



FCC RF TEST REPORT

47 CFR FCC Part 15 Subpart C § 15.249

Equipment : RIDESENSE
BRAND NAME : GIANT
MODEL NAME : RIDESENSE
FCC ID : NWA-RIDESENSE

We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR560446B	Rev. 01	Initial issue of report	Aug. 10, 2015

**1. SUMMARY OF THE TEST RESULT**

Applied Standard:					
Part	FCC Rule	IC Rule	Description of Test	Result	Under Limit
3.1	15.207	RSS-GEN 8.8	AC Power Line Conducted Emissions	Not Necessary	EUT doesn't has AC power port
3.2	2.1049	RSS-GEN 6.6	20dB & 99% Occupied Bandwidth	Complies	-
3.3	15.249(a)	RSS-210 A2.9	Field Strength of Fundamental Emissions	Complies	0.52 dB at 2440.000MHz
3.3	15.249(a)(d)	RSS-210 A2.9	Radiated Spurious Emissions	Complies	14.20 dB at 57.270MHz
3.4	15.203	-	Antenna Requirements	Complies	-

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.9
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2. GENERAL INFORMATION

2.1 Applicant

Microprogram Information Co., Ltd.

11F-8., No. 262, Sec. 2, Henan Rd., Xitun Dist., Taichung City 407, Taiwan

2.2 Manufacturer

Microprogram Information Co., Ltd.

11F-8., No. 262, Sec. 2, Henan Rd., Xitun Dist., Taichung City 407, Taiwan

2.3 Product Details

For more detailed features description, please refer to the manufacturer's specifications or user's manual.

Items	Description
Modulation	GFSK
Channel Bandwidth (99%)	1.646MHz
Max. Field Strength (Peak)	94.08dB μ V/m
Max. Field Strength (Average)	93.48dB μ V/m
ANT+ Channel Number	40
ANT+ Frequency Range	2400-2483.5 MHz

2.4 Table for Test Modes

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode
AC Power Line Conducted Emissions	CTX
Field Strength of Fundamental Emissions	CTX
Bandwidth	CTX
Radiated Emissions	CTX

Note:

1. CTX=continuously transmitting.
2. The programmed RF utility, "TTERMPRO" installed in the notebook to make the EUT get into the engineering modes to continuously transmit.

2.5 Table for Testing Locations

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No.
	TH05-HY

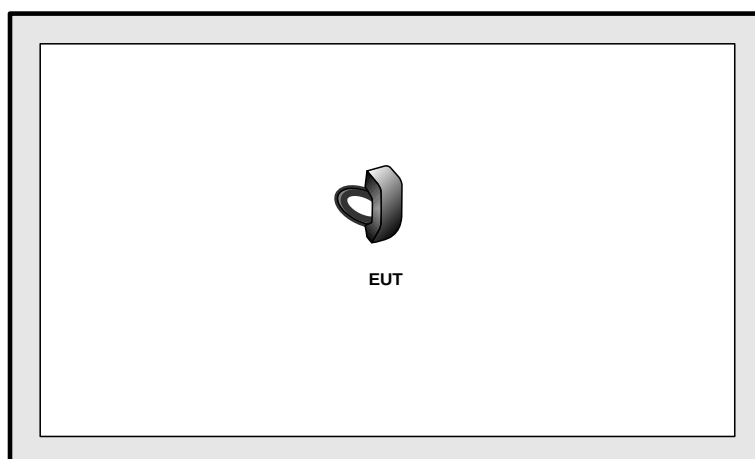
Note: The test site complies with ANSI C63.4 2009 requirement.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-0855
Test Site No.	Sporton Site No.
	03CH10-HY

Note: The test site complies with ANSI C63.4 2009 requirement.

2.6 Test Configurations

<Radiated Spurious Emissions>



3. TEST RESULT

3.1 20dB and & 99% Occupied Bandwidth

3.1.1 Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band.

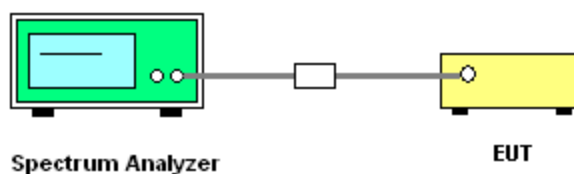
3.1.2 Measuring Instruments

Please refer to section 4 of equipment list in this report.

3.1.3 Test Procedures

1. The transmitter output port was connected to the spectrum analyzer.
2. Measured the spectrum width with highest power setting.

3.1.4 Test Setup Layout



3.1.5 Test Deviation

There is no deviation with the original standard.

