

Reference No.: A06082902 Report No.: FCCA06082902 FCCID: UKT95025-MF001

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Date: Sep. 11, 2006

Product Name:

Wireless Guitar Controller

Model Number:

95025:MF001

Applicant:

Mayflash Ltd.

5/F, Block A3, HuaFeng KeJi Yuan, 82 Zone, Baoan

Shenzhen, China

Date of Receipt:

Aug. 29, 2006

Finished date of Test:

Sep. 11, 2006

Applicable Standards:

47 CFR Part 15, Subpart C

47 CFR Part 15, Subpart B

ANSI C63.4: 2003

We, Spectrum Research & Testing Laboratory Inc., hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

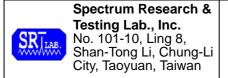
Tested By :

(Mao Feng Hsu) Date: Sep. 11, 2006

Approved By:

Date:

Lab Code: 200099-0



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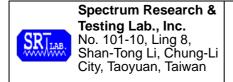


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1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

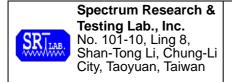
 The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- AC power source, 120 VAC/60 Hz, was used during the test.
- DC 4.5V from battery was used during the test.

1.3 EUT MODIFICATION

No modification in SRT Lab.



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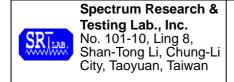
2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless Guitar Controller
MODEL NO.	95025;MF001
POWER SUPPLY	Transmitter: DC 4.5 V
FREQUENCY BAND	2.400~2.4835GHz
CARRIER FREQUENCY	2.406GHz~2.478GHz
NUMBER OF CHANNEL	32
CHANNEL SPACING	2MHz
RATED RF OUTPUT POWER	0dBm (1mW)
I.F. & L.O.	I.F.: 2MHz, L.O.: 1604-1652 MHz
MODULATION TYPE	FSK
BIT RATE OF TRANSMISSION	250Kbps
DUTY CYCLE	2%
ANTENNA TYPE	PCB Antenna
ANTENNA GAIN	Max 2 dBi
OPERATING TEMPERATURE	-10-70°C
CHANNEL BANDWIDTH	5.12MHz

NOTE:

The EUT has two model numbers, one is transmitter part, and the other is receiver part.



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2.2 DESCRIPTION OF SUPPORT UNIT

The transmitter part of EUT was tested with a Game system(Play station 2) and configured by the requirement of ANSI C63.4. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL#	FCC ID/DOC	CABLE
1	PLAY STATION 2	SONY	SCPH-15000	IN/A	1.5m unshielded power cord1.5m unshielded data cable
2	TV	TECO	TL2009FM	N/A	1.5m shielded data cable

NOTE:

For the actual test configuration, please refer to the photos of testing.

2.3 DESCRIPTION OF TEST MODE

32 channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for test..

Channel	Frequency(MHz)
0	2406
17	2440
31	2478

- 1. Below 1 GHz, the channel 0, 17 and 31 were pre-tested in chamber. The channel 31, worst case one, was chosen for radiated emission test.
- 2. Above 1 GHz, the channel 0, 17 and 31 were tested individually.



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3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of wireless product and to be connected with a Game system for normal use. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

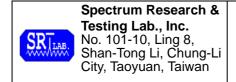
47 CFR Part 15, Subpart C

47 CFR Part 15, Subpart B

ANSI C63.4: 2003

Public DA00-705 (March 2000)

All tests have been performed and recorded as the above standards.



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4. TECHNICAL CHARACTERISTICS TEST

4.1 20dB Bandwidth

4.1.1 **LIMIT**

	Limit(kHz)				
Frequency Range (MHz)	Quantity of Hopping Channel	50	25	15	75
902-928		<250	>250	NA	NA
2400-2483.5		NA	NA	>1000	<1000

4.1.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-7GHz	ROHDE &	FSP7/	APR. 2007
SPECIKUW	9KHZ-7GHZ	SCHWARZ	839511/010	R&S

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.1.3 TEST SET-UP



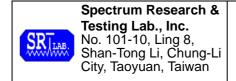
The EUT was connected to a spectrum through a 50 Ω RF cable.

4.1.4 TEST PROCEDURE

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

4.1.5 EUT OPERATING CONDITION

Set the EUT under transmission condition continuously at a specific channel frequency.



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4.1.6 TEST RESULT

Temperature: 24°C Humidity: 55%RH

Spectrum Detector: PK Tested by: Mao Feng Hsu

Test Result: PASS Tested Date: Sep. 01, 2006

Guitar Controller:TX

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	20dB DOWN BW (kHz)
0	2406	5180
17	2440	5200
31	2478	5160

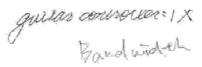


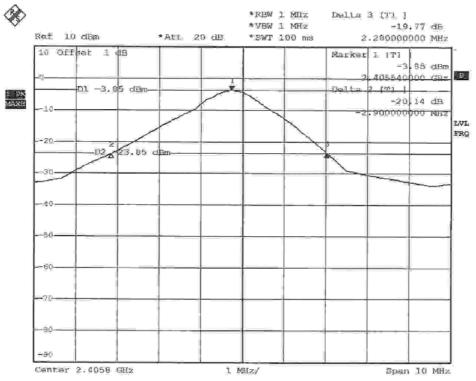
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Date:

