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FCC RADIO TEST REPORT

Applicant's company	**Dorel Juvenile Group**
Applicant Address	2525 State Street, Columbus, Indiana 47201-7494, USA
FCC ID	**MNJ-MO072R**
Manufacturer's company	**Dorel Juvenile Group**
Manufacturer Address	2525 State Street, Columbus, Indiana 47201-7494, USA

Product Name	Tabletop Digital Color Video Monitor - Video Receiver
Brand Name	Safety 1st
Model Name	MO072R / MO080VR
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2409 ~ 2473MHz
Received Date	Sep. 08, 2011
Final Test Date	May 24, 2012
Submission Type	Original Equipment
Multiple Listing	Please refer to section 3.7

Statement

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2009**, **47 CFR FCC Part 15 Subpart C and FCC Public Notice DA00705**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190

ILAC MRA

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR190843	Rev. 01	Initial issue of report	May 29, 2012

Certificate No.: CB10105140

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Tabletop Digital Color Video Monitor - Video Receiver
Brand Name	:	Safety 1st
Model Name	:	MO072R / MO080VR
Applicant	:	Dorel Juvenile Group
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Sep. 08, 2011 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Jordan Hsiao

Jordan Hsiao
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	15.31 dB
4.2	15.247(b)(1)	Maximum Peak Conducted Output Power	Complies	1.37 dB
4.3	-	Average Output Power	-	-
4.4	15.247(a)(1)	Hopping Channel Separation	Complies	-
4.5	15.247(b)(1)	Number of Hopping Frequency	Complies	-
4.6	15.247(a)(1)	Dwell Time	Complies	-
4.7	15.247(d)	Radiated Emissions	Complies	0.44 dB
4.8	15.247(d)	Band Edge Emissions	Complies	13.22 dB
4.9	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Peak Conducted Output Power	±0.8dB	Confidence levels of 95%
Hopping Channel Separation	$\pm 8.5\times10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Power Type	Power Adapter
Modulation	MSK
Frequency Range	2409 ~ 2473MHz
Channel Number	17
Channel Band Width (99%)	4640.00 kHz
Peak Conducted Output Power	19.63 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

3.2. Accessories

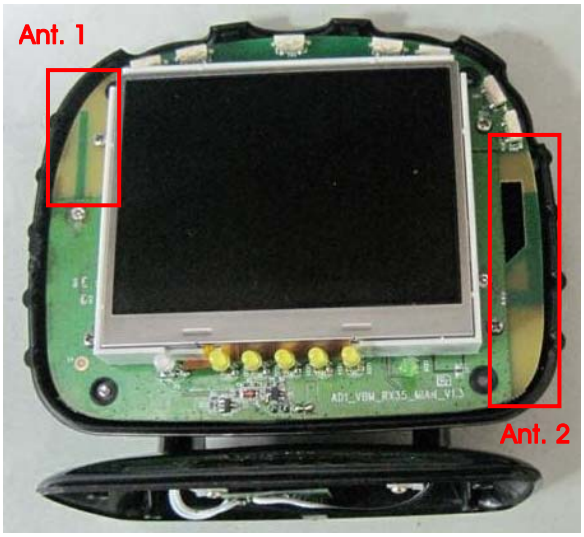
Power	Brand	Model	Rating
Adapter	SURE-POWER	SW-050060A	Input: 100-240VAC. 50/60Hz, 0.2A Output: 5.0VDC, 600mA

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Kin Tech	-	Monopole antenna	N/A	0.7
2	Kin Tech	-	PIFA antenna	N/A	0.3

Note: The EUT supports the antenna with TX/RX diversity functions.

Ant. 1 generated higher output power than Ant. 2, so all the tests were base on this setting and written in the report.



3.4. Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2409~2473MHz	1	2409MHz	10	2445MHz
	2	2413MHz	11	2449MHz
	3	2417MHz	12	2453MHz
	4	2421MHz	13	2457MHz
	5	2425MHz	14	2461MHz
	6	2429MHz	15	2465MHz
	7	2433MHz	16	2469MHz
	8	2437MHz	17	2473MHz
	9	2441MHz	-	-

3.5. Table for Test Modes

Test Items	Mode	Channel	Antenna
AC Power Conducted Emissions	Normal Link	-	-
Max. Peak Conducted Output Power	CTX	1/9/17	NA
Average Output Power	CTX	1/9/17	NA
Hopping Channel Separation	Hopping Mode	1~2/8~9/~16/17	NA
Number of Hopping Frequency	Hopping Mode	Hopping 1~17	NA
Dwell Time	Hopping Mode	Hopping 1~17	NA
Radiated Emissions Below 1GHz	Normal Link	-	-
Radiated Emissions Above 1GHz	CTX	1/9/17	1
Band Edge Emissions	CTX	1/17	1

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D
TH01-CB	OVEN Room	Hsin Chu	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.

3.7. Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	Manufacturer
MO072R	All the models are identical, the difference model served as marketing strategy.
MO080VR	

Note: Only MO072R was selected to perform the test.

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Digital Color Video Monitor - Transimitter	Safety 1st	MO080T	MNJ-M07TX

3.9. Table for Parameters of Test Software Setting

The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the hardware of the final end product.

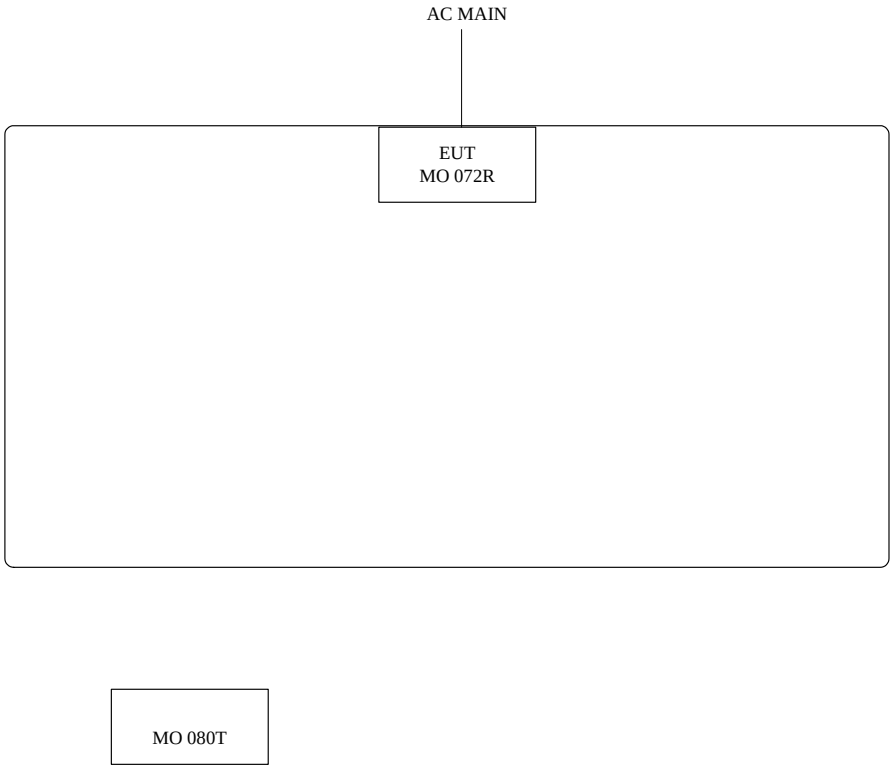
Power Parameters

Test Software Version	Hardware		
Frequency	2409 MHz	2441 MHz	2473 MHz
Power Parameters	DEFAULT	DEFAULT	DEFAULT

3.10. Test Configurations

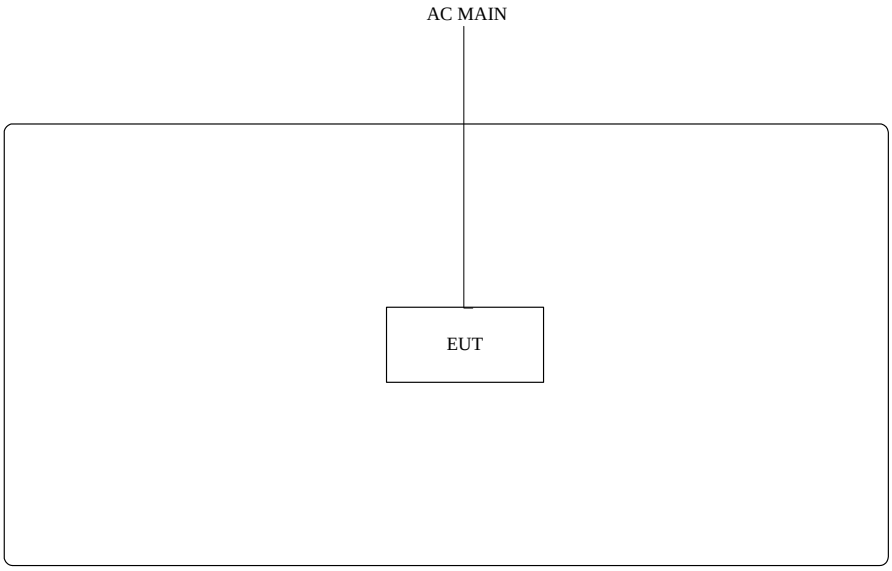
3.10.1. Radiation Emissions Test Configuration