3.1.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

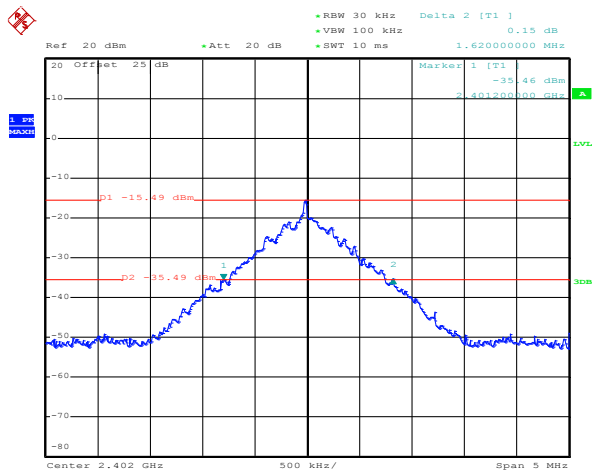


3.1.7 Test Result of 20dB Spectrum Bandwidth

Final Test Date	Jul. 27, 2015 ~ Jul. 31, 2015	Test Site No.	TH05-HY
Temperature	22~25°C	Humidity	51~55%
Test Engineer	Tommy Lee		

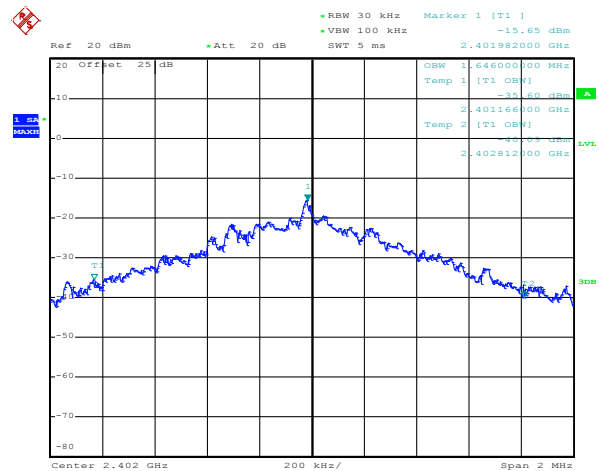
Frequency	20dB BW (MHz)	99% OBW (MHz)
2402MHz	1.62	1.646
2440MHz	1.66	1.610
2480MHz	1.66	1.608