1.SEP.2006 11:51:54

CHO 200B bandwidth=5-18 MHz

M.F. HSU



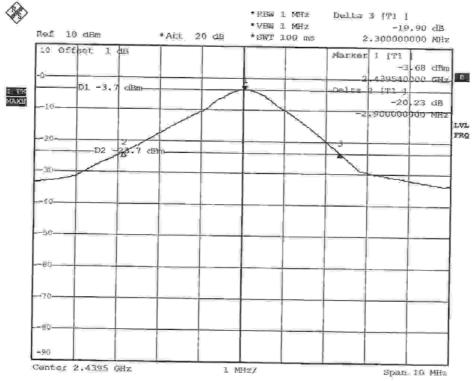
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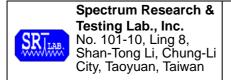


Date:

1.SEP.2006 11:43:16

CH17. 200B bandwidth=5,2 MHz

M.F. Hsu



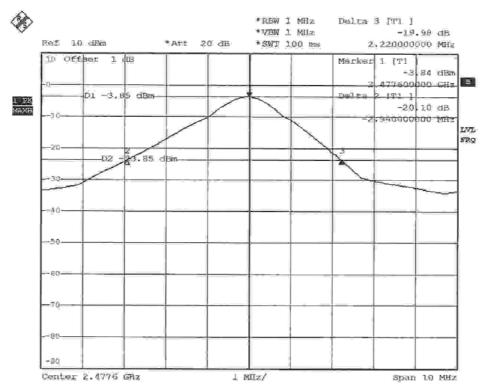
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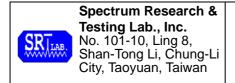


Date:

1.SEP.2006 11:34:22

CH31. 20 dB bandwidth = 5.16 MHz

M.F. Hsu



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4.2 PEAK POWER TEST

4.2.1 **LIMIT**

FCC Part15, Subpart C Section 15.247.

FREQUENCY	LIMIT (W)					
RANGE (MHz)	Quantity of Hopping Channel	Hopping 50 25 15 75				
902-9	928	1(30dBm)	0.125(21dBm)	NA	NA	
2400-2483.5		NA	NA	0.125(21dBm)	1(30dBm)	
5725-5850		NA	NA	NA	1(30dBm)	

4.2.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-7GHz		FSP7/ 839511/010	APR. 2007 R&S
POWER METER	N/A	BOONTON	4232A/ 29001	MAY 2007 ETC
POWER SENSOR	DC-18GHz $0.3\mu\mathrm{W}$ -100mW 50Ω	BOONTON	51011-EMC/ 31184	JUN. 2007 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



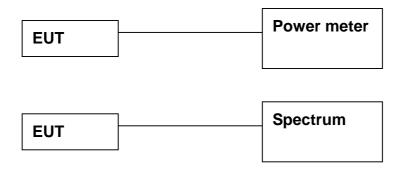
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4.2.3 TEST SET-UP



The EUT was connected to a spectrum through a 50 Ω RF cable.

4.2.4 TEST PROCEDURE

The EUT was operating in hopping mode or could control its channel. Printed out the test result from the spectrum by hard copy function. Recorded the read value of the power meter.

4.2.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.



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4.2.6 TEST RESULT

Temperature: 24°C Humidity: 55%RH

Spectrum Detector: PK Tested by: Mao Feng Hsu

Test Result: PASS Tested Date: Sep. 01, 2006

Guitar Controller:TX

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)
0	2406.0000	-5.53	21
17	2440.0000	-4.96	21
31	2478.0000	-5.14	21



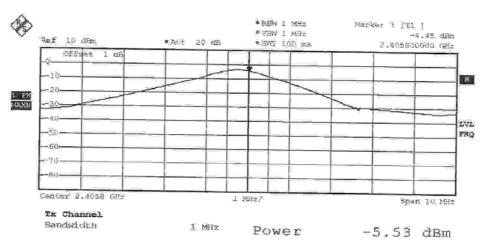
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guilli controller: 1X



CHO

M.F. HSU.

Date: 1.SEP.2006 11:49:17

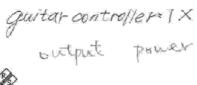


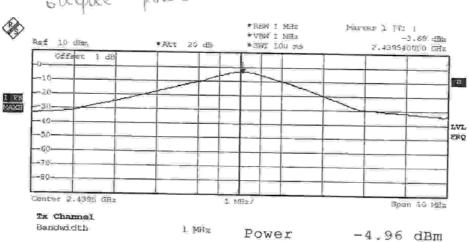
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CH17

M.F. Hau

Date: 1.SEP.2006 11:45:22



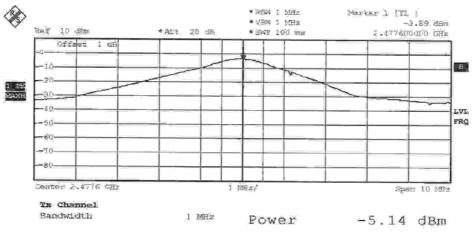
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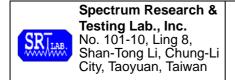
gruntar controller: 1X