Test Configuration: 30MHz ~ 1GHz



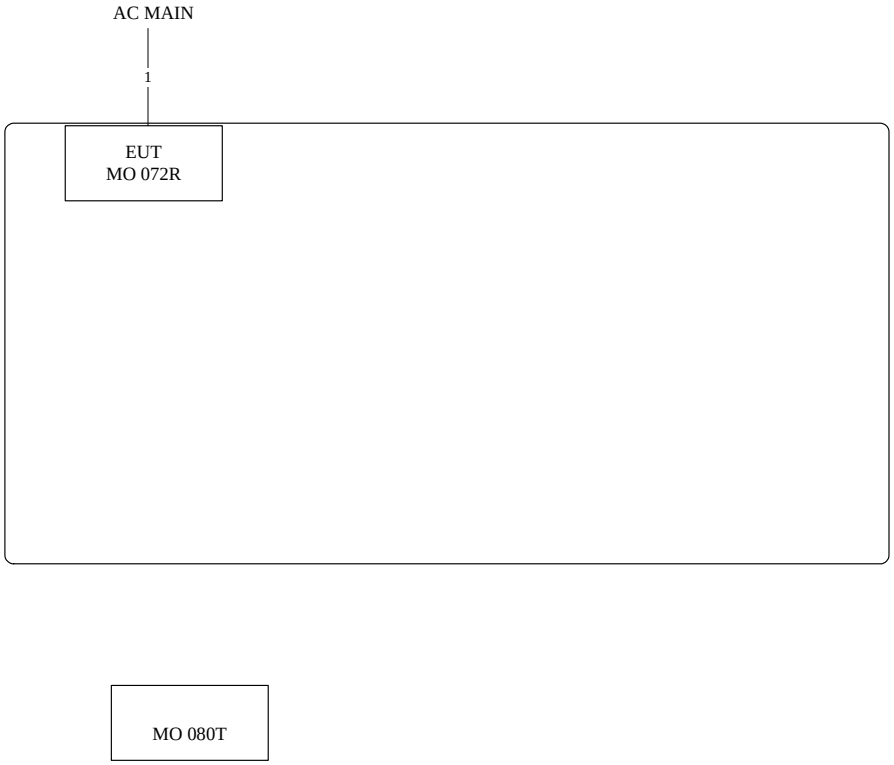
Item	Cable	Shield	Length	Remark
1	Power Cable	No	3.1M	-

Test Configuration: Above 1GHz



Item	Cable	Shield	Length	Remark
1	Power Cable	No	3.1M	-

3.10.2. AC Power Line Conduction Emissions Test Configuration



Item	Cable	Shield	Length	Remark
1	Power Cable	No	3.1M	-

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For a Low-power Radio-frequency Device which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

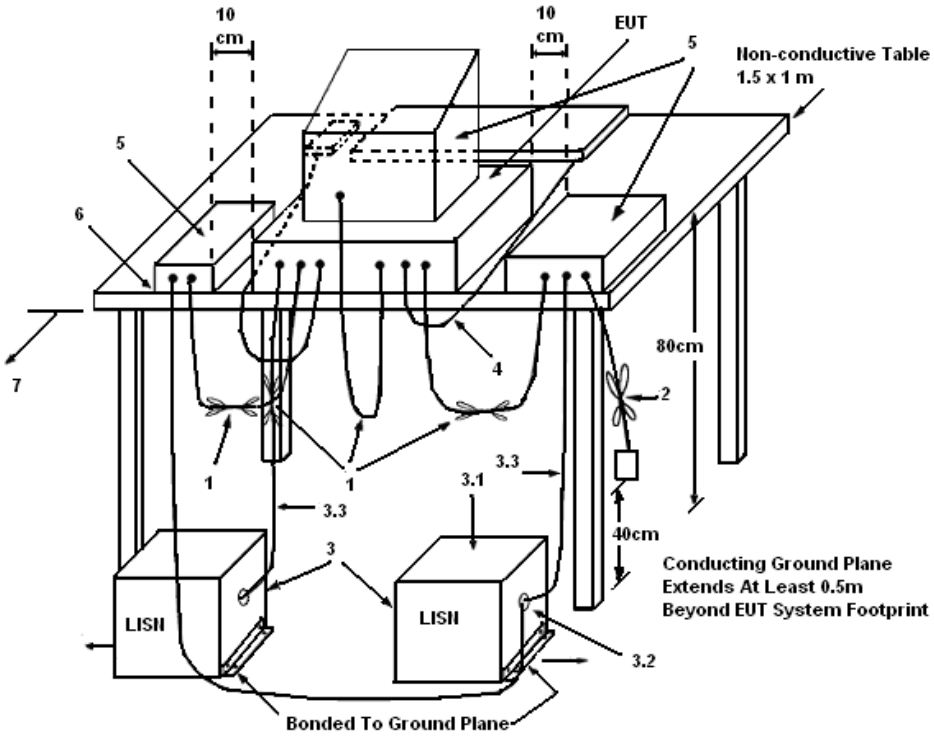
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

(3.1) All other equipment powered from additional LISN(s).

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

(3.3) LISN at least 80 cm from nearest part of EUT chassis.

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

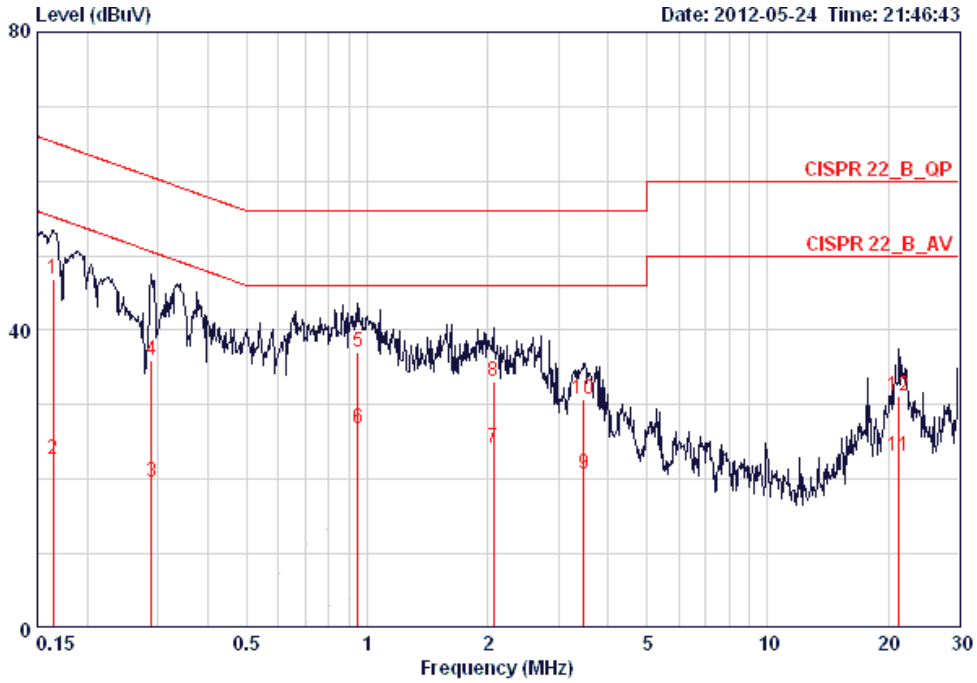
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