20 dB Bandwidth Plot on 2402MHz



Date: 31.JUL.2015 01:56:10

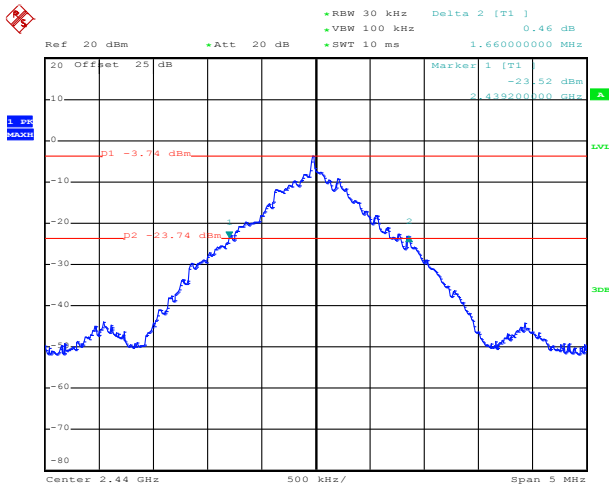
99% Bandwidth Plot on 2402MHz



Date: 31.JUL.2015 01:36:40

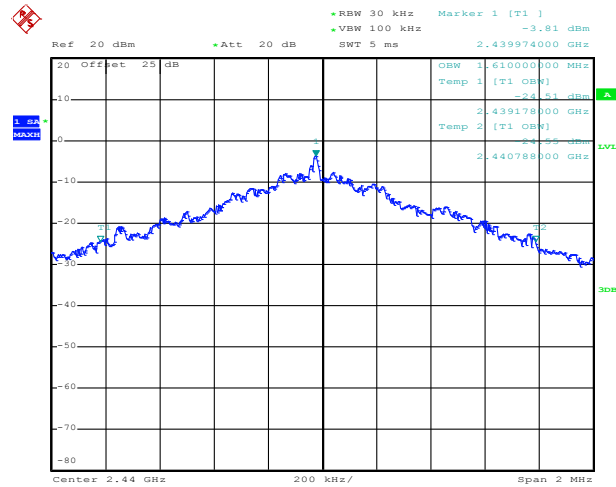


20 dB Bandwidth Plot on 2440MHz



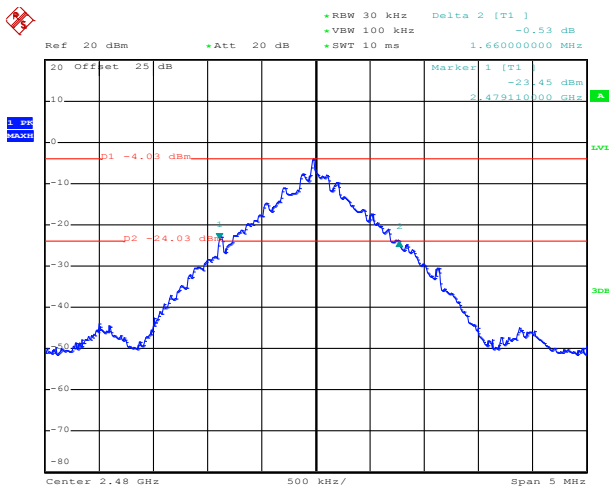
Date: 31.JUL.2015 01:54:30

99% Bandwidth Plot on 2440MHz



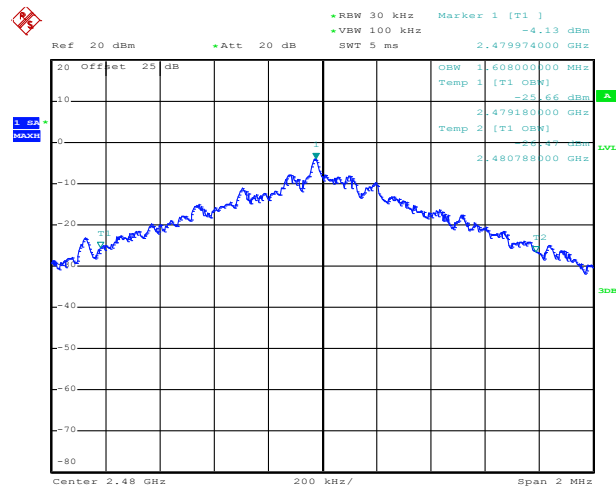
Date: 31.JUL.2015 01:42:24

20 dB Bandwidth Plot on 2480MHz



Date: 31.JUL.2015 01:52:38

99% Bandwidth Plot on 2480MHz



Date: 31.JUL.2015 01:49:38

3.2 Field Strength of Fundamental Emissions and Radiated Spurious Emissions

3.2.1 Limit

The field strength measured at 3 meters shall not exceed the limits in the following table:

Fundamental Frequencies(MHz)	Field Strength(millivolts/m)	
	Fundamental	Harmonics
902~928	50	0.5
2400~2483.5	50	0.5
5725~5875	50	0.5

Note: The limits shown in the above table are based on measurements using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using a CISPR quasi-peak detector.

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 field strength limits listed in 15.209 as below, whichever is less stringent.

Frequency (MHz)	Field Strength (microvolts/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

3.2.2 Measuring Instruments

Please refer to section 4 of equipment list in this report.

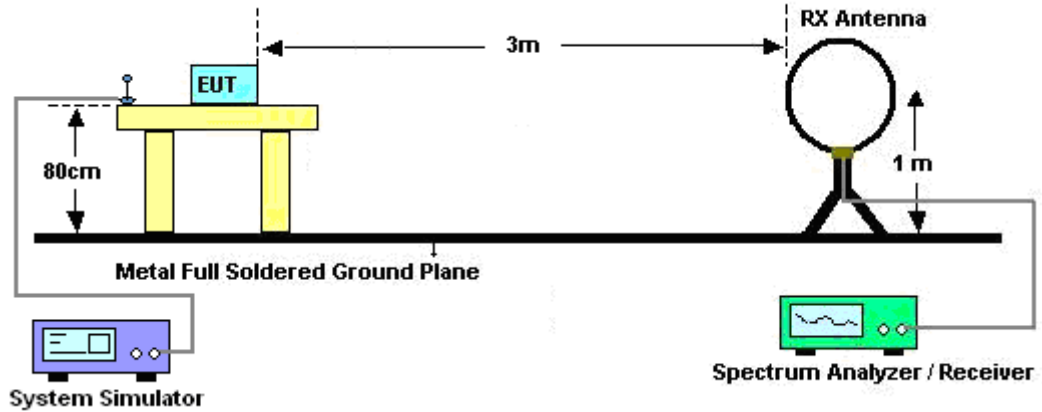
3.2.3 Test Procedures

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. 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 turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.For average measurement:
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

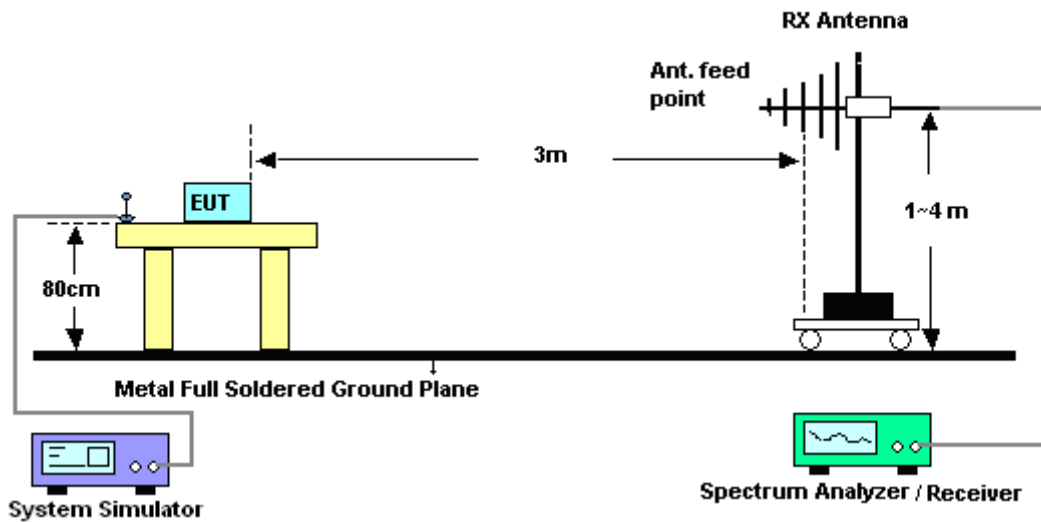
Band	Duty Cycle(%)	T(μ s)	1/T(kHz)	VBW Setting
Ant+	91.78	1072	0.93	1kHz

3.2.4 Test Setup Layout

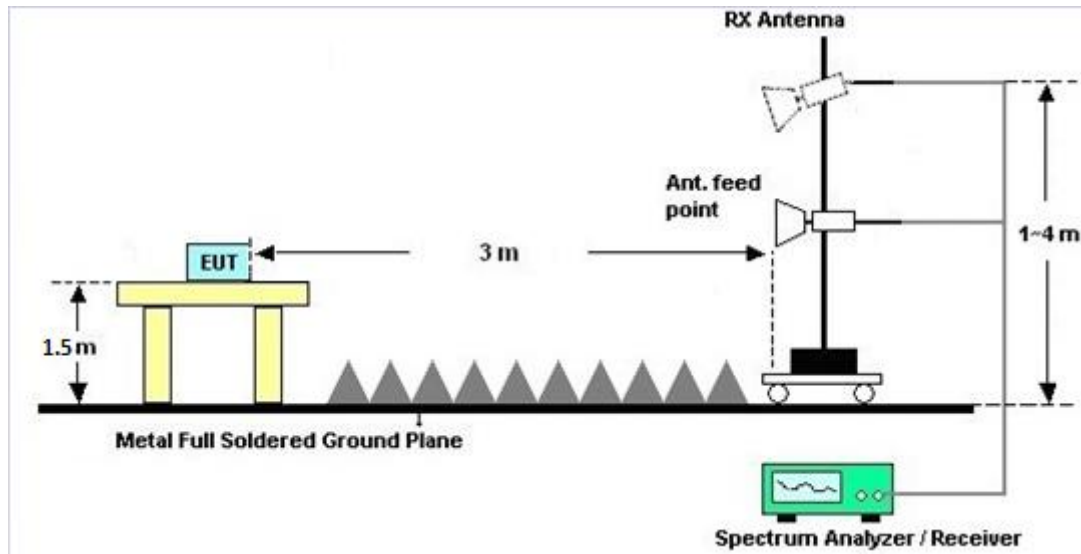
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.2.5 Test Deviation

There is no deviation with the original standard.

3.2.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

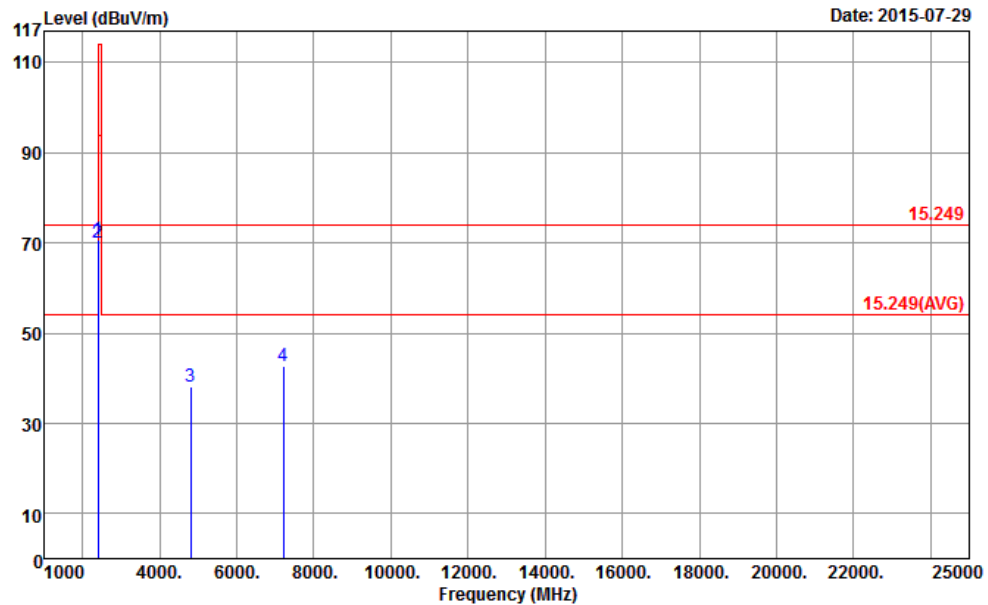
3.2.7 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.



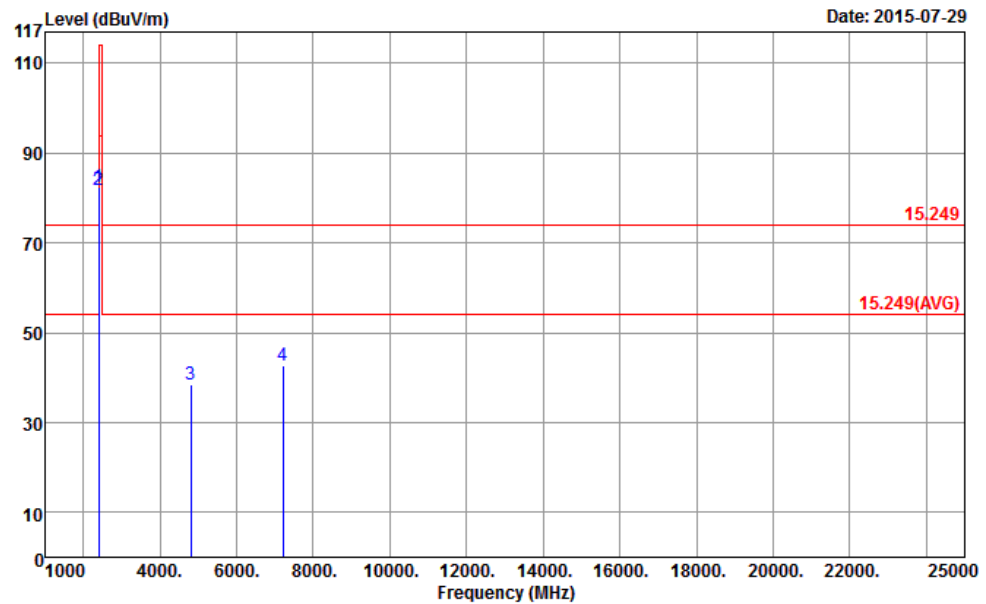
3.2.8 Test Result of Field Strength of Fundamental Emissions and Spurious Emissions

Test Date	Jul. 29, 2015 ~ Jul. 30, 2015	Test Engineer	Stan Hsieh
Temperature	24~26°C	Humidity	44~46%

2402MHz

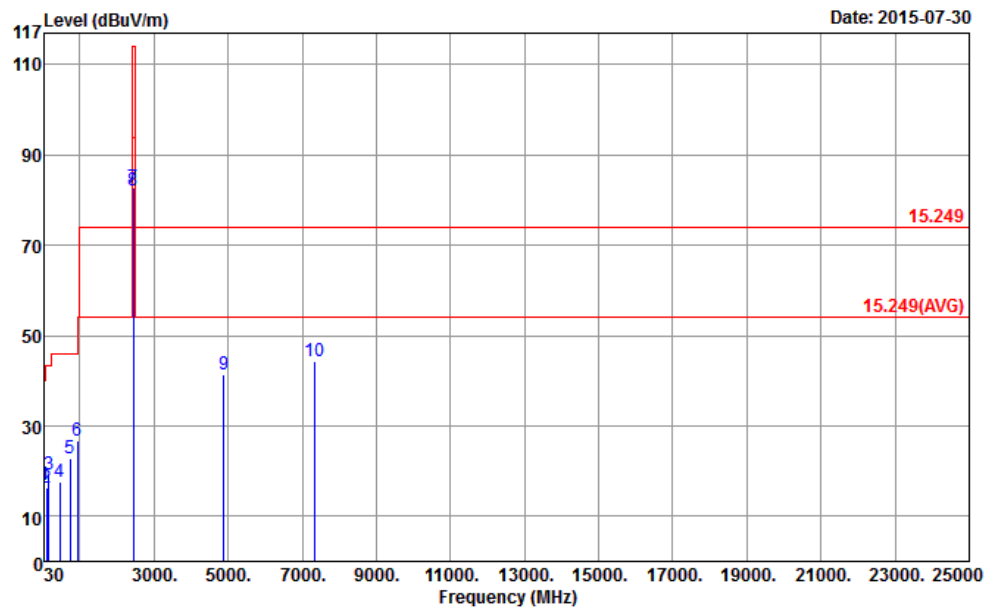
Site : 03CH10-HY
Condition : 15.249 3m HORN_9170_406_1404 HORIZONTAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	2402.00	70.78	-43.22	114.00	71.38	27.23	5.39	33.22	124	11 Peak
2	2402.00	70.13	-23.87	94.00	70.73	27.23	5.39	33.22	124	11 Average
3	4806.00	38.26	-35.74	74.00	59.90	31.42	7.58	60.64	100	0 Peak
4	7206.00	42.74	-31.26	74.00	57.96	35.96	9.44	60.62	100	0 Peak



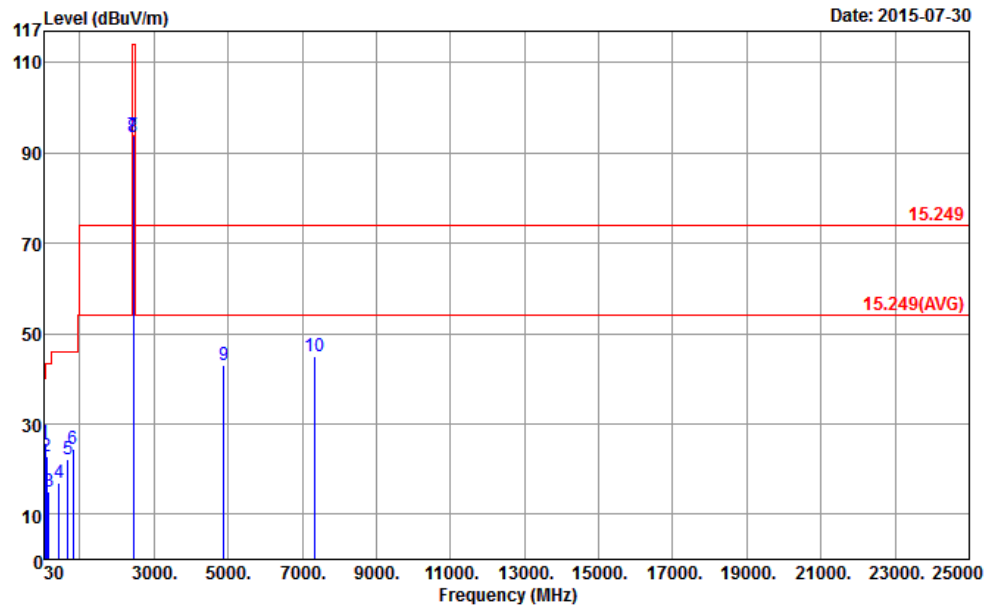
Site : 03CH10-HY
Condition : 15.249 3m HORN_9170_406_1404 VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2402.00	82.39	-31.61	114.00	82.99	27.23	5.39	33.22	100	37	Peak
2	2402.00	81.91	-12.09	94.00	82.51	27.23	5.39	33.22	100	37	Average
3	4806.00	38.30	-35.70	74.00	59.94	31.42	7.58	60.64	100	0	Peak
4	7206.00	42.57	-31.43	74.00	57.79	35.96	9.44	60.62	100	0	Peak

2440MHz

Site : 03CH10-HY
Condition : 15.249 3m HORN_9170_406_1404 HORIZONTAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	31.89	17.07	-22.93	40.00	30.32	18.92	0.65	32.82	---	---	Peak
2	107.76	16.14	-27.36	43.50	36.44	11.20	1.14	32.64	---	---	Peak
3	162.03	19.35	-24.15	43.50	39.81	10.90	1.33	32.69	---	---	Peak
4	447.00	17.72	-28.28	46.00	31.05	17.25	2.30	32.88	---	---	Peak
5	732.60	22.74	-23.26	46.00	31.53	21.25	2.91	32.95	---	---	Peak
6	930.00	26.78	-19.22	46.00	31.60	23.87	3.29	31.98	100	1	Peak
7	2440.00	82.69	-31.31	114.00	83.11	27.37	5.42	33.21	130	49	Peak
8	2440.00	82.20	-11.80	94.00	82.62	27.37	5.42	33.21	130	49	Average
9	4878.00	41.23	-32.77	74.00	62.49	31.56	7.70	60.52	100	0	Peak
10	7320.00	44.23	-29.77	74.00	59.50	36.22	9.49	60.98	100	0	Peak

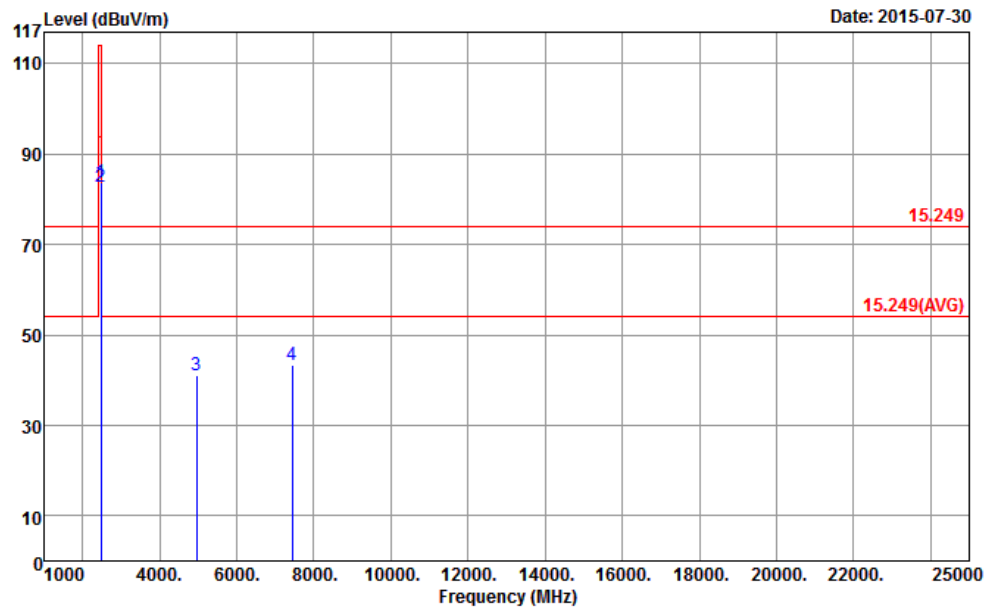


Site : 03CH10-HY
Condition : 15.249 3m HORN_9170_406_1404 VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	57.27	25.80	-14.20	40.00	50.60	7.03	0.93	32.76	122	52 Peak
2	102.09	22.86	-20.64	43.50	43.75	10.60	1.14	32.63	---	---
3	162.03	14.91	-28.59	43.50	35.37	10.90	1.33	32.69	---	---
4	437.90	16.82	-29.18	46.00	30.41	17.12	2.16	32.87	---	---
5	675.90	22.32	-23.68	46.00	32.24	20.41	2.67	33.00	---	---
6	821.50	24.46	-21.54	46.00	31.88	22.27	3.07	32.76	---	---
7	2440.00	93.90	-20.10	114.00	94.32	27.37	5.42	33.21	100	64 Peak
8	2440.00	93.48	-0.52	94.00	93.90	27.37	5.42	33.21	100	64 Average
9	4878.00	42.92	-31.08	74.00	64.18	31.56	7.70	60.52	100	0 Peak
10	7320.00	44.90	-29.10	74.00	60.17	36.22	9.49	60.98	100	0 Peak

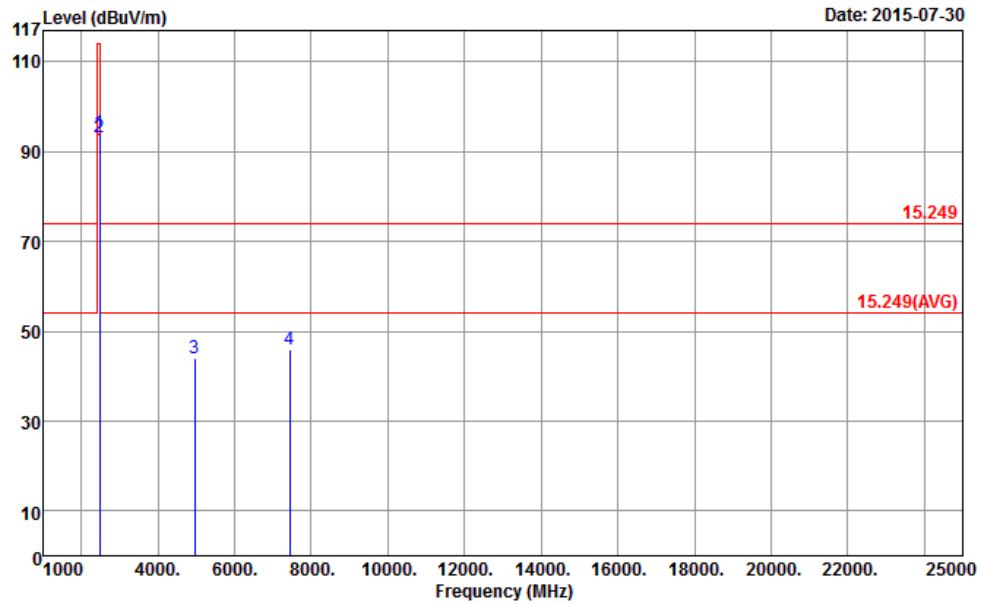


2480MHz



Site : 03CH10-HY
Condition : 15.249 3m HORN_9170_406_1404 HORIZONTAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2480.00	83.84	-30.16	114.00	84.12	27.46	5.44	33.18	243	228	Peak
2	2480.00	82.78	-11.22	94.00	83.06	27.46	5.44	33.18	243	228	Average
3	4962.00	40.96	-33.04	74.00	61.54	31.73	8.05	60.36	100	0	Peak
4	7440.00	43.23	-30.77	74.00	58.47	36.49	9.61	61.34	100	0	Peak



Site : 03CH10-HY
Condition : 15.249 3m HORN_9170_406_1404 VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2480.00	94.08	-19.92	114.00	94.36	27.46	5.44	33.18	104	10	Peak
2	2480.00	93.07	-0.93	94.00	93.35	27.46	5.44	33.18	104	10	Average
3	4962.00	44.14	-29.86	74.00	64.72	31.73	8.05	60.36	100	0	Peak
4	7440.00	46.07	-27.93	74.00	61.31	36.49	9.61	61.34	100	0	Peak



3.3 Antenna Requirements

3.3.1 Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

3.3.2 Antenna Connector Construction

Embedded in Antenna.



4. LIST OF MEASURING EQUIPMENT

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Agilent	E4416A	GB41292344	300MHz~40GHz	Jan. 14, 2015	Jul. 27, 2015 ~ Jul. 31, 2015	Jan. 13, 2016	Conducted (TH05-HY)
Power Sensor	Agilent	E9327A	US40441548	300MHz~40GHz	Jan. 14, 2015	Jul. 27, 2015 ~ Jul. 31, 2015	Jan. 13, 2016	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Oct. 17, 2014	Jul. 27, 2015 ~ Jul. 31, 2015	Oct. 16, 2015	Conducted (TH05-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 03, 2014	Jul. 29, 2015 ~ Jul. 30, 2015	Nov. 02, 2015	Radiation (03CH10-HY)
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	Feb. 02, 2015	Jul. 29, 2015 ~ Jul. 30, 2015	Feb. 01, 2016	Radiation (03CH10-HY)
Amplifier	SONOMA	310N	187311	9kHz~1GHz	Nov. 24, 2014	Jul. 29, 2015 ~ Jul. 30, 2015	Nov. 23, 2015	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D	35413	30MHz~1GHz	Oct. 24, 2014	Jul. 29, 2015 ~ Jul. 30, 2015	Oct. 23, 2015	Radiation (03CH10-HY)
EMI Test Receiver	Keysight	N9038A	MY54130085	20Hz ~ 8.4GHz	Nov. 05, 2014	Jul. 29, 2015 ~ Jul. 30, 2015	Nov. 04, 2015	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1325	1GHz ~ 18GHz	Oct. 03, 2014	Jul. 29, 2015 ~ Jul. 30, 2015	Oct. 02, 2015	Radiation (03CH10-HY)
Preamplifier	Keysight	83017A	MY53270078	1GHz~26.5GHz	Nov. 20, 2014	Jul. 29, 2015 ~ Jul. 30, 2015	Nov. 19, 2015	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHZ	Oct. 14, 2014	Jul. 29, 2015 ~ Jul. 30, 2015	Oct. 13, 2015	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500 -B	N/A	1~4m	N/A	Jul. 29, 2015 ~ Jul. 30, 2015	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0-360 degree	N/A	Jul. 29, 2015 ~ Jul. 30, 2015	N/A	Radiation (03CH10-HY)
Preamplifier	MITEQ	JS44-18004 000-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	Jul. 29, 2015 ~ Jul. 30, 2015	Jun. 01, 2016	Radiation (03CH10-HY)

Note: Test equipment calibration is traceable to the procedure of ISO17025.