CH3/ 2478

M.F. Hsu

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4.3 BAND EDGE TEST

4.3.1 LIMIT

FCC Part15, Subpart C Section 15.247. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

OPERATING PANCE	SPURIOUS EMISSION		LIMIT
FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	Peak power ration to emission(dBc)	Emission level(dBuV/m)
	<902	>20	NA
902-928	>928	>20	NA
	960-1240	NA	54
2400-2483.5	<2400	>20	NA
2400-2463.3	>2483.5-2500	NA	54
	<5350-5460	NA	54
5725-5850	<5725	>20	NA
	>5850	>20	NA



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4.3.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-7GHz	ROHDE &	FSP7/	APR. 2007
SPECIKUM	9KHZ-7GHZ	SCHWARZ	839511/010	R&S
EMI TEST	9 kHz TO 2750	ROHDE &	ESCS30/	AUG. 2007
RECEIVER	MHz	SCHWARZ	830245/012	R&S
CDECTRUM	0VU- 26 FOU-	HP	8593E/	MAY 2007
SPECTRUM	9KHz-26.5GHz	ПР	3710A03220	ETC
PRE-AMPLIFIER	1GHz-26.5GHz	HP	8449B/	NOV. 2006
PRE-AWIPLIFIER	Gain:30dB	ПР	3008A01019	ETC
BI-LOG	25 MHz TO	EMCO	3142/	FEB. 2007
ANTENNA	2 GHz	EIVICO	9701-1124	SRT
LIODAL ANITENINA	10U= to 100U=	EMCO	3115/	DEC. 2006
HORN ANTENNA	1GHz to 18GHz	EMCO	9602-4681	ETC
OATS	3 - 10 M	CDT	CDT 4	APR. 2007
OATS	measurement	SRT	SRT-1	SRT

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



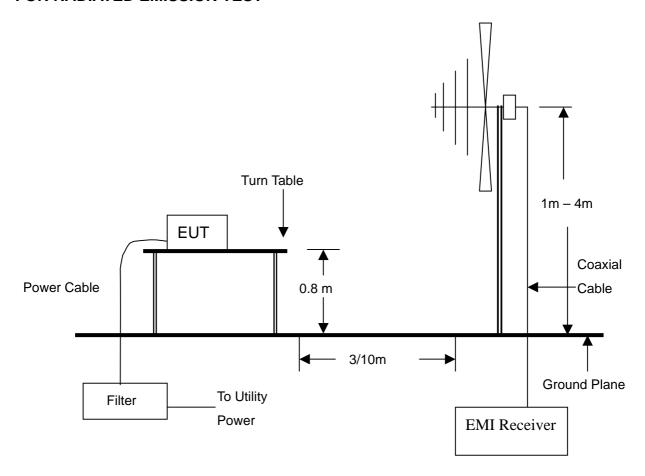
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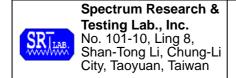
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4.3.3 TEST SET-UP

FOR RADIATED EMISSION TEST



- 1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
- 2. For the actual test configuration, please refer to the photos of testing.



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4.3.4 TEST PROCEDURE

- 1. The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.
- 2. The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22. The measurements were made at an open area test site with 10 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz. All readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

4.3.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.

4.3.6 TEST RESULT

Temperature:	20°C	Humidity:	56%RH
Spectrum Detector:	PK & AV	Tested by:	Mao Feng Hsu
Test Result:	PASS	Tested Date:	Sep. 11, 2006

Radiated emission test-TX

Frequency	Antenna polarization	Reading (dBuV)			ssion IV/m)	Band edge Limit (dBuV/m)		
(MHz)	(H/V)	PK	AV	PK	AV	PK	AV	
<2400	Н	47.4	37.4	43.2	33.3	74.0	54.0	
>2483.5	V	48.6	37.3	44.6	33.3	74.0	54.0	



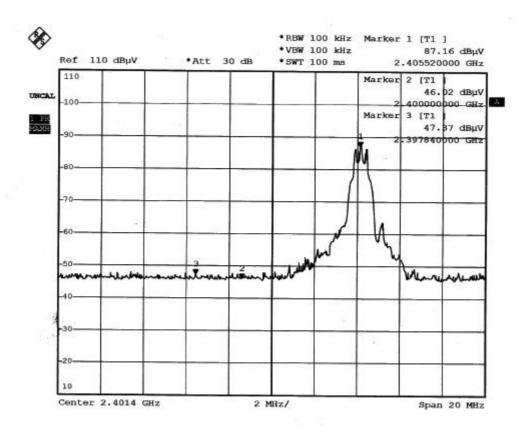
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TX <2400MHz:





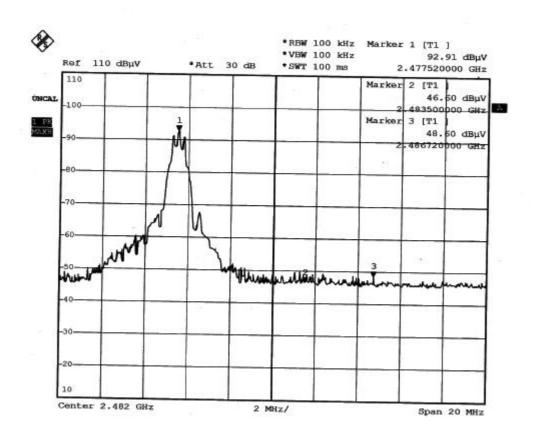
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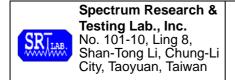
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>2483.5MHz





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4.4 SPURIOUS RADIATED EMISSION TEST

4.4.1 **LIMIT**

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dBμV/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
ABOVE 960	3	54.0

- **NOTE**: 1. In the emission tables above, the tighter limit applies at the band edges.
 - 2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

FCC Part 15, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

FREQUENCY (MHz)	Class A (dBu	ıV/m) (at 3m)	Class B (dBuV/m) (at 3m)			
PREGOLIACT (IMITIZ)	PEAK	AVERAGE	PEAK	AVERAGE		
Above 1000	80.0	60.0	74.0	54.0		

FCC Part 15, Subpart C Section 15.249. The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

FUNDAMENTAL FREQUENCY (MHz)	FILED STRE FUNDAN (dBuV/m)	IENTAL	FIELD STRENGTH OF HARMONICS (dBuV/m) (at 3m)			
	PEAK	AVERAGE	PEAK	AVERAGE		
902-928	114	94	74.0	54.0		
2400-2483.5	114	94	74.0	54.0		
5725-5875	114	94	74.0	54.0		
24000-24250	128	108	88.0	68.0		



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4.4.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	20 kHz TO 1 GHz	ROHDE & SCHWARZ	ESCS30/ 830245/012	OCT. 2006 ETC
SPECTRUM ANALYZER	9KHz TO 26.5GHz	HP	8593E/ 3710A03220	MAY 10,2007 ETC
HORN ANTENNA	18GHz TO 40GHz	ETS	3116/00028513	OCT 05,2006 DBN
HORN ANTENNA	1GHz TO 18GHz	EMCO	3115/9012-3619	JAN. 09,2007 ETC
PREAMPLIFIER	1GHz TO 26.5GHz	HP	8449B/ 3008A01019	NOV. 15,2006 ETC
BI-LOG ANTENNA	25 MHz TO 2 GHz	EMCO	3143/ 9509-1141	SEP. 2006 SRT
OATS	3 – 10 M MEASUREMENT	SRT	SRT-1	DEC. 2006 SRT
COAXIAL CABLE	25M	SUNCITY	J400/ 25M	AUG. 2007 SRT
FILTER	2 LINE, 30A	FIL.COIL	FC-943/ 869	N/A
FREQUENCY CONVERTER	N/A	APC	AFC-2KBB/ F100030031	AUG. 2007 SRT

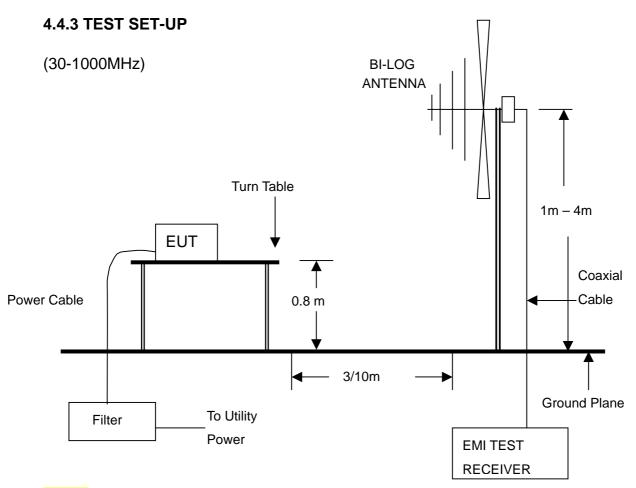
- 1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.
- 2. The Open Area Test Site (SRT-1) is registered by FCC with No. 90957 and VCCI with No. R-1081.
- 3. The Open Area Test Site (SRT-2) is registered by FCC with No. 98458 and VCCI with No. R-1168.



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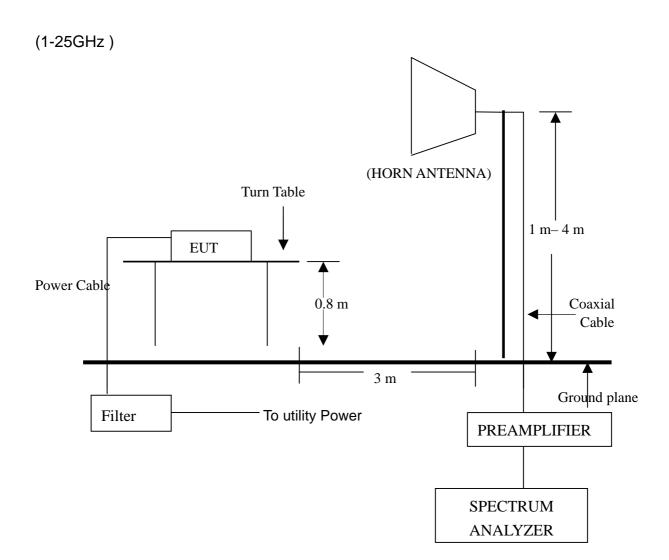
- 1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
- 2. For the actual test configuration, please refer to the photos of testing.



