

FCC Part 15 SUBPART C Test Report
for
2.4Ghz RF Digital Wireless Transmitter
MODEL NO.: TX-9
FCC ID: UAO-TX-9

of

Applicant: **ALITEAM INC.**
Address: **1F., No. 5, Lane 162, Jingye 3rd Rd.,**
Jungshan Chiu, Taipei 104, Taiwan

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.: W6M21006-10752-C-1-T



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	5
2	TECHNICAL TEST	6
2.1	SUMMARY OF TEST RESULTS	6
2.2	TEST ENVIRONMENT	6
2.3	TEST EQUIPMENT LIST	7
2.4	GENERAL TEST PROCEDURE	10
3	TEST RESULTS (ENCLOSURE)	12
3.1	PEAK OUTPUT POWER (TRANSMITTER)	13
3.2	EQUIVALENT ISOTROPIC RADIATED POWER	14
3.3	RF EXPOSURE COMPLIANCE REQUIREMENTS	14
3.4	TRANSMITTER RADIATED EMISSIONS IN RESTRICTED BANDS	15
3.5	SPURIOUS EMISSIONS (TX)	16
3.6	RADIATED EMISSION ON THE BAND EDGE	20
3.7	MINIMUM 6 DB BANDWIDTH	21
3.8	PEAK POWER SPECTRAL DENSITY	22
3.9	RADIATED EMISSION FROM RECEIVER PART	23
3.10	POWER LINE CONDUCTED EMISSION	24
	APPENDIX	26



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

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.

Specific Conditions:

Usage of the hereunder tested device in combination with other integrated or external antennas requires at least additional output power measurements, spurious emission measurements, conducted emission measurements (AC supply lines) and radio frequency exposure evaluations for each individual configuration performed, for certification by FCC.

Tester:

August 13, 2010

Rick Chen

Rick Chen.

Date

WTS-Lab.

Name

Signature

Technical responsibility for area of testing:

August 13, 2010

Chang Tse-Ming

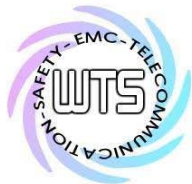
Chang Tse-Ming

Date

WTS

Name

Signature



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

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



Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :

Name: ./.

Accredited number: ./.

Street: ./.

Town: ./.

Country: ./.

Telephone: ./.

Fax: ./.

1.3 Details of approval holder

Name: ALITEAM INC.

Street: 1F., No. 5, Lane 162, Jingye 3rd Rd., Jungshan Chiu,

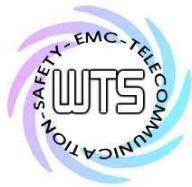
City: Taipei 104,

Country: Taiwan

Telephone: +886-2-2532-7977

Fax: +886-2-2532-7913

Teletex: ./.



Registration number: W6M21006-10752-C-1-T
FCC ID: UAO-TX-9

1.4 Application details

Date of receipt of test item: July 01, 2010
Date of test: from July 01, 2010 to August 05, 2010

1.5 General information of Test item

Type of product : 2.4Ghz RF Digital Wireless Transmitter
Type identification : TX-9
Multi-listing model number : TX-12, TX-6
Brand Name : ALTEAM
Photos : see Appendix

Technical data

Frequency band : 2404-2476 MHz
Frequency (ch 1) : 2404 MHz
Frequency (ch 13) : 2440 MHz
Frequency (ch 25) : 2476 MHz
Number of Channels: 25
Operation modes: duplex
Modulation Type: GFSK
Fixed point-to-point operation: ☐ Yes / ☒ No
Type of Antenna: PCB antenna
Antenna gain: 0.1154 dBi
Power supply: 5 VDC (power on PC)
Emission designator: 1M52G1D



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Host device: none

Classification:

Fixed Device	<input type="checkbox"/>
Mobile Device (Human Body distance > 20cm)	<input type="checkbox"/>
Portable Device (Human Body distance < 20cm)	<input checked="" type="checkbox"/>

Transmitter

Unom

Power (ch A or ch 1) : Conducted: 11.11 dBm

Power (ch B or ch 13) : Conducted: 9.69 dBm

Power (ch C or ch 25) : Conducted: 8.64 dBm

Manufacturer:

(if applicable)

Name: Guangzhou ALTEAM Electronics Co., Ltd.

Street: Xi Nan Industry Zone, Xian Cun,

Town: Xintang Town, Zengcheng, Guangzhou

Country: China

.
Additional information: ./.

1.6 Test standards

Technical standard : FCC RULES PART 15 SUBPART C § 15.247 (2009-10)



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

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 2.5 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

Power supply: 5 VDC (power on PC)

Extreme conditions parameters: ./.



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

2.3 Test Equipment List

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2009/9/10	2010/9/9
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2010/3/2	2011/3/1
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2009/9/9	2010/9/8
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2010/5/8	2011/5/7
ETSTW-CE 007	SPECTRUM ANALYZER 5GHz	FSB	849670/001	R&S	Pre-test Use NCR	
ETSTW-CE 008	HF-EICHLITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2010/7/21	2011/7/19
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2009/9/12	2010/9/11
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2009/9/9	2010/9/8
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	Function Test	
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2009/10/1	2010/9/30
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2009/9/18	2010/9/17
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2009/9/11	2010/9/10
ETSTW-RE 006	Attenuator 10dB	50HF-010-5N-1	None	STEP	2010/3/5	2011/3/4
ETSTW-RE 010	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2009/9/11	2010/9/10
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2009/10/1	2010/9/30
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2009/8/19	2010/8/18
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	EMCO	2009/8/14	2011/8/13
ETSTW-RE 028	Log-Periodic Dipole Array Antenna	3148	34429	EMCO	2010/4/14	2011/4/13
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2010/4/14	2011/4/13
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2010/3/2	2011/3/1
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2009/8/23	2010/8/22
ETSTW-RE 033	WaveRunner 6000A Serie Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	Function Test	
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2009/8/23	2010/8/22
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2010/1/13	2011/1/12
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2010/4/29	2011/4/28
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2010/5/11	2011/5/10



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T
FCC ID: UAO-TX-9

ETSTW-RE 047	PSA SERIES SPECTRUM ANALYZER	E4445A	MY46181369	Agilent	Pre-test Use NCR	
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2009/8/31	2010/8/30
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2010/4/13	2011/4/12
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2010/3/5	2011/3/4
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2010/3/5	2011/3/4
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2010/6/3	2011/6/2
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	Pre-test Use NCR	
ETSTW-RE 061	Amplifier Module	CHC 1	None	ETS	2009/11/12	2010/11/11
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2009/11/12	2010/11/11
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 065	Amplifier	AMF-6F-18002650-25-10P	941608	MITEQ	2010/4/13	2011/4/12
ETSTW-RE 066	Highpass Filter	H1G013G1	206015	MICROWAVE CIRCUITS, INC.	2010/3/5	2011/3/4
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2009/10/2	2010/10/1
ETSTW-RE 073	Power Meter	N1911A	MY45100769	Agilent	2010/1/7	2011/1/6
ETSTW-RE 074	Power Sensor	N1921A	MY45241198	Agilent	2010/1/7	2011/1/6
ETSTW-RE 081	Highpass Filter	H03G13G1	4260-02 DC0428	MICROWAVE CIRCUITS, INC.	2010/3/5	2011/3/4
ETSTW-RE 096	SIGNAL GENERATOR	SMIQ 03B	102274	R&S	2010/5/31	2011/5/30
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2010/3/5	2011/3/4
ETSTW-RE 105	2.4GHz Notch Filter	NO124411	39555	MICROWAVE CIRCUITS, INC.	2010/3/25	2011/3/24
ETSTW-RE 106	Humidity Temperature Meter	TES-1366	091011113	TES	2010/3/25	2011/3/24
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2009/9/22	2010/9/21
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40/12+9SS	3	WI	Function Test	
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	Function Test	
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	Function Test	
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	Function Test	
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2009/9/21	2010/9/20
ETSTW-Cable 002	Microwave Cable	SUCOFLEX 104 (S_Cable 7)	238093	HUBER+SUHNER	2009/9/16	2010/9/15
ETSTW-Cable 003	Microwave Cable	SUCOFLEX 104 (S_Cable 11)	209953	HUBER+SUHNER	2009/9/16	2010/9/15
ETSTW-Cable 006	Microwave Cable	SUCOFLEX 104 (S_Cable 8)	238095	HUBER+SUHNER	2010/3/5	2011/3/4
ETSTW-Cable 010	BNC Cable	5 M BNC Cable	None	JYE BAO CO.,LTD.	2010/3/5	2011/3/4
ETSTW-Cable 011	BNC Cable	BNC Cable 1	None	JYE BAO CO.,LTD.	2009/8/20	2010/8/19
ETSTW-Cable 012	BNC Cable	BNC Cable 2	None	JYE BAO CO.,LTD.	2009/8/20	2010/8/19



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

ETSTW-Cable 013	Microwave Cable	SUCOFLEX 104 (S_Cable 5)	232345	HUBER+SUHNER	2010/3/5	2011/3/4
ETSTW-Cable 022	N TYPE Cable	OATS Cable 3	0002	JYE BAO CO.,LTD.	2010/3/5	2011/3/4
ETSTW-Cable 039	Microwave Cable	SUCOFLEX 104 (S_Cable 19)	316739	HUBER+SUHNER	2010/3/5	2011/3/4
WTSTW-SW 001	EMI TEST SOFTWARE	Harmonics-1000	None	EMC PARTNER	HARCS Version 4.16 Firmware Version 2.18	
WTSTW-SW 002	EMI TEST SOFTWARE	EZ EMC	None	Farad	Version ETS-03A1	
WTSTW-SW 003	EMS TEST SOFTWARE	i2	None	AUDIX	Version 3.2007-8-17b	
WTSTW-SW 005	GSM Fading Level Correction	GSMFadLevCor	None	R&S	Version 1.66	



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

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.



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

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

$T = 100\text{ms}$ 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: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3 Test results (enclosure)

TEST CASE	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.247(b)(3)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Equivalent radiated Power	15.247(b)(3)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions radiated – Transmitter operating	15.247(c): 15.209	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Band Edge Measurement	15.247(c)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimum 6 dB Bandwidth	15.247(a)(2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Peak Power Spectral Density	15.247(d)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated Emission from Receiver Part	15.109	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power Line Conducted Emission	15.207	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3.1 Peak Output Power (transmitter)

FCC Rule: 15.247(b)(3)

This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.

The power was measured with modulation (declared by the applicant).

Test condition		Conducted Power		
		Channel 1	Channel 13	Channel 25
$T_{nom} = 23^{\circ}\text{C}$	$V_{nom} = 5\text{ V}$	[dBm]	[dBm]	[dBm]
		11.11	9.69	8.64

Test condition $T_{nom} = 23^{\circ}\text{C}$, $V_{nom} = \text{-- V}$	Signal Field strength TX highest power mode dB $\mu\text{V/m}$
Frequency [MHz]	--
--	

Limits:

Frequency MHz	Power dBm
902 - 928	30
2400 - 2483.5	30
5725 - 5850	30

In case of employing transmitter antennas having antenna gain $> 6\text{ dBi}$ and using fixed point-to point operation consider §15.247 (b)(4)

Test equipment used: ETSTW-RE 055

Explanation: The diagrams for the peak output power measurements are included in Appendix.



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3.2 Equivalent isotropic radiated power

FCC Rule: 15.247(b)(3)

EIRP = max. conducted output power + antenna gain

EIRP = 11.11 dBm + 0.1154 dBi

= 11.2254 dBm

Limit: EIRP = +36 dBm for Antenna gain <6dBi

Test equipment used: ETSTW-RE 055

3.3 RF Exposure Compliance Requirements

FCC OET Bulletin 65 Edition 97.01 determines the equations for predicting RF fields and applicable limits.

The prediction for power density in the far-field but will over-predict power density in the near field, where it could be used for walking a “worst case” or conservative prediction.

$$S = \frac{PG}{4\pi R^2}$$

S – Power Density

P – Output power ERP

R – Distance

D – Cable Loss

AG – Antenna Gain

Item	Unit	Value	Remarks
P	mW	12.912	Peak value
D	dB		
AG	dBi	0.1154	
G		1.026	Calculated Value
R	cm	20	Assumed value
S	mW/cm ²	0.002636	Calculated value

Limits:

Limit for General Population / Uncontrolled Exposure	
Frequency (MHz)	Power Density (mW/cm ²)
1500 – 100.000	1.0



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3.4 Transmitter Radiated Emissions in Restricted Bands

FCC Rules: 15.247 (c), 15.205, 15.209, 15.35

Radiated emission measurements were performed from 30 MHz to 26500 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: 10 Hz (Average measurements)

Limits.

For frequencies below 1GHz:

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	500	54.0

For frequencies above 1GHz (Average measurements).

Guidance on Measurement of Digit Transmission Systems:

“If the emission is pulsed, modify the unit for continuous operation, use the setting shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.”

The correction factor, based on the total channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty cycle correction = $20 \log (\text{dwell time} / 100\text{ms})$

Note: No duty cycle correction was added to the reading of this EUT.

Explanation: See attached diagrams in Appendix.



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3.5 Spurious Emissions (tx)

Spurious emission was measured with modulation (declared by manufacturer).

In any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB 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 § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c))

FCC Rule: 15.247(c), 15.35

For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Limits:

For frequencies above 1GHz (Peak measurements).

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

For frequencies above 1GHz (Average measurements).

Max. reading – 20dB

Max. reading – 20 dB

Guidance on Measurement of Digit Transmission Systems:

“If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.”

The correction factor, based on the total channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty Cycle correction = $20 \log (\text{dwell time}/100\text{ms})$

Note: No duty cycle correction was added to the reading of EUT.



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance with point 2.3.

Calculation of test results:

Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

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

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

If in the column's correction factor states a value then the max. Field strength in the same row is corrected by a value gained from the "Correction Factor".

Summary table with radiated data of the test plots

Model: TX-9 Date: 2010/07/29
 Mode: TX-2404MHz Temperature: 30.9 °C Engineer: Rick
 Polarization: Horizontal Humidity: 58 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
168.4616	17.37	peak	14.98	32.35	43.50	-11.15	160	150
329.1668	17.06	peak	16.89	33.95	46.00	-12.05	200	150

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1200.3210	60.46	---	-13.55	46.91	---	74.00	54.00	-27.09	200	150
4807.6920	54.23	---	-4.97	49.26	---	74.00	54.00	-24.74	170	150
7217.9490	53.89	---	-2.28	51.61	---	74.00	54.00	-22.39	260	150
9616.0000	29.84	---	12.98	42.82	---	74.00	54.00	-31.18	230	150
12020.0000	30.13	---	15.85	45.98	---	74.00	54.00	-28.02	110	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
163.2692	17.87	peak	15.31	33.18	43.50	-10.32	200	150
611.8590	9.34	peak	23.69	33.03	46.00	-12.97	180	150



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1201.9230	60.72	---	-13.54	47.18	---	74.00	54.00	-26.82	260	150
4807.6920	53.15	---	-4.97	48.18	---	74.00	54.00	-25.82	240	150
7217.9490	52.90	---	-2.28	50.62	---	74.00	54.00	-23.38	290	150
9616.0000	29.06	---	12.98	42.04	---	74.00	54.00	-31.96	270	150
12020.0000	30.25	---	15.85	46.10	---	74.00	54.00	-27.90	110	150

Mode: TX-2440MHz Temperature: 30.9 °C Engineer: Rick
Polarization: Horizontal Humidity: 58 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
169.3270	17.33	peak	14.93	32.26	43.50	-11.24	130	150
329.1668	17.01	peak	16.89	33.90	46.00	-12.10	120	150

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1221.1540	58.46	---	-13.43	45.03	---	74.00	54.00	-28.97	130	150
4884.6160	54.34	---	-4.05	50.29	---	74.00	54.00	-23.71	160	150
7326.9230	52.77	---	-0.95	51.82	---	74.00	54.00	-22.18	170	150
9760.0000	29.01	---	14.67	43.68	---	74.00	54.00	-30.32	180	150
12200.000	28.31	---	17.39	45.70	---	74.00	54.00	-28.30	210	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
169.7597	17.93	peak	14.90	32.83	43.50	-10.67	100	150
611.8590	9.13	peak	23.69	32.82	46.00	-13.18	110	150

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1221.1540	58.46	---	-13.43	45.03	---	74.00	54.00	-28.97	170	150
4884.6160	51.62	---	-4.84	46.78	---	74.00	54.00	-27.22	200	150
7333.3330	52.27	---	-2.86	49.41	---	74.00	54.00	-24.59	170	150
9760.0000	28.33	---	12.85	41.18	---	74.00	54.00	-32.82	200	150
12200.0000	28.72	---	16.47	45.19	---	74.00	54.00	-28.81	140	150



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Mode: TX-2476MHz Temperature: 30.9 °C Engineer: Rick
Polarization: Horizontal Humidity: 58 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
170.6250	15.73	peak	14.81	30.54	43.50	-12.96	260	150
329.1668	17.83	peak	16.89	34.72	46.00	-11.28	300	150

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1238.7820	62.92	---	-13.33	49.59	---	74.00	54.00	-24.41	200	150
4948.7180	56.38	---	-4.97	51.41	---	74.00	54.00	-22.59	140	150
7429.4870	53.63	---	-3.18	50.45	---	74.00	54.00	-23.55	210	150
9904.0000	29.11	---	13.09	42.2	---	74.00	54.00	-31.8	170	150
12380.0000	29.3	---	16.50	45.8	---	74.00	54.00	-28.2	200	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
162.8366	18.65	peak	15.33	33.98	43.50	-9.52	120	150
608.4936	8.67	peak	23.65	32.32	46.00	-13.68	100	150

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1237.1800	59.58	---	-13.34	46.24	---	74.00	54.00	-27.76	200	150
4948.7180	52.67	---	-4.97	47.70	---	74.00	54.00	-26.30	200	150
7429.4870	50.24	---	-3.18	47.06	---	74.00	54.00	-26.94	100	150
9904.0000	29.86	---	13.09	42.95	---	74.00	54.00	-31.05	190	150
12380.0000	30.74	---	16.50	47.24	---	74.00	54.00	-26.76	140	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.

TEST RESULT (Transmitter): The unit DOES meet the FCC requirements.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 018, ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3.6 Radiated Emission on the band edge

According to FCC rules part 15 subpart C §15.247(c) in any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB 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 § 15.209(a) is not required.

In addition radiated emission which fall in the restricted bands, as defined in section 15.205(a), must also with the radiated emission limits.

Test conditions		Attenuation at or outside band-edges	
		Lower Band-edge	Upper Band-edge
$T_{nom} = 23^{\circ}\text{C}$	$V_{nom} = 5\text{ V}$	59.44 dB	60.44 dB

Limit:

Frequency Range / MHz	Limit
902 – 928	- 20 dB
2400 – 2483.5	
5725 - 5850	

Test equipment used: ETSTW-RE 055

Explanation: Please see attached diagram as appendix.



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3.7 Minimum 6 dB Bandwidth

The analyzer ResBW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK reading was taken, two markers were set 6 dB below the maximum level on the right and the left side of the emission.

The 6 dB bandwidth is the frequency difference between the two markers.

Test conditions		6 dB Bandwidth		
		Channel 1	Channel 13	Channel 25
$T_{nom} = 23^{\circ}\text{C}$	$V_{nom} = 5\text{ V}$	605.769230771 kHz	548.076923074 kHz	557.692307695 kHz

Limits:

Frequency Range MHz	Limits
902-928	min 500 kHz
2400-2483.5	min 500 kHz
5725-5850	min 500 kHz

Test equipment used: ETSTW-RE 055

Explanation: See attached diagrams in Appendix.



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3.8 Peak Power Spectral Density

Peak Power Spectral density is a measured at low, middle and high channel.

The peak output power is measured with a measurement bandwidth of 10 MHz and displayed on diagram together with Peak Power Spectral Density result which was measured with a bandwidth of 3 kHz, appreciate frequency span and sweep time.

Test conditions		Peak Power Spectral Density (3 kHz)		
		Channel 1 [dBm]	Channel 13 [dBm]	Channel 25 [dBm]
$T_{nom} = 23^{\circ}\text{C}$	$V_{nom} = 5 \text{ V}$	7.83	6.53	5.75

Limits:

Frequency Range MHz	dBm
902-928	8
2400-2483.5	8
5725-5850	8

Test equipment used: ETSTW-RE 055

Explanation: See attached diagrams in Appendix.



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3.9 Radiated Emission from Receiver Part

According to FCC part 15.109 (g), digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement".

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (microvolts/meter)	Field Strength (dBmicrovolts/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 028, ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043

Explanation: The test results of digital part and receiver part are listed in the separated test report no. W6M21006-10752-P-15B-T.



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

3.10 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 bellows 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 transact 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.

Frequency	Level (dBμV)	
	quasi-peak	average
150 kHz	lower limit line	Lower limit line

Model: TX-9 Date: 2010/7/2
 Mode: Temperature: 24 °C Engineer: Rick
 Polarization: N Humidity: 60 %

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result (dBuV)		Limit (dBuV)		Margin (dB)
	QP	Ave.		QP	Ave.	QP	Ave.	
0.1556	42.09	14.36	10.74	52.83	25.10	65.70	55.70	-12.87
0.2862	33.10	18.09	10.72	43.82	28.81	60.63	50.63	-16.81
0.5854	20.75	5.61	10.62	31.37	16.23	56.00	46.00	-24.63
3.7993	15.44	7.58	10.18	25.62	17.76	56.00	46.00	-28.24
11.1385	21.28	13.44	10.42	31.70	23.86	60.00	50.00	-26.14
16.3984	23.37	16.47	10.71	34.08	27.18	60.00	50.00	-22.82

Polarization: L1

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result (dBuV)		Limit (dBuV)		Margin (dB)
	QP	Ave.		QP	Ave.	QP	Ave.	
0.1663	39.26	16.44	10.76	50.02	27.20	65.14	55.14	-15.12
0.2751	32.84	18.30	10.72	43.56	29.02	60.96	50.96	-17.40
0.4950	19.97	6.85	10.66	30.63	17.51	56.08	46.08	-25.45
3.7200	18.07	8.85	10.19	28.26	19.04	56.00	46.00	-26.96
8.1111	16.99	9.85	10.30	27.29	20.15	60.00	50.00	-29.85
16.7500	22.04	15.00	10.91	32.95	25.91	60.00	50.00	-24.09



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

- Note**
1. The formula of measured value as: **Test Result = Reading + Correction Factor**
 2. The Correction Factor = Cable Loss + LISN Insertion Loss + Pulse Limit Loss
 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. Measurement uncertainty = $\pm 1.77\text{dB}$; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.
 6. See attached diagrams as appendix.

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 004, ETSTW-CE 006



Appendix

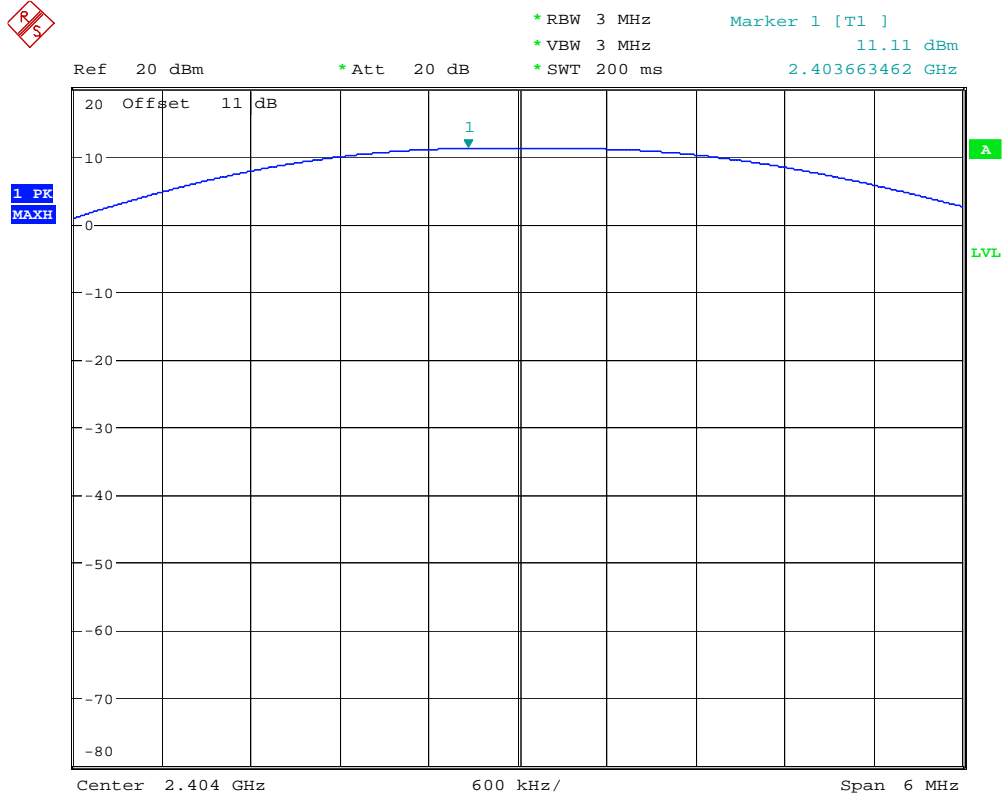
Measurement diagrams

- 1 Peak Output Power
- 2 Spurious Emissions radiated
- 3 Band Edge Measurement
- 4 Minimum 6dB Bandwidth
- 5 Peak Power Spectral Density
- 6 Power Line Conducted Emission



Registration number: W6M21006-10752-C-1-T
FCC ID: UAO-TX-9

Peak Output Power



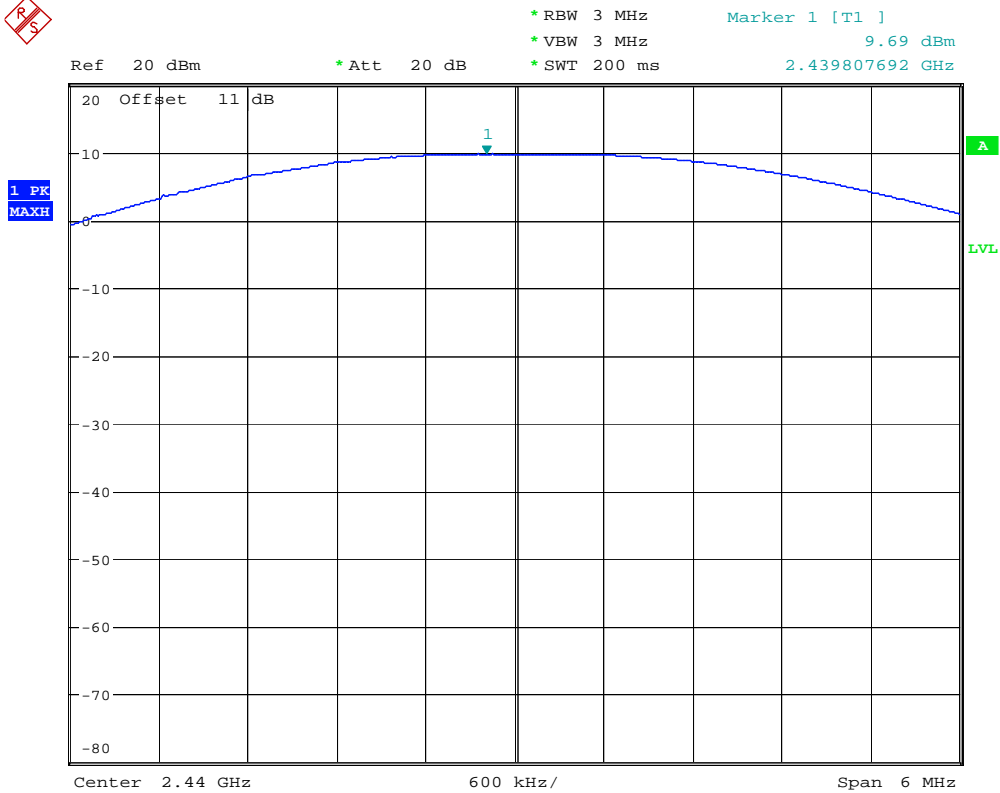
MAX OUTPUT POWER 2404MHz
Date: 28.JUL.2010 19:03:20



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9



MAX OUTPUT POWER 2440MHz

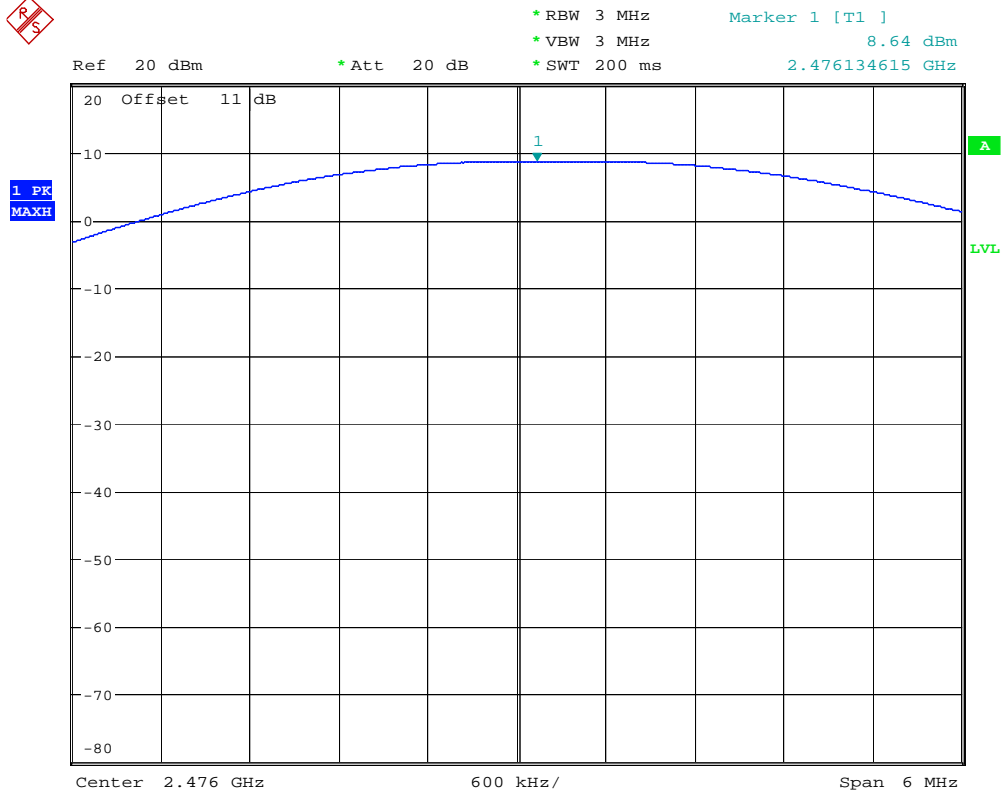
Date: 28.JUL.2010 19:04:35



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9



MAX OUTPUT POWER 2476MHz

Date: 28.JUL.2010 19:05:08



Worldwide Testing Services(Taiwan) Co., Ltd.

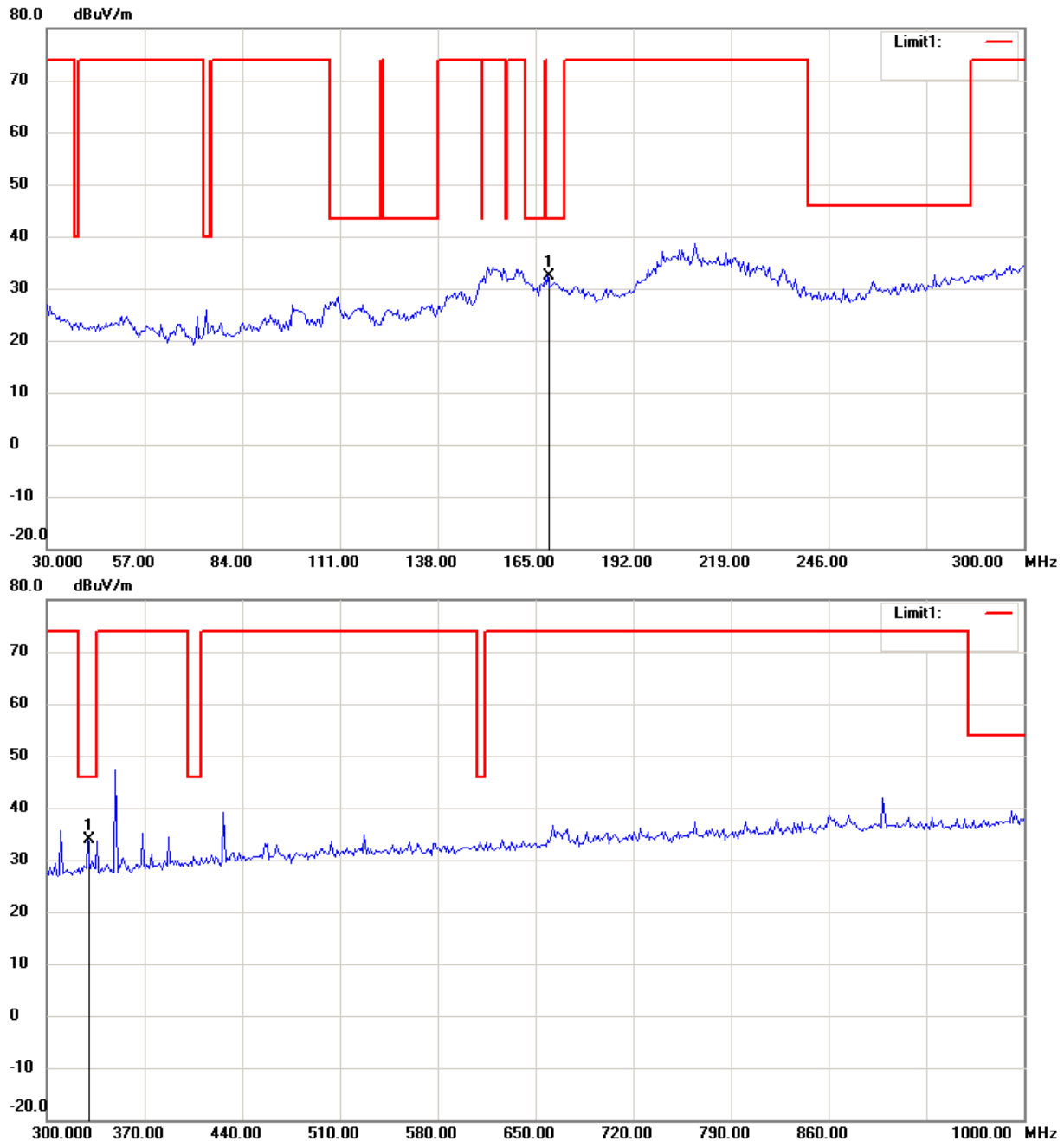
Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Spurious Emissions radiated

TX-2404 MHz (CH 1)

Antenna Polarization H



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

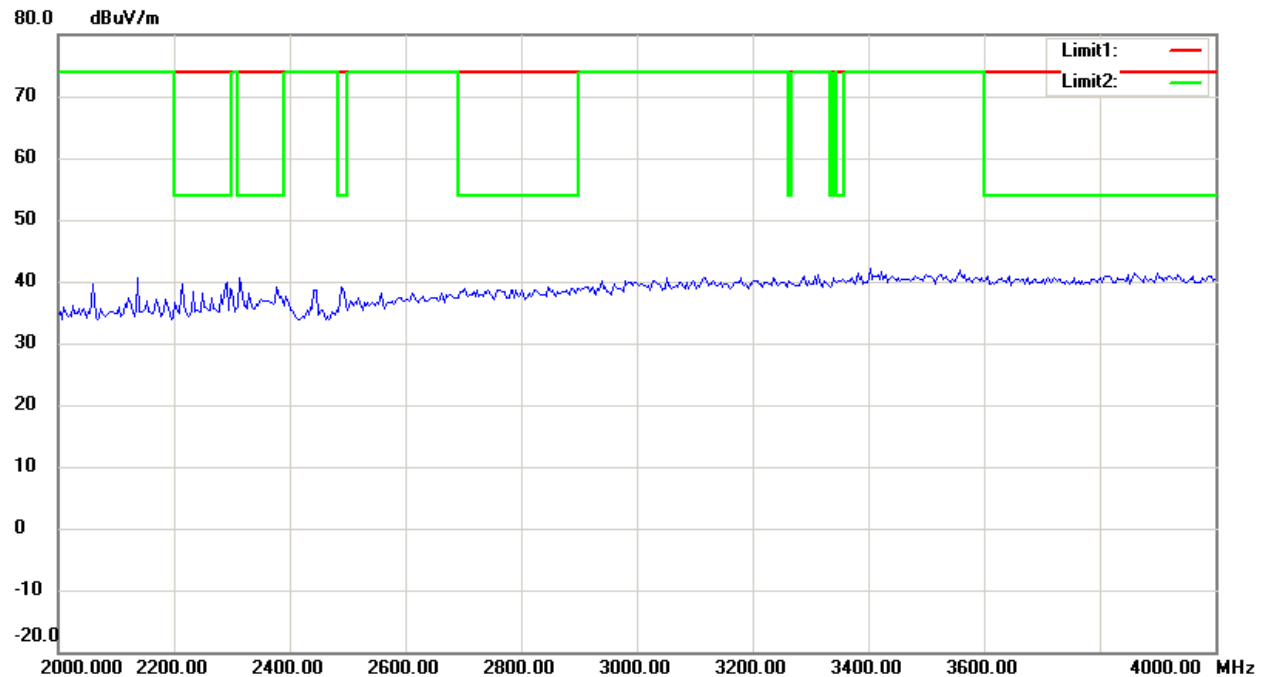
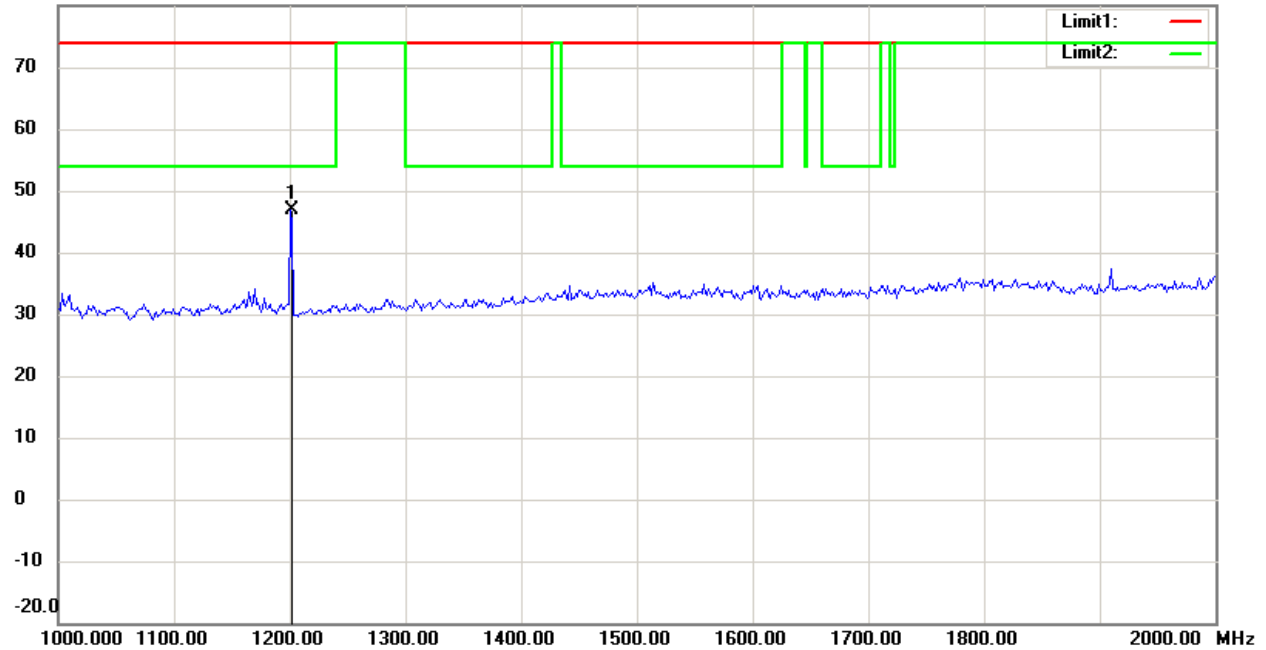


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

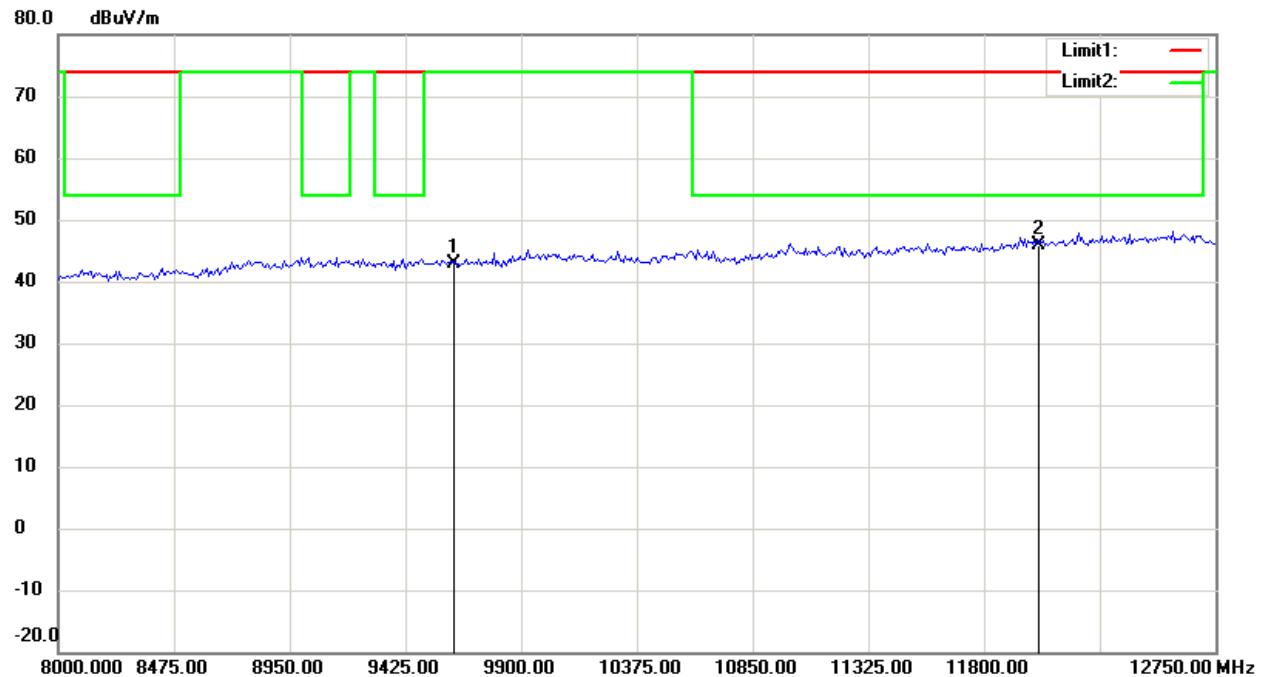
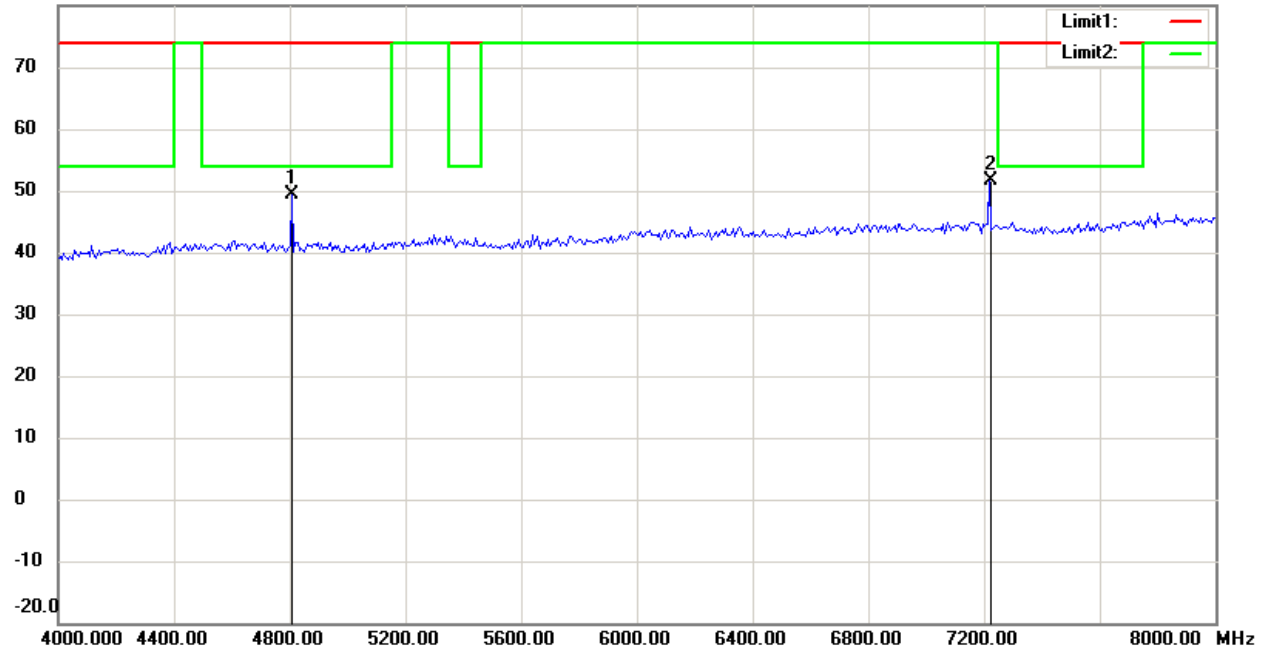


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

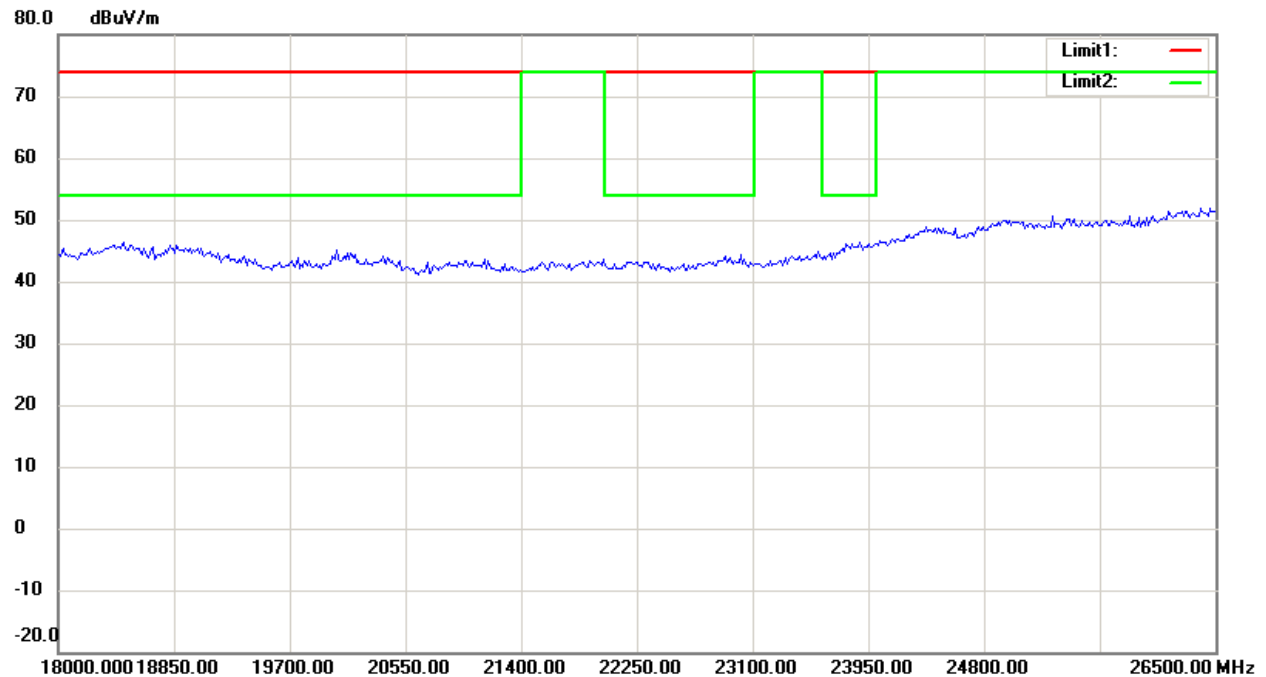
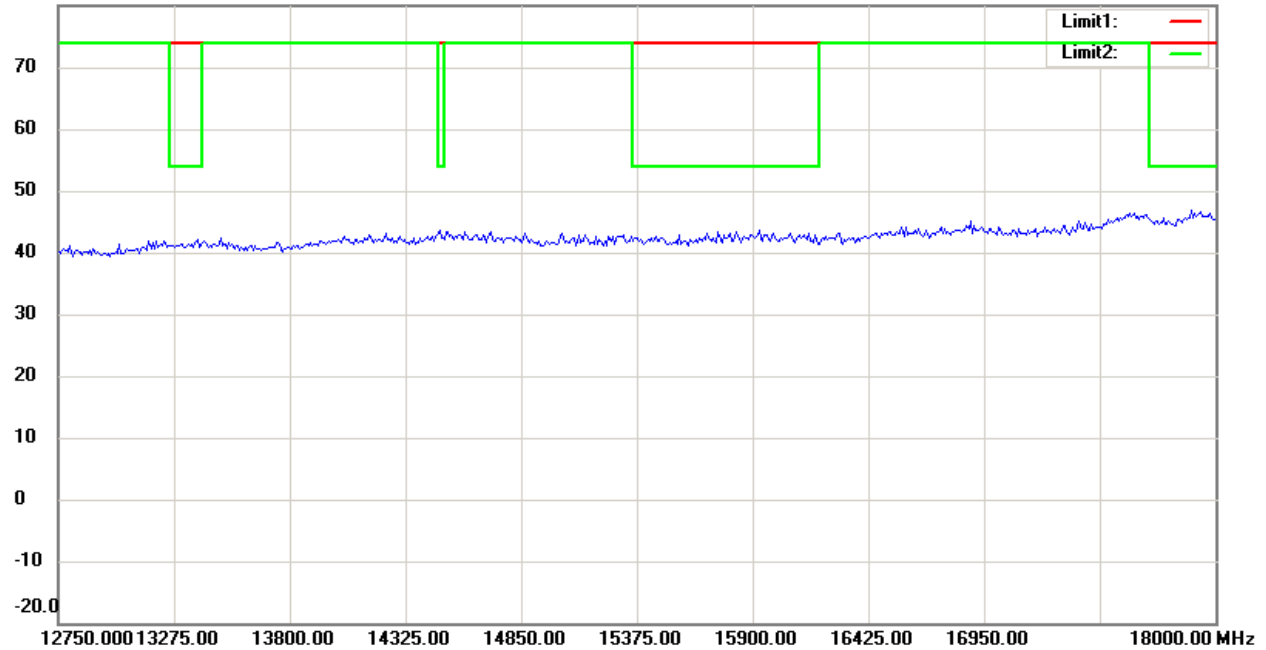


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

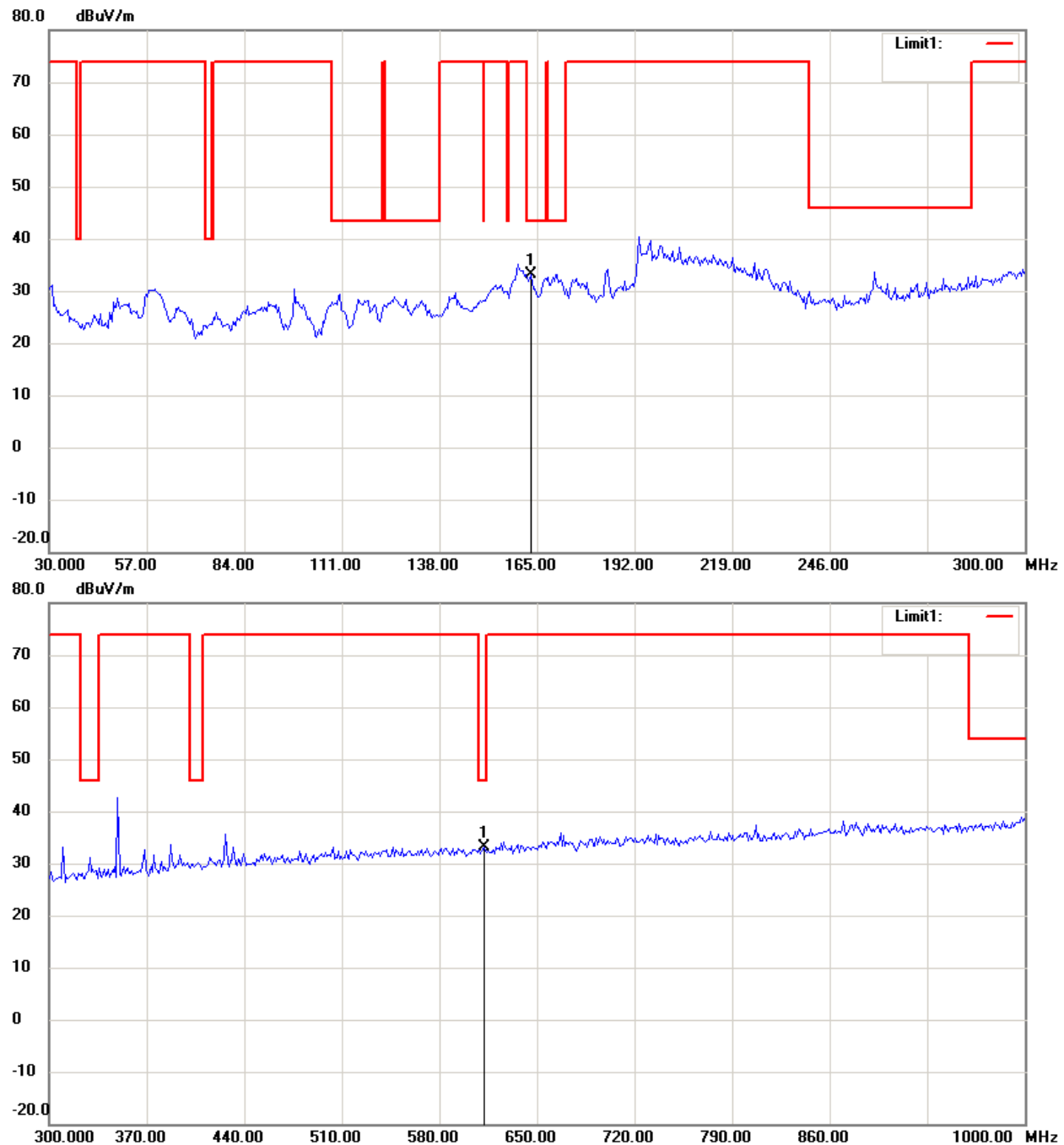


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Antenna Polarization V



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

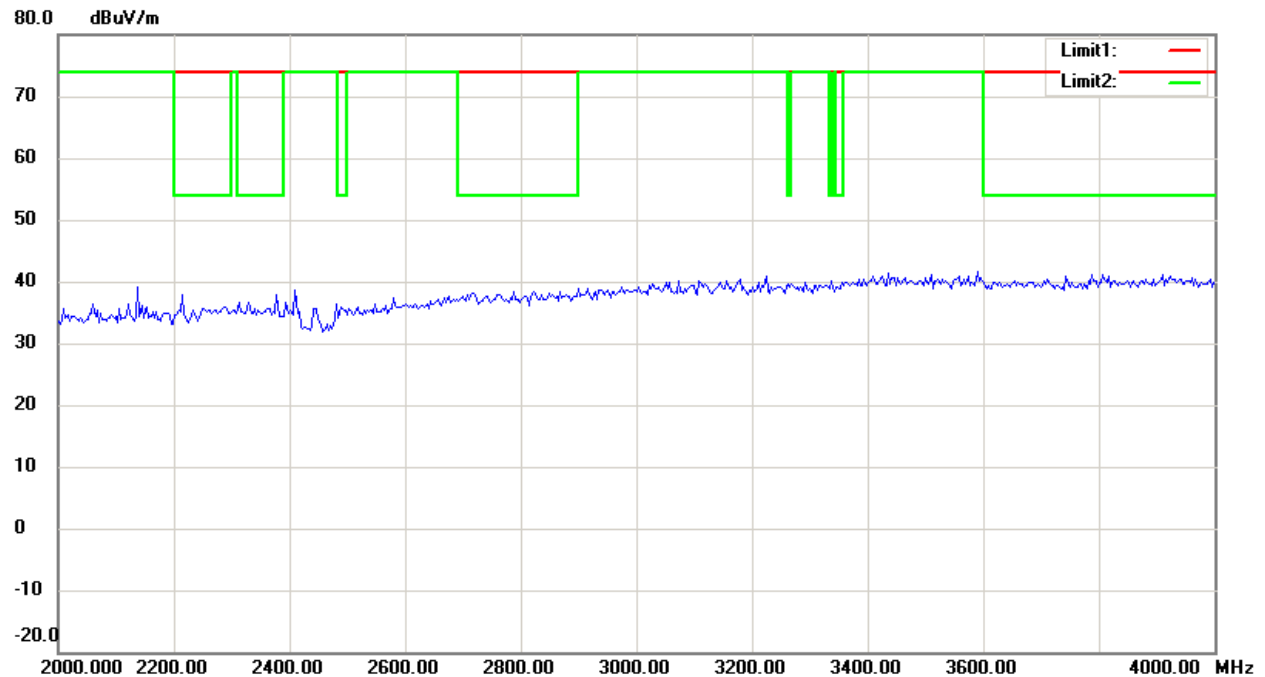
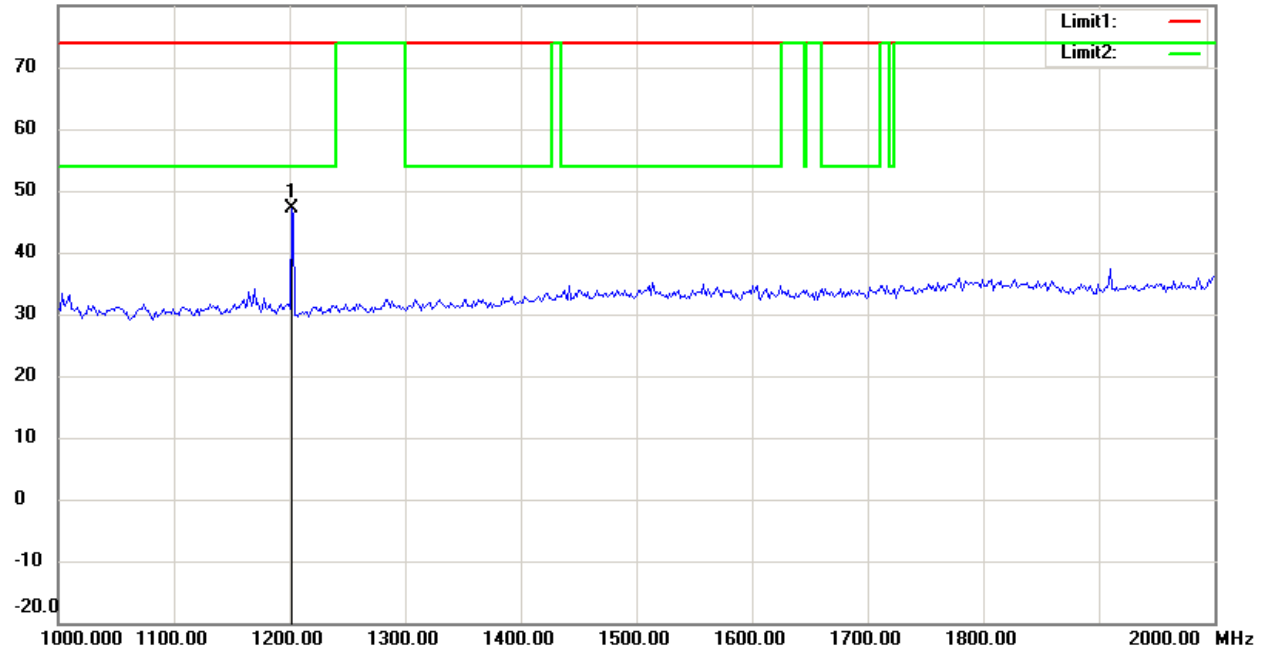


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

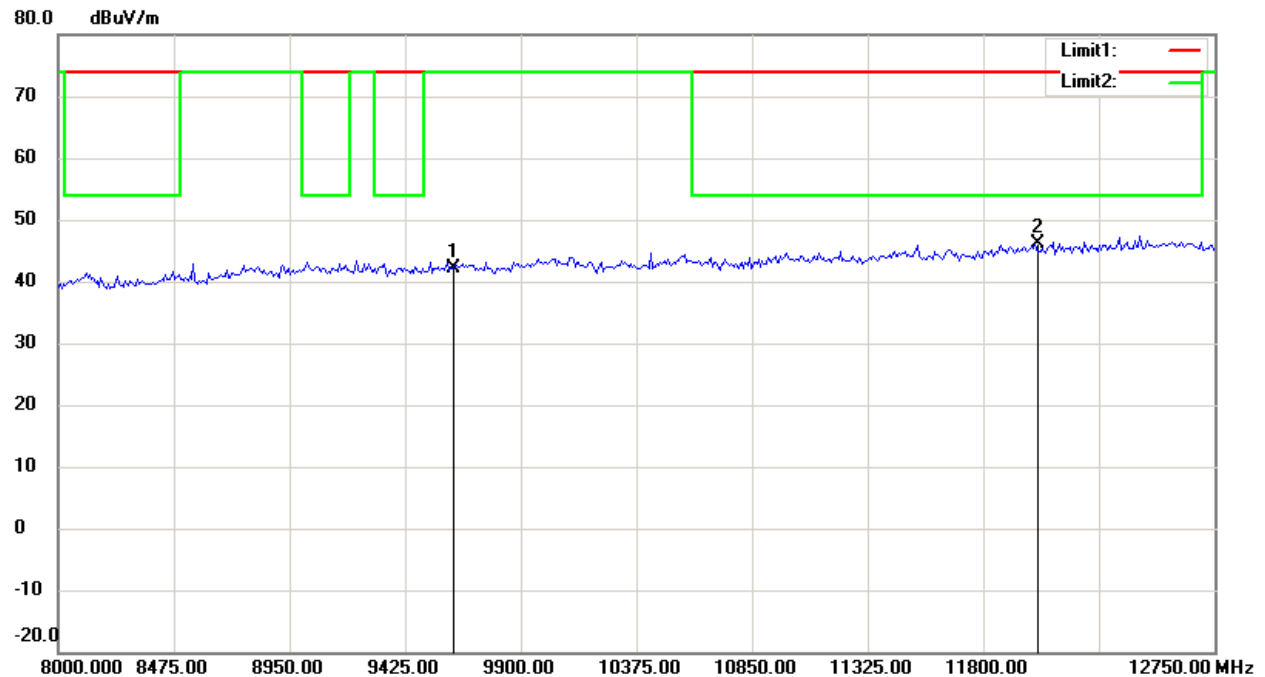
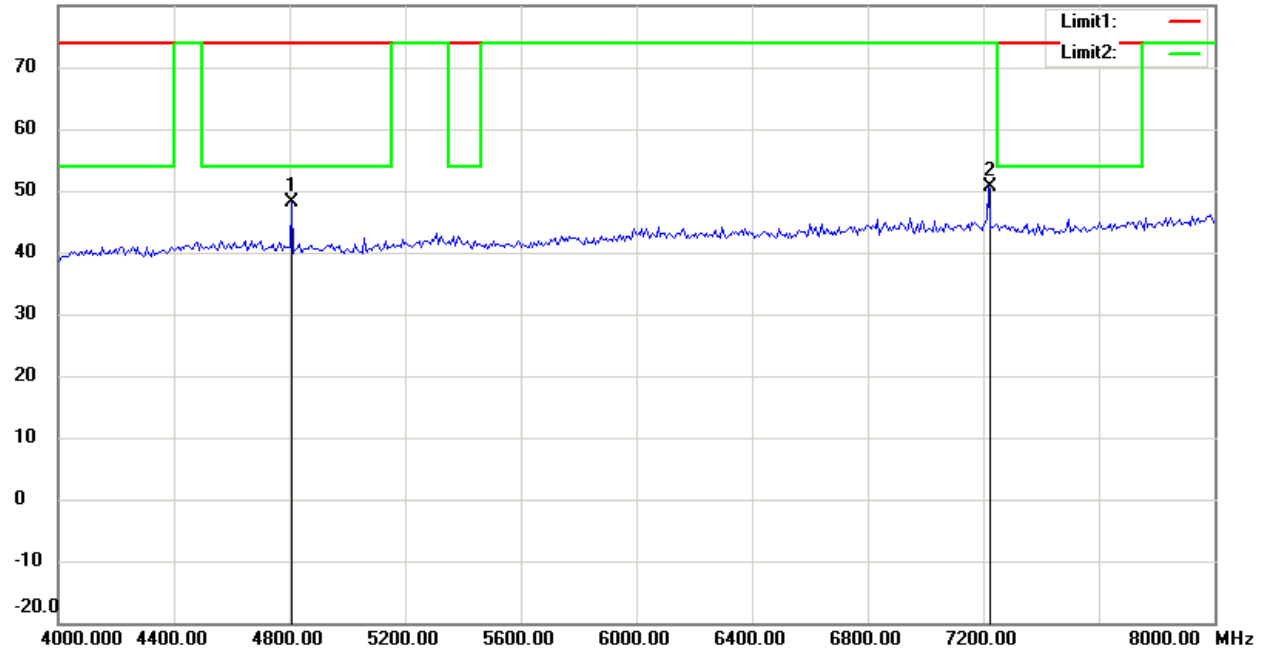


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

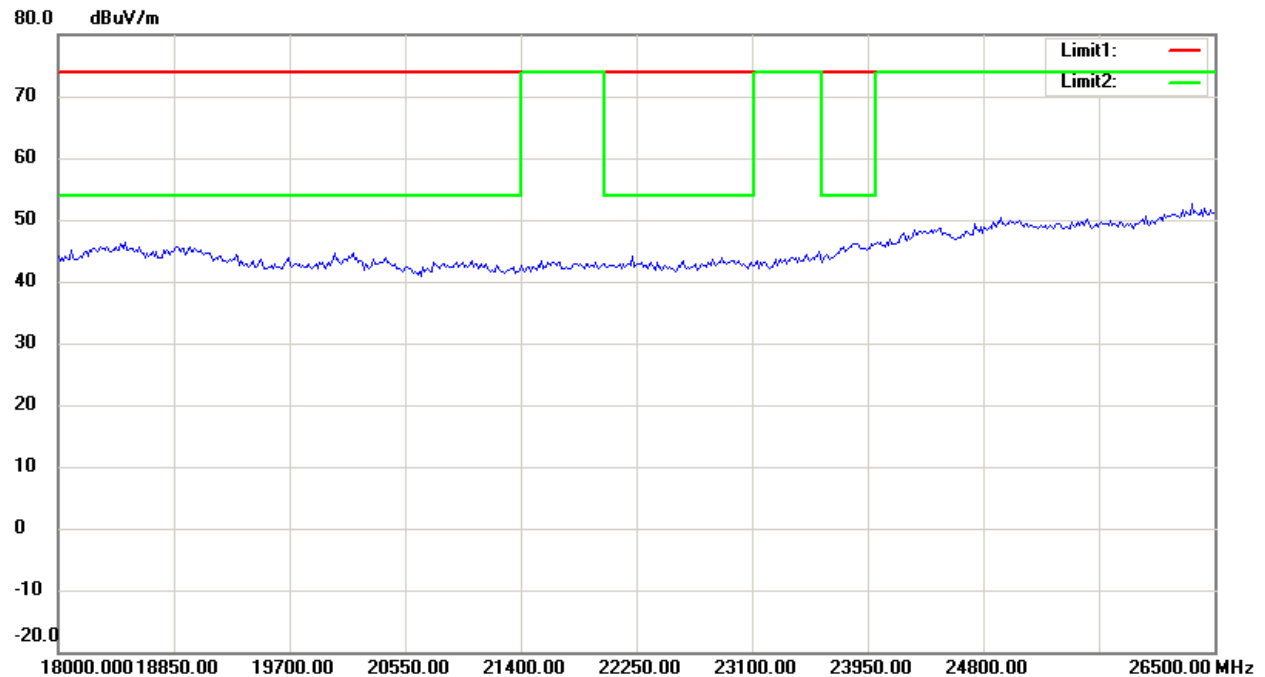
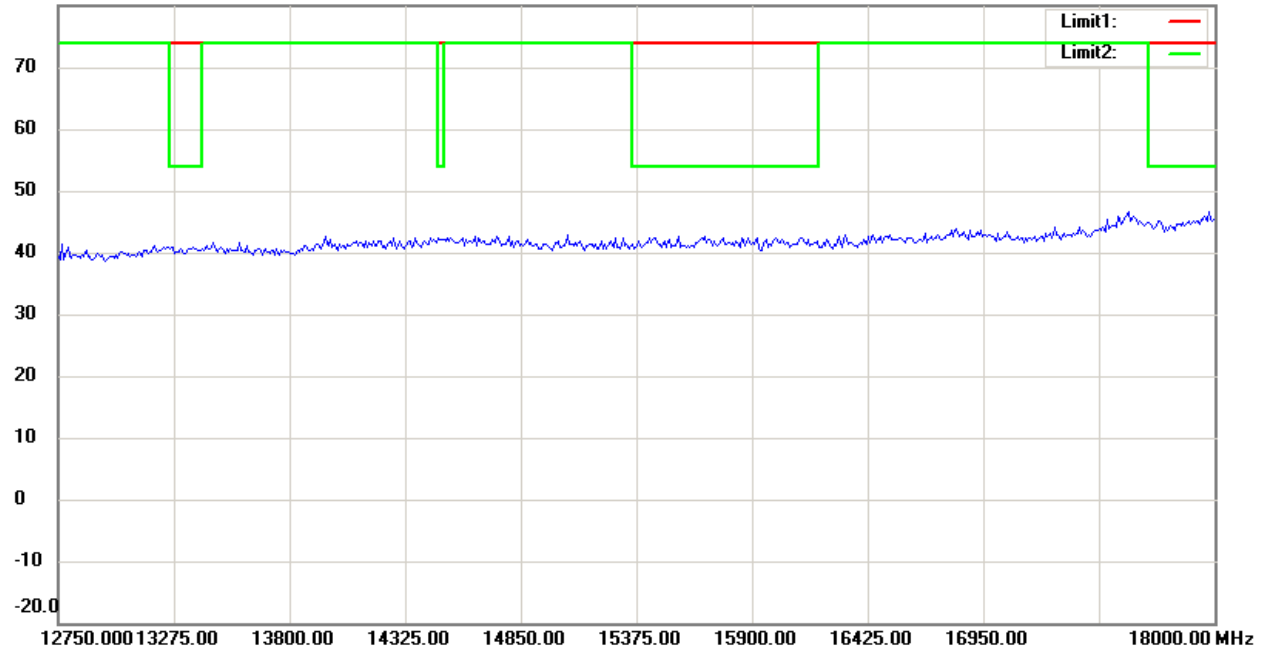


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.



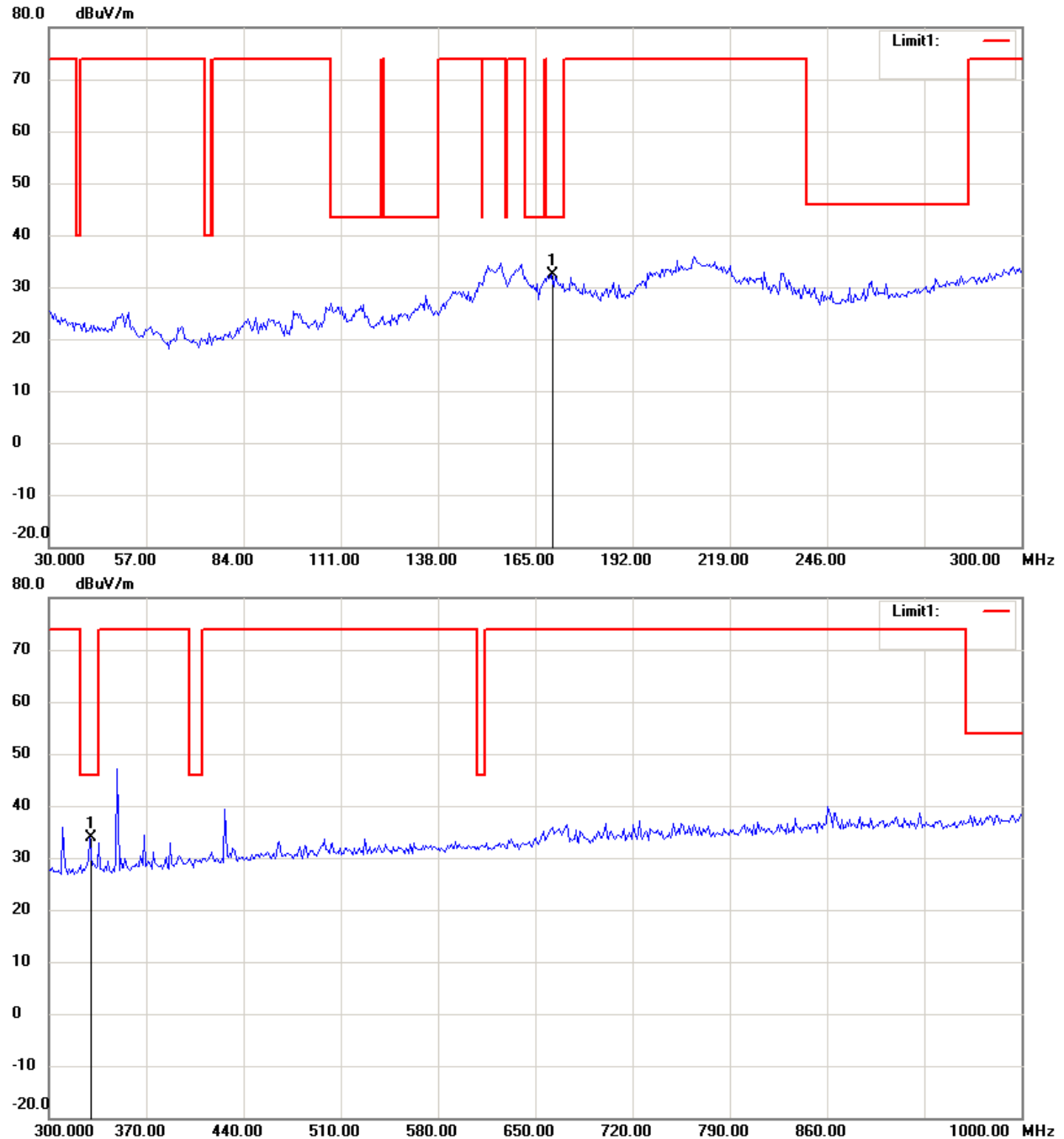
Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

TX-2440 MHz (CH 13)

Antenna Polarization H



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

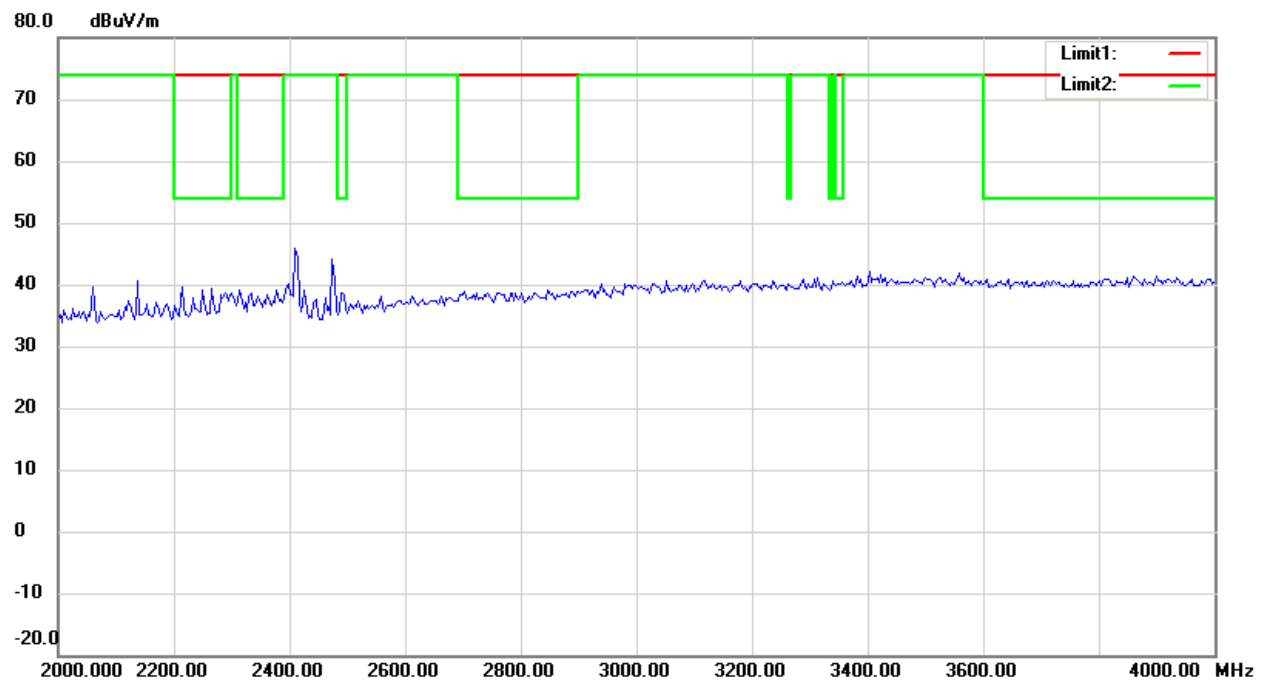
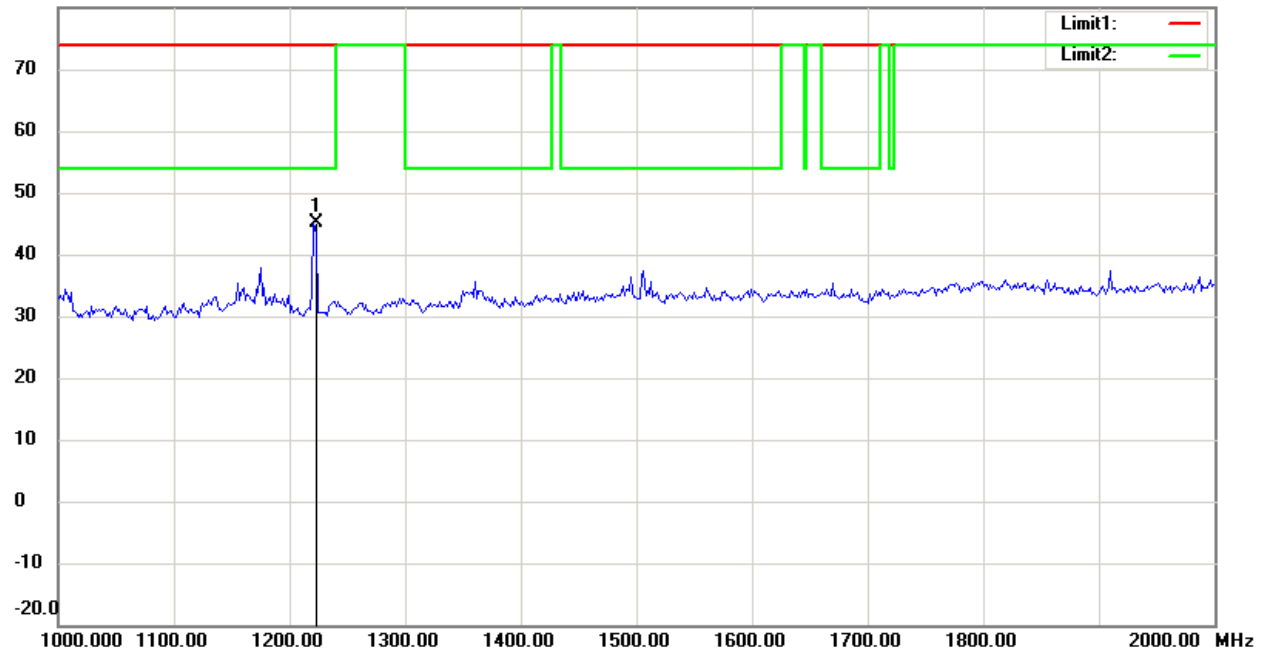


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

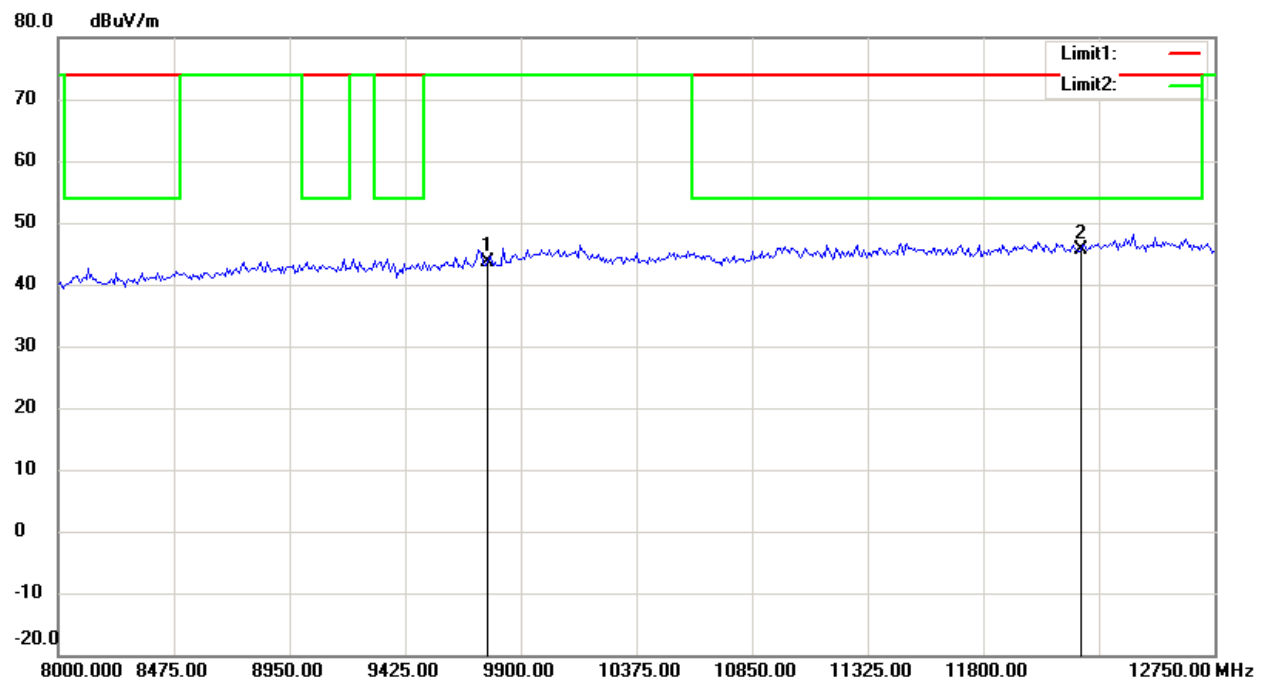
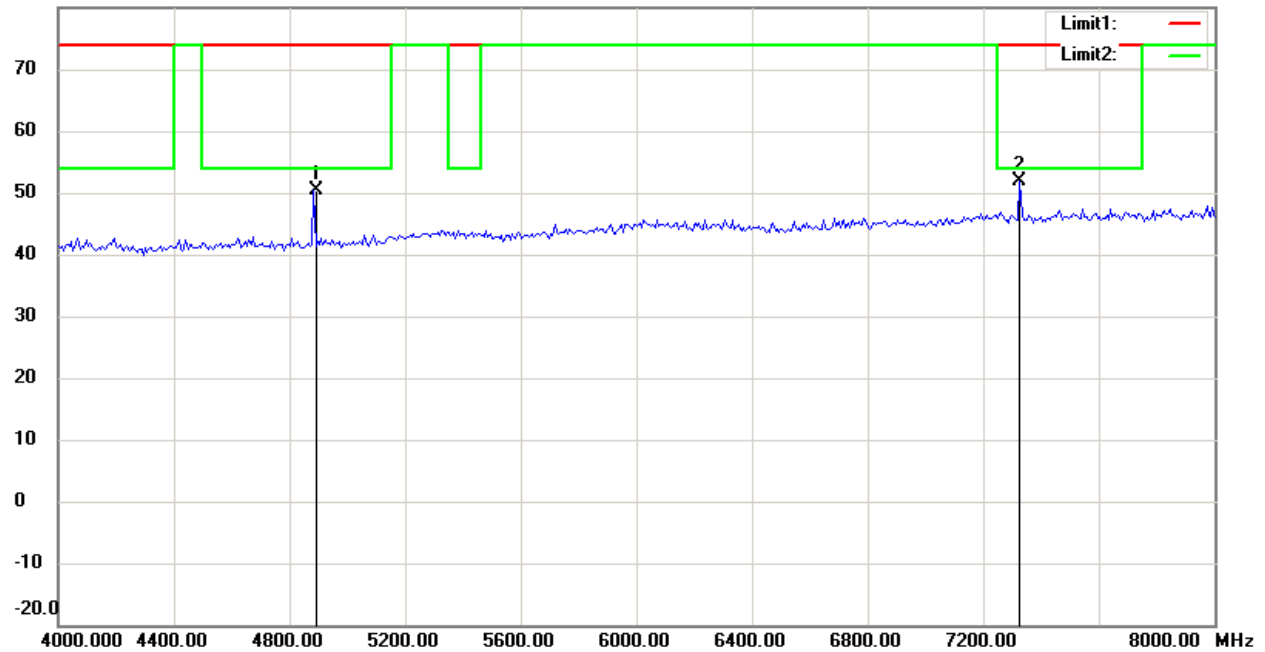


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

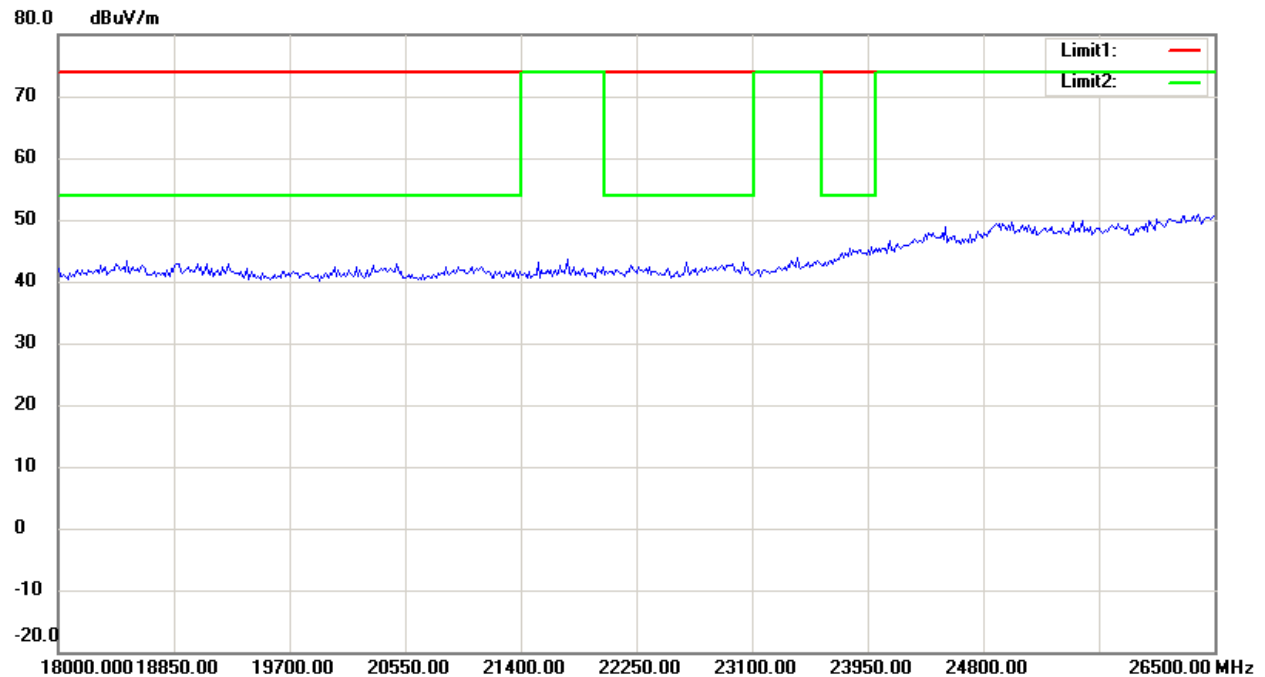
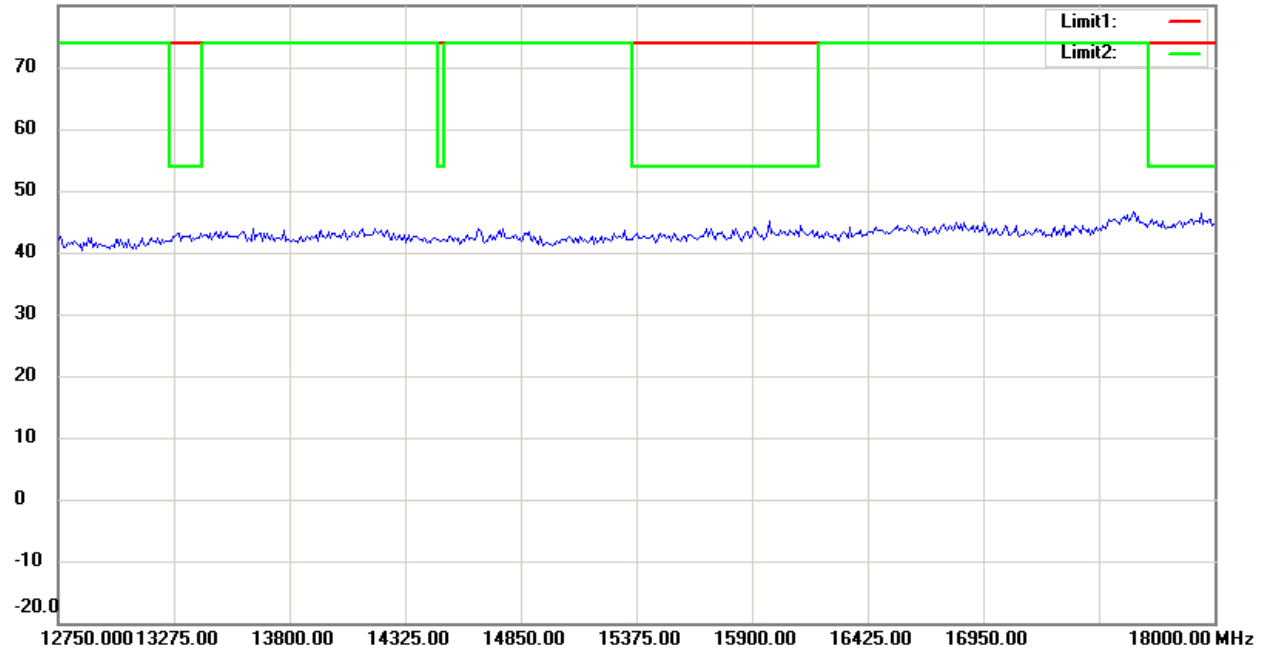


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

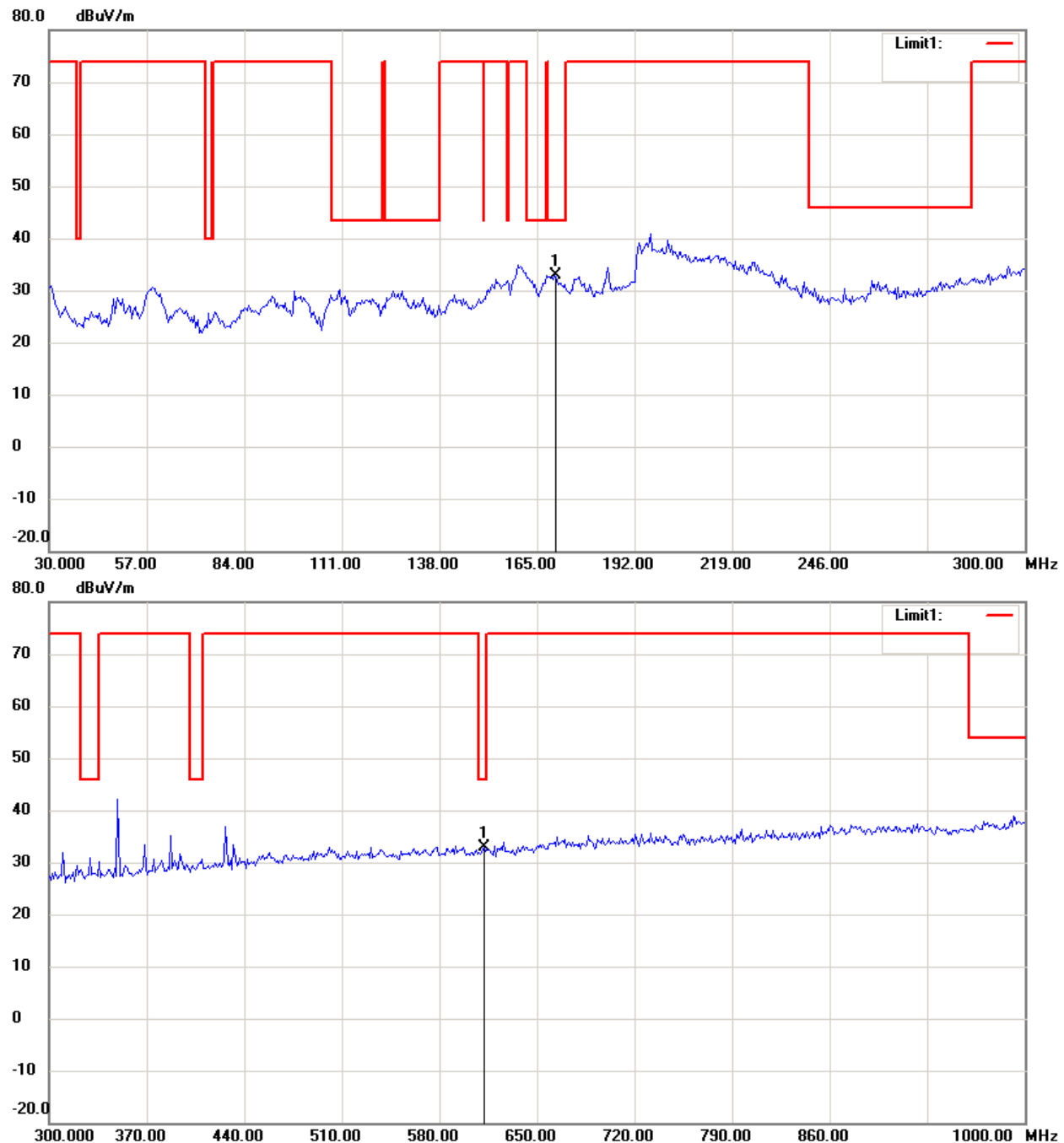


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Antenna Polarization V



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

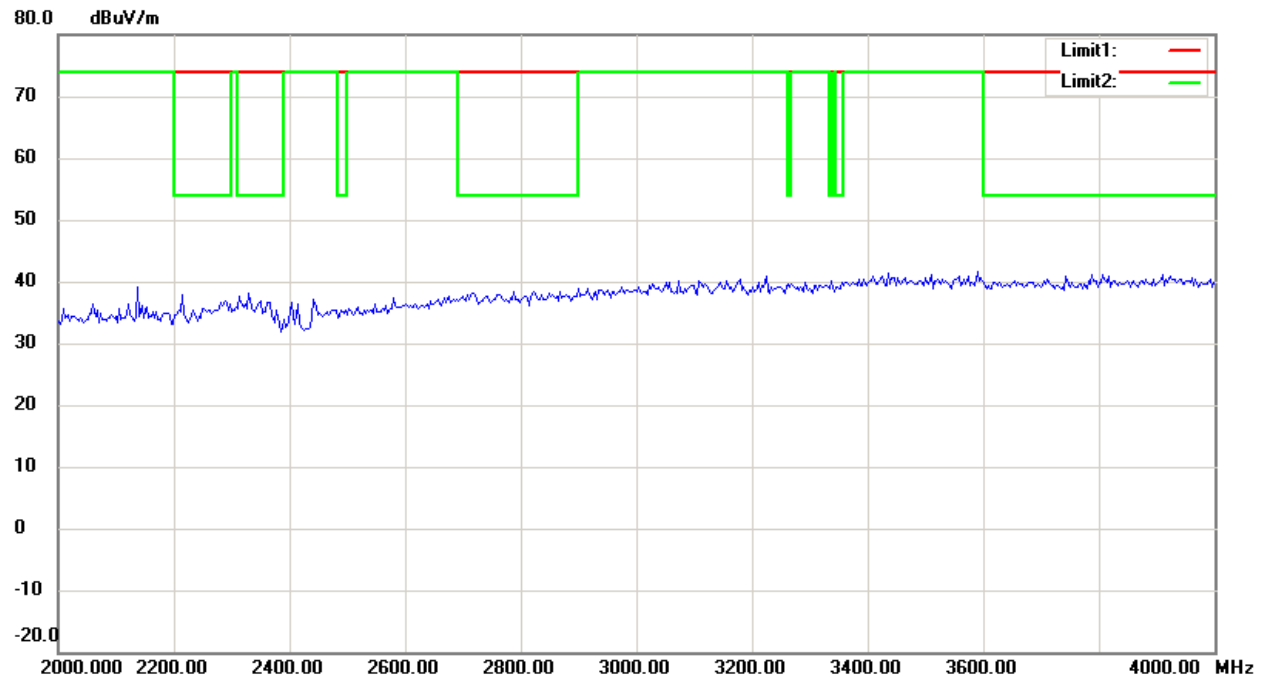
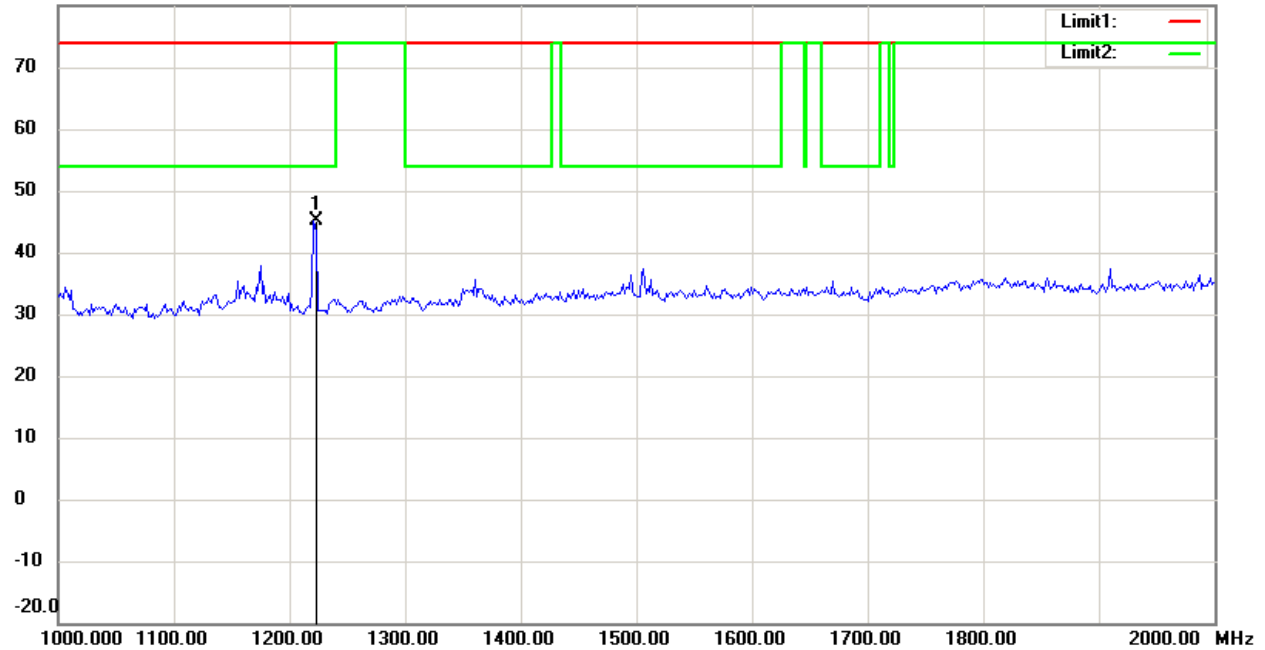


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

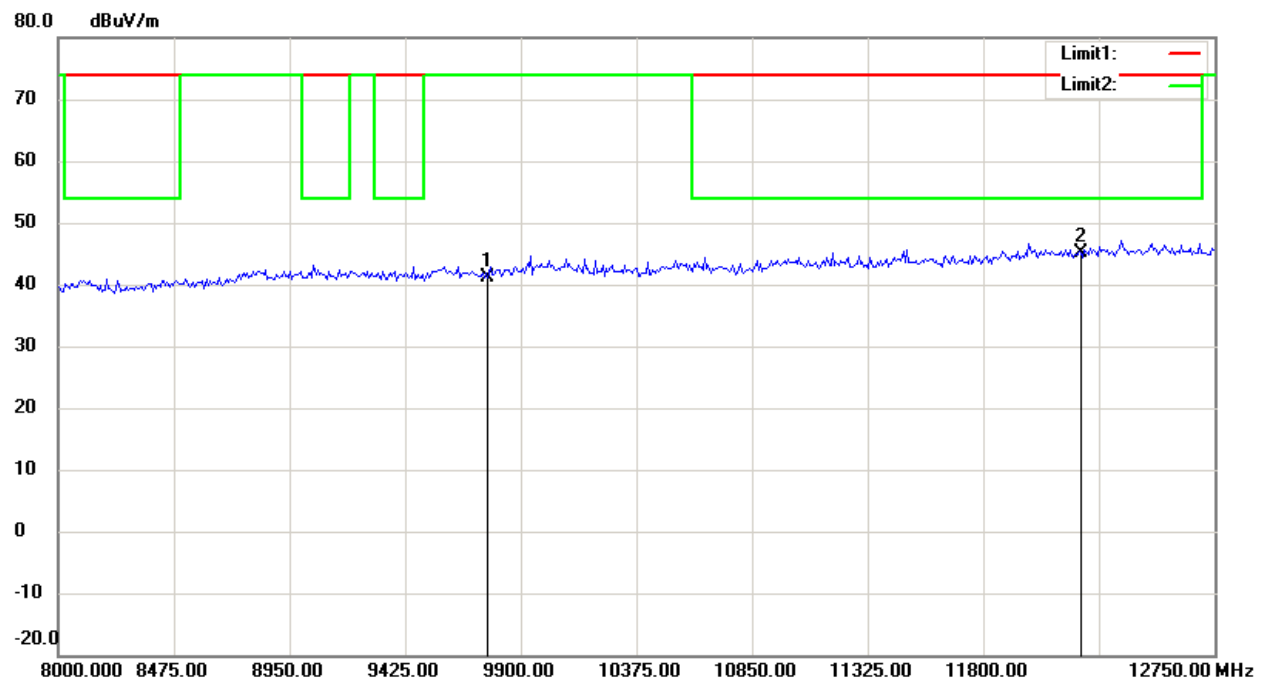
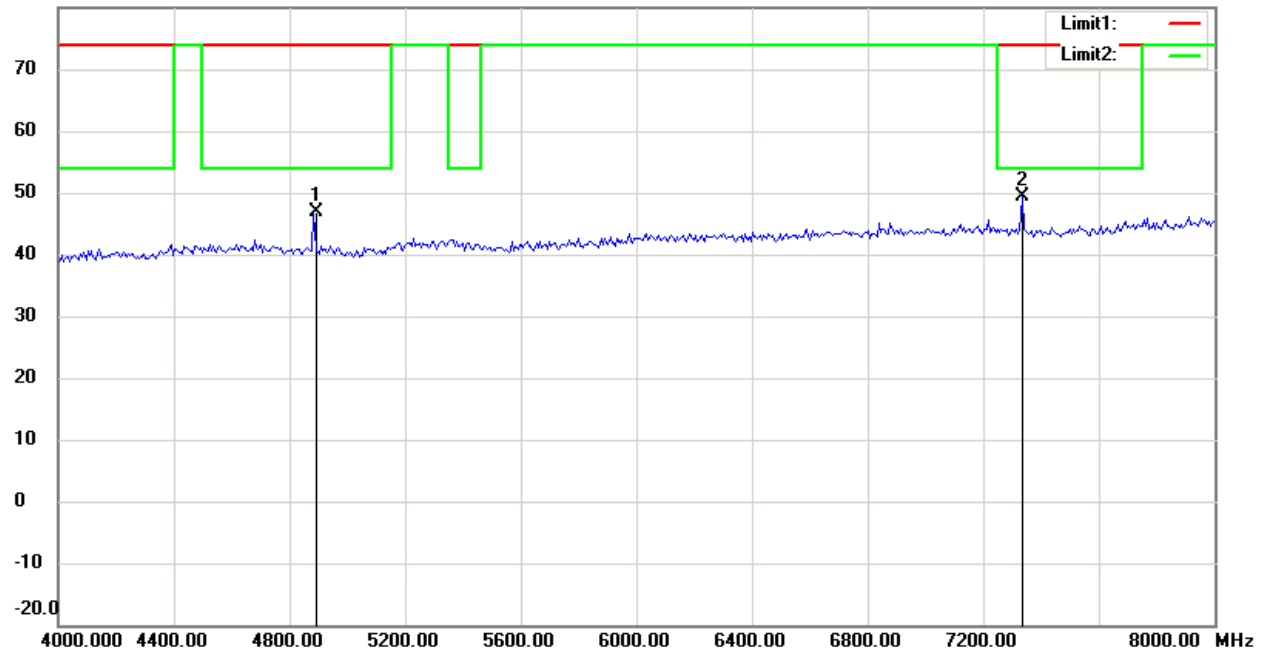


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

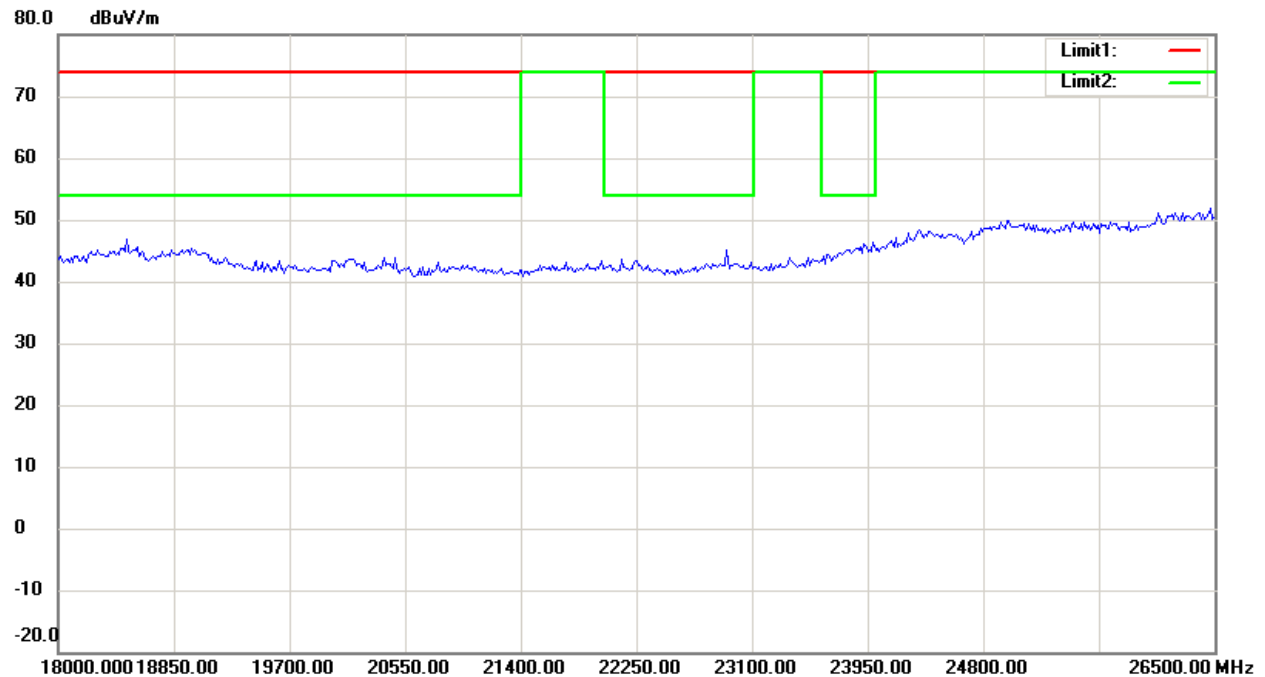
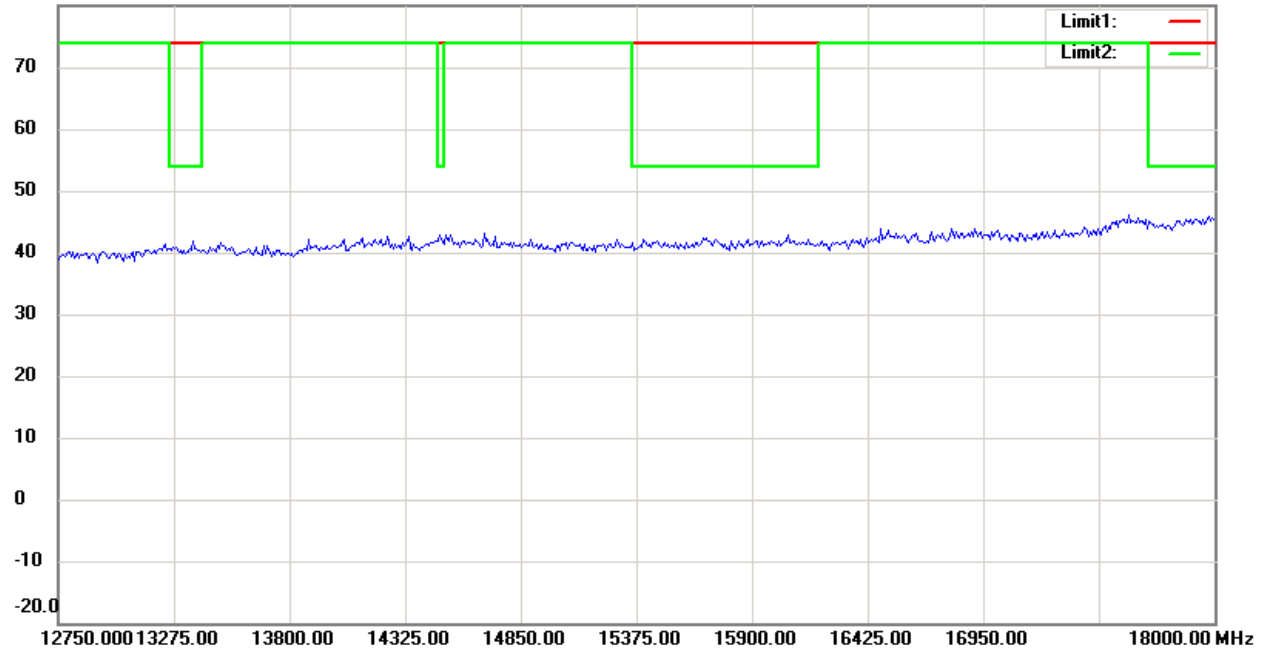


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.



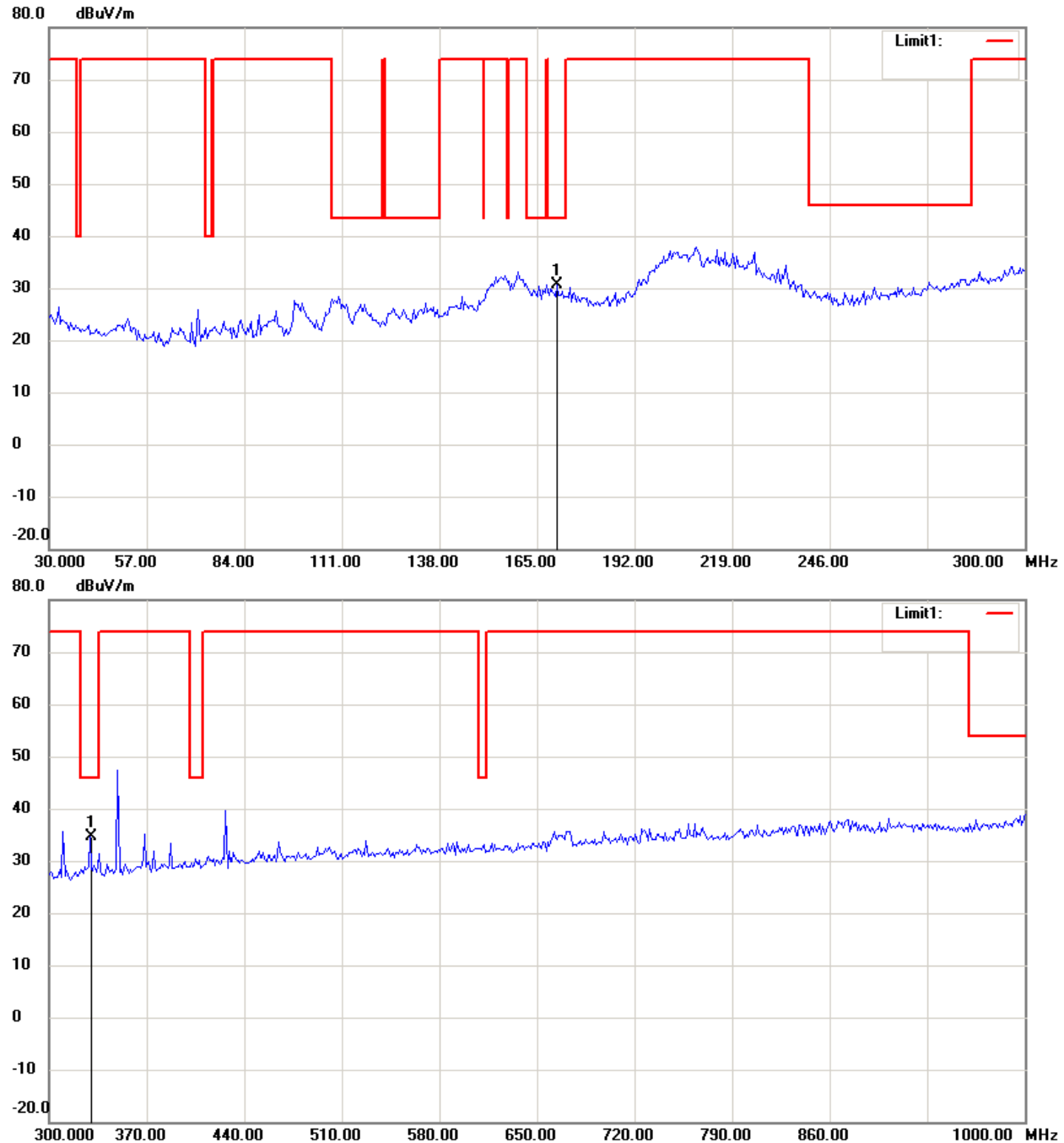
Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

TX-2476 MHz (CH 25)

Antenna Polarization H



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

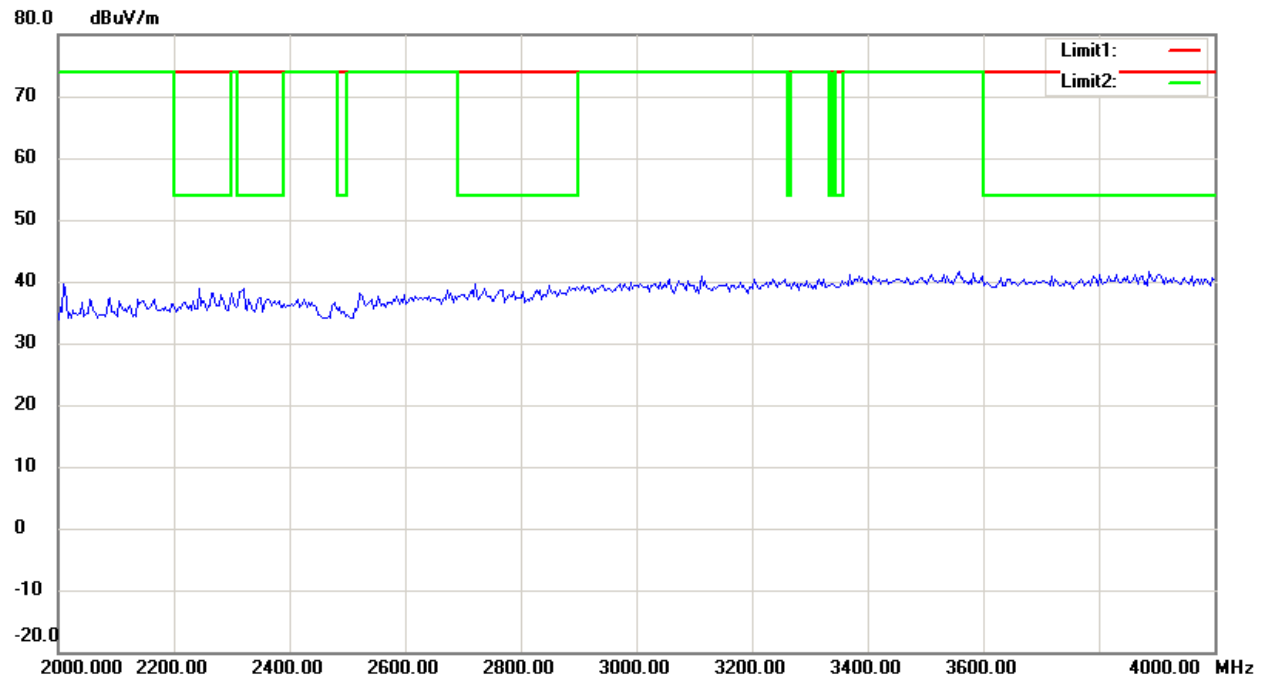
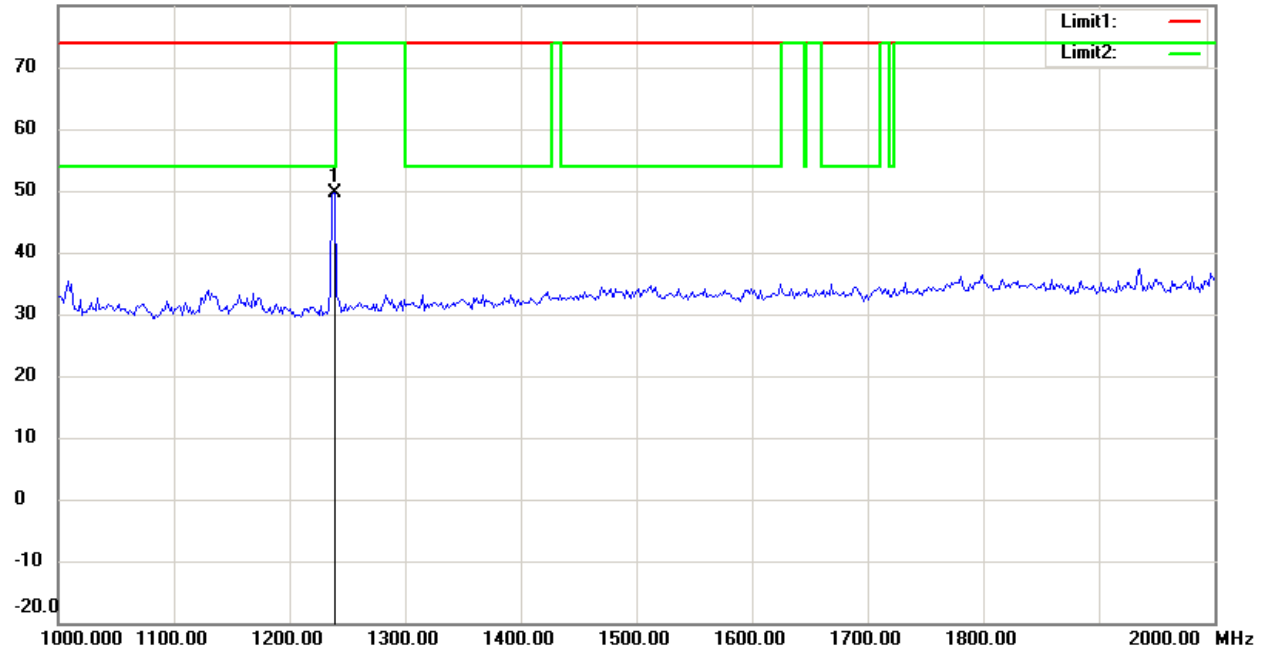


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

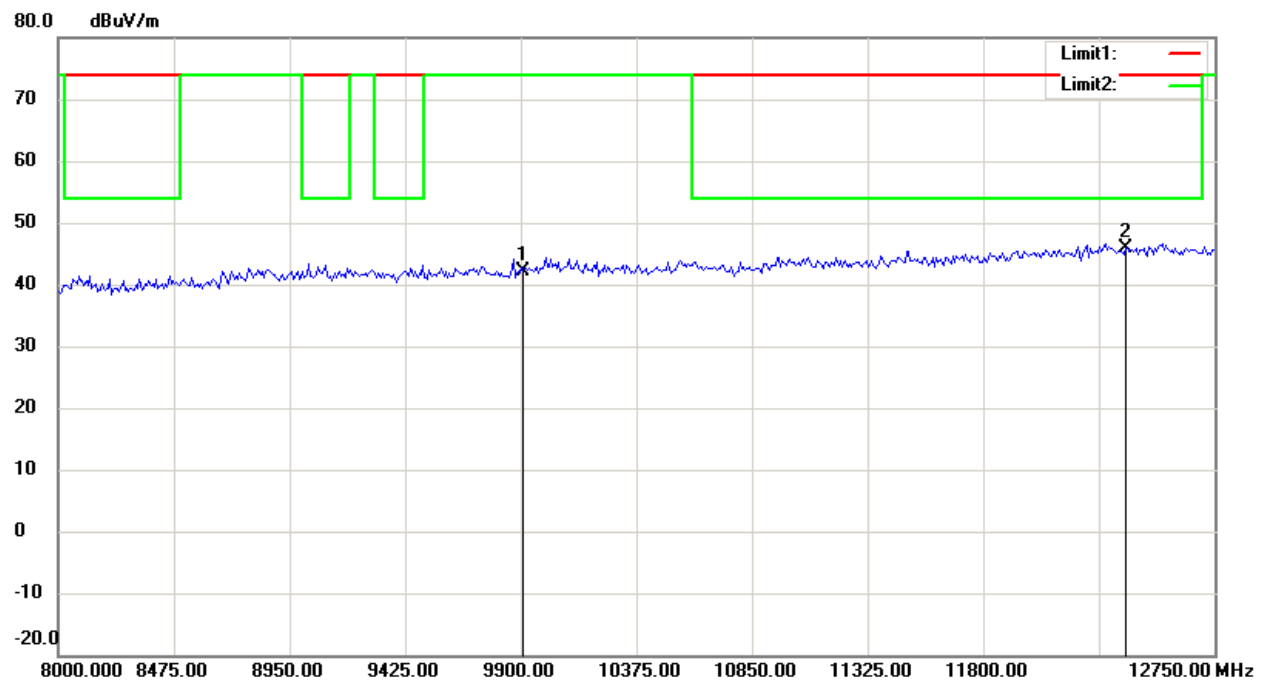
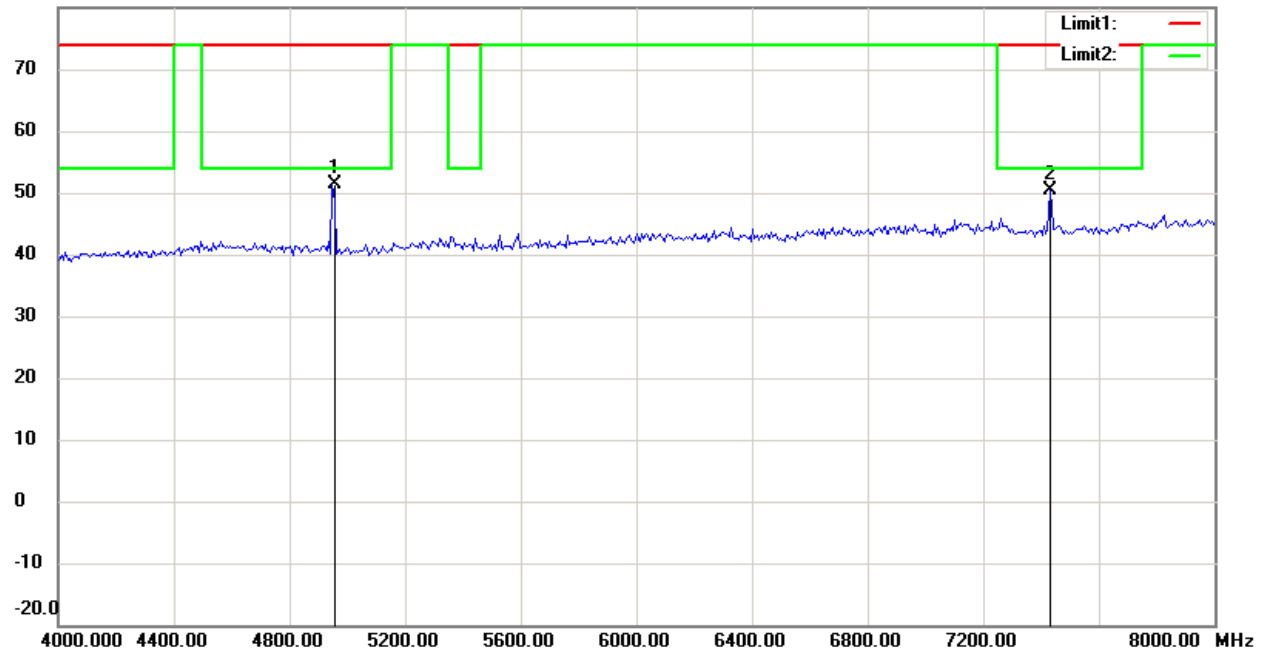


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

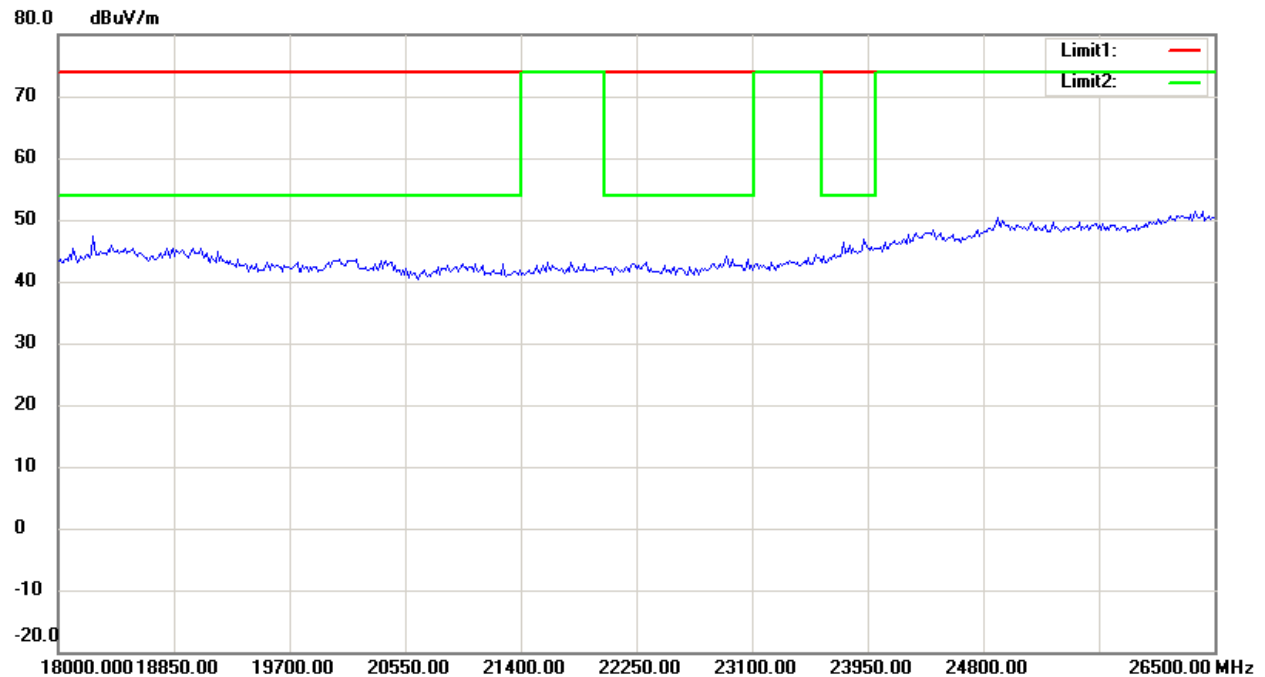
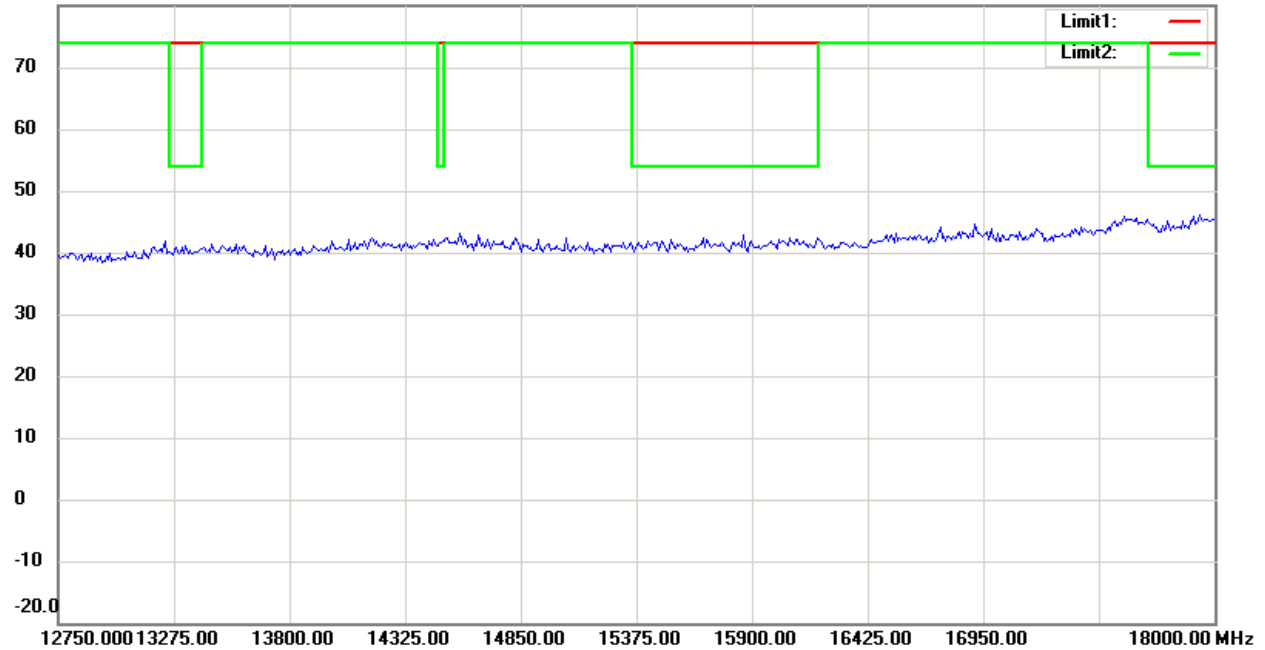


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

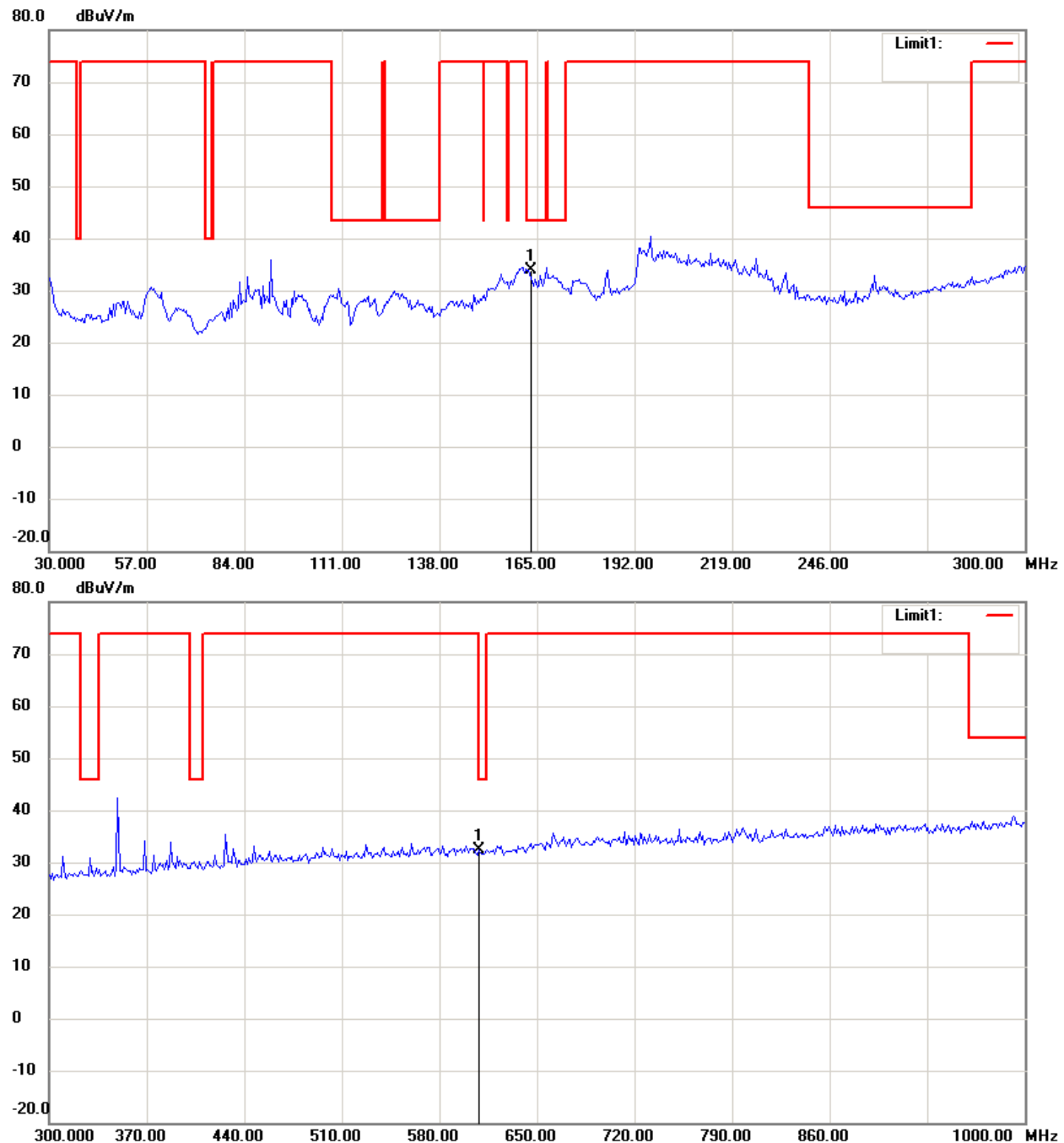


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Antenna Polarization V



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

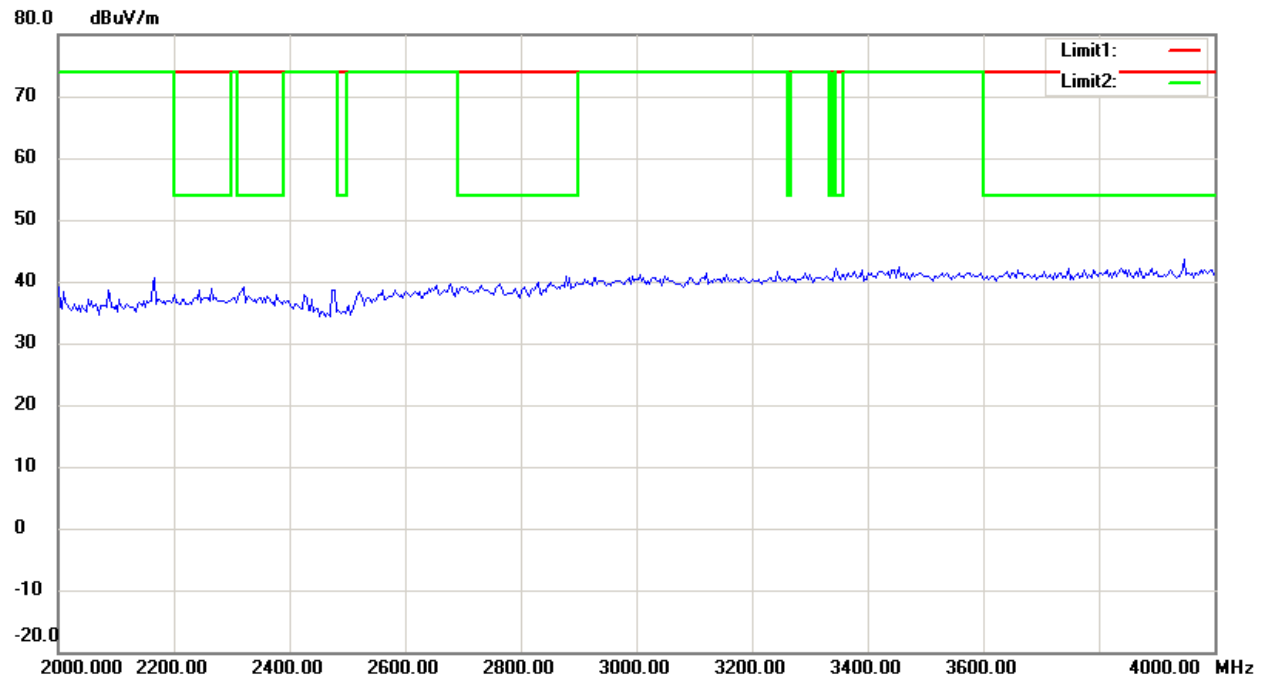
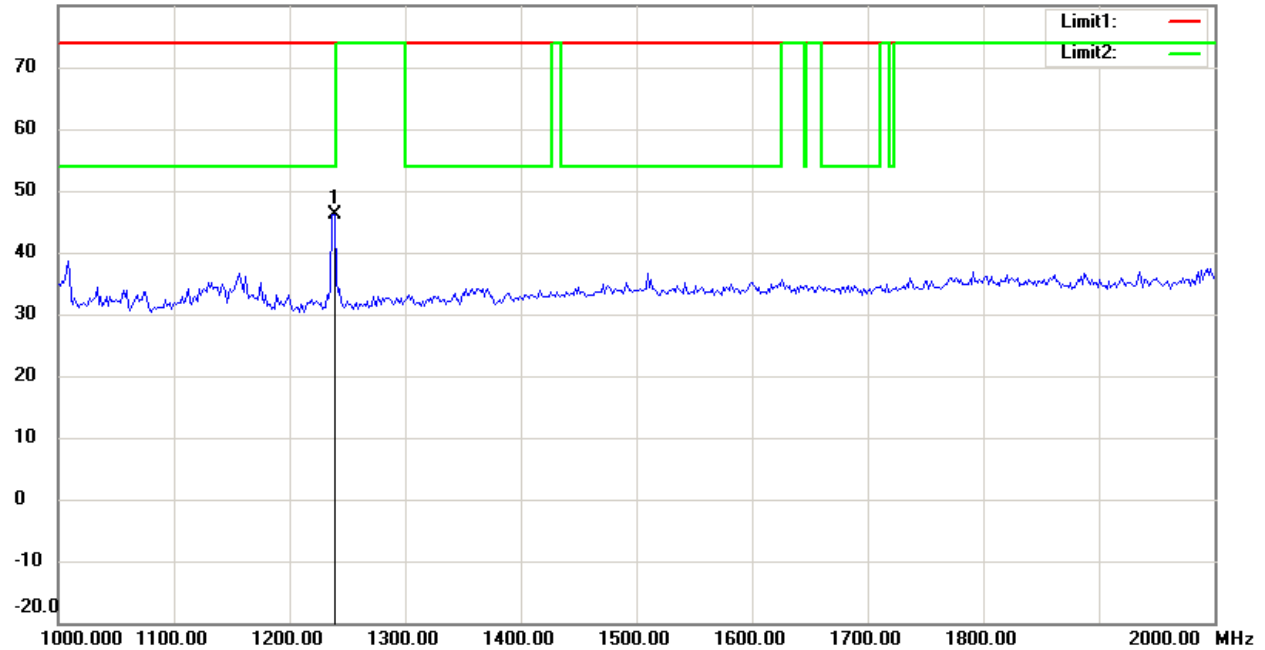


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

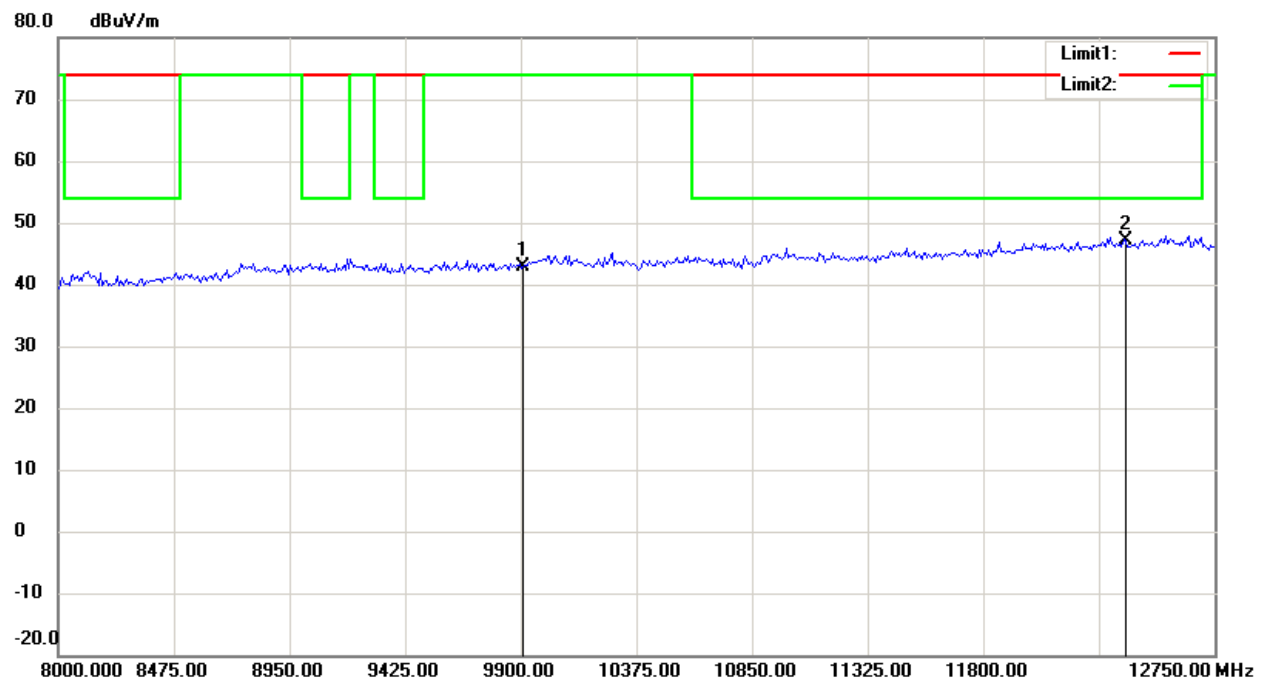
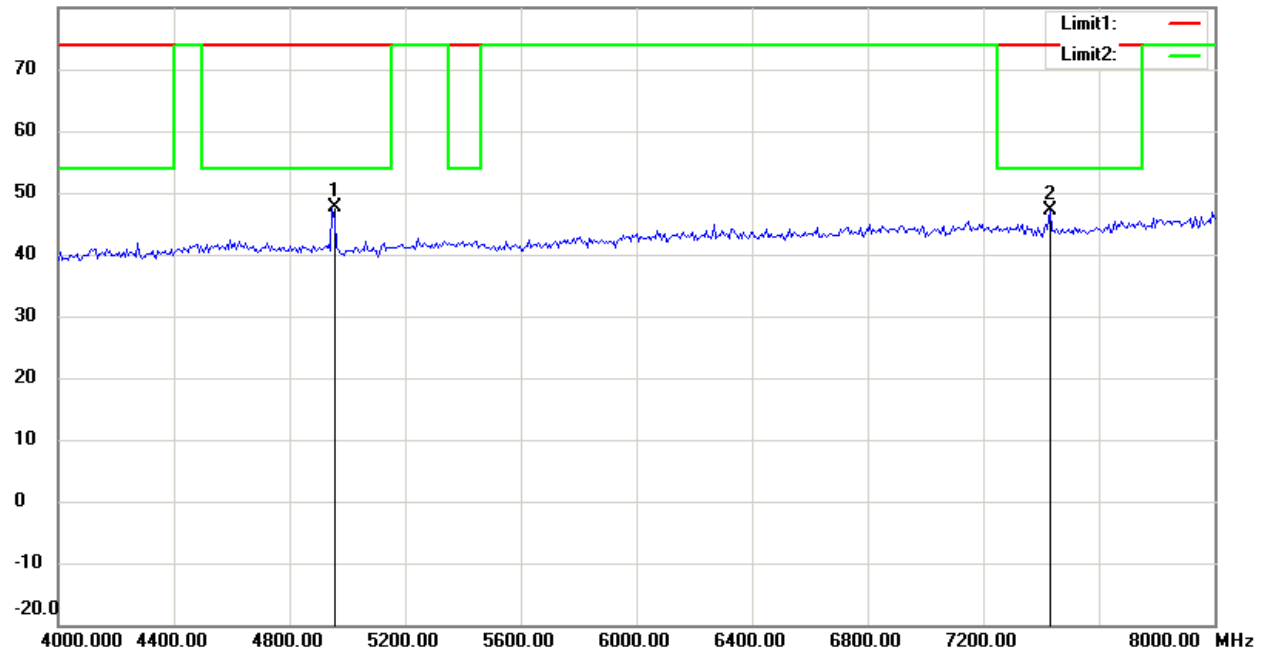


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

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.

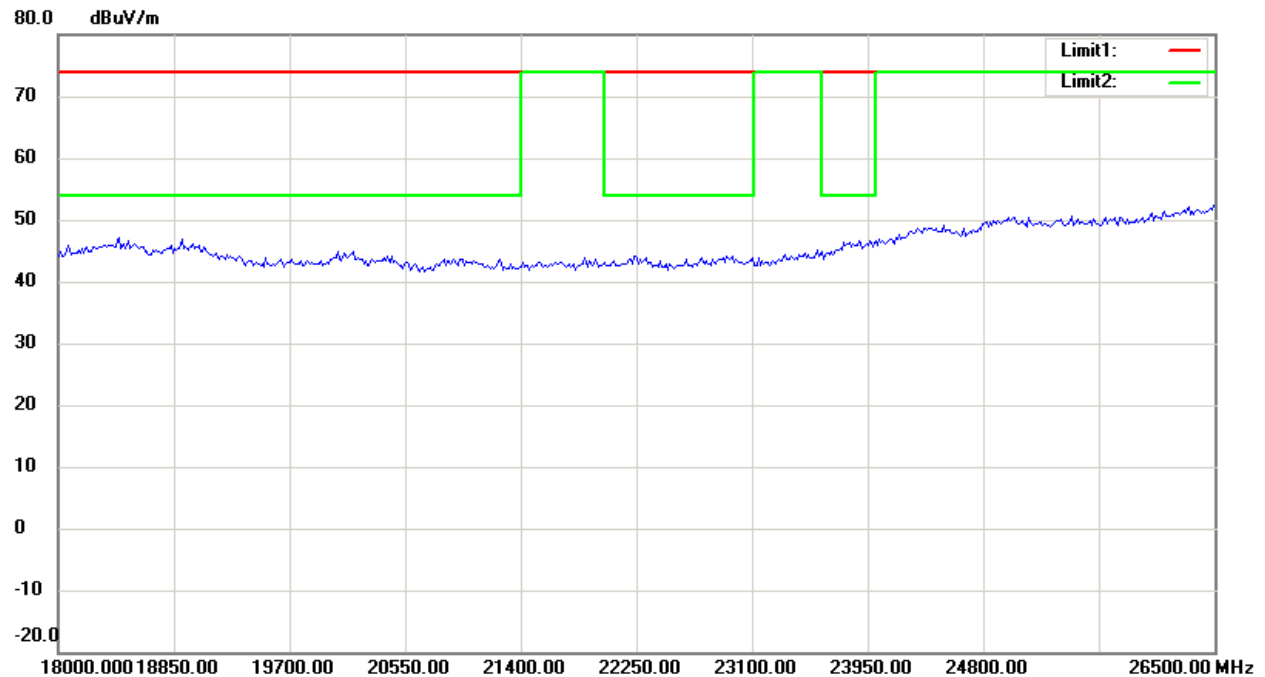
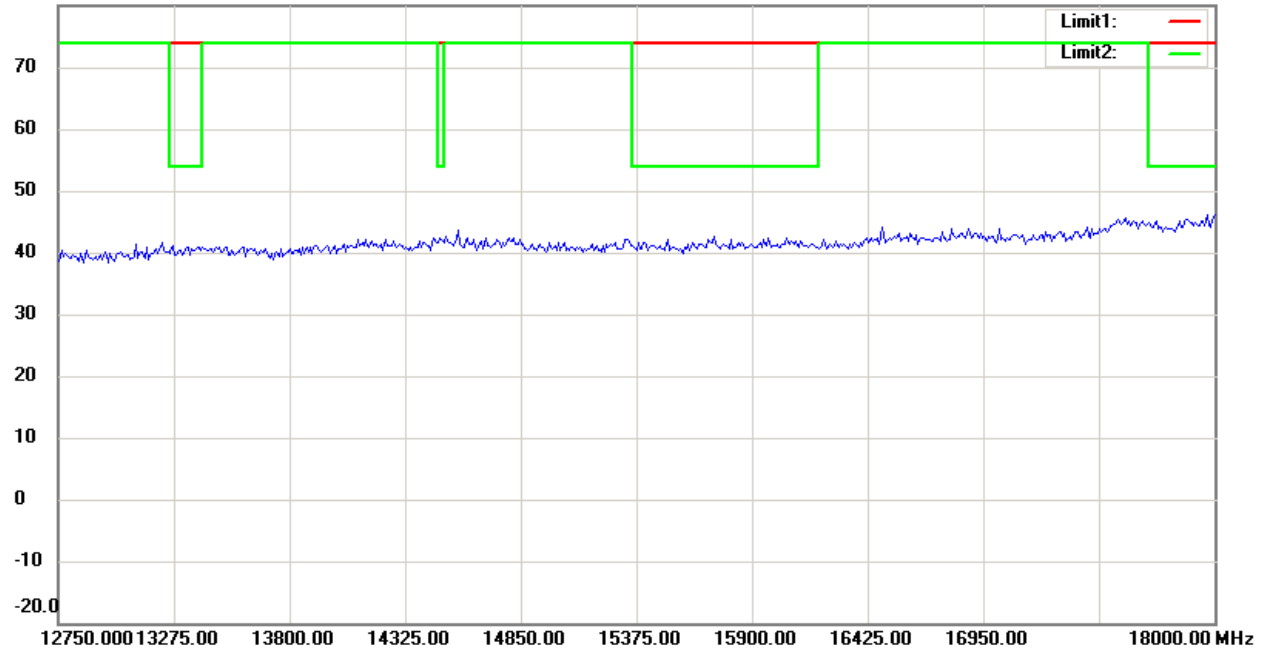


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

80.0 dBuV/m



Up Line: Peak Limit Line Down Line: Ave Limit Line

Note:

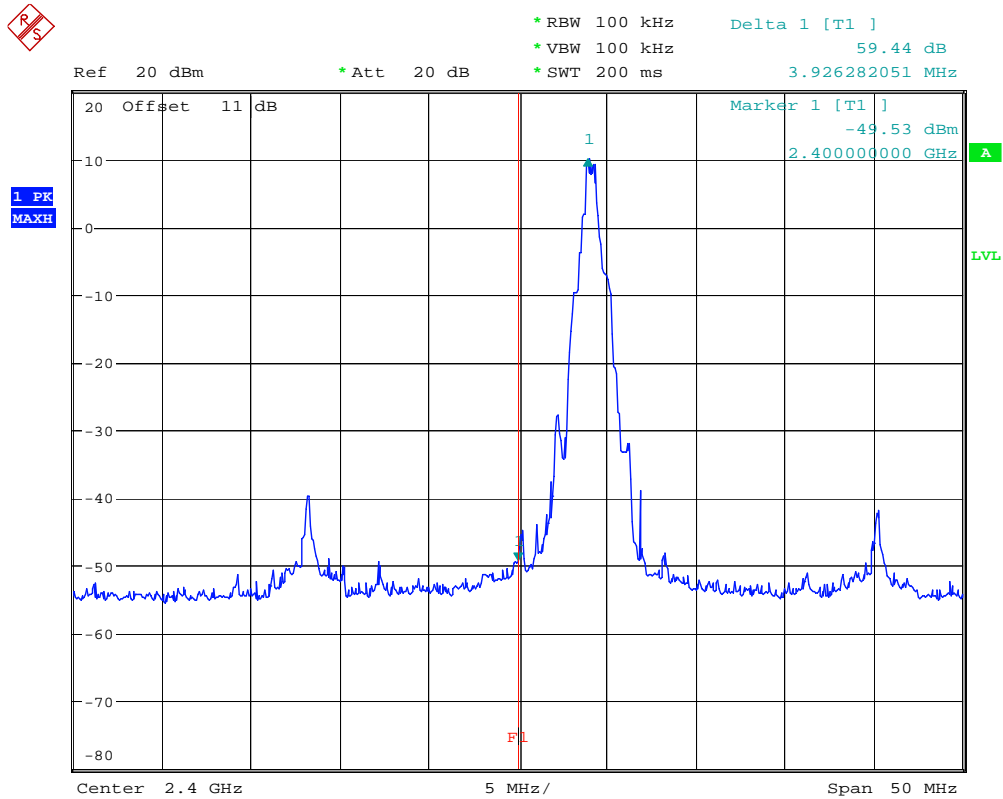
1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification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



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Band Edge Measurement



BAND EDGE LOW CHANNEL

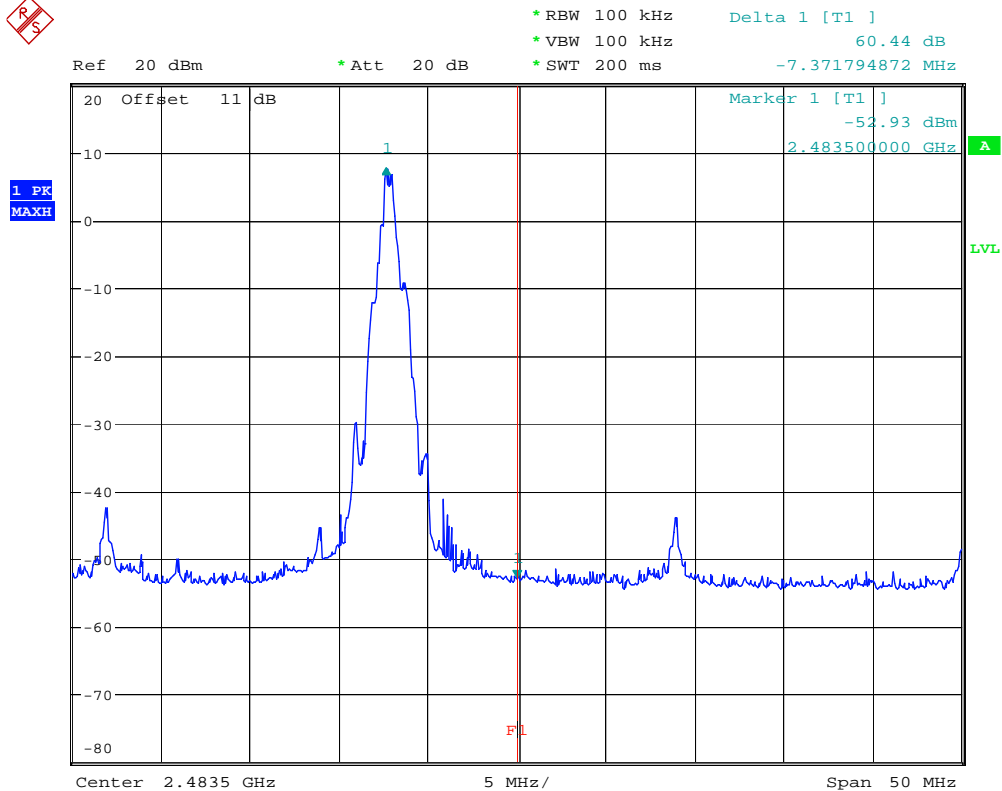
Date: 28.JUL.2010 19:00:42



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9



BAND EDGE HIGH CHANNEL

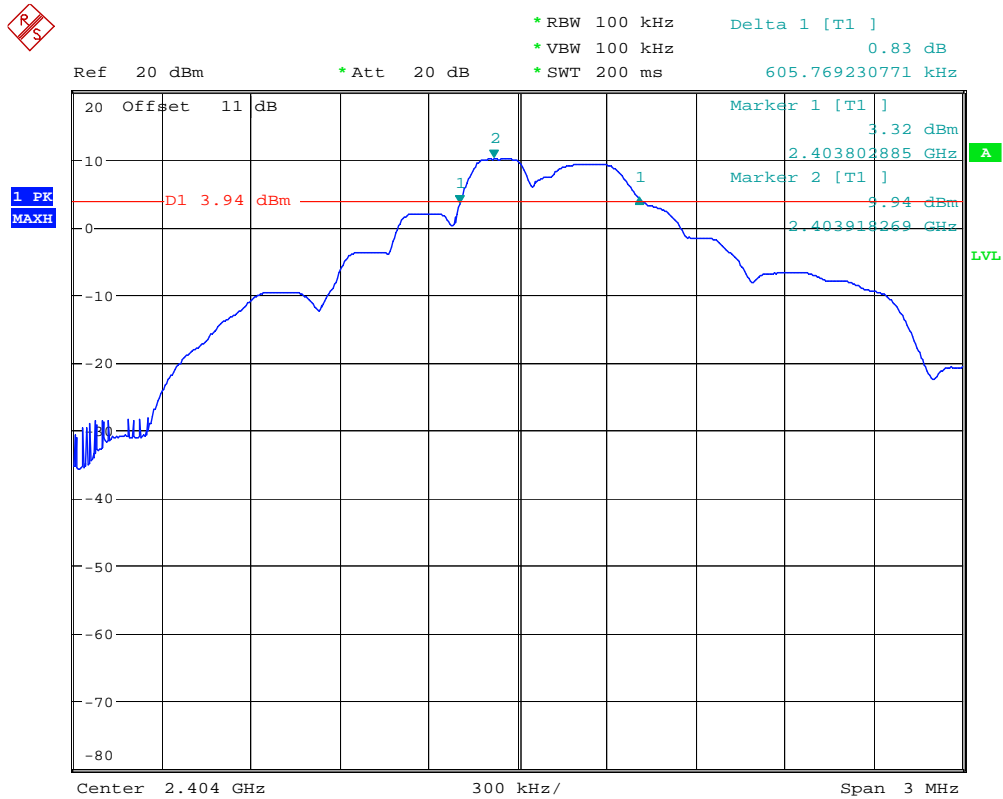
Date: 28.JUL.2010 18:59:19



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Minimum 6dB Bandwidth



6DB BANDWIDTH LOW CHANNEL

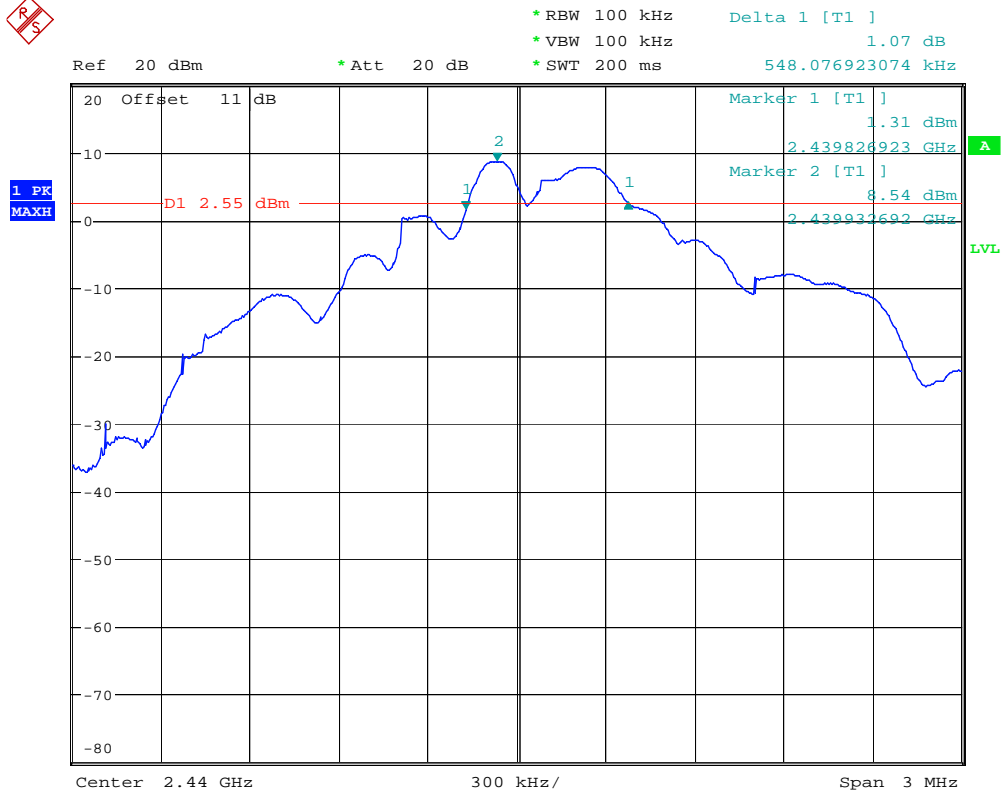
Date: 28.JUL.2010 18:51:21



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9



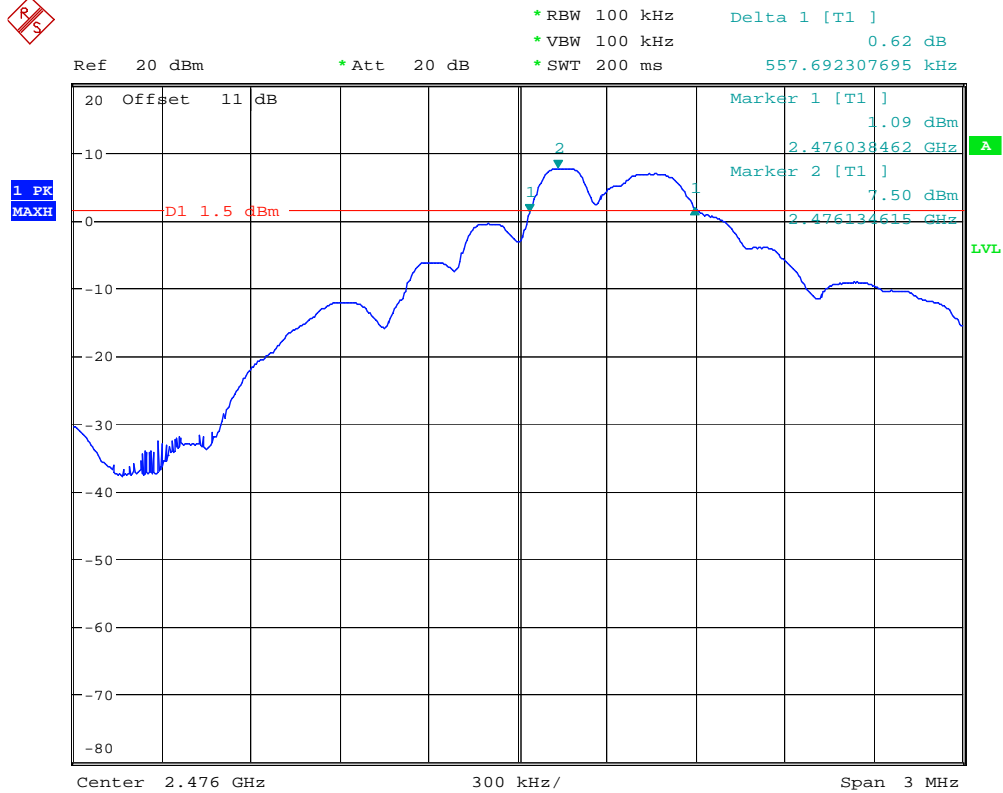
6DB BANDWIDTH MIDDLE CHANNEL

Date: 28.JUL.2010 18:53:27



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9



6DB BANDWIDTH HIGH CHANNEL

Date: 28.JUL.2010 18:55:57

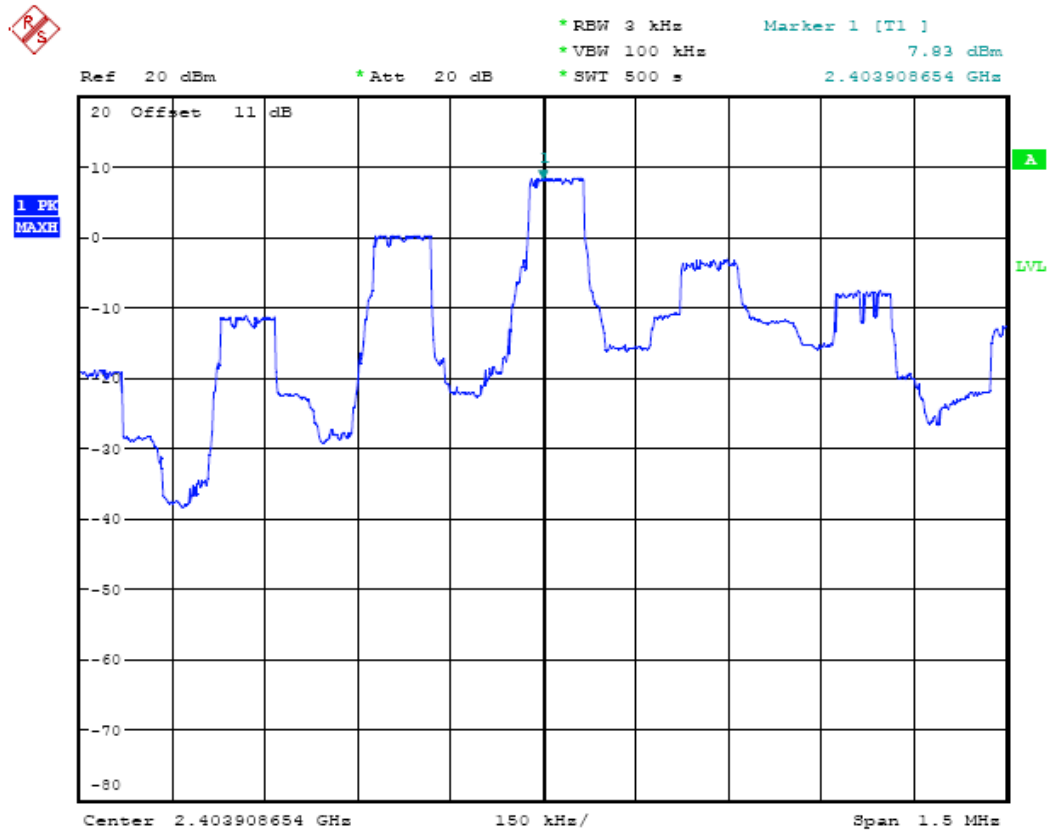


Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9

Peak Power Spectral Density



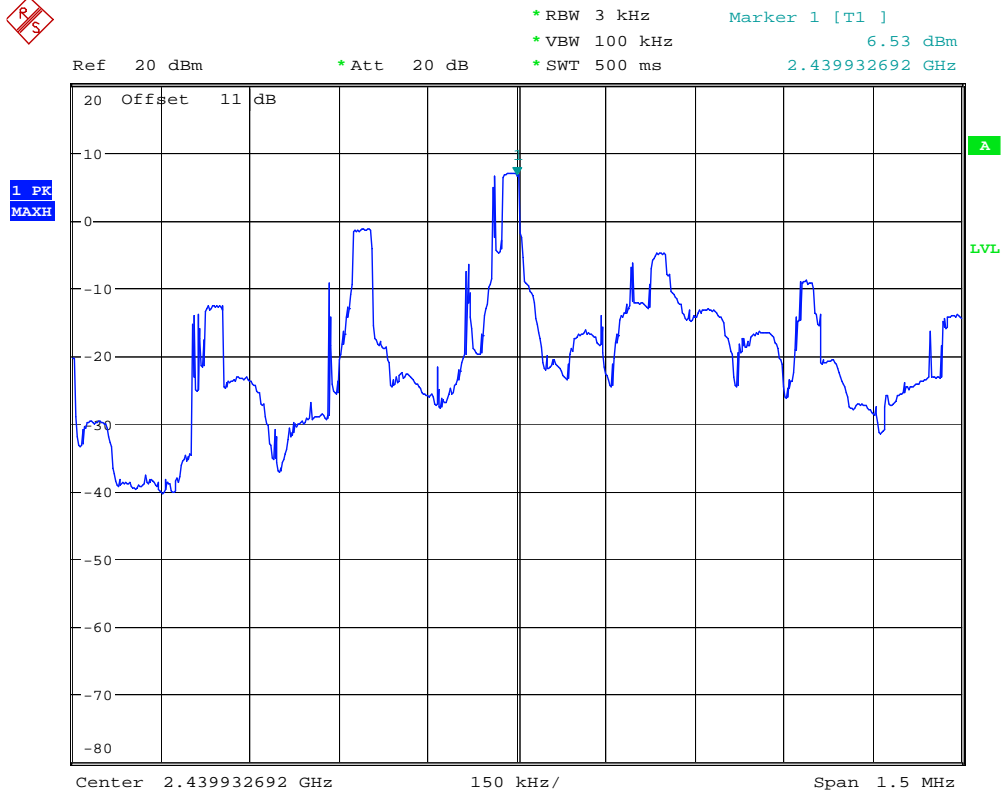
POWER DENSITY LOW CHANNEL

Date: 28.JUL.2010 19:15:40



Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9



POWER DENSITY MIDDLE CHANNEL

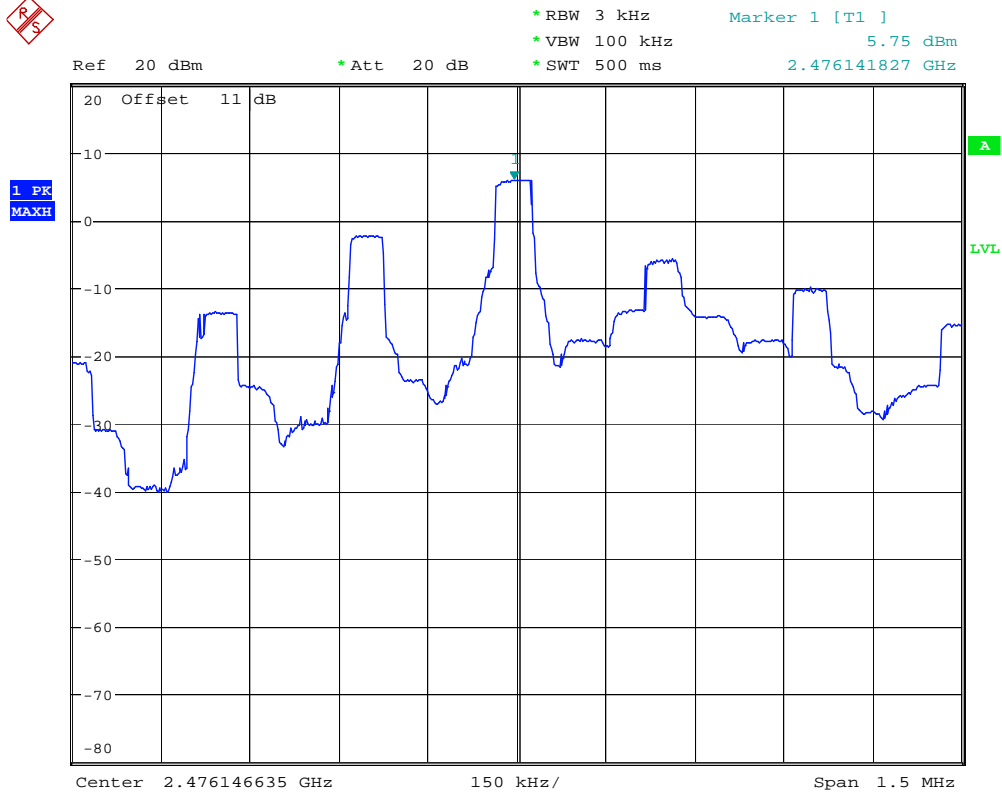
Date: 28.JUL.2010 19:14:32



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21006-10752-C-1-T

FCC ID: UAO-TX-9



POWER DENSITY HIGH CHANNEL

Date: 28.JUL.2010 19:12:21

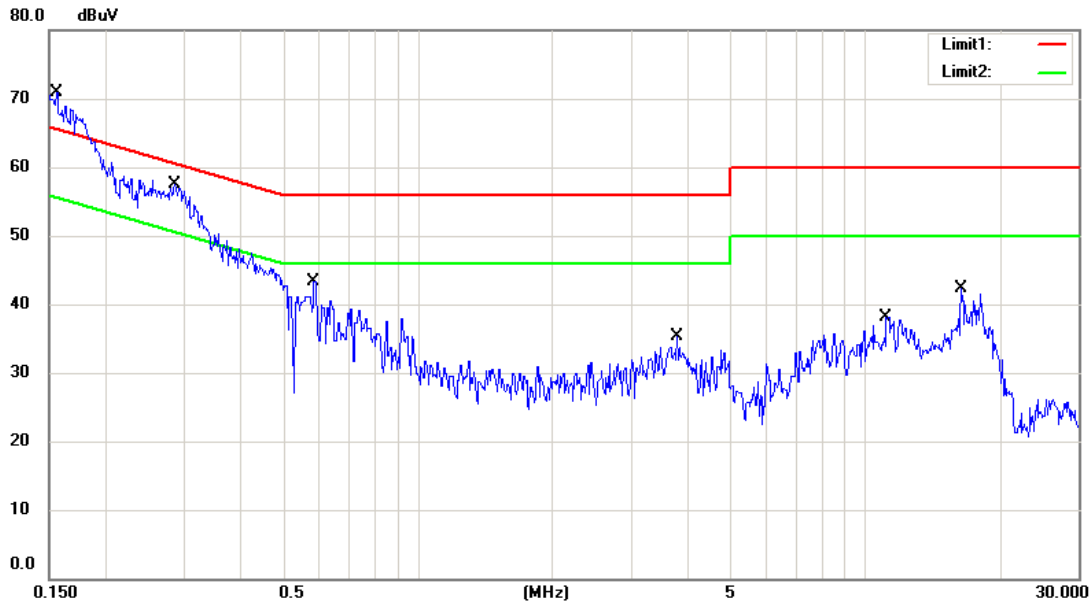


Registration number: W6M21006-10752-C-1-T

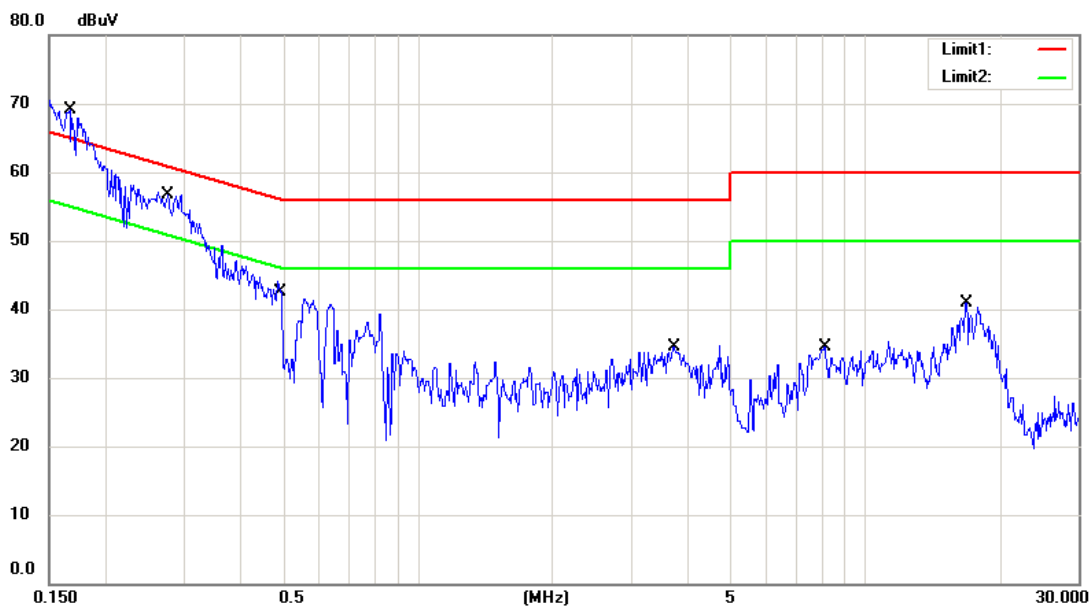
FCC ID: UAO-TX-9

Power Line Conducted Emission

LISN N



LISN L1



Up Line: QP Limit Line, Down Line: Ave Limit Line

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 AC conducted test data of this test report.