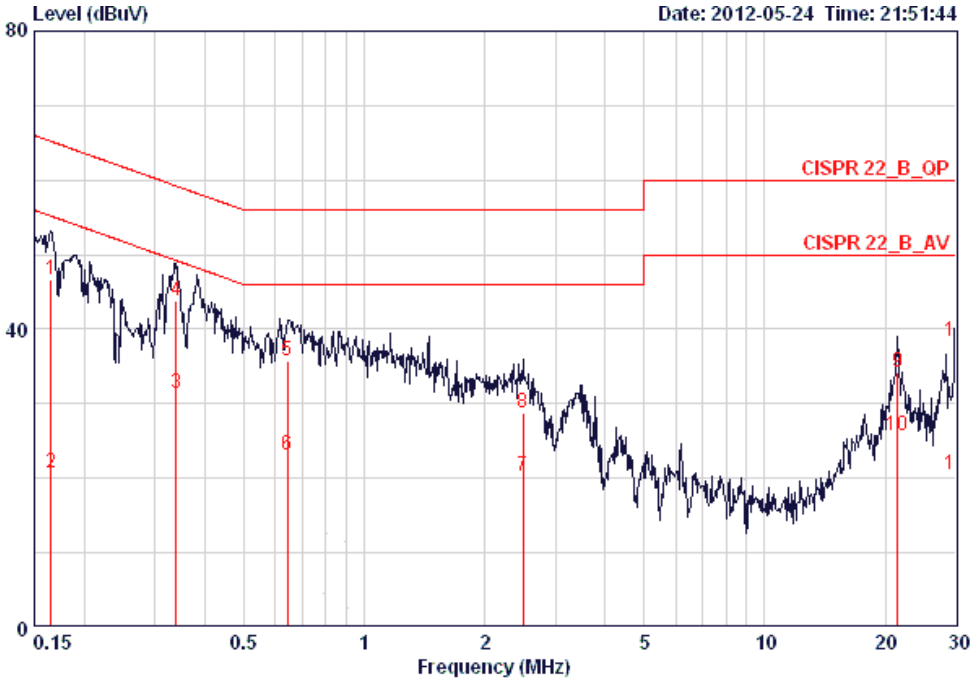
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	69%
Test Engineer	Ryo Fan	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16414	46.89	-18.37	65.25	46.63	0.06	0.20	QP
2	0.16414	22.65	-32.61	55.25	22.39	0.06	0.20	AVERAGE
3	0.28935	19.69	-30.85	50.54	19.46	0.03	0.20	AVERAGE
4	0.28935	36.06	-24.48	60.54	35.83	0.03	0.20	QP
5	0.94809	37.06	-18.94	56.00	36.79	0.07	0.20	QP
6	0.94809	26.91	-19.09	46.00	26.64	0.07	0.20	AVERAGE
7	2.066	24.16	-21.84	46.00	23.88	0.08	0.20	AVERAGE
8	2.066	33.12	-22.88	56.00	32.84	0.08	0.20	QP
9	3.472	20.80	-25.20	46.00	20.41	0.10	0.29	AVERAGE
10	3.472	30.75	-25.25	56.00	30.36	0.10	0.29	QP
11	21.260	23.08	-26.92	50.00	22.30	0.28	0.50	AVERAGE
12	21.260	31.27	-28.73	60.00	30.49	0.28	0.50	QP

Temperature	23°C	Humidity	69%
Test Engineer	Ryo Fan	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16501	46.71	-18.50	65.21	46.45	0.06	0.20	QP
2	0.16501	20.75	-34.46	55.21	20.49	0.06	0.20	AVERAGE
3	0.33920	31.30	-17.92	49.22	31.05	0.05	0.20	AVERAGE
4 @	0.33920	43.91	-15.31	59.22	43.66	0.05	0.20	QP
5	0.64398	35.73	-20.27	56.00	35.47	0.06	0.20	QP
6	0.64398	23.13	-22.87	46.00	22.87	0.06	0.20	AVERAGE
7	2.487	20.26	-25.74	46.00	19.96	0.10	0.20	AVERAGE
8	2.487	28.75	-27.25	56.00	28.45	0.10	0.20	QP
9	21.486	34.13	-25.87	60.00	33.25	0.38	0.50	QP
10	21.486	25.75	-24.25	50.00	24.87	0.38	0.50	AVERAGE
11	30.000	38.38	-21.62	60.00	37.32	0.46	0.60	QP
12	30.000	20.47	-29.53	50.00	19.41	0.46	0.60	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Peak Output Power Measurement

4.2.1. Limit

For frequency hopping systems operating in the 2400~2483.5MHz band employing at least 15 non-overlapping hopping channels, the limit for peak output power is 1Watt (30dBm). For all other frequency hopping systems in the 2400~2483.5MHz band: 0.125 watts (21dBm). The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

4.2.2. Measuring Instruments and Setting

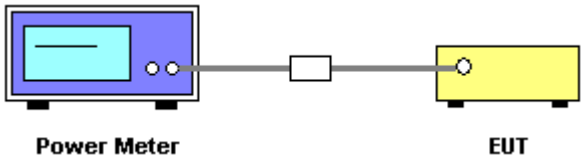
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Peak Sensor	MA2411B

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Peak Output Power

Temperature	24°C	Humidity	65%
Test Engineer	Sean Ku	Configurations	CTX
Test Date	May 22, 2012		

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2409 MHz	19.63	21.00	Complies
9	2441 MHz	18.03	21.00	Complies
17	2473 MHz	19.27	21.00	Complies

4.3. Average Output Power Measurement

4.3.1. Measuring Instruments and Setting

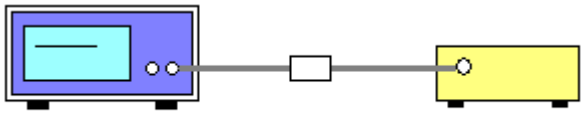
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	Average

4.3.2. Test Procedures

Spectrum Parameter	Setting
RF Output Power Method	☒ ANSI C63.10 clause 6.10.2.1 (a) power meter method
RF Output Power Method	☐ ANSI C63.10 clause 6.10.2.1 (b) channel integration method
RF Output Power Method	☐ ANSI C63.10 clause 6.10.3.1 Method 1 - spectral trace averaging
RF Output Power Method	☐ ANSI C63.10 clause 6.10.3.2 Method 2 - zero-span mode with trace averaging

4.3.3. Test Setup Layout



4.3.4. Test Deviation

There is no deviation with the original standard.

4.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

Note: Average output power is only for Maximum Permissible Exposure use.

4.3.6. Test Result of Average Output Power

Temperature	24°C	Humidity	65%
Test Engineer	Sean Ku	Configurations	CTX
Test Date	May 22, 2012		

Channel	Frequency	Average Conducted Power (dBm)
1	2409 MHz	7.96
9	2441 MHz	6.36
17	2473 MHz	7.60

4.4. Hopping Channel Separation Measurement

4.4.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400~2483.5MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

4.4.2. Measuring Instruments and Setting

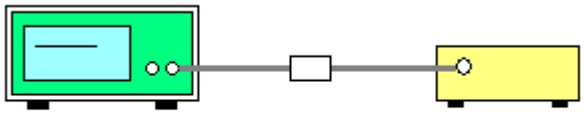
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 100KHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100KHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 30 kHz and the video bandwidth of 100KHz were utilised for 20 dB bandwidth measurement.
3. The resolution bandwidth of 100 kHz and the video bandwidth of 100KHz were utilised for channel separation measurement.
4. Test was performed in accordance with Measurement under FCC Public Notic DA00-705.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in hopping mode.

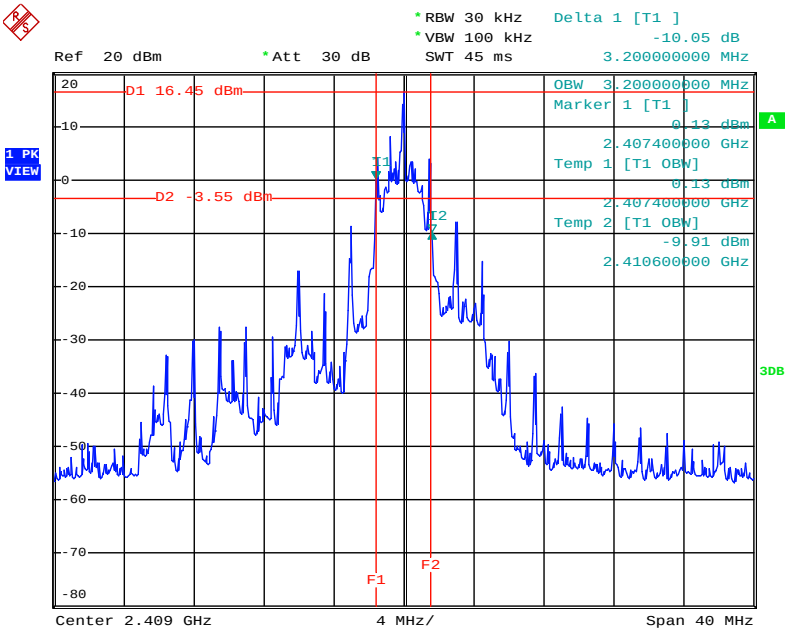
4.4.7. Test Result of 20dB Bandwidth

Temperature	24°C	Humidity	65%
Test Engineer	Sean Ku	Configurations	Hopping mode

Frequency	20dB Bandwidth (kHz)	99% Occupied BW (kHz)	2/3 of 20dB Bandwidth Min. Limits (kHz)	Channel Specing Min. Limits (kHz)	Result
2409 MHz	3200.00	3200.00	2133.33	4000.00	Complies
2441 MHz	3120.00	4560.00	2080.00	4000.00	Complies
2473 MHz	4640.00	4640.00	3093.33	4000.00	Complies

Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth.