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- 1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
- 2. For the actual test configuration, please refer to the photos of testing.



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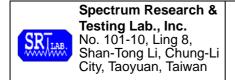
Date: Sep. 11, 2006

4.4.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22. The measurements were made at an open area test site with 10 meters measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz. All readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

4.4.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.



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4.4.6 TEST RESULT

Temperature: 31°C Humidity: 70 %RH

Frequency Range: 30 – 1000 MHz Measured Distance: 3m

Receiver Detector: Q.P. Tested Mode: Link

Tested By: Mao Feng Hsu Tested Date: Sep. 01, 2006

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Level (dBµV/m)		AZ(°)	EL(m)
313.3400	2.59	14.37	19.0	36.0	46.0	-10.0	5	1.1
350.2000	3.29	15.15	7.8	26.2	46.0	-19.8	20	2.1
393.2000	3.14	16.05	15.4	34.6	46.0	-11.4	357	2.0
589.8100	3.71	19.01	14.8	37.5	46.0	-8.5	10	2.1
600.0600	3.72	19.20	7.6	30.5	46.0	-15.5	50	1.2
840.0870	4.69	22.52	7.6	34.8	46.0	-11.2	350	1.3

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Level (dBµV/m)		AZ(°)	EL(m)
40.2750	0.95	9.50	13.3	23.8	40.0	-16.3	2	1.0
54.5250	0.99	4.98	19.5	25.5	40.0	-14.5	350	1.8
313.2400	2.59	14.37	14.3	31.3	46.0	-14.7	15	1.2
393.2120	3.14	16.05	16.0	35.2	46.0	-10.8	20	1.1
637.8625	4.50	19.94	10.0	34.4	46.0	-11.6	10	1.3
786.4125	4.94	21.37	8.8	35.1	46.0	-10.9	0	1.6

- 1. Measurement uncertainty is +/-2dB.
- 2. "*": Measurement does not apply for this frequency.
- 3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
- 4. The field strength of other emission frequencies were very low against the limit.



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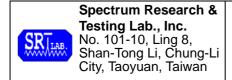
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30 °C Humidity: Temperature: 70 %RH Test mode: TX:CH0 Frequency Range: 1 – 25 GHz Receiver Detector: PK. or AV. Measured Distance: 3m Tested by: Mao Feng Hsu Tested Date: Sep. 01, 2006

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss	Antenna Factor	Da	ding ata µV)	Le	ssion vel uV/m		mit IV/m)	Mar (d	_		
	(dB)	(dB/m)	PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2406.00	-32.17	28.55	88.6	86.1	85.0	82.5	N/A	N/A	N/A	N/A	215	1.2
4812.00	-30.45	33.65	49.4	39.9	52.6	43.1	74.0	54.0	-21.4	-10.9	14	2.6
7218.00	-28.93	36.27	54.5	41.6	61.9	48.9	74.0	54.0	-12.1	-5.1	75	18
2325.00	-32.35	27.85	55.8	*	51.3	*	74.0	54.0	-22.7	*	36	2
2476.00	-32.20	28.15	49.8	*	45.7	*	74.0	54.0	-28.3	*	275	2
4825.00	-30.41	33.66	51.8	39.8	55.0	43.0	74.0	54.0	-19.0	-11.0	45	2.6
9624.00	*	*	*	*	*	*	*	*	*	*	*	*
12030.00	*	*	*	*	*	*	*	*	*	*	*	*
14436.00	*	*	*	*	*	*	*	*	*	*	*	*
16842.00	*	*	*	*	*	*	*	*	*	*	*	*
19248.00	*	*	*	*	*	*	*	*	*	*	*	*
21654.00	*	*	*	*	*	*	*	*	*	*	*	*
24060.00	*	*	*	*	*	*	*	*	*	*	*	*

- 1. Measurement uncertainty is +/-2dB.
- 2. "*": Measurement does not apply for this frequency.
- 3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
- 4. Margin=Emission-Limit
- 5. The field strength of other emission frequencies (Above 8GHz)were very low against the limit.



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Temperature:	30 °C	Humidity:	70 %RH
Frequency Range:	1 – 25 GHz	Test mode:	TX:CH0
Receiver Detector:	PK. or AV.	Measured Distance:	3m
Tested by:	Mao Feng Hsu	Tested Date:	Sep. 01, 2006

Antenna Polarization: Vertical

Frequency (MHz)	Cable	Antenna Factor	Da	ding ata µV)	Le	ssion vel uV/m		mit IV/m)		Margin (dB)		EL(m)
	(dB)	(dB/m)	PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2406.00	-32.17	28.01	88.1	85.9	83.9	81.7	N/A	N/A	N/A	N/A	135	1
4813.00	-30.44	33.65	50.4	39.3	53.6	42.5	74.0	54.0	-20.4	-11.5	47	2.9
7218.00	-28.93	36.27	54.4	41.3	61.7	48.6	74.0	54.0	-12.3	-5.4	98	1.6
2325.00	-32.35	27.85	50.8	*	46.3	*	74.0	54.0	-27.7	*	35	1.3
2478.00	-32.20	28.16	49.5	*	45.4	*	74.0	54.0	-28.6	*	69	2.6
4793.00	-30.47	33.63	49.5	40.0	52.6	43.2	74.0	54.0	-21.4	-10.8	72	1.5
9624.00	*	*	*	*	*	*	*	*	*	*	*	*
12030.00	*	*	*	*	*	*	*	*	*	*	*	*
14436.00	*	*	*	*	*	*	*	*	*	*	*	*
16842.00	*	*	*	*	*	*	*	*	*	*	*	*
19248.00	*	*	*	*	*	*	*	*	*	*	*	*
21654.00	*	*	*	*	*	*	*	*	*	*	*	*
24060.00	*	*	*	*	*	*	*	*	*	*	*	*

- 1. Measurement uncertainty is +/-2dB.
- 2. "*": Measurement does not apply for this frequency.
- 3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
- 4. Margin=Emission-Limit
- 5. The field strength of other emission frequencies (Above 8GHz)were very low against the limit.



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30°C Temperature: Humidity: 70 %RH Test mode: TX:CH17 Frequency Range: 1 – 25 GHz Receiver Detector: PK. or AV. Measured Distance: 3m Mao Feng Hsu Tested by: Tested Date: Sep. 01, 2006

Antenna Polarization: Horizontal

(MHz) Loss Fact		Antenna Factor	Reading Data (dBµV)		Emission Level (dBµV/m		Limit (dBµV/m)		Margin (dB)		AZ(°)	EL(m)
	(ub)	(dB/m)	PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2440.00	-32.22	28.62	92.9	89.1	89.3	85.5	N/A	N/A	N/A	N/A	25	1.5
4876.00	-30.28	33.70	50.8	39.3	54.3	42.7	74.0	54.0	-19.7	-11.3	201	2
7320.00	-29.05	36.36	54.1	40.7	61.4	48.0	74.0	54.0	-12.6	-6.0	86	1.1
2376.00	-32.25	27.95	50.1	*	45.8	*	74.0	54.0	-28.2	*	41	1.4
2467.00	-32.21	28.13	51.7	*	47.6	*	74.0	54.0	-26.4	*	69	2.1
4899.00	-30.22	33.72	50.5	39.5	54.0	43.0	74.0	54.0	-20.0	-11.0	25	1.6
9760.00	*	*	*	*	*	*	*	*	*	*	*	*
12200.00	*	*	*	*	*	*	*	*	*	*	*	*
14640.00	*	*	*	*	*	*	*	*	*	*	*	*
17080.00	*	*	*	*	*	*	*	*	*	*	*	*
19520.00	*	*	*	*	*	*	*	*	*	*	*	*
21960.00	*	*	*	*	*	*	*	*	*	*	*	*
24400.00	*	*	*	*	*	*	*	*	*	*	*	*

- 1. Measurement uncertainty is +/-2dB.
- 2. "*": Measurement does not apply for this frequency.
- 3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
- 4. Margin=Emission-Limit
- 5. The field strength of other emission frequencies (Above 8GHz)were very low against the limit.



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30°C Humidity: 70 %RH Temperature: 1 – 25 GHz Test mode: TX:CH17 Frequency Range: Receiver Detector: PK. or AV. Measured Distance: 3m Sep. 01, 2006 Tested by: Mao Feng Hsu Tested Date:

Antenna Polarization: Vertical

Frequency (MHz)	Cable Antenna Loss Factor		Da	Reading Data (dBµV)		Emission Level (dBµV/m		mit IV/m)	Margin (dB)		AZ(°)	EL(m)
	(dB)	(dB/m)	PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2440.00	-32.22	28.08	89.1	86.9	84.9	82.8	N/A	N/A	N/A	N/A	104	2.1
4879.00	-30.27	33.70	48.8	39.2	52.2	42.6	74.0	54.0	-21.8	-11.4	69	1.1
7321.00	-29.04	36.36	54.0	40.5	61.3	47.8	74.0	54.0	-12.7	-6.2	98	3
2420.00	-32.19	28.04	50.0	*	45.9	*	74.0	54.0	-28.1	*	10	2.8
2460.00	-32.22	28.12	49.0	*	44.9	*	74.0	54.0	-29.1	*	87	1.5
4855.00	-30.33	33.68	50.7	40.2	54.0	43.6	74.0	54.0	-20.0	-10.4	60	2.5
9760.00	*	*	*	*	*	*	*	*	*	*	*	*
12200.00	*	*	*	*	*	*	*	*	*	*	*	*
14640.00	*	*	*	*	*	*	*	*	*	*	*	*
17080.00	*	*	*	*	*	*	*	*	*	*	*	*
19520.00	*	*	*	*	*	*	*	*	*	*	*	*
21960.00	*	*	*	*	*	*	*	*	*	*	*	*
24400.00	*	*	*	*	*	*	*	*	*	*	*	*

- 1. Measurement uncertainty is +/-2dB.
- 2. "*": Measurement does not apply for this frequency.
- 3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
- 4. Margin=Emission-Limit
- 5. The field strength of other emission frequencies (Above 8GHz)were very low against the limit.



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Temperature: 30°C Humidity: 70 %RH Frequency Range: 1 – 25 GHz Test mode: TX:CH31 Receiver Detector: PK. or AV. Measured Distance: 3m Tested by: Mao Feng Hsu Tested Date: Sep. 01, 2006

Antenna Polarization: Horizontal

(MHz) Loss Factor		Antenna Factor	Reading Data (dBµV)		Emission Level (dBµV/m		Limit (dBµV/m)		· · ·		AZ(°)	EL(m)
	(dB)	(dB/m)	PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2478.00	-32.20	28.73	89.8	86.5	86.3	83.0	N/A	N/A	N/A	N/A	15	1.4
4962.00	-30.26	33.77	48.8	39.6	52.3	43.1	74.0	54.0	-21.7	-10.9	196	1.2
7441.00	-28.95	36.45	53.1	40.2	60.6	47.7	74.0	54.0	-13.4	-6.3	82	1.1
2438.00	-32.22	28.08	50.8	*	46.7	*	74.0	54.0	-27.3	*	65	1.3
2504.00	-32.13	28.22	51.2	*	47.3	*	74.0	54.0	-26.7	*	35	1.1
4804.00	-30.47	33.64	49.9	40.0	53.1	43.1	74.0	54.0	-20.9	-10.9	20	1.2
9912.00	*	*	*	*	*	*	*	*	*	*	*	*
12390.00	*	*	*	*	*	*	*	*	*	*	*	*
14868.00	*	*	*	*	*	*	*	*	*	*	*	*
17346.00	*	*	*	*	*	*	*	*	*	*	*	*
19824.00	*	*	*	*	*	*	*	*	*	*	*	*
22302.00	*	*	*	*	*	*	*	*	*	*	*	*
24780.00	*	*	*	*	*	*	*	*	*	*	*	*

- 1. Measurement uncertainty is +/-2dB.
- 2. "*": Measurement does not apply for this frequency.
- 3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
- 4. Margin=Emission-Limit
- 5. The field strength of other emission frequencies (Above 8GHz)were very low against the limit.



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Temperature: 30°C Humidity: 70 %RH Frequency Range: 1 – 25 GHz Test mode: TX:CH31 Receiver Detector: PK. or AV. Measured Distance: 3m Tested by: Mao Feng Hsu Tested Date: Sep. 01, 2006

Antenna Polarization: Vertical

(MHz) Loss		Antenna Factor	Reading Data (dBµV)		Emission Level (dBµV/m		Limit (dBµV/m)		Margin (dB)		AZ(°)	EL(m)
	(dB)	(dB/m)	PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2478.00	-32.20	28.16	85.1	83.6	81.1	79.6	N/A	N/A	N/A	N/A	112	1.4
4962.00	-30.26	33.77	47.8	*	51.3	*	74.0	54.0	-22.7	*	85	1.3
7441.00	-28.95	36.45	54.5	40.1	62.0	47.6	74.0	54.0	-12.0	-6.4	55	1.2
2419.00	-32.19	28.04	51.4	*	47.2	*	74.0	54.0	-26.8	*	15	1.3
2655.00	-32.06	29.07	50.0	*	47.0	*	74.0	54.0	-27.0	*	10	1.2
4881.00	-30.27	33.70	49.7	39.9	53.1	43.3	74.0	54.0	-20.9	-10.7	75	1.4
9912.00	*	*	*	*	*	*	*	*	*	*	*	*
12390.00	*	*	*	*	*	*	*	*	*	*	*	*
14868.00	*	*	*	*	*	*	*	*	*	*	*	*
17346.00	*	*	*	*	*	*	*	*	*	*	*	*
19824.00	*	*	*	*	*	*	*	*	*	*	*	*
22302.00	*	*	*	*	*	*	*	*	*	*	*	*
24780.00	*	*	*	*	*	*	*	*	*	*	*	*

- 1. Measurement uncertainty is +/-2dB.
- 2. "*": Measurement does not apply for this frequency.
- 5. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
- 6. Margin=Emission-Limit
- 5. The field strength of other emission frequencies (Above 8GHz)were very low against the limit.



