

FCC PART 15 SUBPART C TEST REPORT

for

Signal shifter

Model No.: SCBX-3010-XXXXX

FCC ID: MXCSCBX3010-M

of

Applicant: SOARING TECHNOLOGY CO.,LTD

**Address: 1F, No. 34, Chung-Hsing Rd., Hsichih City,
Taipei Hsien, Taiwan, R.O.C.**

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1

A2LA Accredited No.: 2732.01

Report No.: W6M20808-9246-C-1

**6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
TEL: 886-2-66068877 FAX: 886-2-66068879 E-mail: wts@wts-lab.com**

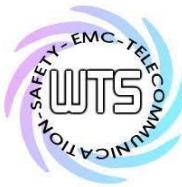


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

TABLE OF CONTENTS

1	GENERAL INFORMATION	2
1.1	NOTES.....	2
1.2	TESTING LABORATORY	3
1.2.1	LOCATION.....	3
1.2.2	DETAILS OF ACCREDITATION STATUS.....	3
1.3	DETAILS OF APPROVAL HOLDER.....	3
1.4	APPLICATION DETAILS	4
1.5	GENERAL INFORMATION OF TEST ITEM.....	4
1.6	TEST STANDARDS.....	4
2	TECHNICAL TEST.....	5
2.1	SUMMARY OF TEST RESULTS	5
2.2	TEST ENVIRONMENT	5
2.3	TEST EQUIPMENT UTILIZED	6
2.4	GENERAL TEST PROCEDURE	8
2.5	PRODUCT DESCRIPTION AND SYSTEM TEST CONFIGURATION.....	10
3	TEST RESULTS (ENCLOSURE)	11
3.1	EMISSION BANDWIDTH	12
3.2	BAND EDGE MEASUREMENT.....	13
3.3	CARRIER (FIELD STRENGTH).....	14
3.4	SPURIOUS EMISSION	15
3.5	POWER LINE CONDUCTED EMISSION	17



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems. The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

The test report may only be reproduced or published in full.

Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.

Tester:

August 20, 2008

Brian

Date

WTS-Lab.

Name

Signature

Technical responsibility for area of testing:

August 20, 2008

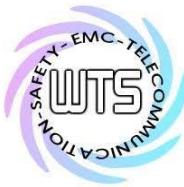
Steven Chuang

Date

WTS

Name

Signature



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

1.2 Testing laboratory

1.2.1 Location

OATS

No.5-1, Shuang Sing Village,
LiShuei Rd., Wanli Township,
Taipei County 207, Taiwan (R.O.C.)
Company
Worldwide Testing Services(Taiwan) Co., Ltd.
6F, NO. 58, LANE 188, RUEY-KUANG RD.
NEIHU, TAIPEI 114, TAIWAN R.O.C.
Tel : 886-2-66068877
Fax : 886-2-66068879

1.2.2 Details of accreditation status

Accredited testing laboratory

A2LA accredited number: 2732.01

FCC filed test laboratory Reg. No. 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1

Town: ./.
Country: ./.
Telephone: ./.
Fax: ./.

1.3 Details of approval holder

Name: SOARING TECHNOLOGY CO.,LTD
Street: 1F, No. 34, Chung-Hsing Rd.,
Town: Hsichih City, Taipei Hsien,
Country: Taiwan, R.O.C
Telephone: 886-2-26918000
Fax: 886-2-26917000



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

1.4 Application details

Date of receipt of test sample: August 08, 2008
Date of test: from August 08, 2008 to August 20, 2008

1.5 General information of Test item

Type of test item: SOARING TECHNOLOGY CO.,LTD
Model Number: SCBX-3010-XXXXX
Multi-listing model number: without
Transmitting frequency: 88.3 – 90.3 MHz
Operation mode: simplex
Modulation Type: FM
Voltage supply: DC 12 V
Channel Numbers: 6
Frequency of selectable channel: 88.3MHz / 88.7MHz / 89.1MHz / 89.9MHz / 90.1MHz / 90.3MHz
Antenna Type: Wired antenna
Photos: see Appendix

Manufacturer:(if applicable)

Name: ./
Street: ./
Town: ./
Country: ./

1.6 Test standards

Technical standard :

FCC RULES PART 15 SUBPART B § 15.109 / SUBPART C § 15.203, § 15.209, § 15.239 (2007-10)



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

or

The deviations as specified in 3 were ascertained in the course of the tests performed.

2.2 Test environment

Temperature: 23 °C

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Details of power supply: DC 12 V

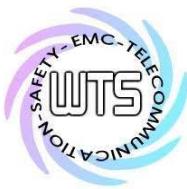


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

2.3 Test equipment utilized

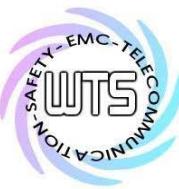
No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2007/10/15	2008/10/14
ETSTW-CE 002	PREREULATOR MODE DC POWER SUPPLY	None	None		Function Test	
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V- NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2007/10/15	2008/10/14
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2007/10/15	2008/10/14
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2008/5/10	2009/5/09
ETSTW-CE 008	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2007/10/23	2009/10/22
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2008/7/25	2009/7/24
ETSTW-CE 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2007/11/2	2009/11/1
ETSTW-CE 014	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T2-02	20241	FCC	2005/12/7	2008/12/6
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2006/11/7	2008/11/6
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2007/10/29	2008/10/28
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	2007/10/12	2009/10/11
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2007/12/3	2008/12/2
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2007/10/29	2008/10/28
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2007/10/11	2008/10/12
ETSTW-RE 010	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070181	MOTECH	Function Test	
ETSTW-RE 011	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070165	MOTECH	Function Test	
ETSTW-RE 017	Log-Periodic Antenna	HL025	352886/001	R&S	2008/5/5	2010/5/4
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2007/11/7	2010/11/6
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2007/10/9	2008/10/8
ETSTW-RE 028	Log-Periodic DipoleArray Antenna	3148	34429	EMCO	2008/4/23	2010/4/22
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2008/4/23	2010/4/22
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2008/3/26	2010/3/25
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2007/10/9	2008/10/8
ETSTW-RE 033	WaveRunner 6000A Serise Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	2008/6/27	2009/6/26



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2007/10/16	2009/10/15
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2007/1/11	2009/1/10
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2008/5/2	2010/5/1
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2008/5/22	2010/5/21
ETSTW-RE 047	ESA-E SERIES SPECTRUM ANALYZER	E4445A	MY46181369	Agilent	2008/6/26	2009/6/25
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2005/3/22	2009/3/21
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2007/5/2	2009/5/1
ETSTW-RE 055	SPECTRUM ANALYZER	FSU-26	200074	R&S	2008/7/1	2009/6/30
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2007/7/2	2009/7/1



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

2.4 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 using a 50 μ H LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

RADIATION INTERFERENCE: The test procedure used was according to ANSI STANDARD C63.4-2003 employing a spectrum analyzer. For investigated frequency is equal to or below 1GHz, the RBW and VBW of the spectrum analyzer was 100 kHz and 100kHz respectively with an appropriate sweep speed. For investigated frequency is above 1GHz, both of RBW and VBW of the spectrum analyzer were 1 MHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dB μ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

Freq (MHz)	METER READING + ACF + CABLE LOSS (to the receiver) = FS
33	20 dB μ V + 10.36 dB + 6 dB = 36.36 dB μ V/m @3m

The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table) and arranged according to ANSI C63.4-2003 Section 13.1.2. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to the frequency specified as follows:

- (1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
- (2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
- (3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
- (4) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a)(1)-(a)(3) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this Section, whichever is the higher frequency range of investigation.

For hand-held devices, a exploratory test was performed with three (3) orthogonal planes to determine the highest emissions.

Measurements were made by Worldwide Testing Services(Taiwan) Co., Ltd. at the registered open field test site located at No.5-1, Shuang Sing Village, LiShuei Rd., Wanli Township, Taipei County 207, Taiwan (R.O.C.) The Registration Number: **930600**.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

When the radiated emission limits are expressed in terms of the average value of the emission, 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.

The formula is as follows:

Average = Peak + Duty Factor

Duty Factor = $20 \log (\text{dwell time}/T)$

T = 100ms when the pulse train period is over 100 ms or the period of the pulse train.

Modified Limits for peak according to 15.35 (b) = Max Permitted average Limits + 20dB

Registration number: W6M20808-9246-C-1
 FCC ID: MXCSCBX3010-M

2.5 Product Description and System Test Configuration

2.5.1 Production Description

This Equipment Under Test (EUT) is a Signal shifter which can be operated from 88.3 to 90.3 MHz. The main function of this EUT is used to encode analog signal to become FM code, and control the transmitter frequency to the radio receivers and broadcast. Because of this function, it could be used to read CD/DVD disc to play music. This transmitter is fed by 12V car power supply.

2.5.2 System Test Configuration

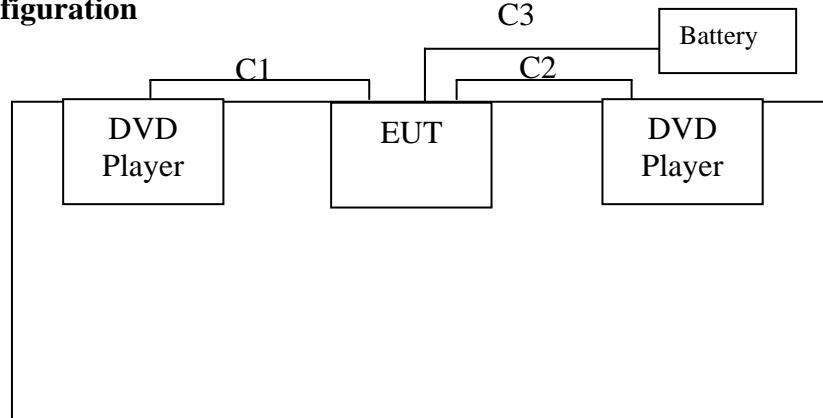
2.5.2.1 Supported Ancillary Equipment

Item	Name of Equipment	Manufacturer	Model Number	FCC ID	Note
1	DVD Player	INVISION	SSLM7BA1	N/A	N/A
2	DVD Player	INVISION	SSLM7BB1	N/A	N/A

2.5.2.2 The relevant cables of Supported Ancillary Equipment

Item	Name of Cables	Shielded Used	Ferrite Used	Length	Note
C1	Data cable	Non-Shielded	N/A	0.6m	Detachable
	Data cable	Non-Shielded	N/A	0.6m	Detachable
C2	Data cable	Non-Shielded	N/A	0.6m	Detachable
	Data cable	Non-Shielded	N/A	0.6m	Detachable
C3	Power line	Non-Shielded	N/A	1.7m	Detachable

2.5.2.3 Setup Configuration



2.5.2.4 Description of Test Mode

The system was configured for testing in a typical arrangement as the manufacturer's declaration. During the test, the CD/DVD player played program and set the volume to the maximum level. There was no special software to be exercised during the test.

There are six channels on EUT, and the operating frequency range of EUT is from 88.3 MHz to 90.3 MHz. We choose the middle channel (89.1 MHz) for main final test, except choosing the lowest channel (88.3 MHz) for Band Edge testing.



Worldwide Testing Services(Taiwan) Co., Ltd.

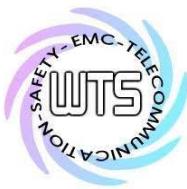
Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

3 Test results (enclosure)

TEST CASE	Required	Test passed	Test failed
Emission bandwidth 15.239 (a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Band Edge Measurement 15.239 (a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Carrier (Field Strength) 15.239 (b)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions 15.239 (c)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Power Line Conducted Emission 15.207	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: The lowest channel is 88.3 MHz and the highest channel is 90.3 MHz. The tuning control were manually adjusted to verify maximum tuning range.

(The follows is intended to leave blank.)



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

3.1 Emission Bandwidth

FCC Rule: 15.239(a)

Test condition	Detector	Bandwidth (kHz)	Limit (kHz)	
T _{nom} = 23°C	V _{nom} = 12 V	Peak	95.69138277	200

Limit: 15.239(a)

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 029, ETSTW-RE 042

Explanation: See attached diagrams as Appendix.



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

3.2 Band Edge Measurement

FCC Rule: 15.239(a)

Channel	Frequency MHz	Detector	Test Results (dB μ V/m)	Limit (dB μ V/m)
Lower Band-edge	88.3	Peak	19.26	40
Upper Band-edge	90.3	Peak	--	40

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 029, ETSTW-RE 042

Explanation: Before testing, the tuning control were manually adjusted to verify maximum tuning range. The lowest channel is 88.3 MHz and the highest channel is 90.3 MHz. For Band edge Measurement, the Upper Band-edge is not required because the highest operational frequency (90.3 MHz) is much far from the 108 MHz. See attached diagrams as Appendix.



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

3.3 Carrier (Field Strength)

FCC Rule: 15.239(b) , 15.35

Model: SCBX-3010-XXXXX Date: 2008/8/15
Mode: Temperature: 26 °C Engineer: Brian
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
89.095	31.77	peak	10.45	42.22	47.90	-5.68	230	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
89.095	31.99	peak	10.45	42.44	47.90	-5.46	215	150

Limit:

15.239(b)

The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter (47.90 dBuV/m) at 3 meters.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 029, ETSTW-RE 042

Explanation: In this case, the average limit is met when using a peak detector, the EUT shall be deemed to meet both limits of peak and average and measurement with the average detector is unnecessary. See attached diagrams as Appendix.



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

3.4 Spurious Emission

FCC Rules: 15.239 (c), 15.209

Radiated emission measurements were performed from 30 MHz to 1000 MHz.

For radiated emission tests, the analyzer setting was as followings:

Frequency \leq 1 GHz, RBW:100 kHz, VBW: 100 kHz (Peak measurements)

Frequency >1 GHz, RBW: 1 MHz, VBW: 1 MHz (Peak measurements)

Frequency >1 GHz , RBW:1 MHz , VBW: 10Hz (Average measurements)

The peak and average spurious emission plots was measured with the average limits.

In the Table being listed the critical peak and average value an exhibit the compliance with the above calculated Limits.

Summary table with radiated data of the test plots

Model:	SCBX-3010-XXXXX	Date:	2008/8/15
Mode:	TX	Temperature:	26 °C
Polarization:	Horizontal	Humidity:	60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
110.621	25.67	peak	12.43	38.10	43.50	-5.40	220	150
178.257	27.74	QP	14.18	41.92	43.50	-1.58	215	150
267.535	25.32	peak	14.37	39.69	46.00	-6.31	250	150
356.112	27.89	QP	16.62	44.51	46.00	-1.49	125	150
444.489	25.20	QP	18.82	44.02	46.00	-1.98	165	150
534.269	20.59	peak	20.39	40.98	46.00	-5.02	190	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
46.232	24.02	QP	13.65	37.67	40.00	-2.33	235	150
177.174	20.80	peak	14.28	35.08	43.50	-8.42	210	150
267.535	17.37	peak	14.37	31.74	46.00	-14.26	215	150
356.112	21.53	peak	16.62	38.15	46.00	-7.85	185	150
444.489	16.85	peak	18.82	35.67	46.00	-10.33	200	150
539.880	12.15	peak	20.50	32.65	46.00	-13.35	220	150

Note

- 1. Correction Factor = Antenna factor + Cable loss - Preamplifier**
- 2. The formula of measured value as: Test Result = Reading + Correction Factor**
- 3. Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
- 4. All not in the table noted test results are more than 20 dB below the relevant limits.**
- 5. See the attached diagram as appendix.**



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

Limits: 15.209

Frequency of Emission (MHz)	Field strength (microvolts/meter)	Field Strength (dB microvolts/meter)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 017, ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043, ETSTW-RE 044



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

3.5 Power Line Conducted Emission

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the table below with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transacted first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.

Limits:

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi Peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Test equipment used: ETSTW-CE 001, ETSTW-CE 003, ETSTW-CE 004, ETSTW-CE 006

Explanation: This test is not required because there is no AC power line or signal line for this EUT.



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Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

Appendix

A Measurement diagrams

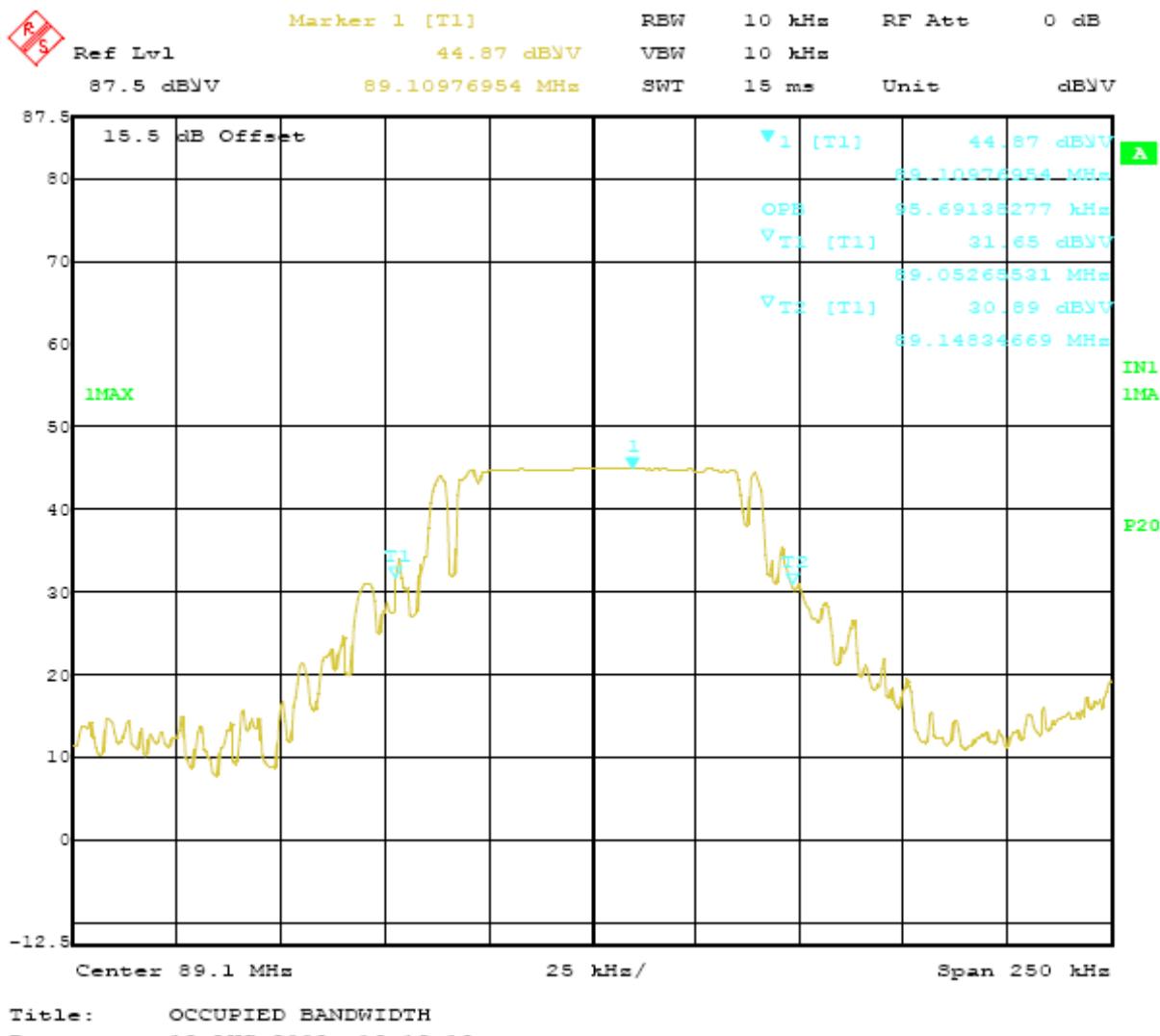
1. Emission Bandwidth
2. Band Edge Measurement
3. Carrier Field Strength
4. Spurious Emissions