20 dB Bandwidth Plot on Channel 1 / 2409 MHz



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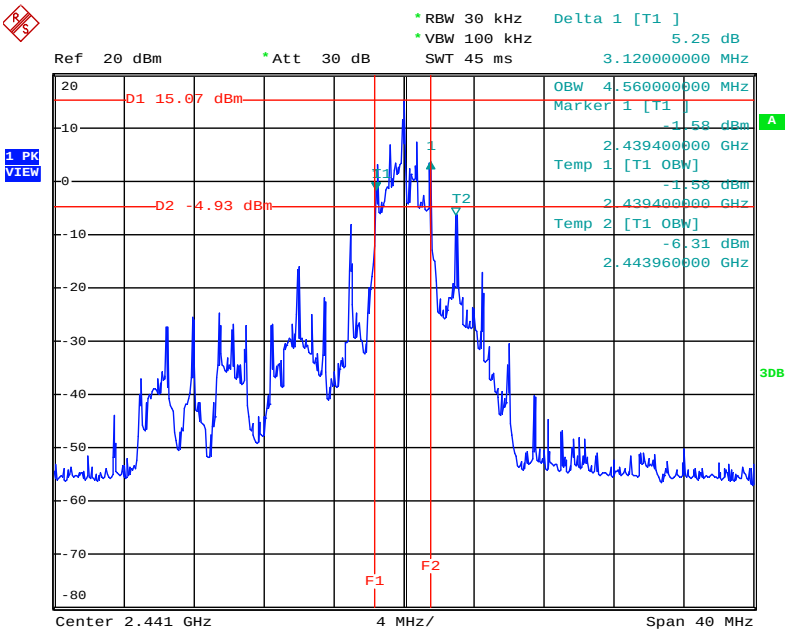
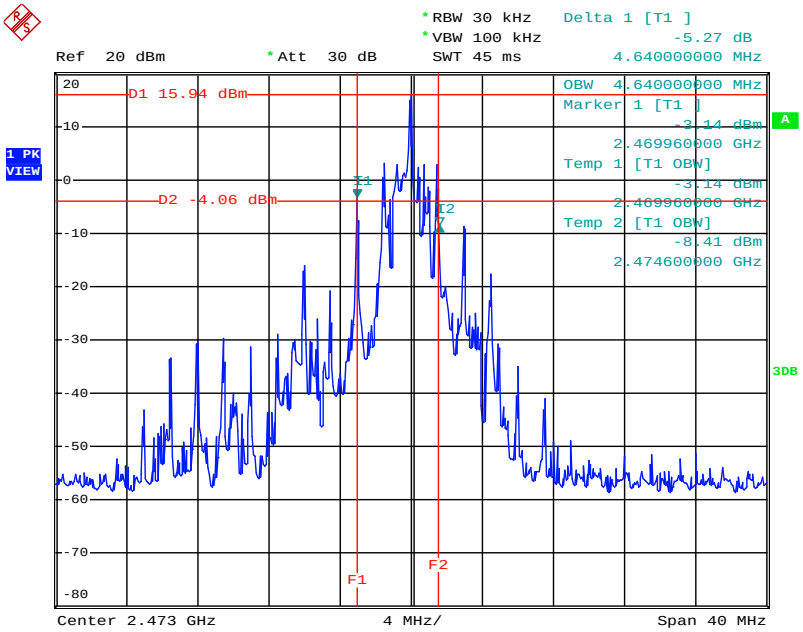
20 dB Bandwidth Plot on Channel 9 / 2441 MHz



Date: 22.MAY.2012 23:15:25

20 dB Bandwidth Plot on Channel 17 / 2473 MHz



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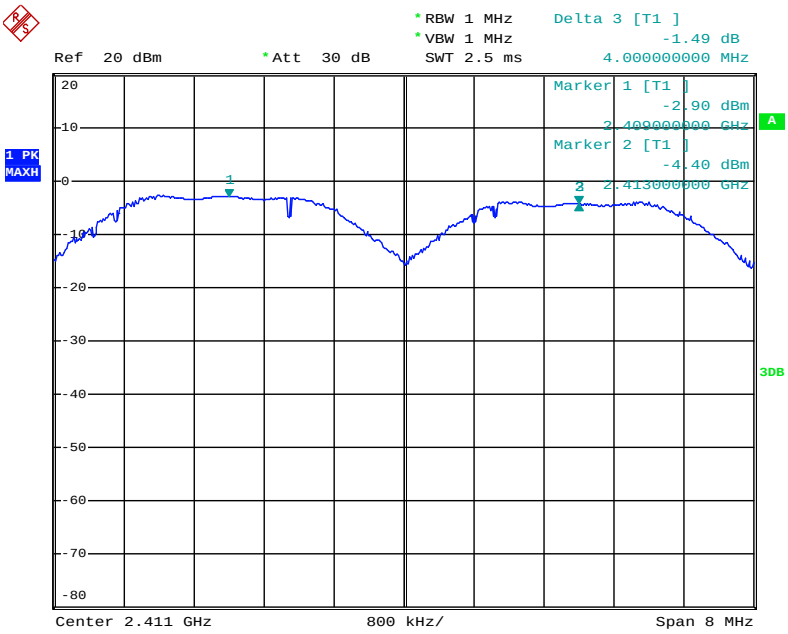
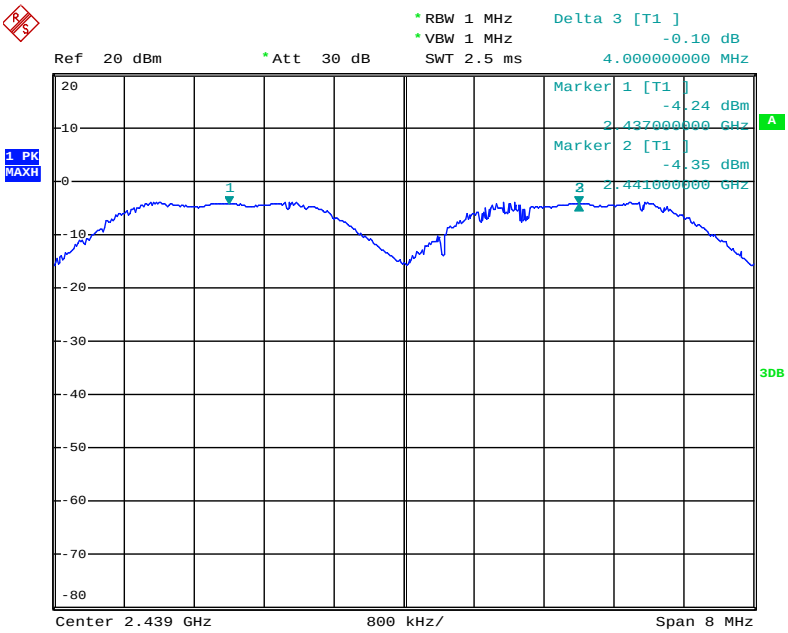
4.4.8. Test Result of Hopping Channel Separation

Channel Separation Plot on Channel 1~2 / 2409MHz~2413MHz



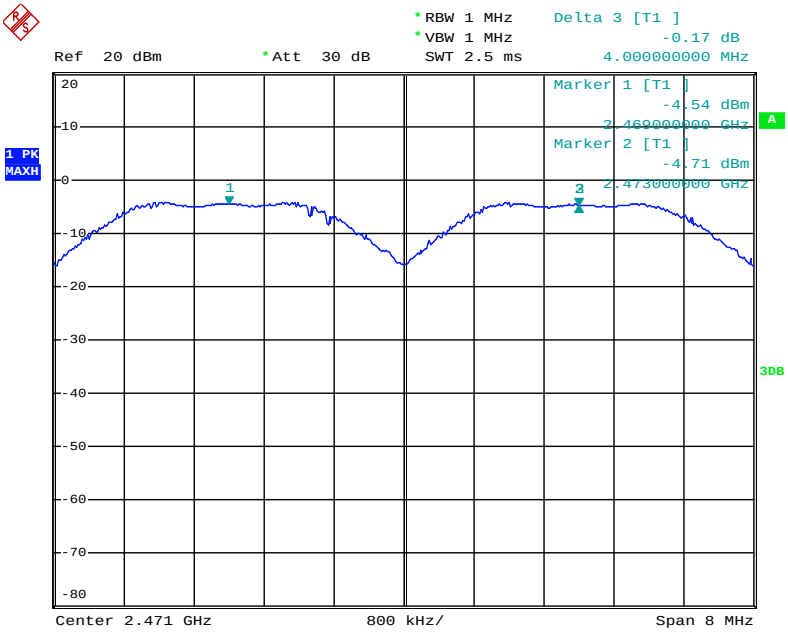
Date: 22.MAY.2012 21:53:47

Channel Separation Plot on Channel 8~9 / 2437MHz~2441MHz



Date: 22.MAY.2012 21:51:58

Channel Separation Plot on Channel 16~17 / 2469MHz~2473MHz



Date: 22.MAY.2012 21:49:29

4.5. Number of Hopping Frequency Measurement

4.5.1. Limit

For frequency hopping systems operating in the 2400~2483.5MHz band employing at least 15 non-overlapping hopping channels.

