FCC PART 15 SUBPART C TEST REPORT

for

Remote Control

Model No.: TRX98B

FCC ID: H5OTR39

of

Applicant: Advance Security Inc.
Address: 3F, 48 Ta-An Street, Hsi-Chih 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.: W6M21005-10675-P-15

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
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TABLE OF CONTENTS

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 is 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.
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Tester:

Date	WTS-Lab.	Name	Signature
June 21, 2010		Kevin Wang	Kevin Wang

Technical responsibility for area of testing:

Date	WTS	Name	Signature
June 21, 2010		Chang Tse-Ming	Chang Tse-Ming

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	: Advance Security Inc.
Street	: 3F, 48 Ta-An Street,
Town	: Hsi-Chih, Taipei Hsien,
Country	: Taiwan R.O.C.
Telephone	: +886-2-86481688
Fax	: +886-2-86481689

1.4 Application details

Date of receipt of test item : May 28, 2010
Date of test : from May 31, 2010 to June 21, 2010

1.5 General information of Test item

Type of test item : Remote Control
Model Number : TRX98B
Multi-listing model number : ./.
Photos : see Appendix

Technical data

Frequency band : 909 - 921.778 MHz
Frequency (ch A) : 909.000 MHz
Frequency (ch B) : 915.500 MHz
Frequency (ch C) : 921.778 MHz

Transmitter **Unom**

Power (ch A or ch 1) : Conducted: 22.78 dBm
Power (ch B or ch 13) : Conducted: 22.42 dBm
Power (ch C or ch 25) : Conducted: 22.72 dBm

Power supply : DC 12V

Operation modes : Half-duplex

Modulation Type : FSK

Antenna Type : Helical antenna

Antenna gain : < 6 dBi

Host device : none

Classification :

Fixed Device	☐
Mobile Device (Human Body distance ＞ 20cm)	☒
Portable Device (Human Body distance ＜ 20cm)	☐

Manufacturer:
(if applicable)

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

1.6 Test standards

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

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

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 ℃
Relative humidity content	: 20 ... 75 %
Air pressure	: 86 ... 103 kPa
Details of power supply	: DC 12V
Extreme conditions parameters	: test voltage : -- extreme min :-- V max :-- V
Description of Tested System	: ./.

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-EICHLEITUNG 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	2009/7/21	2010/7/20
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 Serise 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
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	2009/6/10	2010/6/09
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
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

2.4 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 using a 50μH 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 dBμV) 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 dBμV + 10.36 dB + 6 dB = 36.36 dBμV/m @3m

The UUT 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 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.

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 (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

3 Test results (enclosure)

TEST CASE	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.247(b)	☒	☒	☐
Equivalent radiated Power	15.247(b)	☒	☒	☐
Spurious Emissions radiated – Transmitter operating	15.247(c)	☒	☒	☐
Spurious Emissions conducted – Transmitter operating	15.247	☐	☐	☐
Carrier Frequency Separation	15.247(a) (1)	☒	☒	☐
Number of Hopping Frequencies	15.247(a) (1)(i)	☒	☒	☐
Time of Occupancy (Dwell Time)	15.247(a) (1)(i)	☒	☒	☐
20 dB Bandwidth	15.247(a) (1)(i)	☒	☒	☐
Band-edge Compliance of RF Emission	15.247(c)	☒	☒	☐
Radiated Emission from Receiver L.O.	15.109	☒	☒	☐
Power Line Conducted Emission	15.207(a)	☐	☐	☐

3.1 Peak Output Power (transmitter)

FCC Rule: 15.247

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 conditions		Conducted Power		
		Channel A [dBm]	**Channel B** [dBm]	**Channel C** [dBm]
T_{nom}= 23°C	V_{nom} = 12 V	22.78	22.42	22.72

Test conditions		Radiated Power		
		Channel A [dBm]	**Channel B** [dBm]	**Channel C** [dBm]
T_{nom}= --°C	V_{nom} = -- V	--	--	--

Test conditions T_{nom}= --°C, V_{nom}= -- V Frequency[MHz]	Signal Field strength TX highest power mode dBµV/m
--	--
Measurement uncertainty	< 3 dB

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

Maximum Peak Output Power

Limits:

Frequency	Number of hopping channels			
MHz	≥ 75	≥ 50	49 ≥ 25	74 ≥ 15
902-928		30 dBm	24 dBm	
2400-2483.5 MHz	30 dBm	-		21 dbm
5725-5850 MHz	30 dBm	-		

In case of employing transmitter antennas having antenna gain >dBi and using fixed poin-to point operation consider §15.247 (b)(4).

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

3.2 RF Exposure Compliance Requirements

According to Supplement C, Edition 01-01 to OET Bulletin 65, Edition 97-01 this spread spectrum transmitter is categorically excluded from routine environmental evaluation because of the low power level, where there is a high likelihood of compliance with RF exposure standards.

3.3 Out of Band Radiated Emissions

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 below 1GHz :
Max. reading – 20 dB

Guidance on Measurement of FHSS 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." Here the correction was added to the limit instead subtracted from the reading.

Duty Cycle correction = 20 log (dwell time/100ms)
For frequencies above 1GHz (Peak measurements).
Limit = max. aver. reading-20dB +20dB(because Peak detector is used)

For frequencies above 1GHz (Average measurements).
Max. reading – 20 dB - duty cycle correction:

No duty cycle correction was added to the reading

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043, ETSTW-RE 044, ETSTW-RE 064

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 26000 MHz.
For radiated emission tests, the analyzer setting was as followings:
RES BW VID BW
Frequency <1 GHz 100 kHz 100 kHz (Peak measurements)
Frequency >1 GHz 1 MHz 1 MHz (Peak measurements)
1 MHz 1 MHz (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 960	500	54.0

For frequencies above 1GHz (Average measurements).
Guidance on Measurement of FHSS Systems:
“If the emission is pulsed, modify the unit for continues operation , use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.” Here the correction was added to the limit instead subtracted from the reading.

Duty cycle correction = 20 log (dwell time/100ms)

For frequencies above 1GHz (Average measurements).

Limit – duty cycle correction

No duty cycle correction was added to the reading.

54.0dBµV/m

For frequencies above 1GHz (Peak measurements).

Limit + 20dB

54.0dBµV/m + 20 dB= 74 dBµV/m

Note: See attached diagrams.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043, ETSTW-RE 044, ETSTW-RE 064

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))

SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance to 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 an 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 “Marker-Delta-Method“ or the „Duty-Cycle Correction Factor“.

Model: TRX98B Date: 2010/6/18
Mode: 909MHz Temperature: 21.4 °C Engineer: Kevin
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)
281.0620	12.55	peak	15.76	28.31	46.00	-17.69	120	150
1000.0000	11.58	peak	29.22	40.80	54.00	-13.20	140	150

Frequency	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
2725.4510	61.34	58.35	-5.44	55.90	52.91	74.00	54.00	-1.09	145	150
3636.0000	48.34	---	-3.92	44.42	---	74.00	54.00	-29.58	140	150
4545.0000	48.83	---	-2.35	46.48	---	74.00	54.00	-27.52	135	150
5454.0000	45.60	---	0.13	45.73	---	74.00	54.00	-28.27	140	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
277.2746	11.57	peak	15.59	27.16	46.00	-18.84	300	150
994.3887	11.28	peak	29.15	40.43	54.00	-13.57	120	150

Frequency	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
2725.4510	58.85	55.65	-5.44	53.41	50.21	74.00	54.00	-3.79	140	150
3636.0000	48.30	---	-3.92	44.38	---	74.00	54.00	-29.62	145	150
4545.0000	47.76	---	-2.35	45.41	---	74.00	54.00	-28.59	140	150
5454.0000	45.54	---	0.13	45.67	---	74.00	54.00	-28.33	130	150

Mode: 915.5MHz Temperature: 21.4 °C Engineer: Kevin
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)
282.1443	12.13	peak	15.78	27.91	46.00	-18.09	130	150
1000.0000	10.16	peak	29.22	39.38	54.00	-14.62	135	150

Frequency	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
2745.4910	60.36	57.35	-5.42	54.94	51.93	74.00	54.00	-2.07	150	150
3662.0000	47.51	---	-3.85	43.66	---	74.00	54.00	-30.34	140	150
4577.5000	46.71	---	-2.20	44.51	---	74.00	54.00	-29.49	145	150
5493.0000	45.06	---	0.27	45.33	---	74.00	54.00	-28.67	150	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
280.5210	11.55	peak	15.74	27.29	46.00	-18.71	120	150
990.1803	9.77	peak	29.09	38.86	54.00	-15.14	125	150

Frequency (MHz)	Reading (dBuV) Peak	Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Ave.	Limit @3m (dBuV/m) Peak	Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
2745.4910	57.81	54.85	-5.42	52.39	49.43	74.00	54.00	-4.57	135	150
3662.0000	48.11	---	-3.85	44.26	---	74.00	54.00	-29.74	145	150
4577.5000	46.78	---	-2.20	44.58	---	74.00	54.00	-29.42	140	150
5493.0000	44.76	---	0.27	45.03	---	74.00	54.00	-28.97	130	150

Mode: 921.778MHz Temperature: 21.4 °C Engineer: Kevin
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)
281.6032	12.29	peak	15.77	28.06	46.00	-17.94	130	150
991.5832	9.95	peak	29.11	39.06	54.00	-14.94	120	150

Frequency (MHz)	Reading (dBuV) Peak	Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Ave.	Limit @3m (dBuV/m) Peak	Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
2765.5310	61.27	58.25	-5.39	55.88	52.86	74.00	54.00	-1.14	130	150
3687.1120	48.87	---	-3.78	45.09	---	74.00	54.00	-28.91	135	150
4608.8900	49.28	---	-2.09	47.19	---	74.00	54.00	-26.81	145	150
5530.6680	44.55	---	0.35	44.90	---	74.00	54.00	-29.10	135	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
274.0281	11.44	peak	15.42	26.86	46.00	-19.14	110	150
997.1943	9.55	peak	29.18	38.73	54.00	-15.27	115	150

Frequency (MHz)	Reading (dBuV) Peak	Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Ave.	Limit @3m (dBuV/m) Peak	Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
2765.5310	58.13	55.10	-5.39	52.74	49.71	74.00	54.00	-1.26	140	150
3687.1120	48.54	---	-3.78	44.76	---	74.00	54.00	-29.24	145	150
4608.8900	46.29	---	-2.09	44.20	---	74.00	54.00	-29.80	145	150
5530.6680	44.58	---	0.35	44.93	---	74.00	54.00	-29.07	150	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.**

All other not noted test plots do not contain significant test results in relation to the limits.

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

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043, ETSTW-RE 044, ETSTW-RE 064

3.6 Carrier Frequency Separation

Carrier Frequency Separation was measured with modulation (declared by manufacturer).

According to FCC rules part 15 subpart C §15.247 frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater.

Test conditions		Channel Separation	
		Channel 0	Channel 0+1
T_{nom}= 23°C	V_{nom} = 12 V	500 kHz	

Test conditions		Channel Separation	
		Channel 12	Channel 12+1
T_{nom}= 23°C	V_{nom} = 12 V	500 kHz	

Test conditions		Channel Separation	
		Channel 24	Channel 24+1
T_{nom}= 23°C	V_{nom} = 12 V	500 kHz	

Limits:

Frequency Range MHz	Limits	
	20 dB bandwidth < 25 kHz	20 dB bandwidth > 25 kHz
902-928	25 kHz	20 dB bandwidth
2400-2483.5 5725-5850.0	25 kHz	20 dB bandwidth

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

Note: See attached diagram as appendix.

3.7 Number of Hopping Frequencies

According to FCC rules part 15 subpart C §15.247 frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies. Frequency hopping systems in 5725-5850 MHz bands shall use least 75 hopping frequencies.

For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies; if the 20dB bandwidth of the hopping channel 250 kHz or greater, the system shall use at least 25 hopping frequencies.

Test conditions		Operating Mode	Number of Channels
T_{nom}= 23°C	V_{nom}= 12 V	normal transmitting	25
T_{nom}= 23°C	V_{nom}= 12 V	inquiry mode	--

Limits:

Frequency Range MHz	Limit	
	20dB Bandwidth	Number of Channels
902-928 MHz	Bandwidth < 250 kHz	≥ 50
	Bandwidth ≥ 250 kHz	≥ 25
2400-2483.5	not defined	15
5725-5850.0 MHz	1 MHz	75

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

Note: See attached diagrams as appendix.

3.7.1 Pseudorandom Frequency Hopping Sequence

This FHSS transmitter is controlled by a microchip to generate the Pseudorandom Frequency Hopping Sequence. There are three hopping sequences listed below:

Sequence A : 915.5, 914, 912.47, 910.5, 913.45, 911.5, 910, 909, 909.5, 911, 912.96, 914.5, 916.51, 916, 915, 917.6, 919.6, 921.77, 920.29, 918.11, 919.11, 921.29, 920.8, 918.62, 917.05

Sequence B : 921.29, 919.11, 917.6, 919.6, 918.11, 916, 914.5, 912.96, 910.5, 909, 911, 909.5, 911.5, 910, 912.47, 914, 913.45, 915, 917.05, 915.5, 916.51, 918.62, 920.8, 921.77, 920.29

Sequence C : 913.45, 915.5, 918.11, 920.29, 920.8, 918.62, 916.51, 915, 912.96, 911, 910, 911.5, 909.5, 909, 910.5, 912.47, 914, 916, 917.6, 919.6, 921.77, 921.29, 919.11, 917.05, 914.5

3.7.2 Coordination of hopping sequences to other transmitters

This transmitter does not have the ability of being coordinated with other FHSS system for as soon as the transmitter is in operation, the hopping frequency will follow the selected hopping sequence to transmit independently and no coordination is possible. Especially, this transmitter is used as a duplex car alarm system, so no coordination of hopping frequency is required.

3.7.3 System Receiver Hopping Capability

There are two steps to make the receiver to shift the frequencies in synchronization with the transmitted signals:
First, the Transmitter will emit a preamble signal of 50 ms and the receiver will scan this signal by 2ms sweeping until the preamble signal is caught. Second, the preamble signal is coded with the information of hopping sequence and the next transmitting frequency, so the receiver will be able to shift the receiving frequencies in synchronization with the transmitted signals.

3.7.4 Equal Hopping Frequency Use

Due to each hopping frequency will be transmitted in accordance to the frequency tables described above, there is no any frequency will be able to hop more times than others. Therefore each frequency will be used equally.

3.8 Time of Occupancy (Dwell Time)

Frequency hopping systems operating in the 5725-5850 MHz band shall use an average time of occupancy on any frequency not greater than 0.4 seconds within a 30 second period.
In 2400-2483.5 MHz band the average time of occupancy on any channel shall not be greater than 0.4 seconds multiplied by the number of hopping channels employed.

For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not greater than 0.4 seconds within a 20 second period; if the 20dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

Test conditions	**Operating mode**	**Measurement period**	**Time of Occupancy**
T_{nom}= 23°C V_{nom} = 12 V 909MHz	normal transmitting	10 s	263.621 ms

Test conditions	**Operating mode**	**Measurement period**	**Time of Occupancy**
T_{nom}= 23°C V_{nom} = 12 V 915.5MHz	normal transmitting	10 s	263.621 ms

Test conditions	**Operating mode**	**Measurement period**	**Time of Occupancy**
T_{nom}= 23°C V_{nom} = 12 V 921.778MHz	normal transmitting	10 s	263.621 ms

Limits and measurement periods:

Frequency MHz	Number of channels	Measurement Period	Limit
902 – 928	≥50	20 s	0.4 s
	49 ≥ 25	10 s	0.4 s
2400 – 2483.5	≥ 15	0.4 s * number of used channels	0.4 s
5725- 5850	≥ 75	30 s	0.4s

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

Note: See attached diagrams as appendix, which show the On-time and the number of counted events during the measurement period

3.9 20dB Bandwidth

Frequency hopping systems operating in the 5725-5850 MHz bands shall use a maximum 20dB bandwidth of 1 MHz.
The 20dB bandwidth is measured on the lowest, middle and highest hopping channel.

For frequency hopping systems operating in the 902-928 MHz band the maximum 20dB bandwidth of the hopping channel is 500 kHz.

Test conditions		20 dB Bandwidth		
		Channel A	Channel B	Channel C
T_{nom}= 23°C	V_{nom} = 12 V	339.743589744 kHz	346.153846154 kHz	330.128205128 kHz

Limits:

Frequency Range / MHz	Limit
902-928	≤ 500 kHz
2400-2483.5	not defined
5725-5850	≤ 1 MHz

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

Note: See attached diagram as appendix.

3.10 Band-edge Compliance of RF Emissions

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 **Single Frequency**	
		Lower Band-edge	Upper Band-edge
T_{nom}= 23°C	V_{nom} = 12 V	54.43 dB	47.49 dB

Test conditions		Attenuation at or outside band-edges **Hopping Frequency**	
		Lower Band-edge	Upper Band-edge
T_{nom}= 23°C	V_{nom} = 12 V	54.32 dB	47.49 dB

Limits:

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

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

Note: See attached diagrams as appendix.

3.11 Radiated Emissions from Receiver Section of Transceiver

FCC Rule: 15.109

Model: TRX98B Date: 2010/6/18
Mode: 909MHz Temperature: 21.4 °C Engineer: Kevin
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)
203.6874	14.19	peak	12.20	26.39	43.50	-17.11	120	150
285.3908	13.98	peak	15.86	29.84	46.00	-16.16	110	150
736.2726	9.10	peak	25.49	34.59	46.00	-11.41	130	150
936.8738	7.95	peak	28.33	36.28	46.00	-9.72	120	150

Frequency	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
3825.6510	49.67	---	-3.26	46.41	---	74.00	54.00	-27.59	155	150
7511.0220	45.76	---	2.98	48.74	---	74.00	54.00	-25.26	150	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
47.8558	6.60	peak	14.27	20.87	40.00	-19.13	110	150
203.6874	13.36	peak	12.20	25.56	43.50	-17.94	115	150
680.1604	8.26	peak	24.55	32.81	46.00	-13.19	130	150
838.6774	7.64	peak	26.75	34.39	46.00	-11.61	120	150

Frequency	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
3969.9400	48.90	---	-2.44	46.46	---	74.00	54.00	-27.54	140	150
7190.3810	46.73	---	2.31	49.04	---	74.00	54.00	-24.96	145	150

Mode: 915.5MHz Temperature: 21.4 °C Engineer: Kevin
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)
198.8177	12.98	peak	12.03	25.01	43.50	-18.49	110	150
285.3908	11.87	peak	15.86	27.73	46.00	-18.27	115	150
854.1082	6.62	peak	26.90	33.52	46.00	-12.48	110	150
950.9018	6.01	peak	28.58	34.59	46.00	-11.41	135	150

Frequency	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
3831.6630	49.16	---	-3.21	45.95	---	74.00	54.00	-28.05	140	150
7182.3650	45.71	---	2.29	48.00	---	74.00	54.00	-26.00	135	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
47.8558	6.96	peak	14.27	21.23	40.00	-18.77	115	150
211.8036	11.79	peak	12.75	24.54	43.50	-18.96	105	150
840.0802	7.49	peak	26.76	34.25	46.00	-11.75	130	150
887.7756	7.35	peak	27.44	34.79	46.00	-11.21	120	150

Frequency	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
3933.8680	48.76	---	-2.52	46.24	---	74.00	54.00	-27.76	150	150
7390.7820	45.64	---	2.73	48.37	---	74.00	54.00	-25.63	145	150

Mode: 921.778MHz Temperature: 21.4 °C Engineer: Kevin
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)
203.1463	14.50	peak	12.16	26.66	43.50	-16.84	120	150
285.3908	12.45	peak	15.86	28.31	46.00	-17.69	115	150
827.4548	7.17	peak	26.68	33.85	46.00	-12.15	110	150
925.6513	6.54	peak	28.12	34.66	46.00	-11.34	120	150

Frequency (MHz)	Reading (dBuV) Peak	Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Ave.	Limit @3m (dBuV/m) Peak	Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
3909.8200	49.42	---	-2.57	46.85	---	74.00	54.00	-27.15	145	150
7535.0700	45.49	---	2.86	48.35	---	74.00	54.00	-25.65	135	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
30.5412	10.14	peak	13.30	23.44	40.00	-16.56	100	150
203.1463	13.17	peak	12.16	25.33	43.50	-18.17	95	150
524.4490	8.72	peak	21.60	30.32	46.00	-15.68	125	150
859.7195	6.95	peak	26.99	33.94	46.00	-12.06	130	150

Frequency (MHz)	Reading (dBuV) Peak	Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Ave.	Limit @3m (dBuV/m) Peak	Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
3981.9640	49.29	---	-2.41	46.88	---	74.00	54.00	-27.12	140	150
7286.5730	46.35	---	2.34	48.69	---	74.00	54.00	-25.31	130	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.**

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, ETSTW-RE 044, ETSTW-RE 064

3.12 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: TRX98B Date: --
Mode: Temperature: -- °C Engineer: --
Polarization: N Humidity: -- %

Frequency (MHz)	Reading (dBuV) QP	Reading (dBuV) Ave.	Factor (dB) Corr.	Result (dBuV) QP	Result (dBuV) Ave.	Limit (dBuV) QP	Limit (dBuV) Ave.	Margin (dB)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Polarization: L1

Frequency (MHz)	Reading (dBuV) QP	Reading (dBuV) Ave.	Factor (dB) Corr.	Result (dBuV) QP	Result (dBuV) Ave.	Limit (dBuV) QP	Limit (dBuV) Ave.	Margin (dB)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

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, ETSTW-RE 064

Note: This test is not required.

Appendix

A Measurement diagrams

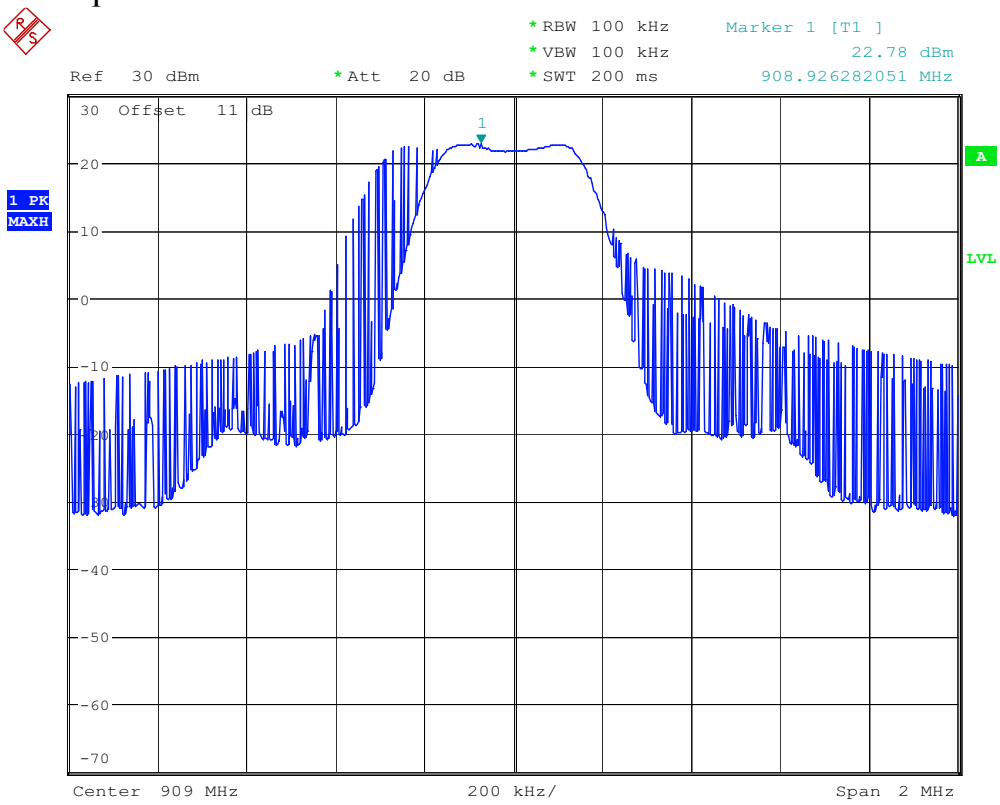
1. Peak Output Power
2. Spurious Emissions radiated
3. Carrier Frequency Separation
4. Number of Hopping Frequencies
5. Time of Occupancy (Dwell Time)
6. 20dB Bandwidth
7. Band-edge Compliance of RF Conducted Emissions
8. Radiated Emissions from Receiver Section of Transceiver

B Photos

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

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

Peak Output Power



MAX OUTPUT POWER 909MHz

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Registration number: W6M21005-10675-P-15
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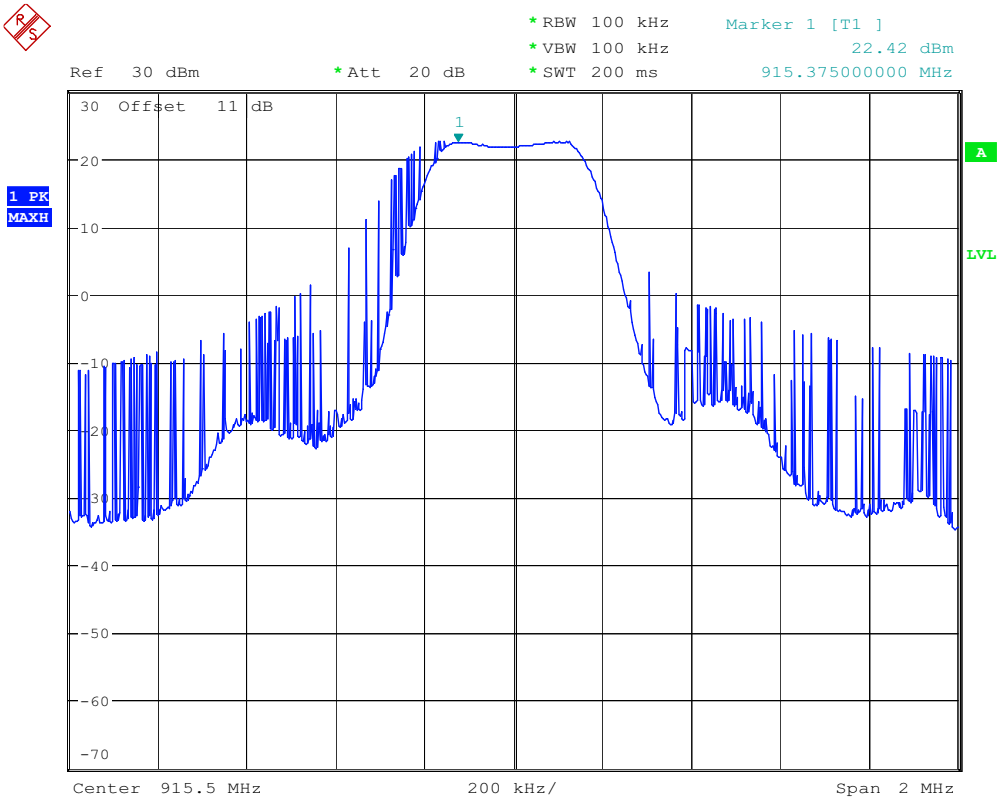

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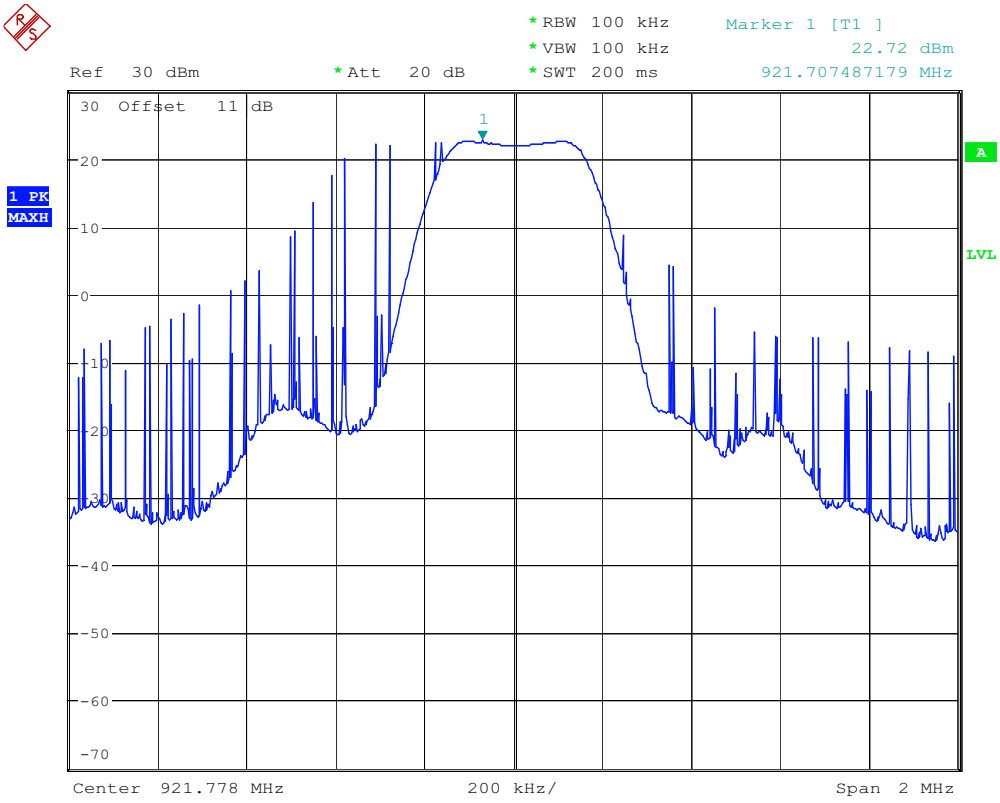
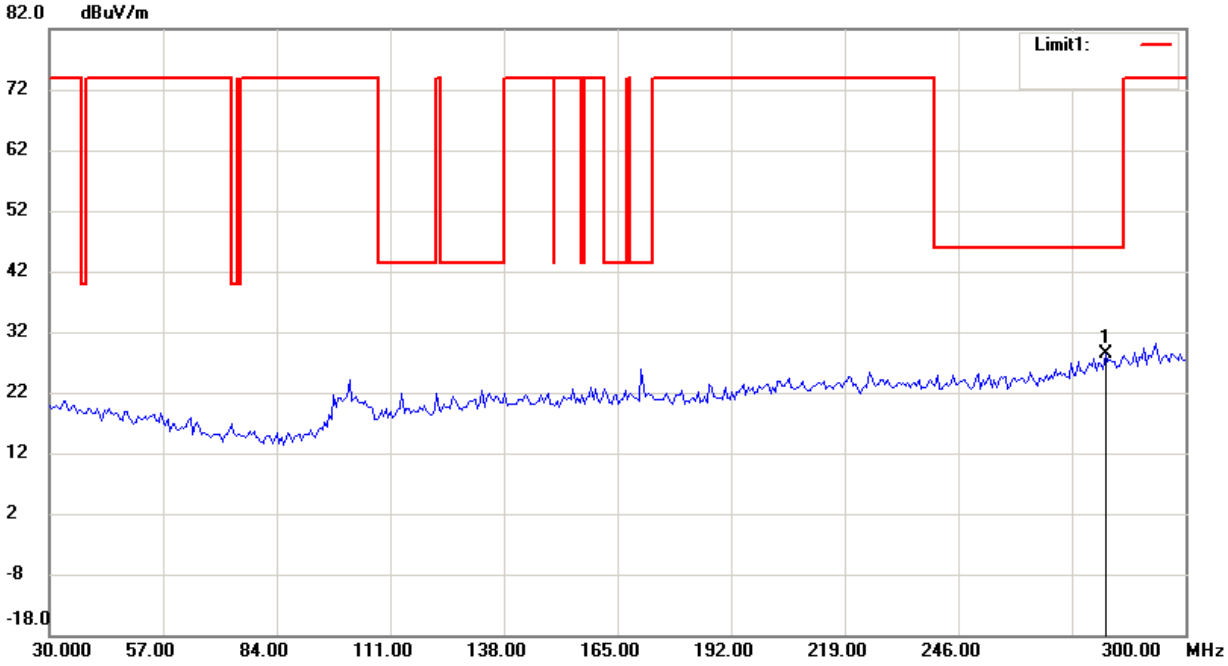
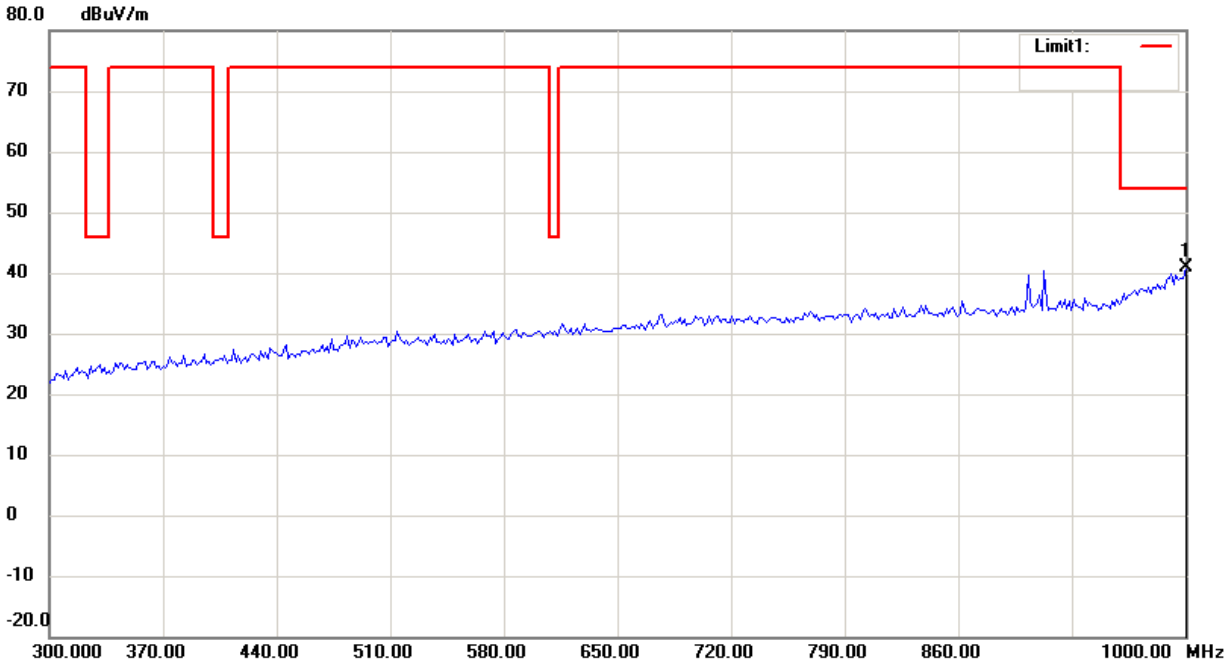


MAX OUTPUT POWER 921.778MHz
Date: 18.JUN.2010 15:55:06

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

Spurious Emission Radiated
ch 1
Antenna Polarization H





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

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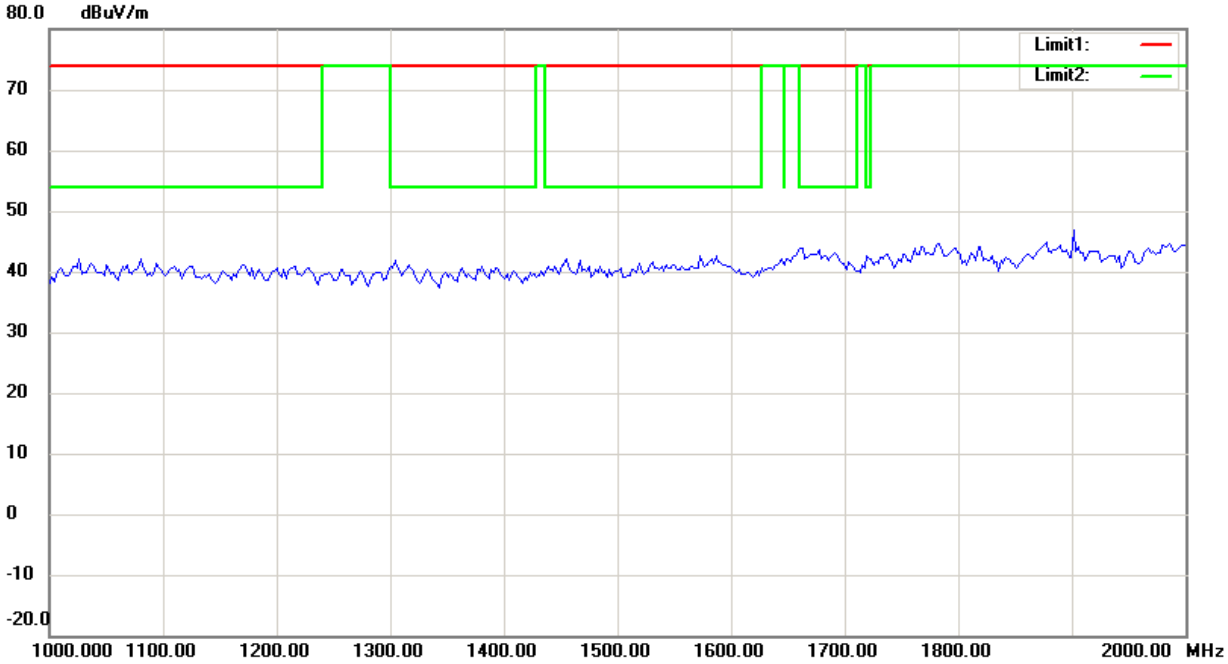
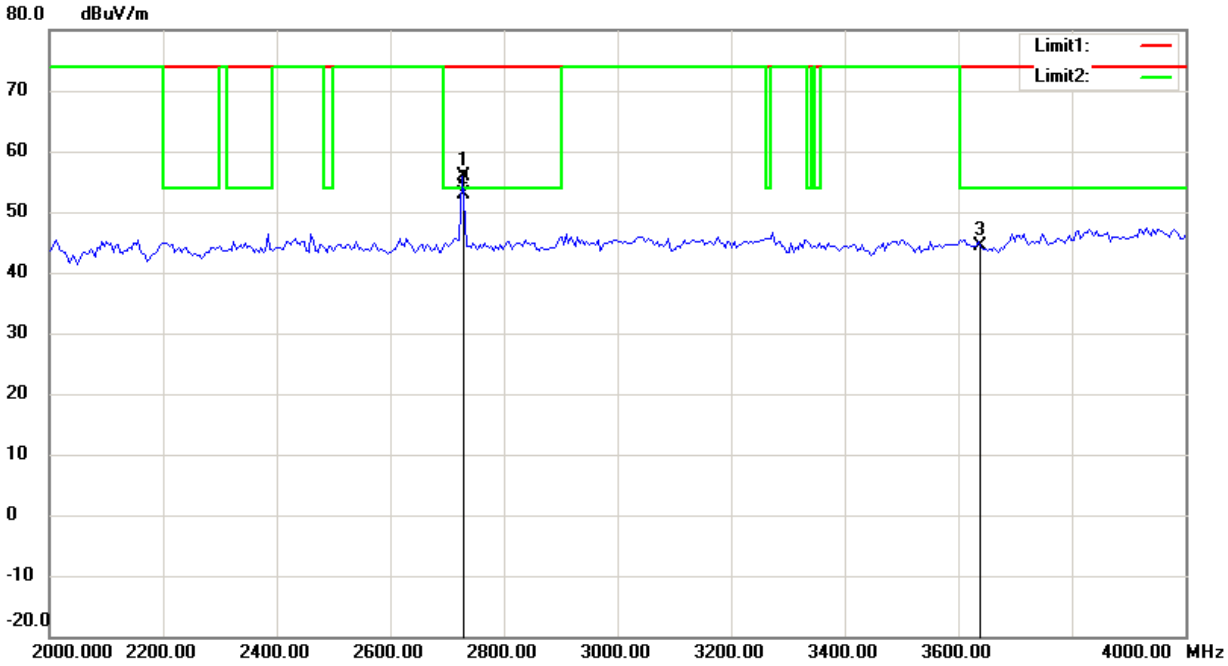
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**





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

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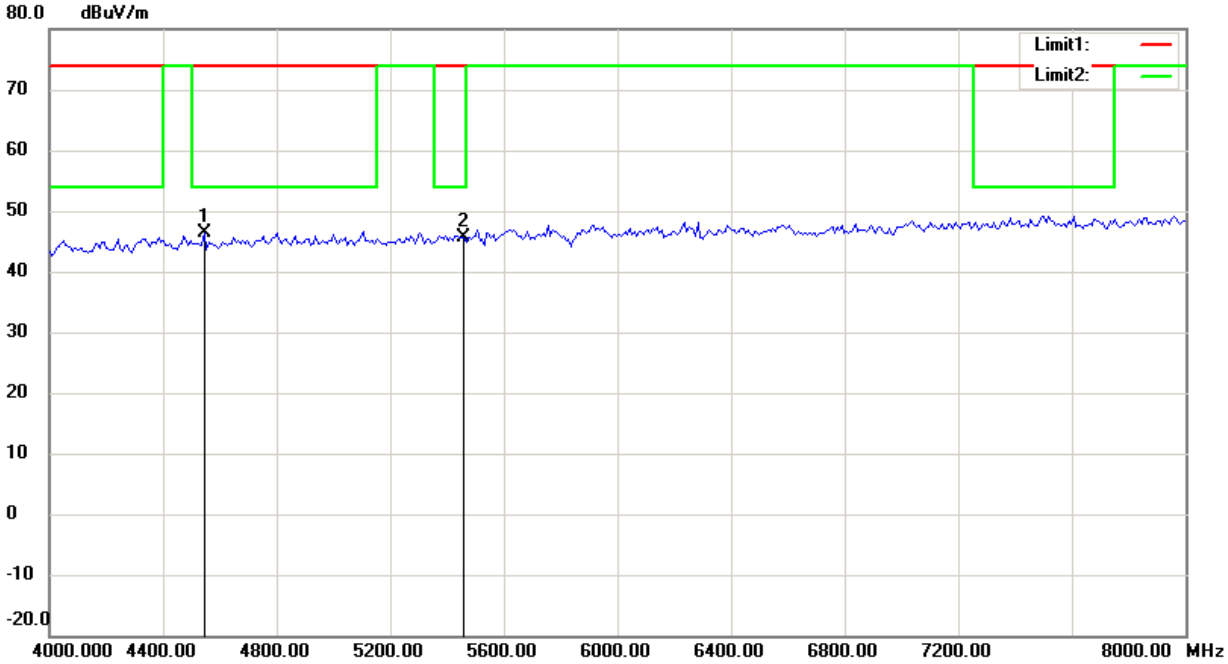

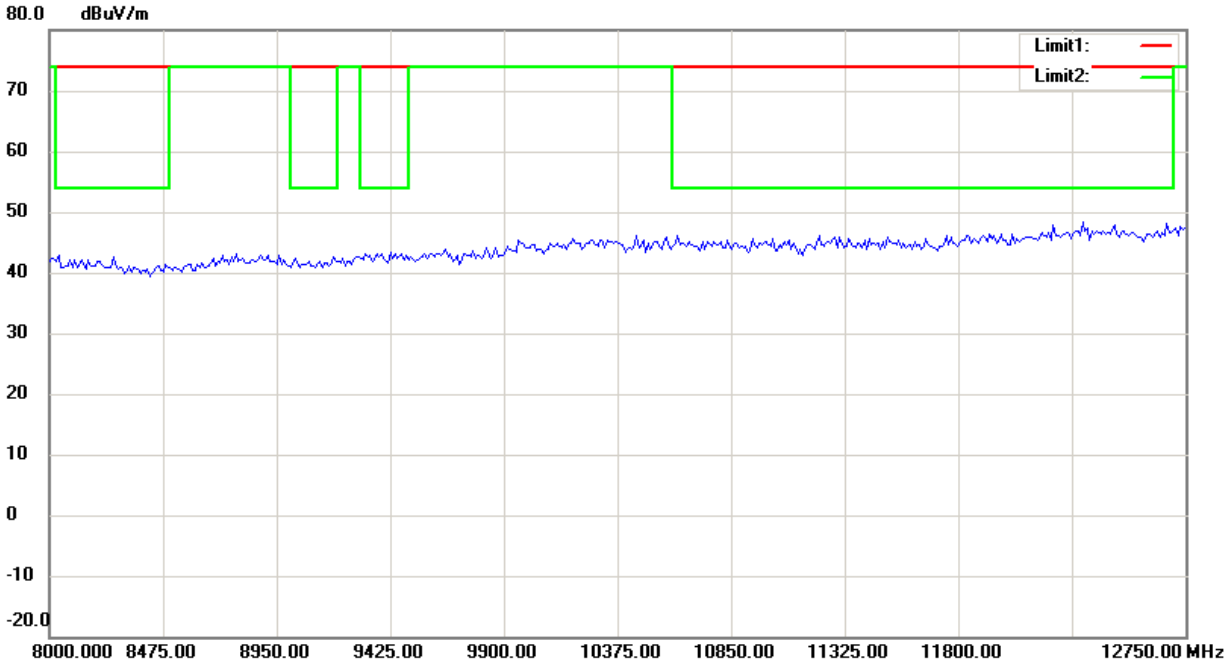

Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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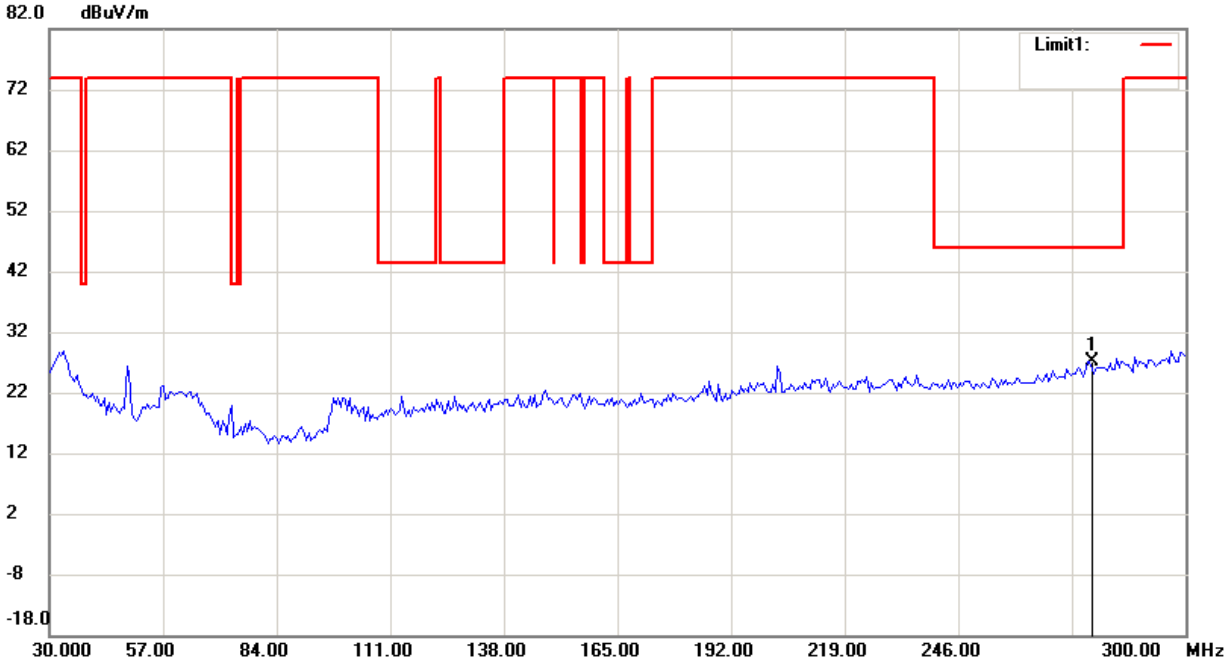
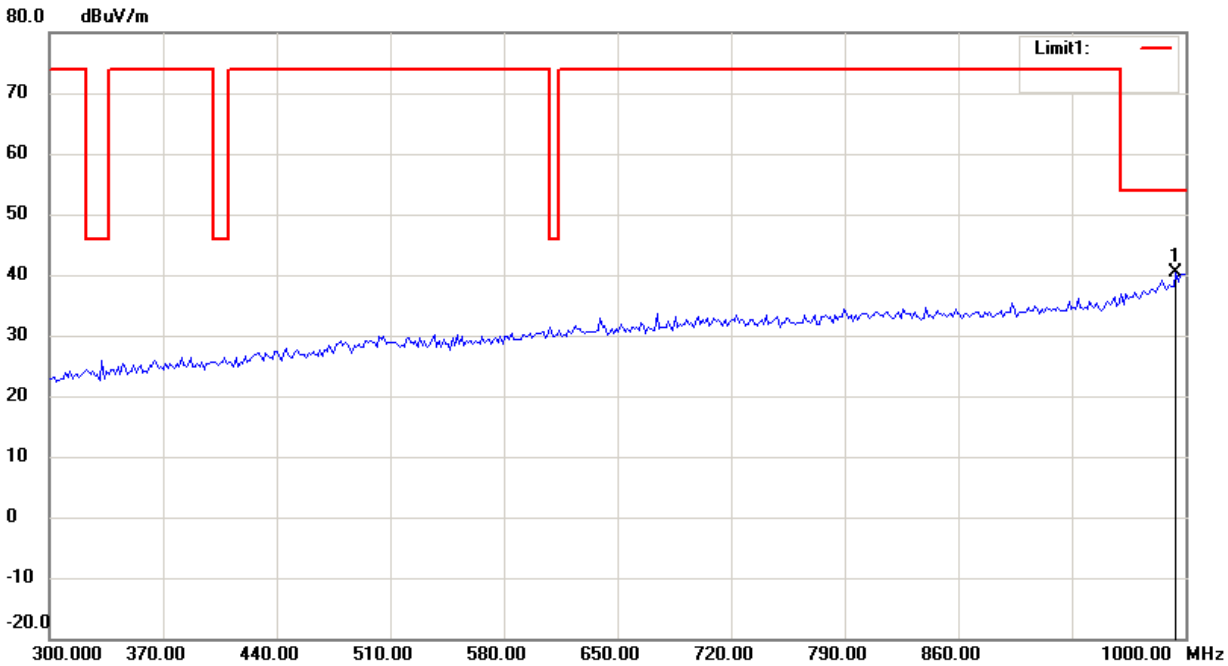
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

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.**
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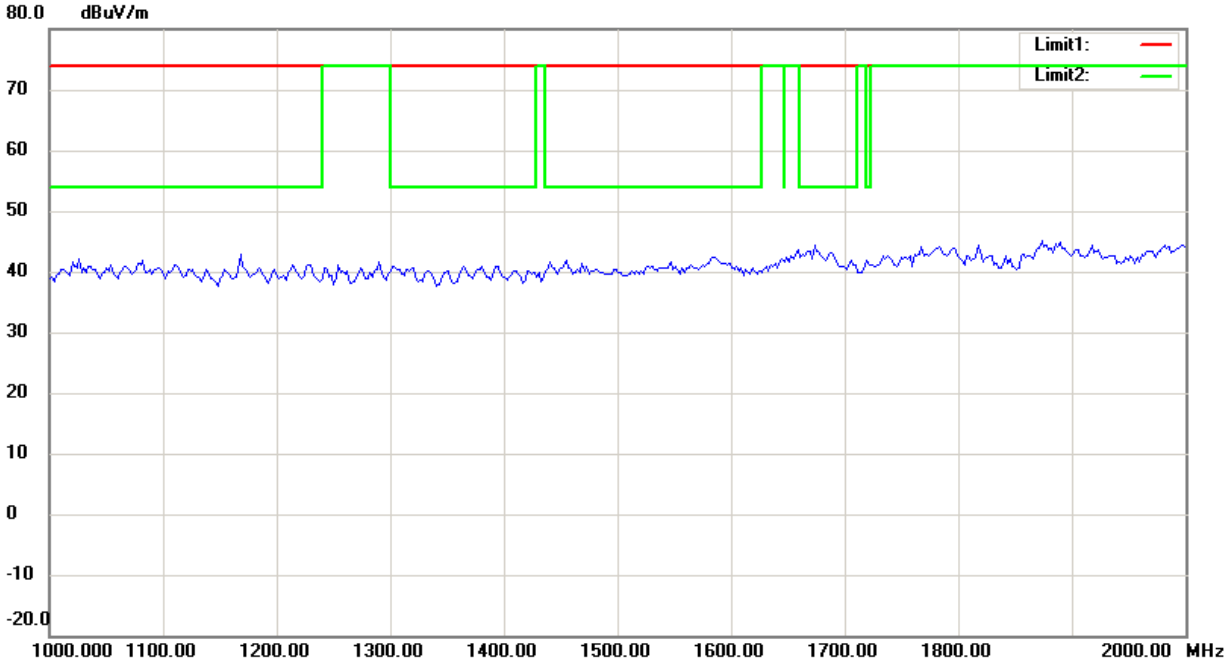

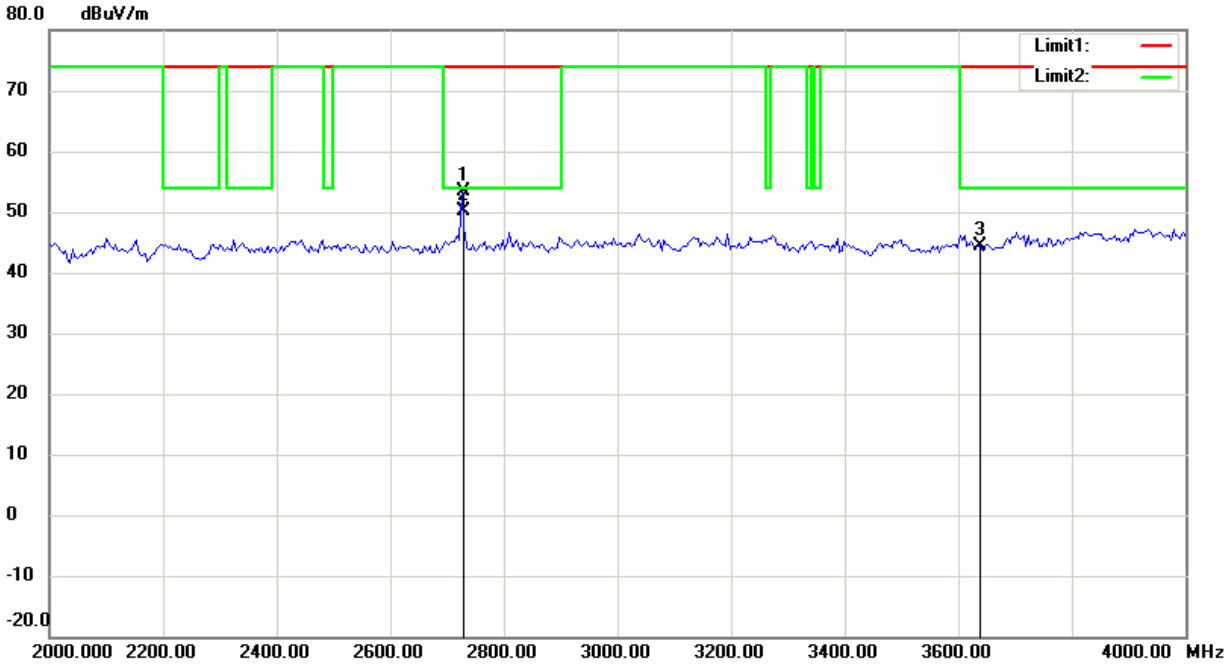

Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
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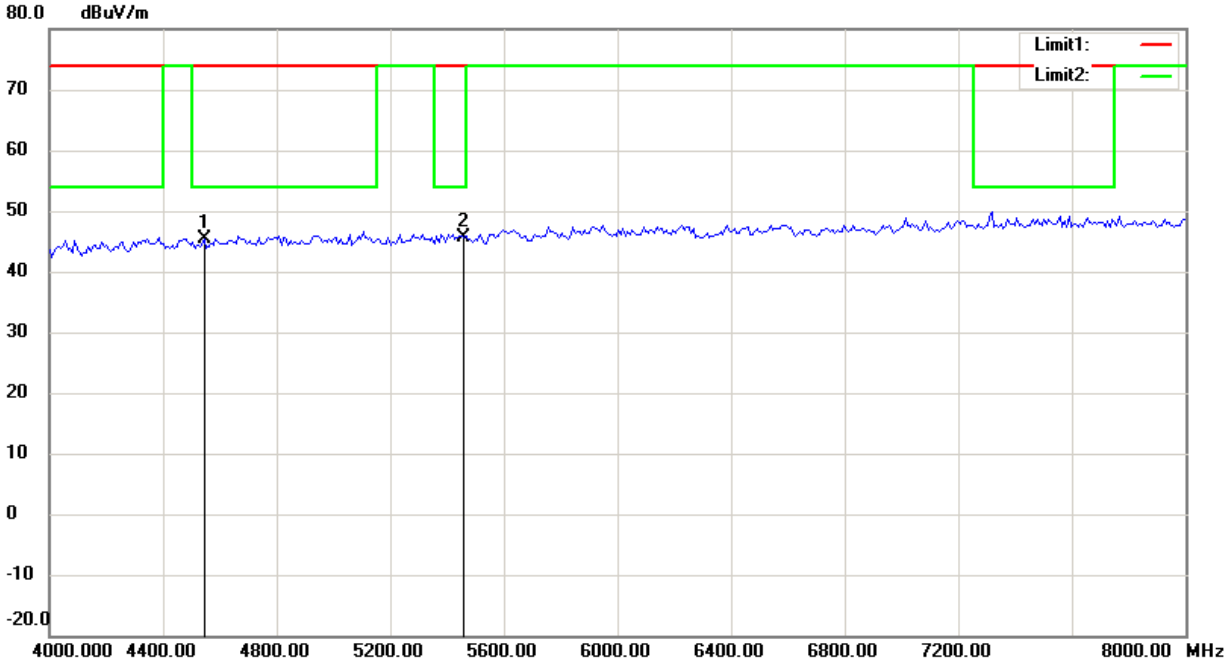

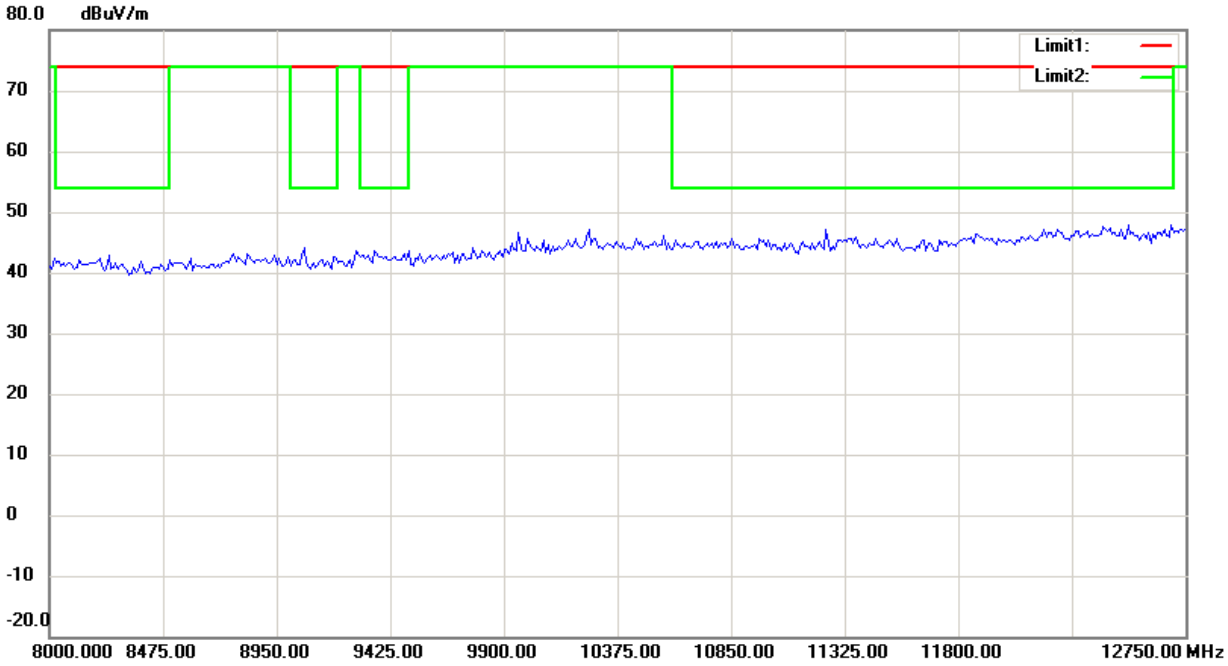

Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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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.**
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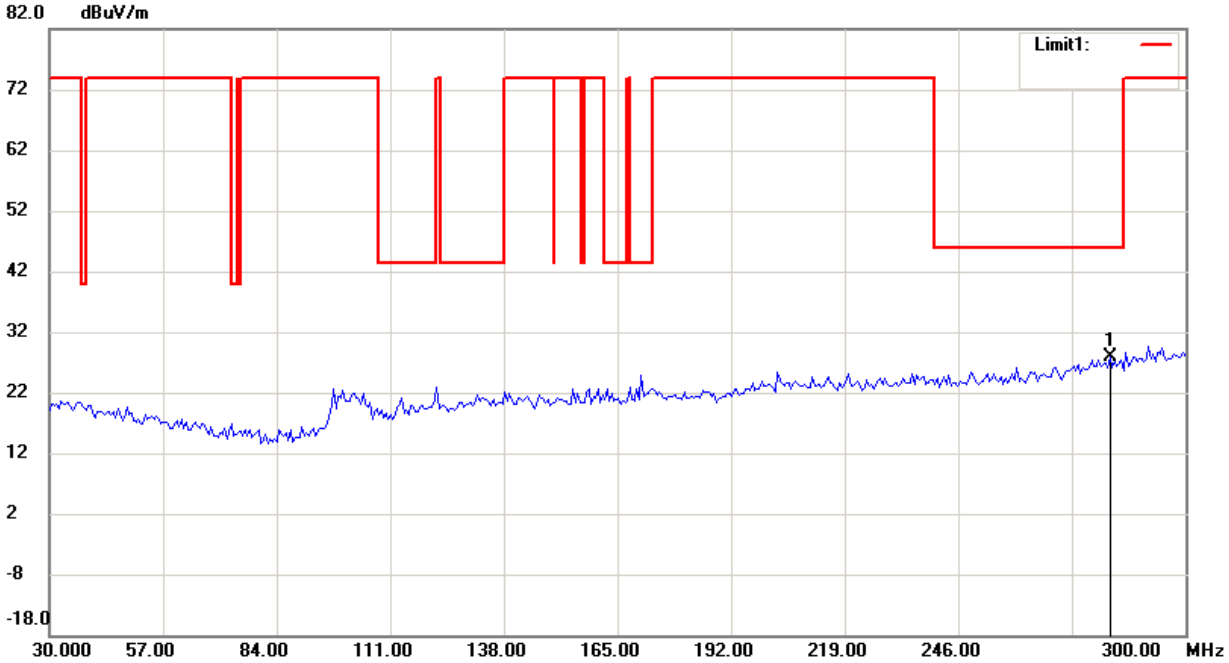
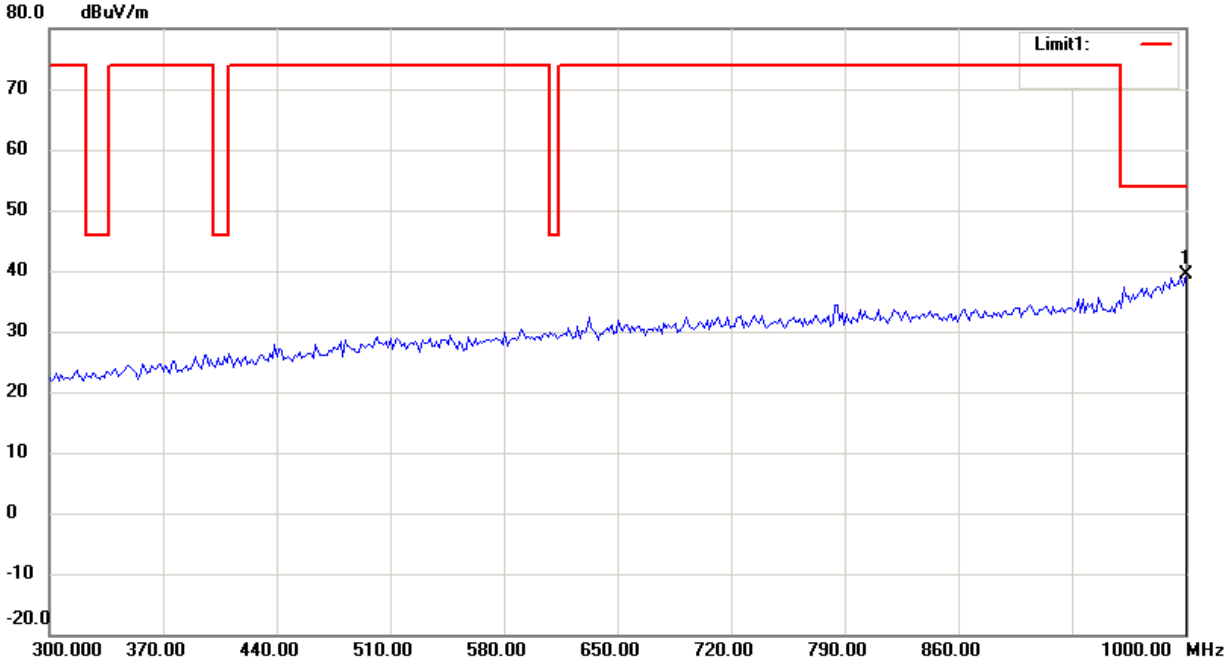
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

ch 13

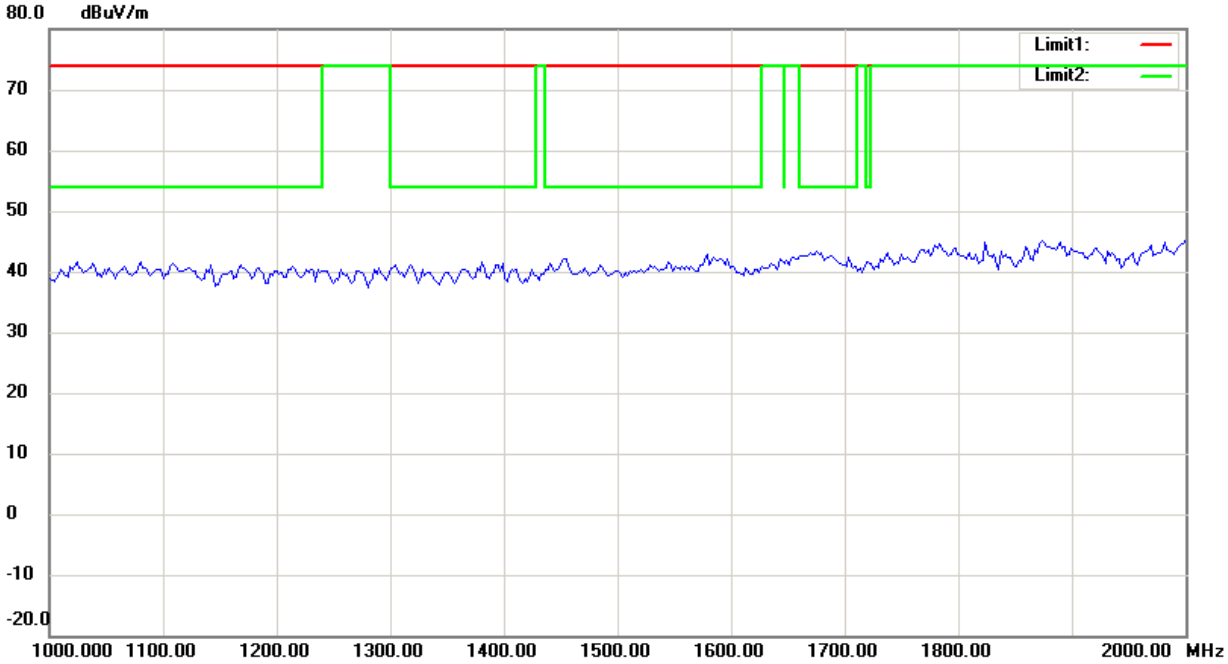
Antenna Polarization H

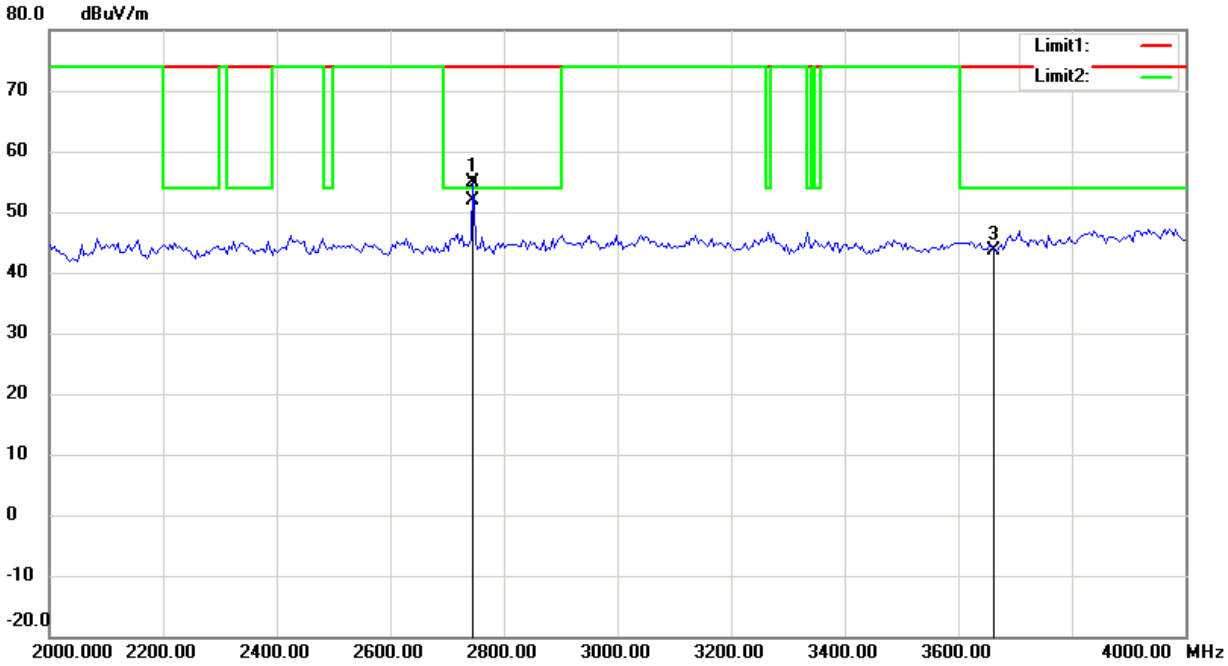




Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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.**





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.**
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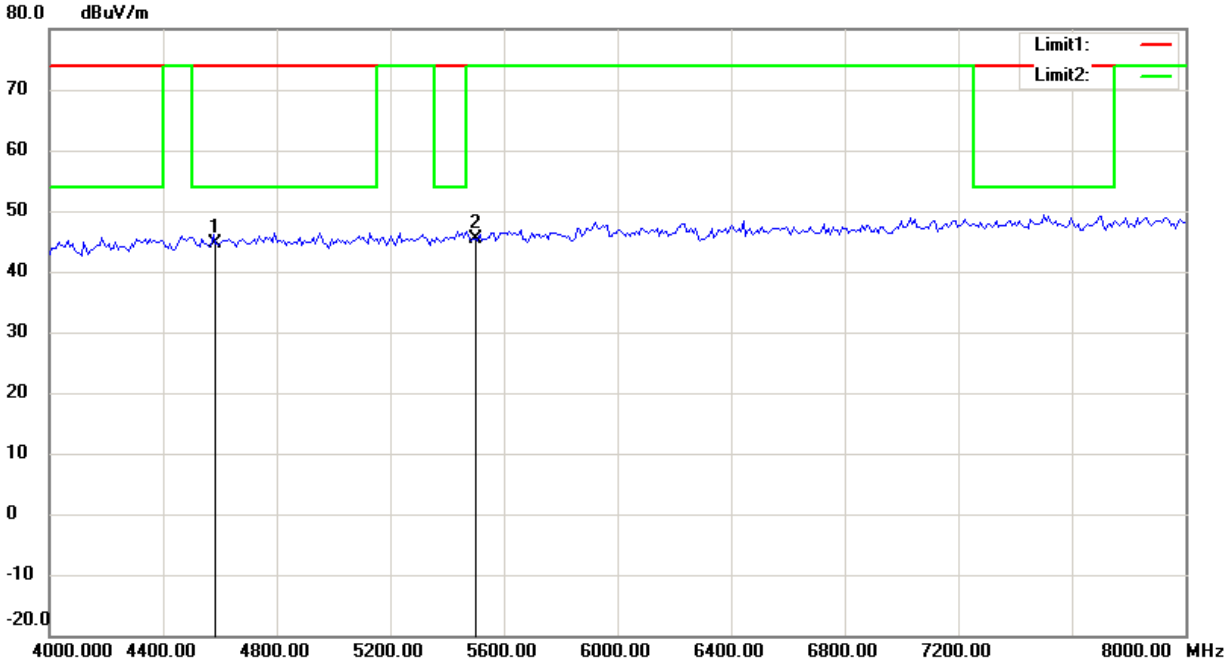

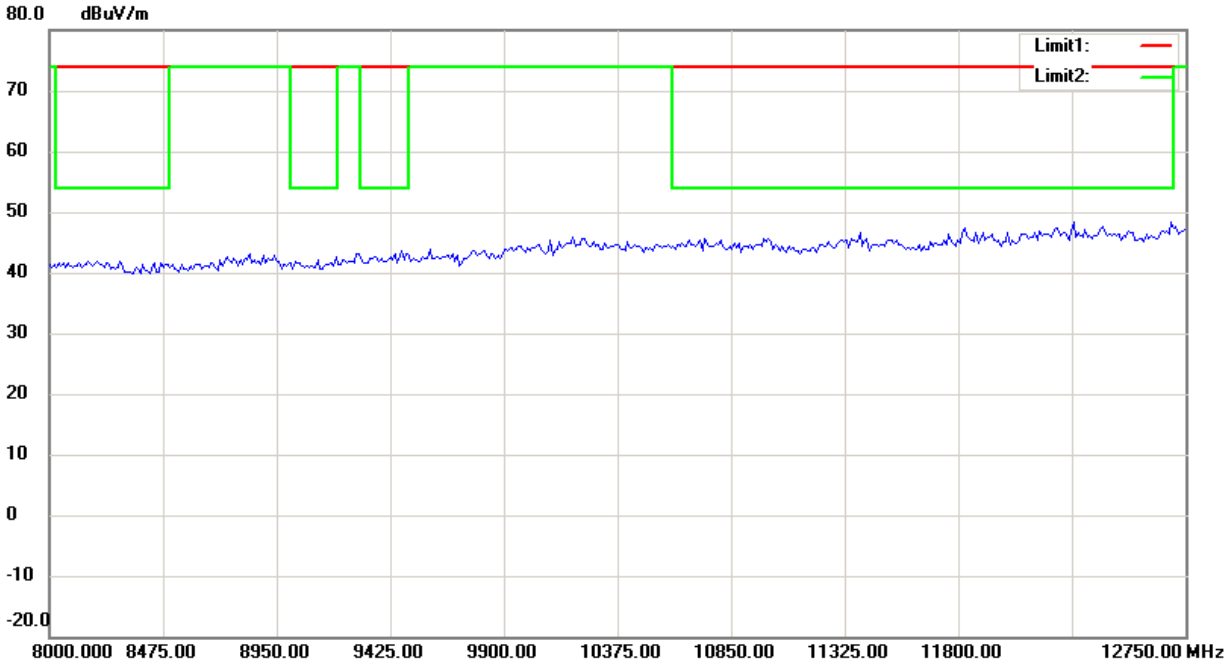

Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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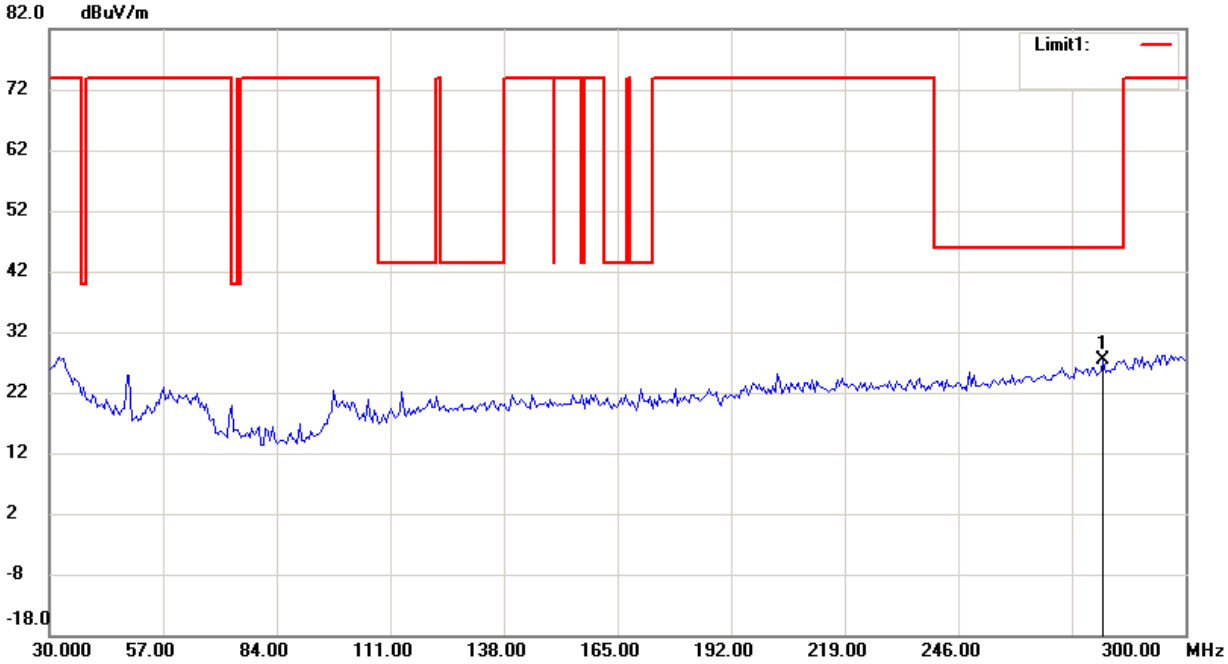
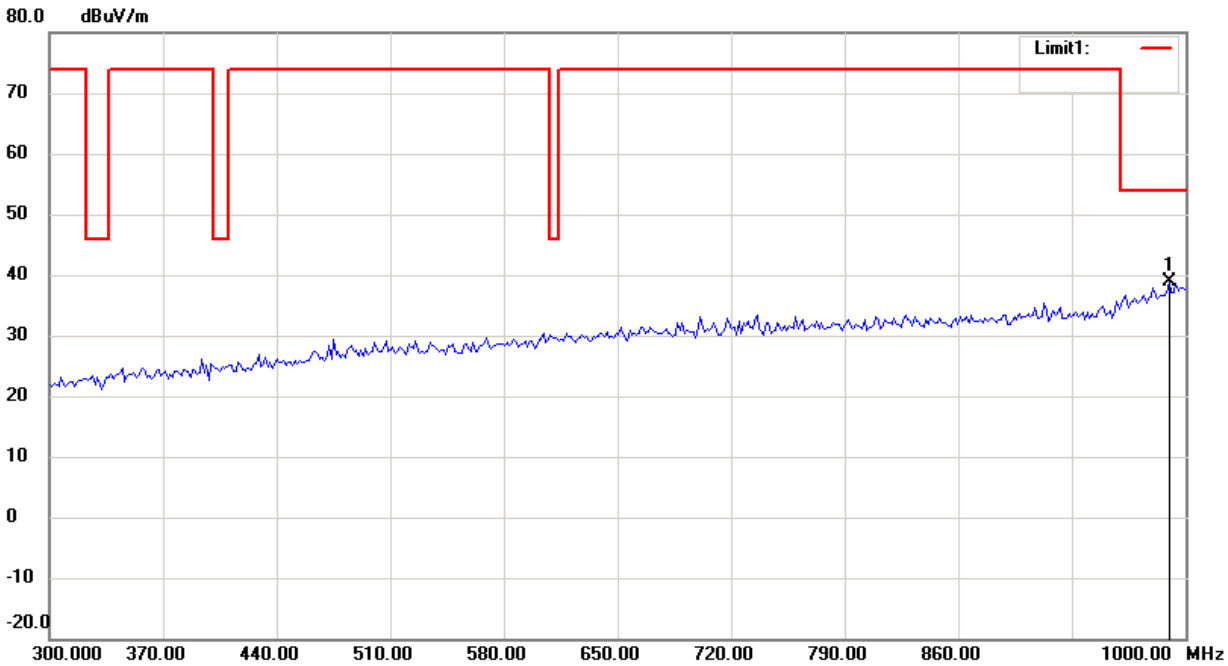
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

Antenna Polarization V





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

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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.**
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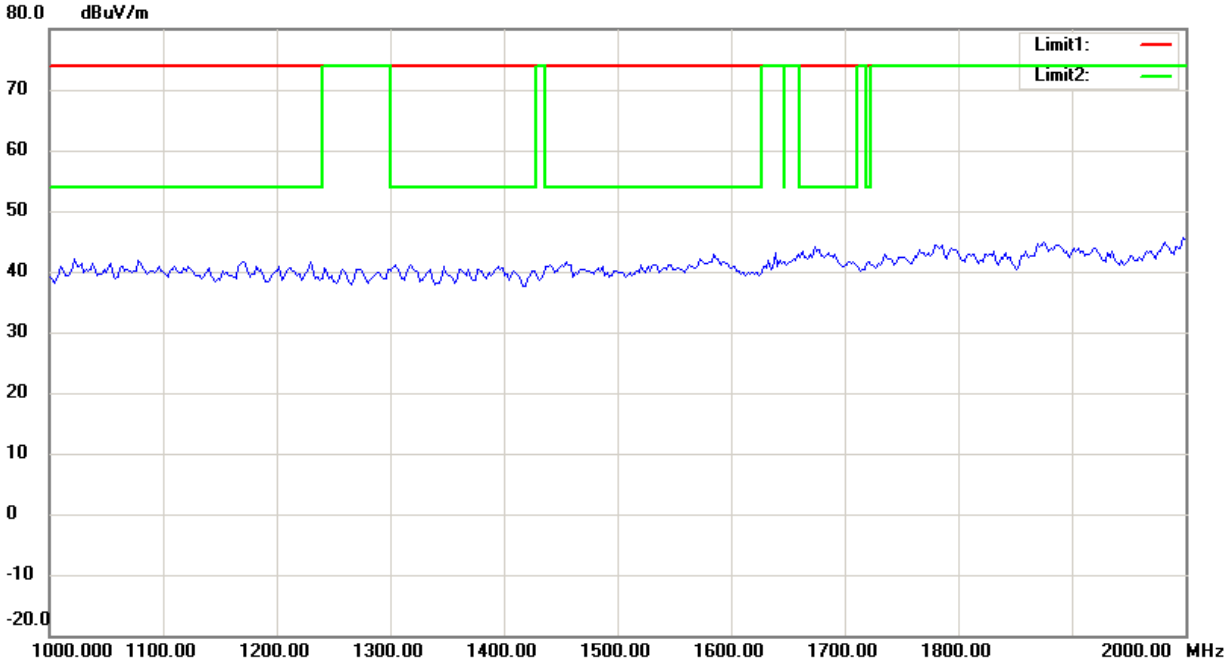

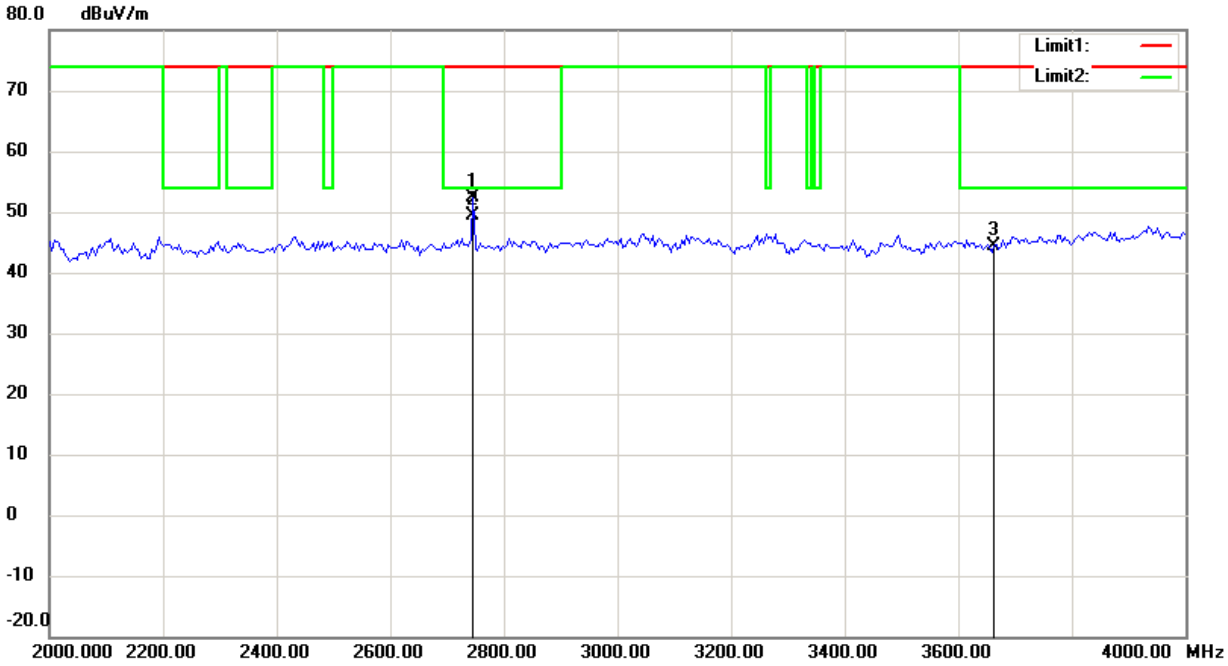

Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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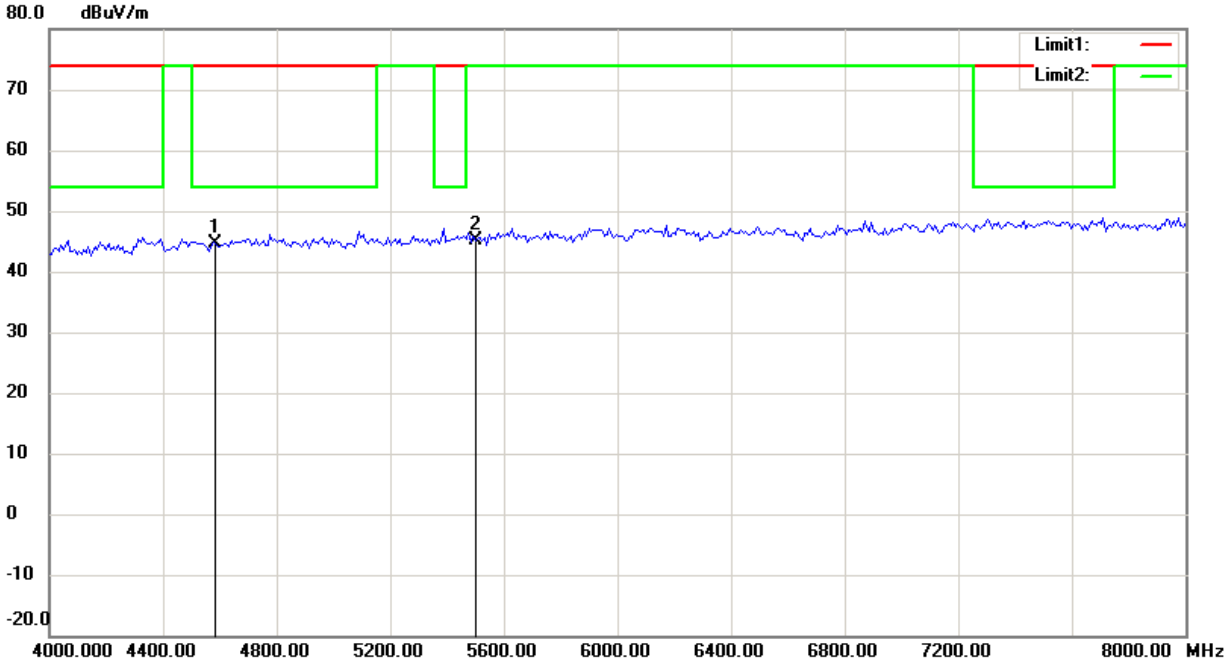

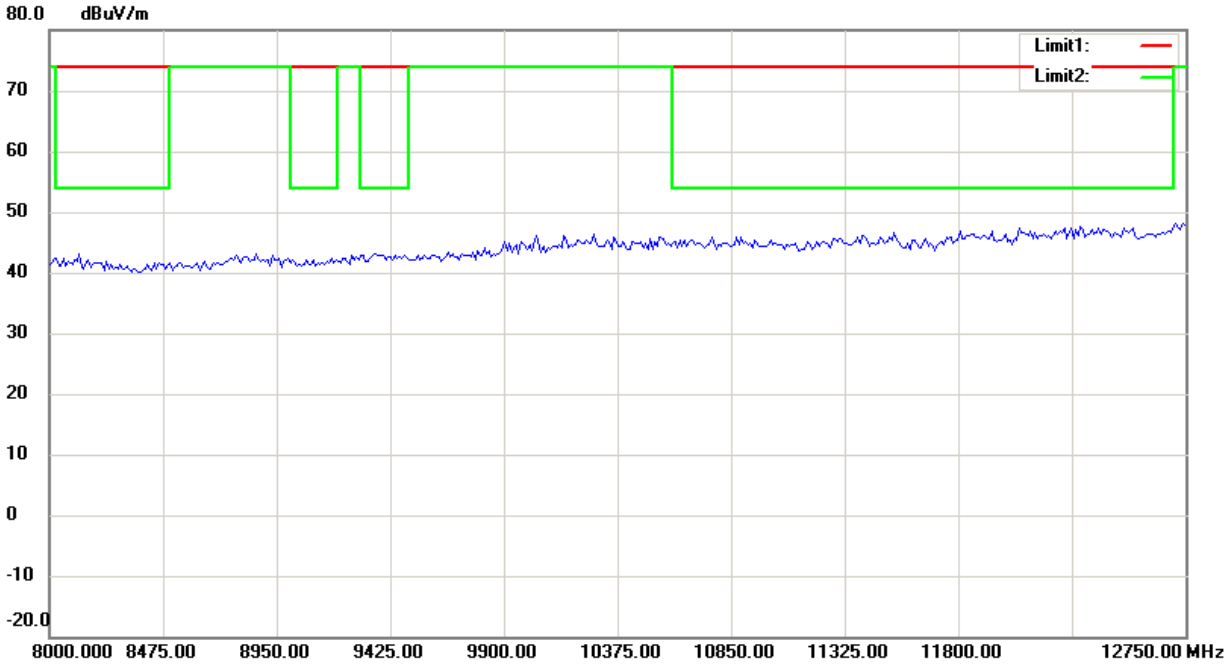

Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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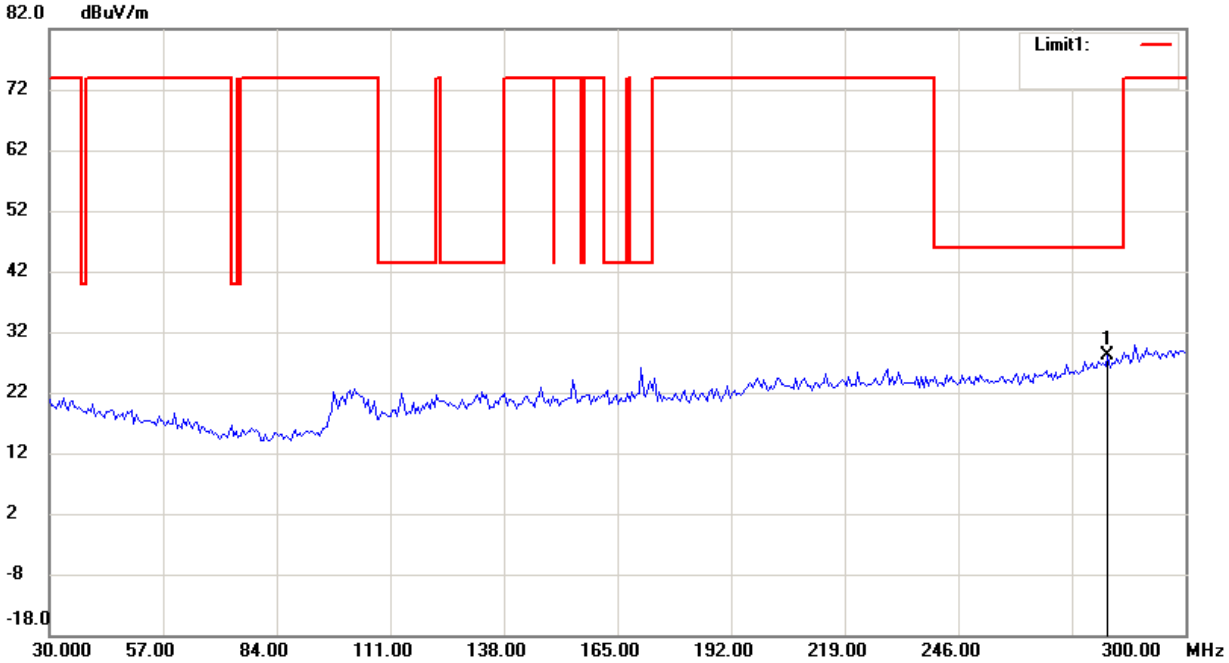
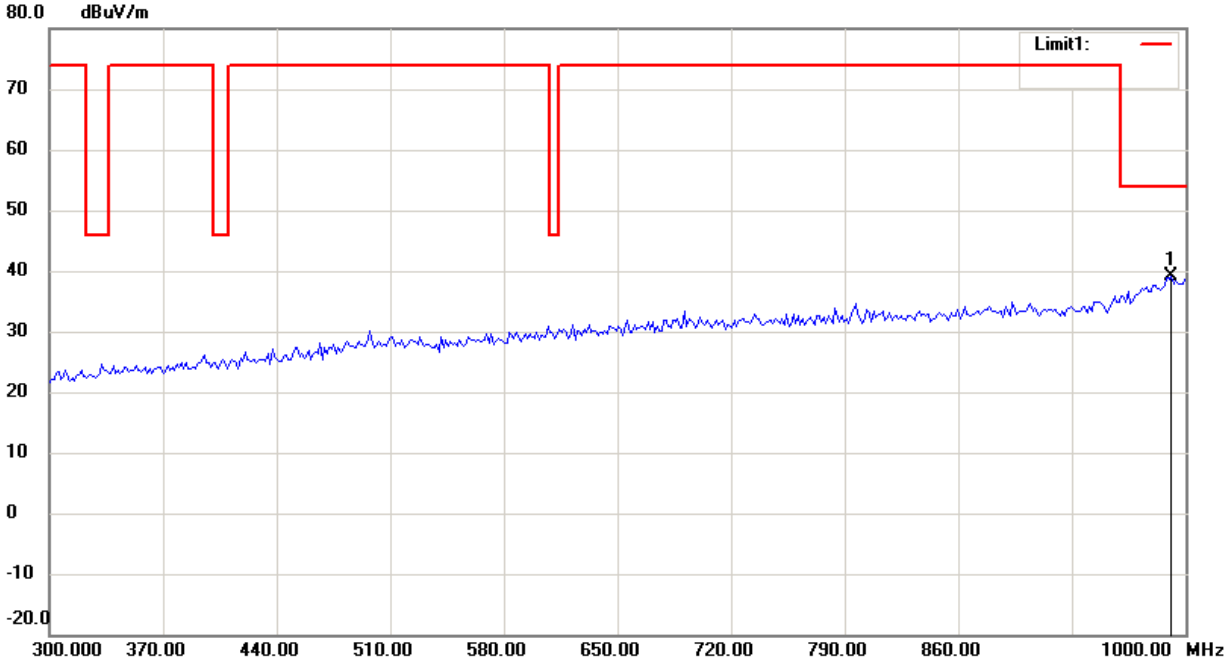
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

ch 25

Antenna Polarization H





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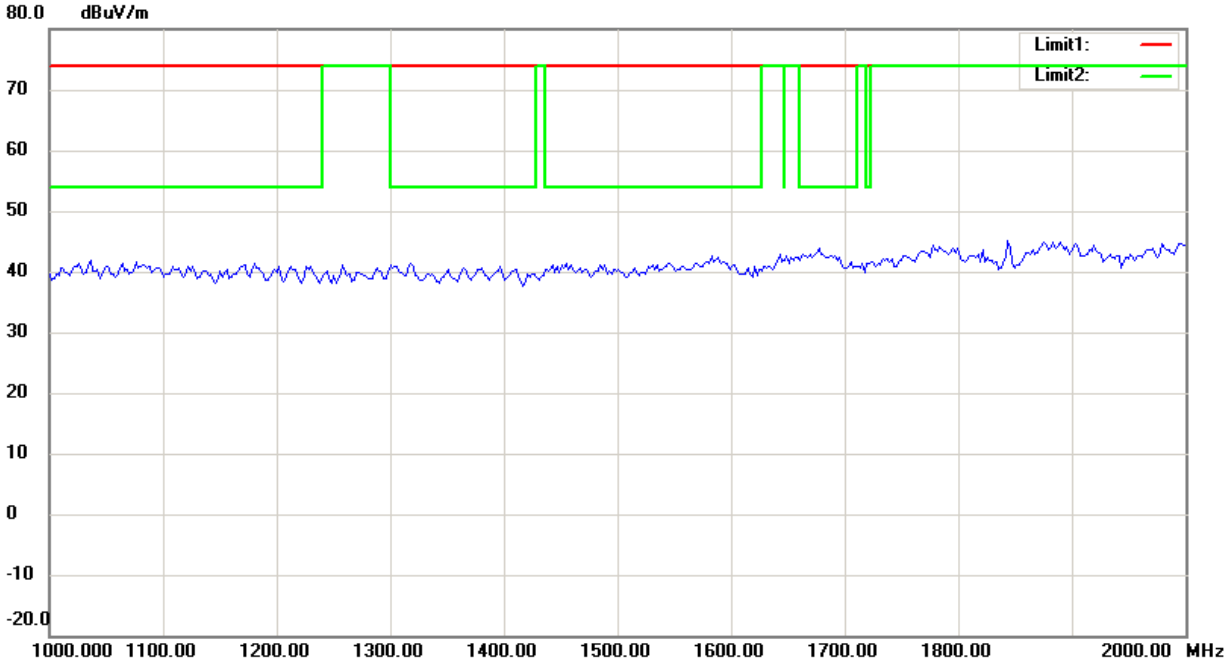

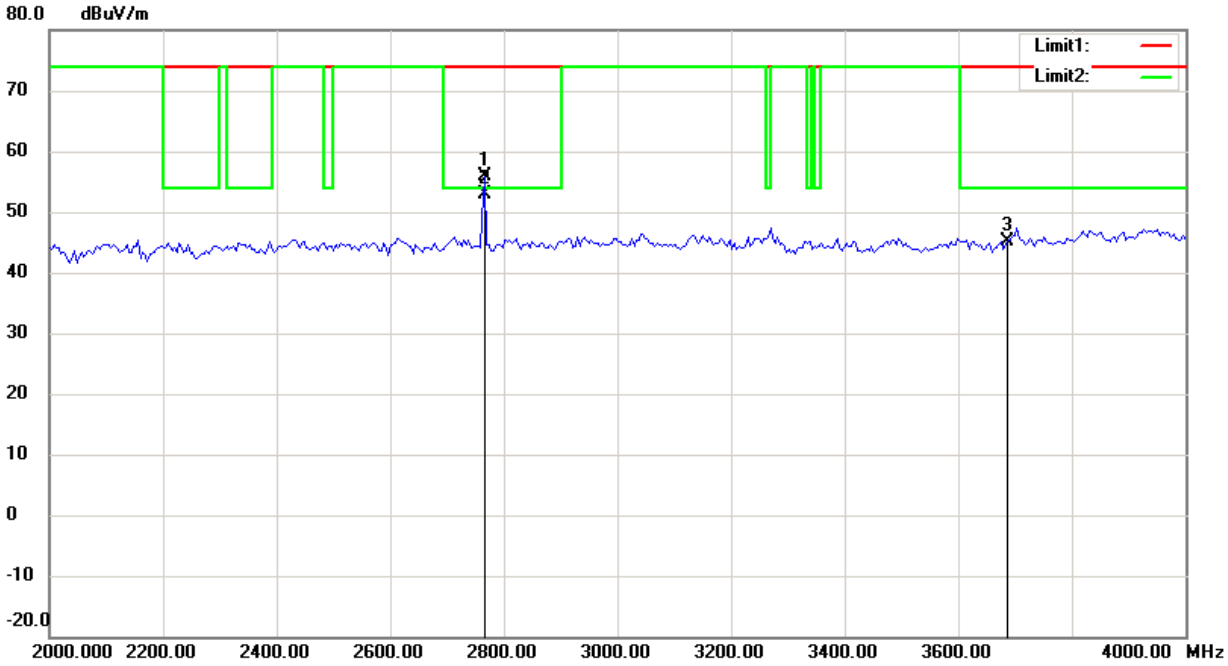

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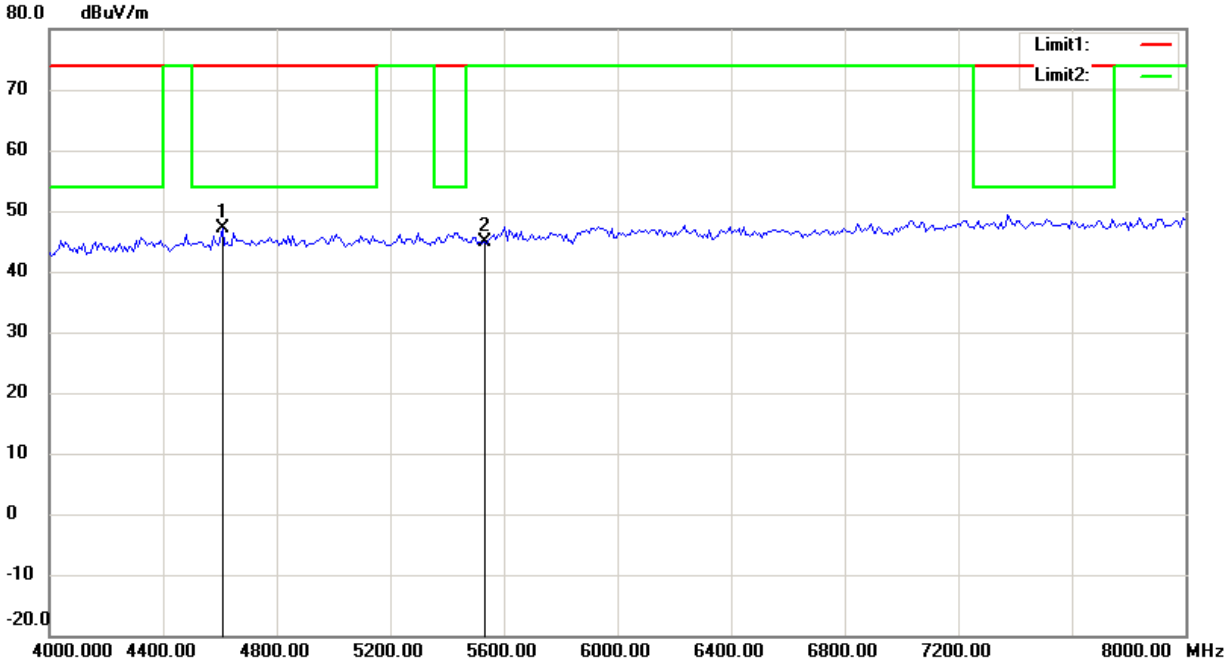

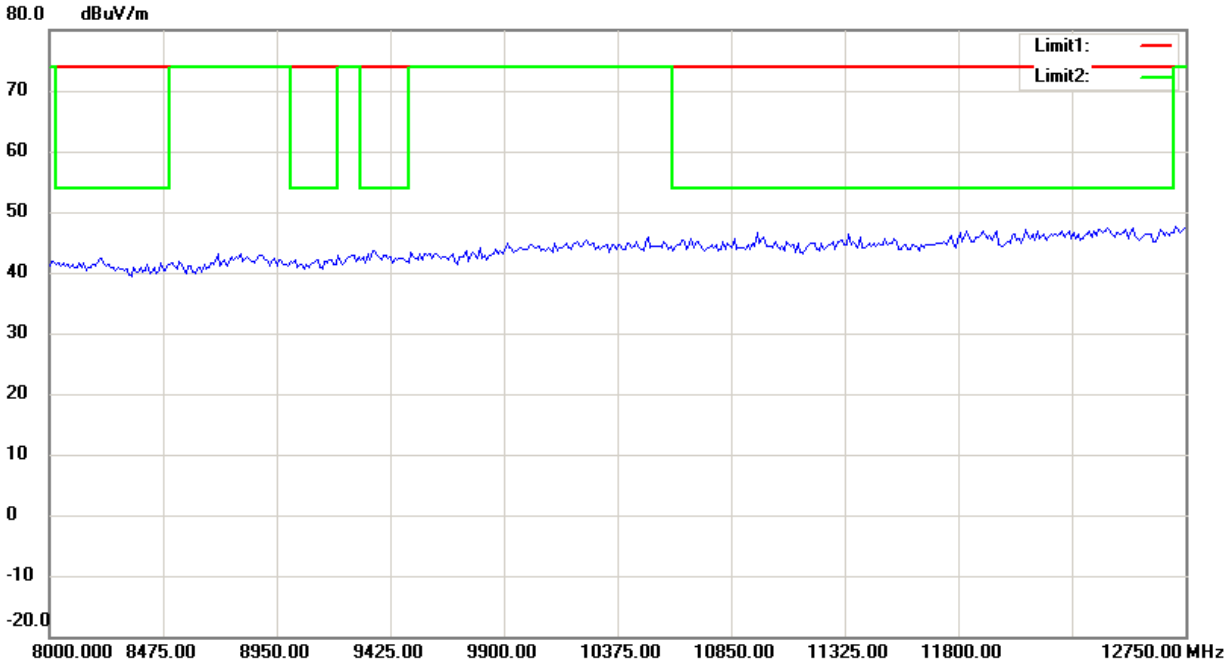

Up Line: Peak Limit Line Down Line: Ave Limit Line
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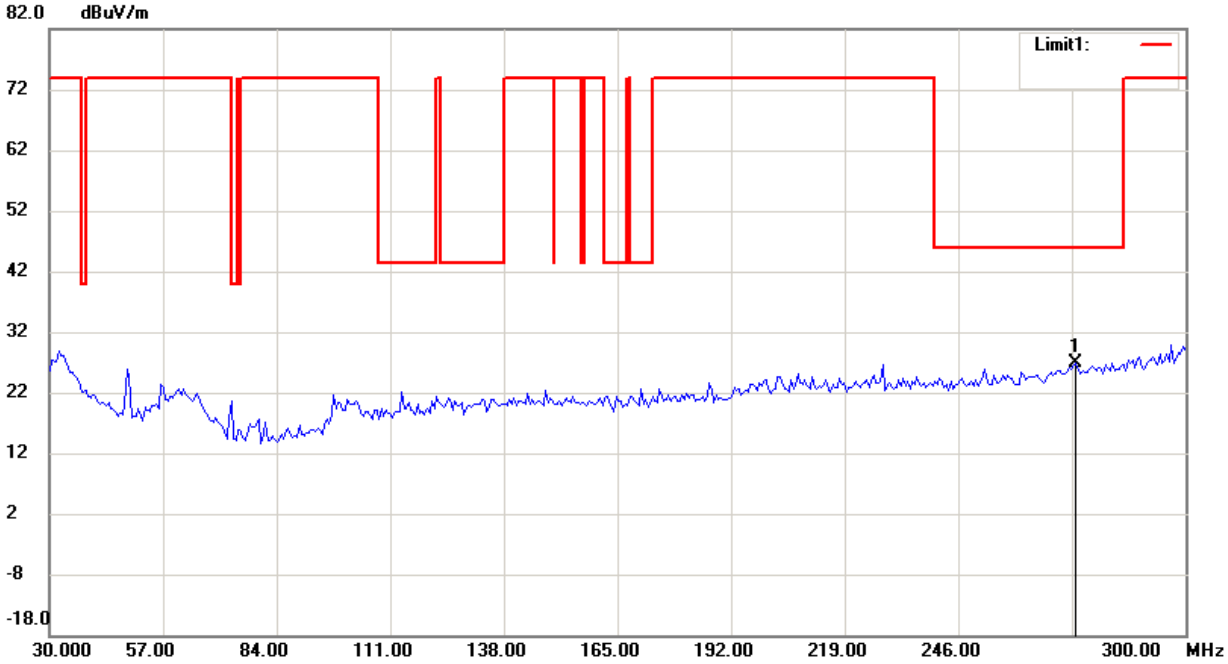
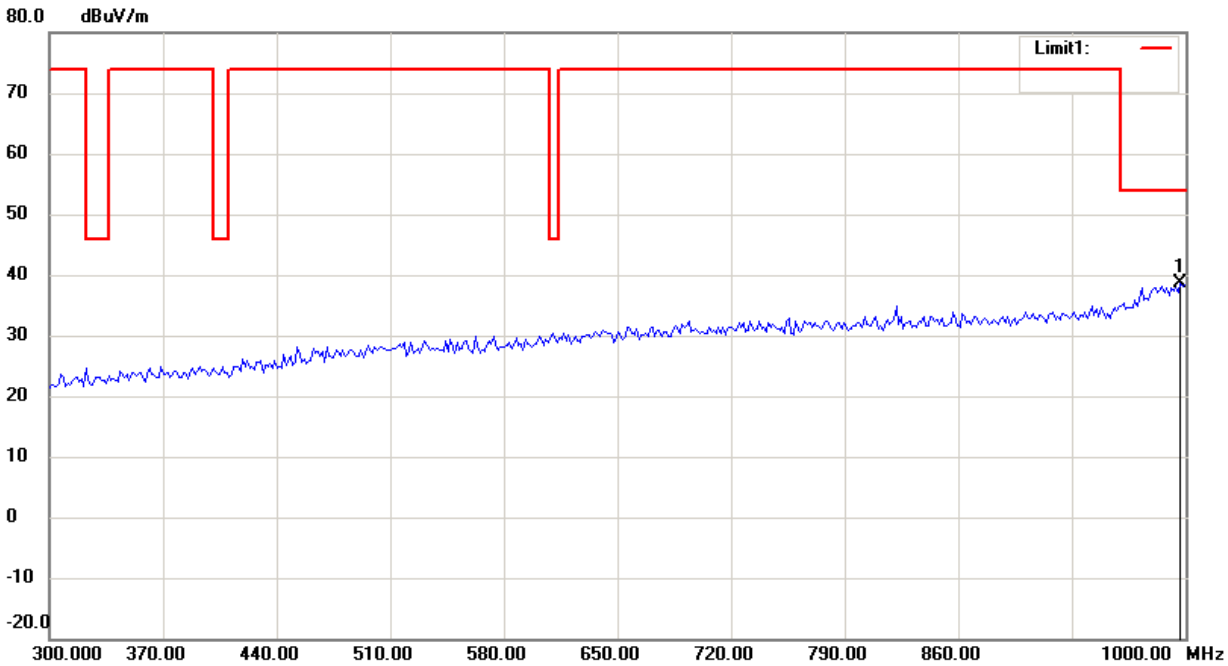
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

Antenna Polarization V





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

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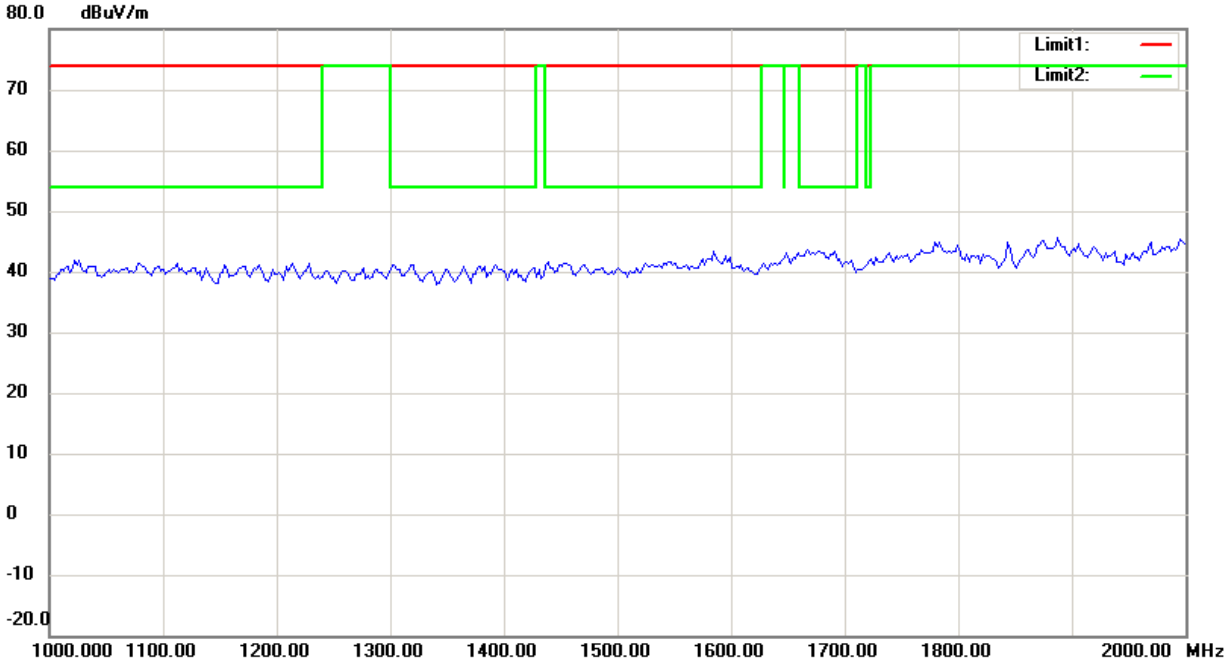

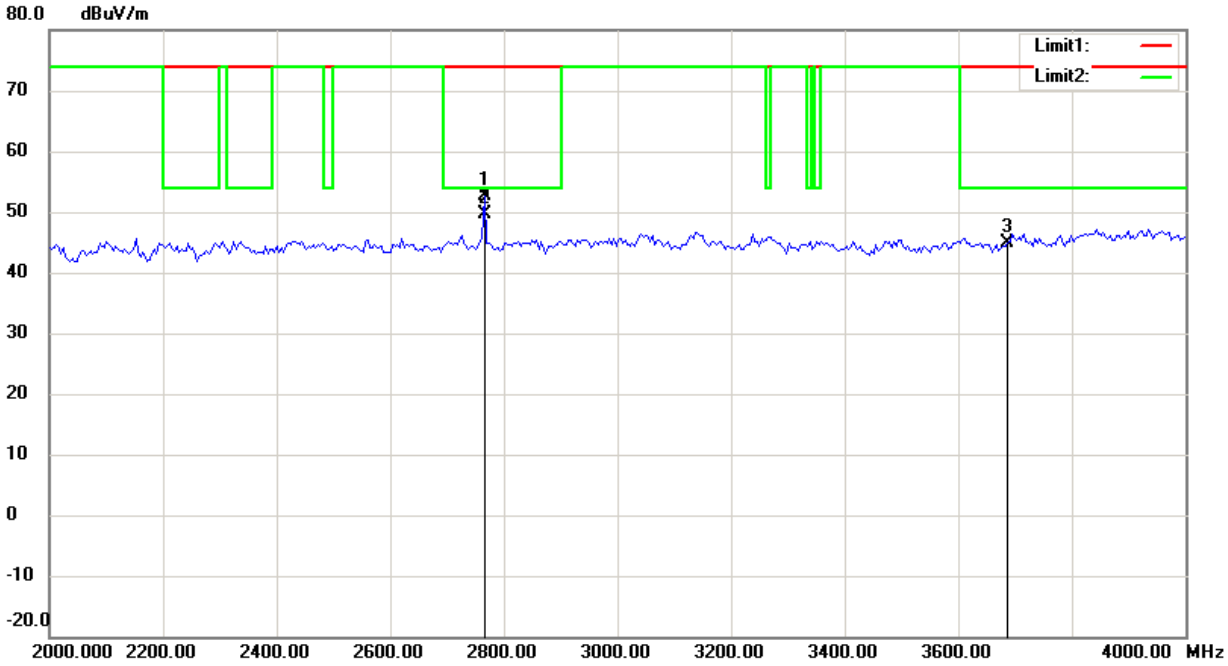

Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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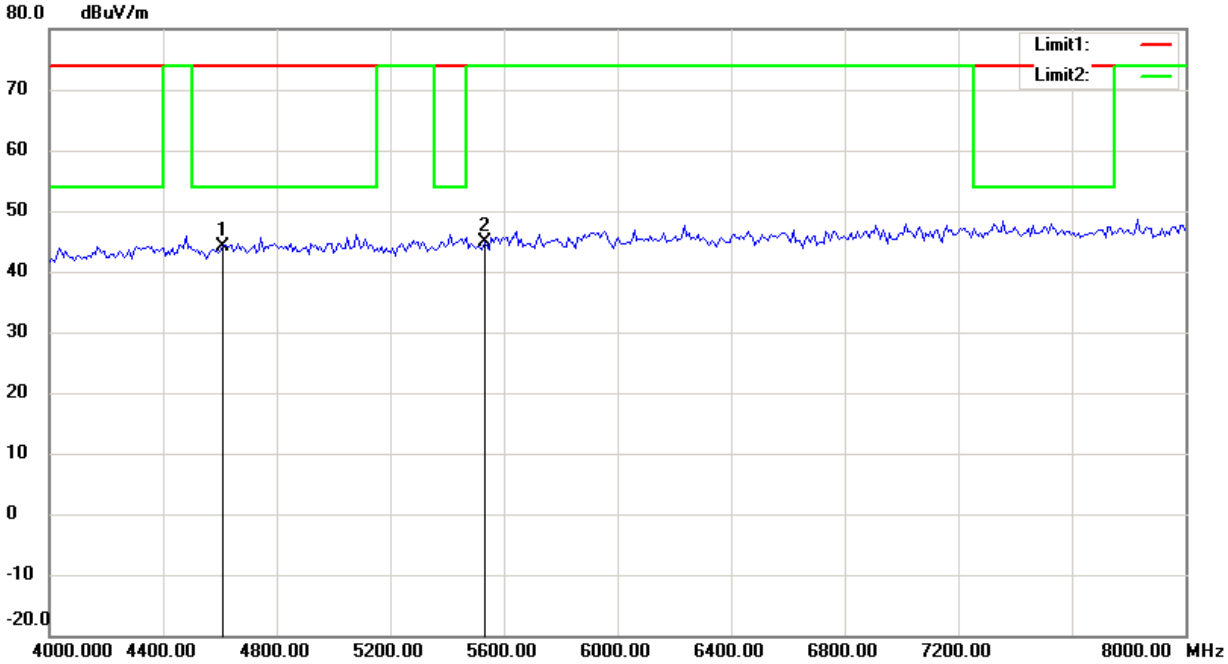

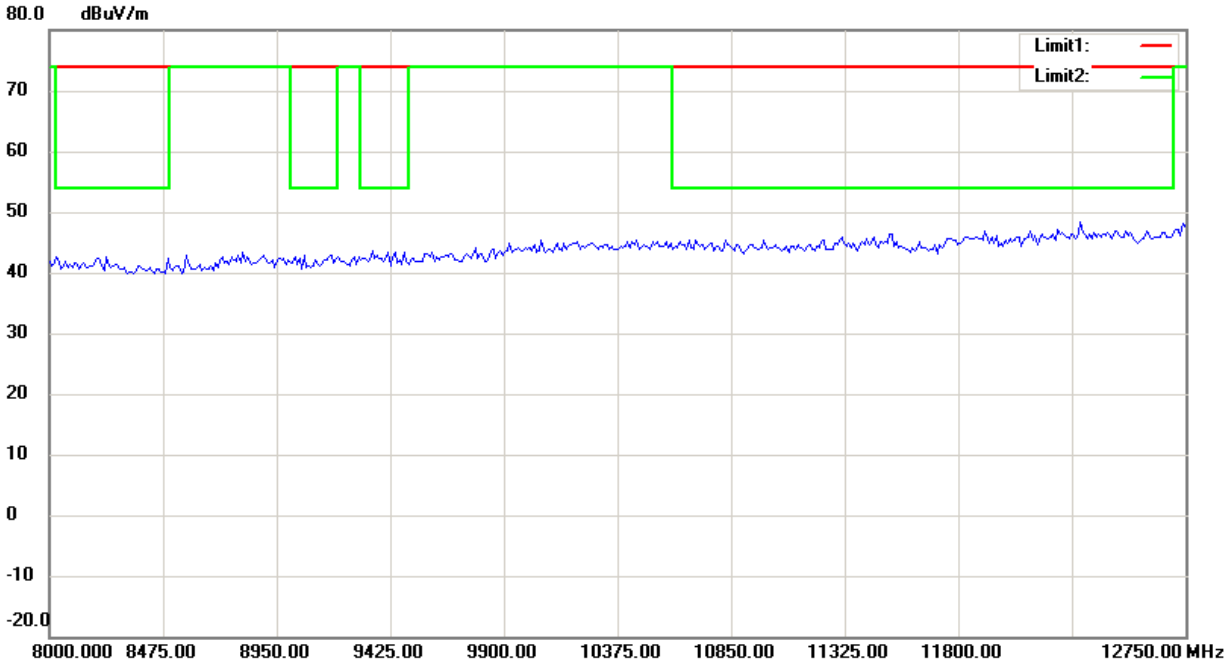

Up Line: Peak Limit Line Down Line: Ave Limit Line
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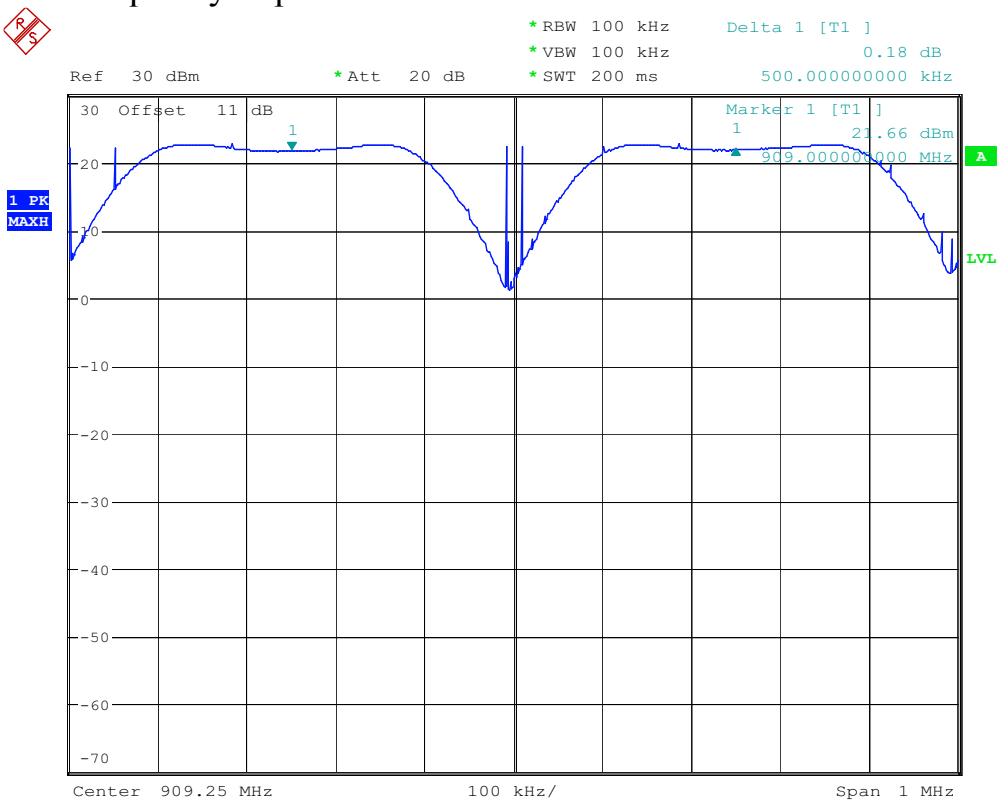
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

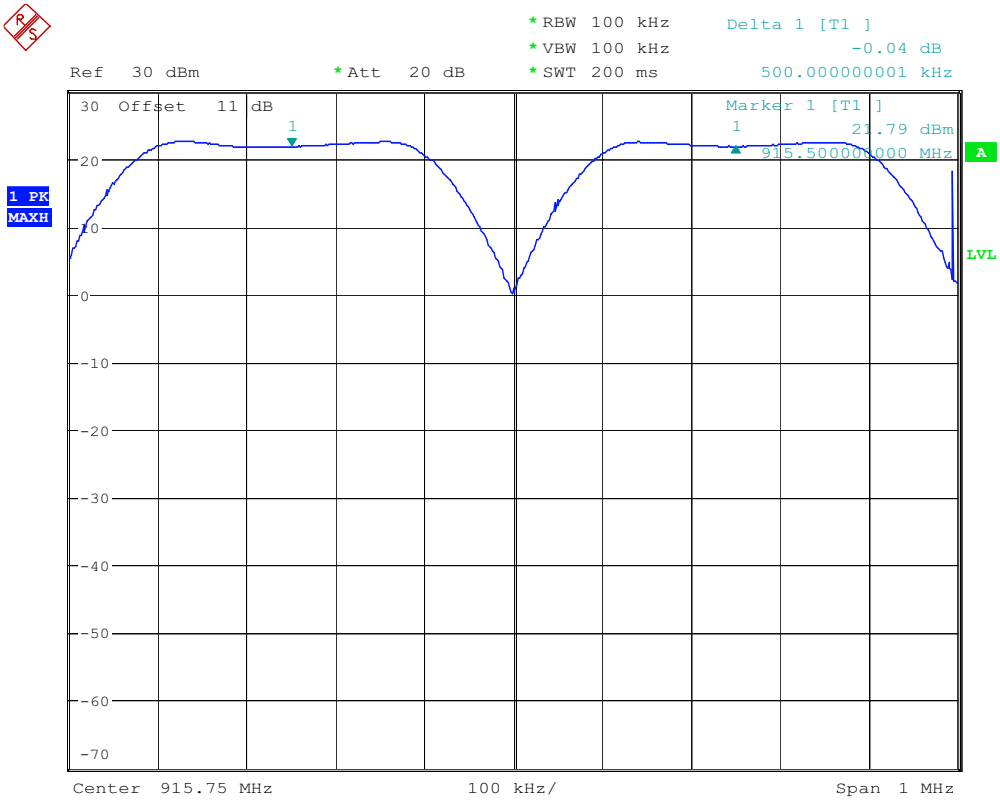
Carrier Frequency Separation



FREQUENCY SEPARATION 909MHz

Date: 18.JUN.2010 15:47:48

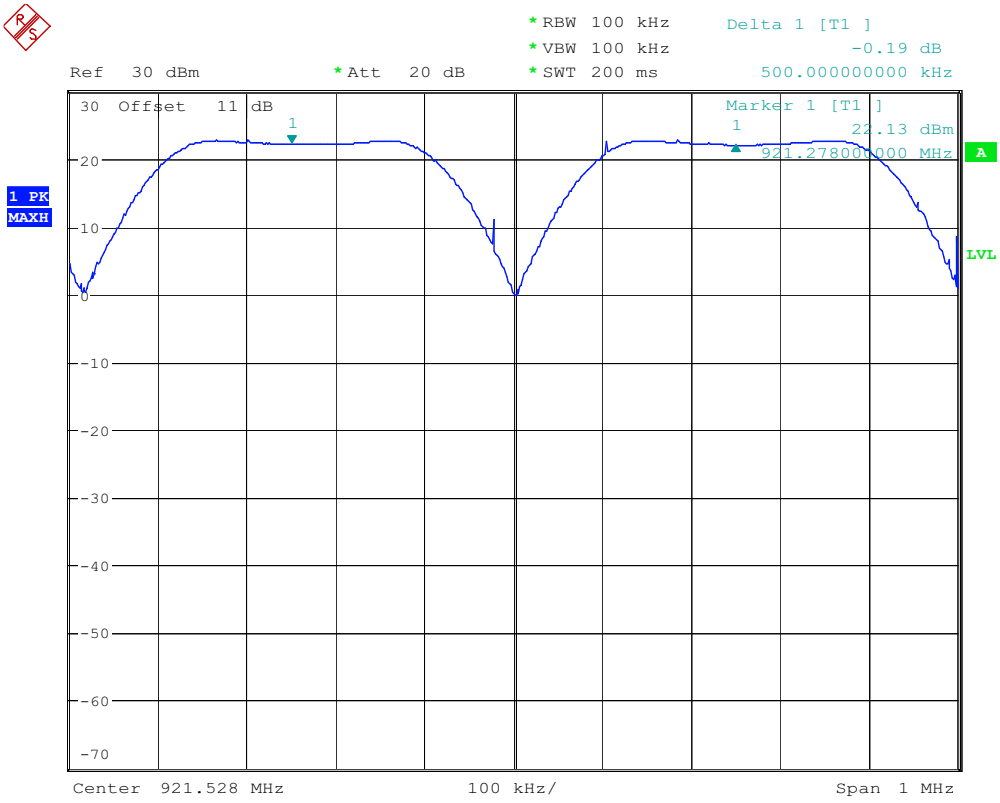
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39



FREQUENCY SEPARATION 915.5MHz

Date: 18.JUN.2010 15:49:07

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

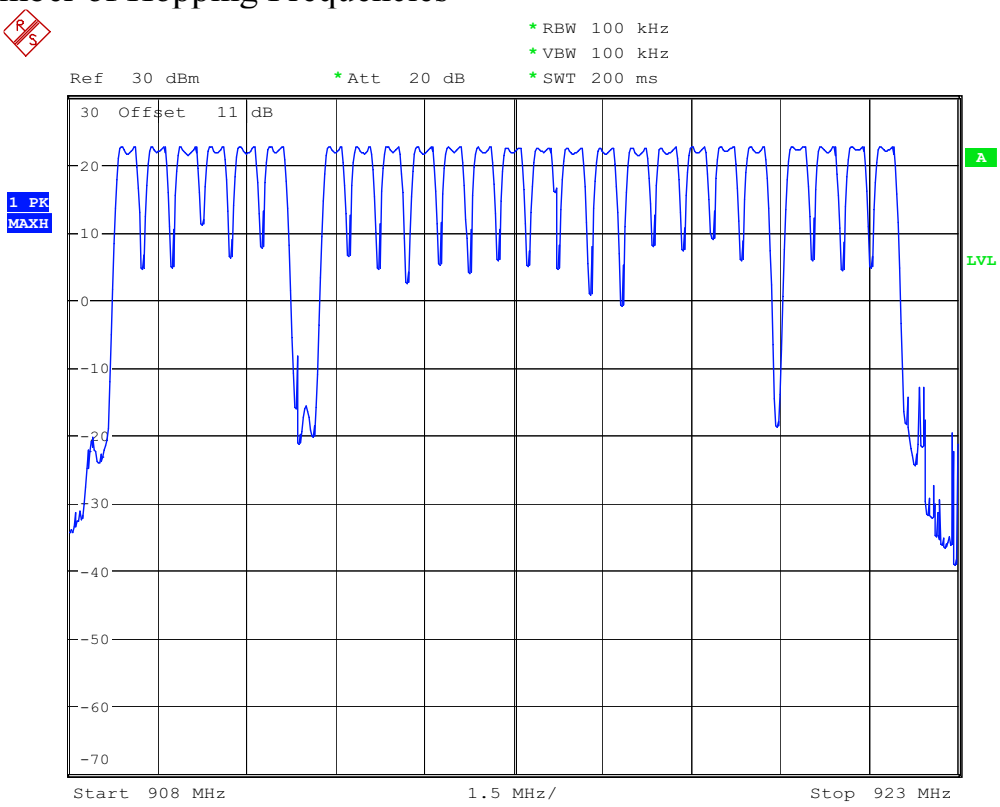


FREQUENCY SEPARATION 921.778MHz

Date: 18.JUN.2010 15:49:58

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

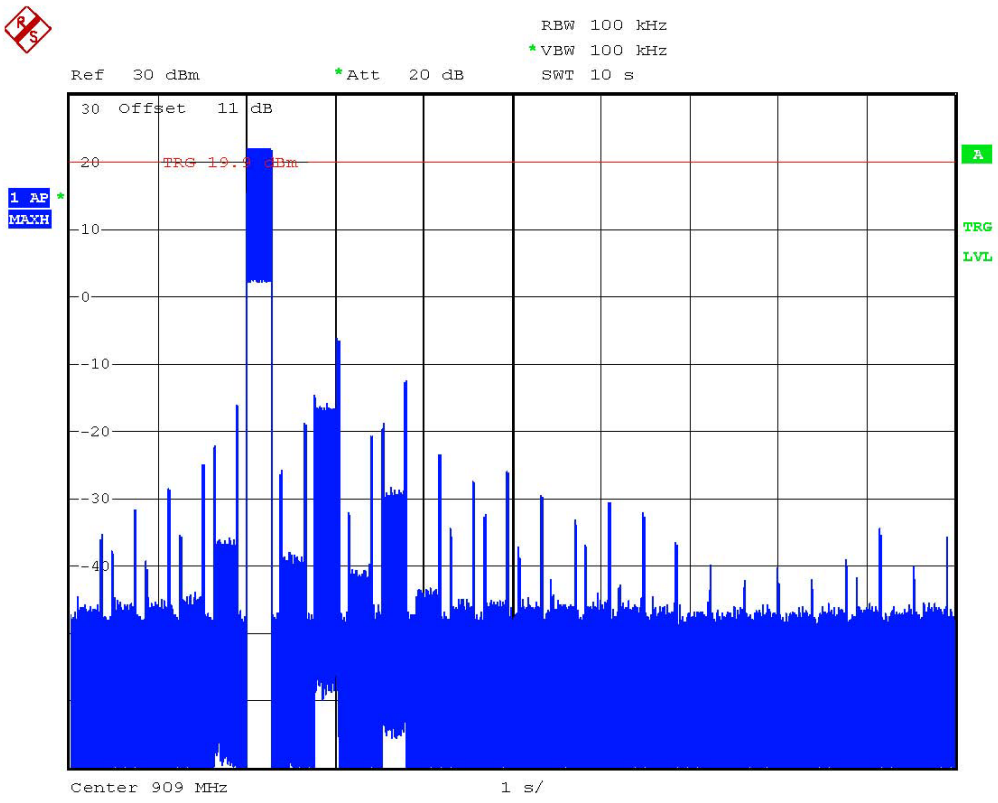
Number of Hopping Frequencies



NUMBER OF HOPPING

Date: 18.JUN.2010 15:57:28

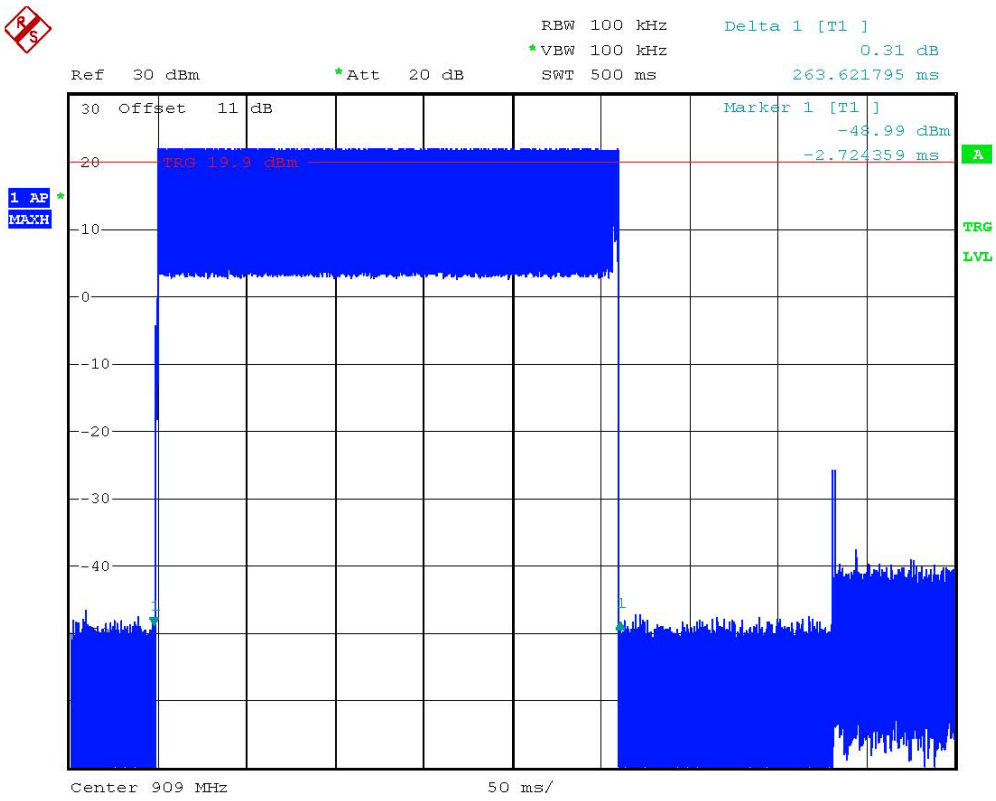
Time of Occupancy (Dwell Time)



DWELL TIME 909MHz (263.621ms * 1event = 263.621ms)

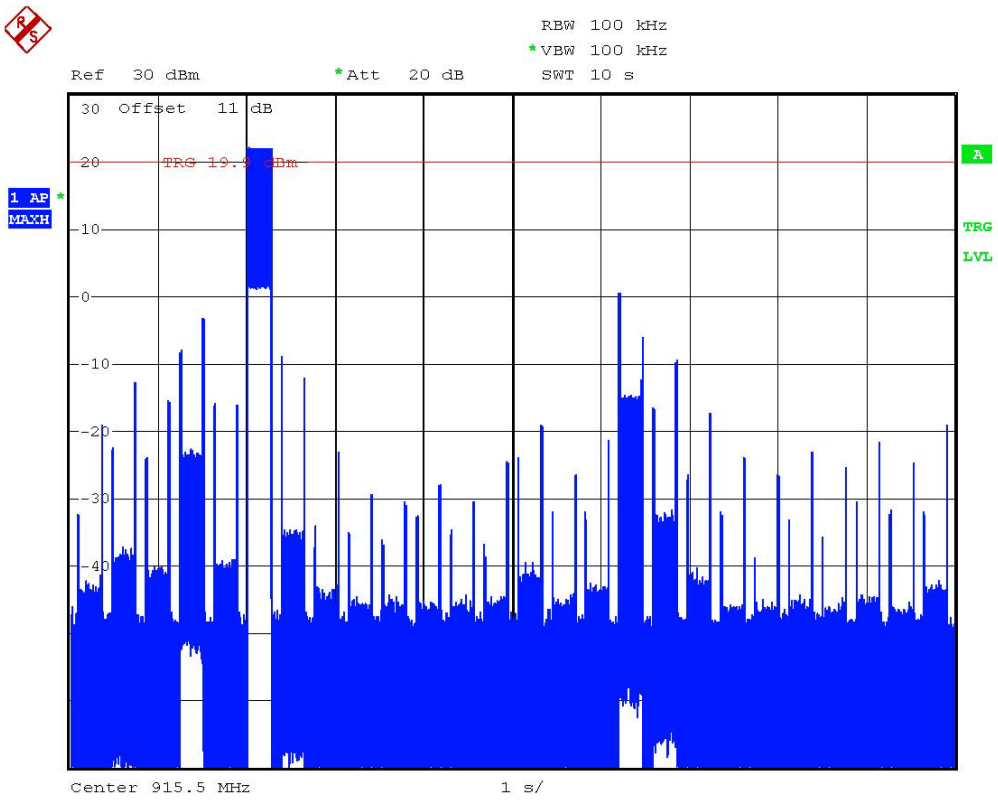
Date: 18.JUN.2010 15:59:56

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39



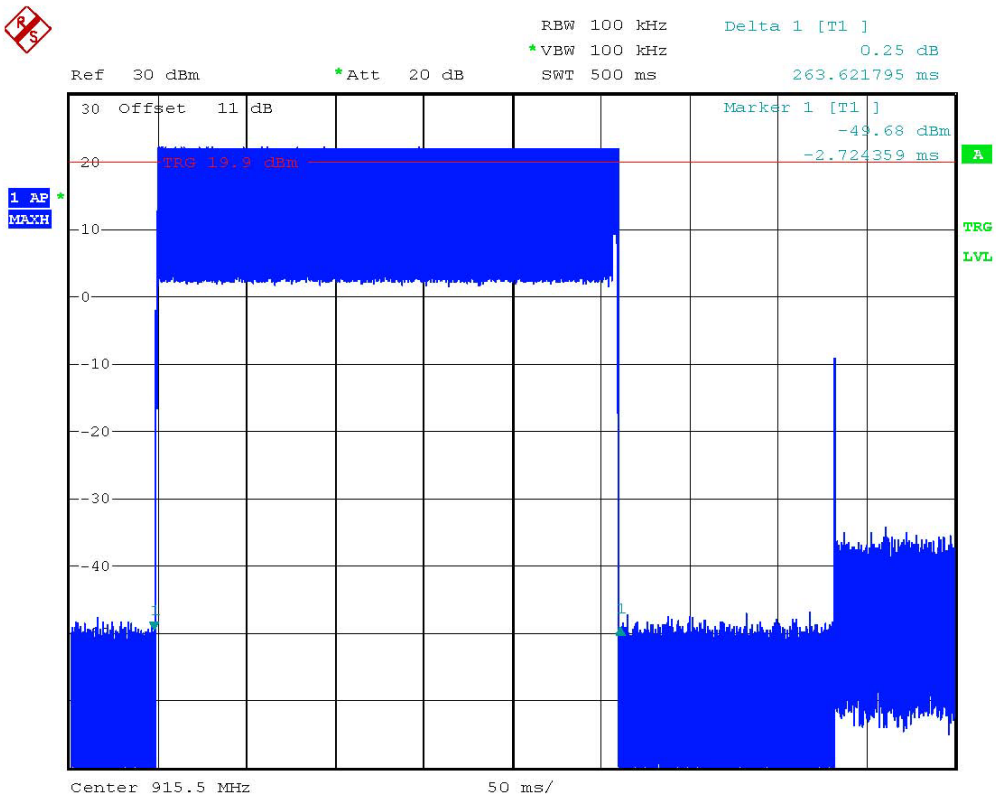
DWELL TIME 909MHz
Date: 18.JUN.2010 16:04:56

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

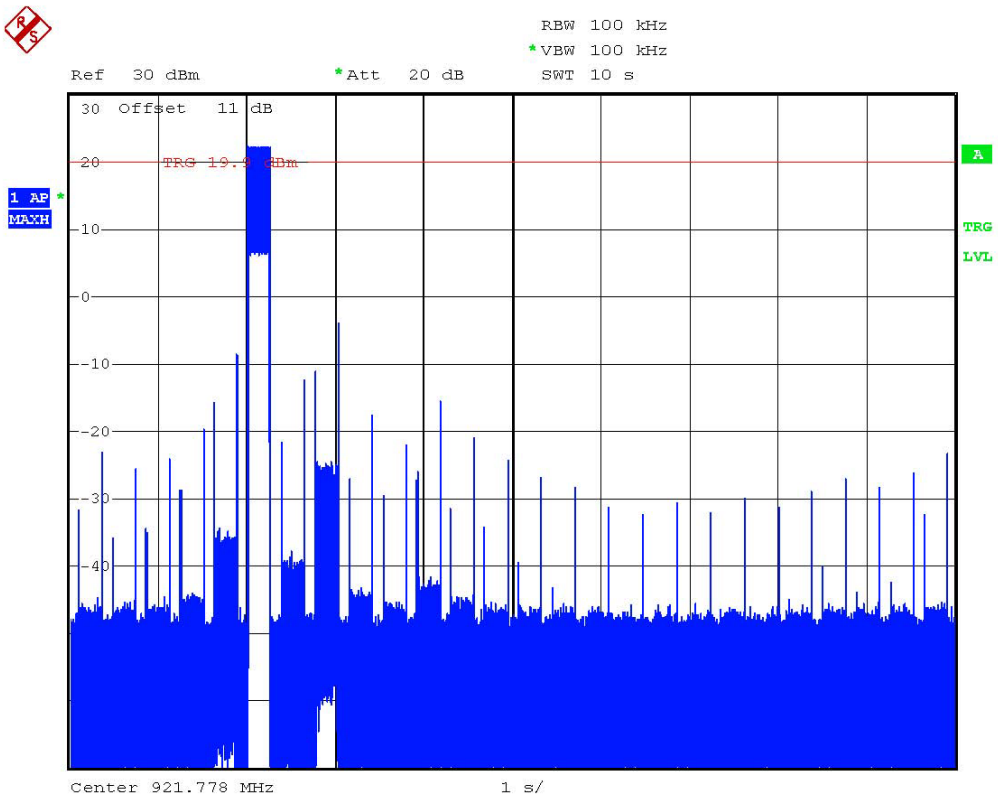


DWELL TIME 915.5MHz (263.621ms * 1event = 263.621ms)
Date: 18.JUN.2010 16:01:10

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39



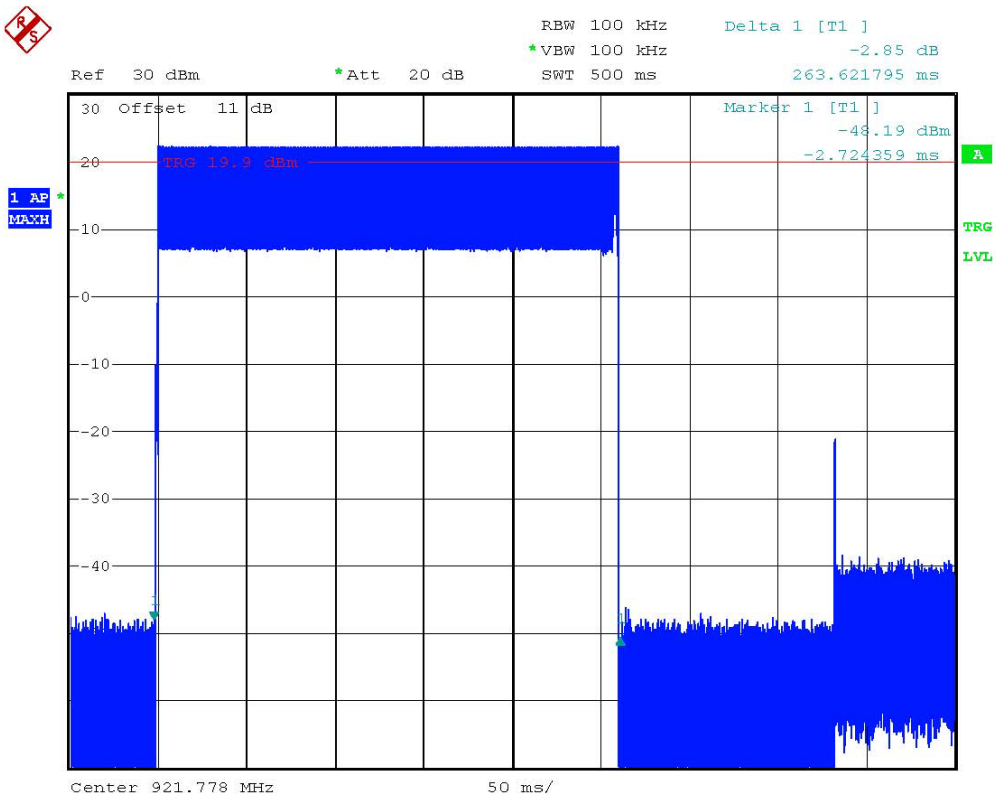
DWELL TIME 915.5MHz
Date: 18.JUN.2010 16:04:16



DWELL TIME 921.778MHz (263.621ms * 1event = 263.621ms)

Date: 18.JUN.2010 16:02:08

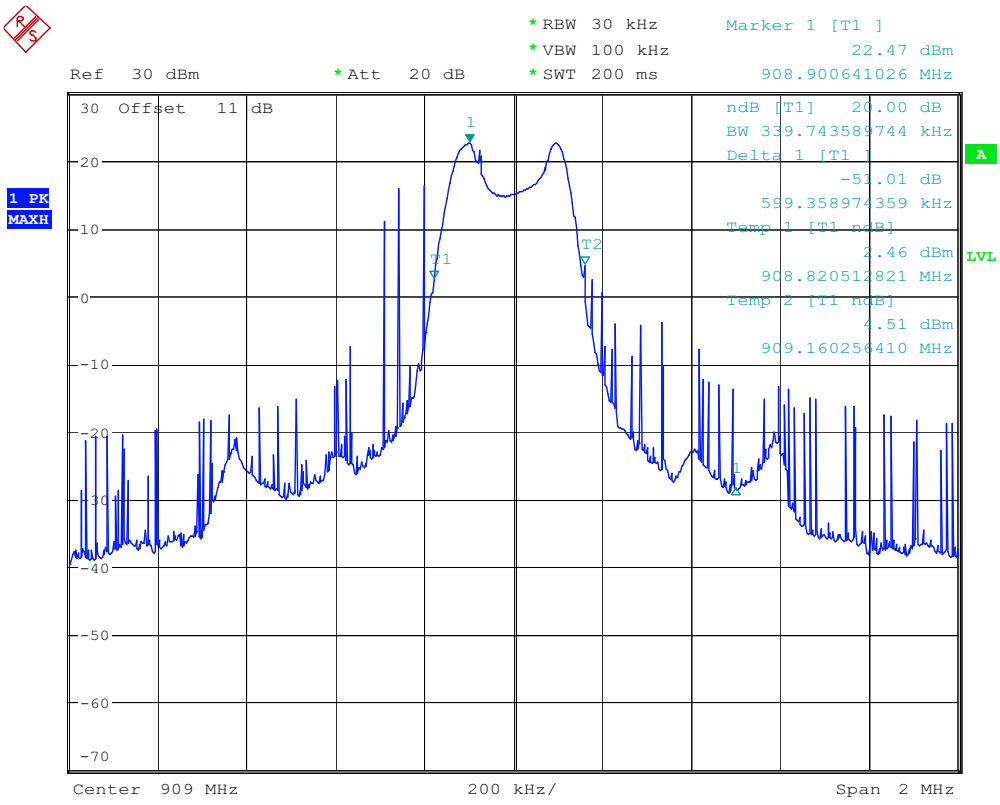
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39



DWELL TIME 921.778MHz
Date: 18.JUN.2010 16:03:44

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

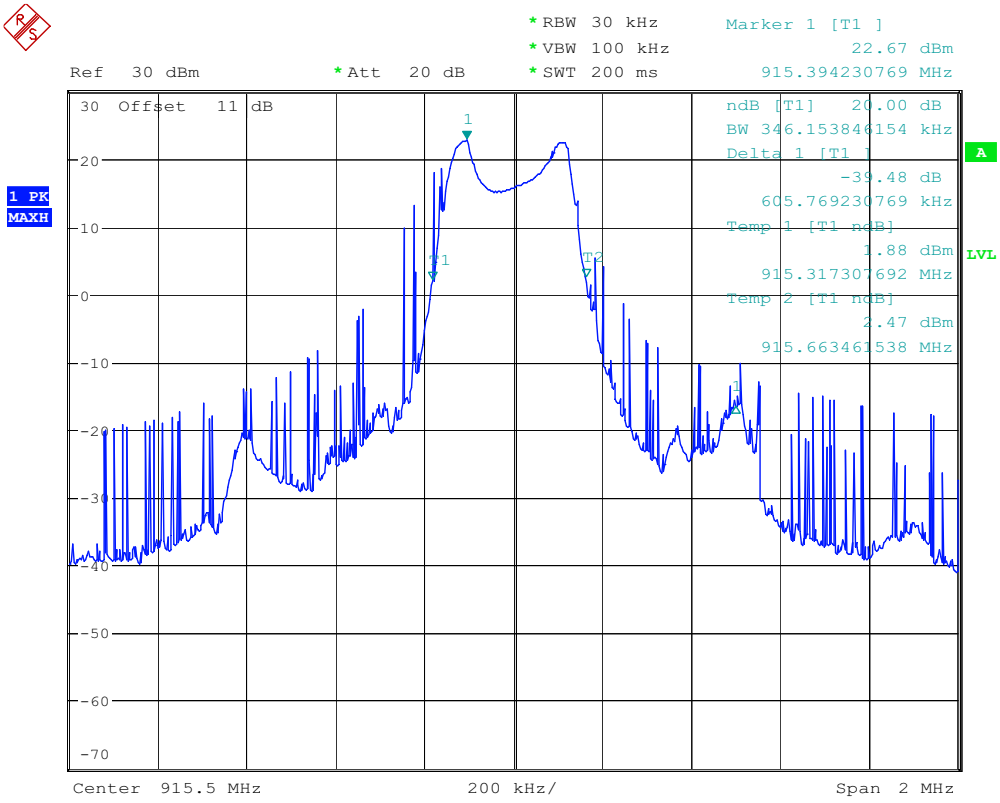
20dB Bandwidth



20DB BANDWIDTH 909MHz

Date: 17.JUN.2010 12:35:20

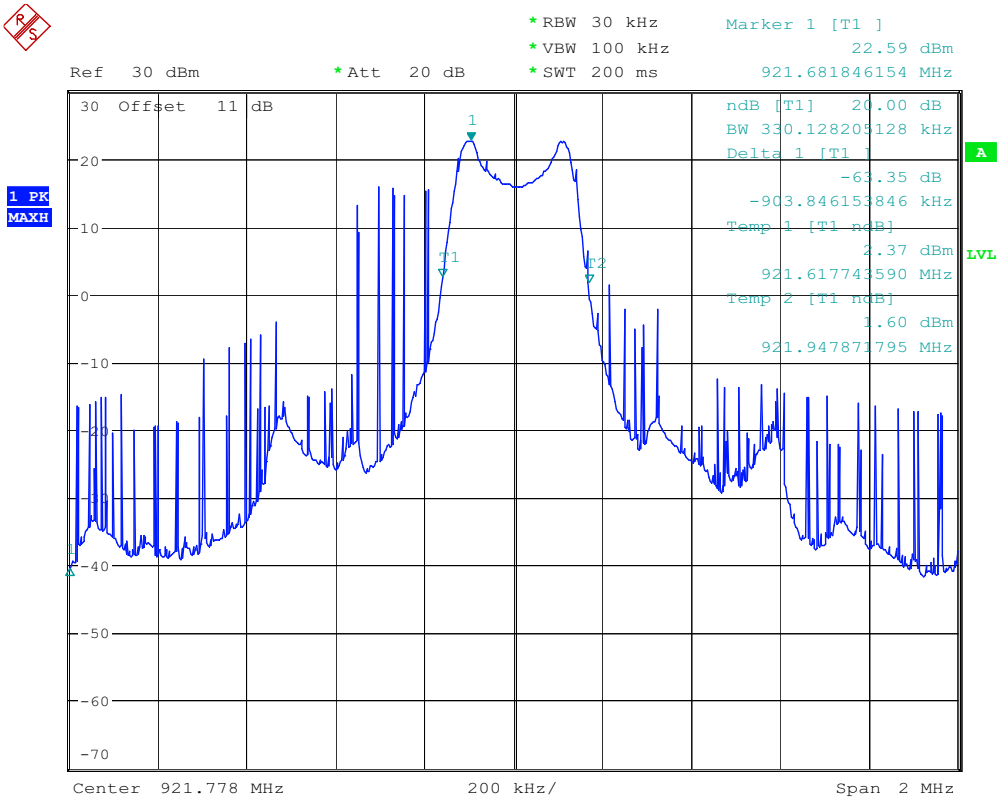
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39



20DB BANDWIDTH 915.5MHz

Date: 17.JUN.2010 12:39:52

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

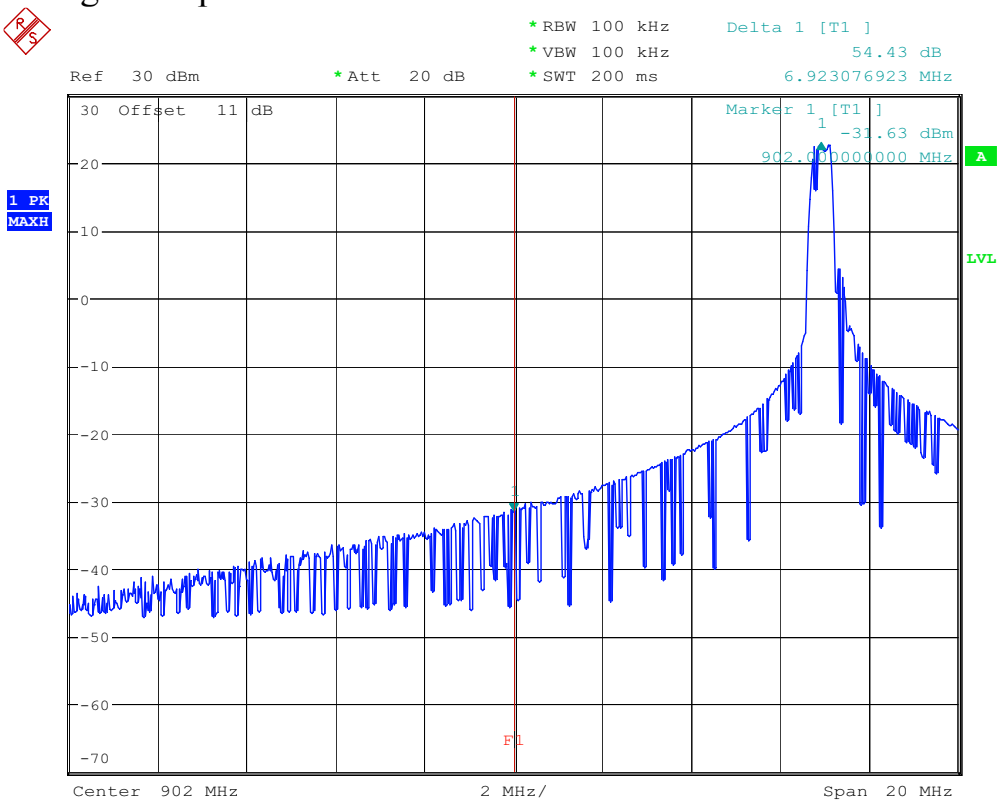


20DB BANDWIDTH 921.778MHz

Date: 17.JUN.2010 12:39:01

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

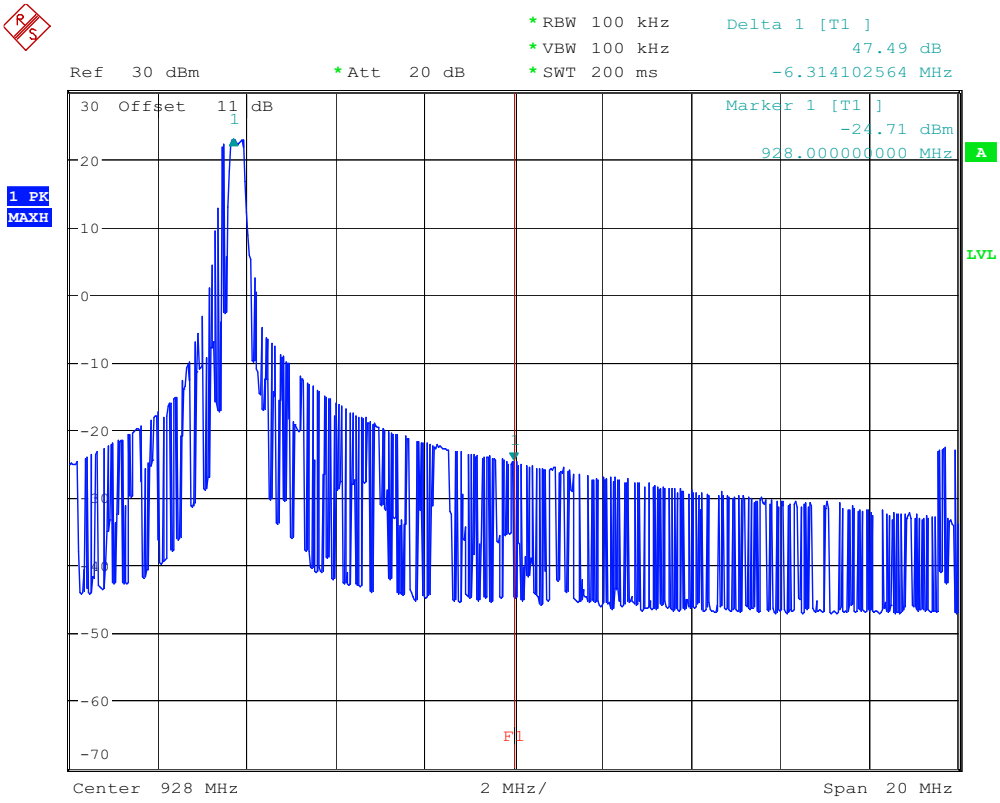
Band-edge Compliance of RF Conducted Emissions



BAND EDGE 909MHz

Date: 18.JUN.2010 15:31:15

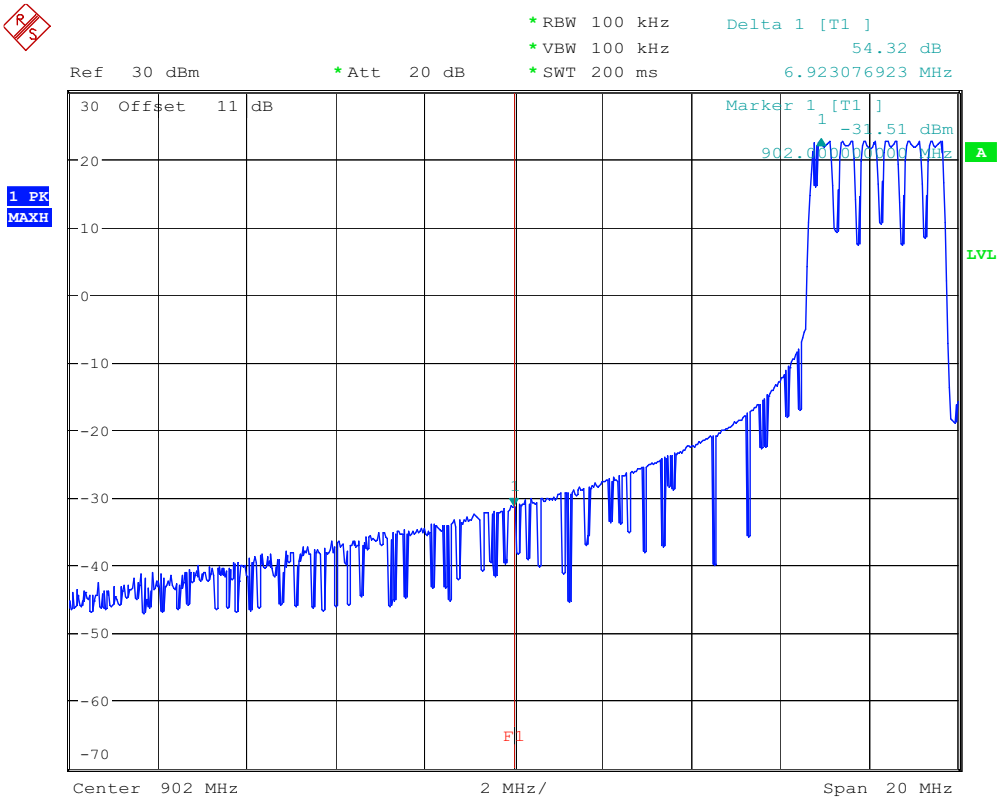
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39



BAND EDGE 921.778MHz

Date: 18.JUN.2010 15:42:50

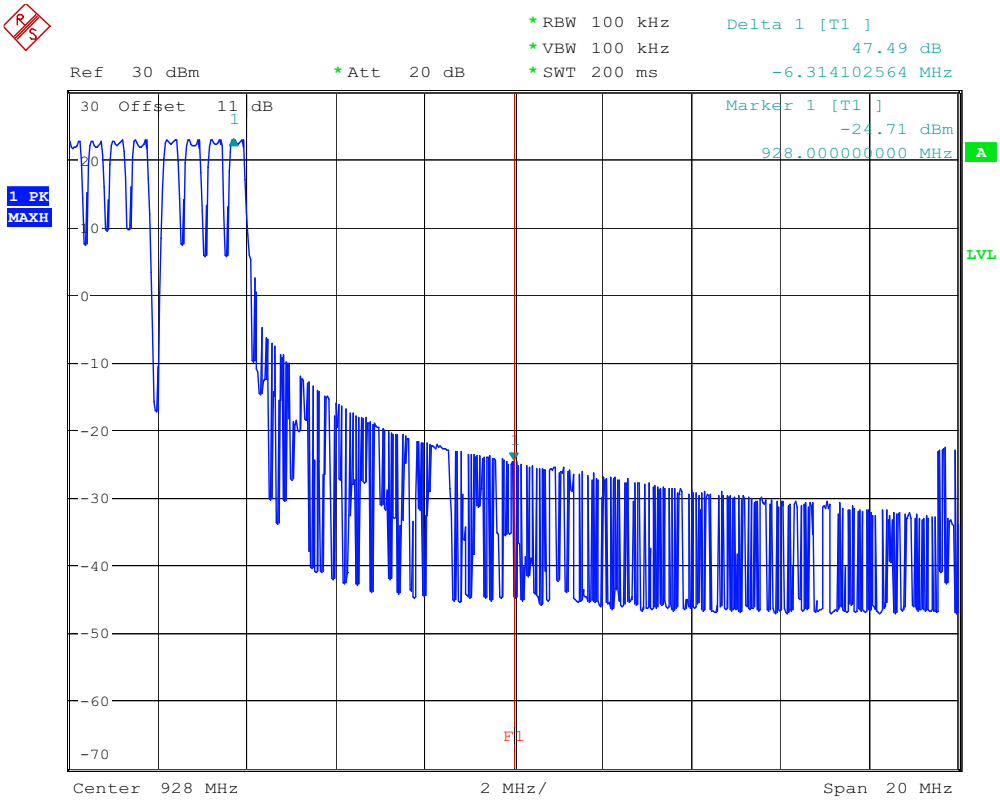
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39



BAND EDGE HOPPING MODE 909MHz

Date: 18.JUN.2010 15:34:50

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

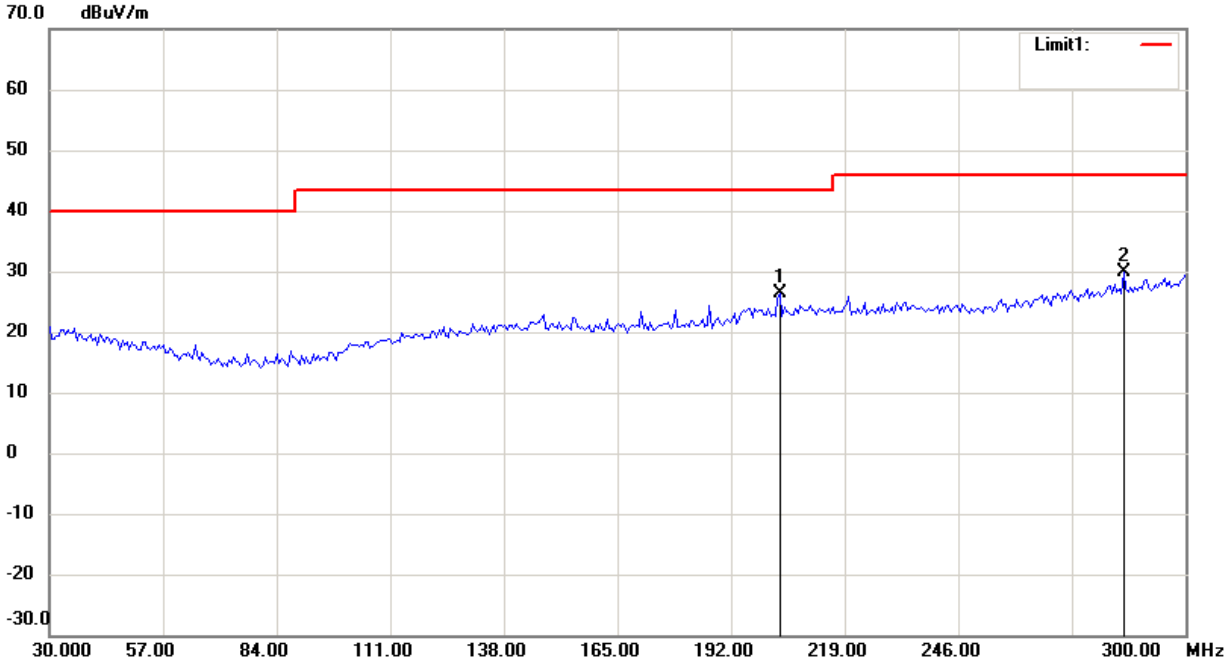


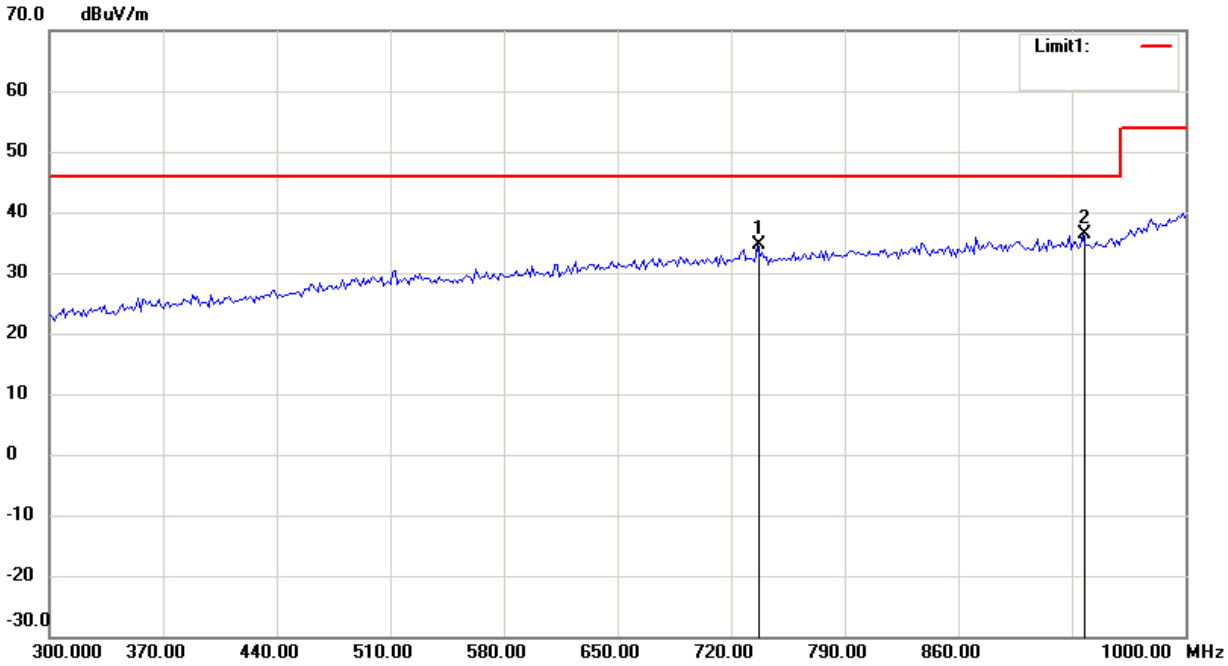
BAND EDGE HOPPING MODE 921.778MHz

Date: 18.JUN.2010 15:43:52

Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

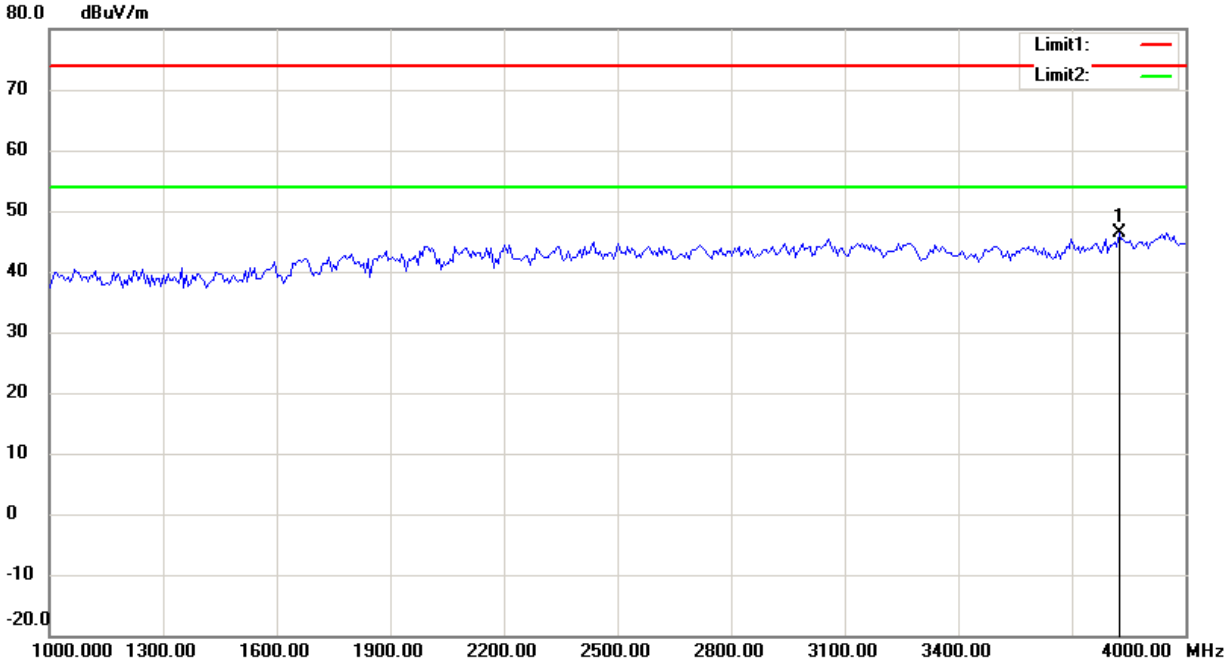
Radiated Emissions from Receiver Section of Transceiver
ch 1
Antenna Polarization H

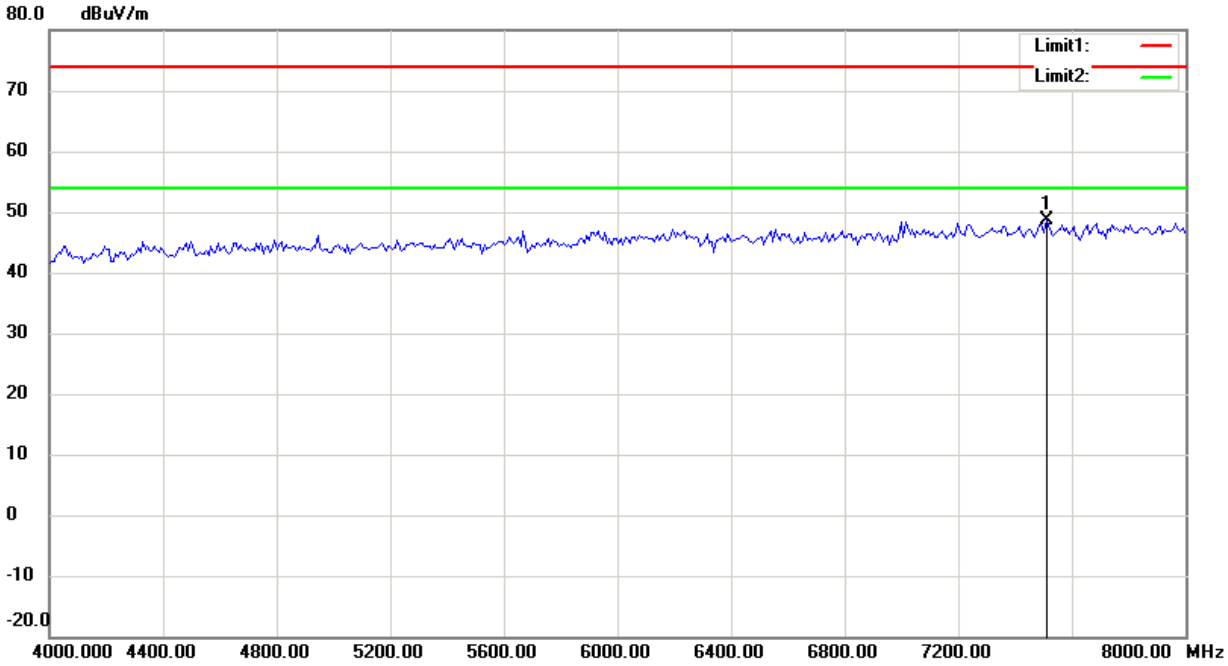




Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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.**



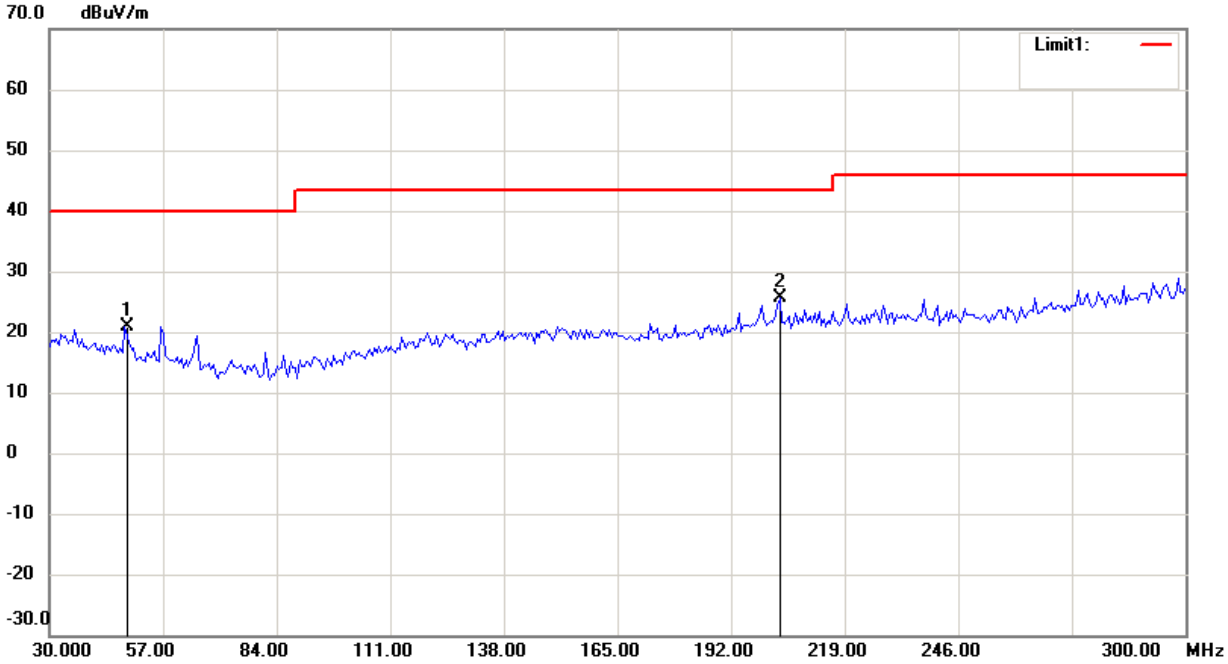


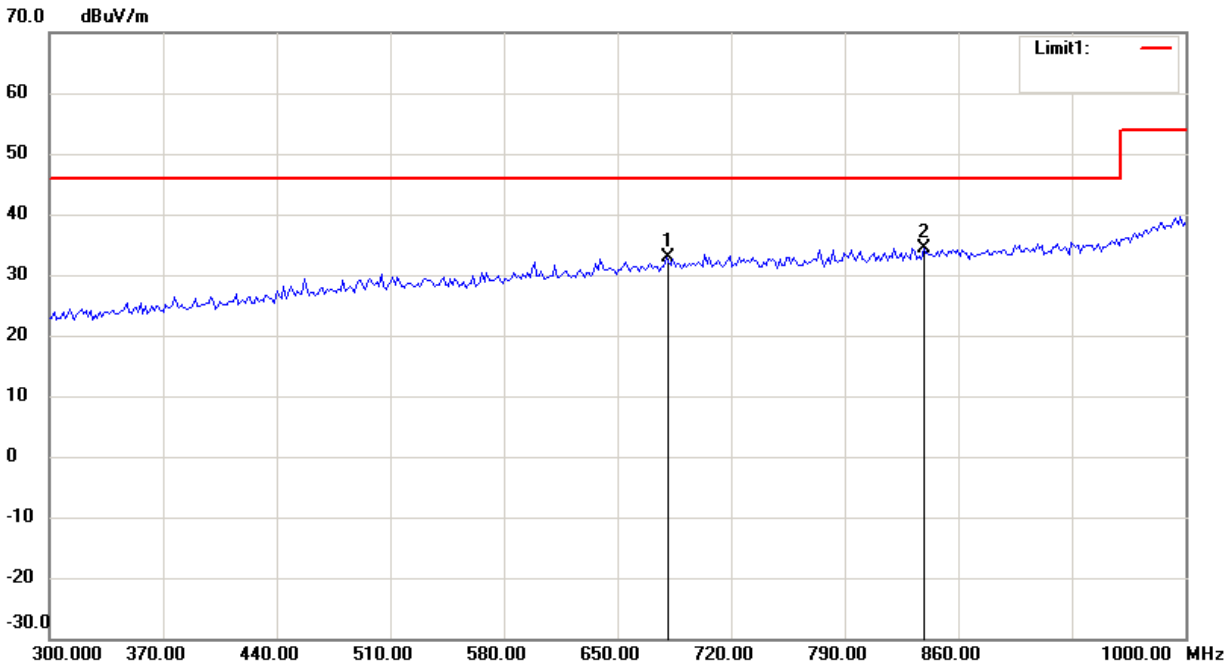
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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: W6M21005-10675-P-15
FCC ID: H5OTR39

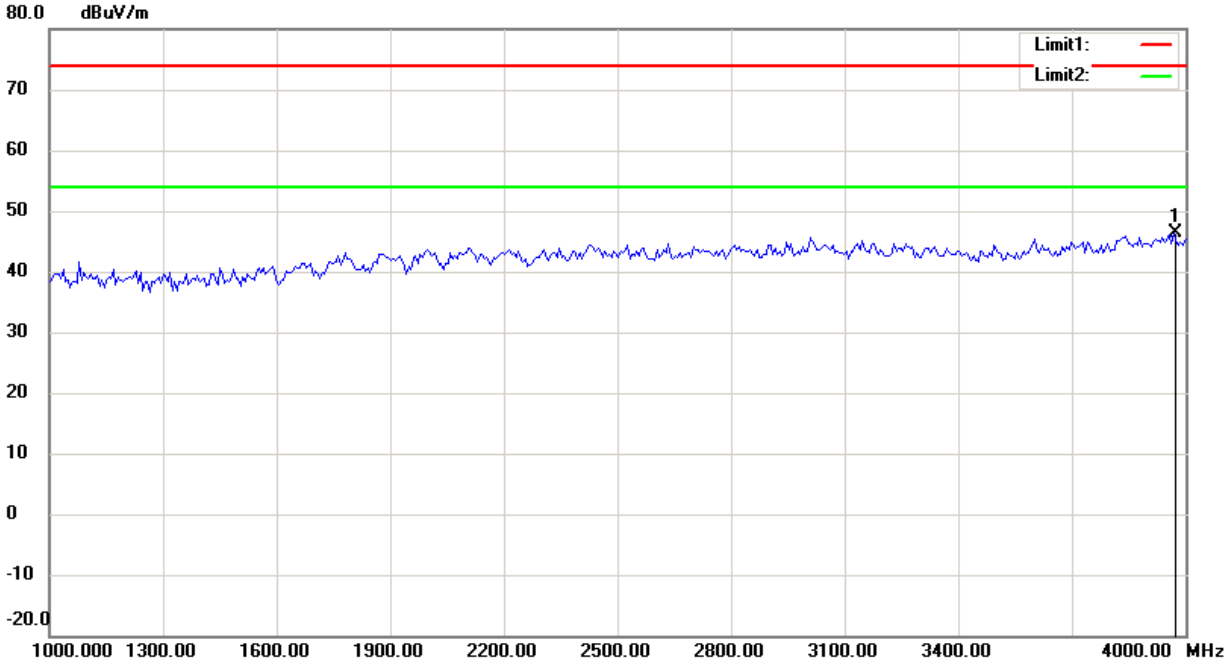
Antenna Polarization V

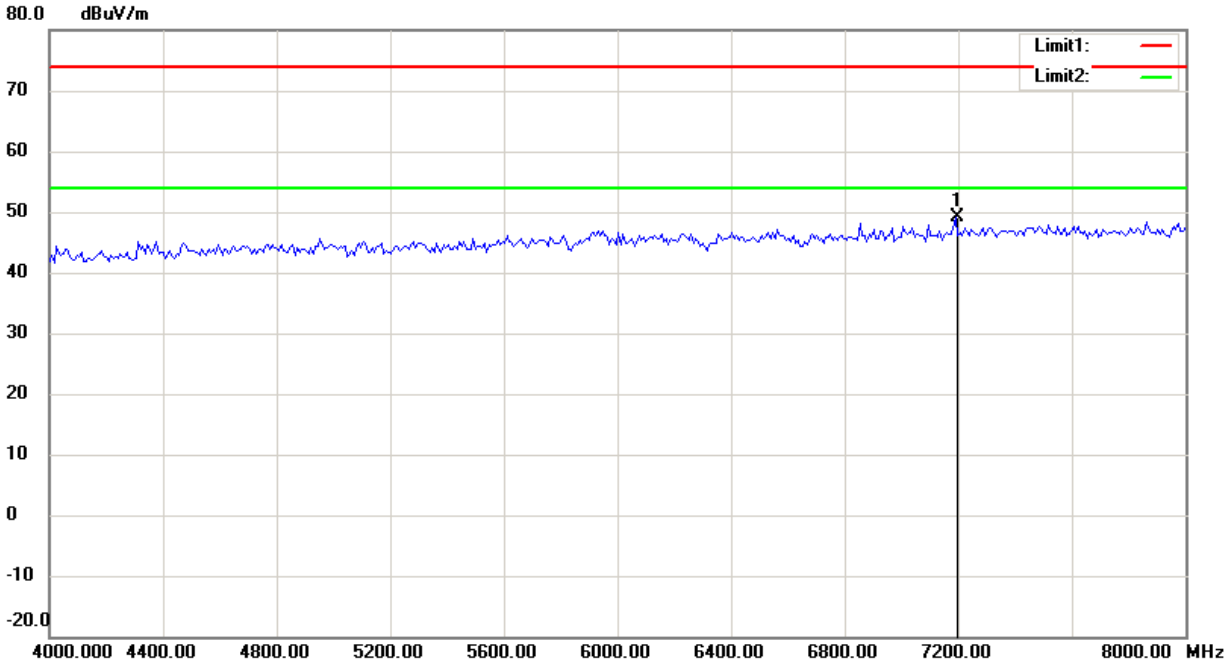




Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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.**





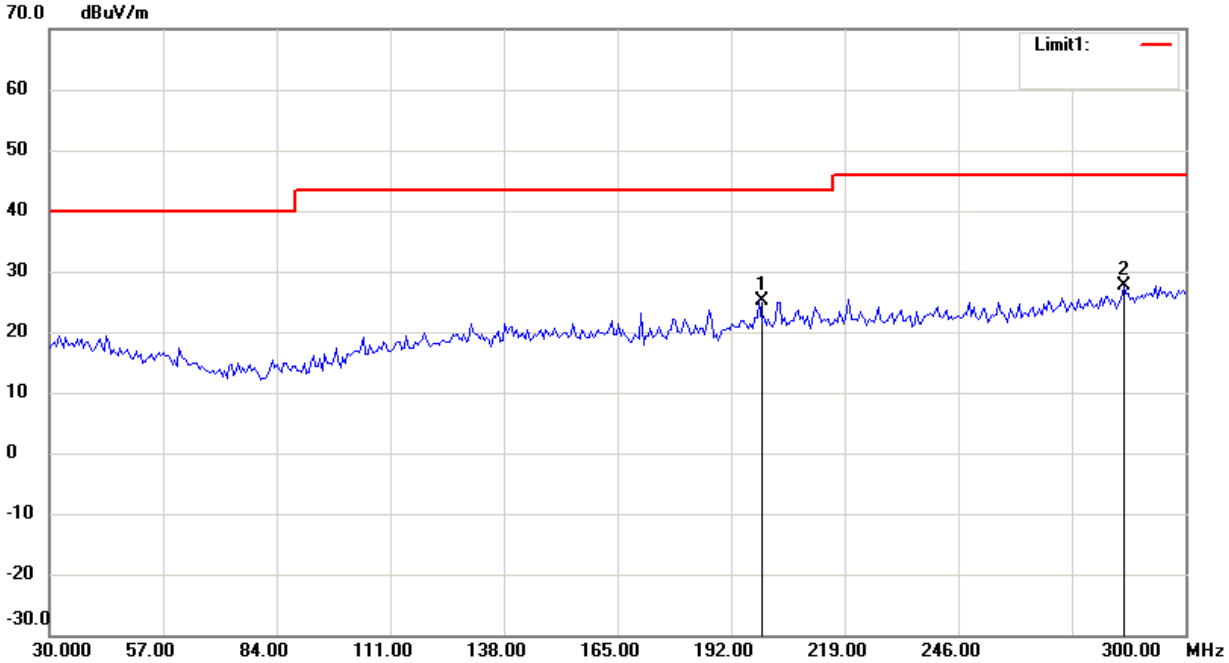
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

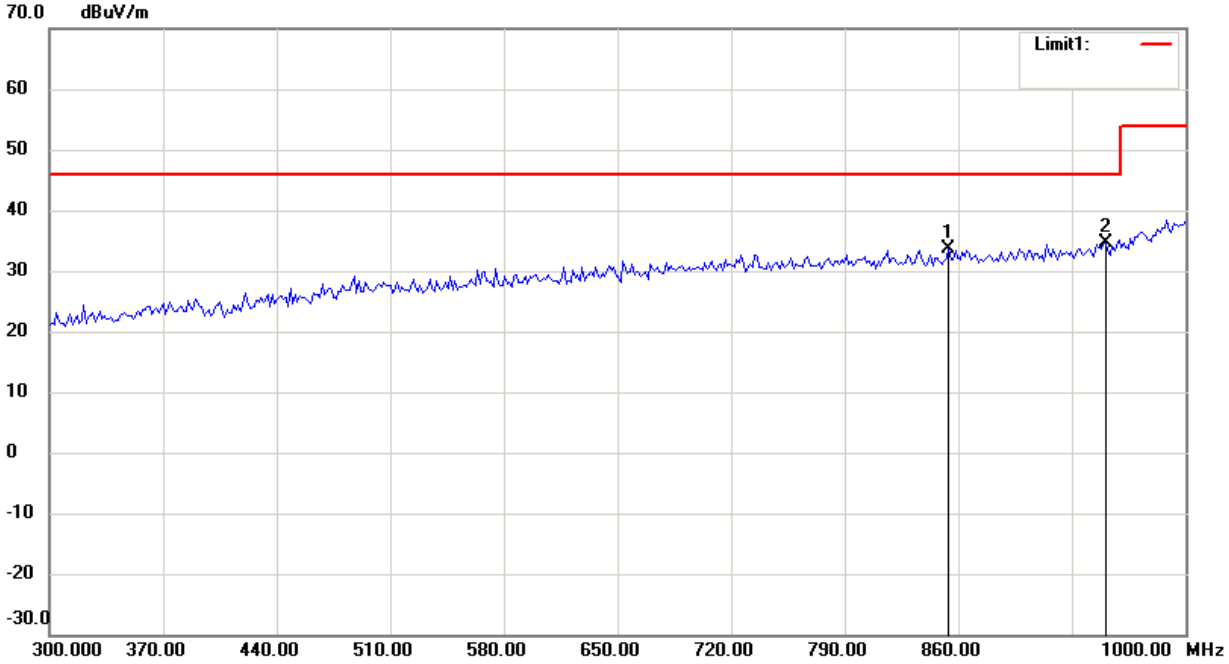
1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the 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: W6M21005-10675-P-15
FCC ID: H5OTR39

ch 13

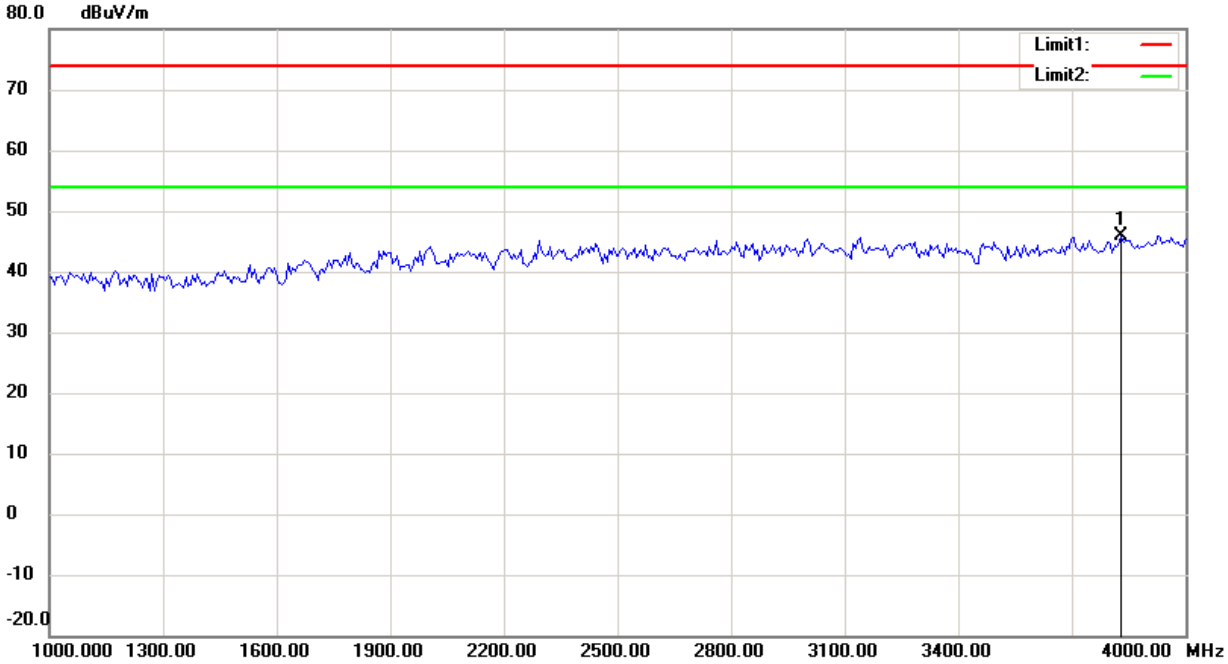
Antenna Polarization H

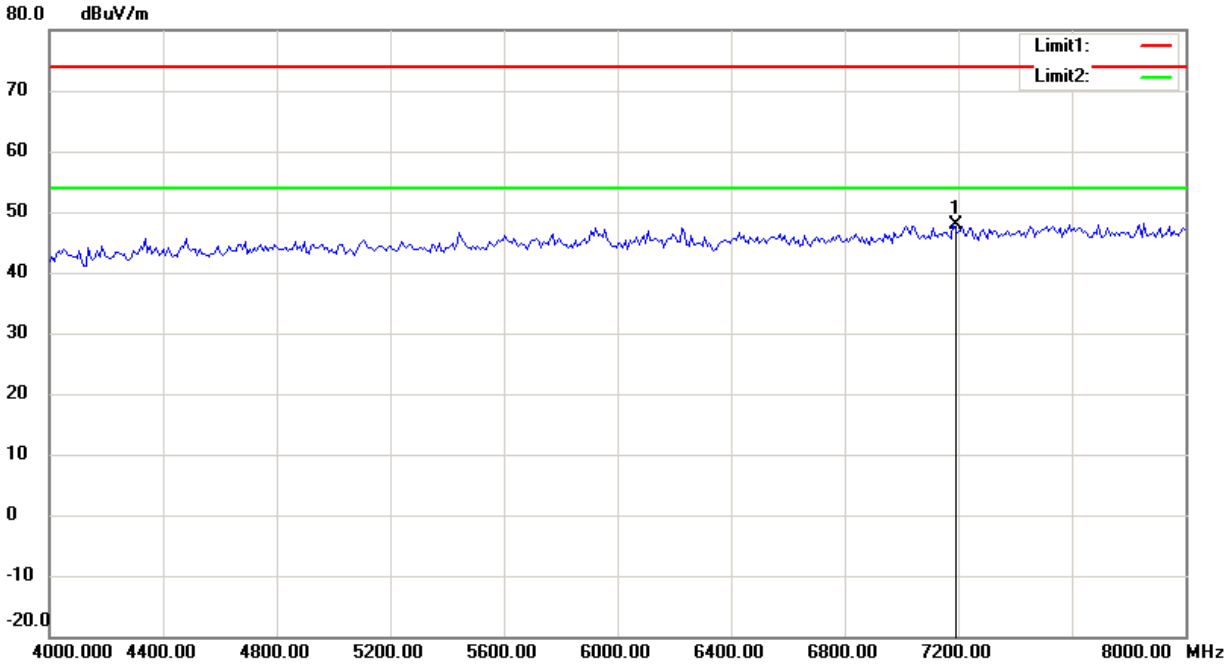




Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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.**



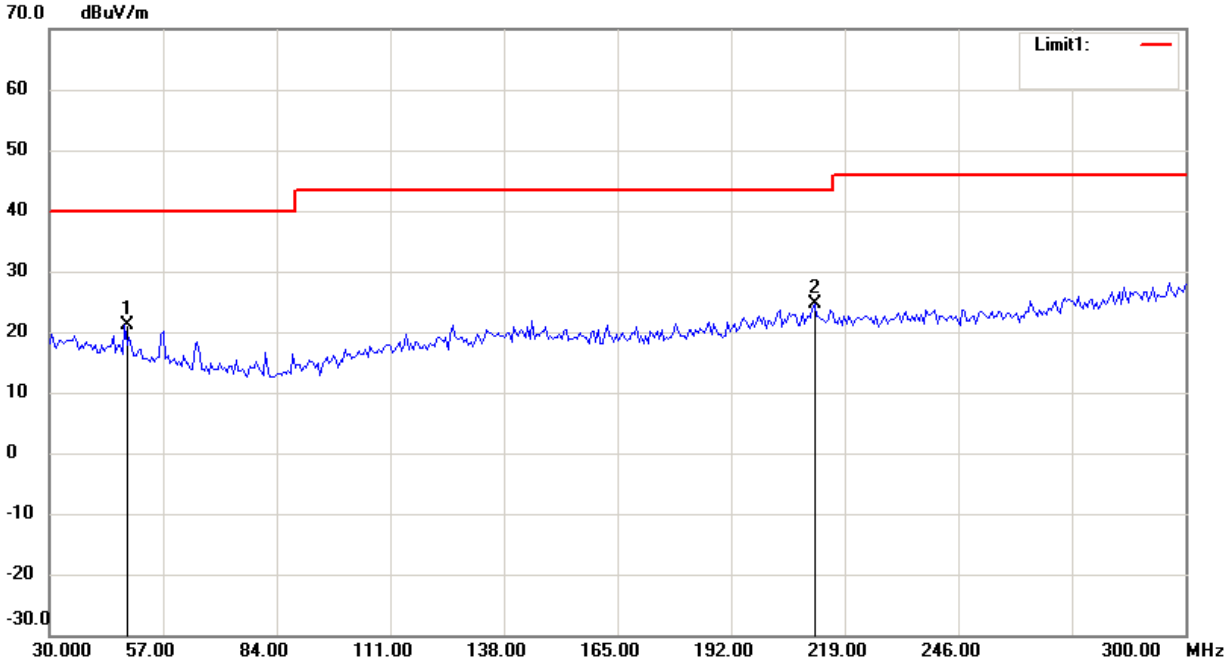


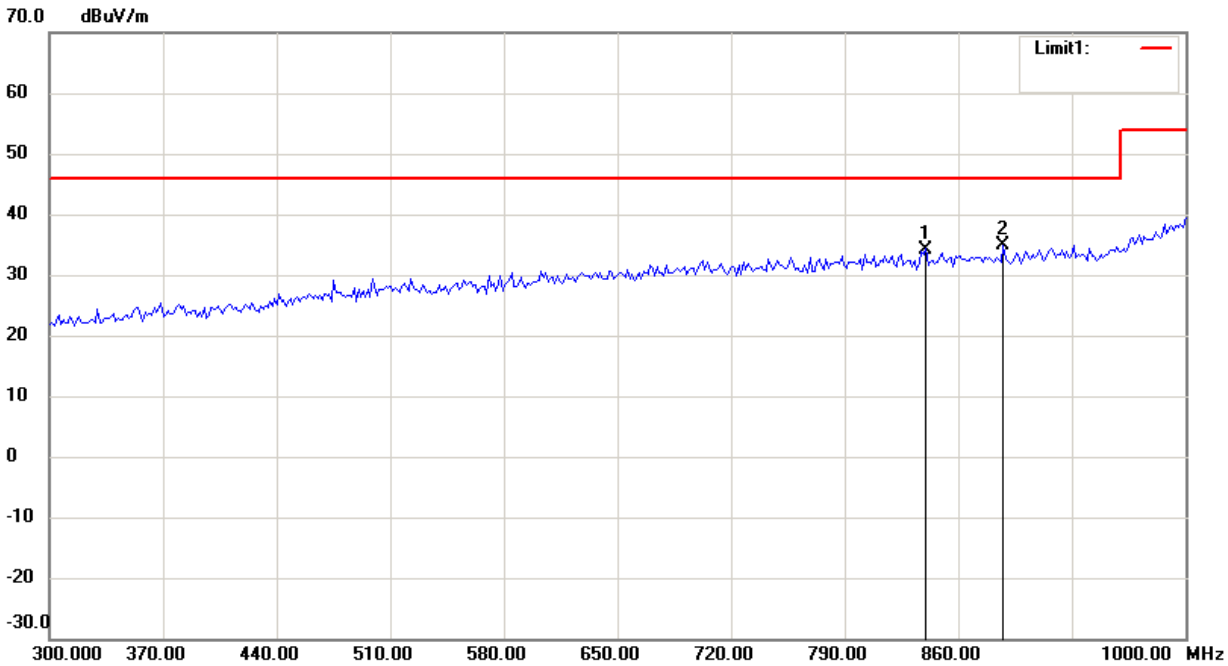
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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: W6M21005-10675-P-15
FCC ID: H5OTR39

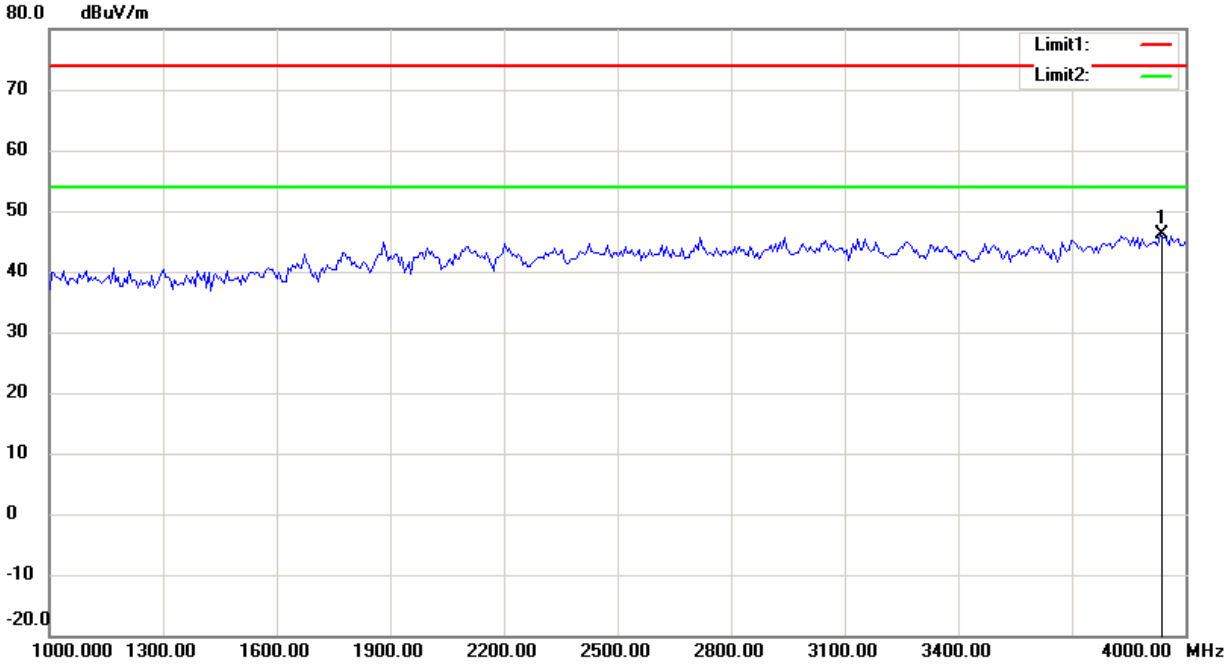
Antenna Polarization V

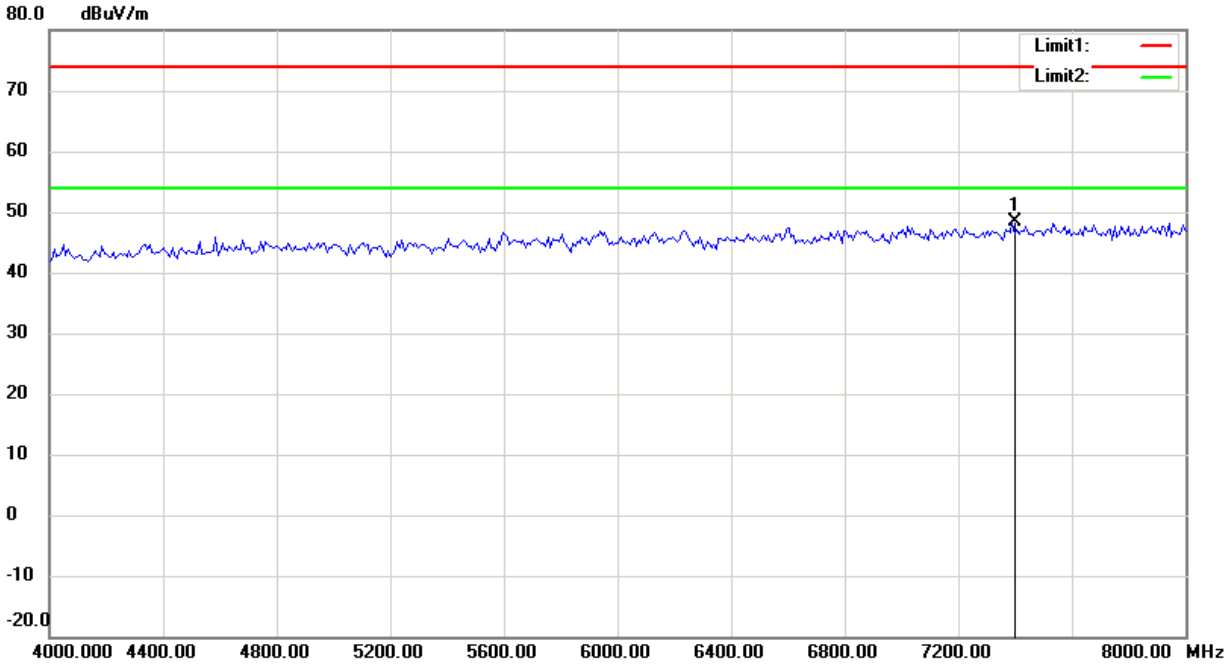




Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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.**





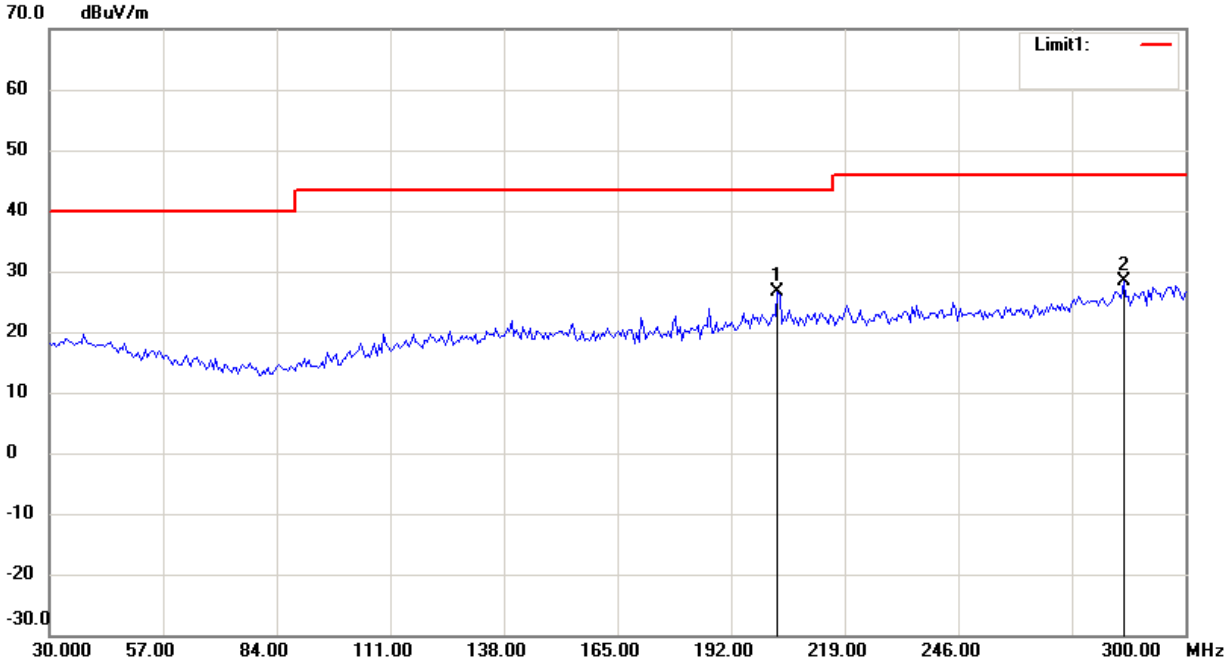
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

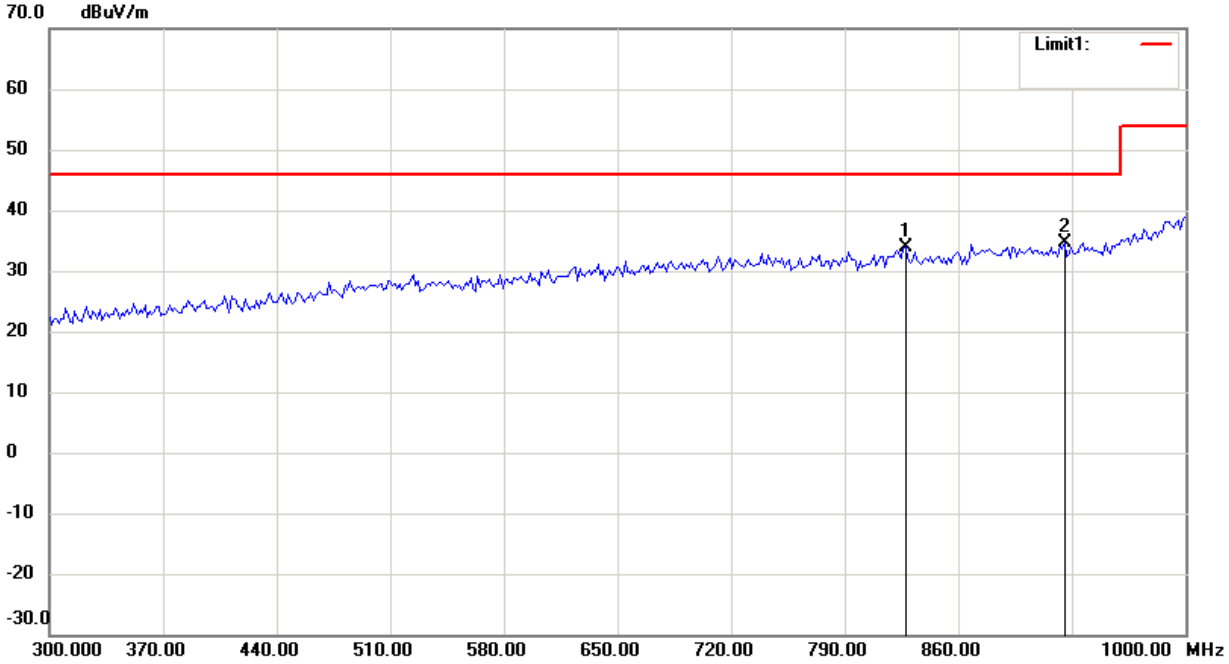
1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the 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: W6M21005-10675-P-15
FCC ID: H5OTR39

ch 25

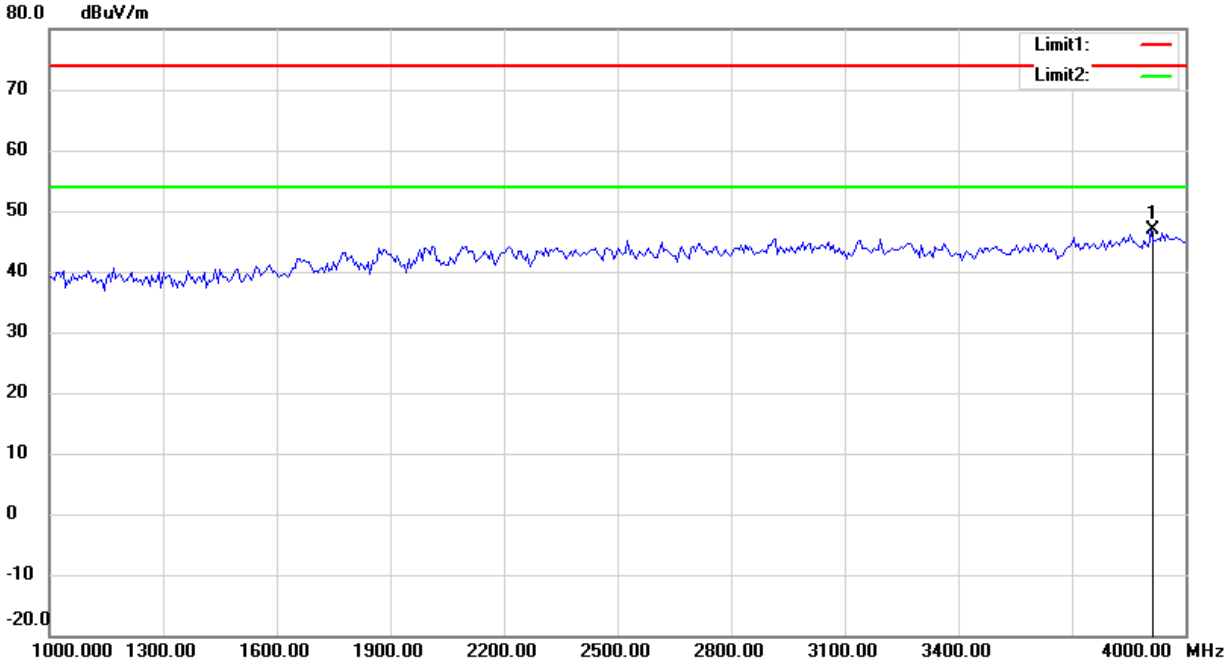
Antenna Polarization H

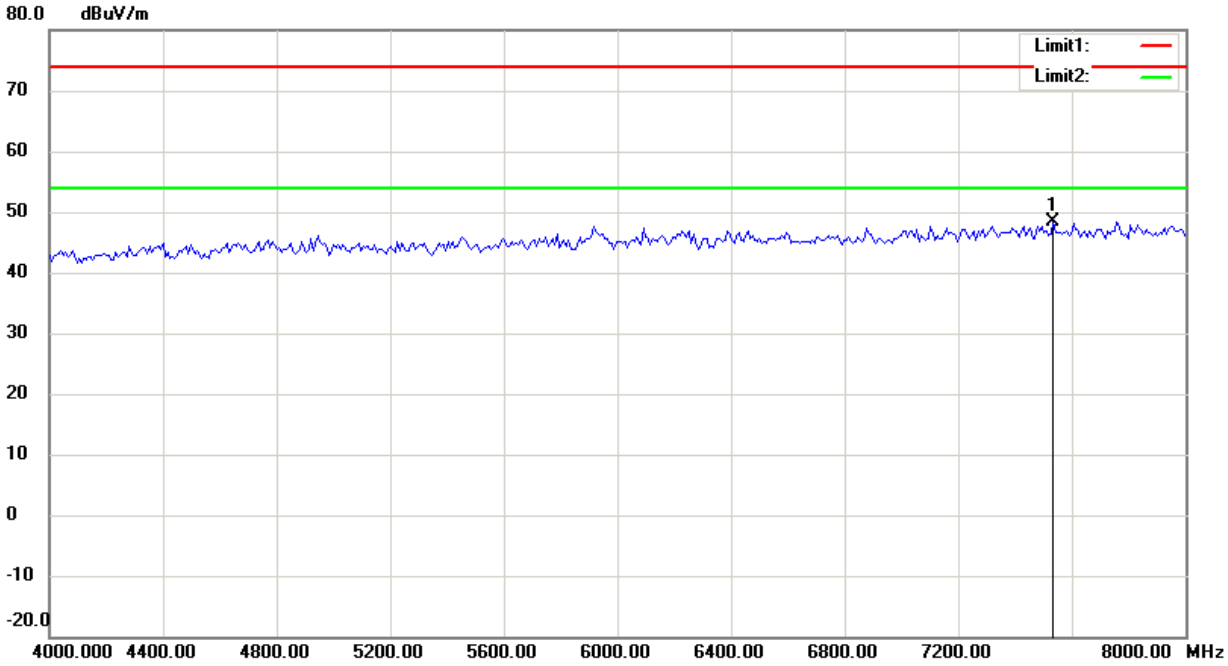




Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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.**



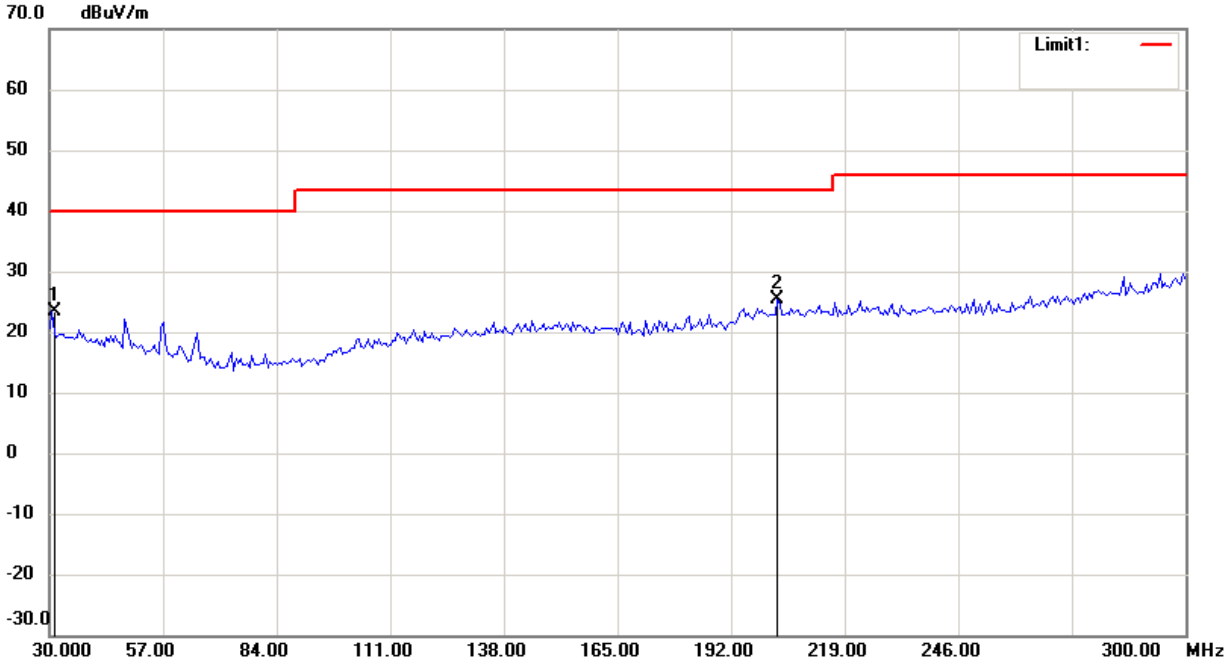


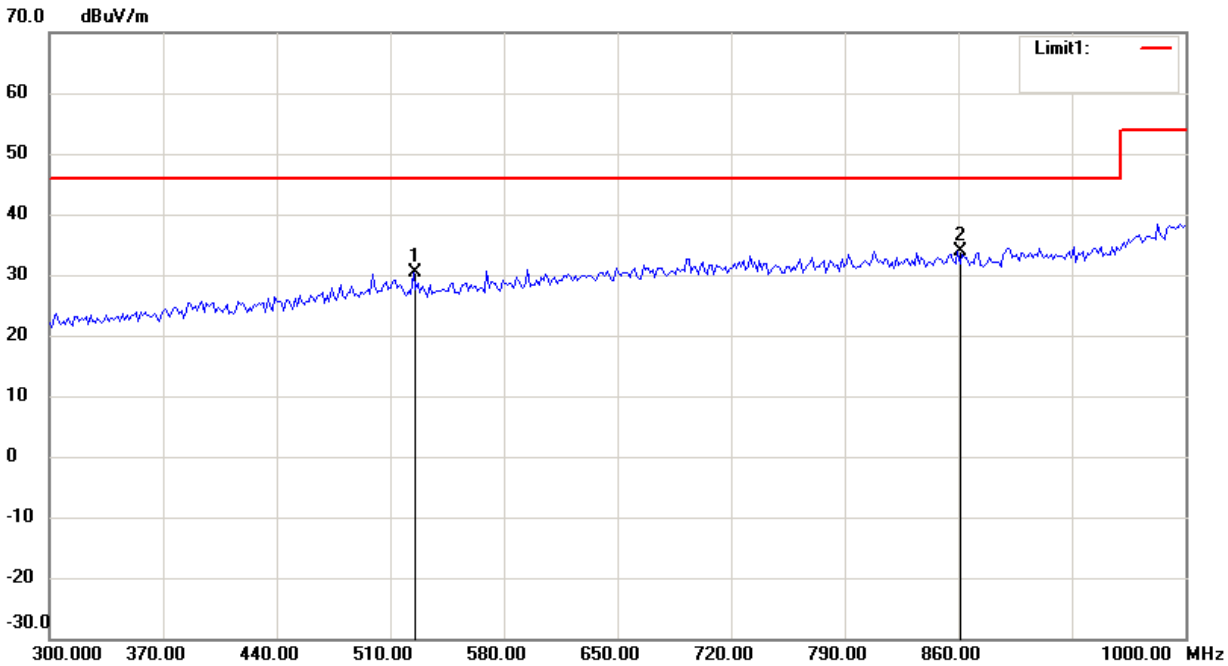
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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: W6M21005-10675-P-15
FCC ID: H5OTR39

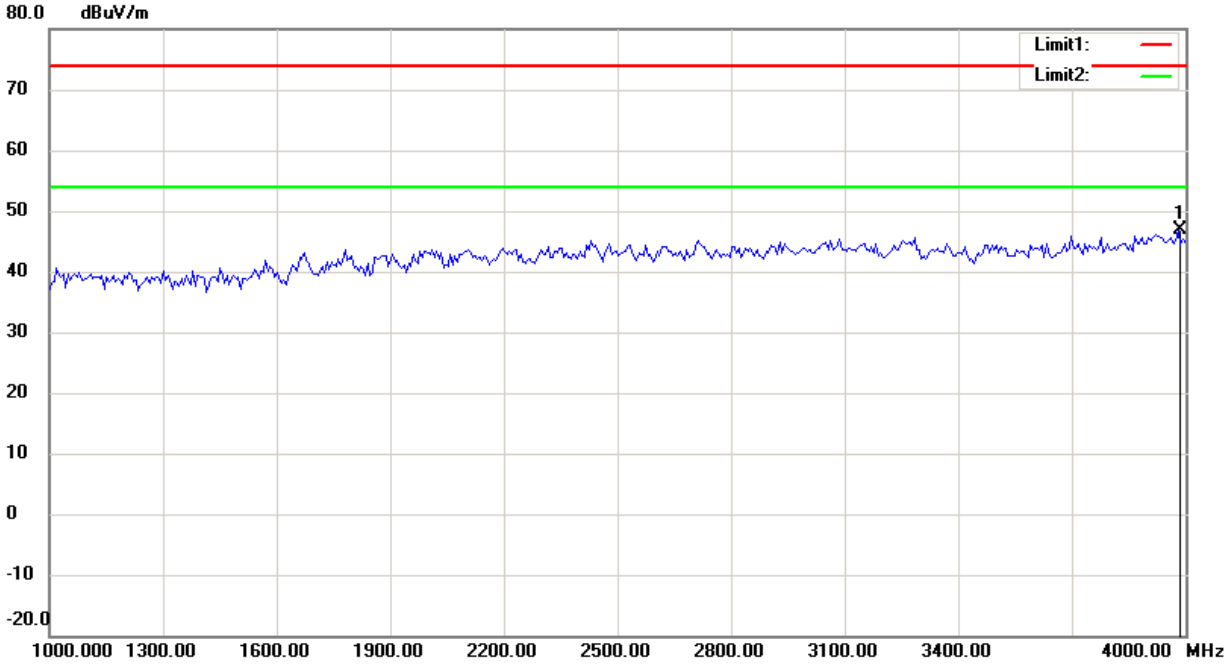
Antenna Polarization V

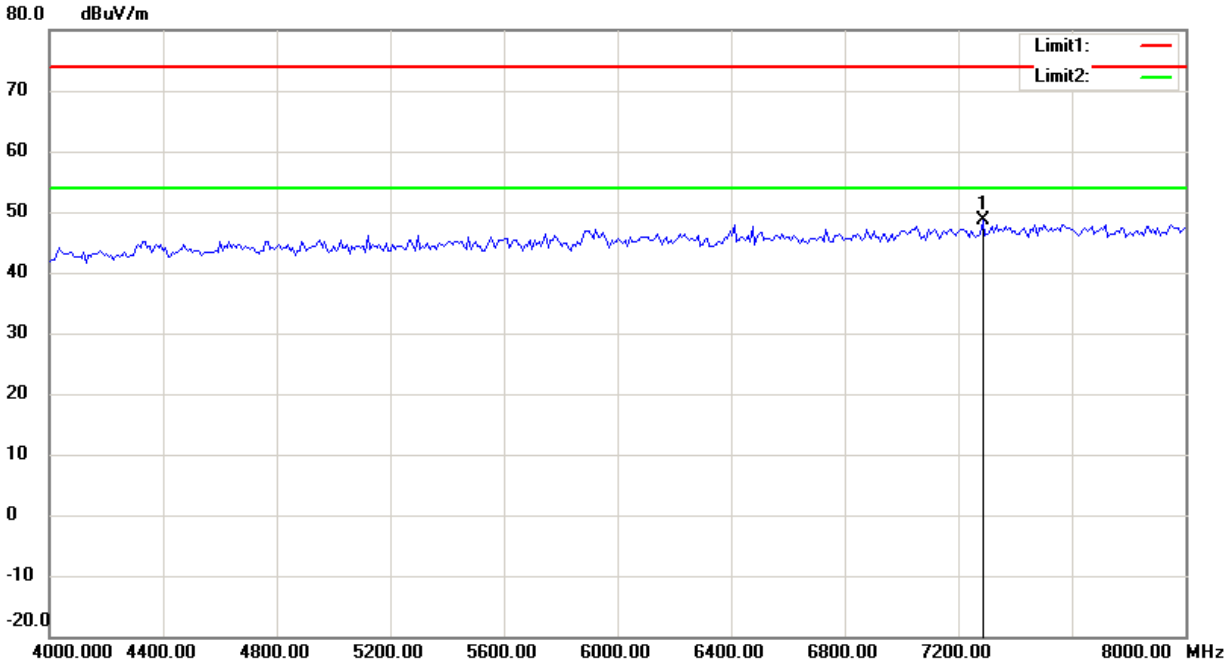




Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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.**





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

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3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

External Photos


45
46
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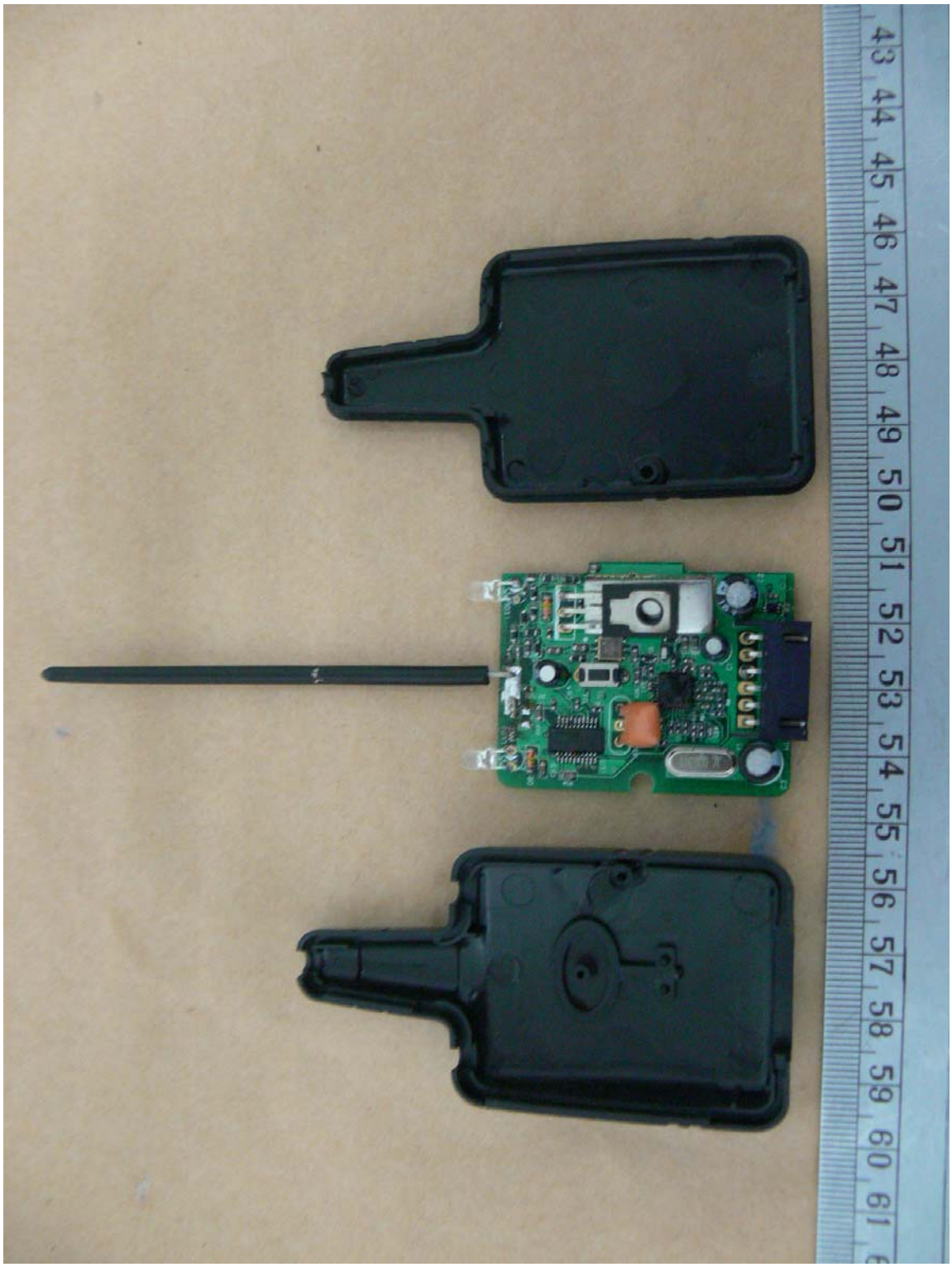
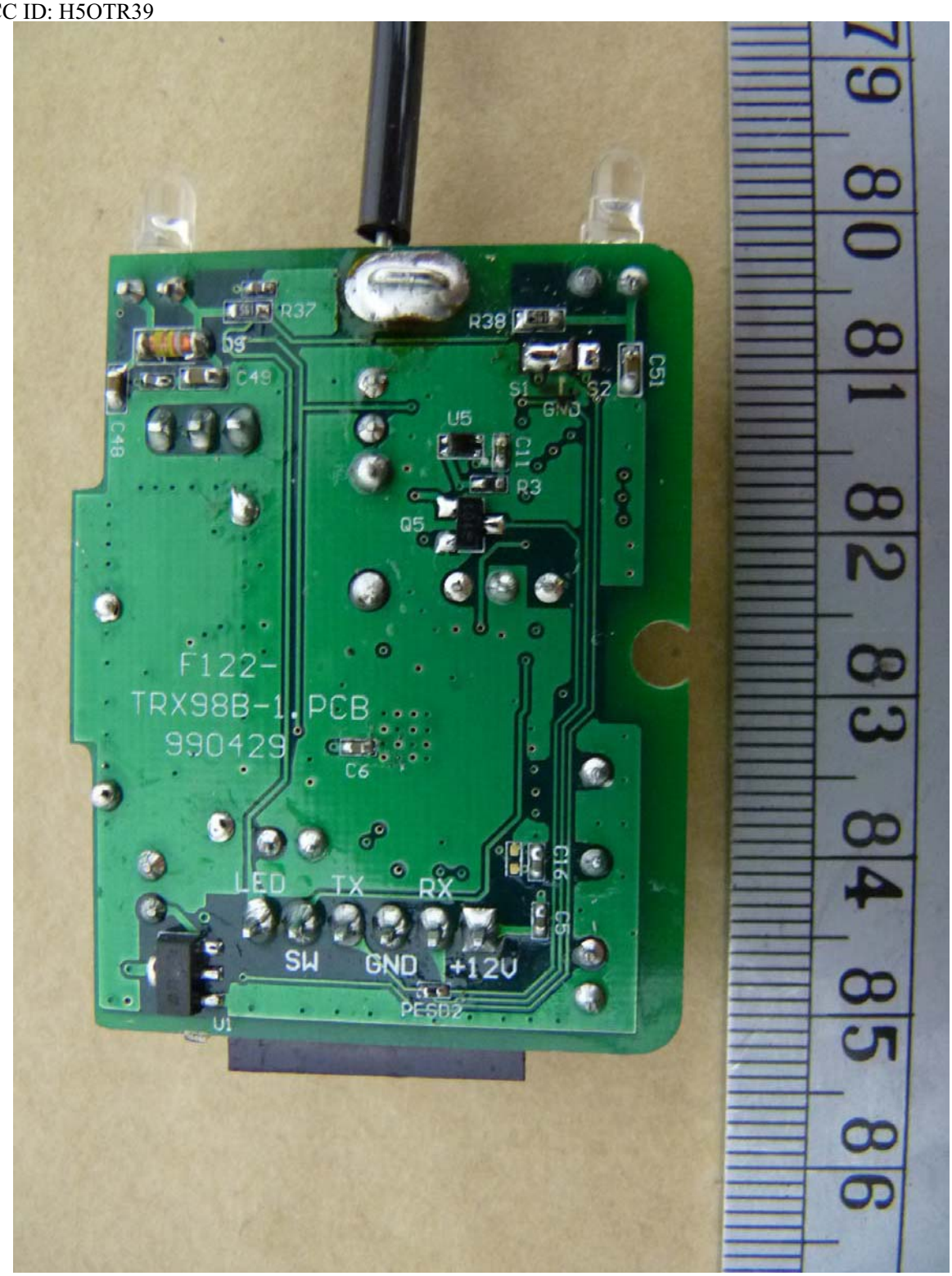
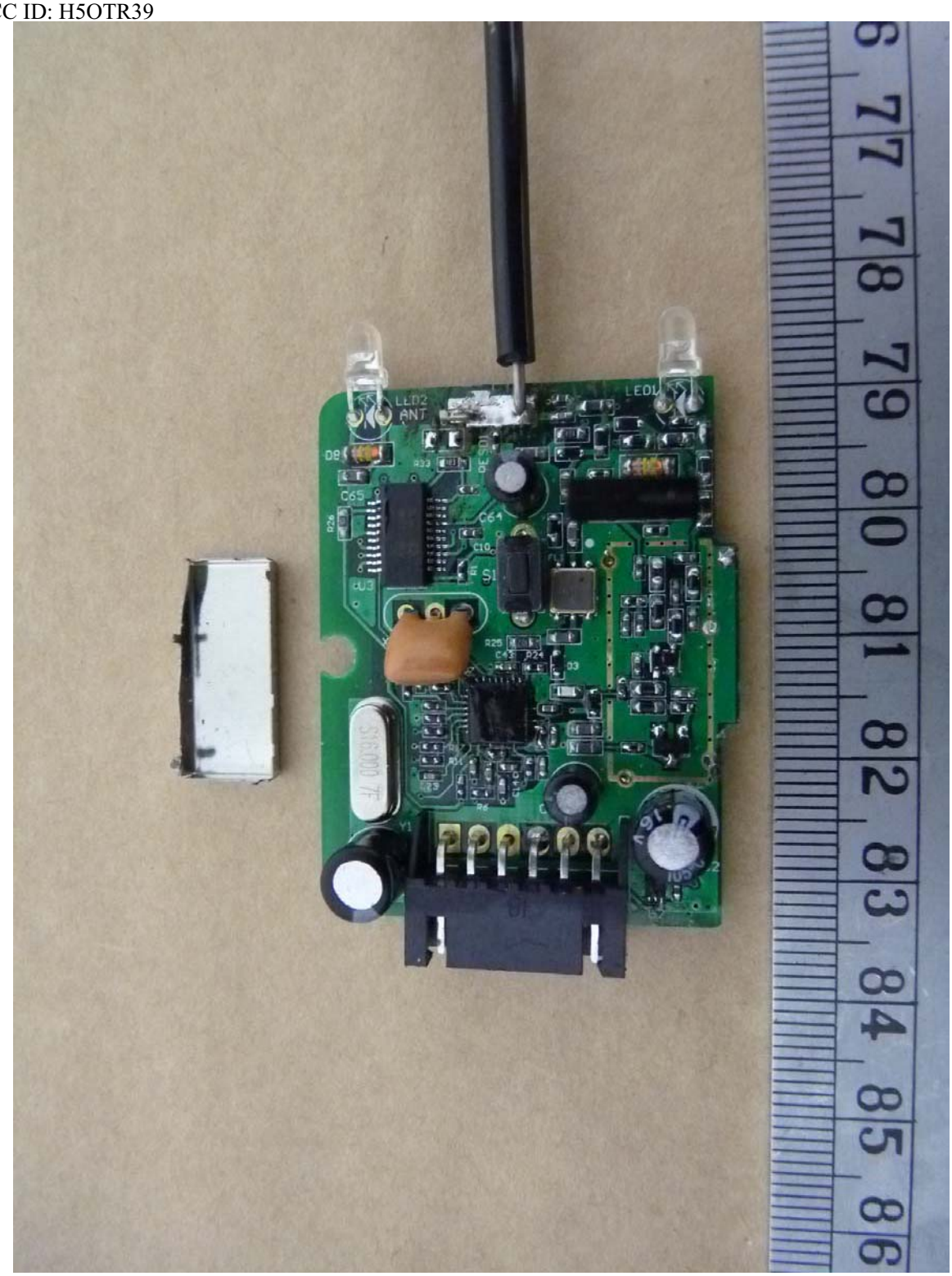
Registration number: W6M21005-10675-P-15
FCC ID: H5OTR39

Internal Photos




R37
R38
C49
C48
C51
S1
S2
GND
U5
C11
R3
Q5
F122-
TRX98B-1.PCB
990429
C6
C13
C5
LED
TX
RX
SW
GND
+12V
PESD2
U1


LED2
ANT
LED1
D8
C65
C64
S1
R25
R24
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U3
V1
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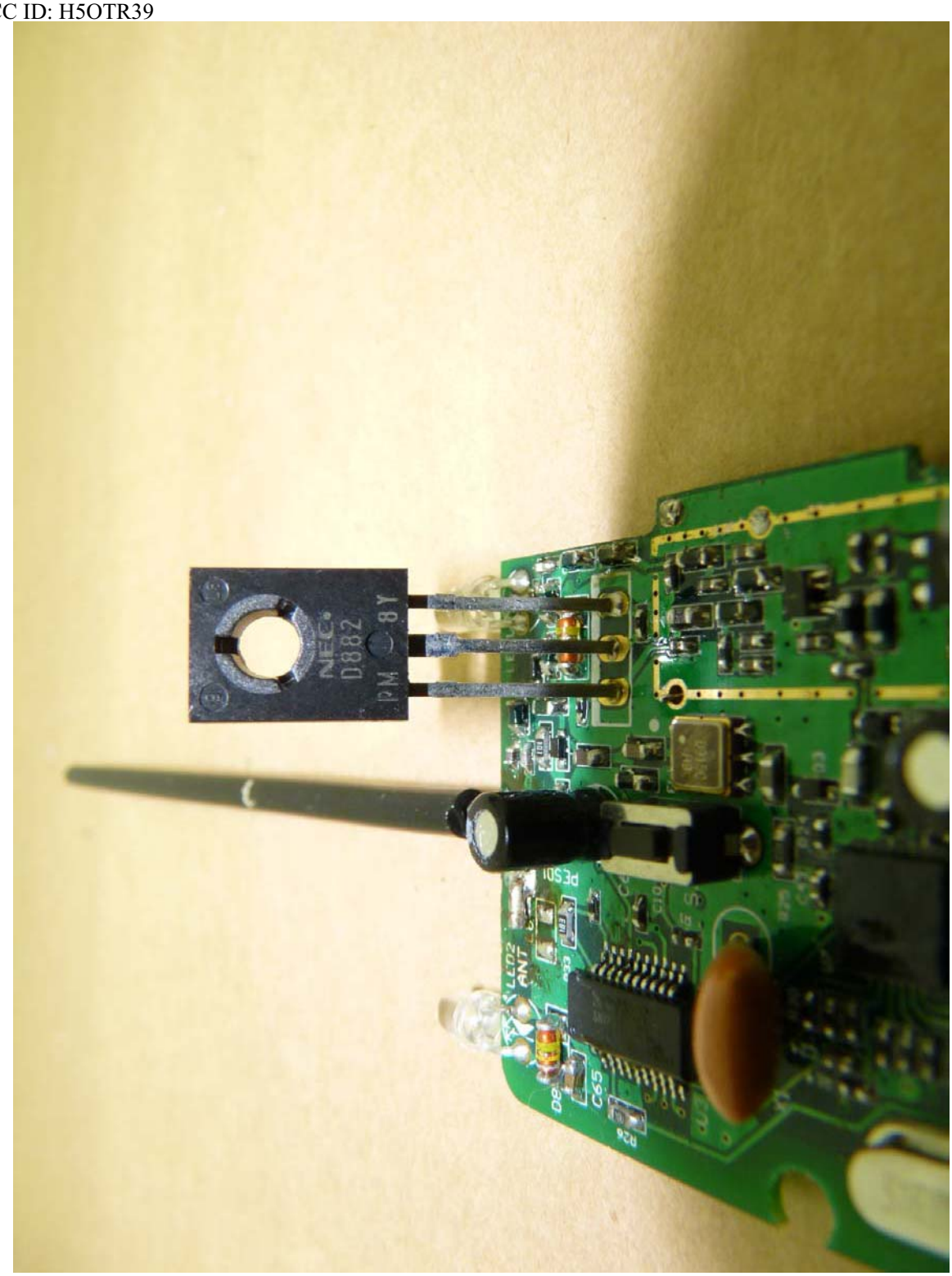
NEC
D882
PM 8Y
ANT

Set Up Photo of Radiated Emission