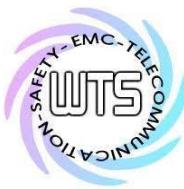
B Photos

1. External Photos
2. Internal Photos
3. Set Up Photo of Radiated Emission

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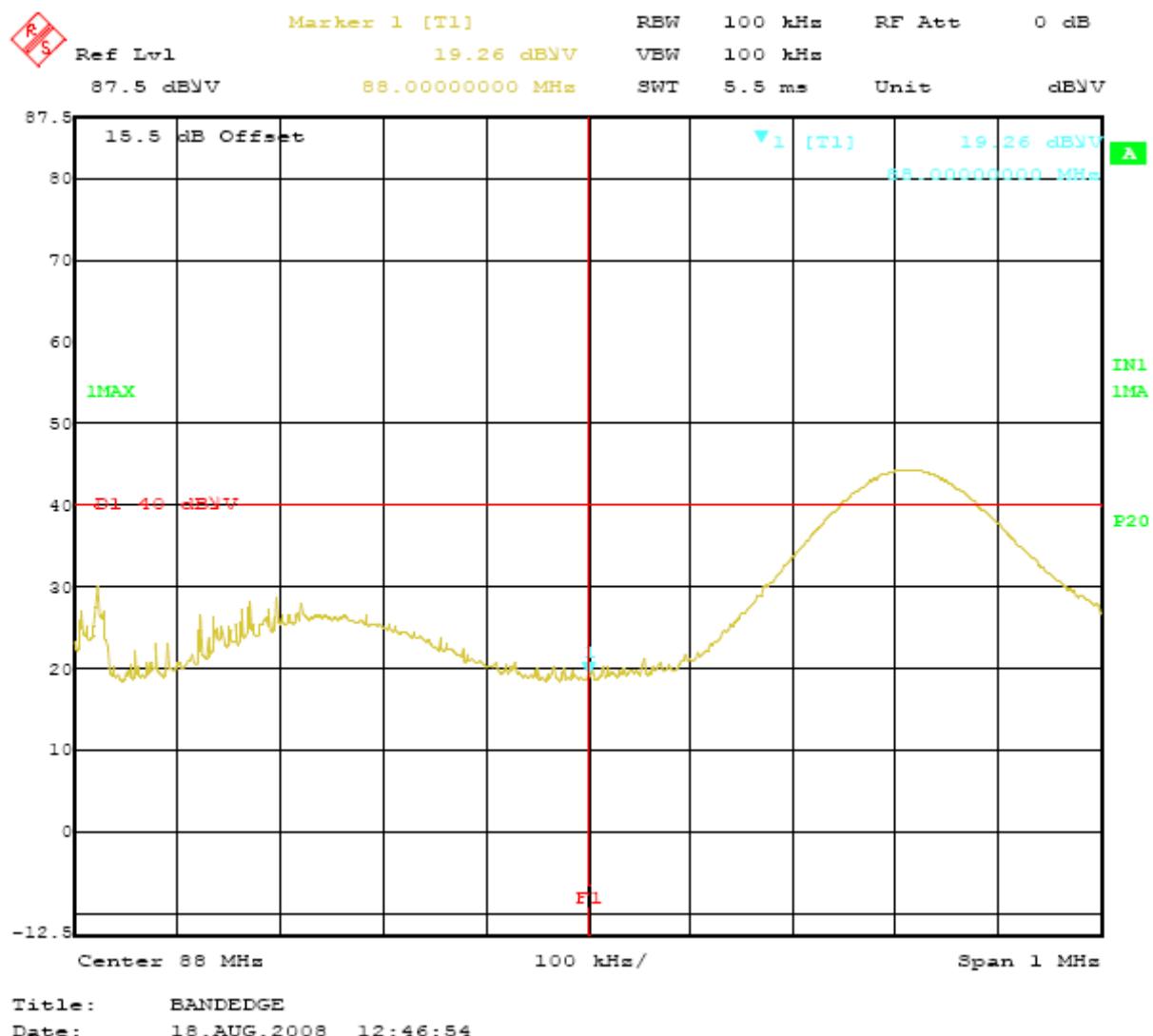
Emission Bandwidth





Registration number: W6M20808-9246-C-1
FCC ID: MXCSCBX3010-M

Band Edge Measurement

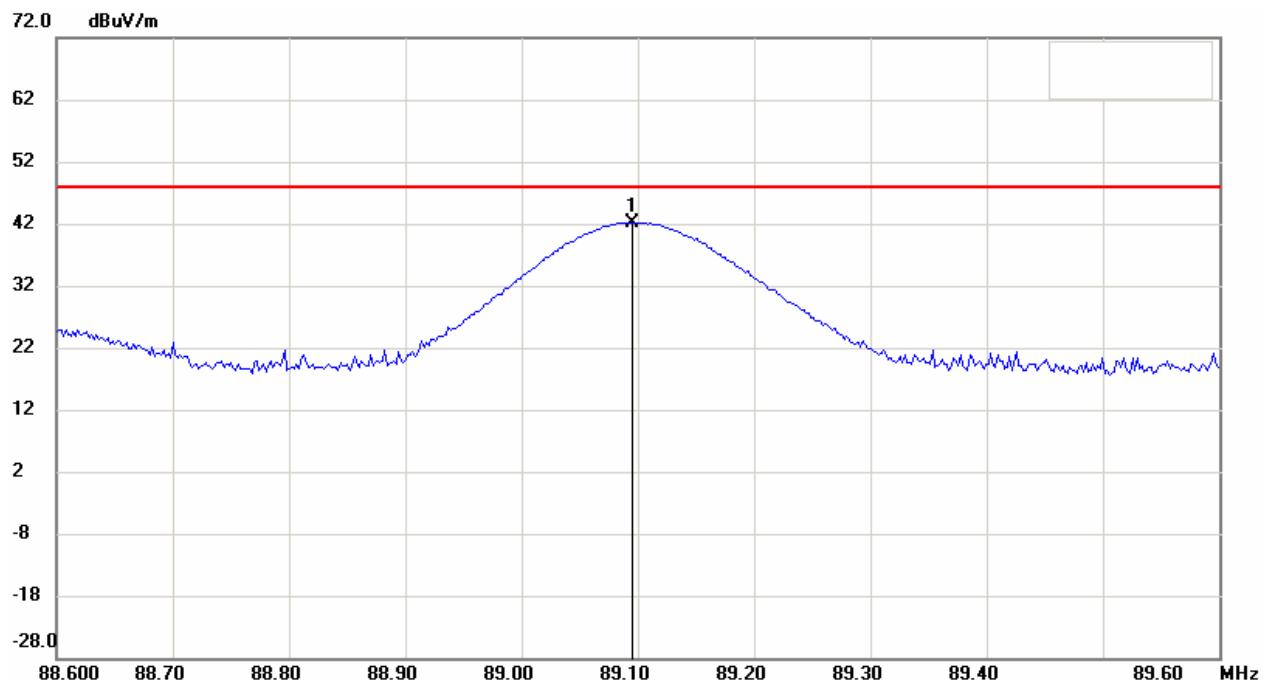




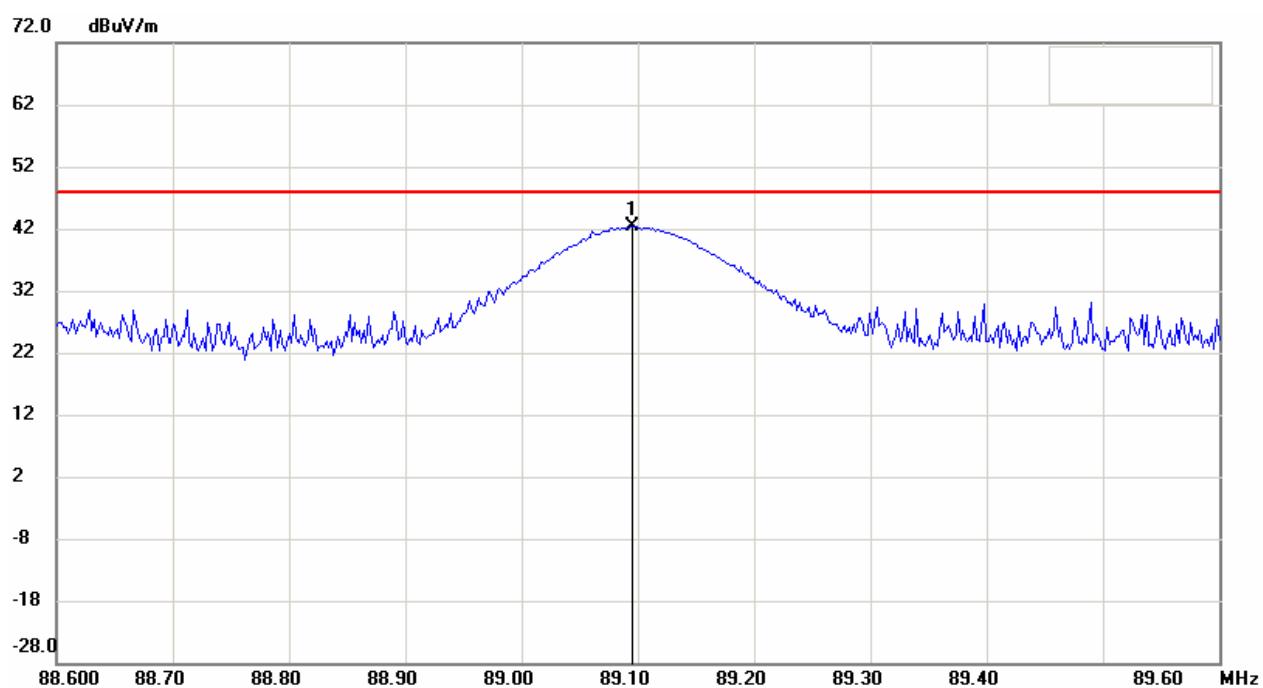
Worldwide Testing Services(Taiwan) Co., Ltd.

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FCC ID: MXCSCBX3010-M

Carrier Field Strength Antenna Polarization H



Antenna Polarization V

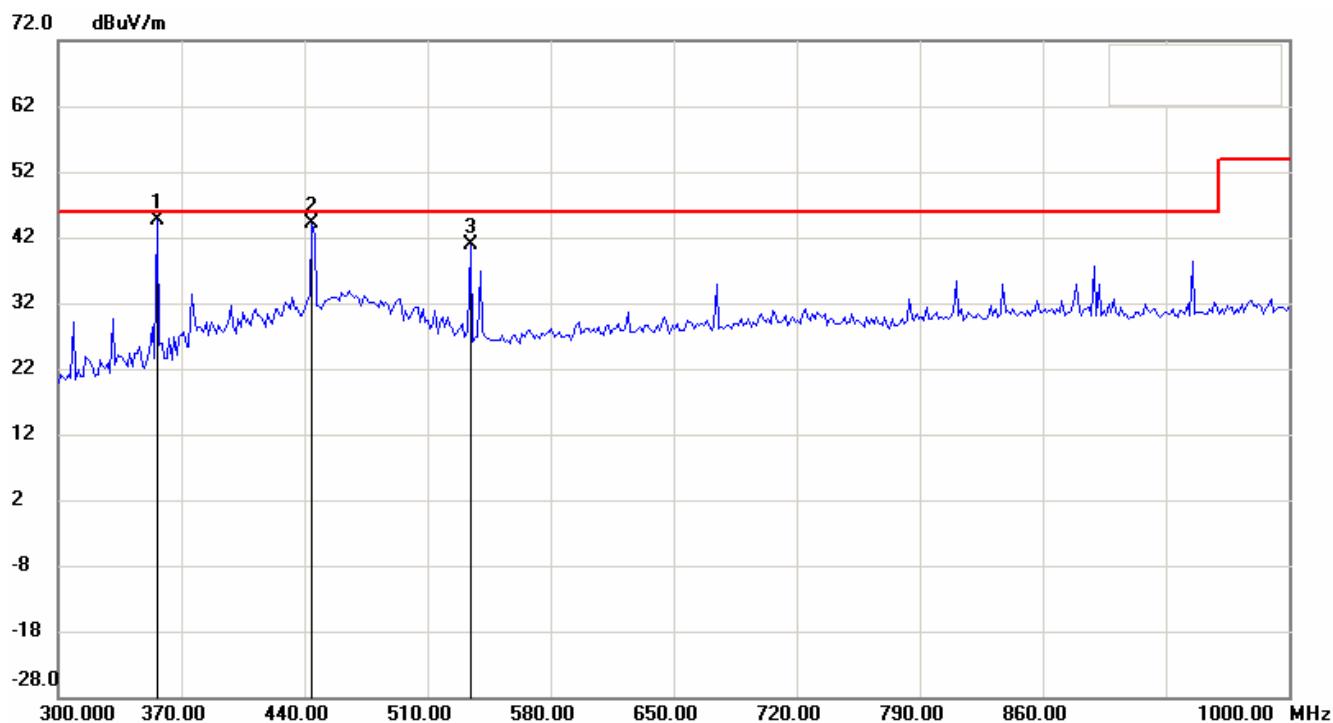
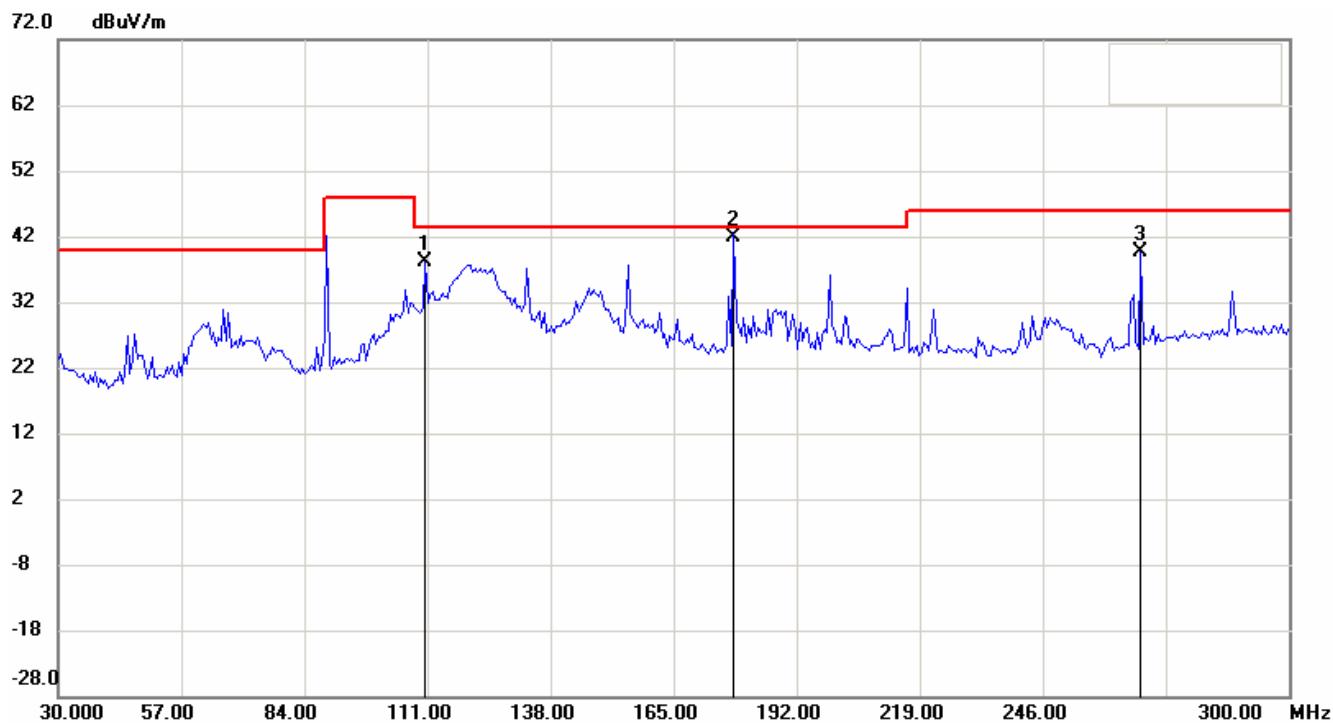


Note:

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of Carrier Field Strength test data of this test report.

Registration number: W6M20808-9246-C-1
 FCC ID: MXCSCBX3010-M

Spurious Emissions Antenna Polarization H

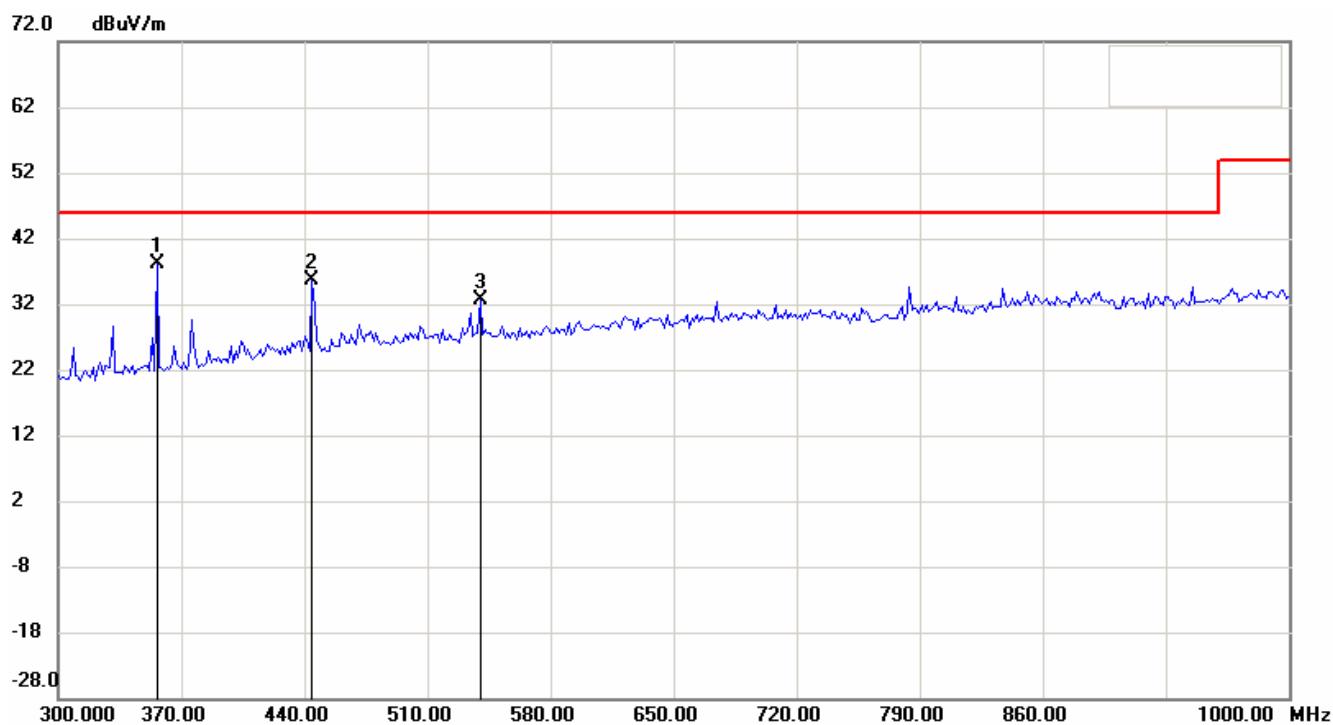
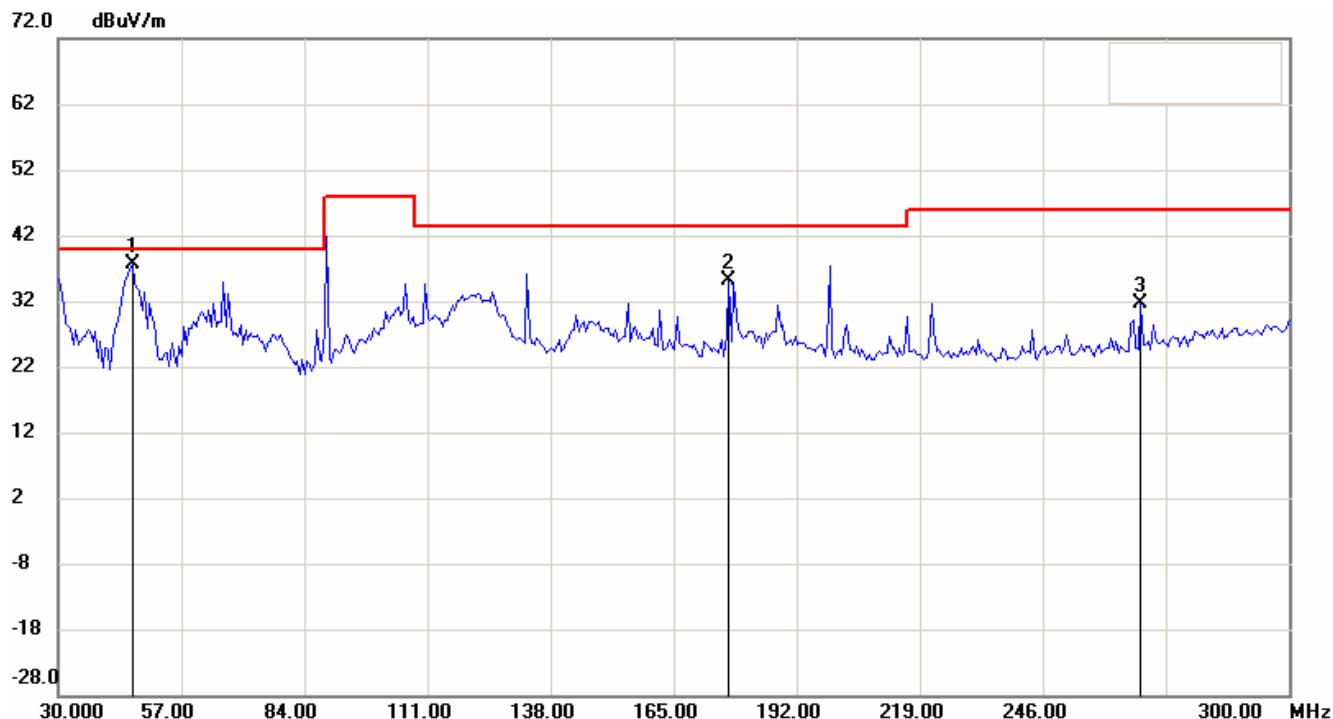


Note:

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.

Registration number: W6M20808-9246-C-1
 FCC ID: MXCSCBX3010-M

Antenna Polarization V



Note:

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.