4.5.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RB	1 MHz
VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.5.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 1 MHz and the video bandwidth of 1 MHz were utilised.
3. Observe frequency hopping in 2400~2483.5MHz, there are at least 15 non-overlapping channels.

4.5.4. Test Setup Layout

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

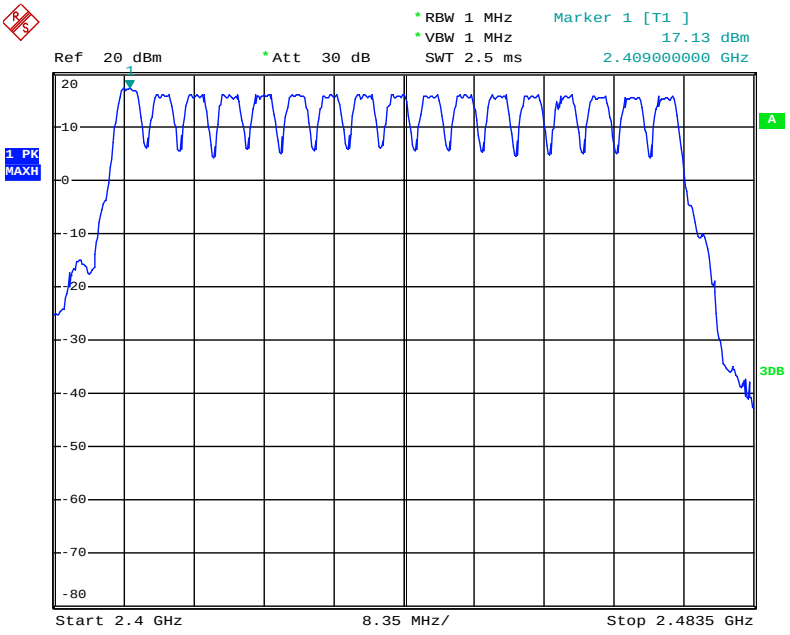
The EUT was programmed to be in hopping mode.

4.5.7. Test Result of Number of Hopping Frequency

Temperature	24°C	Humidity	65%
Test Engineer	Sean Ku	Configurations	Hopping mode

Channel No.	Frequency (MHz)	Hopping Ch. (Channels)	Min. Limit (Channels)	Test Result
1~17	2409 MHz ~ 2473 MHz	17	15	Complies

Number of Hopping Channel Plot on Channel 1~17 / 2409 MHz ~ 2473 MHz



Date: 22.MAY.2012 21:26:40

4.6. Dwell Time Measurement

4.6.1. Limit

Frequency hopping systems in the 2400~2483.5MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

4.6.2. Measuring Instruments and Setting

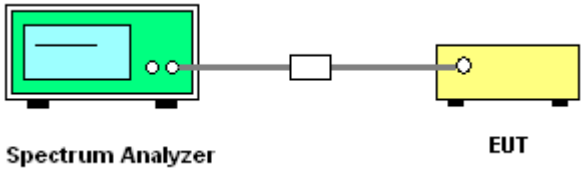
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 MHz
Detector	Peak
Trace	Single Trigger

4.6.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer
2. Set RBW of spectrum analyzer to 1 MHz and VBW to 1 MHz.
3. Use a video trigger with the trigger level set to enable triggering only on full pulses.
4. Sweep Time is more than once pulse time.
5. Set the center frequency on any frequency would be measure and span to zero span.
6. Measure the maximum time duration of one single pulse.
7. Count the number of pulses in the dwell time duration (0.4 seconds multiplied by the number of hopping channels).
8. Dwell time=pulse duration x number of pulses / measure time x dwell time duration.

4.6.4. Test Setup Layout



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in hopping mode.

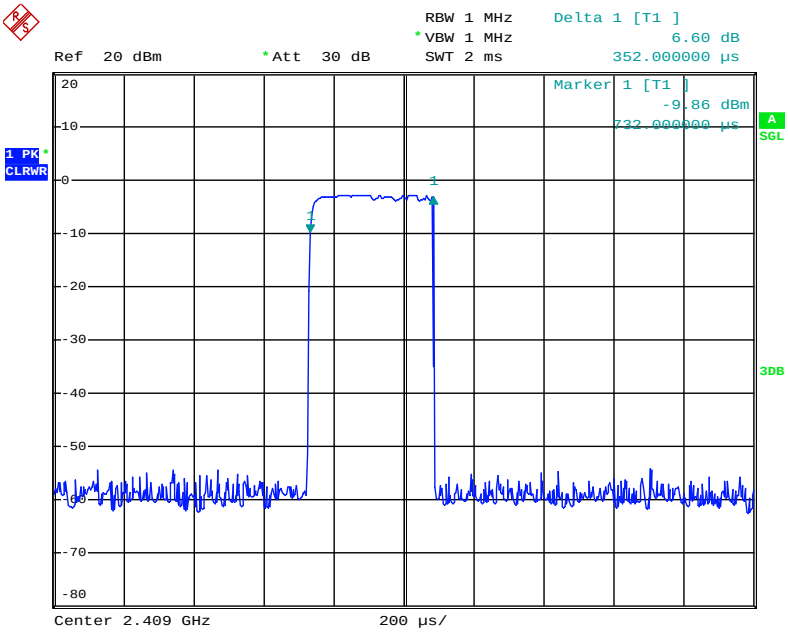
4.6.7. Test Result of Dwell Time

Temperature	24°C	Humidity	65%
Test Engineer	Sean Ku	Configurations	Hopping Mode

Frequency	Pulse Duration (ms)	Number of Pulses	Measure Time (s)	Dwell time duration (s)	Dwell Time (s)	Limits (s)	Test Result
2409 MHz	0.3520	16	1.00	6.8	0.0383	0.4000	Complies
2441MHz	0.4800	16	1.00	6.8	0.0522	0.4000	Complies
2473 MHz	0.3440	15	1.00	6.8	0.0351	0.4000	Complies

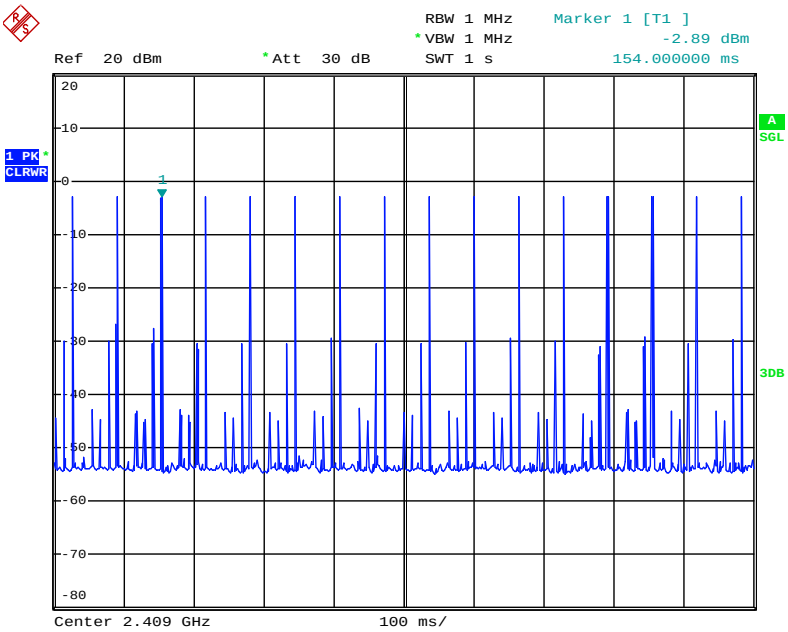
Note: Dwell time=pulse duration x number of pulses / measure time x dwell time duration

Single Pulse Plot on Channel 1 / 2409 MHz



Date: 22.MAY.2012 21:36:00

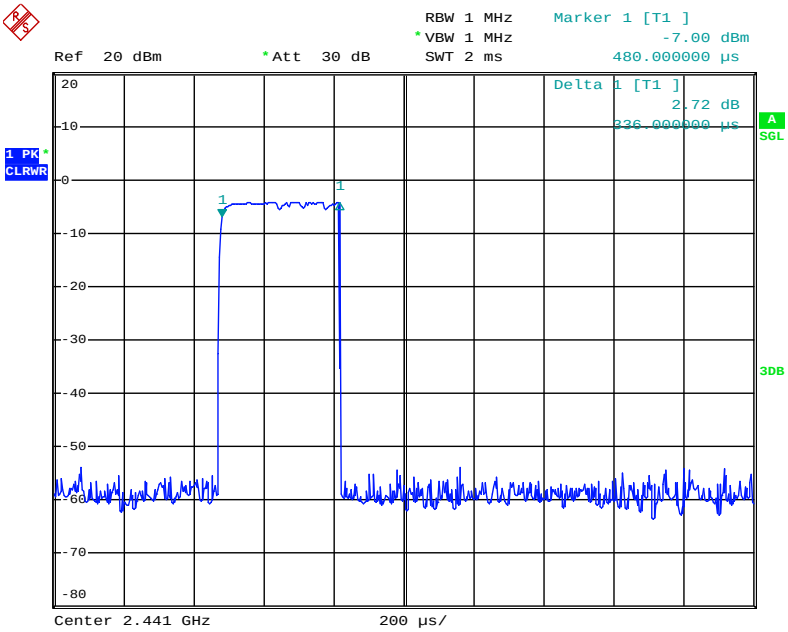
Number of Pulses Plot on Channel 1 / 2409 MHz



Date: 22.MAY.2012 21:33:24

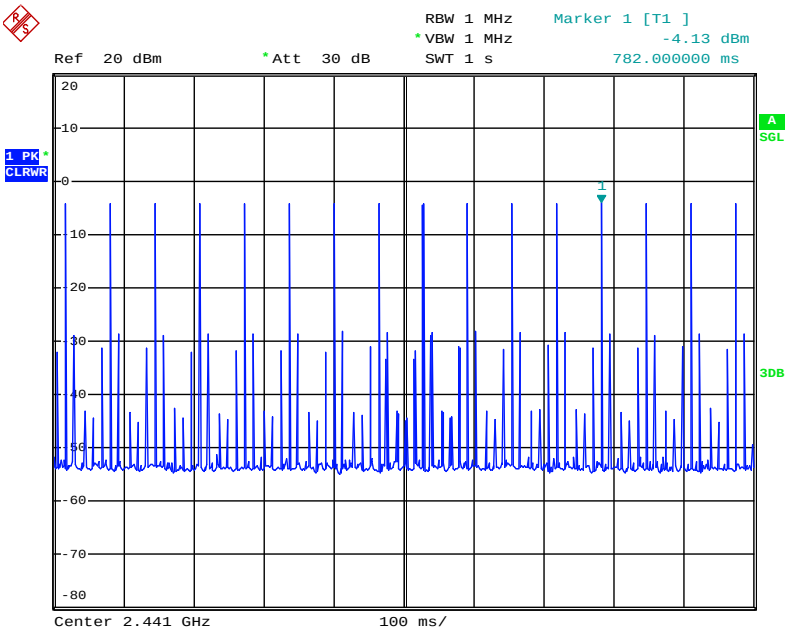
Note: Below 10dBm of the pulse emissions were adjacent channel emission.

Single Pulse Plot on Channel 9 / 2441 MHz



Date: 22.MAY.2012 21:39:28

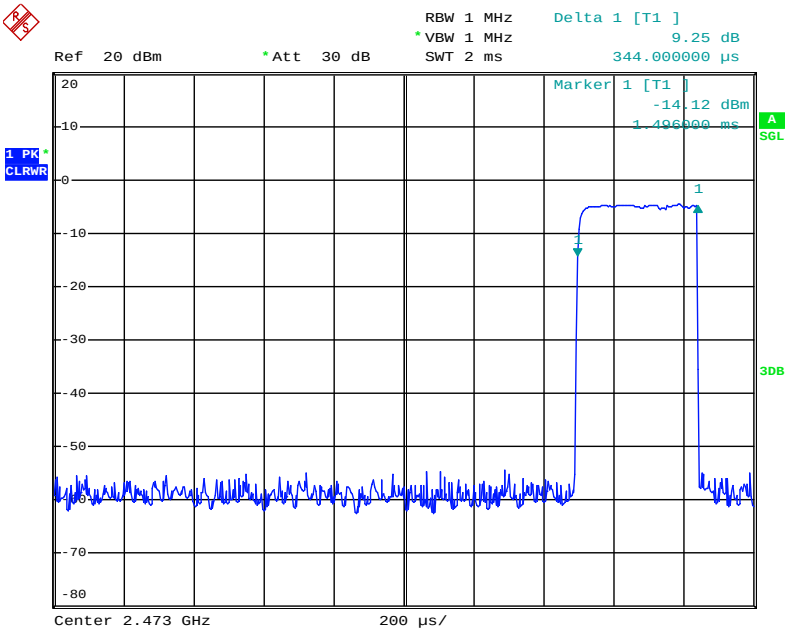
Number of Pulses Plot on Channel 9 / 2441 MHz



Date: 22.MAY.2012 21:40:09

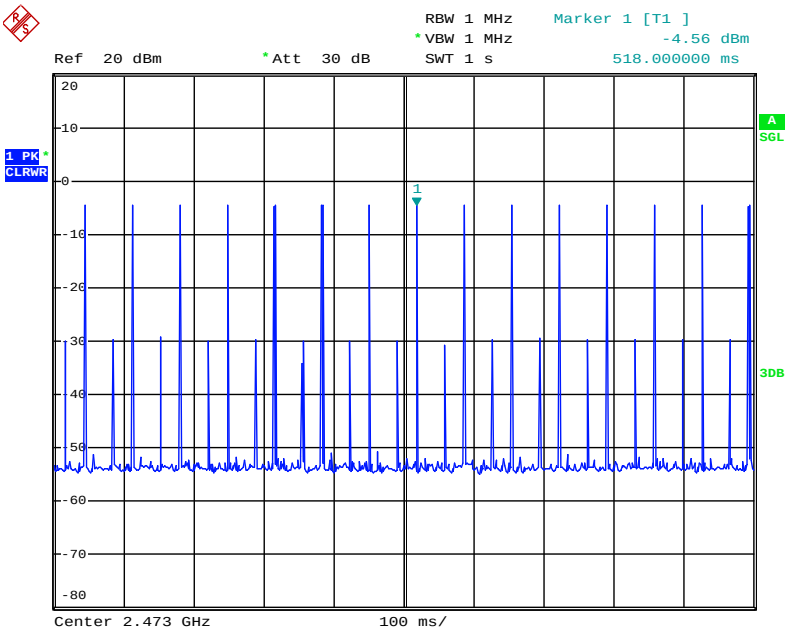
Note: Below 10dBm of the pulse emissions were adjacent channel emission.

Single Pulse Plot on Channel 17 / 2473 MHz



Date: 22.MAY.2012 21:45:35

Number of Pulses Plot on Channel 17 / 2473 MHz



Date: 22.MAY.2012 21:41:19

Note: Below 10dBm of the pulse emissions were adjacent channel emission.

4.7. Radiated Emissions Measurement

4.7.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

4.7.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1000KHz / 1000KHz for peak

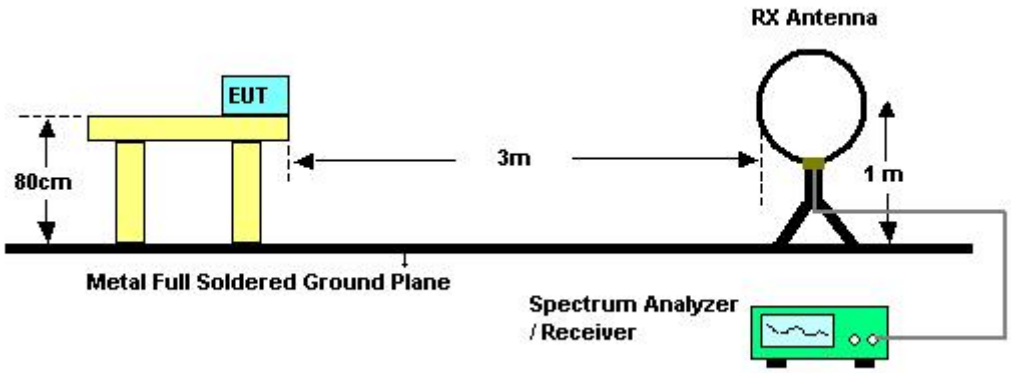
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.7.3. Test Procedures

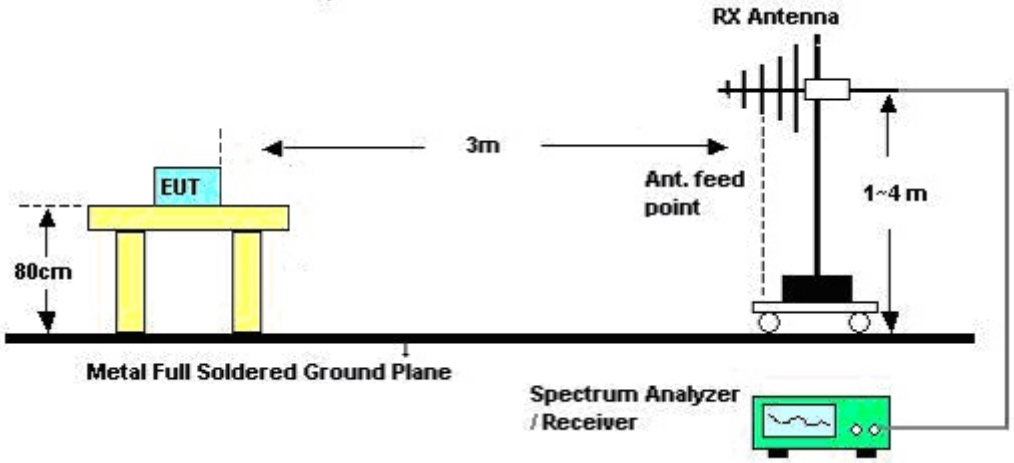
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average 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 for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions 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.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.7.4. Test Setup Layout