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4.5 CONDUCTED EMISSION TEST FOR POWER PORT 4.5.1 CONDUCTED EMISSION LIMIT

FREQUENCY (MHz)	Class A	(dBμV)	Class B (dBμV)			
PREGOENCT (MITZ)	Quasi-peak	Average	Quasi-peak	Average		
0.15 - 0.5	79	66	66 - 56	56 - 46		
0.5 - 5.0	73	60	56	46		
5.0 - 30.0	73	60	60	50		

NOTE:

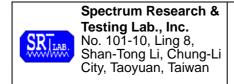
- 1. The lower limit shall apply at the transition frequencies.
- 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.5.2 TEST EQUIPMENT

The following test equipment was used for the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER	
EMI TEST	9 kHz TO	ROHDE &	ESHS30/	AUG. 2007	
RECEIVER	30 MHz	SCHWARZ	826003/008	ETC	
LISN (for EUT)	50 μH, 50 ohm	SOLAR	8012-50-R-24-BNC	JUN. 2007	
LISIN (IOI LOT)	30 μπ, 30 σππ	ELECTRONICS	/ 924839	ETC	
LISN	50uH 50 ohm	SOLAR	9252-50-R-24-BNC	JUN. 2007	
(for Peripheral)	50μH, 50 ohm	ELECTRONICS	/ 951318	ETC	
50 ohm	50 ohm	HP	11593A/	JUN. 2007	
TERMINATOR	50 OHH	ПР	2	ETC	
COAXIAL	3m	SUNCITY	J400/	JUL. 2007	
CABLE	SIII	SUNCITY	3M	SRT	
ISOLATION	N/A	ADC	AFC-11015/	N/A	
TRANSFORMER	IV/A	APC	F102040016	IN/A	
CII TED		LII COII	FC-943/	NI/A	
FILTER	2 LINE, 30A	FIL.COIL	771	N/A	
CDOLIND DLANE	2.3M (H) x	CDT	NI/A	APR. 2007	
GROUND PLANE	2.4M (W)	SRT	N/A	SRT	
CDOLIND DI ANE	2.4M (H) x	CDT	N1/A	APR. 2007	
GROUND PLANE	2.4M (W)	SRT	N/A	SRT	

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

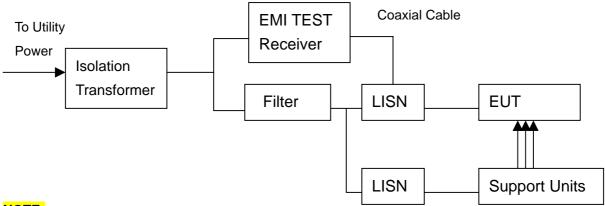


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4.5.3 TEST SETUP



NOTE:

- 1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
- 2. For the actual test configuration, please refer to the photos of testing.
- 3. The serial no. of the LISN connected to EUT is 01017.
- 4. The serial no. of the LISN connected to support units is 01018.

4.5.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR22:2003. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50µH as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



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4.5.5 TEST RESULT

Temperature: 24 °C Humidity: 68 %RH

Frequency Range: 0.15 – 30 MHz Tested Mode: Link

Receiver Detector: Q.P. and AV. Tested By: Mao Feng Hsu

Tested Result: Pass Tested Date: Aug. 31, 2006

Power Line Measured: Line

Freq. (MHz)	Correct. Factor	Factor (dBμV)		Emission Level (dBμV)			nit μV)	Margin (dB)		
((dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
0.189	0.30	49.86	35.97	50.16	36.27	64.06	54.06	-13.90	-17.79	
0.198	0.30	48.58	31.79	48.88	32.09	63.68	53.68	-14.80	-21.59	
0.572	0.24	38.70	27.15	38.94	27.39	56.00	46.00	-17.06	-18.61	
4.695	0.21	31.52	28.64	31.73	28.85	56.00	46.00	-24.27	-17.15	
4.883	0.22	32.58	30.81	32.80	31.03	56.00	46.00	-23.20	-14.97	
5.832	0.22	31.60	28.85	31.82	29.07	60.00	50.00	-28.18	-20.93	

Power Line Measured: Neutral

Freq. (MHz)	Correct. Factor	Reading Value (dBμV)		Emission Level (dBμV)			nit μV)	Margin (dB)	
()	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.186	0.30	48.60	34.58	48.90	34.88	64.20	54.20	-15.30	-19.32
0.189	0.30	50.14	38.17	50.44	38.47	64.06	54.06	-13.62	-15.59
0.577	0.24	35.88	18.70	36.12	18.94	56.00	46.00	-19.88	-27.06
3.487	0.19	32.96	31.44	33.15	31.63	56.00	46.00	-22.85	-14.37
3.804	0.20	33.02	31.64	33.22	31.84	56.00	46.00	-22.78	-14.16
7.994	0.23	31.86	26.98	32.09	27.21	60.00	50.00	-27.91	-22.79

- 1. Measurement uncertainty is +/-1.32dB
- 2. Emission level = Reading valus + Correction factor
- 3. Correction Factor = Cable loss + Insertion loss of LISN
- 4. Margin value = Emission level Limit
- 5. The emission of other frequencies were very low against the limit.
- 6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



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5. Antenna application

5.1 Antenna requirement

The EUT's antenna is met the requirement of FCC part15C section15.203 and 15.204.

FCC part15C section15.247 requirement:

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.2 Result

The EUT's antenna used a dipole antenna and integrated on PCB. The antenna's gain is 2dBi and meets the requirement.



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6. PHOTOS OF TESTING

- Radiated test -below 1GHz (LINK)







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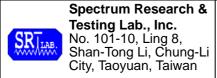
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- Radiated test-Above 1GHz







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- Conducted test (Link)







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7. TERMS OF ABBREVIATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction