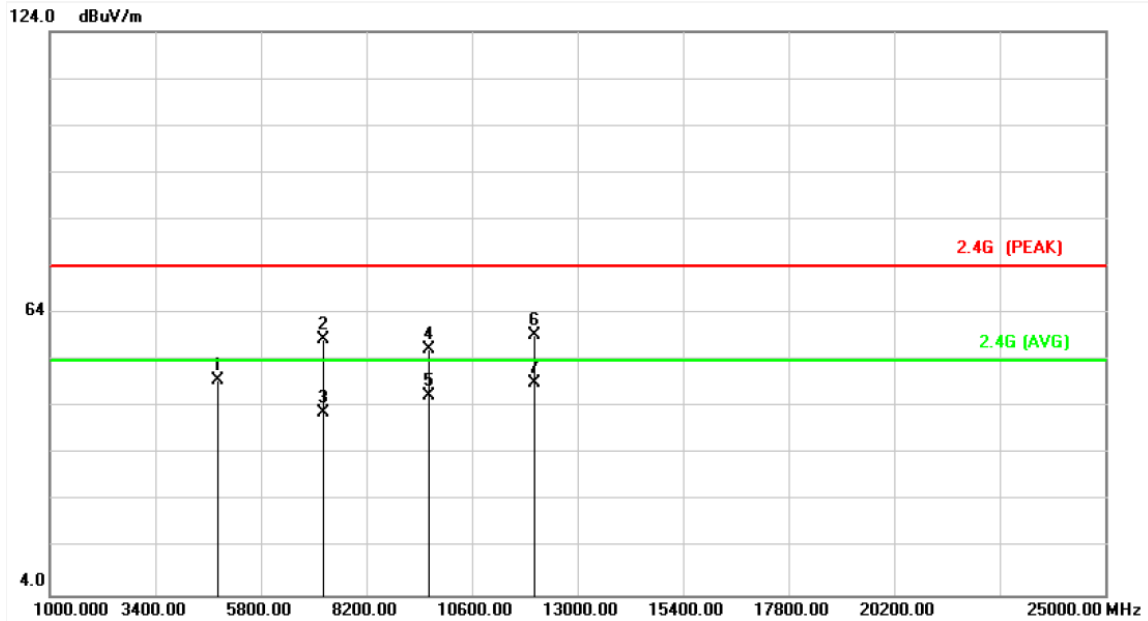
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode 1	: O-QPSK, CH0b	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	4810.000	7.32	42.36	49.68	74.00	-24.32	peak	100	182	P
2	7215.000	12.34	45.98	58.32	74.00	-15.68	peak	100	182	P
3	7215.000	12.34	30.54	42.88	54.00	-11.12	AVG	100	182	P
4	9620.000	16.10	40.33	56.43	74.00	-17.57	peak	100	182	P
5	9620.000	16.10	30.21	46.31	54.00	-7.69	AVG	100	182	P
6	12025.000	19.75	39.47	59.22	74.00	-14.78	peak	100	182	P
7	12025.000	19.75	29.48	49.23	54.00	-4.77	AVG	100	182	P

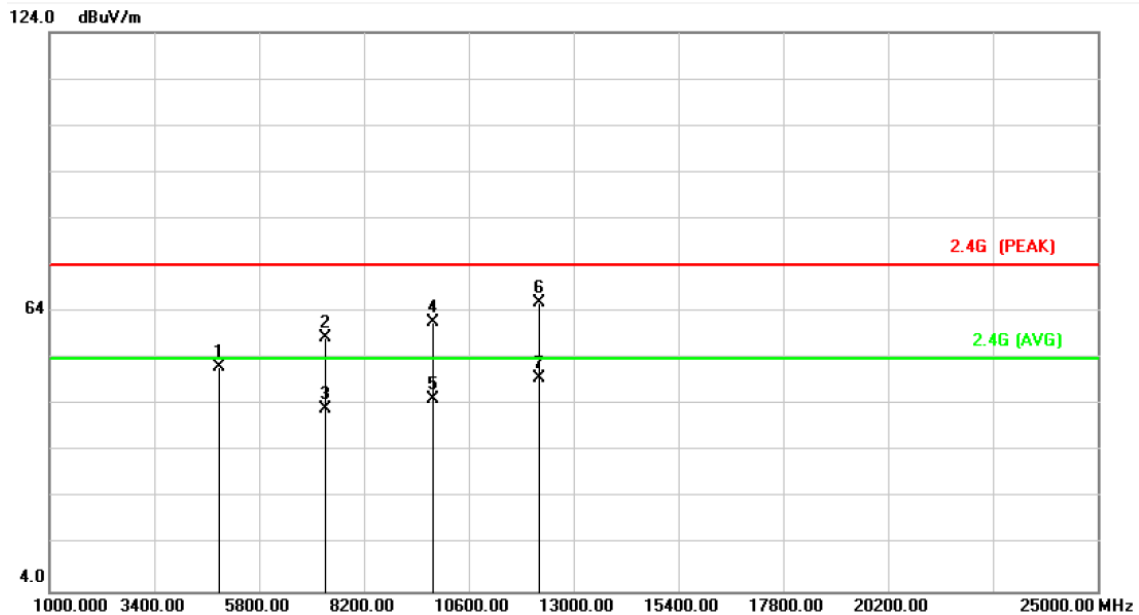
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode 2	: O-QPSK, CH13	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	4890.000	7.56	44.45	52.01	74.00	-21.99	peak	102	175	P
2	7335.000	12.83	45.63	58.46	74.00	-15.54	peak	102	175	P
3	7335.000	12.83	30.45	43.28	54.00	-10.72	AVG	102	175	P
4	9780.000	16.26	45.61	61.87	74.00	-12.13	peak	102	175	P
5	9780.000	16.26	29.10	45.36	54.00	-8.64	AVG	102	175	P
6	12225.000	19.85	46.18	66.03	74.00	-7.97	peak	102	175	P
7	12225.000	19.85	29.81	49.66	54.00	-4.34	AVG	102	175	P

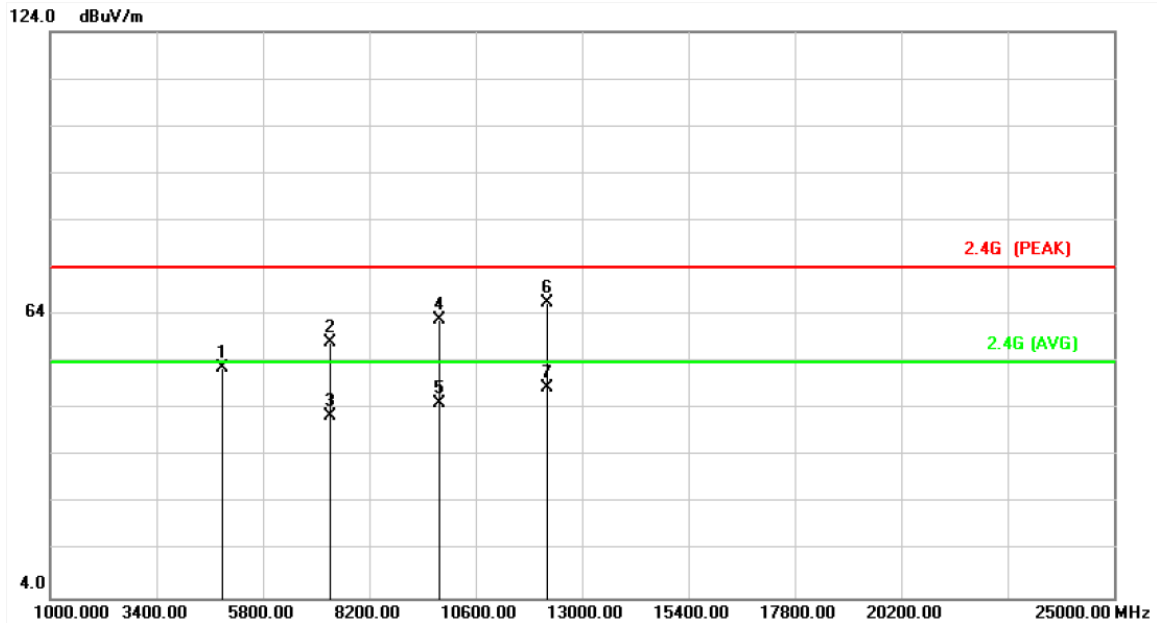
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode 2	: O-QPSK, CH13	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	4890.000	7.56	45.32	52.88	74.00	-21.12	peak	102	175	P
2	7335.000	12.83	45.33	58.16	74.00	-15.84	peak	102	175	P
3	7335.000	12.83	29.71	42.54	54.00	-11.46	AVG	102	175	P
4	9780.000	16.26	46.80	63.06	74.00	-10.94	peak	102	175	P
5	9780.000	16.26	29.02	45.28	54.00	-8.72	AVG	102	175	P
6	12225.000	19.85	46.56	66.41	74.00	-7.59	peak	102	175	P
7	12225.000	19.85	28.80	48.65	54.00	-5.35	AVG	102	175	P

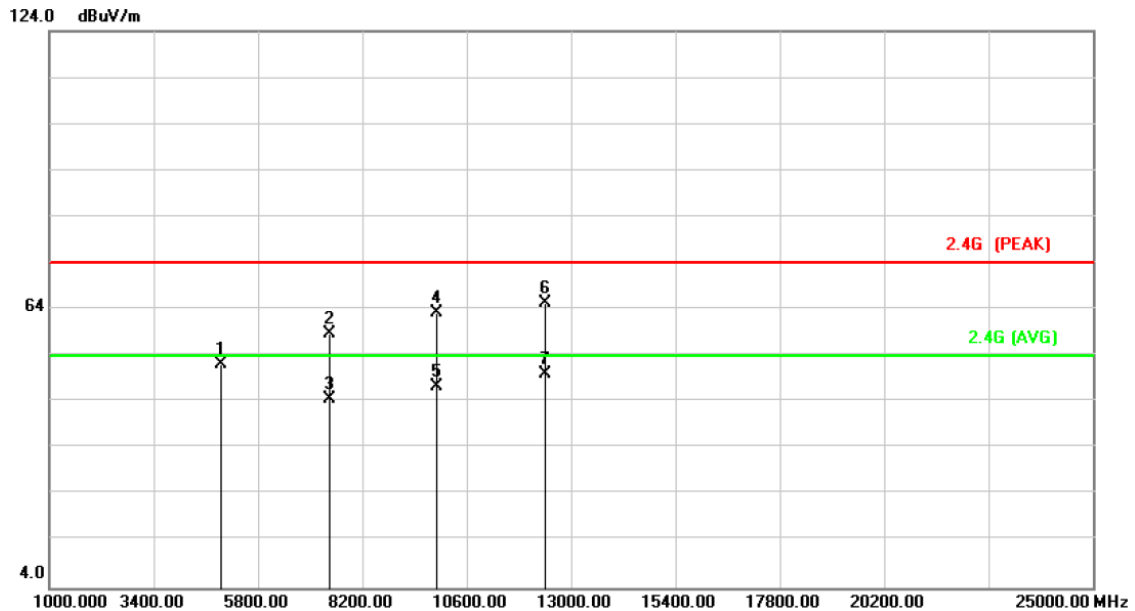
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode 3	: O-QPSK, CH1a	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	7.78	44.38	52.16	74.00	-21.84	peak	105	183	P
2	7440.000	13.26	45.58	58.84	74.00	-15.16	peak	105	183	P
3	7440.000	13.26	31.26	44.52	54.00	-9.48	AVG	105	183	P
4	9920.000	16.42	46.86	63.28	74.00	-10.72	peak	105	183	P
5	9920.000	16.42	30.87	47.29	54.00	-6.71	AVG	105	183	P
6	12400.000	19.94	45.47	65.41	74.00	-8.59	peak	105	183	P
7	12400.000	19.94	30.22	50.16	54.00	-3.84	AVG	105	183	P

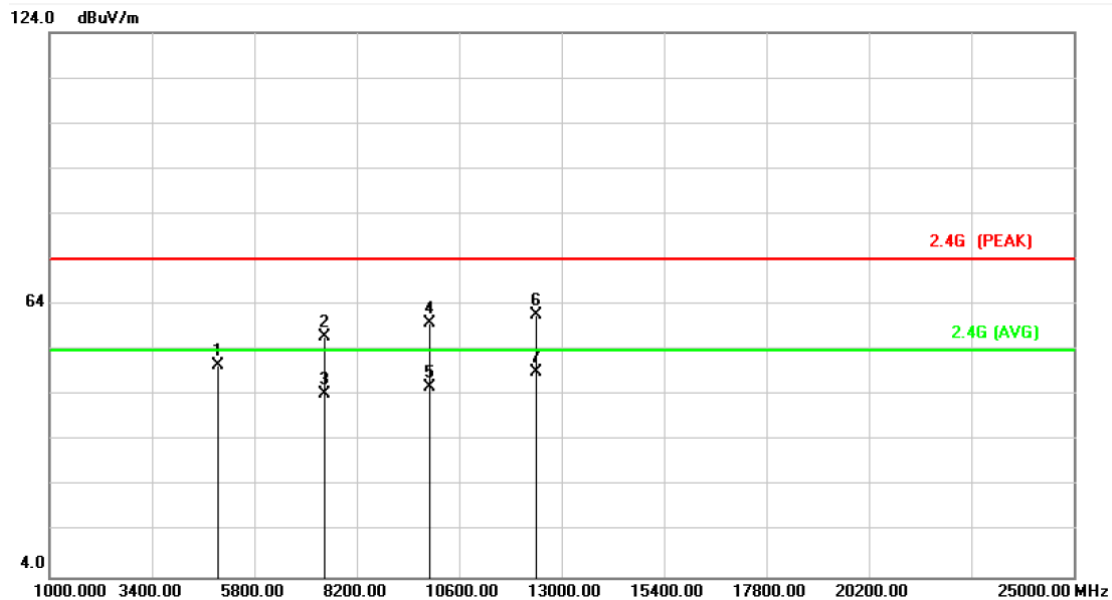
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode 3	: O-QPSK, CH1a	Temperature	: 18°C
Test Date	: Jul. 29, 2015	Humidity	: 49%
Memo	:	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	7.78	42.95	50.73	74.00	-23.27	peak	105	183	P
2	7440.000	13.26	43.64	56.90	74.00	-17.10	peak	105	183	P
3	7440.000	13.26	30.95	44.21	54.00	-9.79	AVG	105	183	P
4	9920.000	16.42	43.64	60.06	74.00	-13.94	peak	105	183	P
5	9920.000	16.42	29.45	45.87	54.00	-8.13	AVG	105	183	P
6	12400.000	19.94	41.93	61.87	74.00	-12.13	peak	105	183	P
7	12400.000	19.94	29.22	49.16	54.00	-4.84	AVG	105	183	P

Note: Level = Reading + Factor

Margin = Level – Limit



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: Jul. 29, 2015

Temperature: 23°C

Atmospheric pressure: 1043 hPa

Humidity: 53%

Modulation Standard: O-QPSK

Channel 1						Fundamental Frequency: 2425 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			
2340.305	V	50.97	-1.42	49.55	Peak	74	54	-24.45	186	1.03
-----	V	-----	-----	-----	Ave	74	54	-----	-----	-----
2389.420	H	48.69	-1.22	47.47	Peak	74	54	-26.53	186	1.03
-----	H	-----	-----	-----	Ave	74	54	-----	-----	-----
Channel 16						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			
2494.280	V	47.65	-0.81	46.85	Peak	74	54	-27.15	183	1.01
-----	V	-----	-----	-----	Ave	74	54	-----	-----	-----
2490.440	H	47.06	-0.82	46.24	Peak	74	54	-27.76	183	1.01
-----	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)

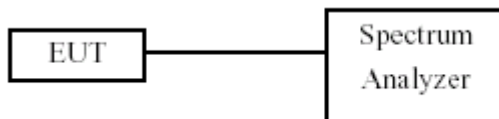
7.1 Test Limit

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

7.2 Test Procedure

- The transmitter output was connected to the spectrum analyzer via a low lose cable.
- Set both RBW and VBW of spectrum analyzer to 100 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- The band edges was measured and recorded.

7.3 Test Setup Layout



7.4 Test Result and Data

Test Date: Mar. 19, 2015

Temperature: 24°C

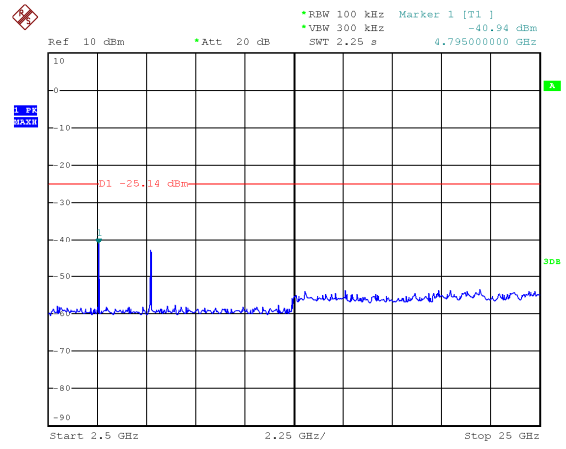
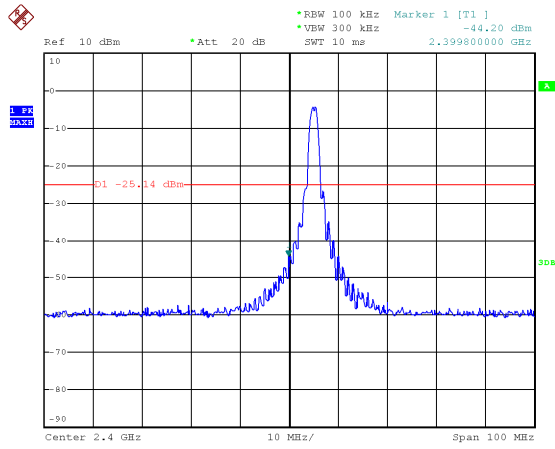
Atmospheric pressure: 1035 hPa

Humidity: 57%

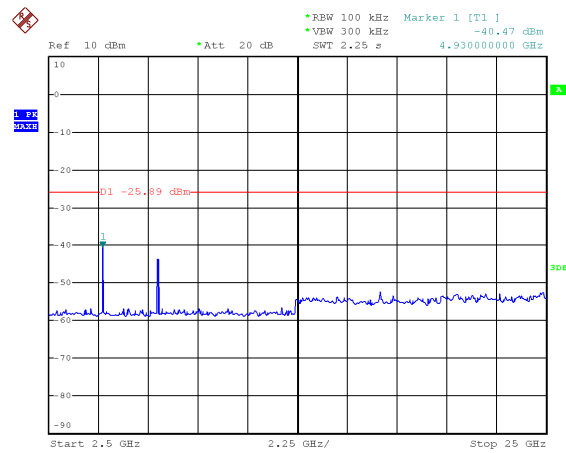
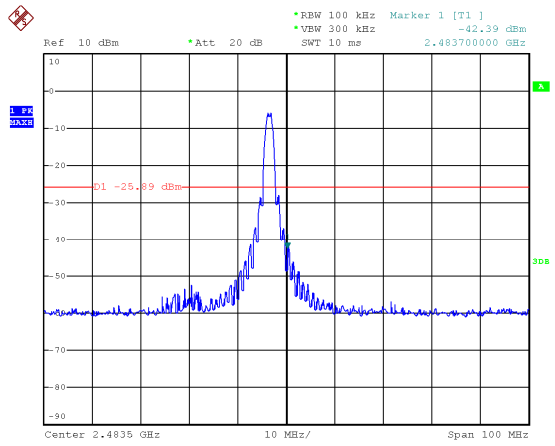
Modulation Standard	Channel	Frequency (MHz)	Maximum value in frequency (MHz)	Test Result (dB)
O-QPSK	0b	2405	4795.000	-40.94
	1a	2480	4930.000	-40.47



Modulation Type: O-QPSK
CH0b



CH1a





8. 6dB Bandwidth Measurement Data

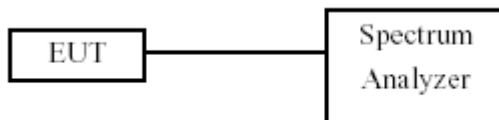
8.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

8.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 100 KHz and VBW to 100 KHz.
- The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

8.3 Test Setup Layout



8.4 Test Result and Data

Test Date: Mar. 19, 2015

Temperature: 24°C

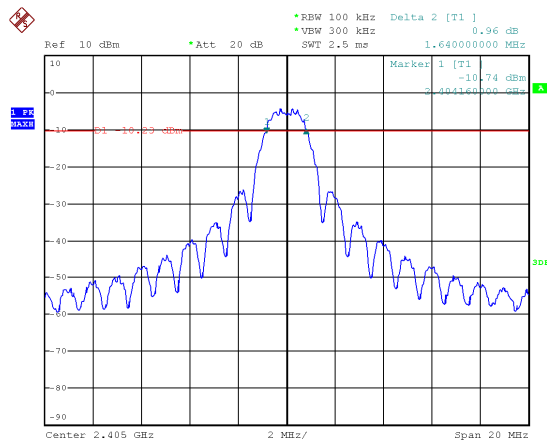
Atmospheric pressure: 1035 hPa

Humidity: 57%

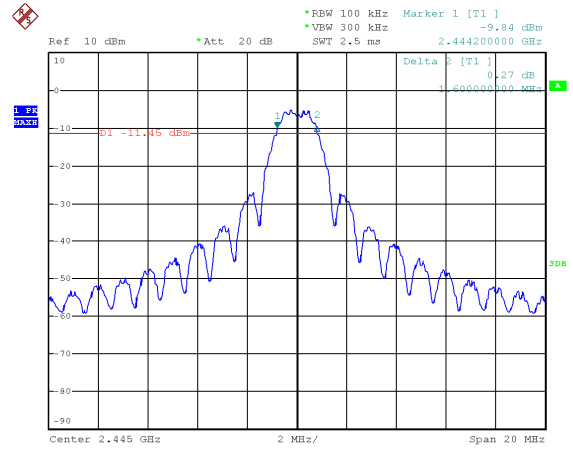
Modulation Standard	Channel	Frequency (MHz)	6dB Bandwidth (MHz)
O-QPSK	0b	2405	1.64
	13	2445	1.60
	1a	2480	1.72



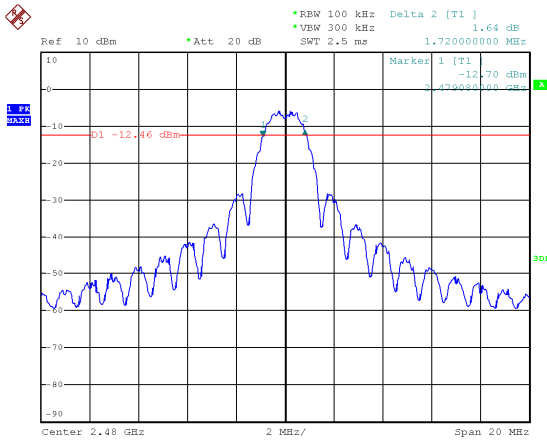
Modulation Type: O-QPSK
CH0b



CH13



CH1a





9. Maximum Peak Output Power

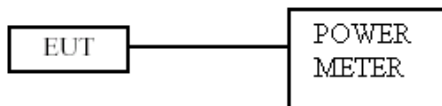
9.1 Test Limit

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: Mar. 19, 2015

Temperature: 24°C

Atmospheric pressure: 1035 hPa

Humidity: 57%

Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)		Peak Power Output (mW)	
			Peak	Average	Peak	Average
O-QPSK	0b	2405	1.91	1.77	1.552	1.503
	13	2445	1.05	0.91	1.274	1.233
	1a	2480	0.27	0.05	1.064	1.012



10. Power Spectral Density

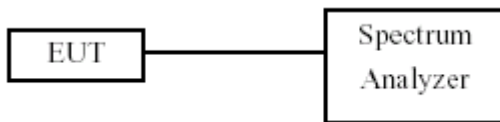
10.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm.

10.2 Test Procedures

- The transmitter output was connected to spectrum analyzer.
- The spectrum analyzer's resolution bandwidth were set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=span/3KHz.
- The power spectral density was measured and recorded.
- The Sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

10.3 Test Setup Layout



10.4 Test Result and Data

Test Date: Mar. 19, 2015

Temperature: 24°C

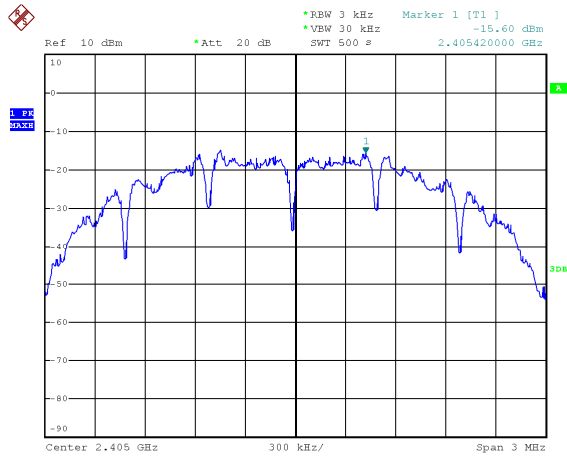
Atmospheric pressure: 1014 hPa

Humidity: 57%

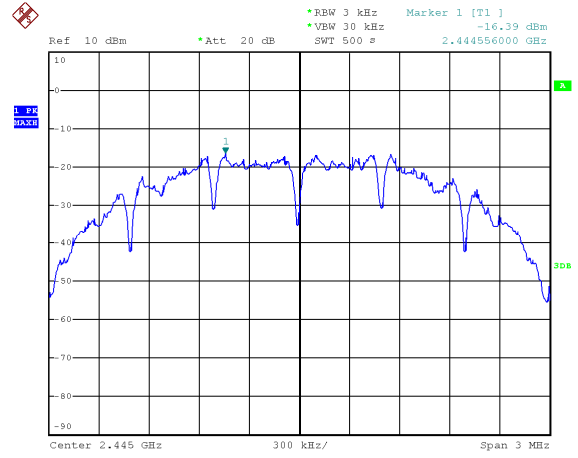
Modulation Standard	Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)
O-QPSK	0b	2405	-15.60
	13	2445	-16.39
	1a	2480	-16.80



Modulation Type: O-QPSK
CH0b



CH13



CH1a