For radiated emissions below 1GHz



For radiated emissions above 1GHz



4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.7.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	24°C	Humidity	65%
Test Engineer	Wen Chao	Test Date	May 18, 2012

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

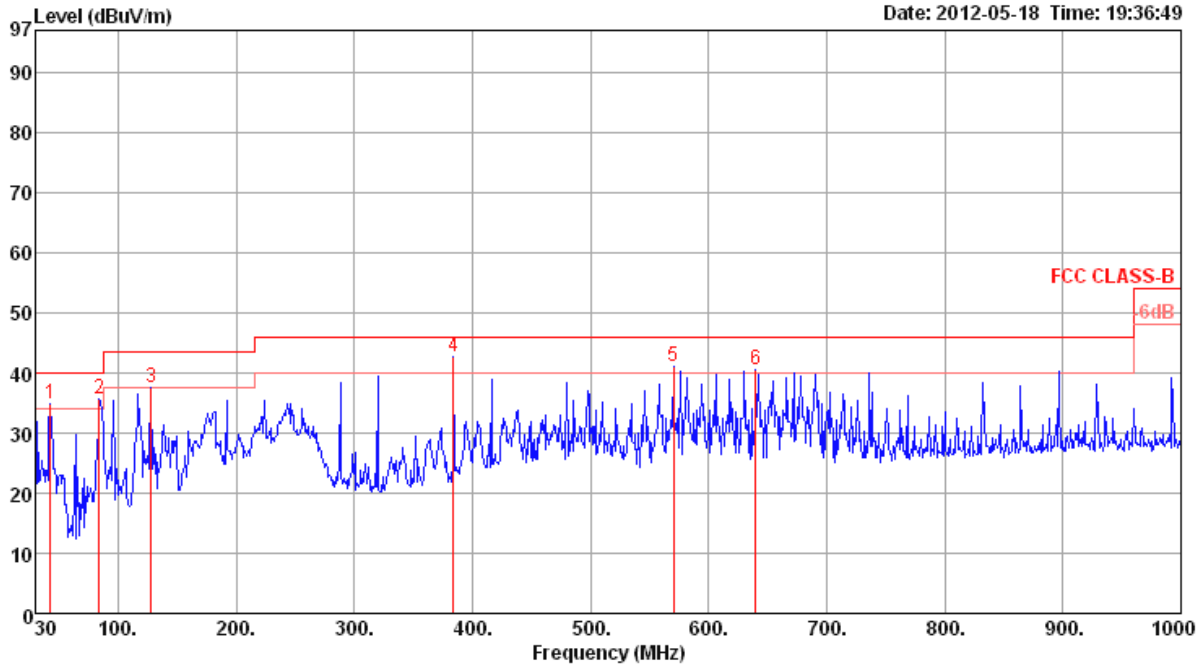
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

4.7.8. Results of Radiated Emissions (30MHz~1GHz)

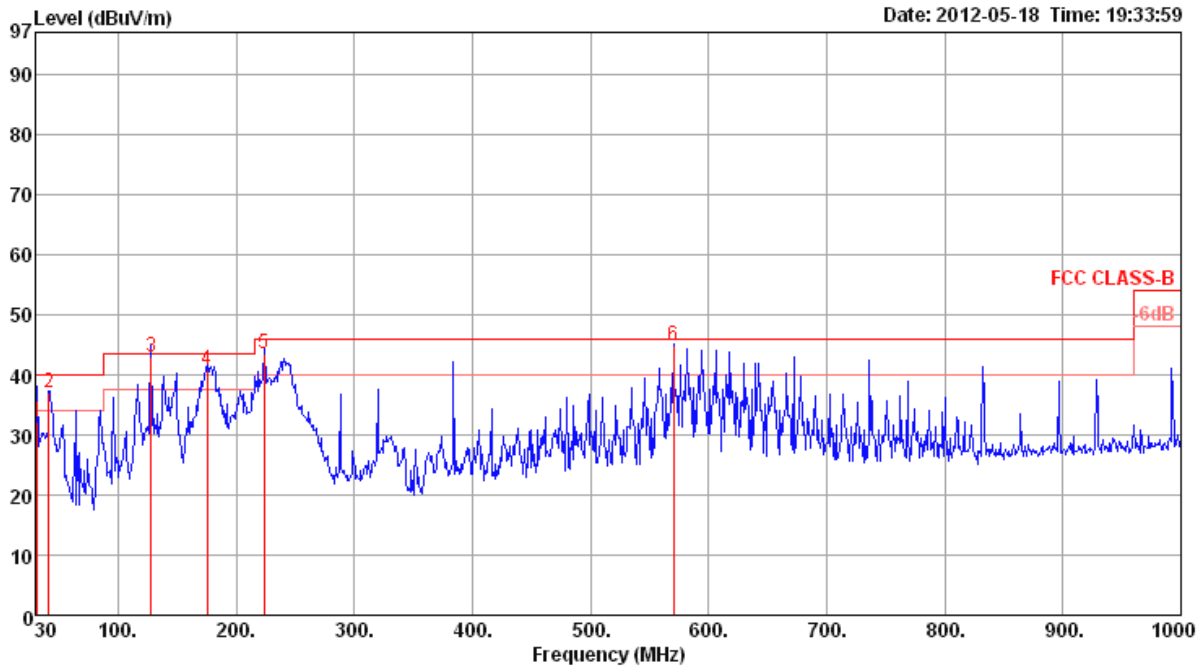
Temperature	24°C	Humidity	65%
Test Engineer	Wen Chao	Configurations	Normal Link

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	42.61	34.77	40.00	-5.23	50.43	0.70	11.44	27.80	Peak	100	0	HORIZONTAL
2	84.32	35.71	40.00	-4.29	54.38	1.10	7.89	27.66	Peak	100	0	HORIZONTAL
3	127.97	37.61	43.50	-5.89	51.55	1.28	12.24	27.46	Peak	100	0	HORIZONTAL
4	384.05	42.62	46.00	-3.38	52.20	2.27	15.64	27.49	Peak	100	0	HORIZONTAL
5	570.29	41.15	46.00	-4.85	47.98	2.84	18.43	28.10	Peak	100	0	HORIZONTAL
6	640.13	40.57	46.00	-5.43	46.59	3.14	18.90	28.06	Peak	100	0	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	31.94	32.13	40.00	-7.87	41.74	0.50	17.69	27.80	QP	200	0	VERTICAL
2	41.64	36.95	40.00	-3.05	52.06	0.70	11.99	27.80	QP	200	0	VERTICAL
3	128.00	43.06	43.50	-0.44	57.00	1.28	12.24	27.46	QP	100	171	VERTICAL
4	175.50	40.88	43.50	-2.62	53.40	1.58	13.12	27.22	QP	200	0	VERTICAL
5	224.00	43.44	46.00	-2.56	57.85	1.80	10.84	27.05	QP	200	0	VERTICAL
6	570.29	44.88	46.00	-1.12	51.71	2.84	18.43	28.10	QP	200	0	VERTICAL

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.7.9. Results for Radiated Emissions (1GHz~10th Harmonic)

Temperature	24°C	Humidity	65%
Test Engineer	Wen Chao	Configurations	Channel 1
Test Date	May 22, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4817.89	28.55	54.00	-25.45	24.16	6.23	33.36	35.20	Average	100	144	HORIZONTAL
2	4817.89	51.90	74.00	-22.10	47.51	6.23	33.36	35.20	Peak	100	144	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4817.79	32.68	54.00	-21.32	28.29	6.23	33.36	35.20	Average	121	135	VERTICAL
2	4817.79	56.03	74.00	-17.97	51.64	6.23	33.36	35.20	Peak	121	135	VERTICAL

Temperature	24°C	Humidity	65%
Test Engineer	Wen Chao	Configurations	Channel 9
Test Date	May 22, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4882.40	28.76	54.00	-25.24	24.19	6.29	33.48	35.20	Average	139	234	HORIZONTAL
2	4882.40	52.11	74.00	-21.89	47.54	6.29	33.48	35.20	Peak	139	234	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4881.64	27.50	54.00	-26.50	22.93	6.29	33.48	35.20	Average	126	139	VERTICAL
2	4881.64	50.85	74.00	-23.15	46.28	6.29	33.48	35.20	Peak	126	139	VERTICAL

Temperature	24°C	Humidity	65%
Test Engineer	Wen Chao	Configurations	Channel 17
Test Date	May 22, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4946.40	29.57	54.00	-24.43	24.79	6.37	33.61	35.20	Average	169	306	HORIZONTAL
2	4946.40	52.92	74.00	-21.08	48.14	6.37	33.61	35.20	Peak	169	306	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4945.79	31.15	54.00	-22.85	26.37	6.37	33.61	35.20	Average	153	99	VERTICAL
2	4945.79	54.50	74.00	-19.50	49.72	6.37	33.61	35.20	Peak	153	99	VERTICAL

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.8. Band Edge Emissions Measurement

4.8.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

4.8.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100 KHz / 300 KHz for Peak

4.8.3. Test Procedures

1. The test procedure is the same as section 4.5.3, only the frequency range investigated is limited to 100MHz around bandedges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

4.8.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.6.4.

4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.8.7. Test Result of Band Edge and Fundamental Emissions

Temperature	24°C	Humidity	65%
Test Engineer	Wen Chao	Configurations	Channel 1, 9, 17
Test Date	May 22, 2012		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2385.80	35.38	54.00	-18.62	3.22	4.11	28.05	0.00	Average	100	211	VERTICAL
2	2385.80	58.73	74.00	-15.27	26.57	4.11	28.05	0.00	Peak	100	211	VERTICAL
3	2409.00	91.12				4.14	28.09	0.00	Average	100	211	VERTICAL
4	2409.00	114.47				4.14	28.09	0.00	Peak	100	211	VERTICAL

Item 3, 4 are the fundamental frequency at 2409 MHz.

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2383.60	33.14	54.00	-20.86	0.98	4.11	28.05	0.00	Average	188	80	VERTICAL
2	2383.60	56.49	74.00	-17.51	24.33	4.11	28.05	0.00	Peak	188	80	VERTICAL
3	2440.20	89.77				4.18	28.18	0.00	Average	100	80	VERTICAL
4	2440.20	113.12				4.18	28.18	0.00	Peak	100	80	VERTICAL
5	2489.10	35.60	54.00	-18.40	3.07	4.23	28.30	0.00	Average	100	80	VERTICAL
6	2489.10	58.95	74.00	-15.05	26.42	4.23	28.30	0.00	Peak	100	80	VERTICAL

Item 3, 4 are the fundamental frequency at 2441 MHz.

Channel 17

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2472.20	91.06				4.21	28.26	0.00	Average	100	262	VERTICAL
2	2472.20	114.41				4.21	28.26	0.00	Peak	100	262	VERTICAL
3	2497.10	37.43	54.00	-16.57	4.90	4.23	28.30	0.00	Average	165	262	VERTICAL
4	2497.10	60.78	74.00	-13.22	28.25	4.23	28.30	0.00	Peak	165	262	VERTICAL

Item 1, 2 are the fundamental frequency at 2473 MHz.

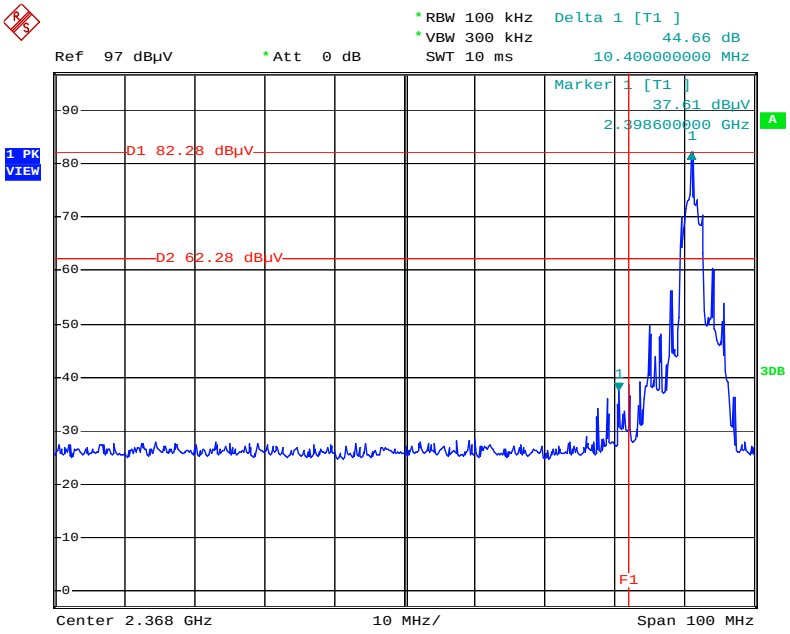
Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

For Emission not in Restricted Band

Low Band Edge Plot on Channel 1 / 2409 MHz



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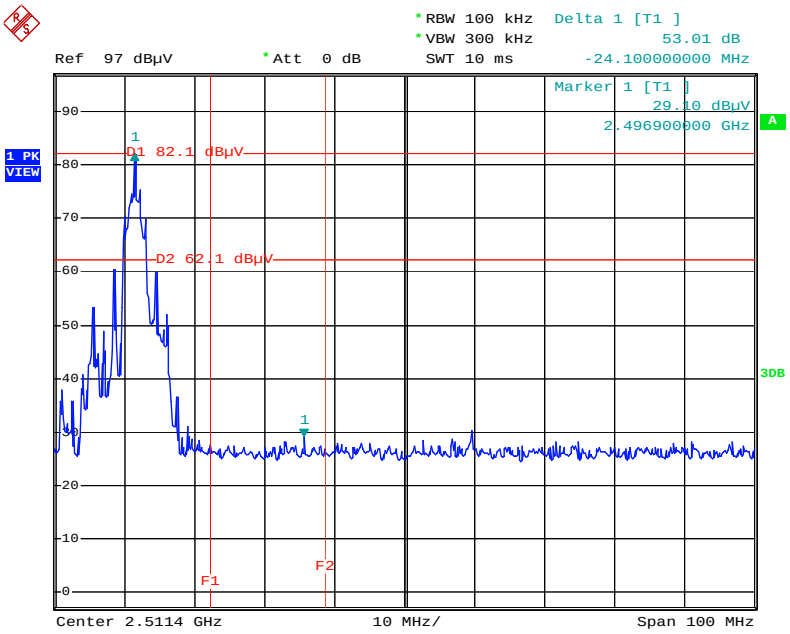
High Band Edge Plot on Channel 17 / 2473 MHz



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4.9. Antenna Requirements

4.9.1. 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. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.9.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100377	9kHz ~ 2.75GHz	Sep. 14, 2011	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov. 14, 2011	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9K ~ 30MHz	Nov. 30, 2011	Conduction (CO01-CB)
PULSE LIMITER	R&S	ESH3-Z2	100430	9K~30MHz	Feb. 03, 2012	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	0.15MHz~30MHz	Dec. 04, 2011	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 11, 2012	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 25, 2011	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 22, 2011	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 17, 2011	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 29, 2011	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 29, 2011	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 03, 2011	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2012	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Sep. 09, 2010*	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N/A	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N/A	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Sep. 26, 2011	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	May 20, 2012	Conducted (TH01-CB)
Thermo-Hygro Meter	N/A	HC 520	#1	15~70 degree	Nov. 02, 2010	Conducted (TH01-CB)
Signal Generator	R&S	SMR40	100302	10MHz-40GHz	Nov. 22, 2011	Conducted (TH01-CB)
RF Power Divider	HP	11636A	00306	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Power Splitter	Anaren	44100	1839	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	42100	17930	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
Signal generator	R&S	SMU200A	102782	10MHz-40GHz	Jun. 07, 2011	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071187	1GHz – 18GHz	May 09, 2012	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071042	1GHz – 18GHz	Nov. 01, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-12	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-13	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 01, 2011	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 01, 2011	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

Note: "*" Calibration Interval of instruments listed above is two years.

6. TEST LOCATION

SHIJR	ADD	:	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL	:	886-2-2696-2468
	FAX	:	886-2-2696-2255
HWA YA	ADD	:	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL	:	886-3-327-3456
	FAX	:	886-3-318-0055
LINKOU	ADD	:	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL	:	886-2-2601-1640
	FAX	:	886-2-2601-1695
DUNGHU	ADD	:	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL	:	886-2-2631-4739
	FAX	:	886-2-2631-9740
JUNGHE	ADD	:	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL	:	886-2-8227-2020
	FAX	:	886-2-8227-2626
NEIHU	ADD	:	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085

7. TAF CERTIFICATE OF ACCREDITATION

Certificate No.：L1190-110702

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Road, Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	：	ISO/IEC 17025:2005
Accreditation Number	：	1190
Originally Accredited	：	December 15, 2003
Effective Period	：	January 10, 2010 to January 09, 2013
Accredited Scope	：	Testing Field, see described in the Appendix
Specific Accreditation Program	：	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date：July 02, 2011

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The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix