FCC Part 15 SUBPART C Test Report

for

SurroundBar 4000 Instant Home Theater

Model No.: SURROUNDBAR 4000

FCC ID: WLQSB4000IHTTX

of

Applicant: **Polk Audio**
Address: **5601 Metro Drive Baltimore, MD 21215, United States**

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.: W6M21102-11224-C-1

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

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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.
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:

March 15, 2011		Rick Chen	Rick Chen.
Date	WTS-Lab.	Name	Signature

Technical responsibility for area of testing:

March 15, 2011		Chang Tse-Ming	Chang Tse-Ming
Date	WTS	Name	Signature

Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

1.2 Testing laboratory

1.2.1 Location

OATS
No.5-1, Lishui, Shuang Sing Village,
Wanli Dist., New Taipei City 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 : 886-2-66068875

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:	Polk Audio
Street:	5601 Metro Drive
City:	Baltimore, MD 21215,
Country:	United States
Telephone:	./.
Fax:	./.
Teletex:	./.

1.4 Application details

Date of receipt of test item:	February 9, 2011
Date of test:	from February 10, 2011 to March 8, 2011

1.5 General information of Test item

Type of product	: SurroundBar 4000 Instant Home Theater
Type identification	: SURROUNDBAR 4000
Multi-listing model number	: ./.
Brand Name	: polkaudio
Photos	: see Appendix

Technical data

Frequency band	: 2404-2479 MHz
Frequency (ch 1)	: 2404 MHz
Frequency (ch 9)	: 2444 MHz
Frequency (ch 16)	: 2479 MHz
Number of Channels:	16
Operation modes:	duplex
Modulation Type:	DSSS / GFSK
Fixed point-to-point operation:	☐ Yes / ☒ No
Type of Antenna:	Monopole Antenna
Antenna gain:	3.14 dBi
Power supply:	Transmitter: Adaptor (I/P: AC 100-240 V / 50-60 Hz / 1.5 A, O/P: 20 Vdc / 2500 mA) Receiver: 100-240 V, 50-60 Hz, 60 W
Emission designator:	DSSS: 1M70G1D

Host device: none

Classification:

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

Transmitter **Unom**

Power (ch A or ch 1) : Conducted: 11.64 dBm
Power (ch B or ch 9) : Conducted: 10.87 dBm
Power (ch C or ch 16) : Conducted: 10.38 dBm

Manufacturer:
(if applicable)

Name: DONGGUAN MEILOON ACOUSTIC EQUIPMENTS CO., LTD.
Street: FENG HUANG GANG INDUSTRIAL, ESTATE, NO.77 YUANLIN RD, TANGXIA,
Town: DONGGUAN, GUANDONG PROVINCE,
Country: CHINA
.
Additional information: : ./.

1.6 Test standards

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

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:	Transmitter: Adaptor (I/P: AC 100-240 V / 50-60 Hz / 1.5 A, O/P: 20 Vdc / 2500 mA) Receiver: 100-240 V, 50-60 Hz, 60 W
Extreme conditions parameters:	./.

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	2010/9/2	2011/9/1
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2010/9/8	2011/9/7
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	2010/7/21	2011/7/20
ETSTW-CE 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2010/10/21	2011/10/20
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2010/9/6	2011/9/5
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2011/2/21	2012/2/20
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	Function Test	
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2010/8/10	2011/8/9
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2010/9/14	2011/9/13
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2010/9/2	2011/9/1
ETSTW-RE 006	Attenuator 10dB	50HF-010-5N-1	None	STEP	2011/3/1	2012/2/28
ETSTW-RE 010	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2010/9/6	2011/9/5
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	2010/10/4	2011/10/3
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2010/8/20	2011/8/19
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	EMCO	2010/7/22	2011/7/21
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	2011/2/25	2012/2/24
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2010/10/4	2011/10/3
ETSTW-RE 033	WaveRunner 6000A Serise Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	Function Test	
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2010/10/4	2011/10/3
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2011/1/14	2012/1/13
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	2010/8/30	2011/8/29
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2010/4/13	2011/4/12
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2011/3/1	2012/2/28

ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2011/3/1	2012/2/28
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2011/3/1	2012/2/28
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	2011/3/1	2012/2/28
ETSTW-RE 061	Amplifier Module	CHC 1	None	ETS	2010/9/27	2011/9/26
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2010/11/30	2011/11/29
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.	2011/3/1	2012/2/28
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2010/10/7	2011/10/6
ETSTW-RE 073	Power Meter	N1911A	MY45100769	Agilent	2011/1/10	2012/1/9
ETSTW-RE 074	Power Sensor	N1921A	MY45241198	Agilent	2011/1/10	2012/1/9
ETSTW-RE 081	Highpass Filter	H03G13G1	4260-02 DC0428	MICROWAVE CIRCUITS, INC.	2011/3/1	2012/2/28
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	2011/3/1	2012/2/28
ETSTW-RE 105	2.4GHz Notch Filter	NO124411	39555	MICROWAVE CIRCUITS, INC.	2011/3/1	2012/2/28
ETSTW-RE 106	Humidity Temperature Meter	TES-1366	091011113	TES	2011/3/1	2012/2/28
ETSTW-RE 111	Log-Periodic Dipole Array Antenna	VULB 9160	9160-3309	Schwarz beck	2010/12/17	2011/12/16
ETSTW-RE 114	2.4GHz Notch Filter	N0124411	473873	MICROWAVE CIRCUITS	2011/1/13	2012/1/12
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2010/10/7	2011/10/6
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40/12+9SS	3	WI	2011/1/14	2012/1/13
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2011/1/14	2012/1/13
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2011/1/14	2012/1/13
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2011/1/14	2012/1/13
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2010/9/20	2011/9/19
ETSTW-Cable 002	Microwave Cable	SUCOFLEX 104（S_Cable 7）	238093	HUBER+SUHNER	2010/9/27	2011/9/26
ETSTW-Cable 003	Microwave Cable	SUCOFLEX 104（S_Cable 11）	209953	HUBER+SUHNER	2010/9/27	2011/9/26
ETSTW-Cable 010	BNC Cable	5 M BNC Cable	None	JYE BAO CO.,LTD.	2011/3/1	2012/2/28
ETSTW-Cable 011	BNC Cable	BNC Cable 1	None	JYE BAO CO.,LTD.	2010/8/19	2011/8/18
ETSTW-Cable 012	BNC Cable	BNC Cable 2	None	JYE BAO CO.,LTD.	2010/8/19	2011/8/18
ETSTW-Cable 013	Microwave Cable	SUCOFLEX 104（S_Cable 5）	232345	HUBER+SUHNER	2011/3/1	2012/2/28
ETSTW-Cable 022	N TYPE Cable	OATS Cable 3	0002	JYE BAO CO.,LTD.	2011/3/1	2012/2/28
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2010/9/13	2011/9/12
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2010/9/13	2011/9/12
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104（S_Cable 9）	279067	SPECTRUM	2011/1/28	2012/1/27

ETSTW-Cable 031	Microwave Cable	SUCOFLEX 104 （S_Cable 10）	238092	HUBER+SUHNER	2010/11/30	2011/11/29
ETSTW-Cable 039	Microwave Cable	SUCOFLEX 104 （S_Cable 19）	316739	HUBER+SUHNER	2011/3/1	2012/2/28
ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2010/11/30	2011/11/29
ETSTW-Cable 047	Microwave Cable	SUCOFLEX 104	325518	HUBER+SUHNER	2010/11/30	2011/11/29
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 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.

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)

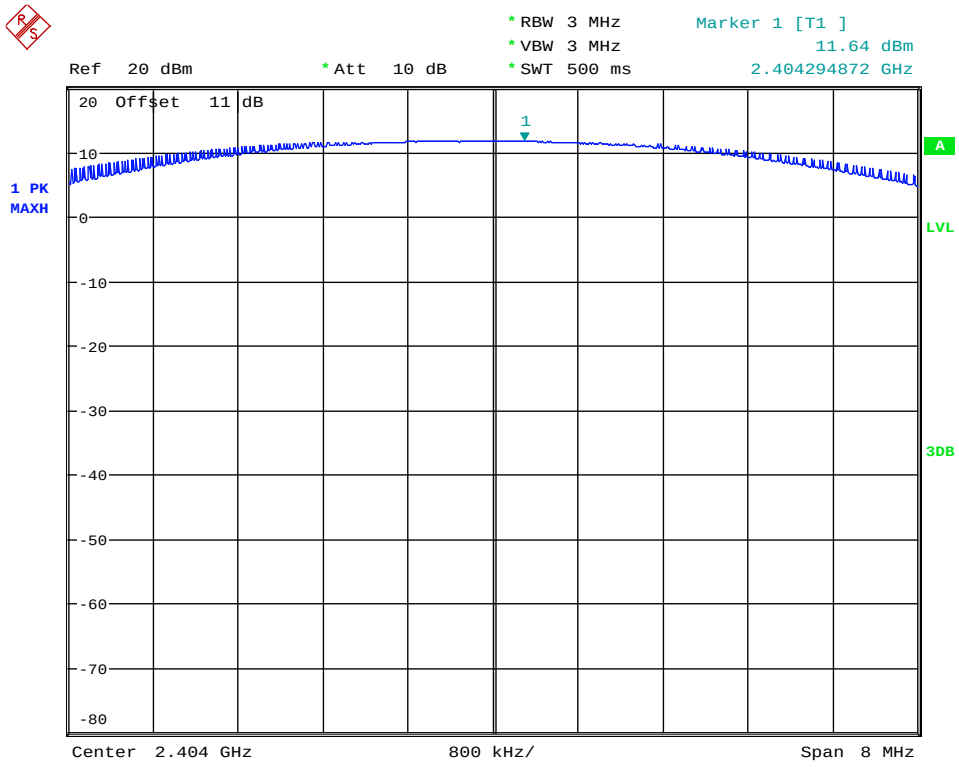
TEST CASE	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.247(b)(3)	☒	☒	☐
Equivalent radiated Power	15.247(b)(3)	☒	☒	☐
Spurious Emissions radiated – Transmitter operating	15.247(c): 15.209	☒	☒	☐
Band Edge Measurement	15.247(c)	☒	☒	☐
Minimum 6 dB Bandwidth	15.247(a)(2)	☒	☒	☐
Peak Power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

The follows is intended to leave blank.

3.1 Peak Output Power (transmitter)

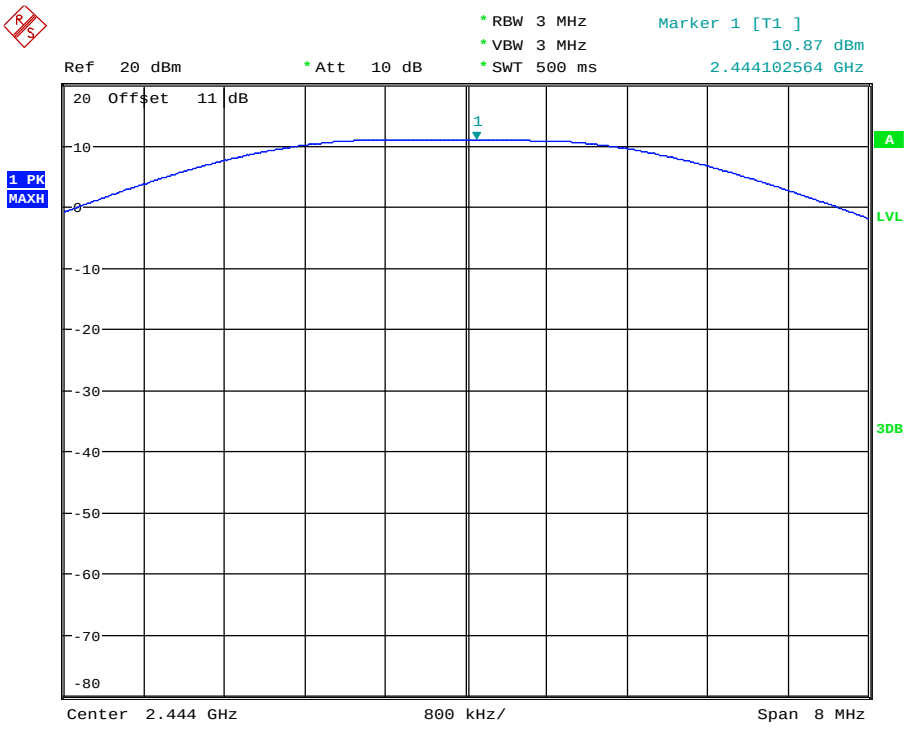
FCC Rule: 15.247(b)(3)
This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.

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

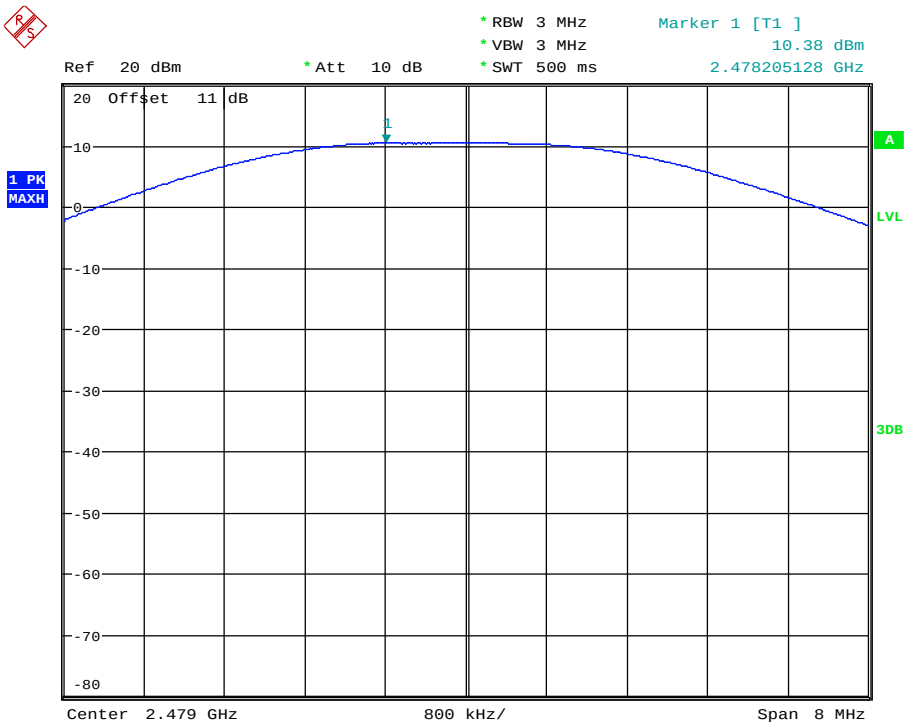


MAX OUTPUT POWER 2404MHz
Date: 16.FEB.2011 09:51:18

Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX



MAX OUTPUT POWER 2444MHz
Date: 16.FEB.2011 09:52:27



MAX OUTPUT POWER 2479MHz
Date: 16.FEB.2011 09:53:12

Test condition T_{nom}= 23°C, V_{nom} = 120 V	Signal Field strength TX highest power mode dB μ 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 dBi and using fixed point-to point operation consider §15.247 (b)(4)

Test equipment used: ETSTW-RE 055

3.2 Equivalent isotropic radiated power

FCC Rule: 15.247(b)(3)

EIRP = max. conducted output power + antenna gain
EIRP = 11.64 dBm + 3.14 dBi
= 14.78 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	14.588	Peak value
D	dB		
AG	dBi	3.14	
G		2.06	Calculated Value
R	cm	20	Assumed value
S	mW/cm^2	0.006	Calculated value

Limits:

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

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 ≦ 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 (dwell time/ 100ms)

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

Explanation: See attached diagrams in Appendix.

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 (dwell time/100ms)

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

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: SURROUNDBAR 4000 Date: 2011/2/17
Mode: Tx 2404 MHz Temperature: 16.9 °C Engineer: Rick
Polarization: Horizontal Humidity: 57 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
172.3557	27.31	peak	15.34	41.65	43.50	-1.85	200	150
331.4103	27.95	peak	16.75	44.70	46.00	-1.30	230	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
4807.6920	57.58	51.85	-4.20	53.38	47.65	74.00	54.00	-6.35	130	150
7217.9490	59.36	51.35	-1.28	58.08	50.07	74.00	54.00	-3.93	250	150
9613.7820	40.49	32.45	19.56	60.05	52.01	74.00	54.00	-1.99	210	150
12020.0000	23.97	---	21.92	45.89	---	74.00	54.00	-28.11	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)
172.3557	22.69	peak	15.34	38.03	43.50	-5.47	210	150
405.4486	20.26	peak	18.50	38.76	46.00	-7.24	130	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
4807.6920	55.71	---	-4.20	51.51	---	74.00	54.00	-22.49	230	150
7217.9490	59.38	51.39	-1.28	58.10	50.11	74.00	54.00	-3.89	250	150
9613.7820	44.08	34.01	19.56	63.64	52.57	74.00	54.00	-1.43	210	150
12020.0000	24.02	---	21.92	45.94	---	74.00	54.00	-28.06	160	150

Mode: Tx 2444 MHz
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
172.3557	27.34	peak	15.34	41.68	43.50	-1.82	220	150
331.4103	27.99	peak	16.75	44.74	46.00	-1.26	140	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
4888.3900	57.96	51.25	-3.95	54.01	47.30	74.00	54.00	-6.70	160	150
7332.8770	56.20	46.92	-1.94	54.26	44.98	74.00	54.00	-9.02	200	150
9773.6380	34.57	26.55	19.49	54.06	46.04	74.00	54.00	-7.96	240	150
12220.0000	23.58	---	22.30	45.88	---	74.00	54.00	-28.12	180	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
172.3557	22.02	peak	15.34	37.36	43.50	-6.14	140	150
405.4486	20.59	peak	18.50	39.09	46.00	-6.91	200	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
4884.6160	57.22	51.25	-3.97	53.25	47.28	74.00	54.00	-6.72	190	150
7332.8850	56.02	48.01	-1.94	54.08	46.07	74.00	54.00	-7.93	240	150
9773.6380	35.73	27.75	19.49	55.22	47.24	74.00	54.00	-6.76	160	150
12220.0000	23.74	---	22.30	46.04	---	74.00	54.00	-27.96	270	150

Mode: Tx 2479 MHz
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
172.3557	27.45	peak	15.34	41.79	43.50	-1.71	230	150
331.4103	27.98	peak	16.75	44.73	46.00	-1.27	230	150

Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

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)
4955.1280	55.99	---	-3.90	52.09	---	74.00	54.00	-21.91	170	150
7437.8550	56.95	46.96	-2.15	54.80	44.81	74.00	54.00	-9.19	140	150
9918.2690	32.87	---	19.80	52.67	---	74.00	54.00	-21.33	160	150
12395.0000	23.22	---	22.36	45.58	---	74.00	54.00	-28.42	240	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
172.3557	22.53	peak	15.34	37.87	43.50	-5.63	120	150
405.4486	20.23	peak	18.50	38.73	46.00	-7.27	180	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)
4955.1280	56.75	50.75	-3.90	52.85	46.85	74.00	54.00	-7.15	160	150
7442.3080	55.39	49.35	-2.15	53.24	47.20	74.00	54.00	-6.80	270	150
9918.2690	32.92	---	19.80	52.72	---	74.00	54.00	-21.28	200	150
12395.0000	23.62	---	22.36	45.98	---	74.00	54.00	-28.02	160	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.**

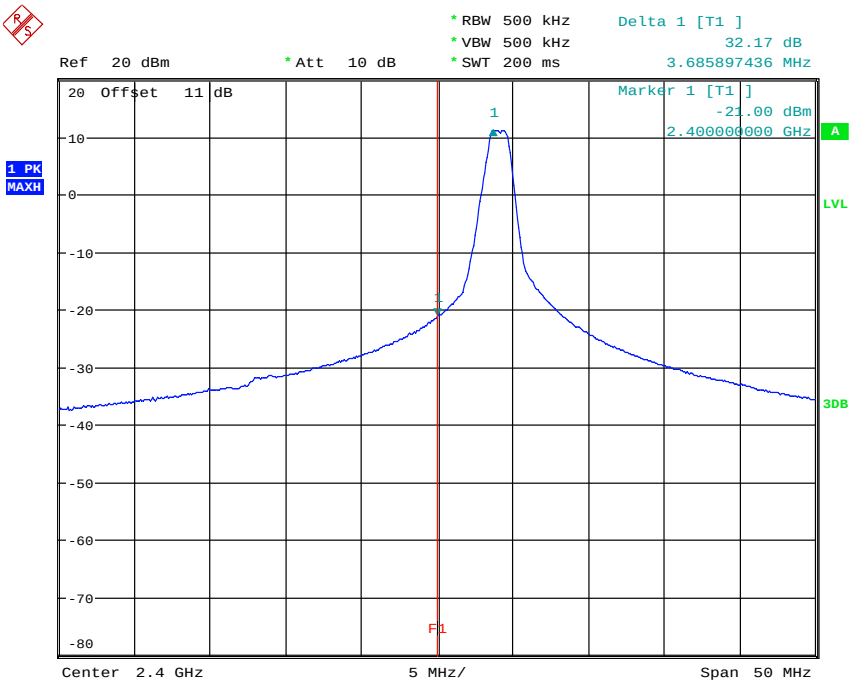
TEST RESULT (Transmitter): The unit DOES meet the FCC requirements.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 018, ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 044

3.6 Radiated Emission on the band edge

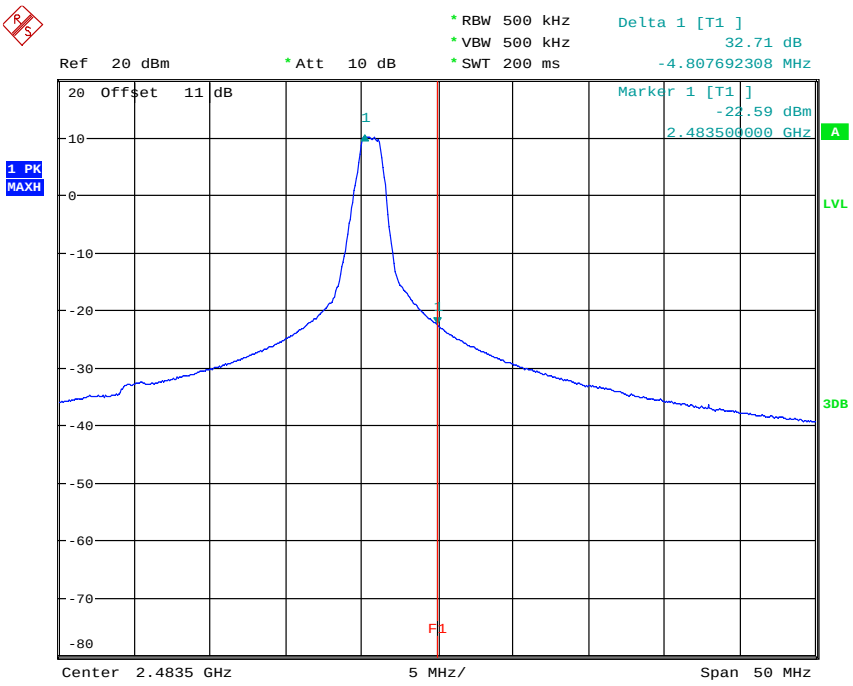
According to FCC rules part 15 subpart C §15.247(c) in any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that 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.



BANDBDGE 2404MHz
Date: 16.FEB.2011 10:10:56

Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX



BANDBDGE 2479MHz
Date: 16.FEB.2011 10:07:11

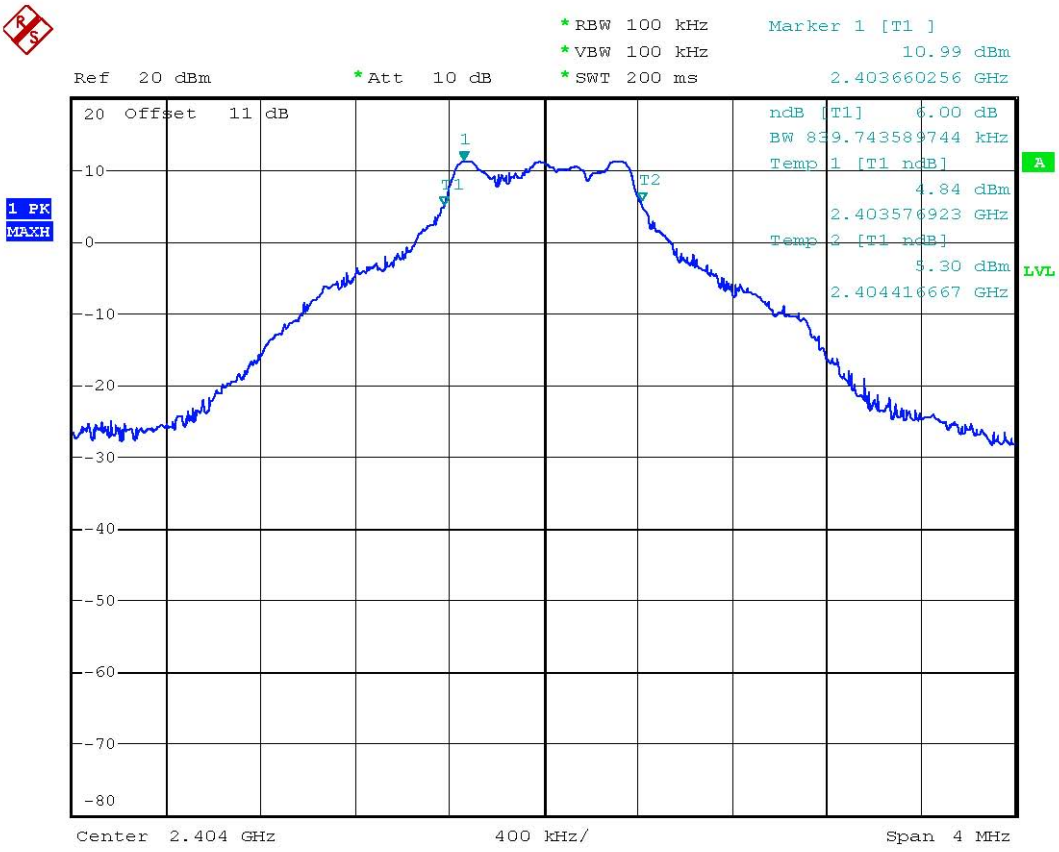
Limit:

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

Test equipment used: ETSTW-RE 055

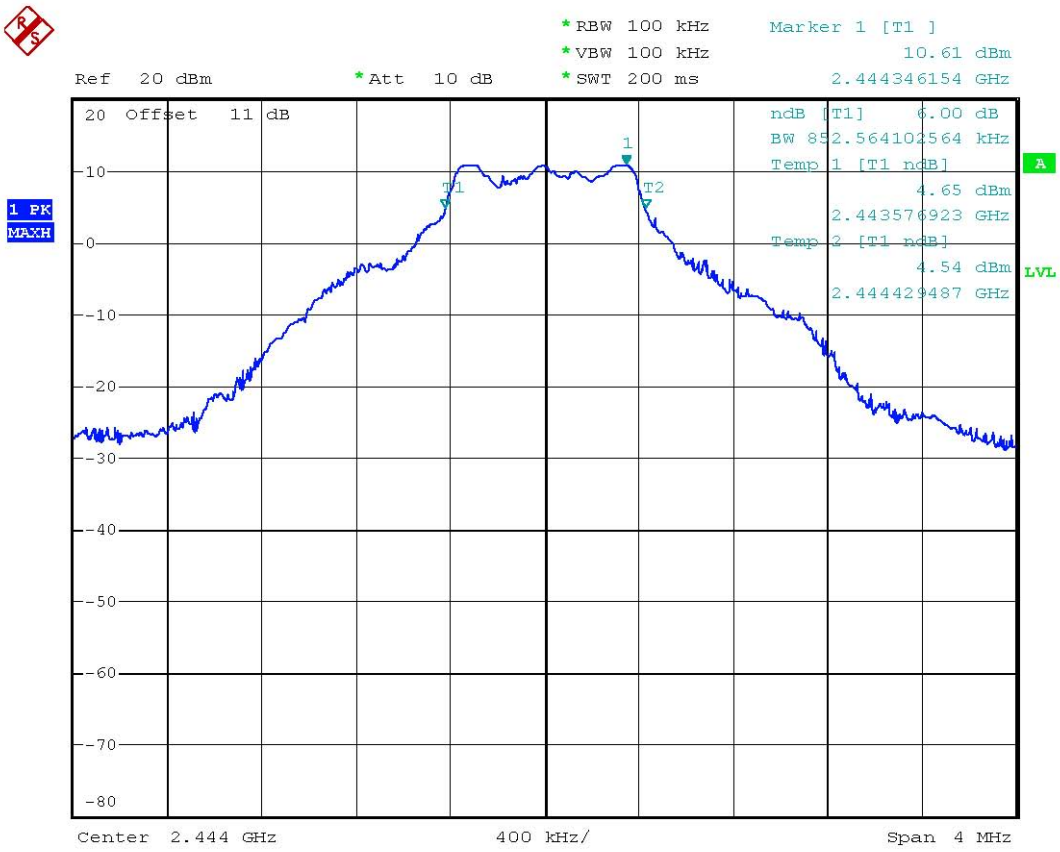
3.7 Minimum 6 dB Bandwidth

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.



6DB BANDWIDTH 2404MHz

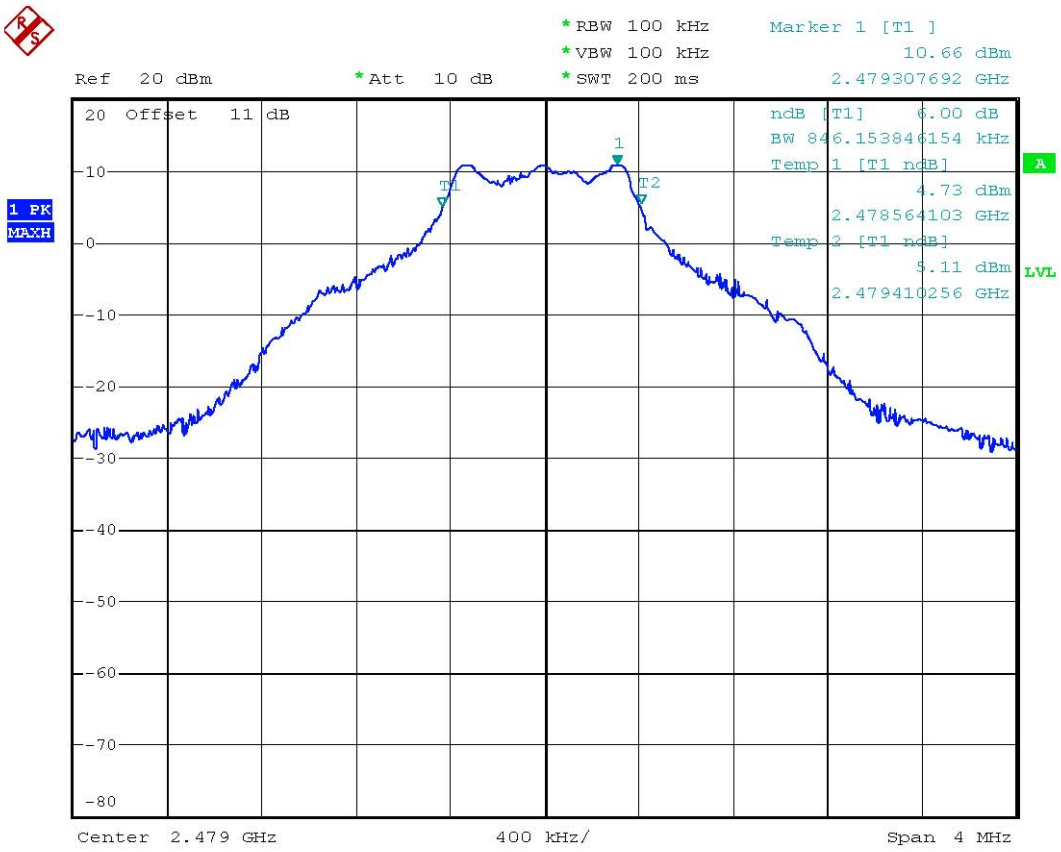
Date: 16.FEB.2011 11:51:22



6DB BANDWIDTH 2444MHz

Date: 16.FEB.2011 11:57:12

Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX



6DB BANDWIDTH 2479MHz
Date: 16.FEB.2011 12:00:15

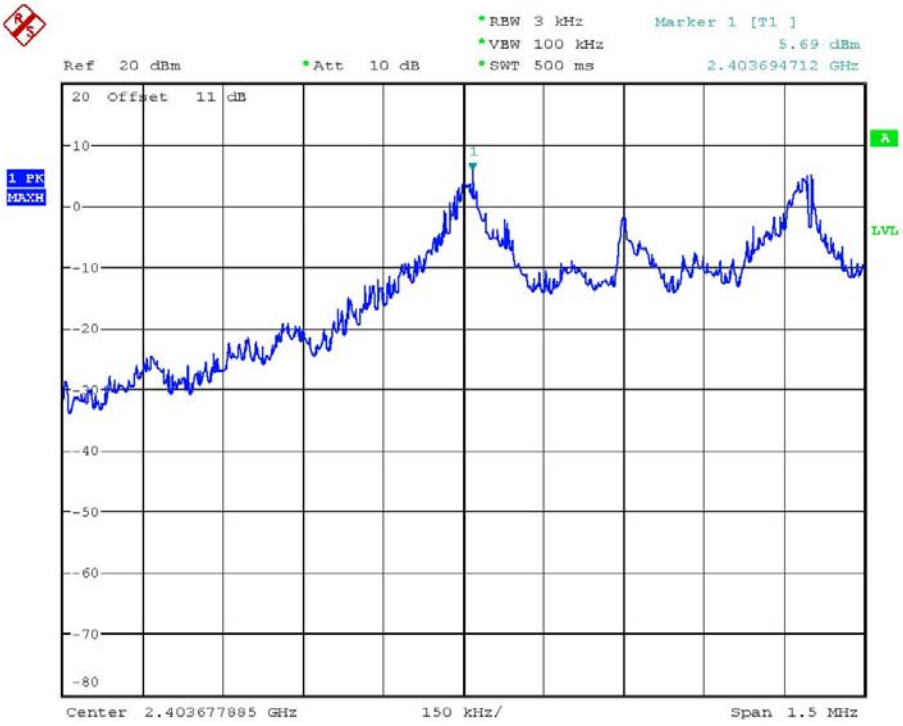
Limits:

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

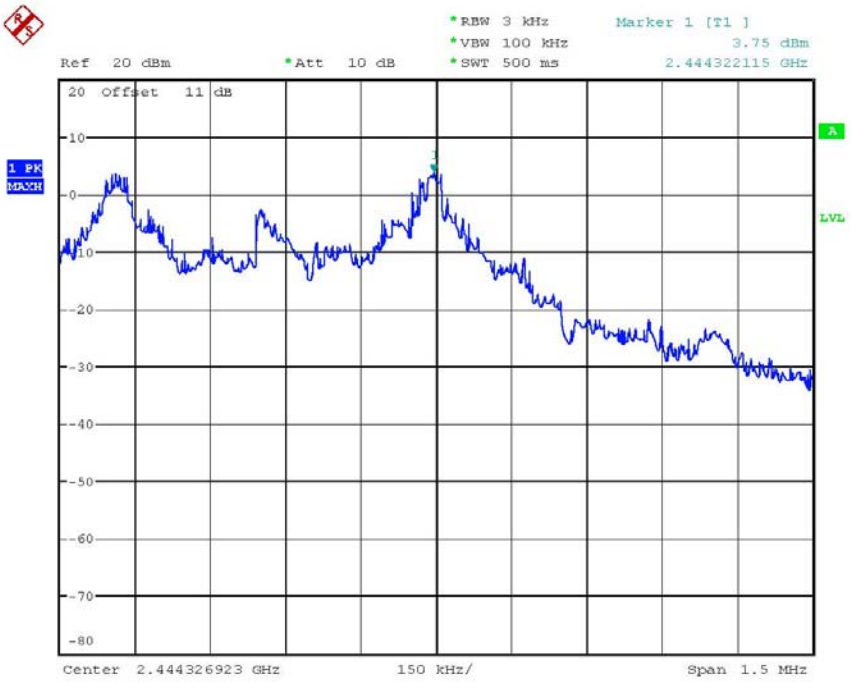
Test equipment used: ETSTW-RE 055

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.

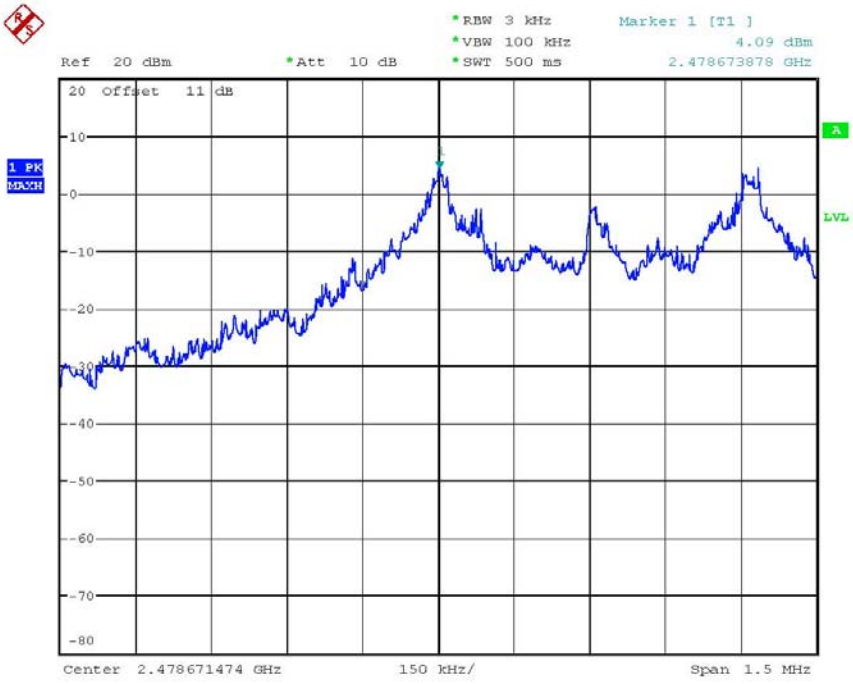


POWER DENSITY 2404MHz
Date: 16.FEB.2011 13:02:00



POWER DENSITY 2444MHz

Date: 16.FEB.2011 13:04:11



POWER DENSITY 2479MHz

Date: 16.FEB.2011 13:13:11

Limits:

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

Test equipment used: ETSTW-RE 055

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”.

Model: SURROUNDBAR 4000 Date: 2011/2/17
Mode: Rx 2404 MHz Temperature: 16.9 °C Engineer: Rick
Polarization: Horizontal Humidity: 57 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
119.1346	12.22	peak	13.93	26.15	43.50	-17.35	160	150
217.3557	18.18	peak	13.13	31.31	46.00	-14.69	210	150
476.1218	2.61	peak	20.09	22.70	46.00	-23.30	130	150
909.1345	-1.01	peak	26.94	25.93	46.00	-20.07	220	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
3923.0770	44.59	---	-1.51	43.08	---	74.00	54.00	-30.92	240	150
6987.1800	48.43	---	-0.66	47.77	---	74.00	54.00	-26.23	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)
192.2596	18.58	peak	13.24	31.82	43.50	-11.68	130	150
299.5672	22.30	peak	15.92	38.22	46.00	-7.78	210	150
467.1474	1.20	peak	19.90	21.10	46.00	-24.90	170	150
842.9487	-1.35	peak	26.09	24.74	46.00	-21.26	220	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
3937.5000	44.31	---	-1.44	42.87	---	74.00	54.00	-31.13	260	150
7935.8970	47.95	---	-0.60	47.35	---	74.00	54.00	-26.65	150	150

Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

Mode: Rx 2444MHz
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
202.6442	19.47	peak	12.78	32.25	43.50	-11.25	300	150
283.5577	22.07	peak	15.56	37.63	46.00	-8.37	210	150
393.1090	4.40	peak	18.21	22.61	46.00	-23.39	180	150
466.0255	3.68	peak	19.88	23.56	46.00	-22.44	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)
3932.6920	43.89	---	-1.46	42.43	---	74.00	54.00	-31.57	190	150
7942.3080	48.44	---	-0.62	47.82	---	74.00	54.00	-26.18	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)
186.6346	17.28	peak	13.83	31.11	43.50	-12.39	170	150
295.2404	20.14	peak	15.82	35.96	46.00	-10.04	260	150
528.8461	2.02	peak	20.90	22.92	46.00	-23.08	130	150
877.7243	-1.01	peak	26.49	25.48	46.00	-20.52	260	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)
3932.6920	44.44	---	-1.46	42.98	---	74.00	54.00	-31.02	210	150
7955.1280	47.68	---	-0.65	47.03	---	74.00	54.00	-26.97	230	150

Mode: Rx 2479 MHz
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
209.5672	19.91	peak	12.94	32.85	43.50	-10.65	130	150
291.7787	21.56	peak	15.75	37.31	46.00	-8.69	220	150
384.1345	4.60	peak	17.98	22.58	46.00	-23.42	260	150
720.6730	0.22	peak	24.46	24.68	46.00	-21.32	210	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)
3817.3080	46.01	---	-1.87	44.14	---	74.00	54.00	-29.86	160	150
7916.6670	47.55	---	-0.55	47.00	---	74.00	54.00	-27.00	220	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
196.1537	19.74	peak	12.98	32.72	43.50	-10.78	220	150
294.8077	21.50	peak	15.81	37.31	46.00	-8.69	210	150
328.0448	10.18	peak	16.66	26.84	46.00	-19.16	200	150
878.8461	-0.79	peak	26.50	25.71	46.00	-20.29	180	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
3793.2690	44.88	---	-1.95	42.93	---	74.00	54.00	-31.07	170	150
7929.4870	48.49	---	-0.58	47.91	---	74.00	54.00	-26.09	180	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:

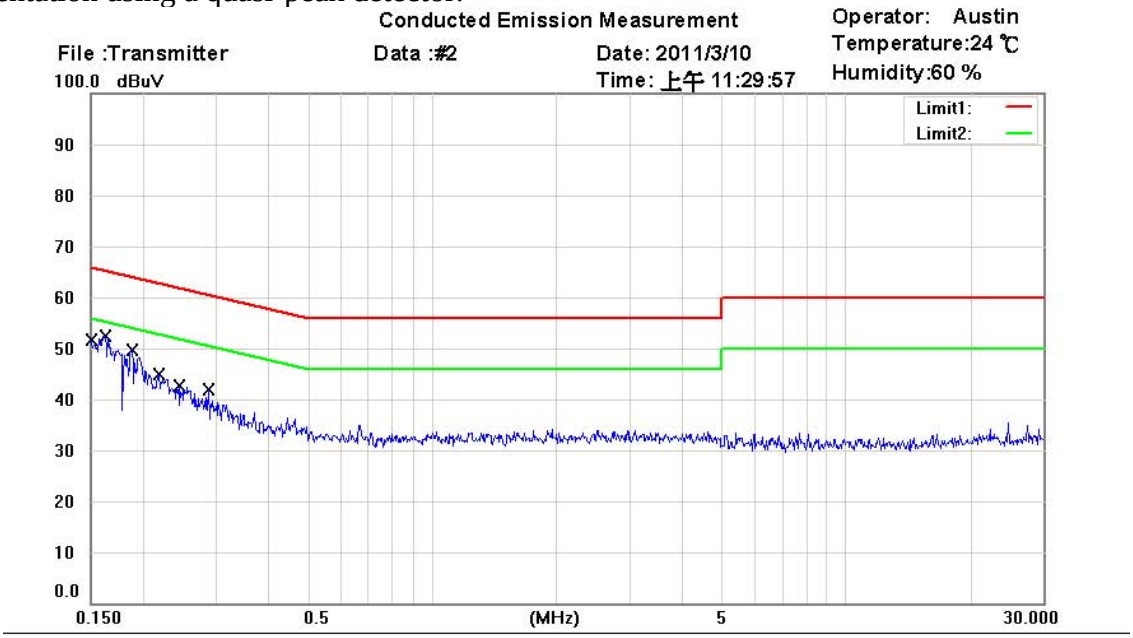
Frequency of Emission (MHz)	Field Strength (microvolts/meter)	Field Strength (dBmicrovolts/meter)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 018, ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 044

Explanation: The test results of digital part are listed in the separated test report no. W6M21102-11224-P-15B.

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.

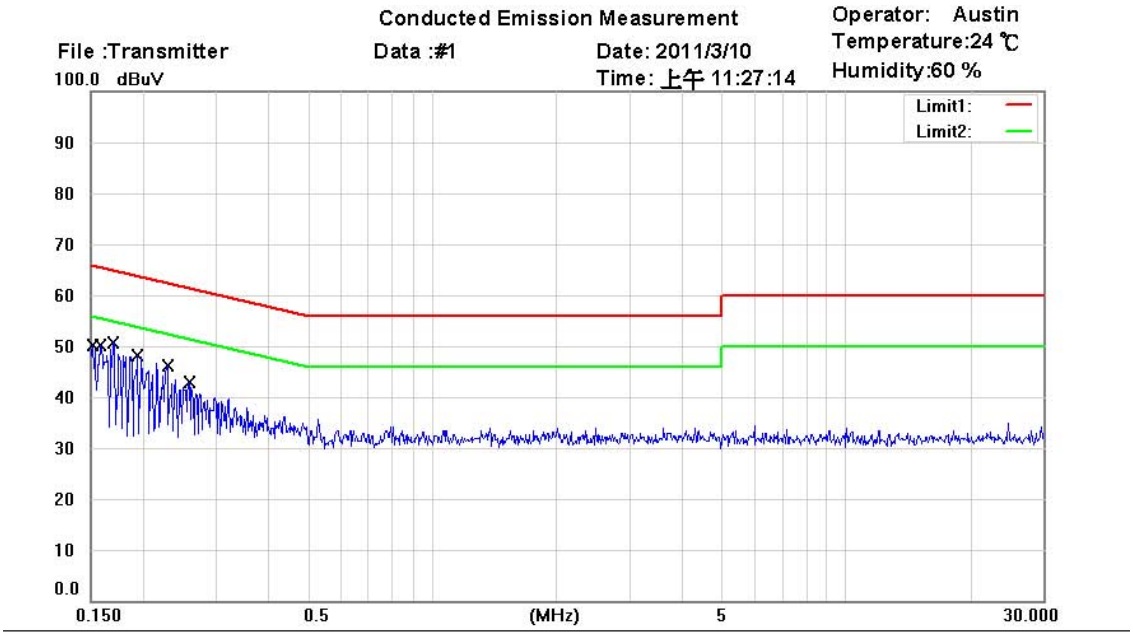


Site : Chamber_01
Condition : FCC Part 15 Class B Conduction (QP)
EUT : W6M21102-11224
M/N: SURROUNDBAR 4000
Test Mode : Transmitter
Note :

Phase: N
Power : 110V 60Hz

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
	0.1500	29.40	QP	9.62	39.02	66.00	-26.98	
	0.1500	5.80	AVG	9.62	15.42	56.00	-40.58	
*	0.1616	35.34	QP	9.62	44.96	65.38	-20.42	
	0.1616	19.76	AVG	9.62	29.38	55.38	-26.00	
	0.1875	28.60	QP	9.63	38.23	64.15	-25.92	
	0.1875	8.27	AVG	9.63	17.90	54.15	-36.25	
	0.2176	23.57	QP	9.64	33.21	62.91	-29.70	
	0.2176	2.91	AVG	9.64	12.55	52.91	-40.36	
	0.2433	19.52	QP	9.65	29.17	61.98	-32.81	
	0.2433	0.25	AVG	9.65	9.90	51.98	-42.08	
	0.2867	20.75	QP	9.66	30.41	60.62	-30.21	
	0.2867	3.62	AVG	9.66	13.28	50.62	-37.34	

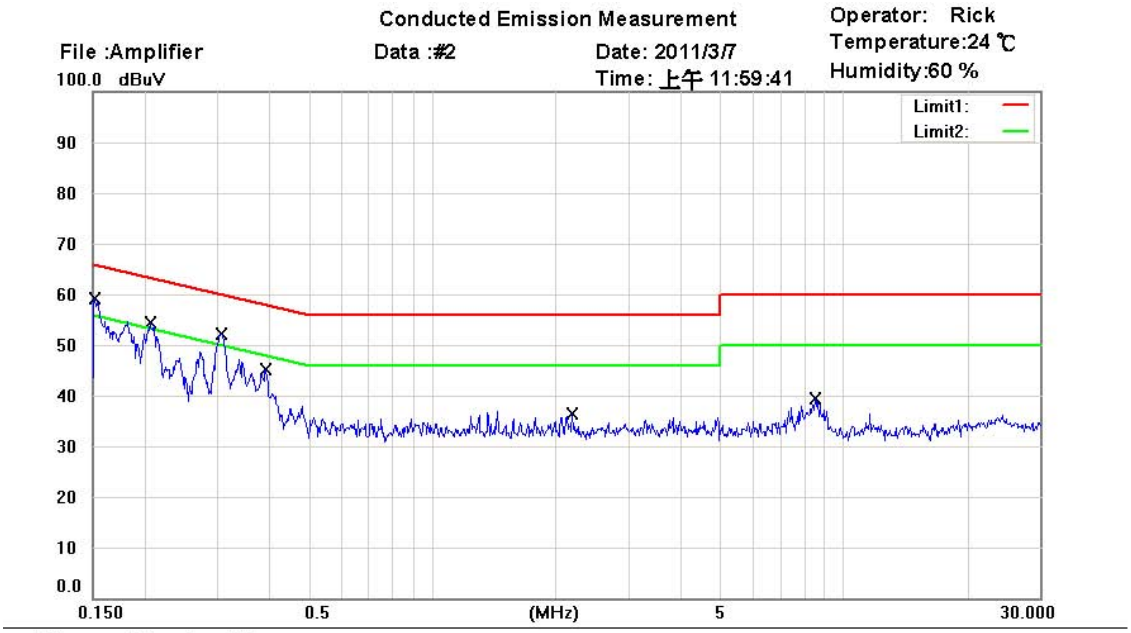
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX



Site : Chamber_01
Condition : FCC Part 15 Class B Conduction (QP)
Phase: L1
EUT : W6M21102-11224
Power : 110V 60Hz
M/N: SURROUNDBAR 4000
Test Mode : Transmitter
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
	0.1514	29.59	QP	9.64	39.23	65.92	-26.69	
	0.1514	6.29	AVG	9.64	15.93	55.92	-39.99	
*	0.1577	34.50	QP	9.64	44.14	65.58	-21.44	
	0.1577	16.68	AVG	9.64	26.32	55.58	-29.26	
	0.1694	31.38	QP	9.65	41.03	64.99	-23.96	
	0.1694	11.22	AVG	9.65	20.87	54.99	-34.12	
	0.1941	31.66	QP	9.66	41.32	63.86	-22.54	
	0.1941	17.13	AVG	9.66	26.79	53.86	-27.07	
	0.2291	27.64	QP	9.67	37.31	62.48	-25.17	
	0.2291	13.37	AVG	9.67	23.04	52.48	-29.44	
	0.2583	24.57	QP	9.68	34.25	61.49	-27.24	
	0.2583	10.19	AVG	9.68	19.87	51.49	-31.62	

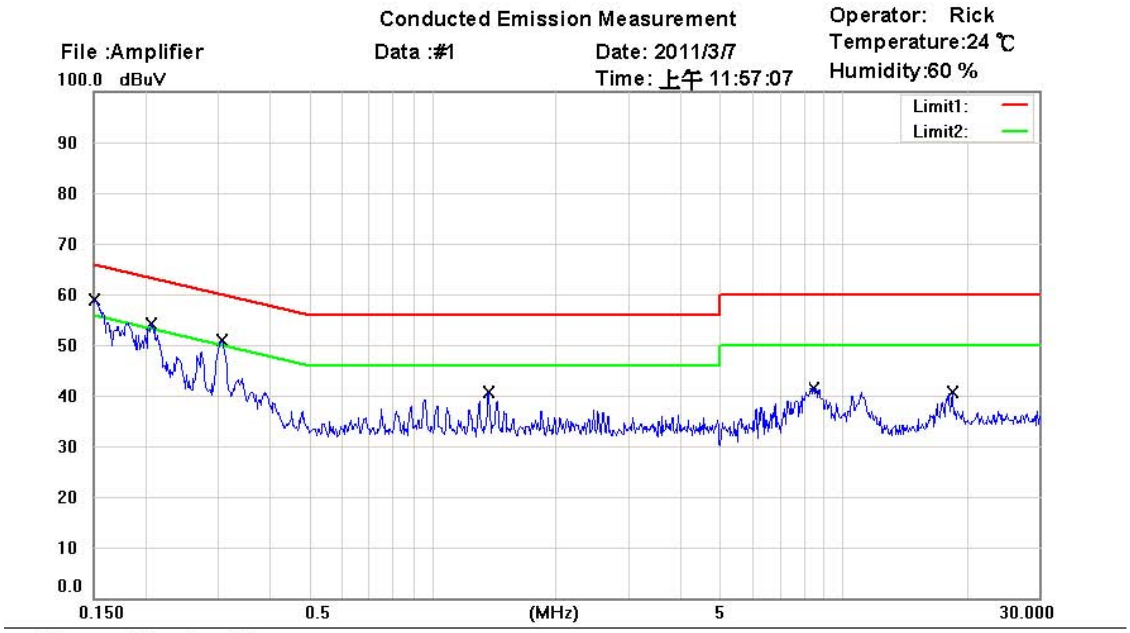
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX



Site : Chamber_01
Condition : FCC Part 15 Class B Conduction (QP)
Phase: N
EUT : W6M21102-11224
Power : 110V
M/N: SURROUNDBAR 4000
Test Mode : Receiver
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
	0.1511	44.78	QP	9.99	54.77	65.94	-11.17	
	0.1511	30.30	AVG	9.99	40.29	55.94	-15.65	
	0.2058	36.62	QP	9.95	46.57	63.37	-16.80	
	0.2058	24.85	AVG	9.95	34.80	53.37	-18.57	
	0.3052	38.77	QP	9.91	48.68	60.10	-11.42	
*	0.3052	36.67	AVG	9.91	46.58	50.10	-3.52	
	0.3922	30.69	QP	9.93	40.62	58.02	-17.40	
	0.3922	26.47	AVG	9.93	36.40	48.02	-11.62	
	2.1875	16.13	QP	9.99	26.12	56.00	-29.88	
	2.1875	9.43	AVG	9.99	19.42	46.00	-26.58	
	8.5375	24.12	QP	10.33	34.45	60.00	-25.55	
	8.5375	14.59	AVG	10.33	24.92	50.00	-25.08	

Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX



Site : Chamber_01
Condition : FCC Part 15 Class B Conduction (QP)
Phase: L1
EUT : W6M21102-11224
Power : 110V
M/N: SURROUNDBAR 4000
Test Mode : Receiver
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
	0.1502	45.28	QP	9.99	55.27	65.99	-10.72	
	0.1502	30.02	AVG	9.99	40.01	55.99	-15.98	
	0.2060	36.32	QP	9.96	46.28	63.37	-17.09	
	0.2060	22.68	AVG	9.96	32.64	53.37	-20.73	
	0.3064	37.75	QP	9.93	47.68	60.07	-12.39	
*	0.3064	35.89	AVG	9.93	45.82	50.07	-4.25	
	1.3685	23.44	QP	9.97	33.41	56.00	-22.59	
	1.3685	14.71	AVG	9.97	24.68	46.00	-21.32	
	8.4625	27.04	QP	10.42	37.46	60.00	-22.54	
	8.4625	17.66	AVG	10.42	28.08	50.00	-21.92	
	18.3625	24.32	QP	11.15	35.47	60.00	-24.53	
	18.3625	16.73	AVG	11.15	27.88	50.00	-22.12	

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

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, AVG = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **Up line: QP limit, Down line: AVG limit.**

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 006, ETSTW-CE 016

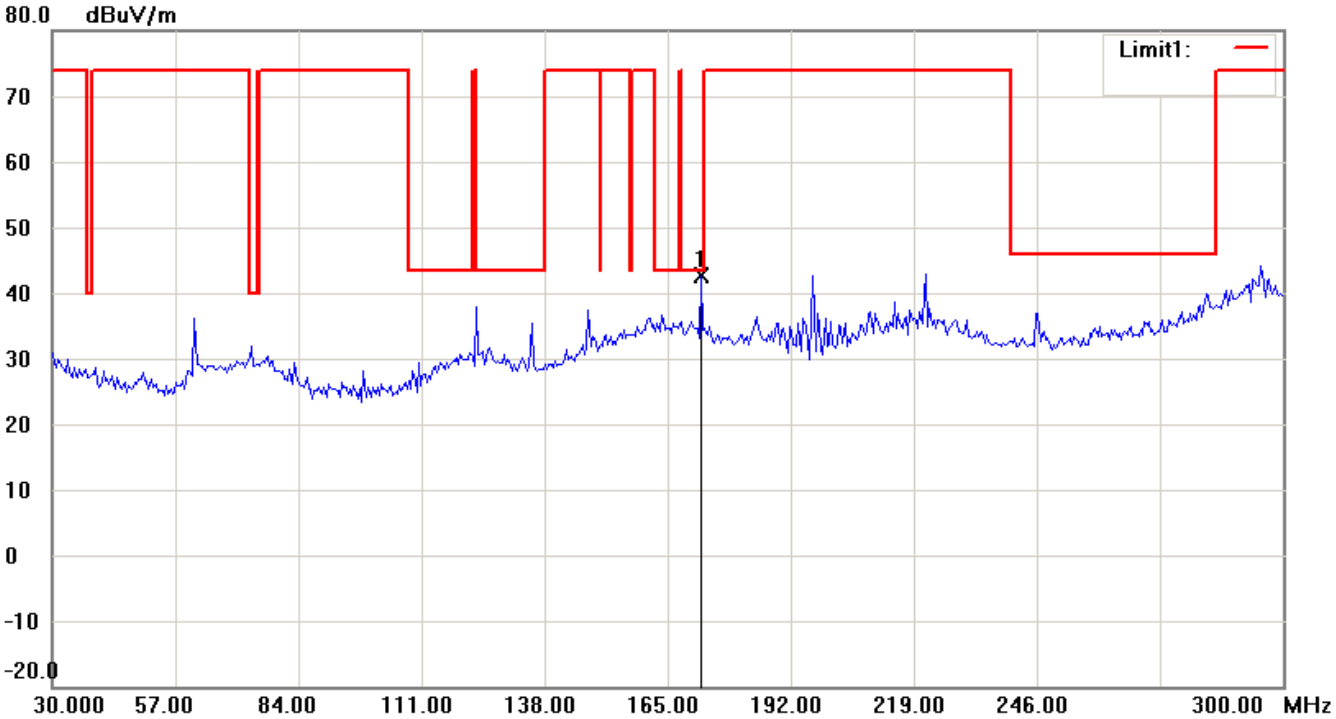
Appendix

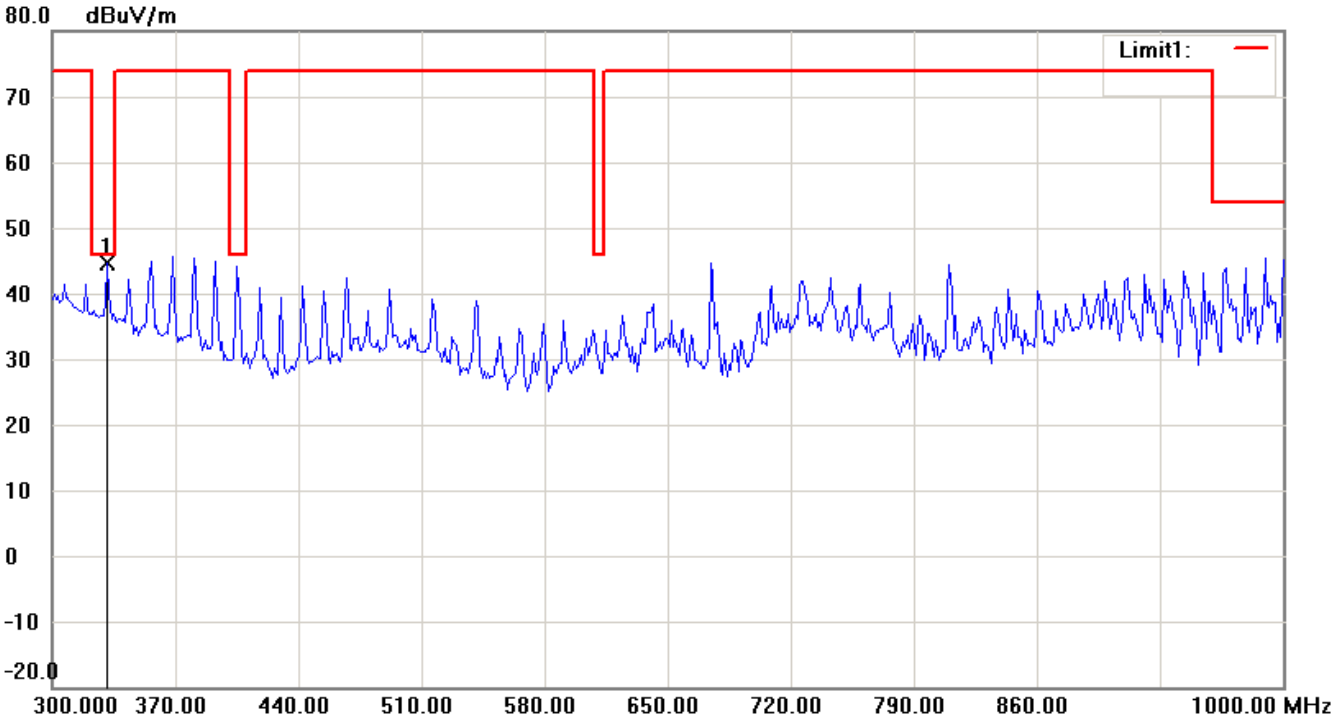
Measurement diagrams

Spurious Emissions radiated

Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

Spurious Emissions radiated
Transmitter_CH 1
Antenna Polarization H

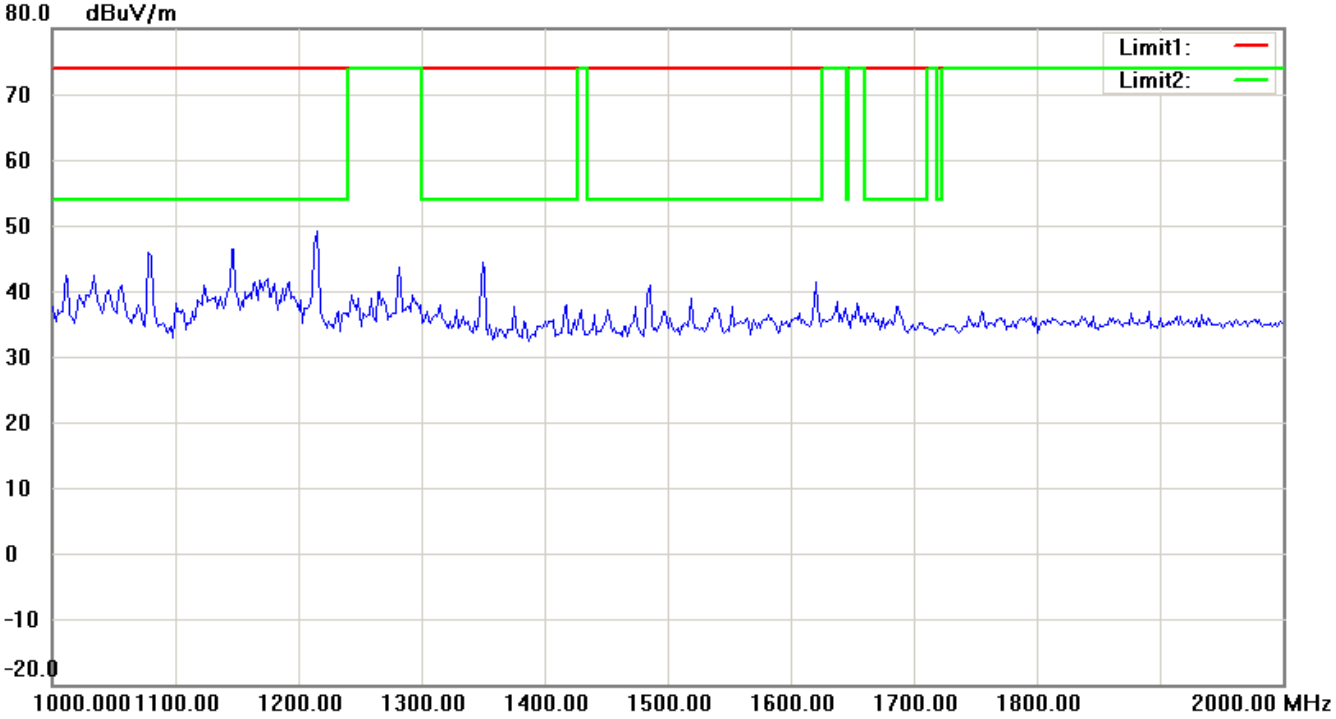


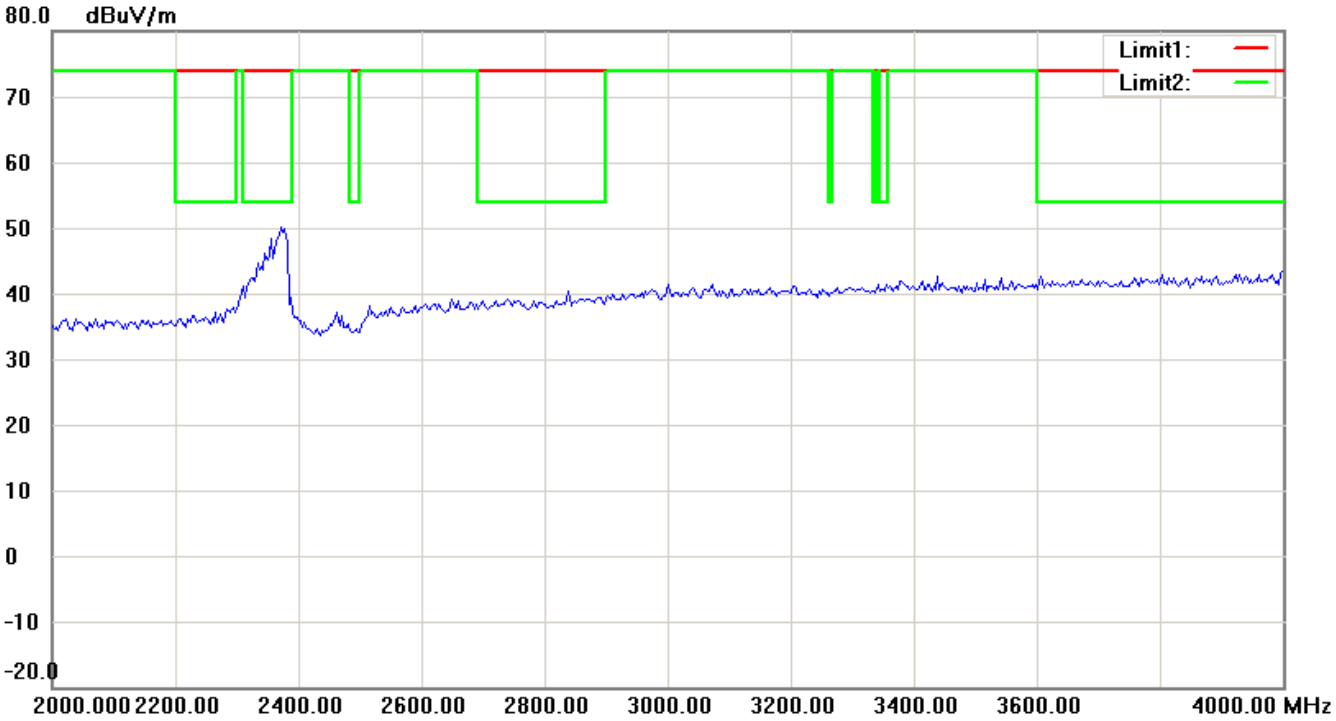


Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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.**

Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





Up Line: Peak Limit Line Down Line: Ave Limit Line
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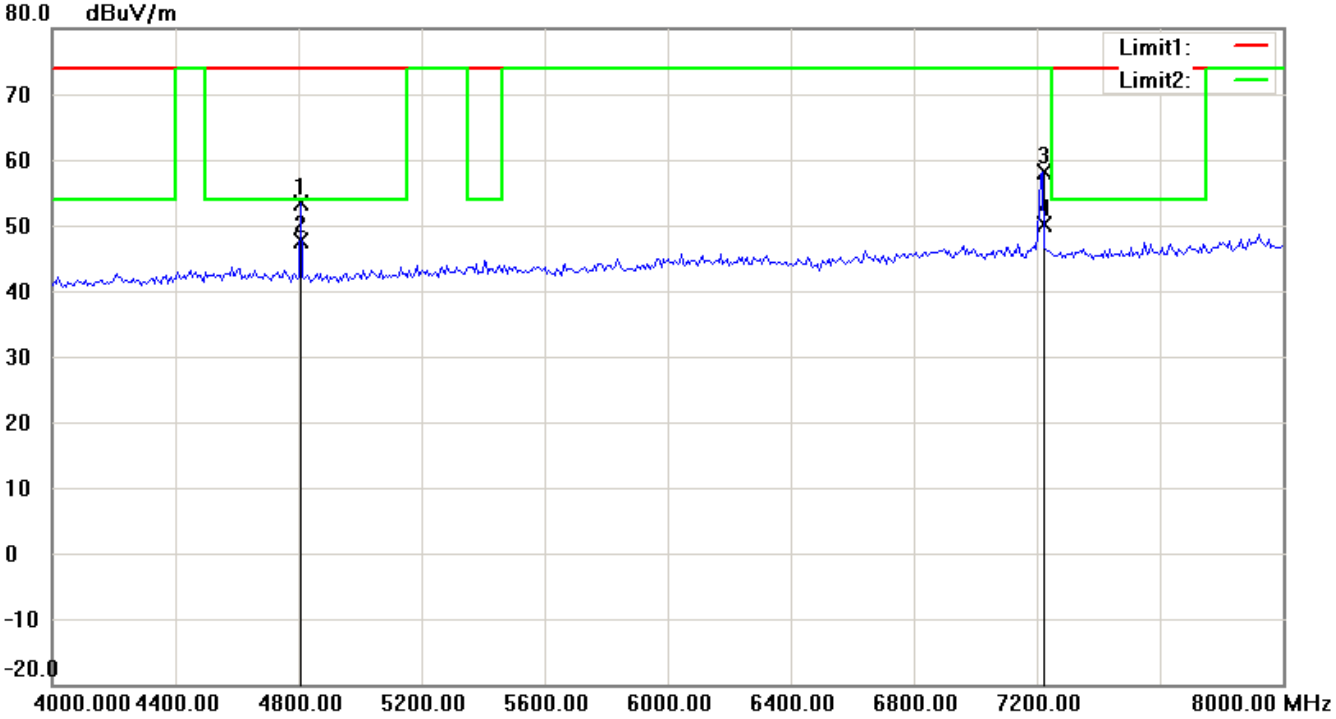
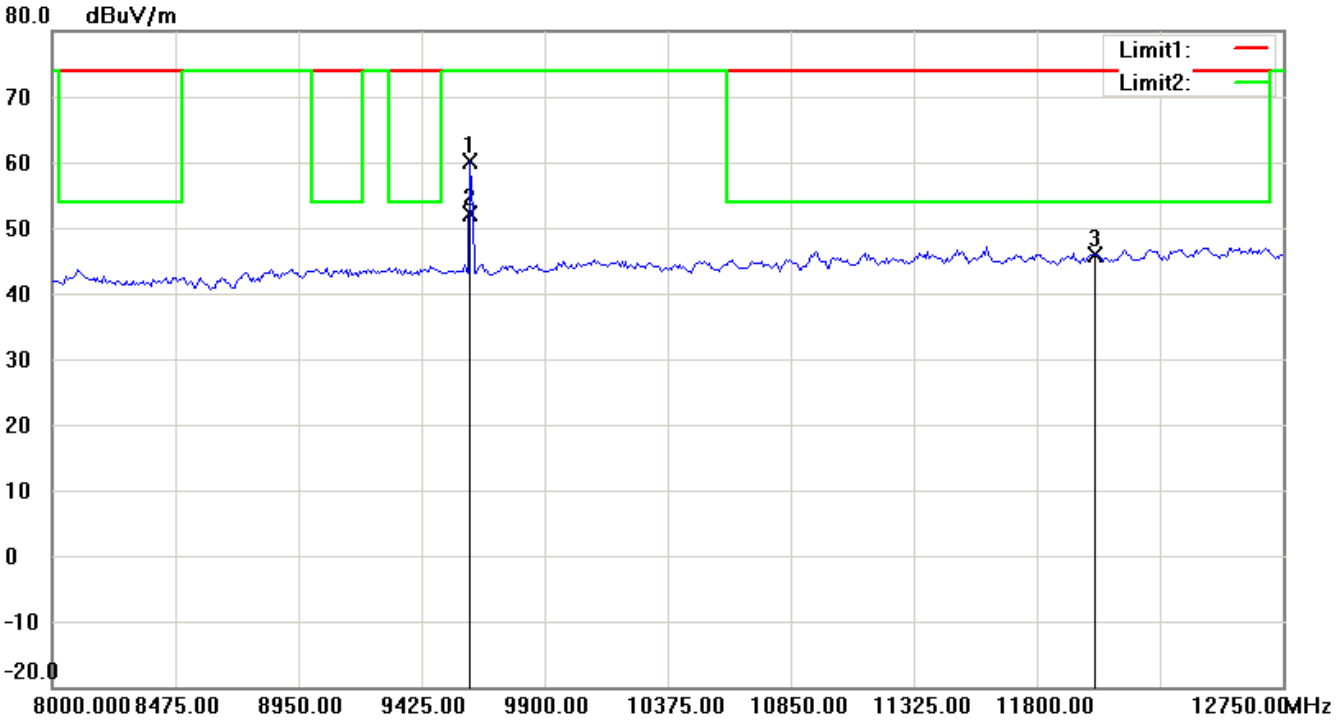
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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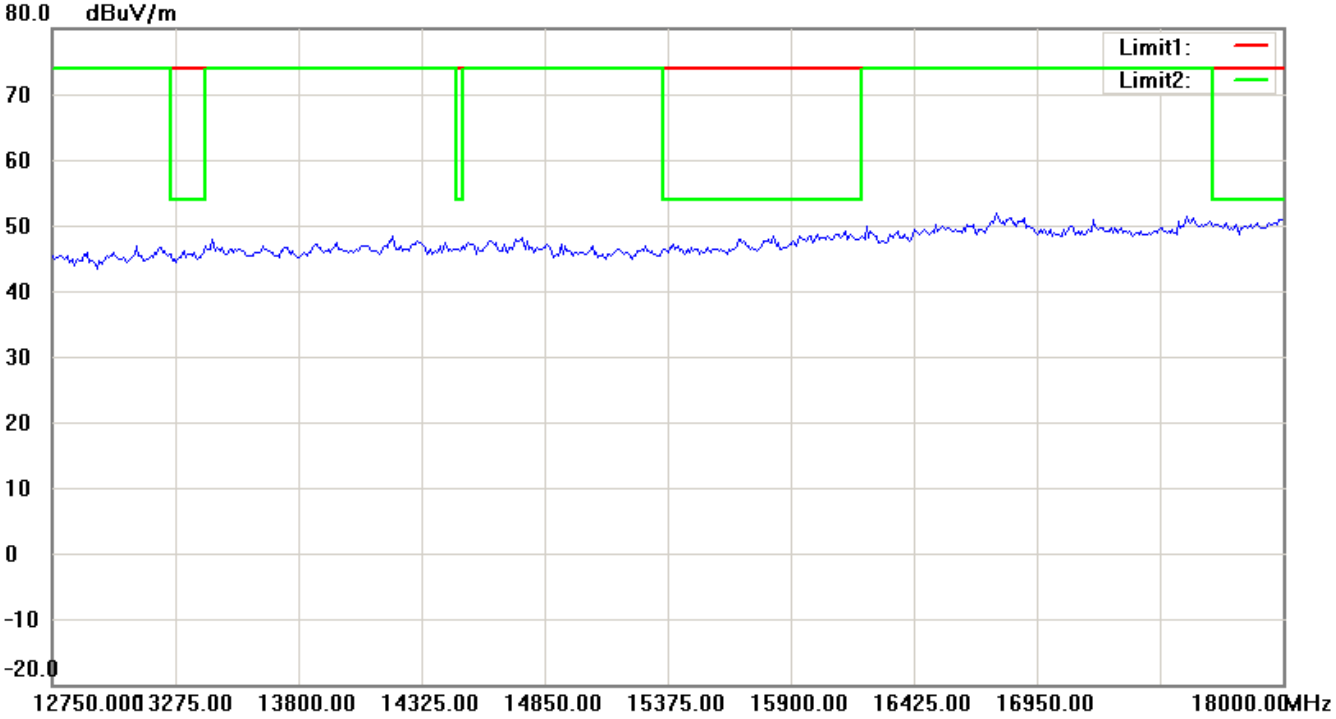

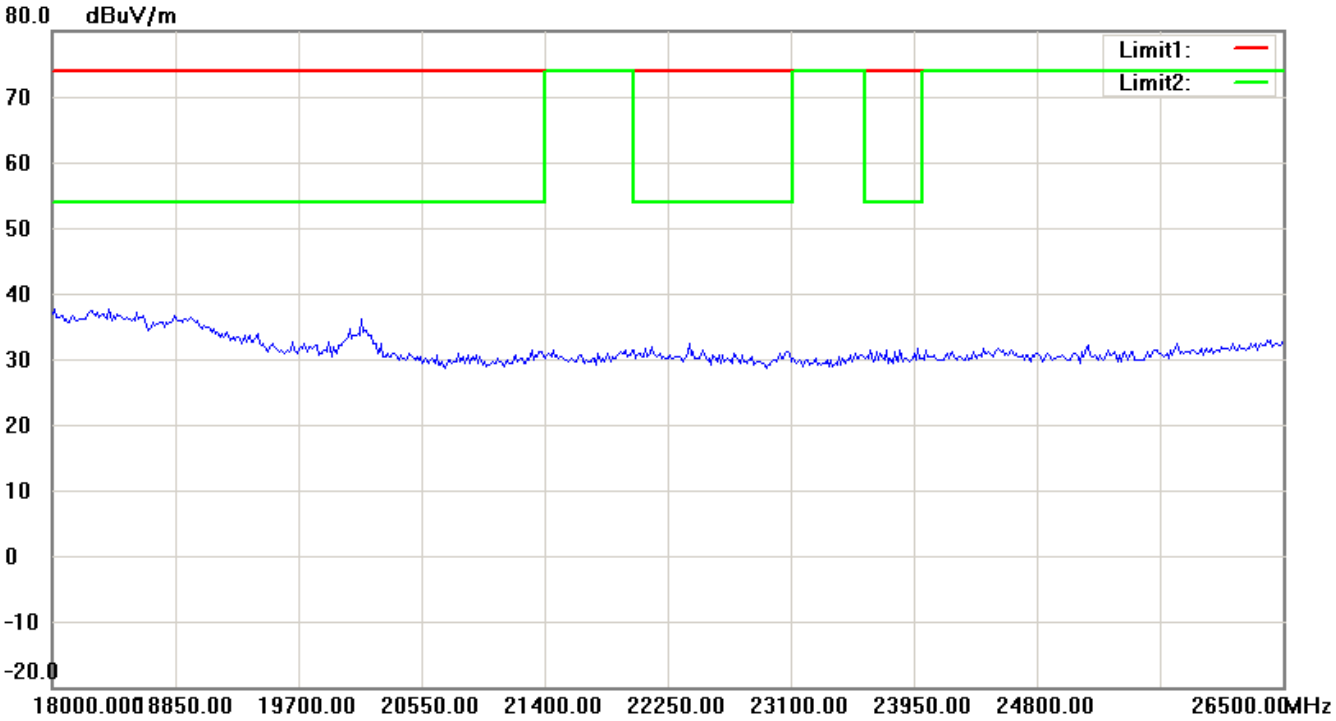

Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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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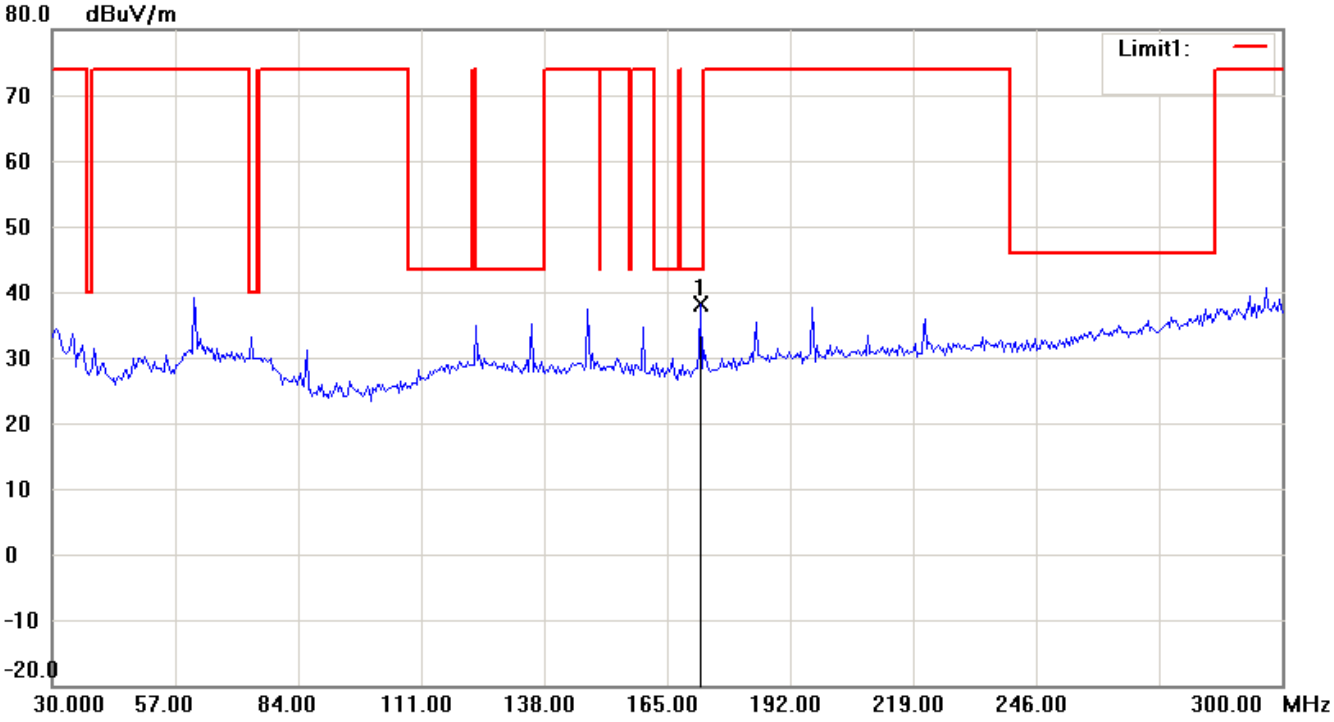
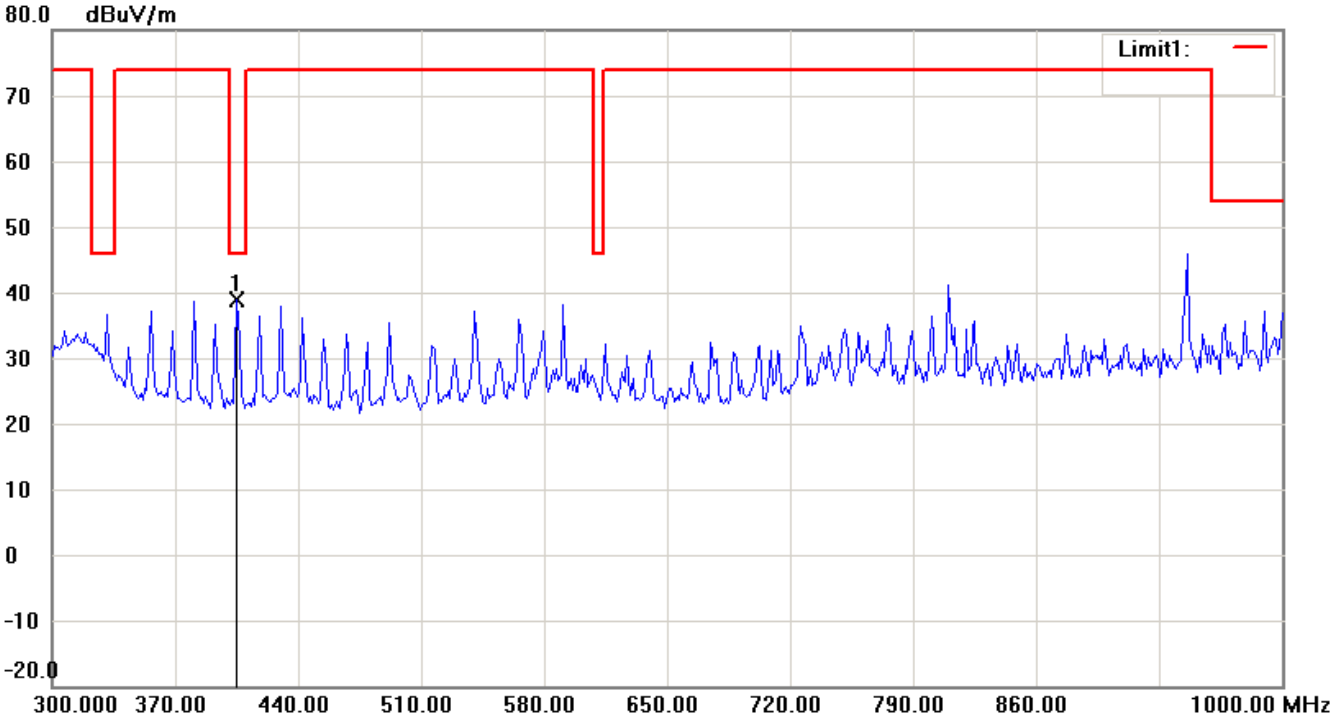
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

Antenna Polarization V





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

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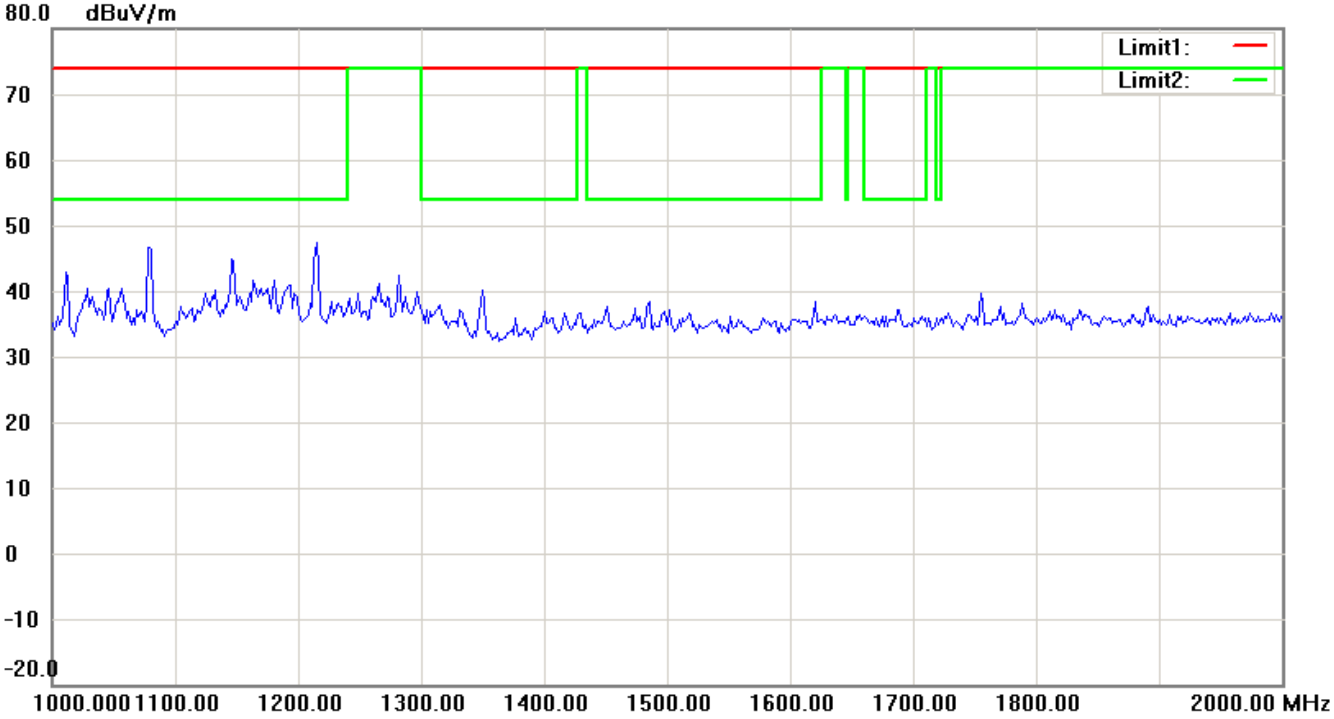
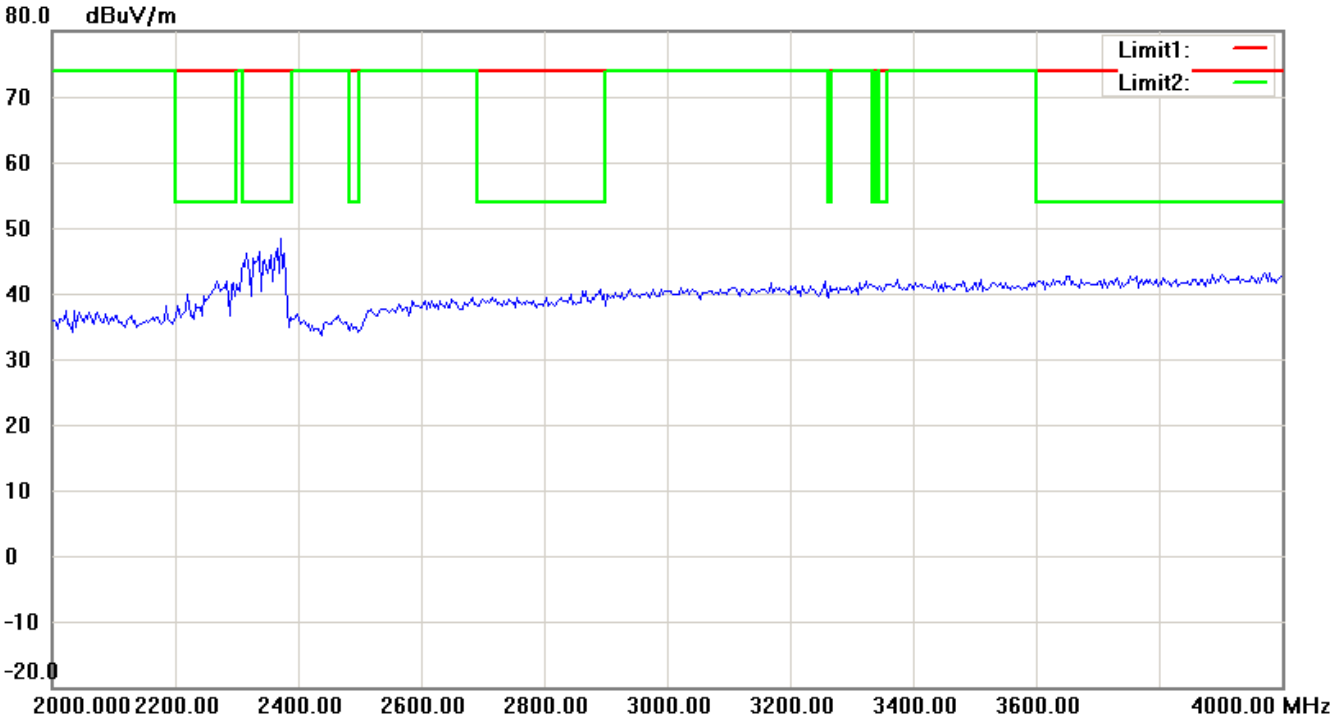
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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

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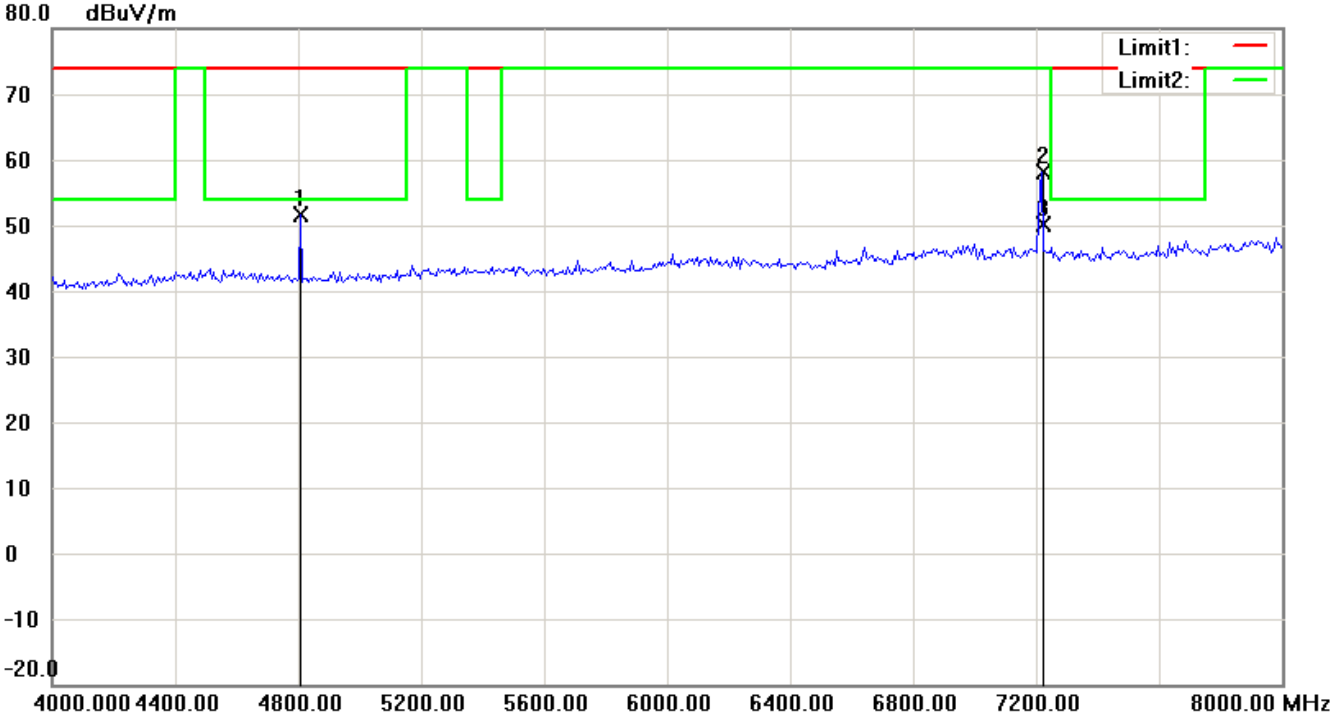
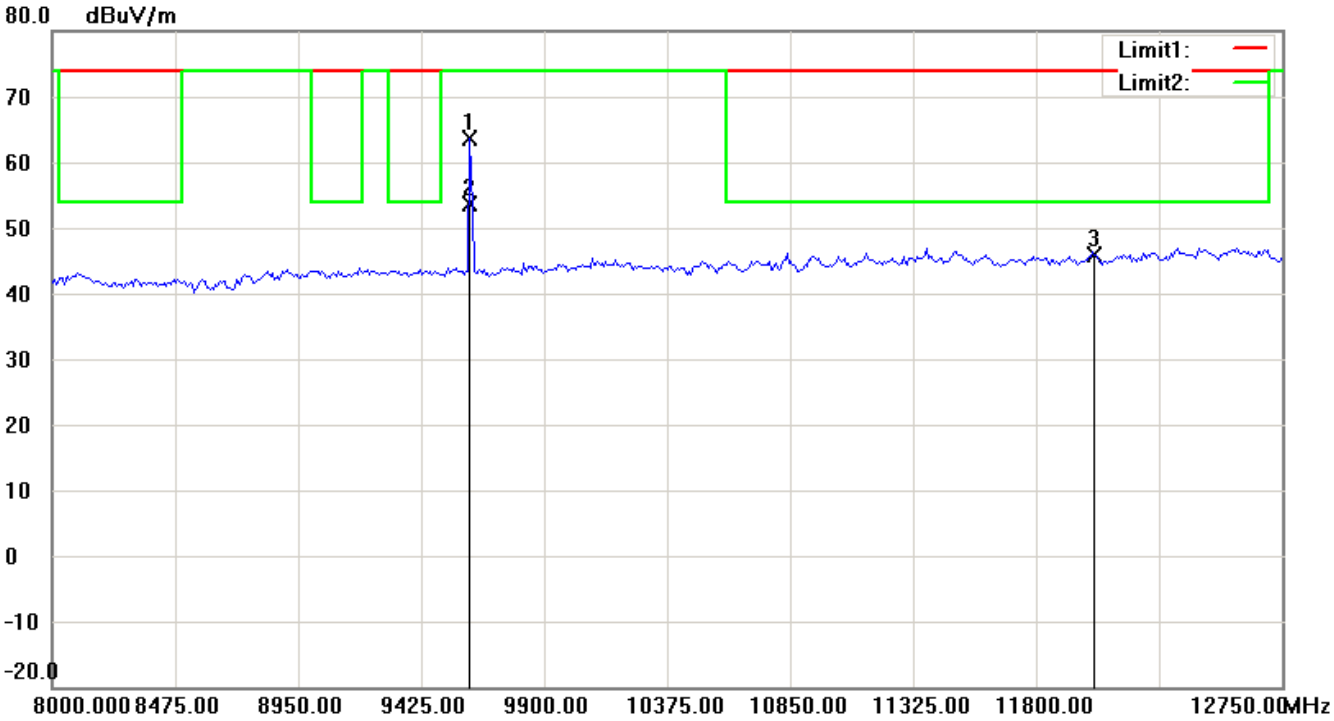
FCC ID: WLQSB4000IHTTX





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

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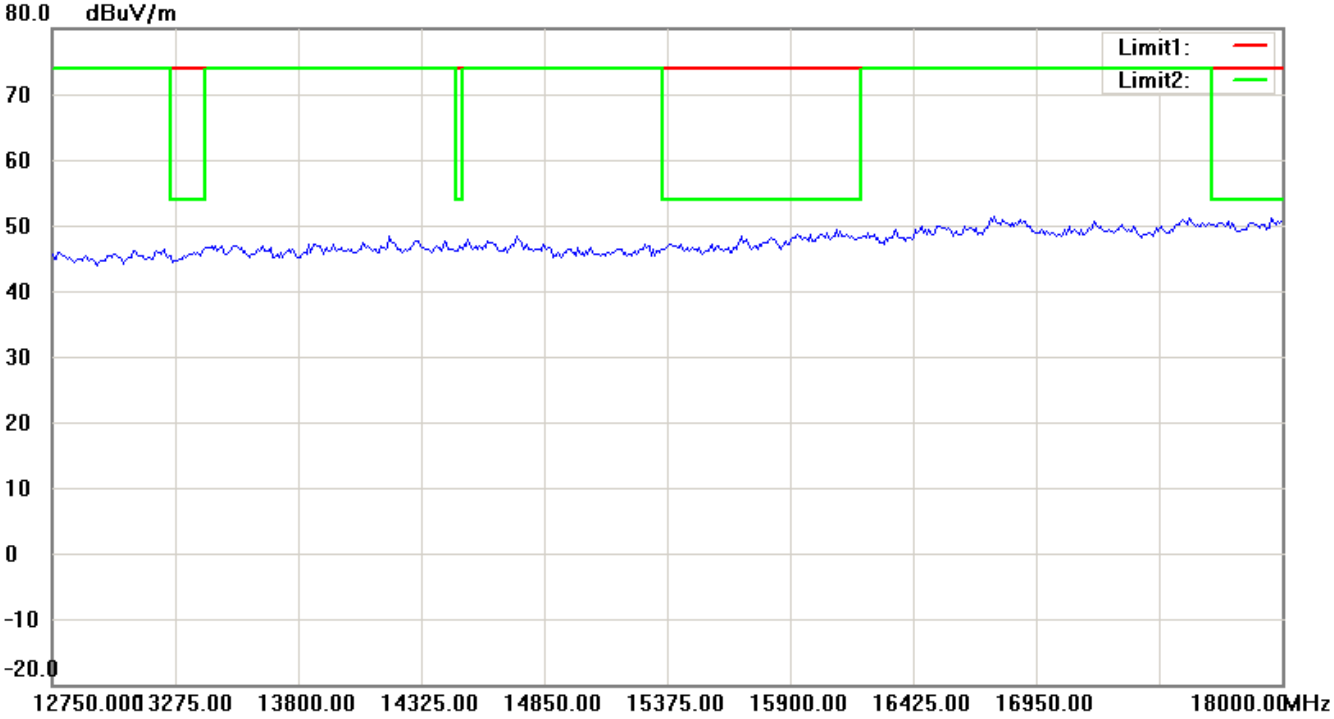
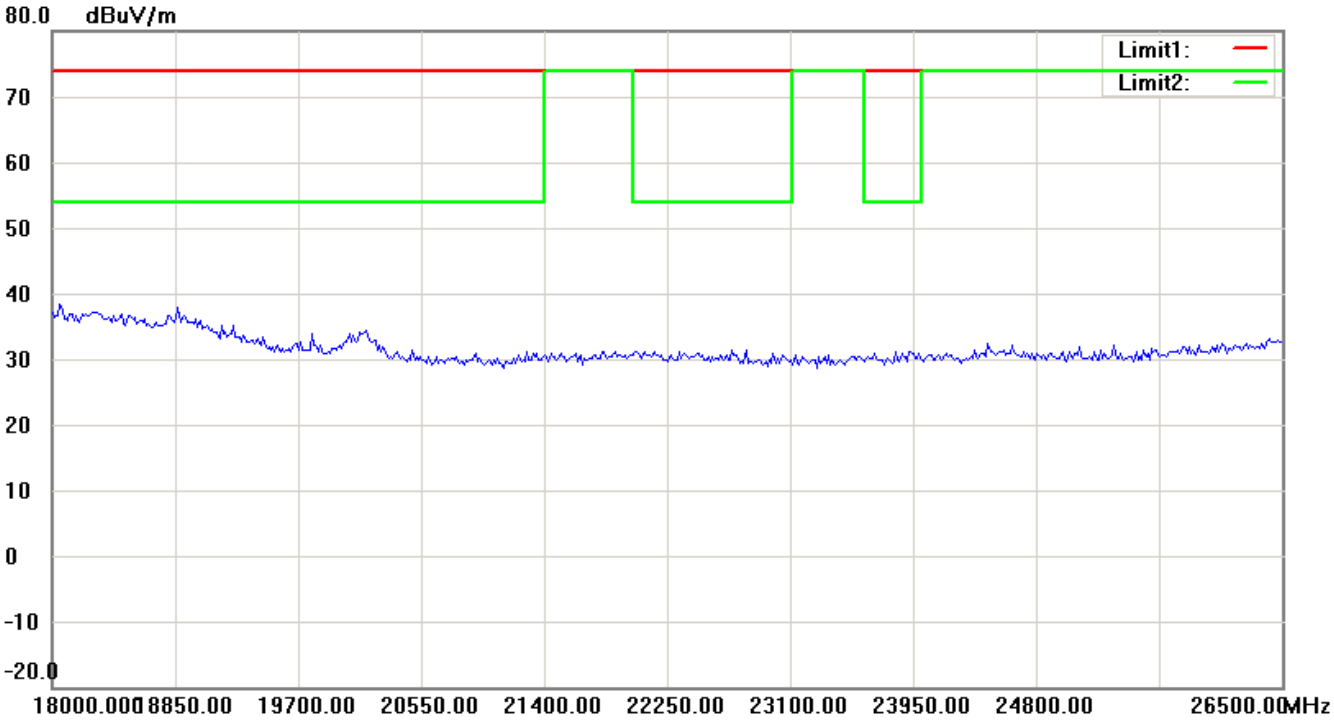
FCC ID: WLQSB4000IHTTX





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

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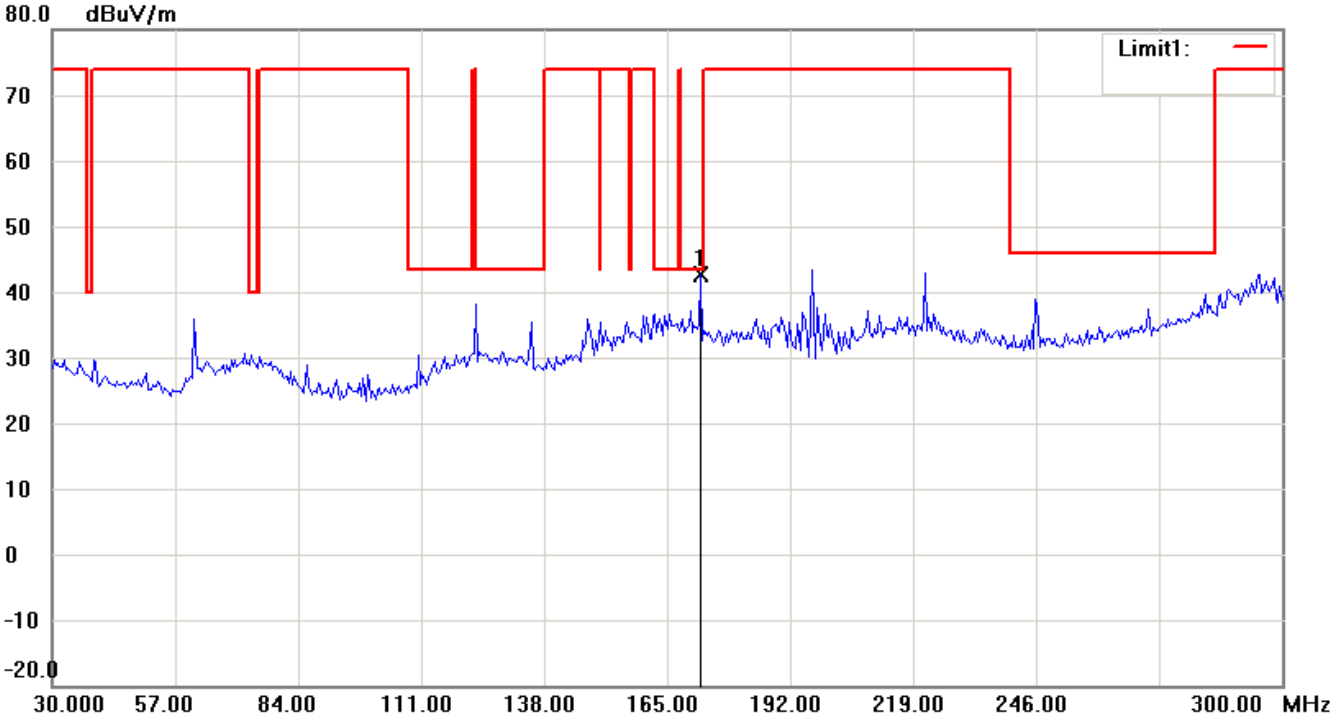
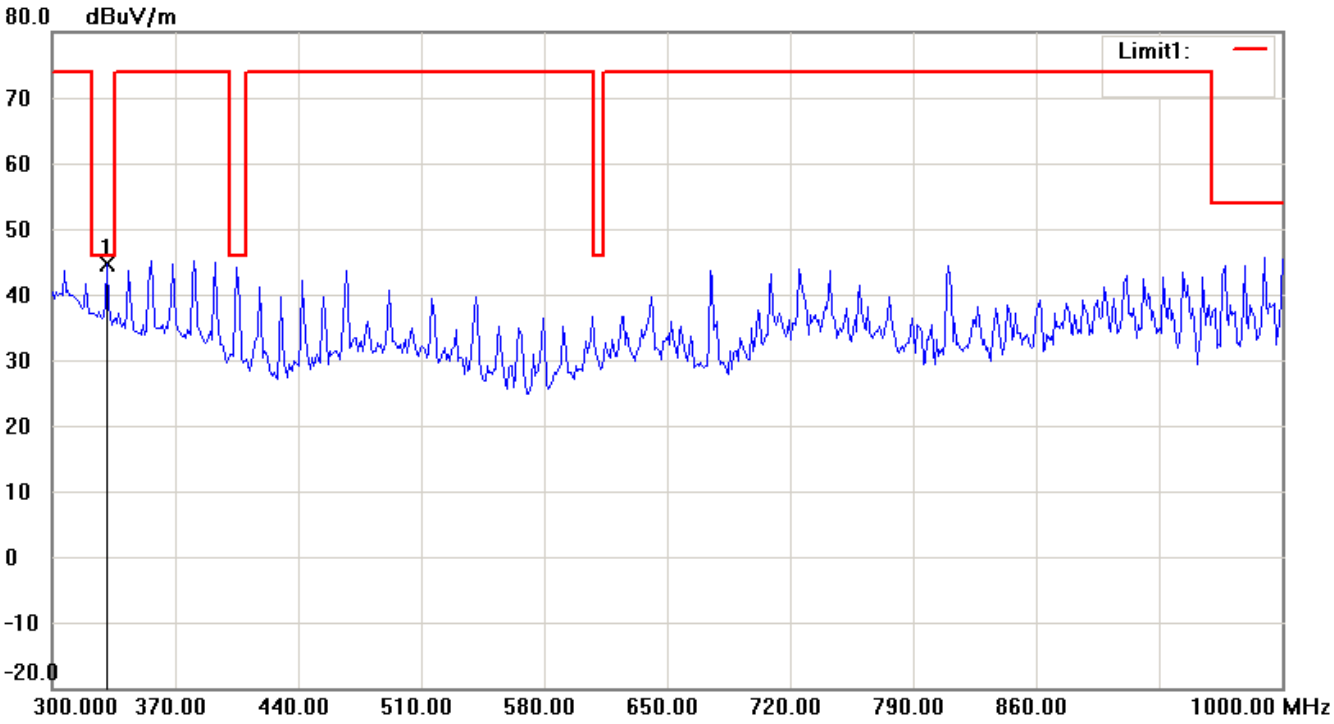
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

Transmitter_ CH 9

Antenna Polarization H





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

Note:

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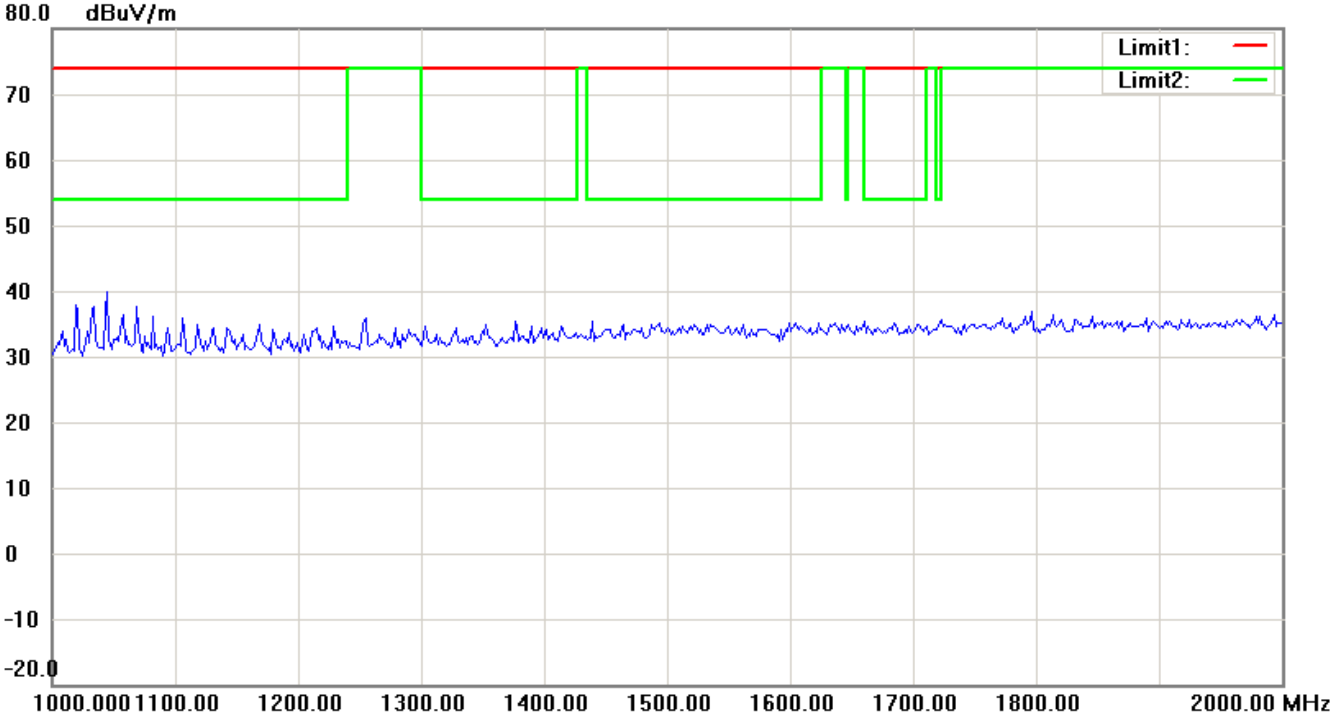
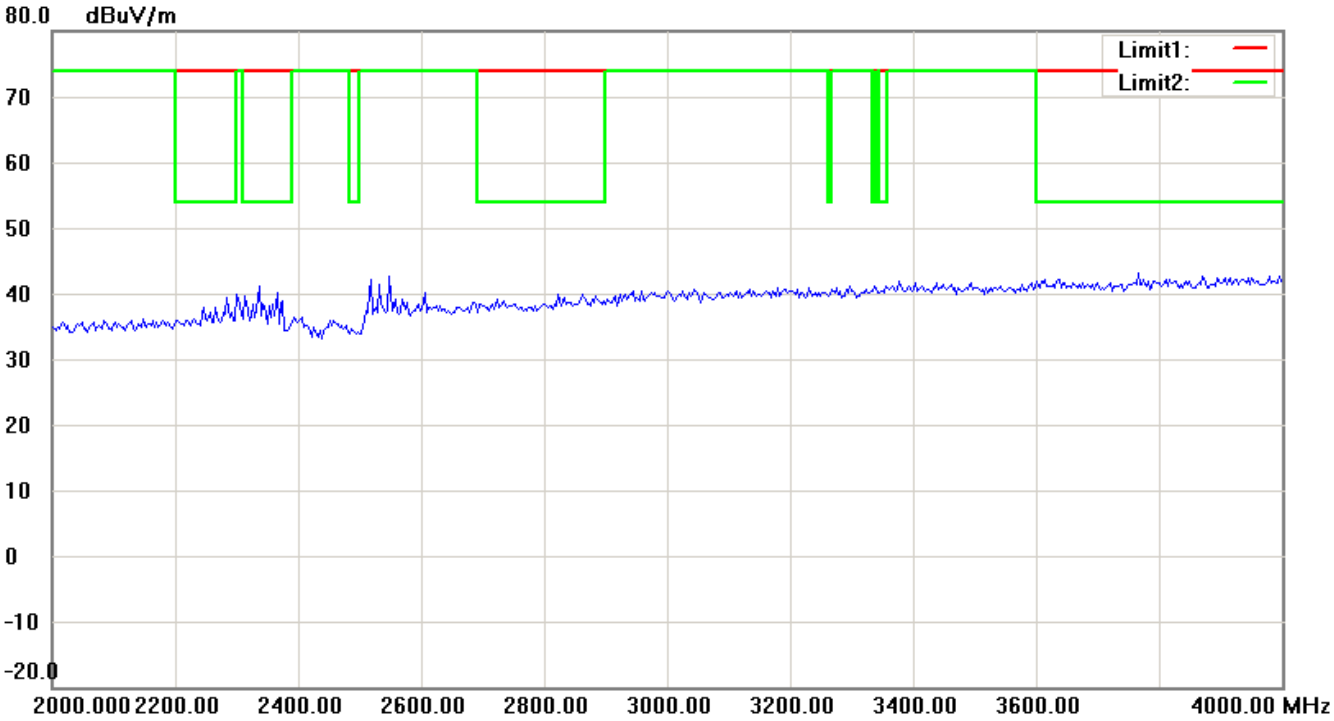
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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

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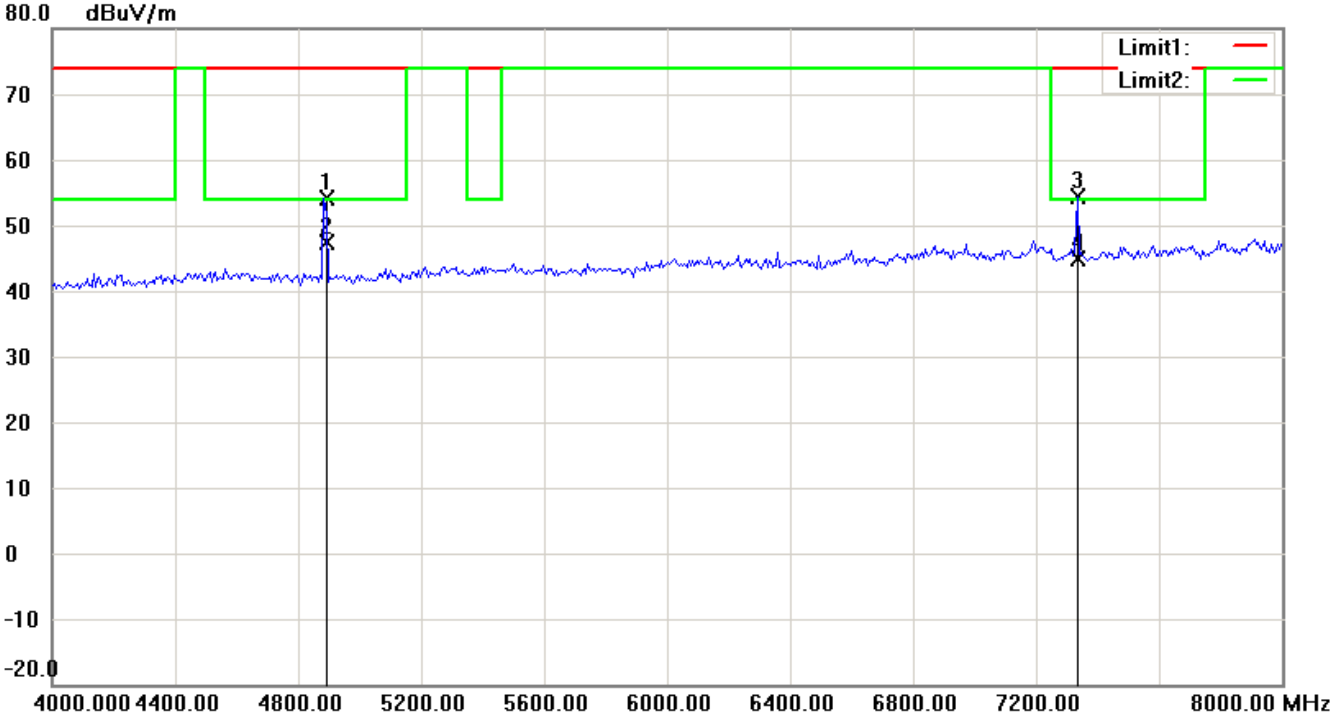
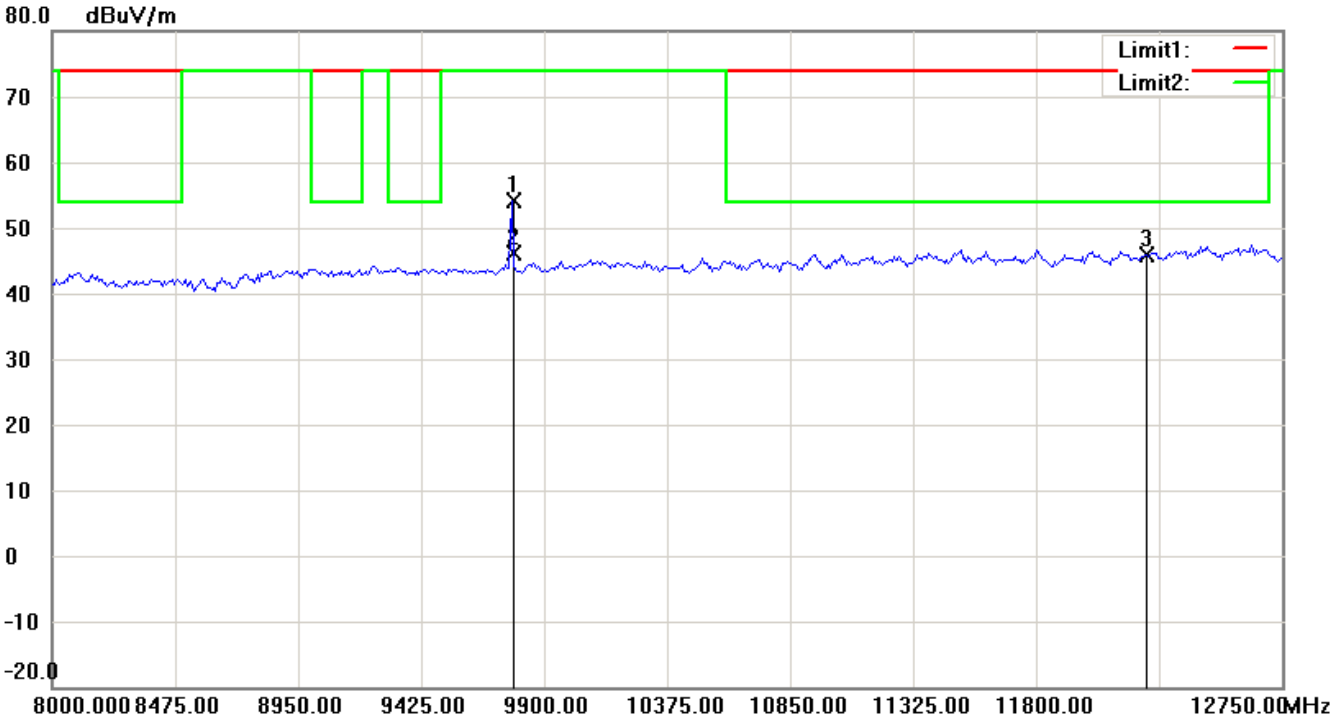
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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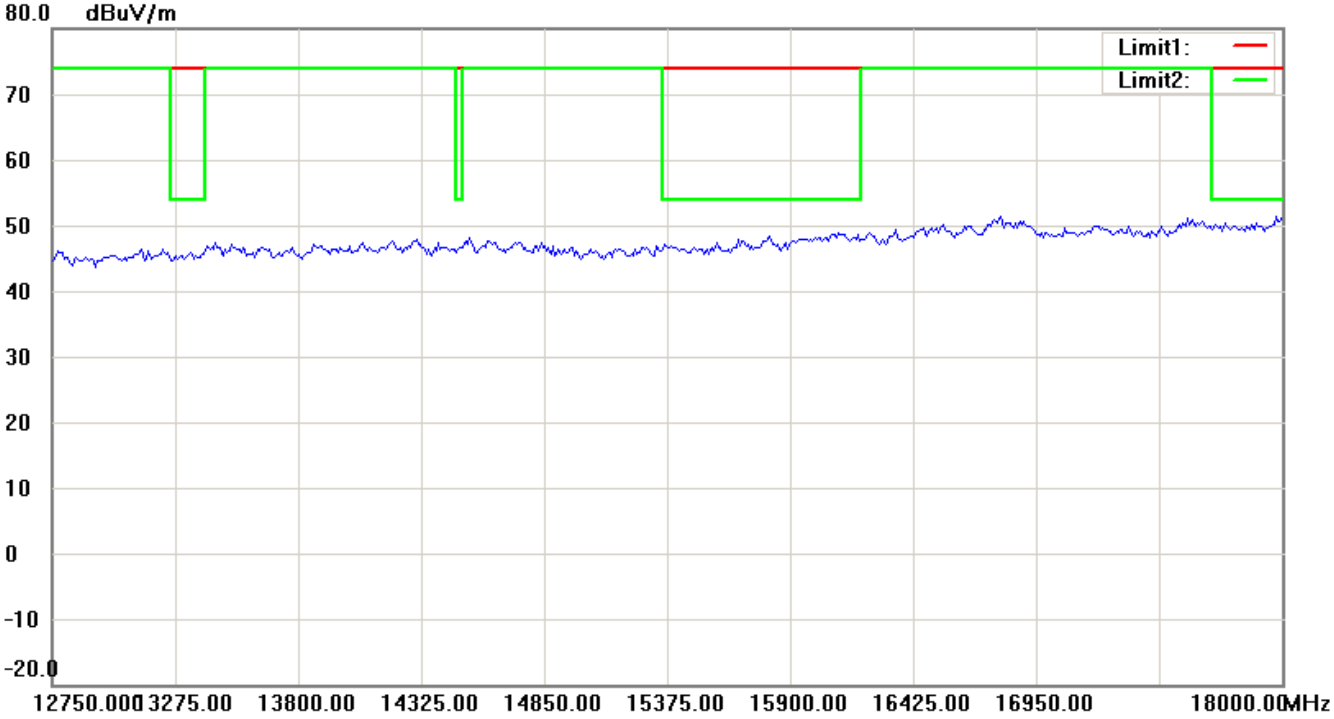

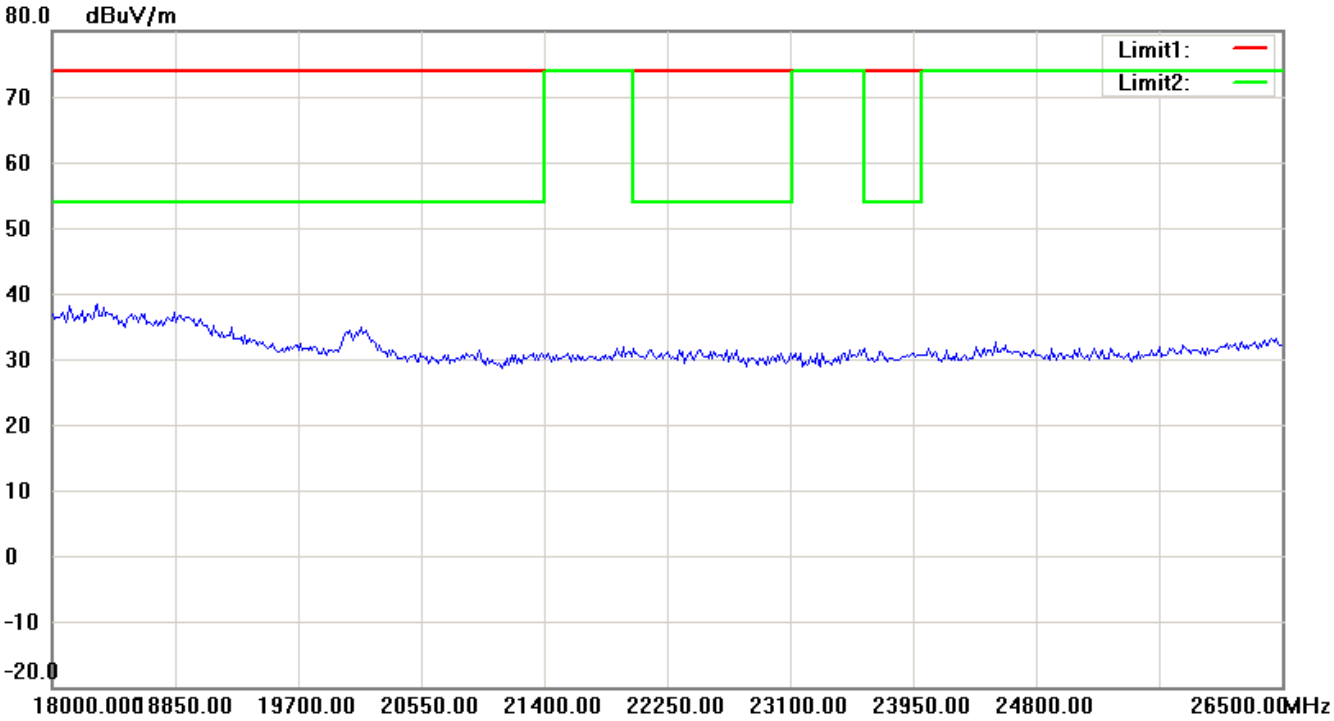

Up Line: Peak Limit Line Down Line: Ave Limit Line
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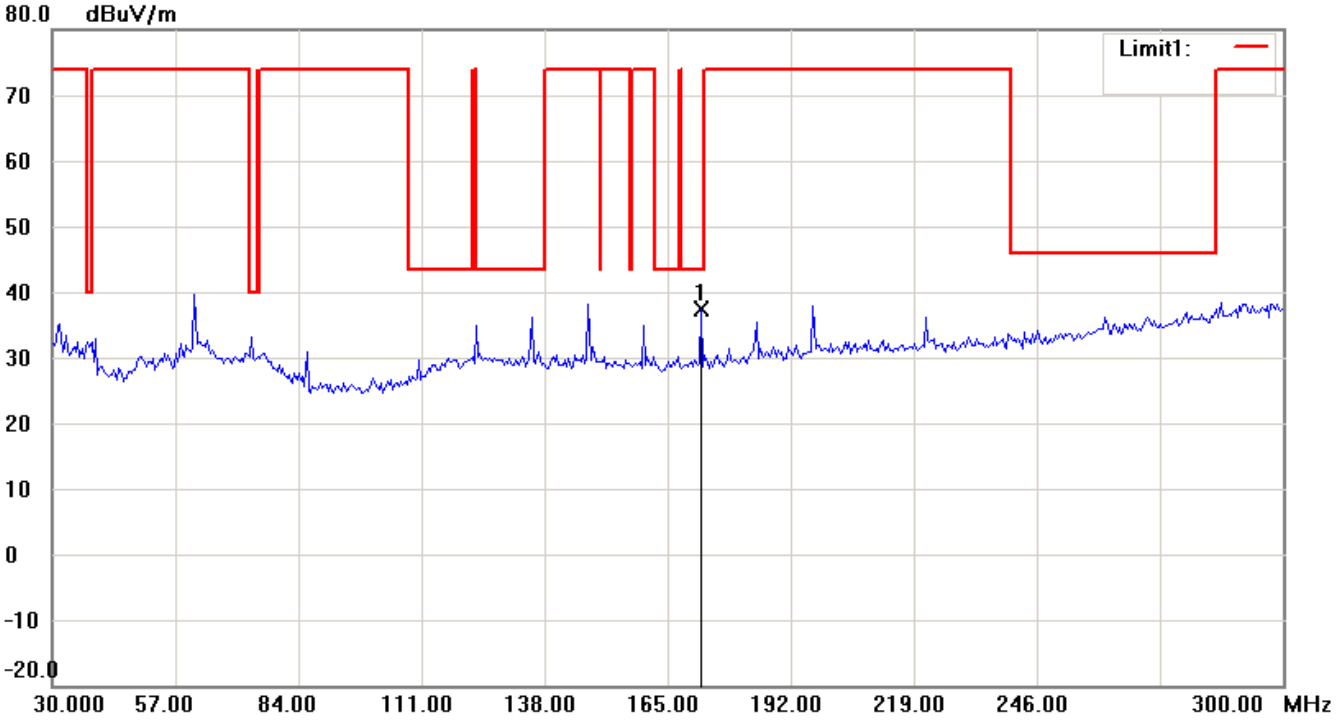
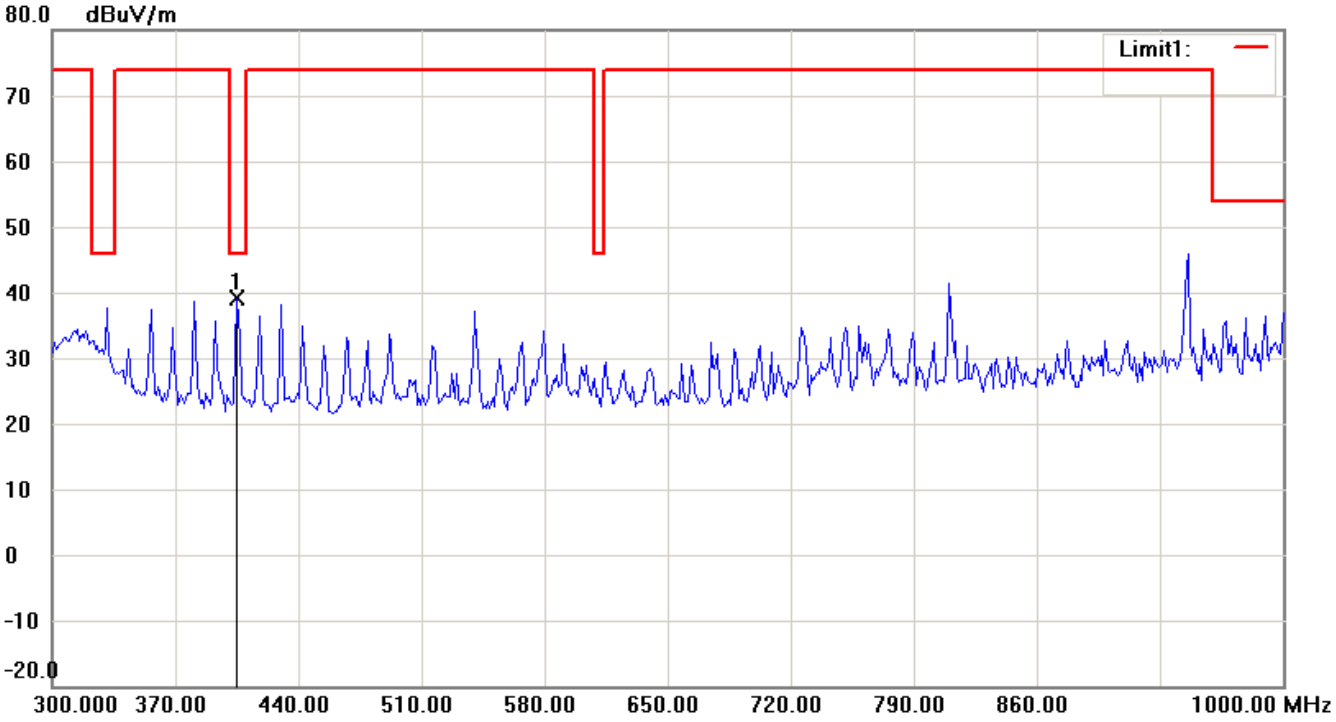
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

Antenna Polarization V





Up Line: Peak Limit Line Down Line: Ave Limit Line
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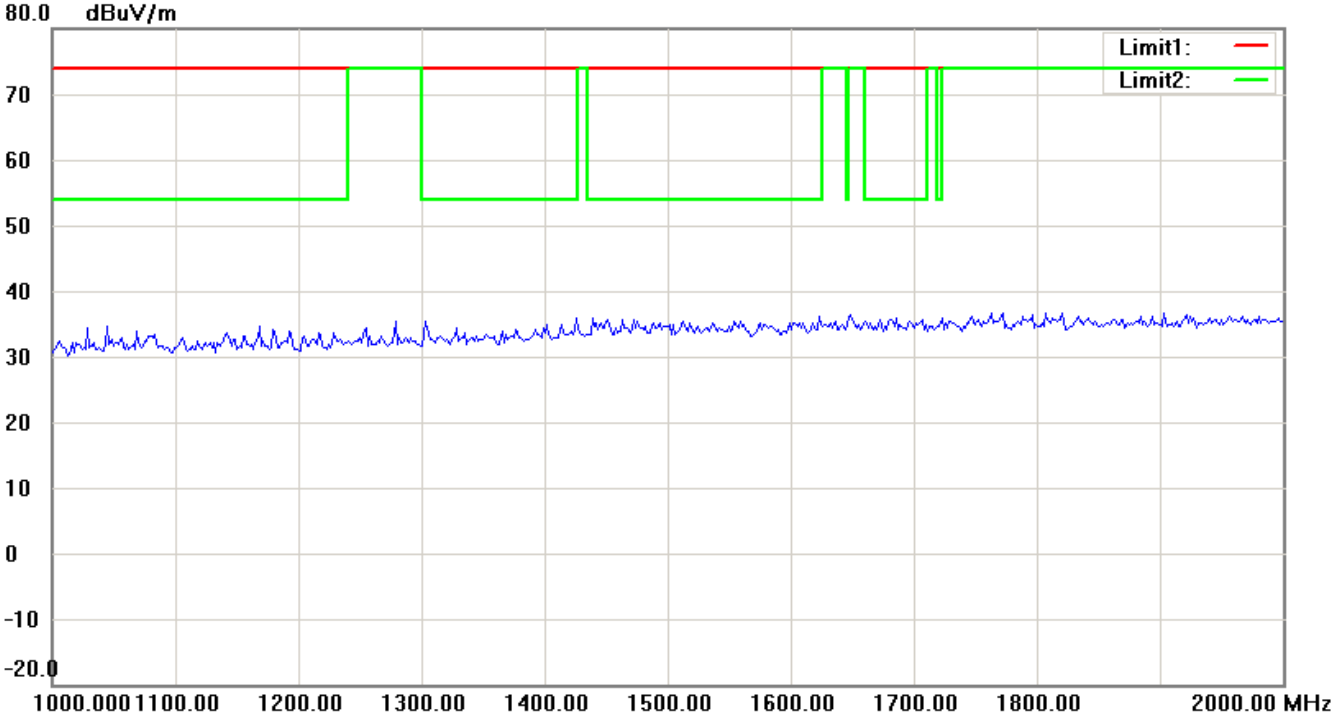
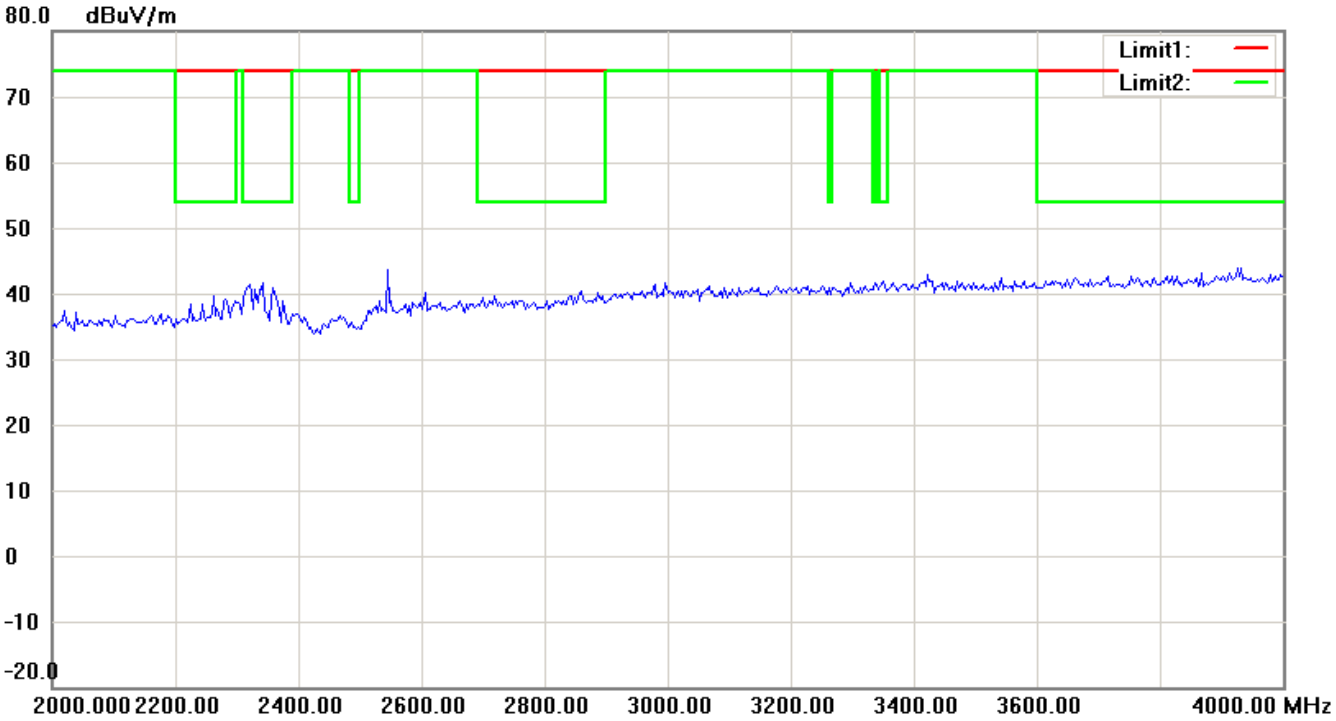
FCC ID: WLQSB4000IHTTX





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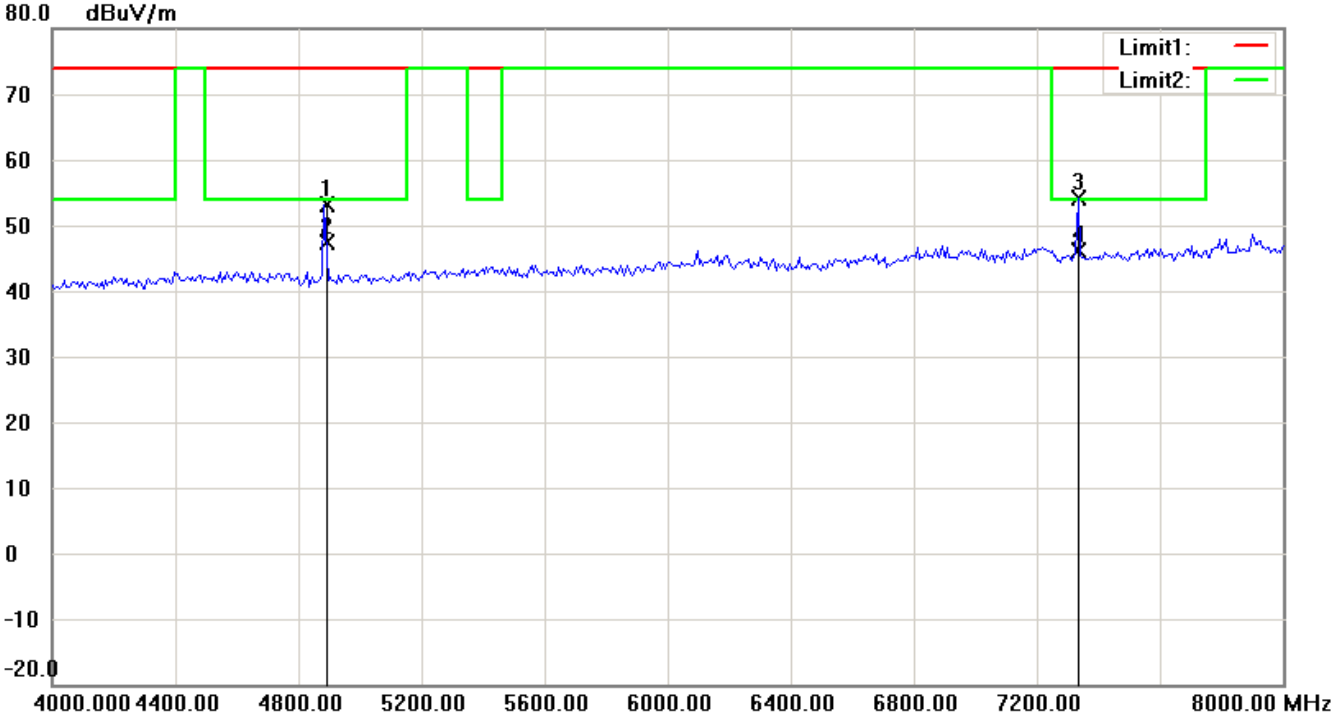

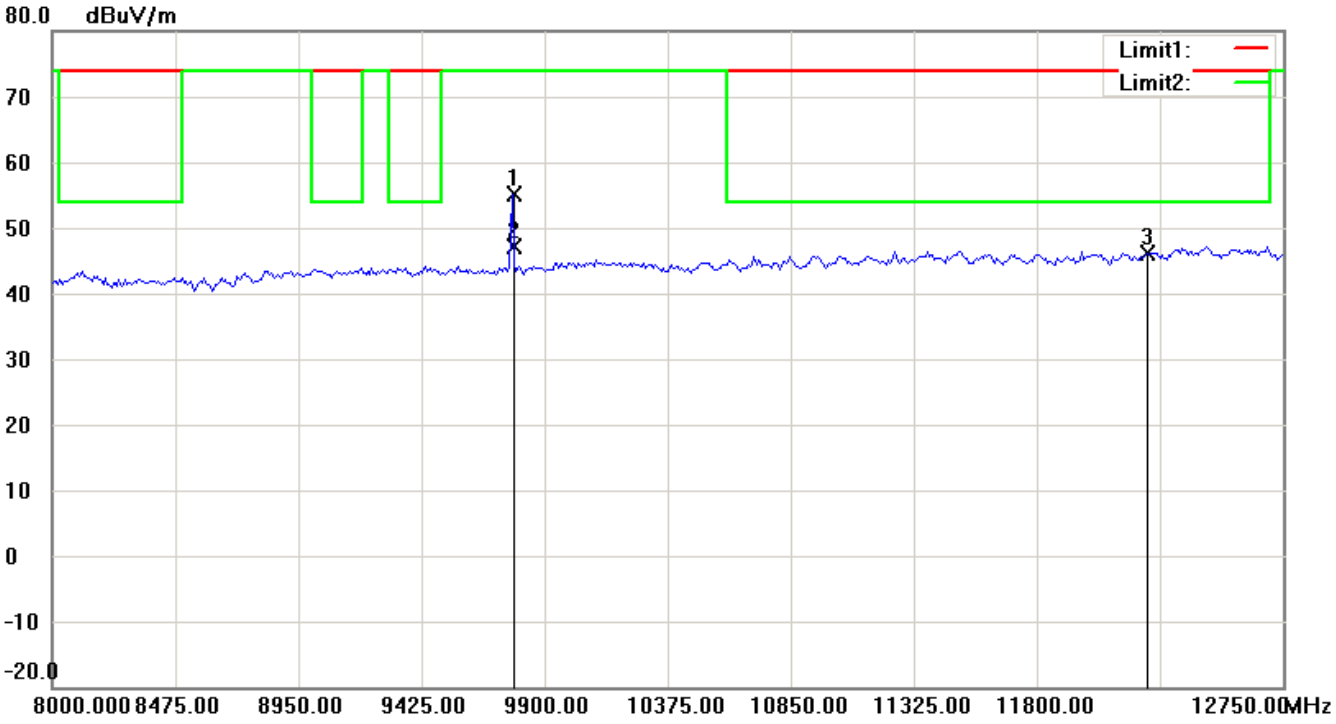

Up Line: Peak Limit Line Down Line: Ave Limit Line
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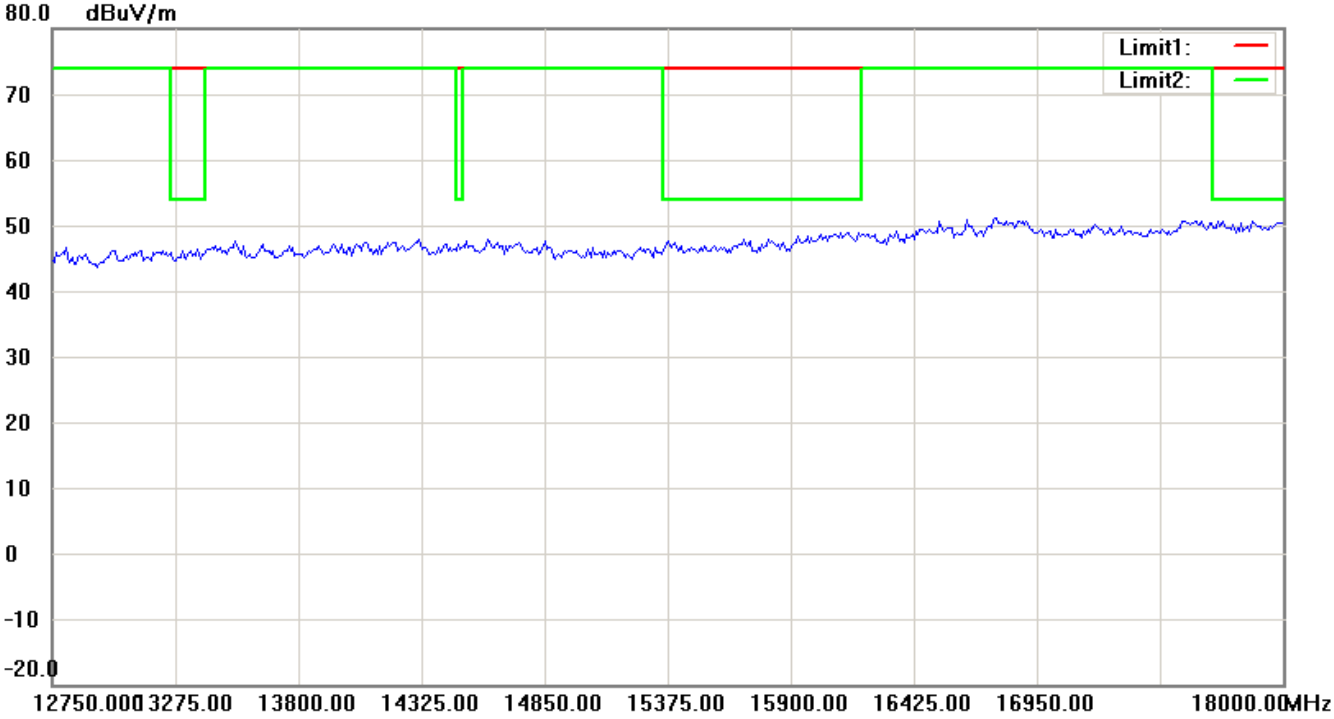
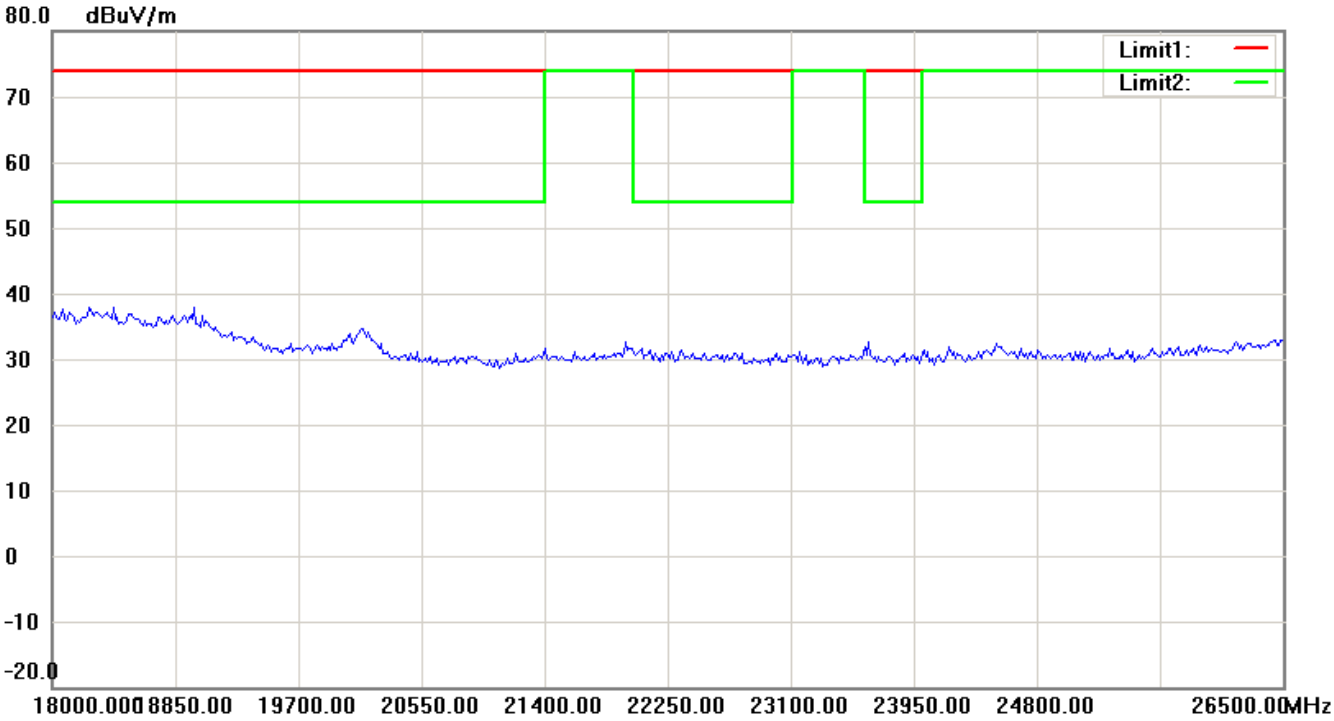
FCC ID: WLQSB4000IHTTX





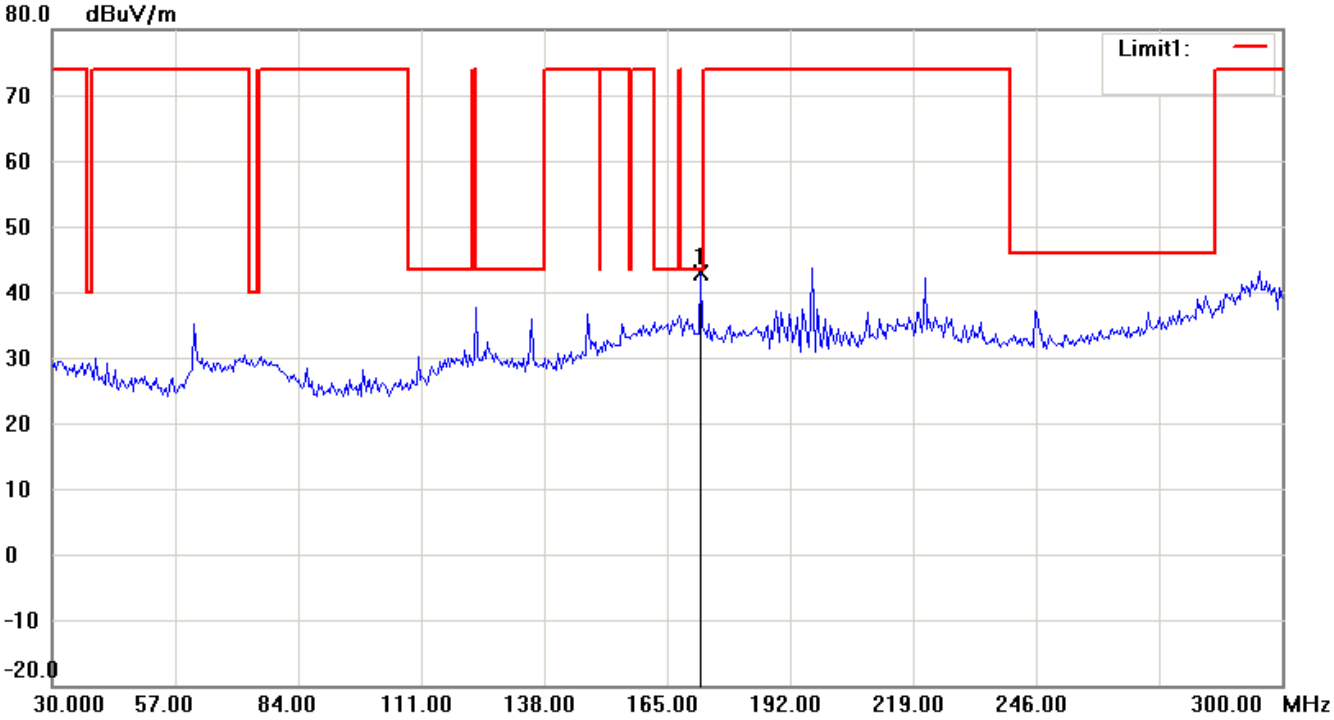
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

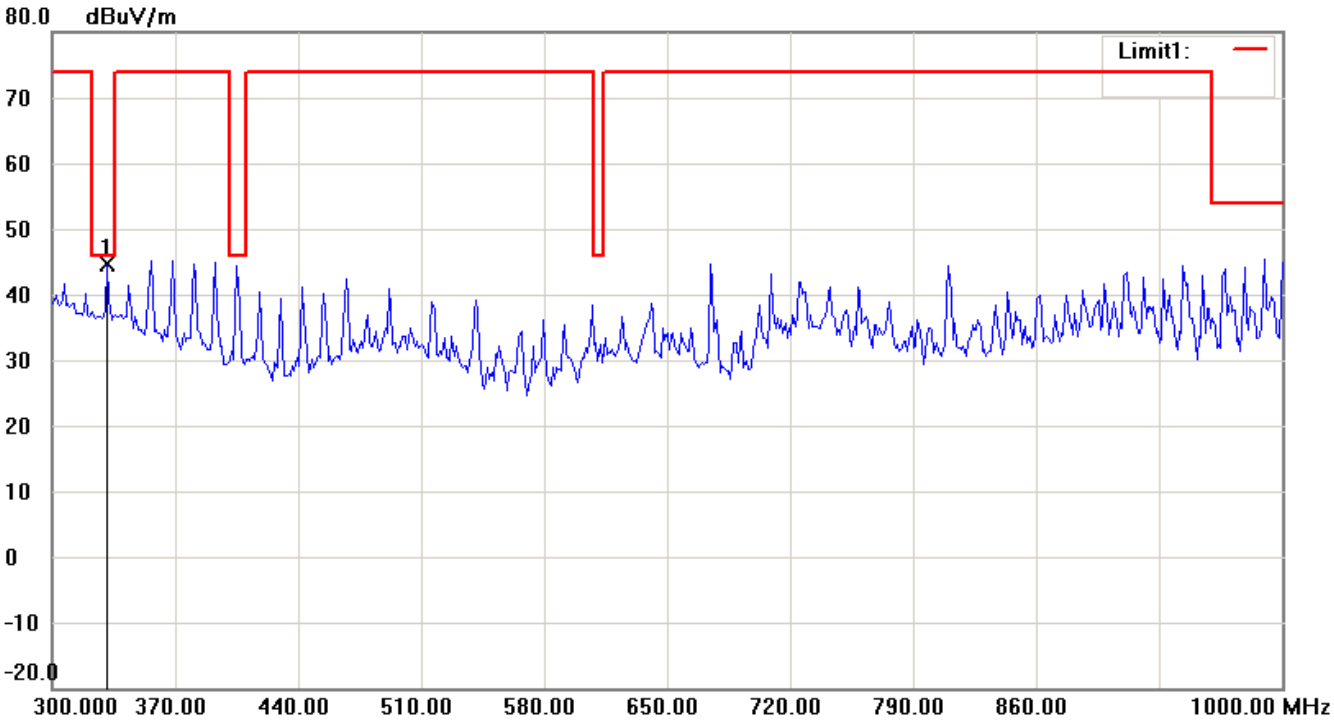
1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the 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: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

Transmitter_ CH 16

Antenna Polarization H





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

Note:

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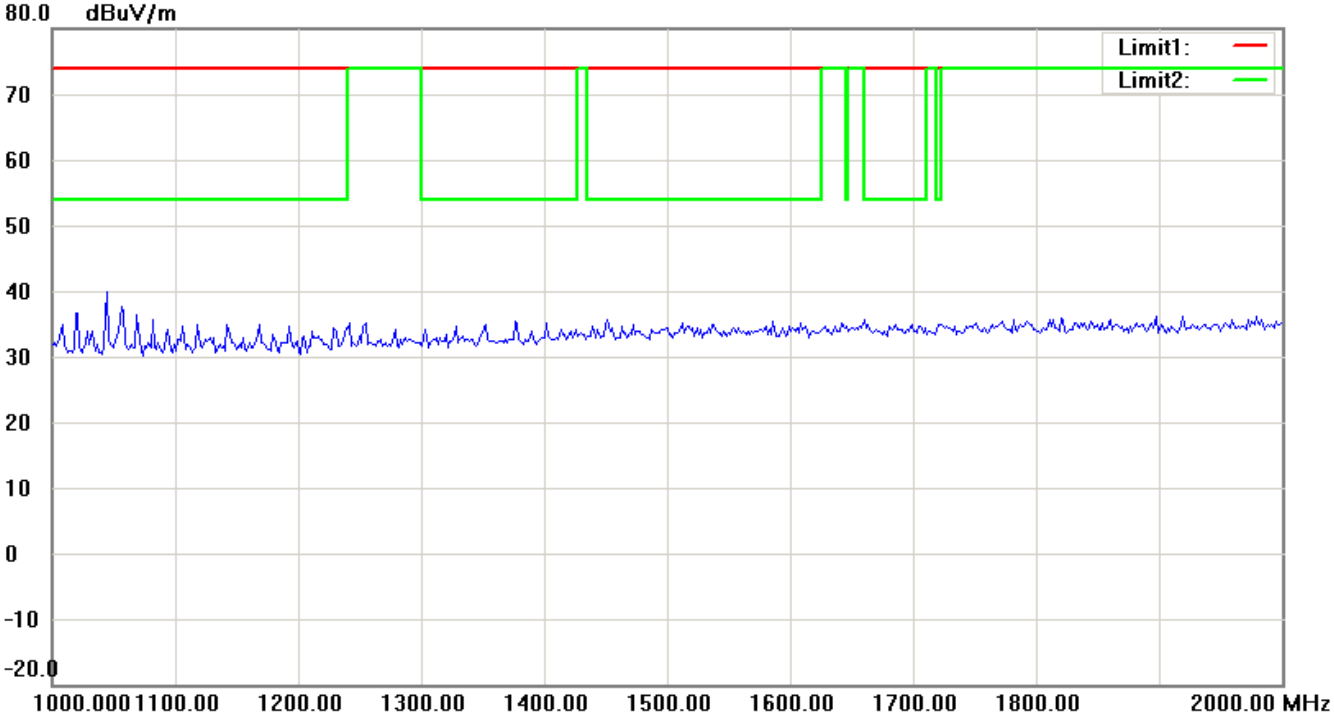
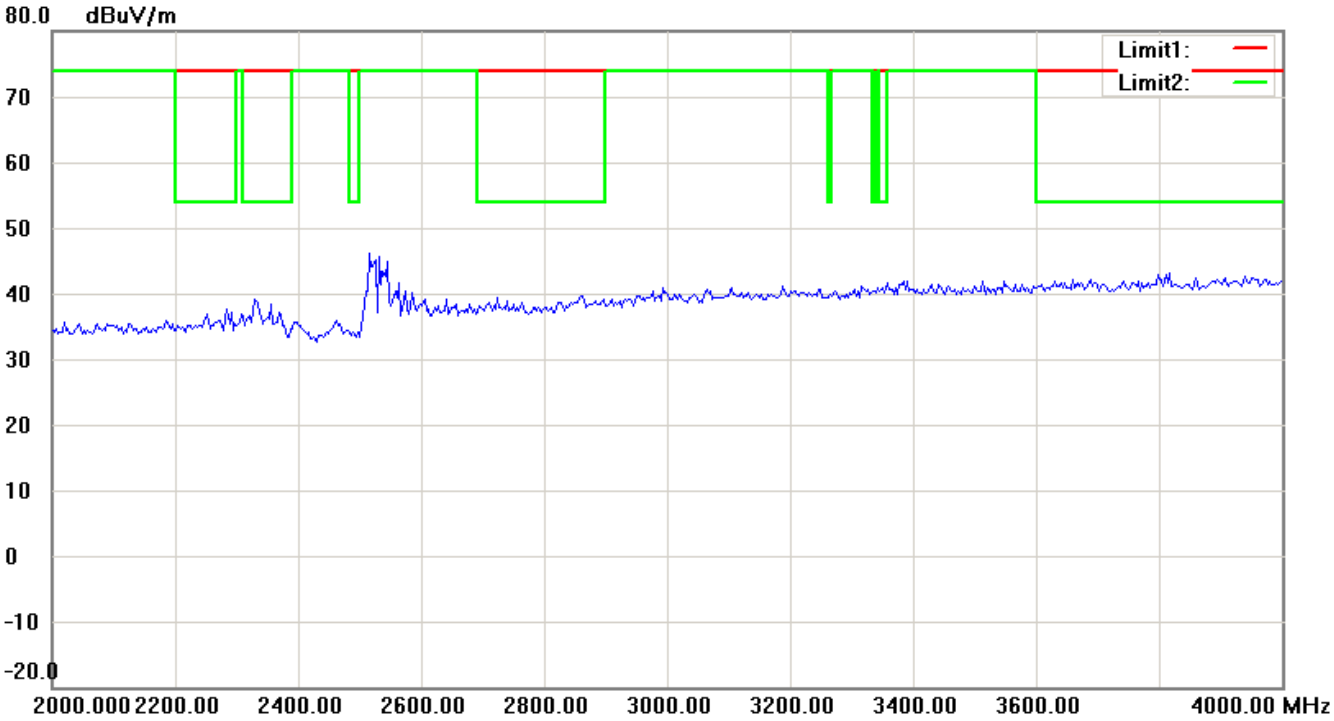
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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

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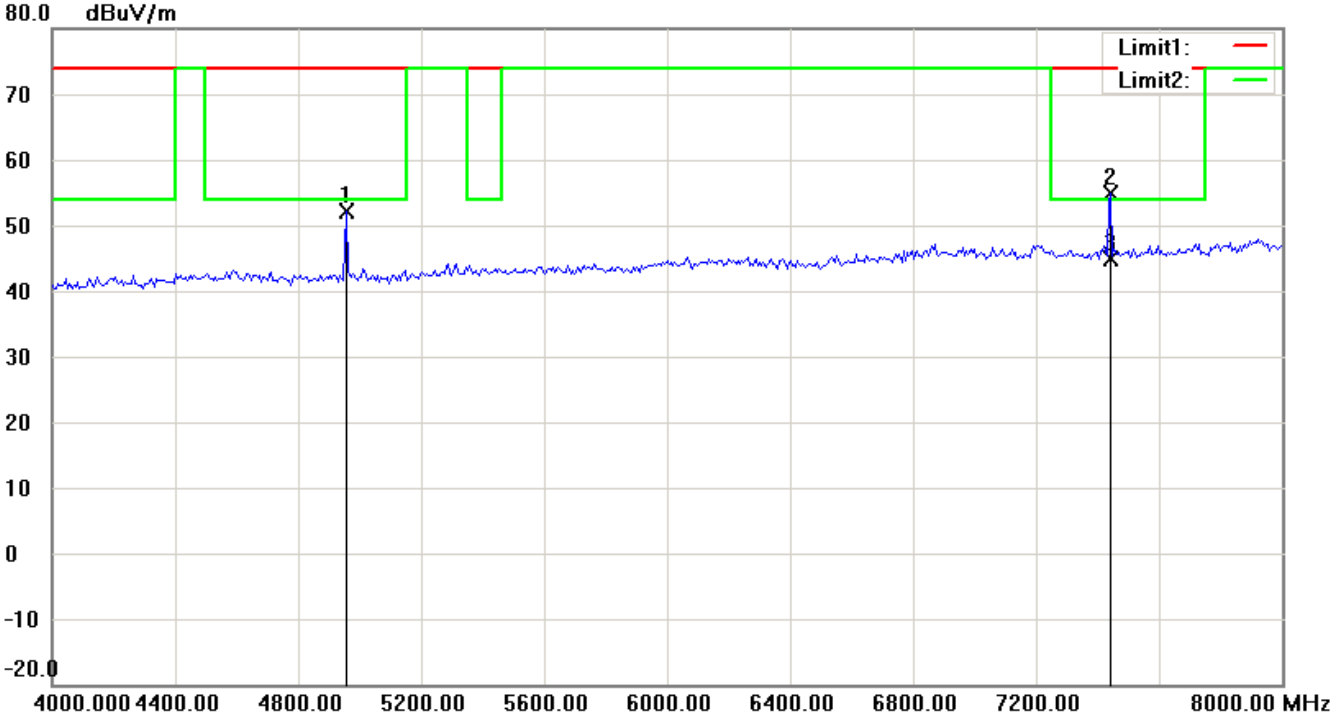
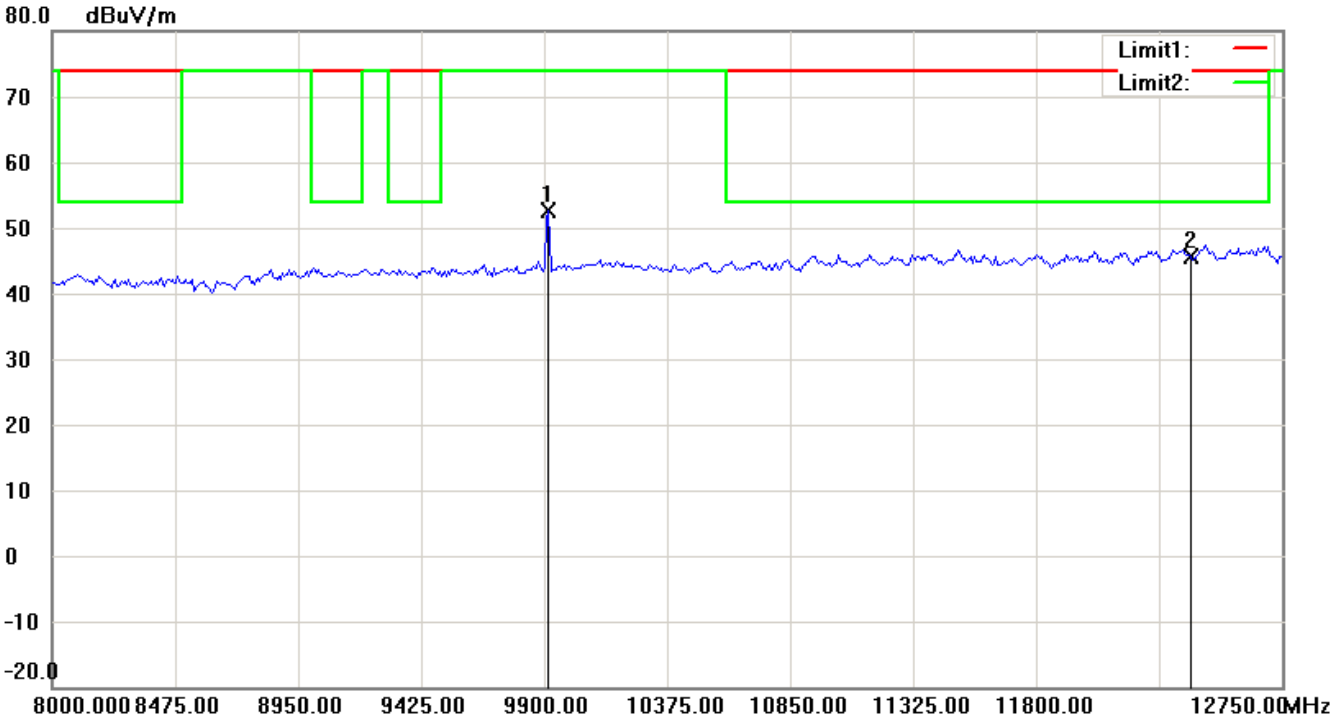
FCC ID: WLQSB4000IHTTX





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

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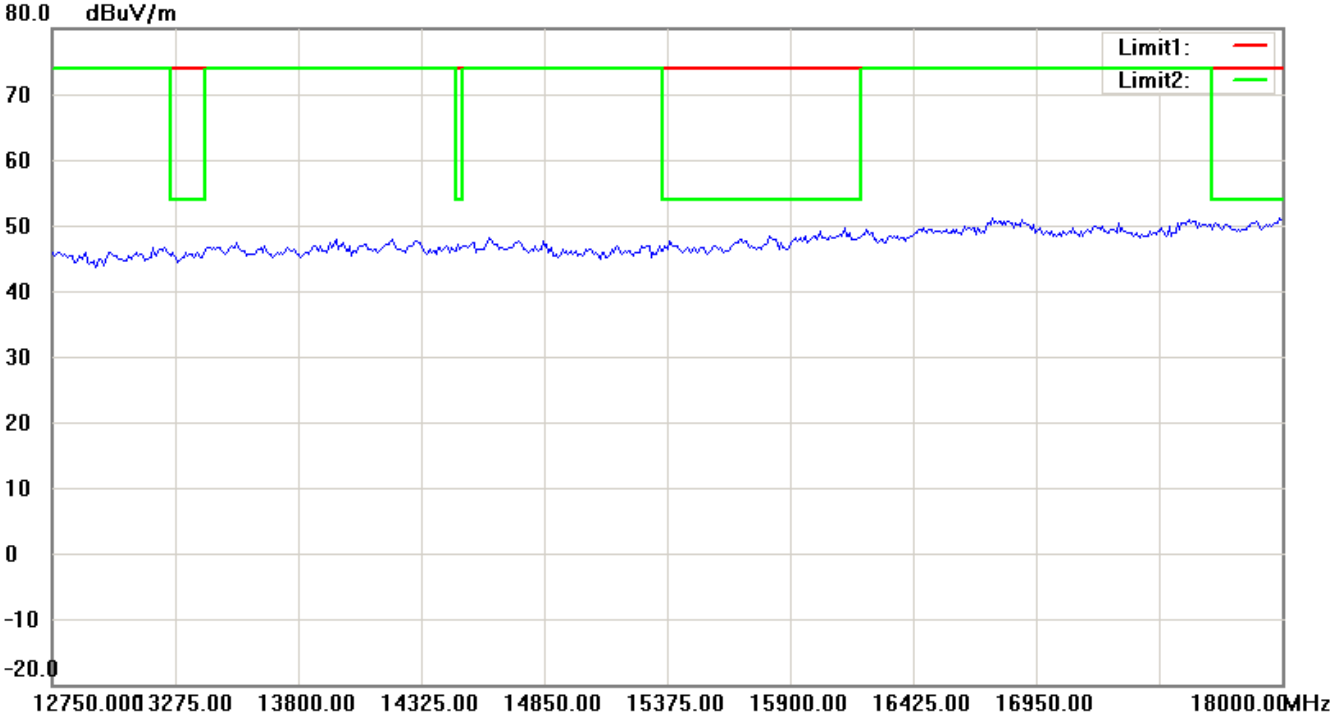
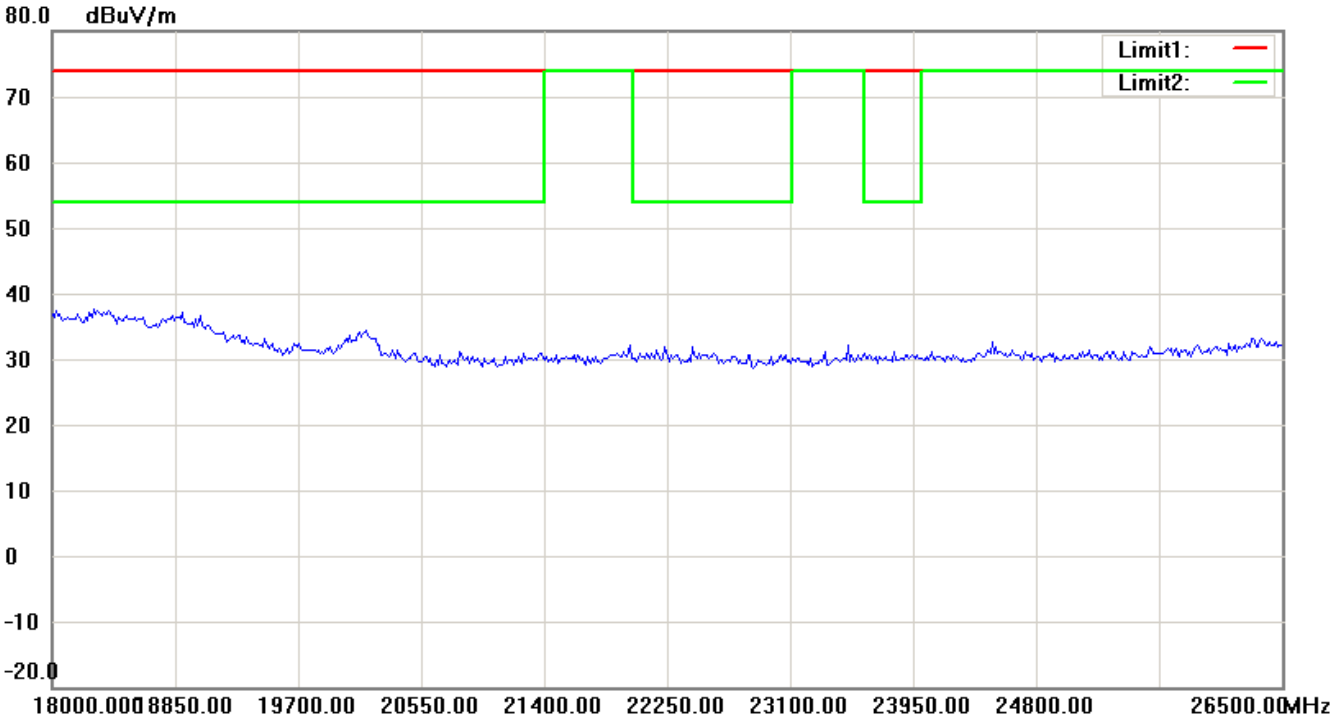
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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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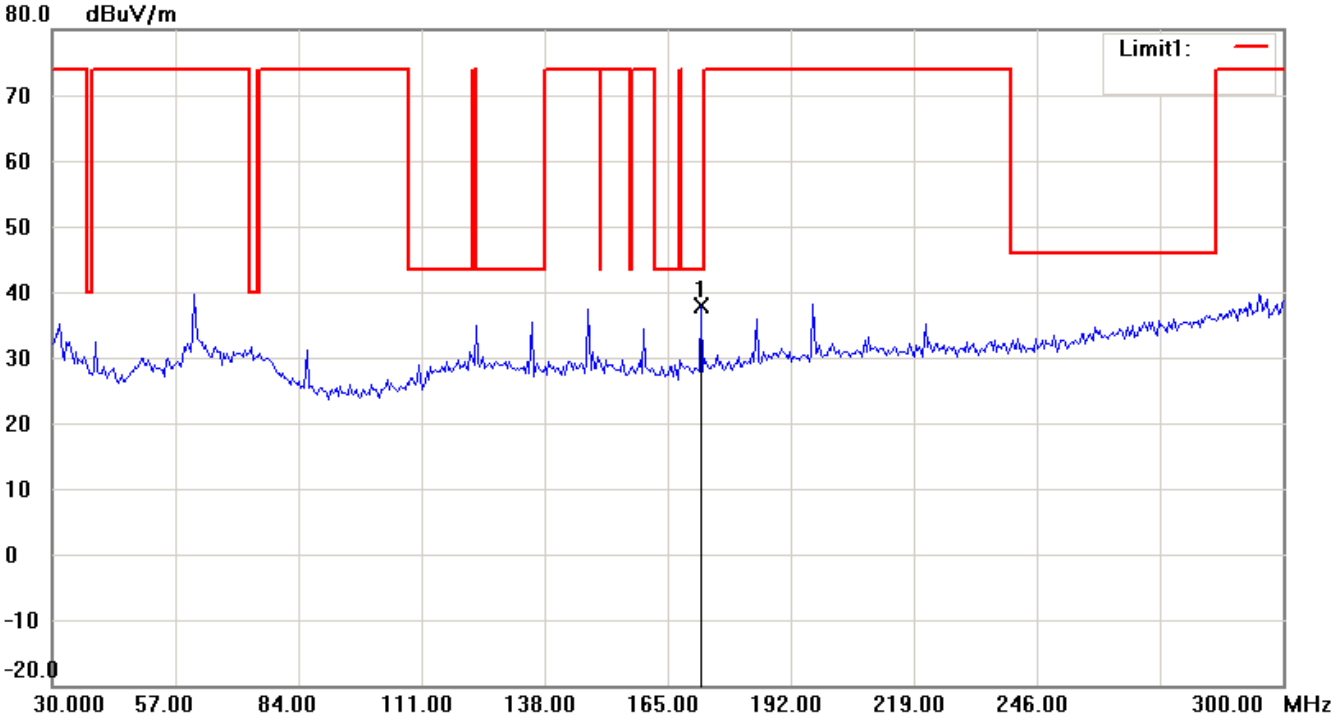
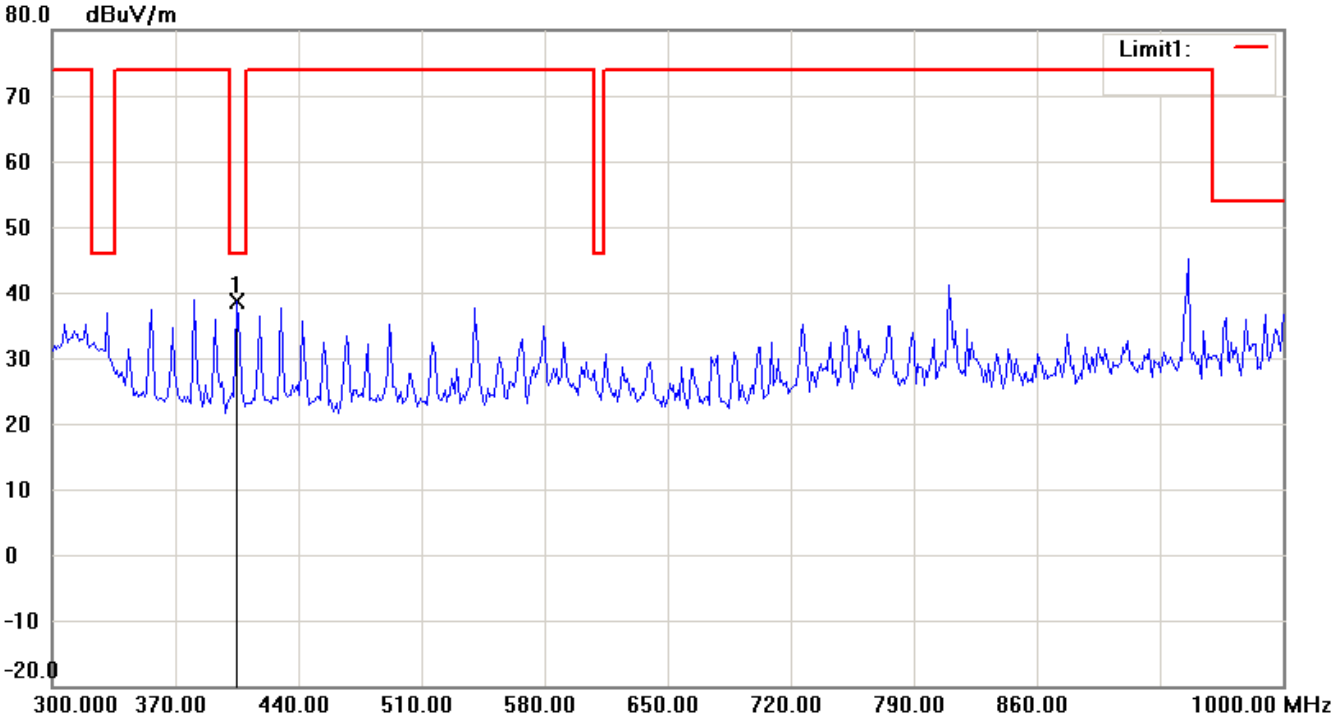
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

Antenna Polarization V





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

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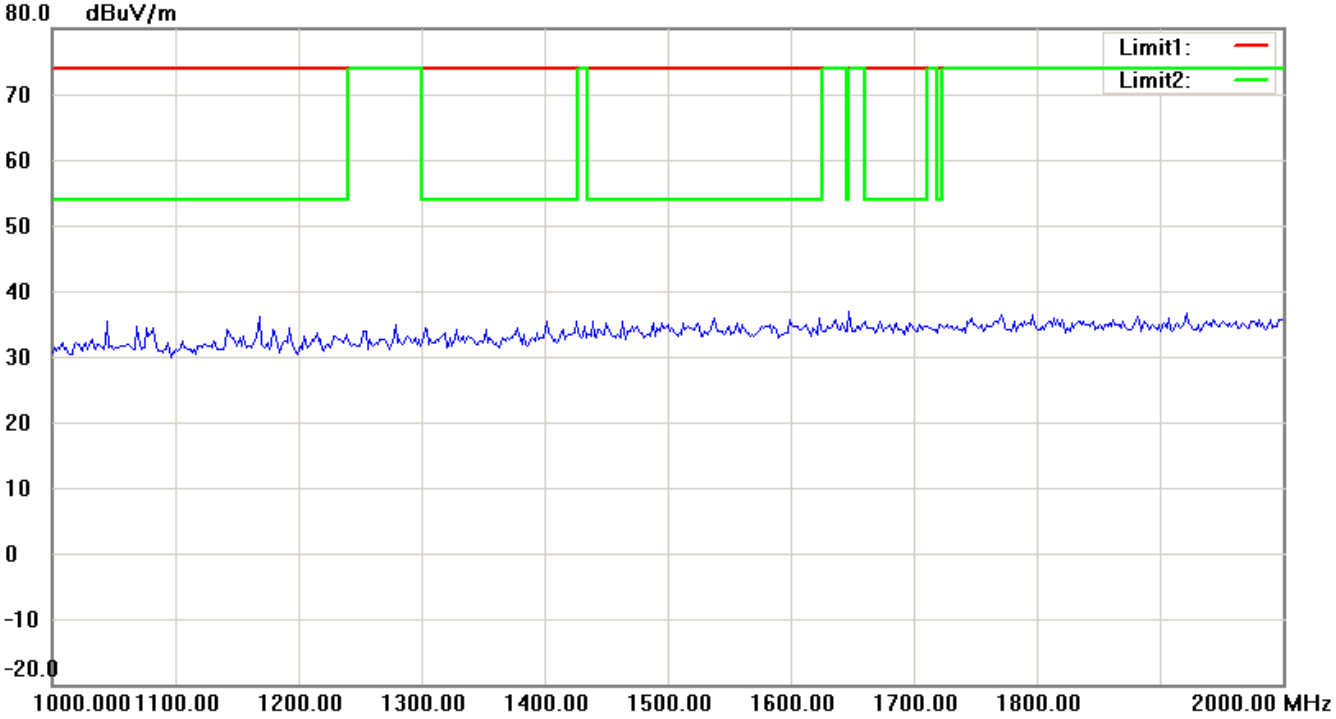
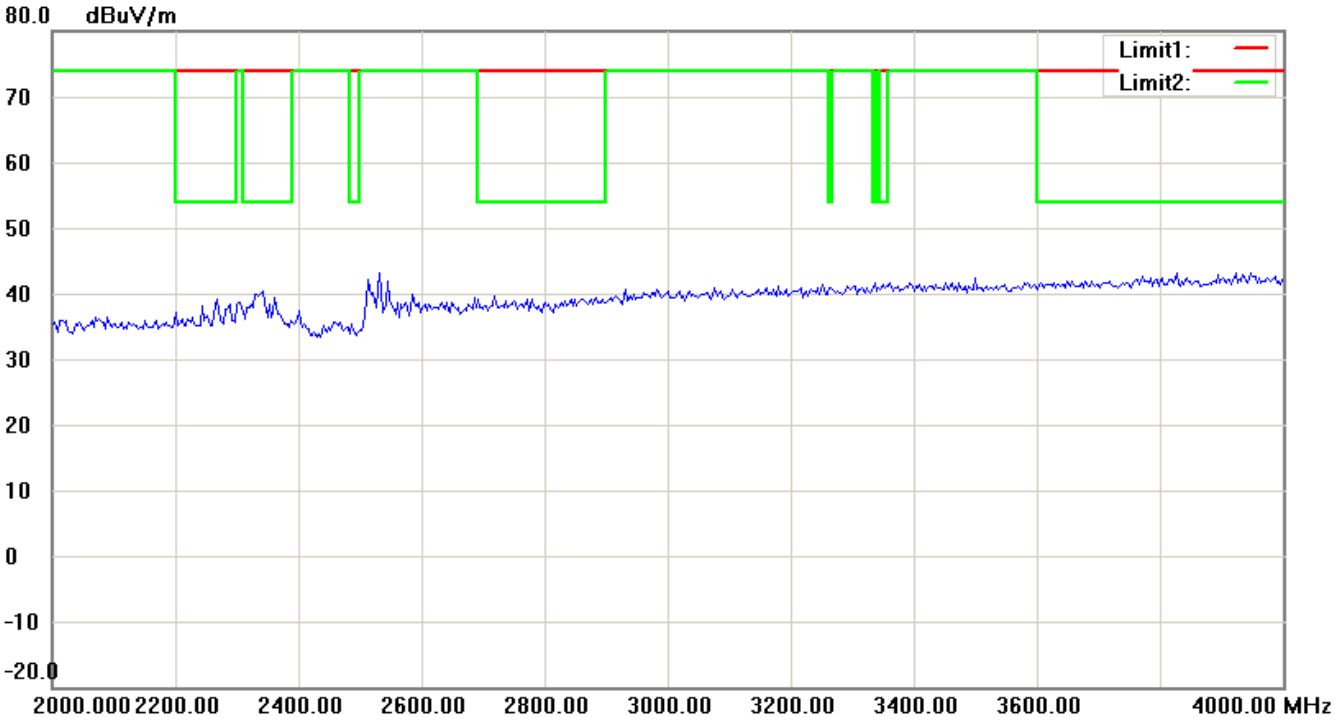
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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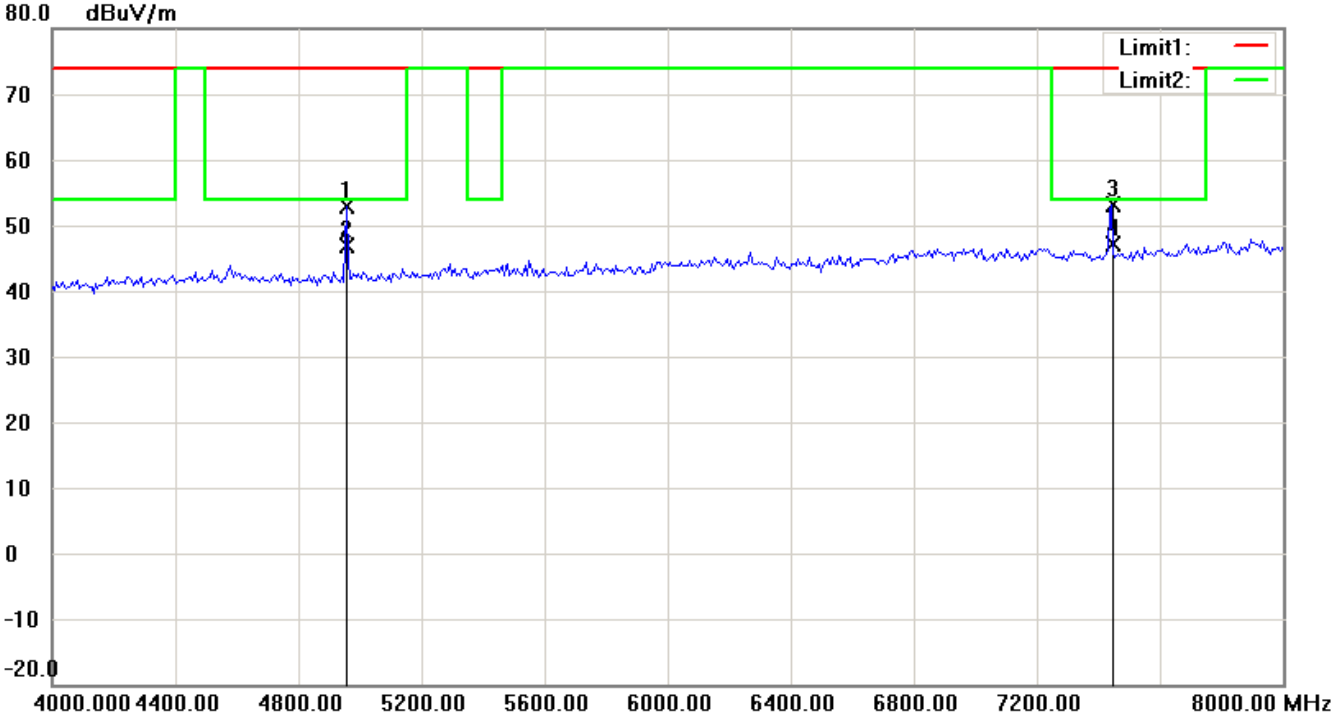
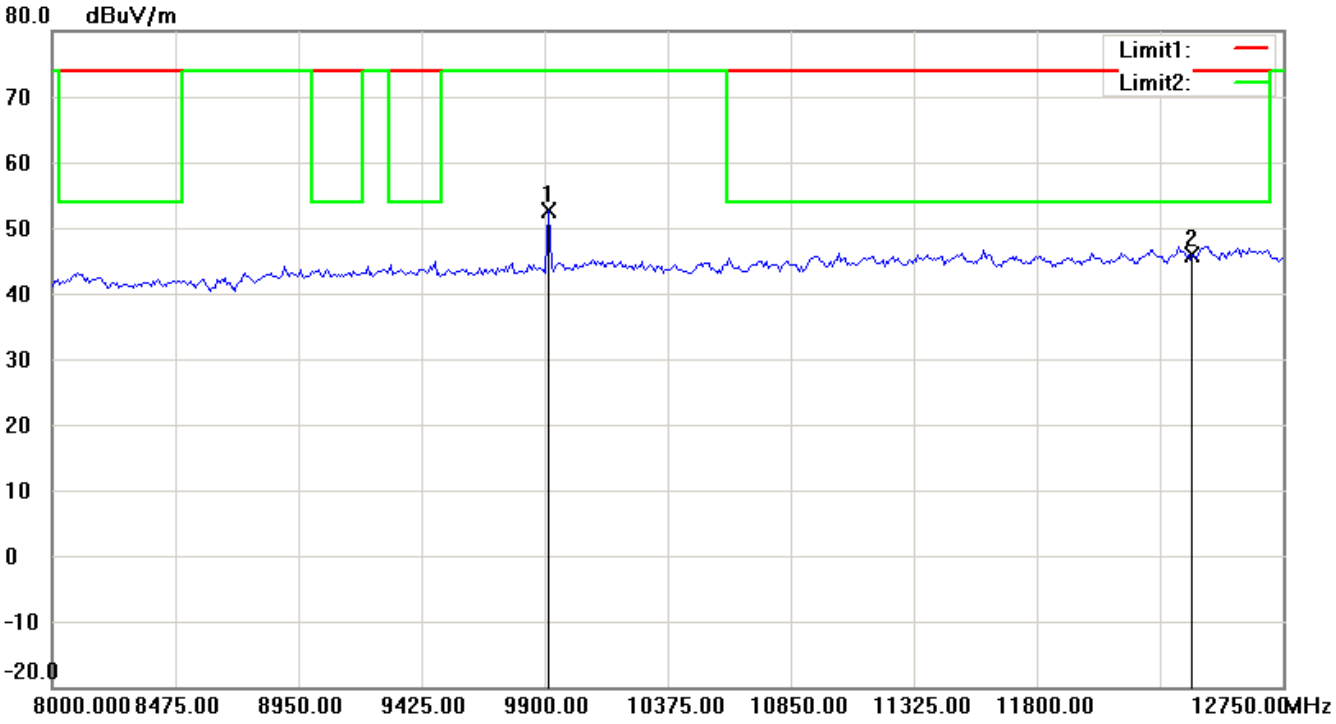
FCC ID: WLQSB4000IHTTX





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

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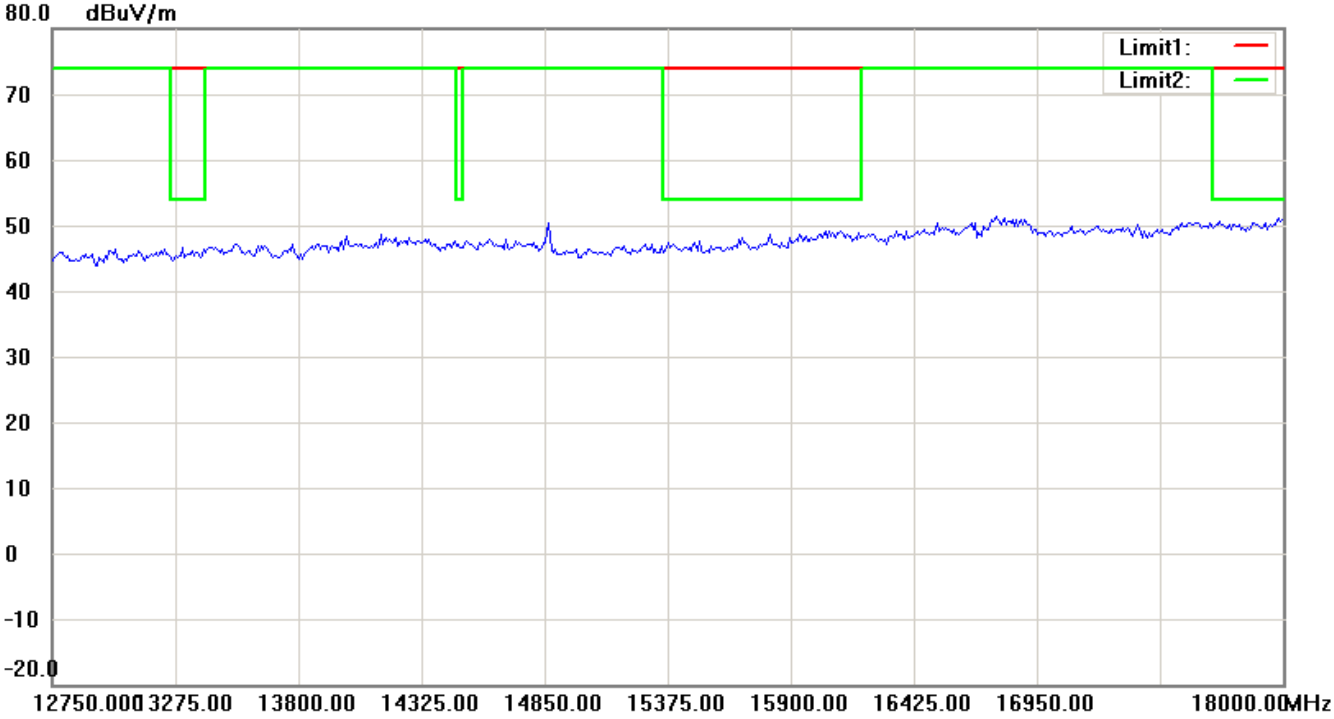
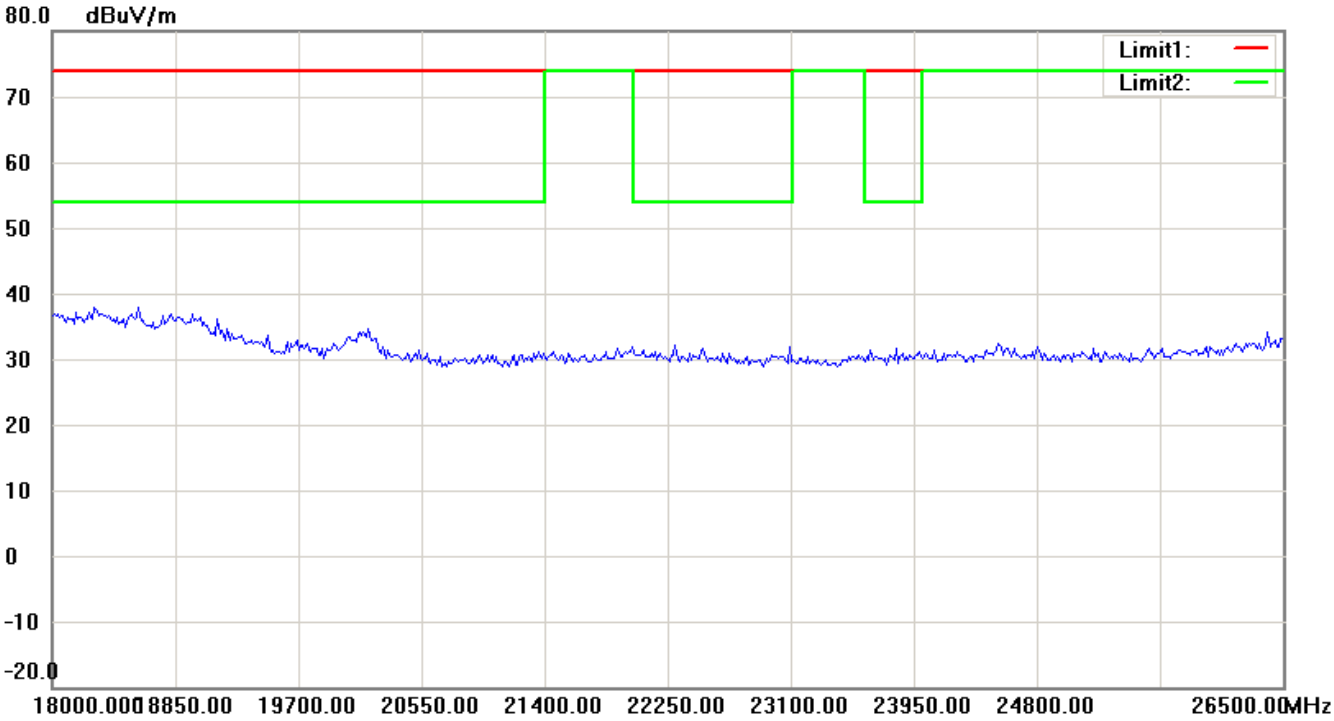
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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

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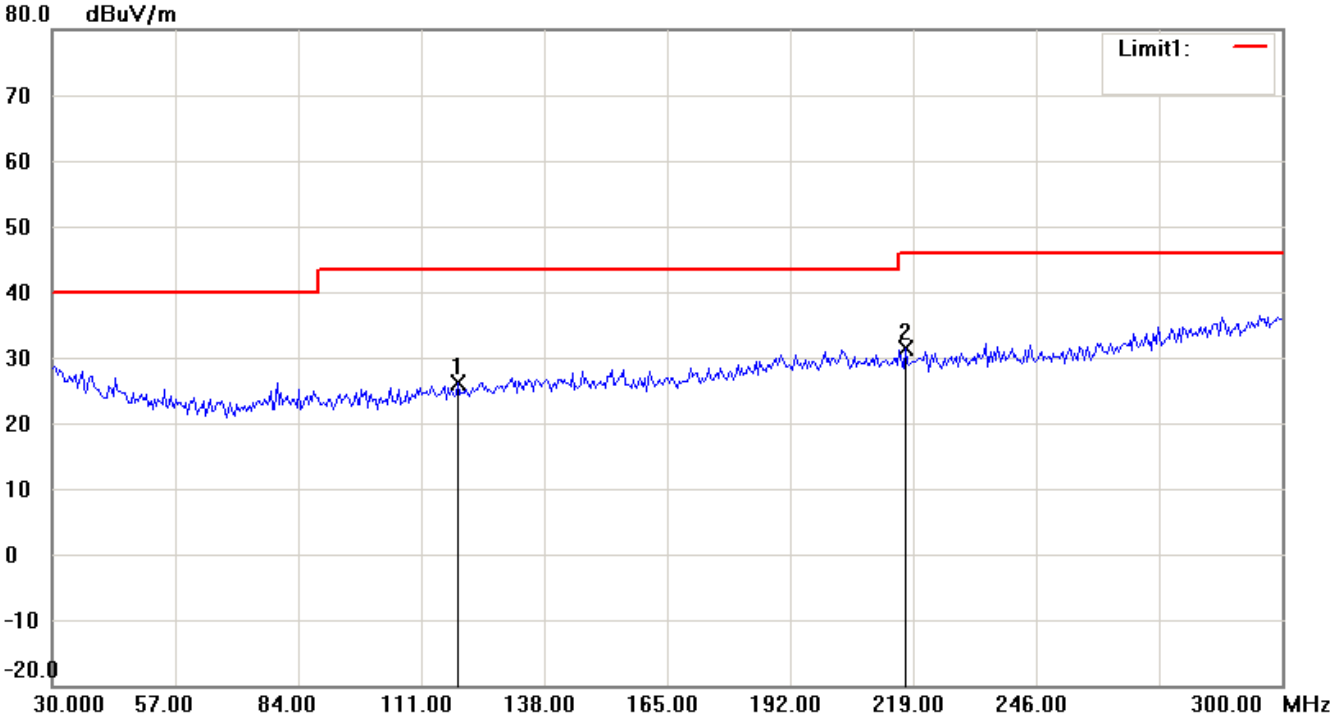
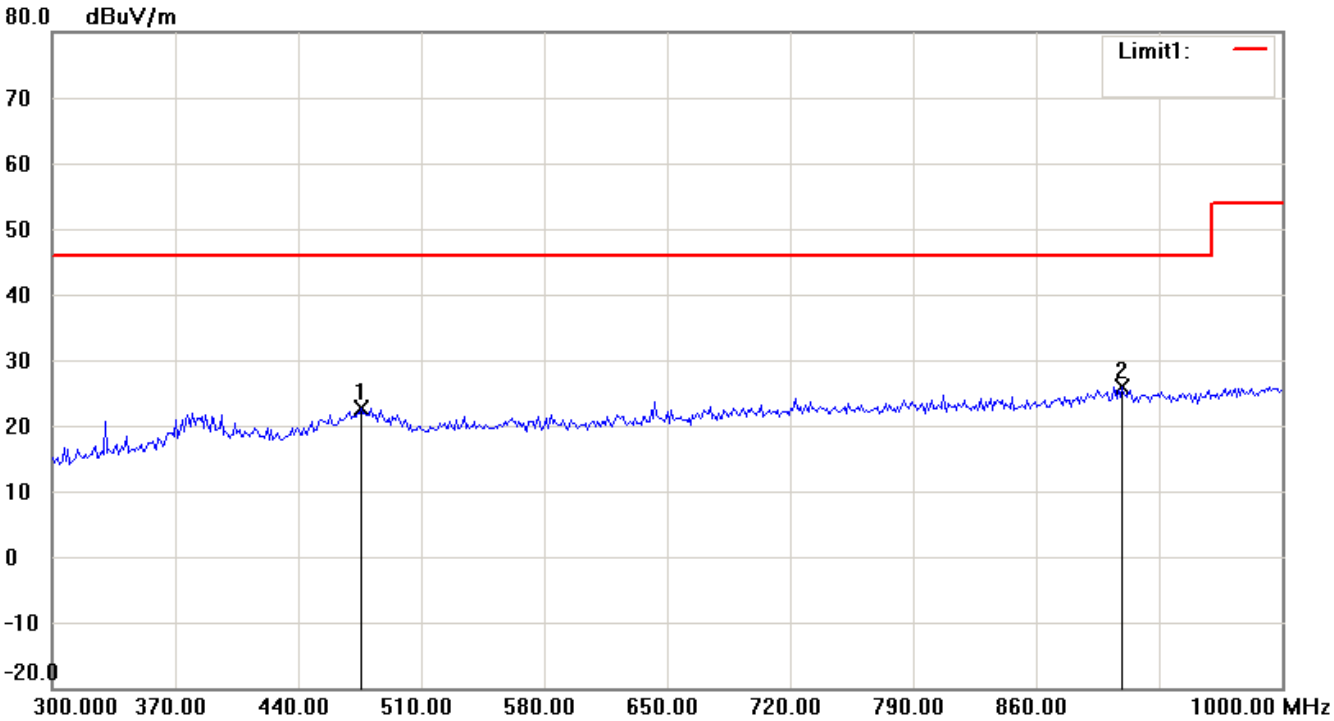
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

Receiver _ CH 1

Antenna Polarization H





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

Note:

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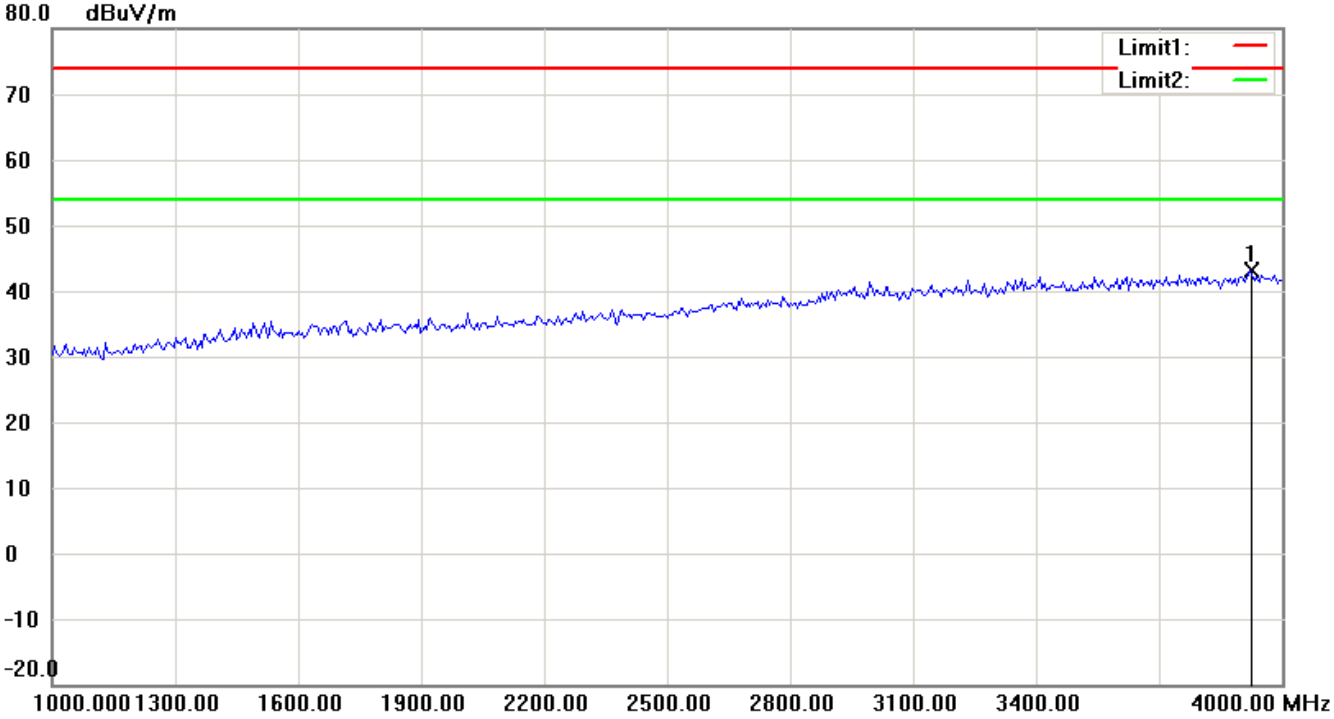
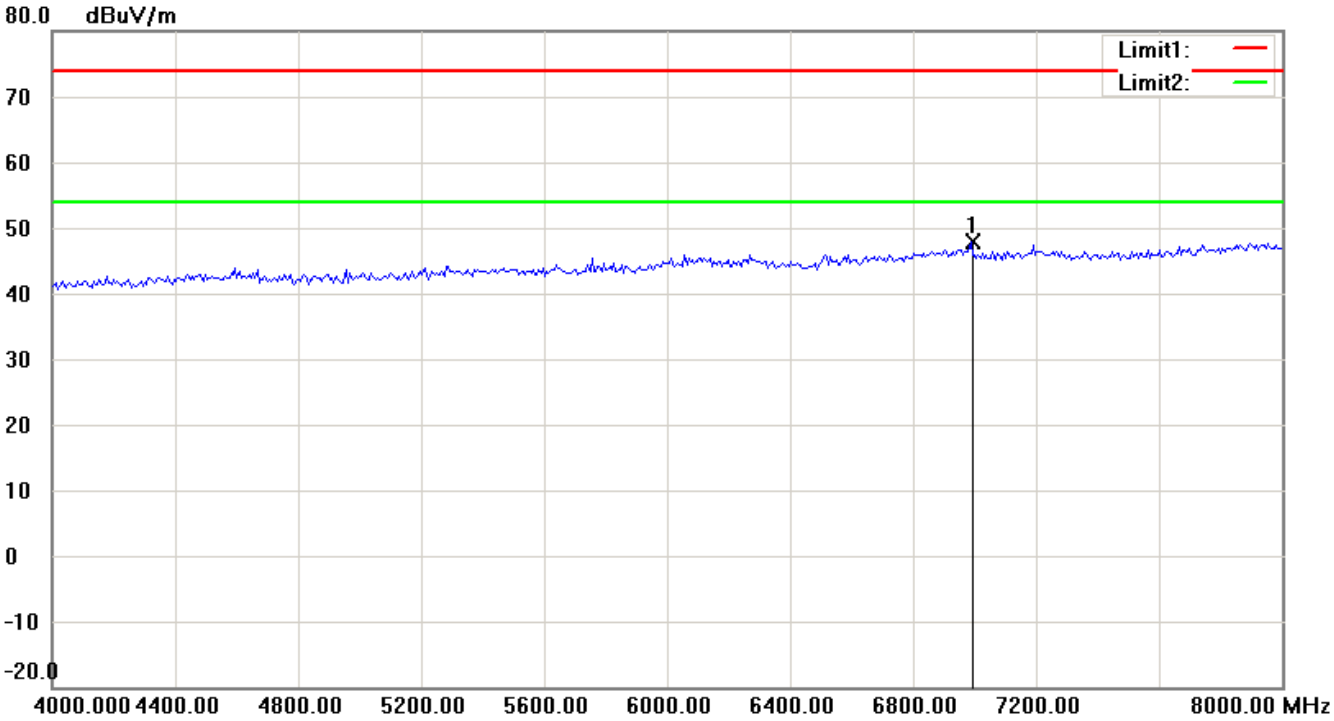
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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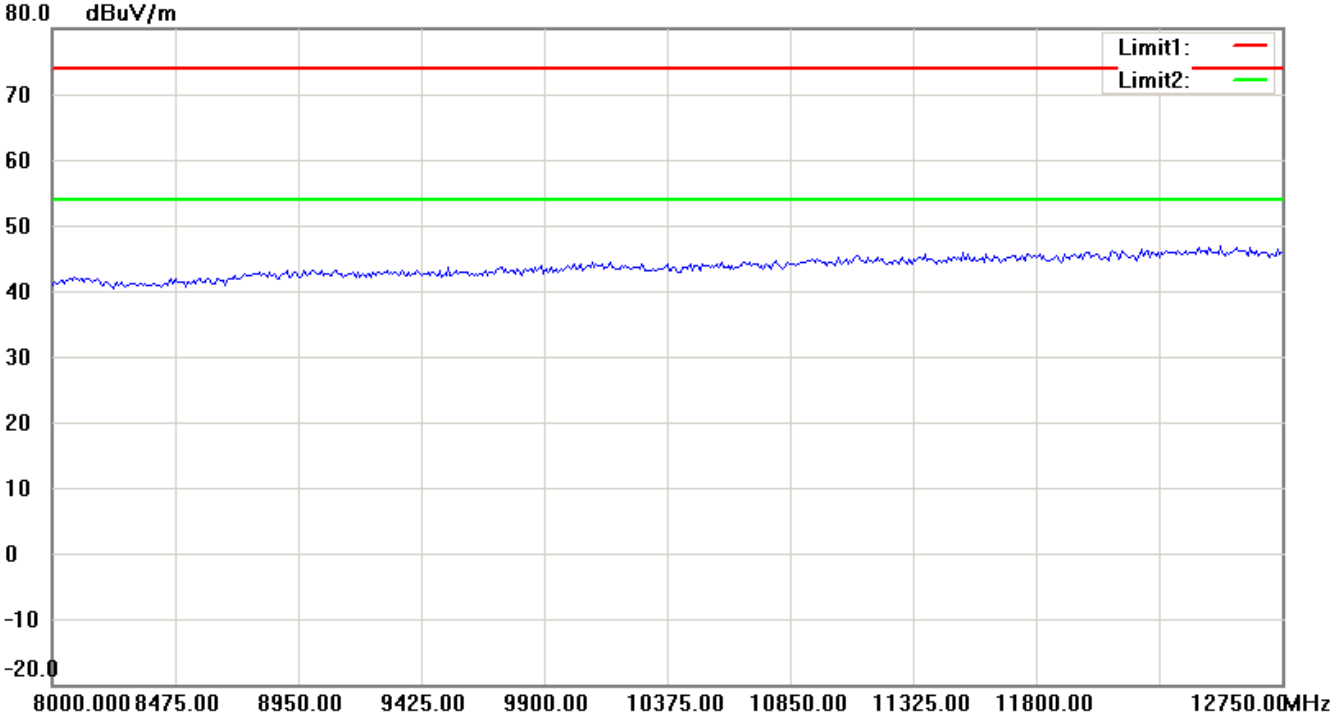
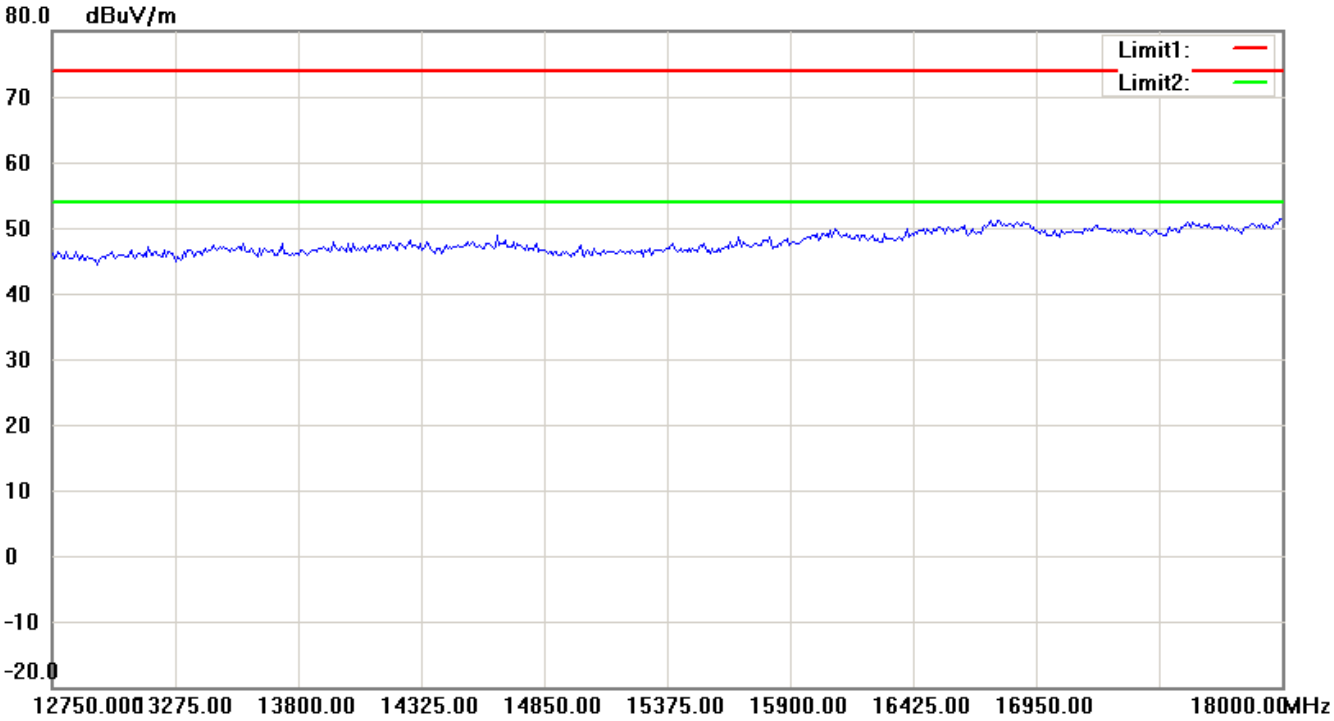
FCC ID: WLQSB4000IHTTX





Up Line: Peak Limit Line Down Line: Ave Limit Line
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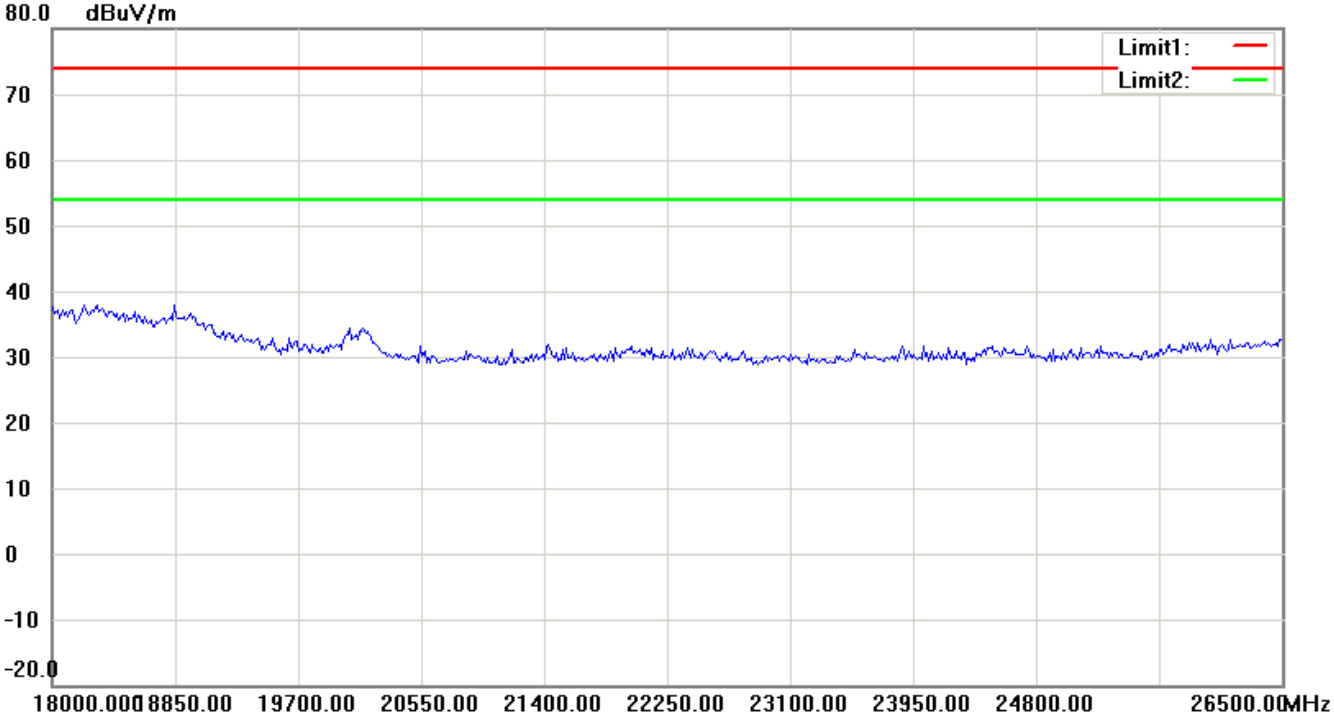
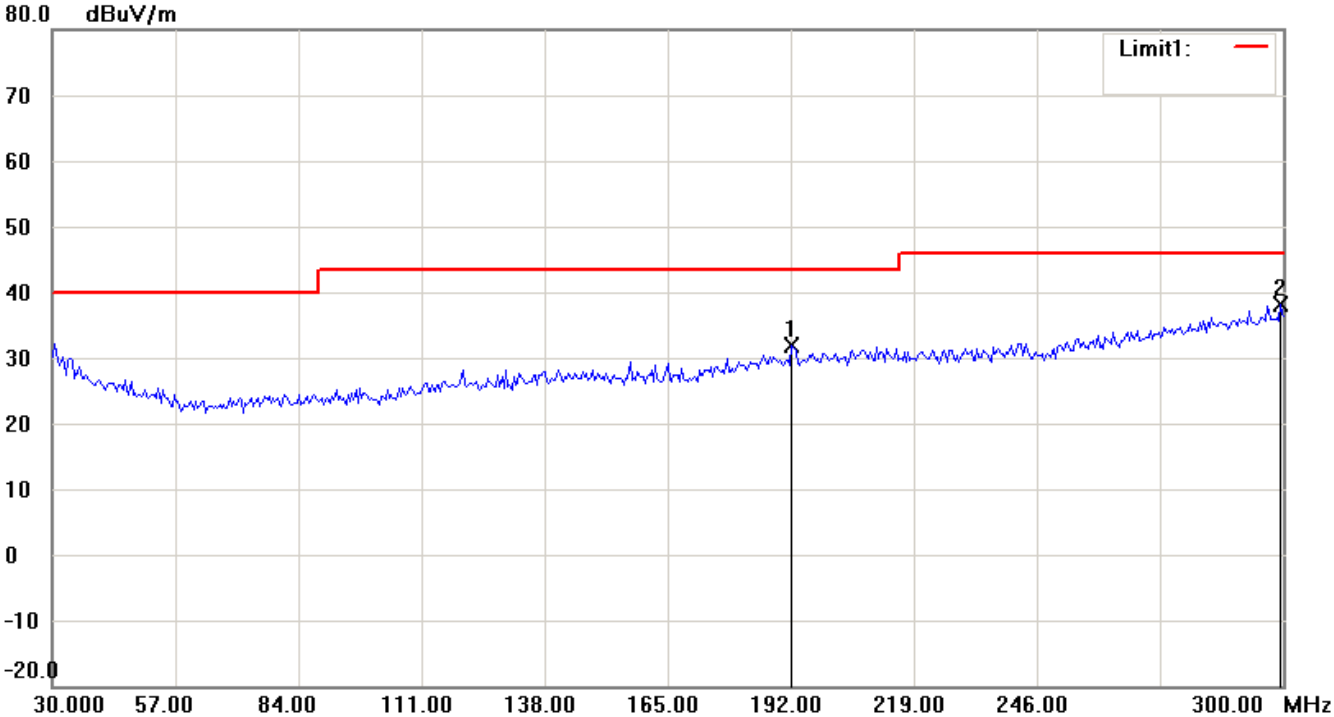
FCC ID: WLQSB4000IHTTX



Antenna Polarization V



Up Line: Peak Limit Line Down Line: Ave Limit Line
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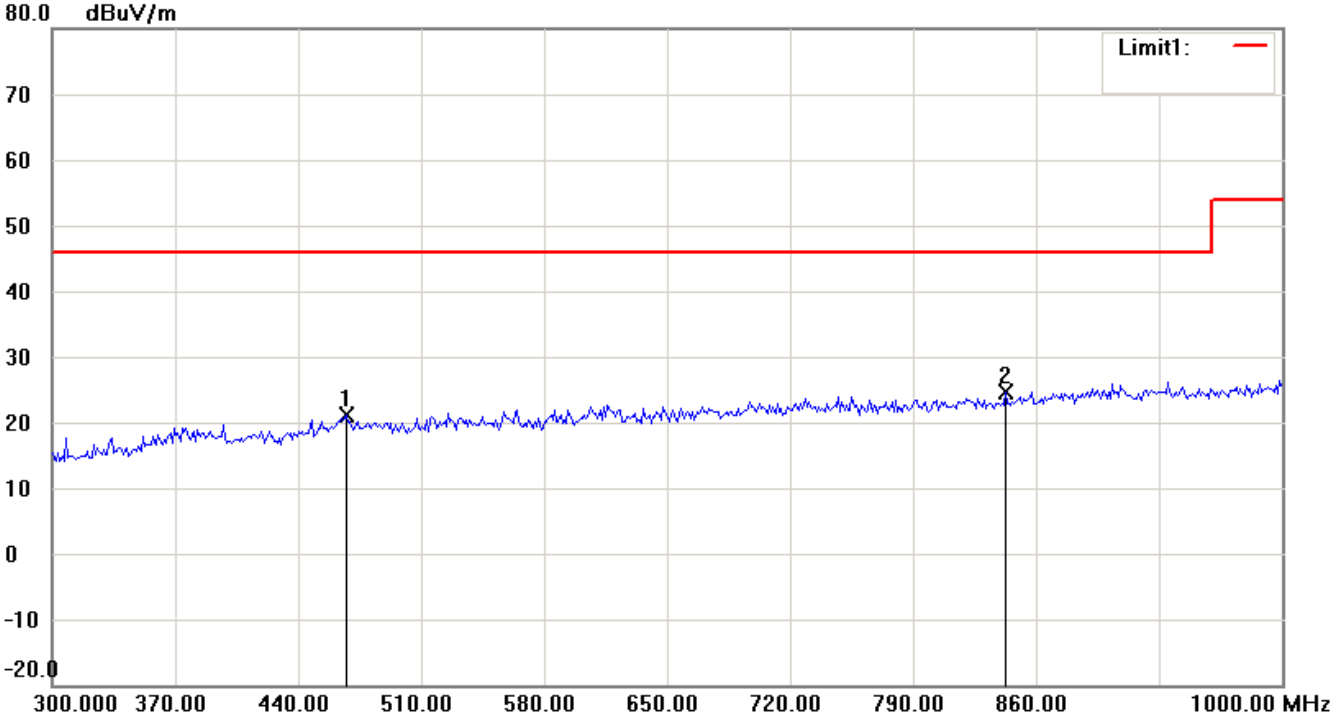
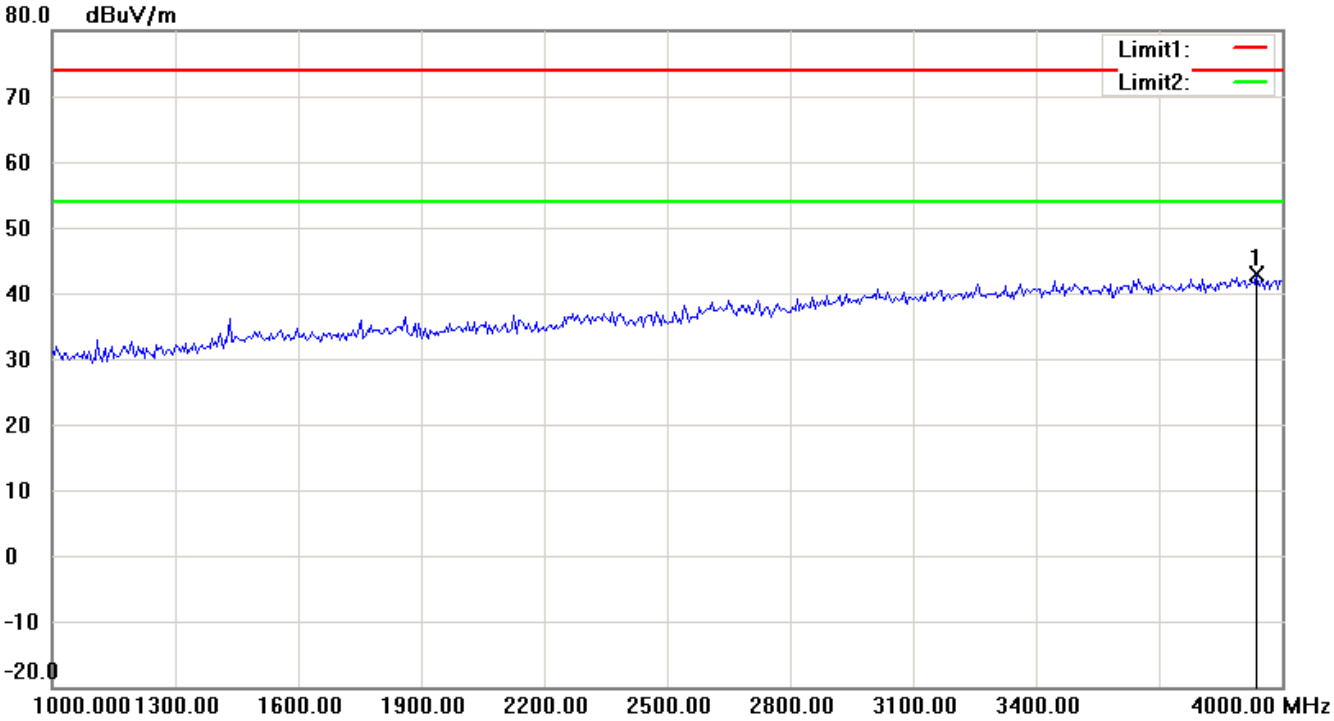
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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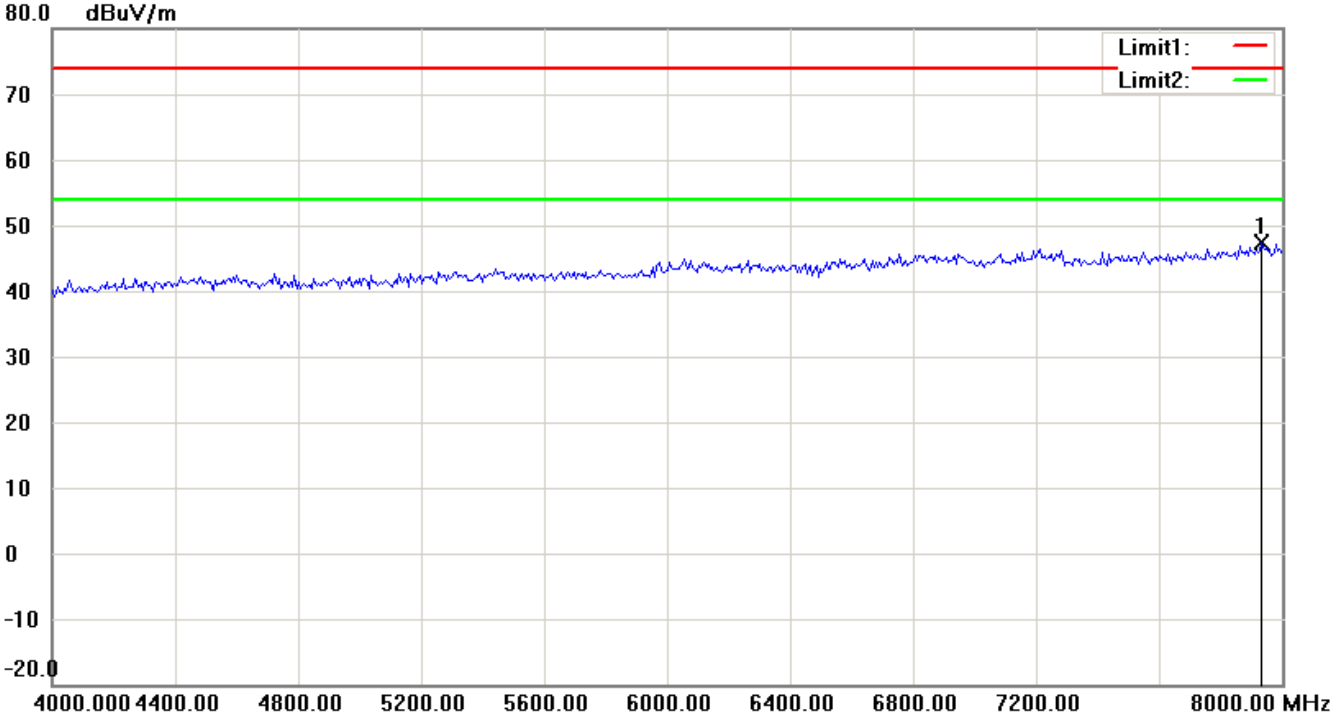

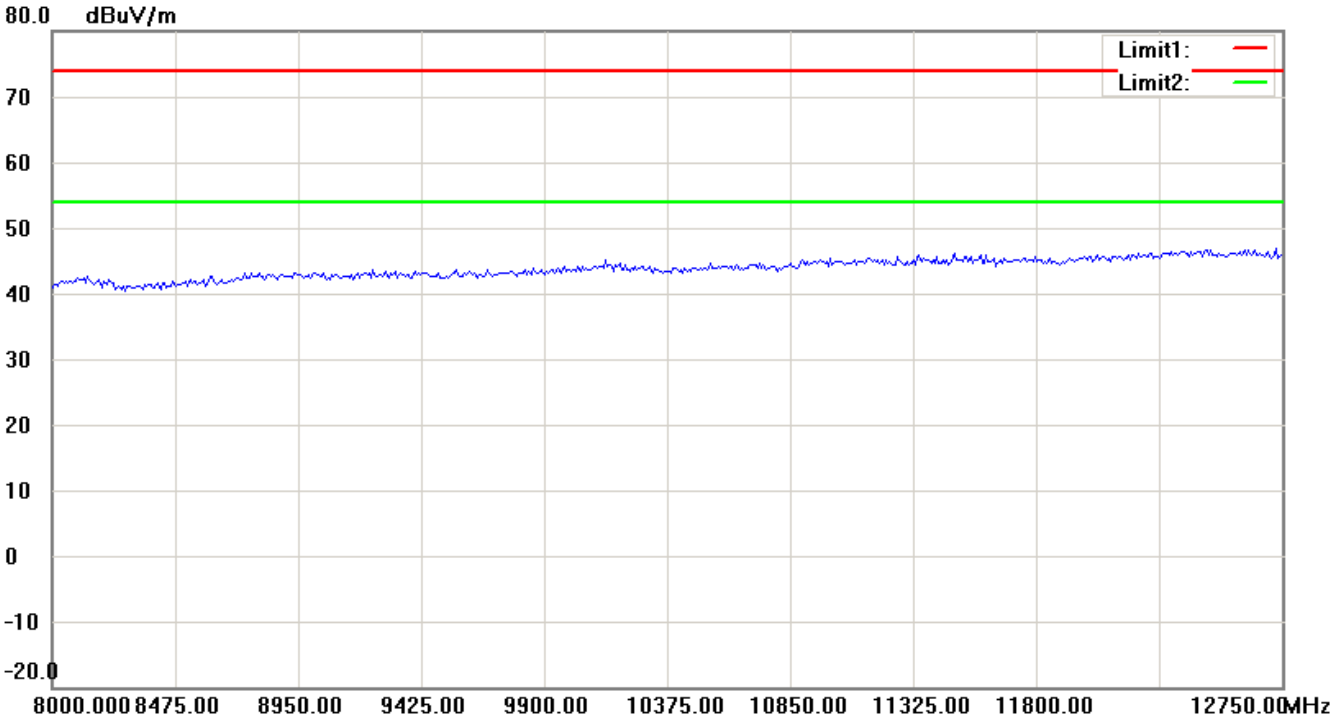

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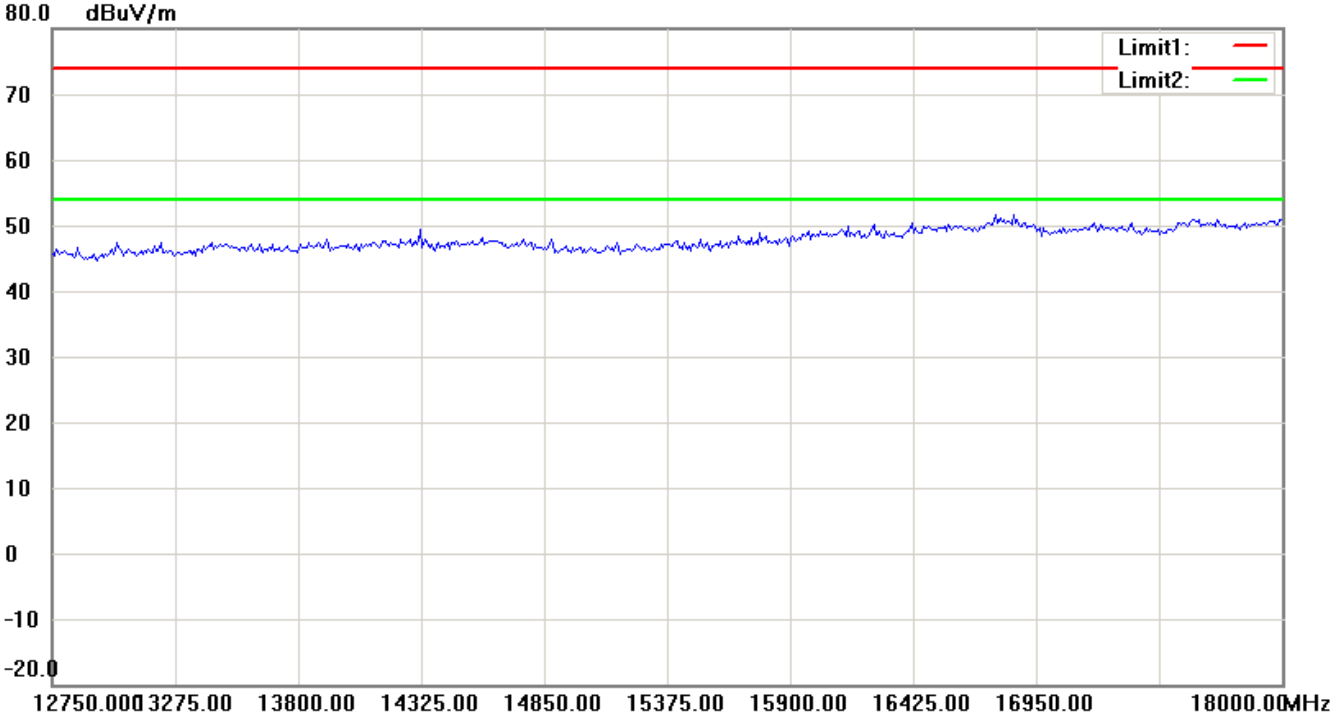

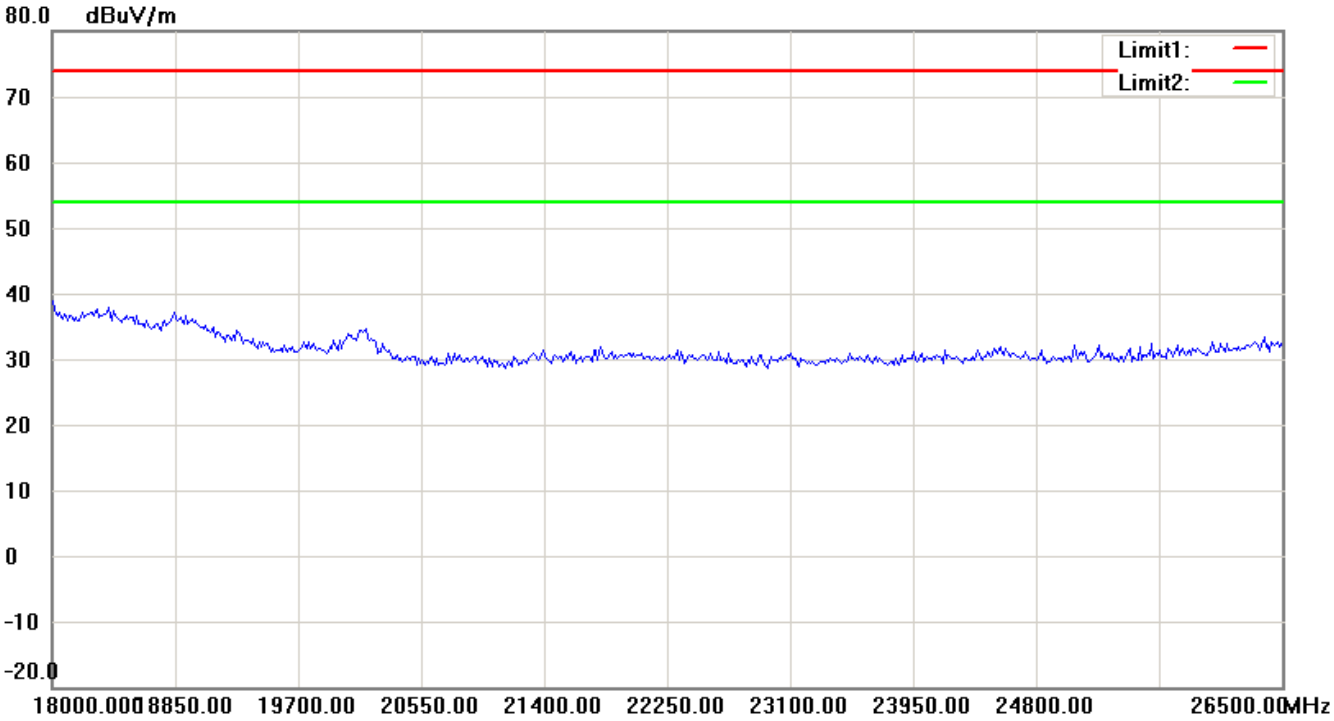

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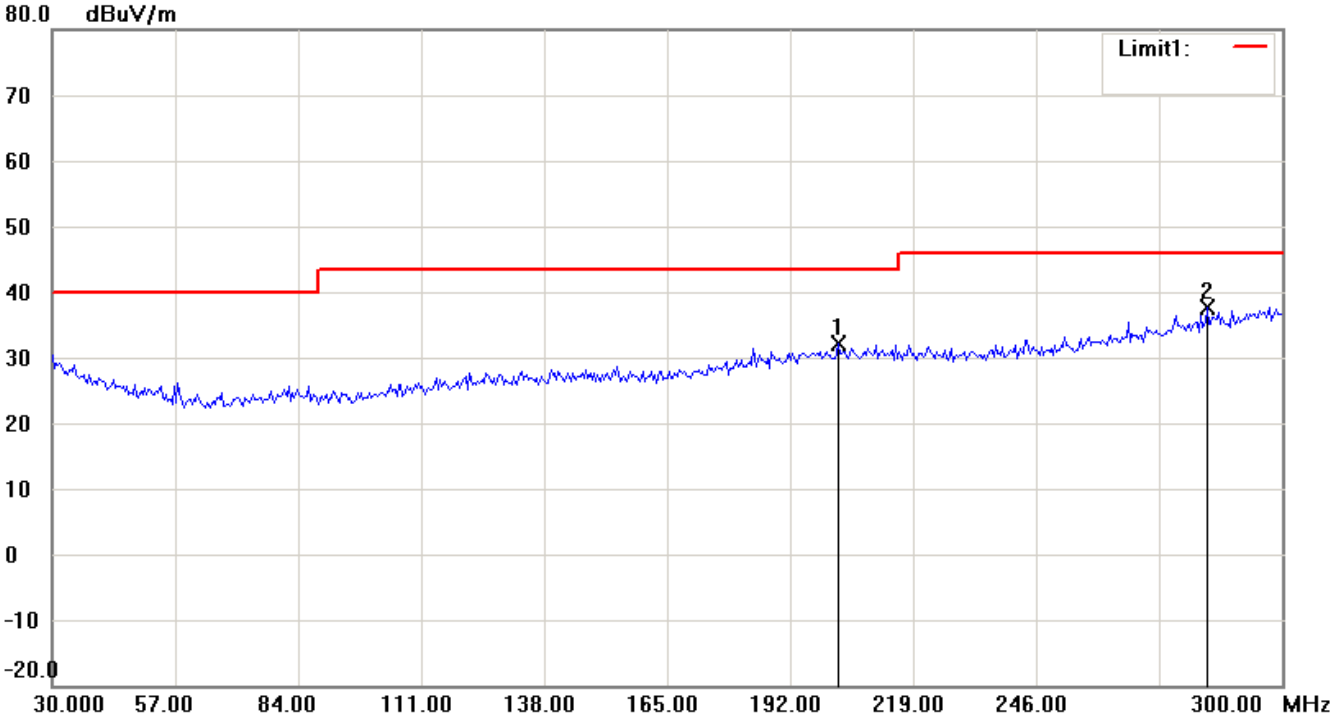
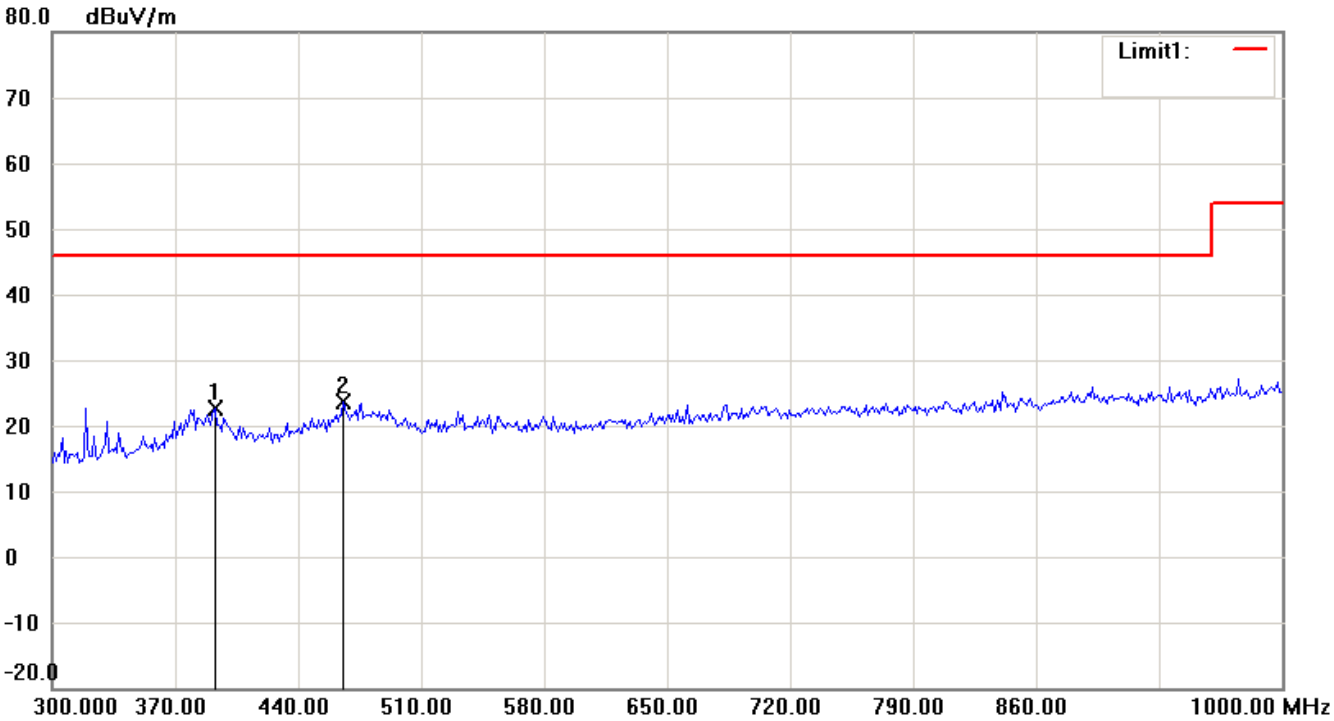
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX

Receiver _ CH 9

Antenna Polarization H





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

Note:

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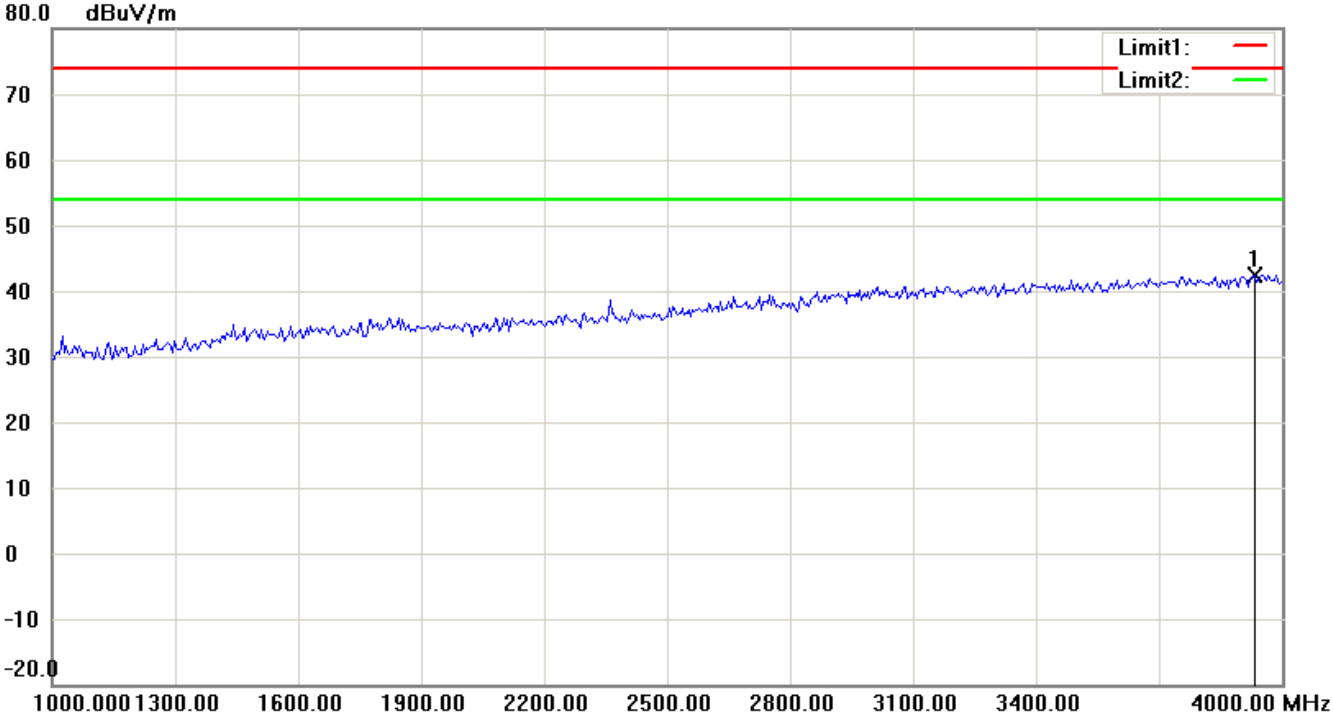
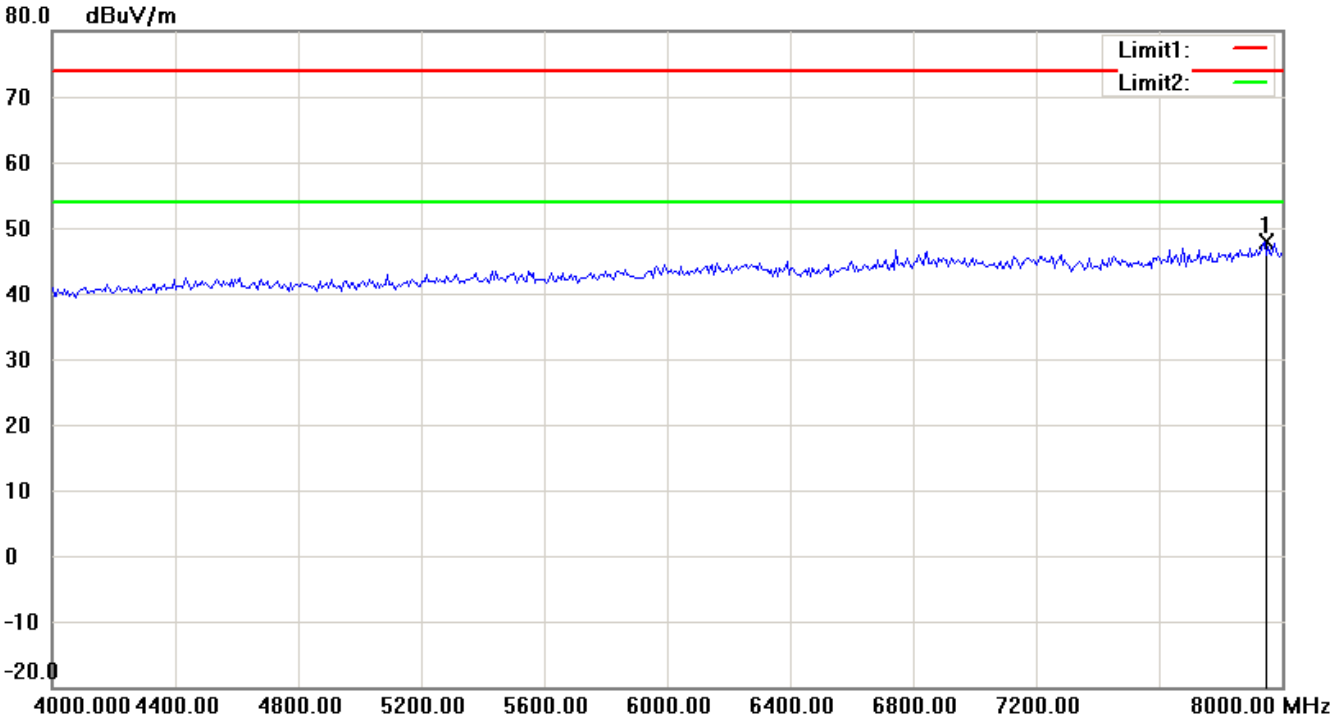
Registration number: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





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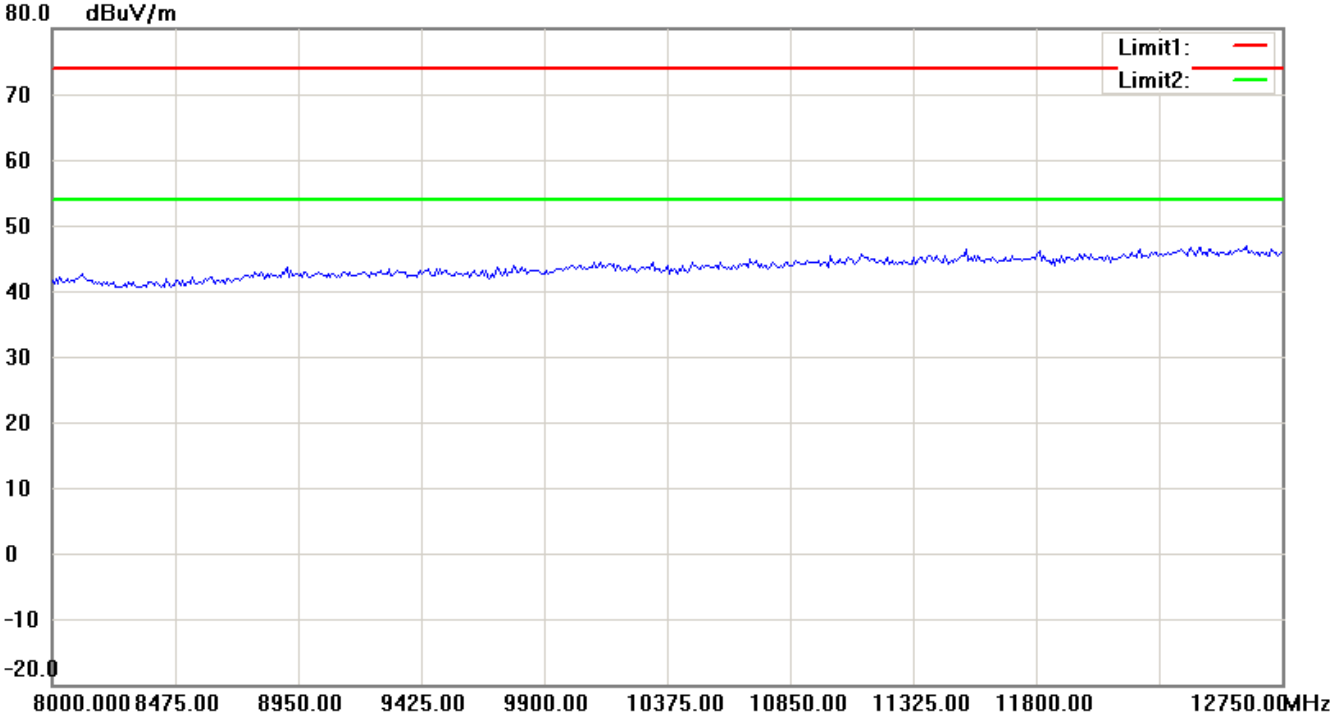

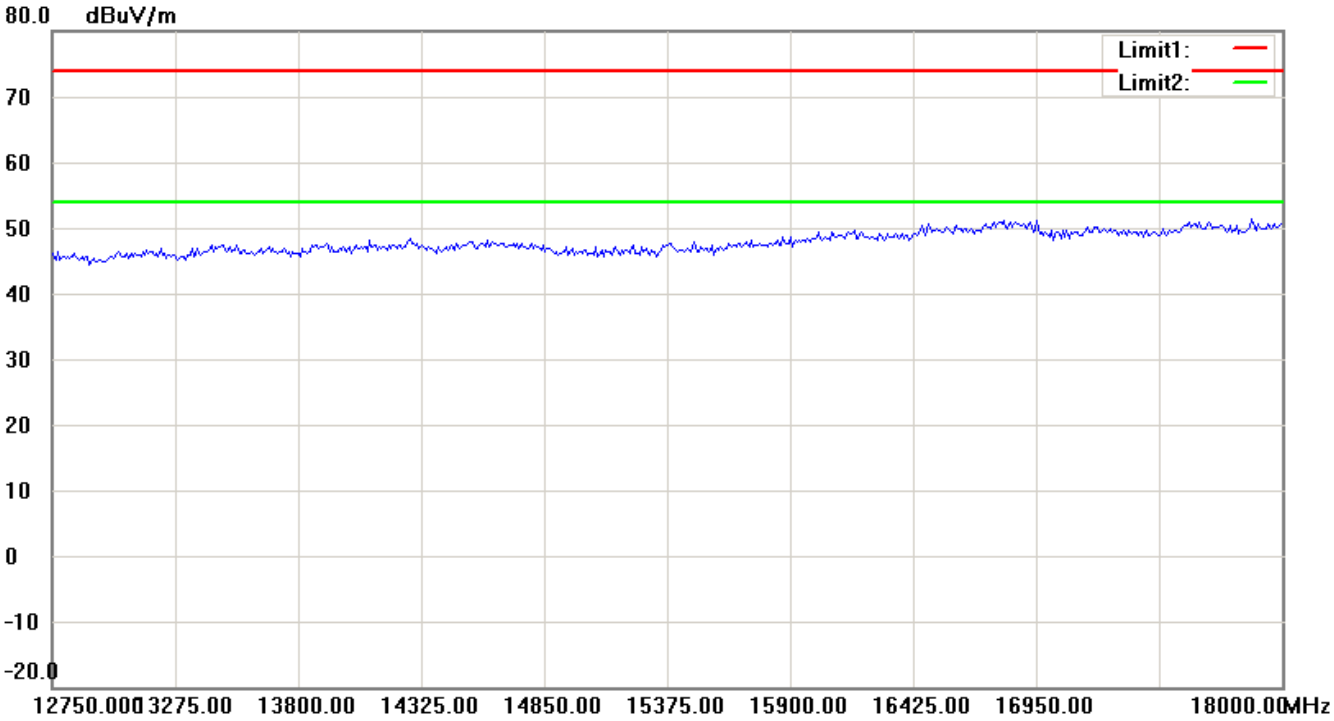

Up Line: Peak Limit Line Down Line: Ave Limit Line
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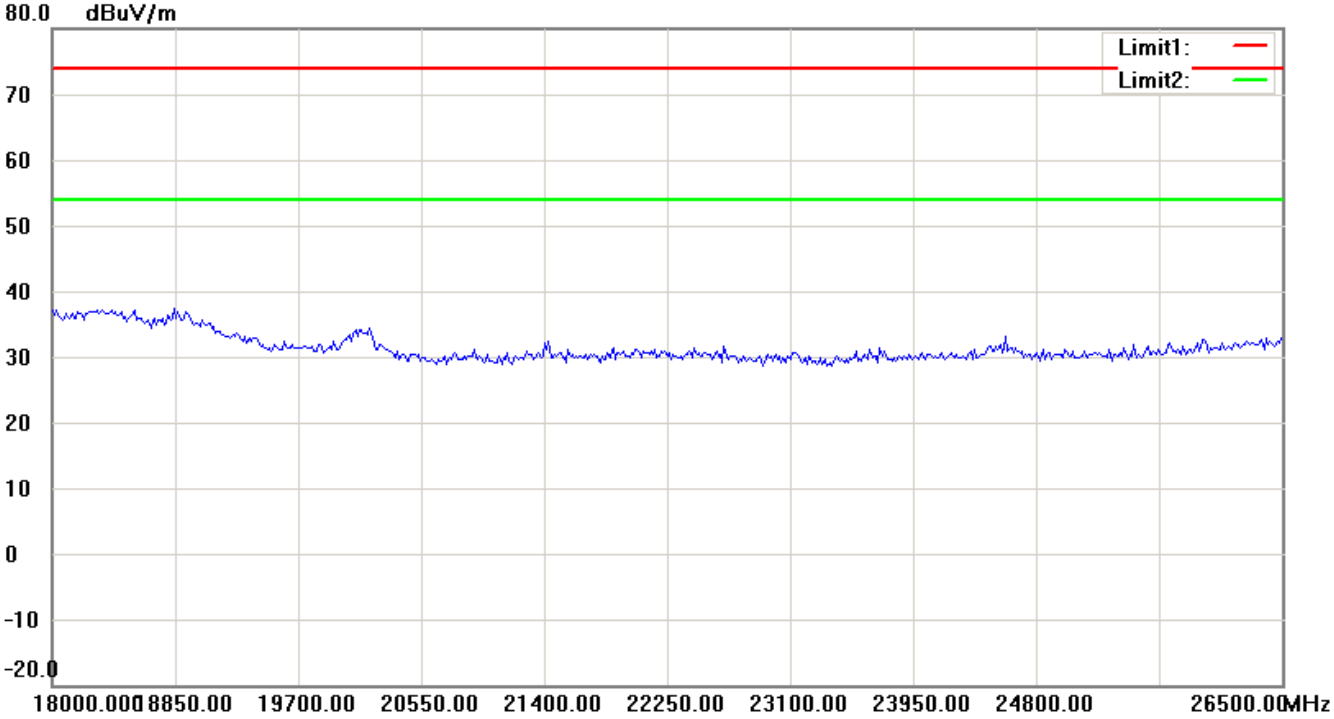
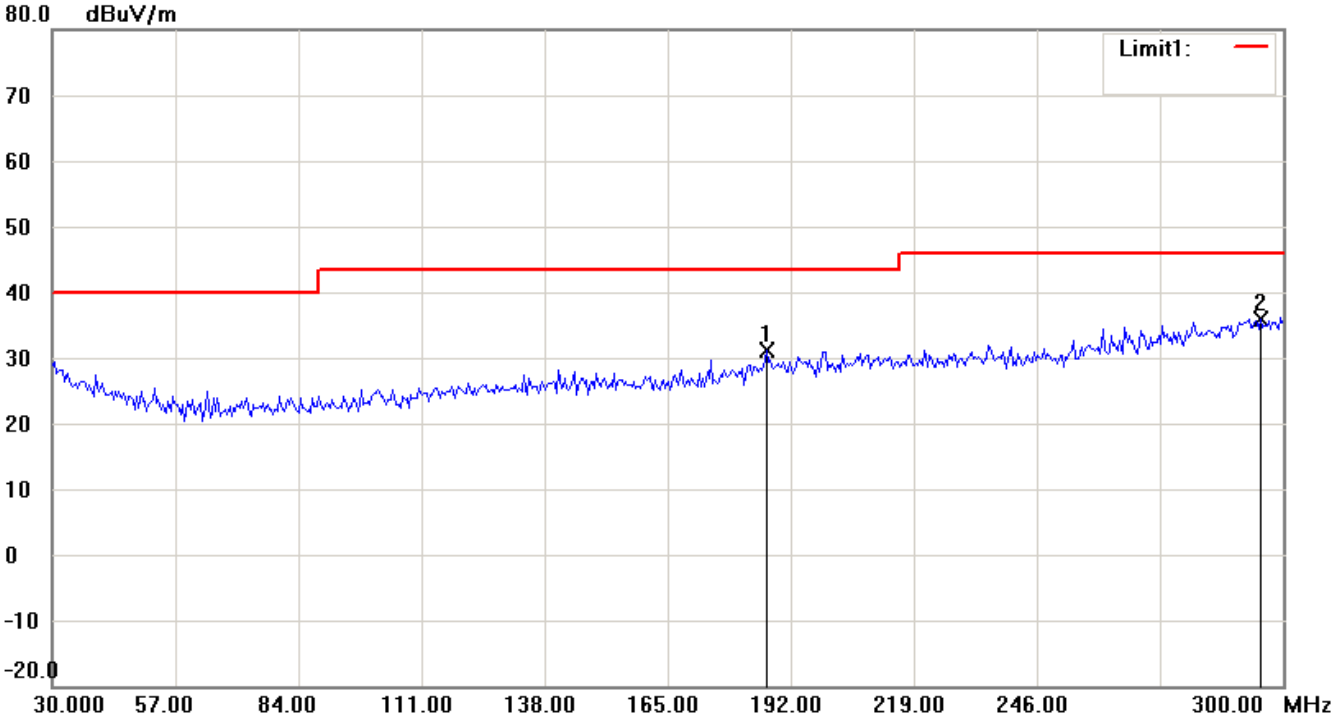


Antenna Polarization V



Up Line: Peak Limit Line Down Line: Ave Limit Line
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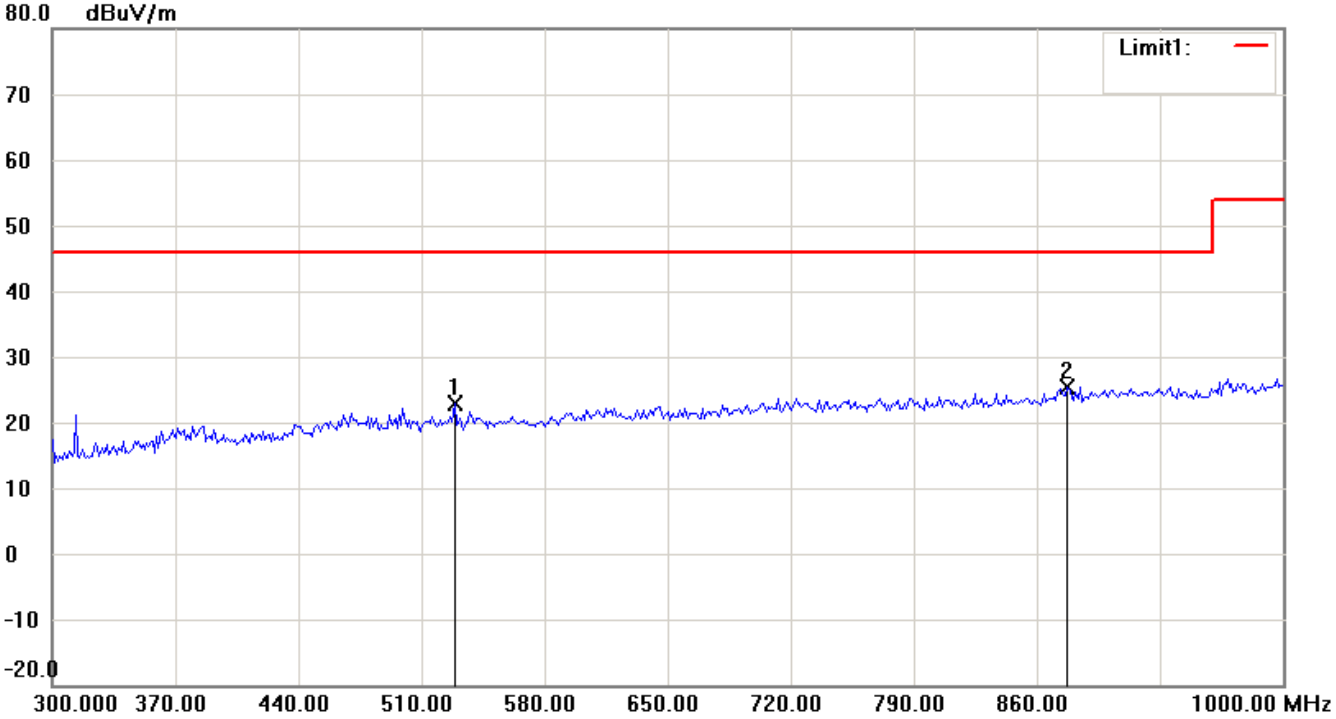
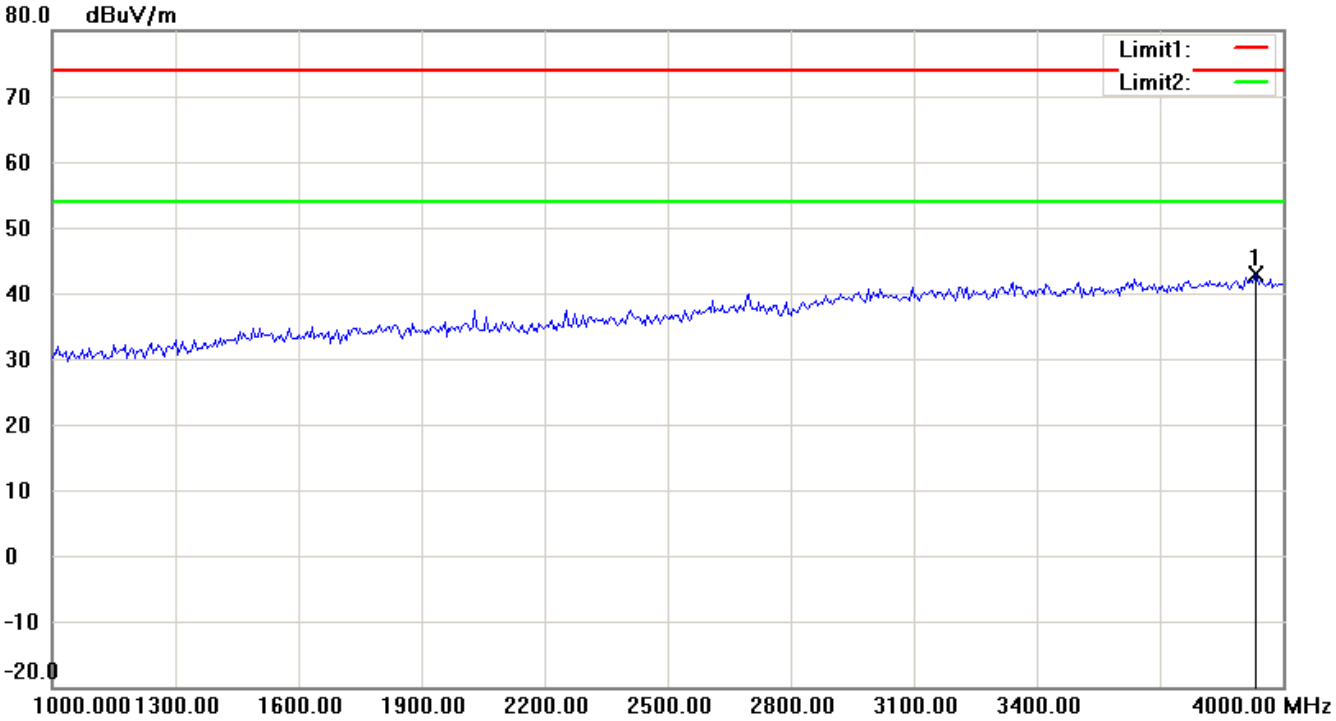
FCC ID: WLQSB4000IHTTX





Up Line: Peak Limit Line Down Line: Ave Limit Line
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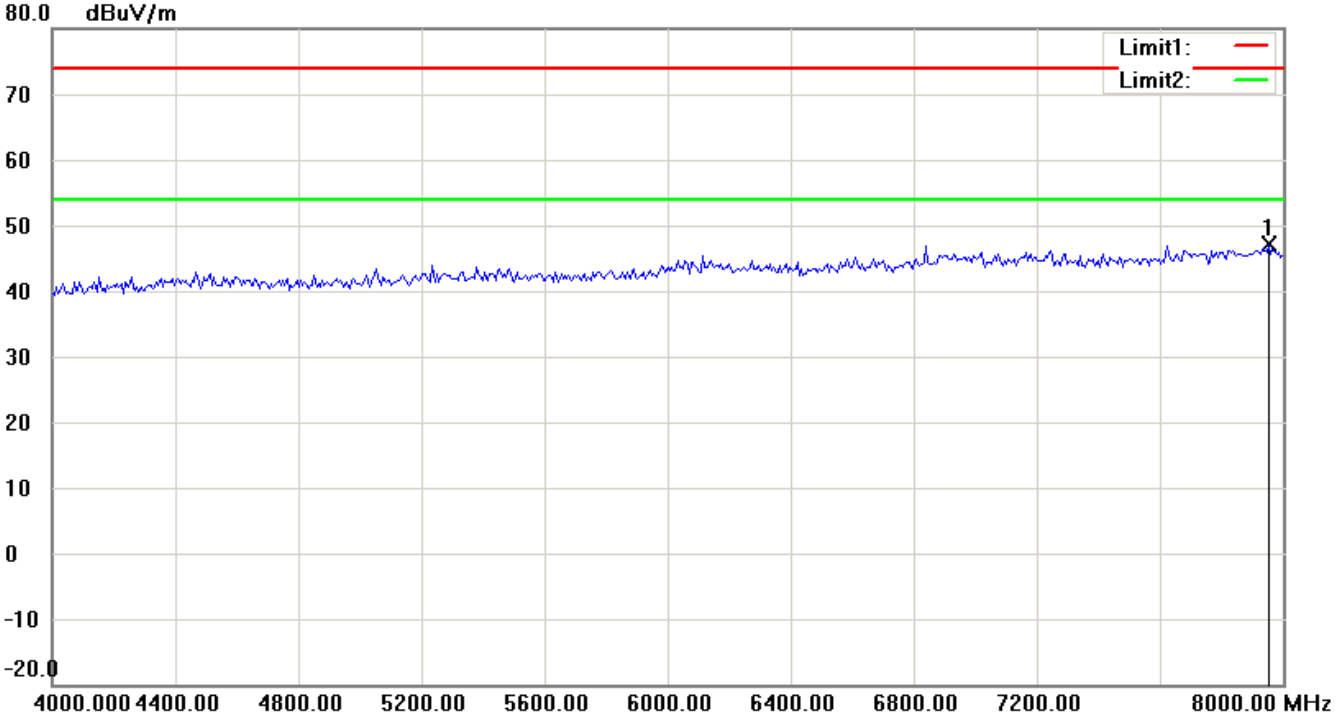
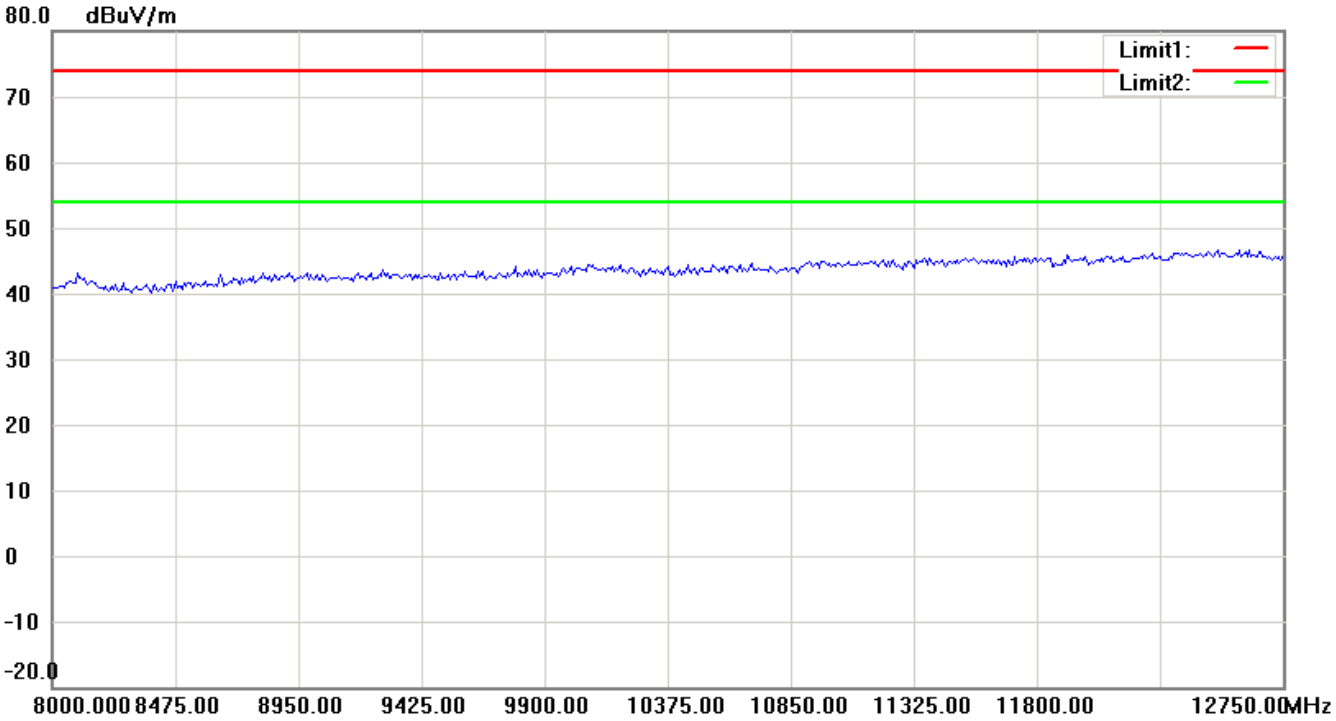
FCC ID: WLQSB4000IHTTX

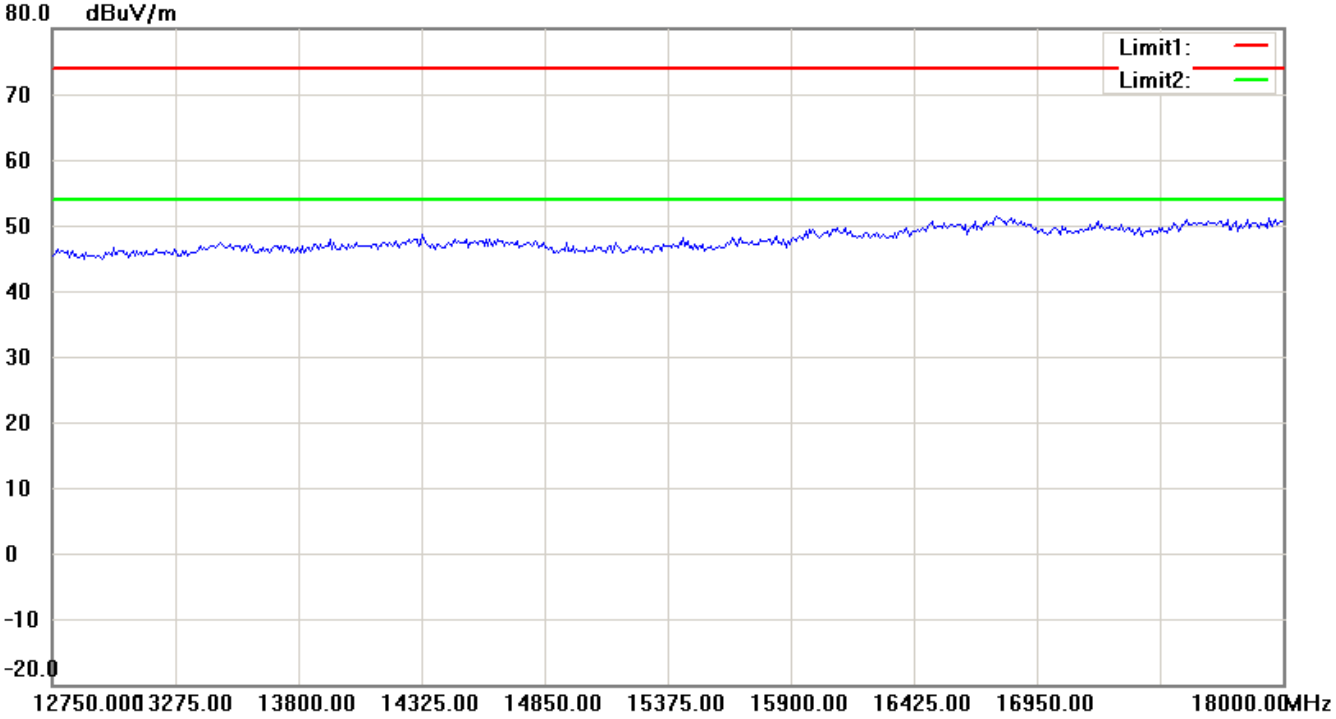


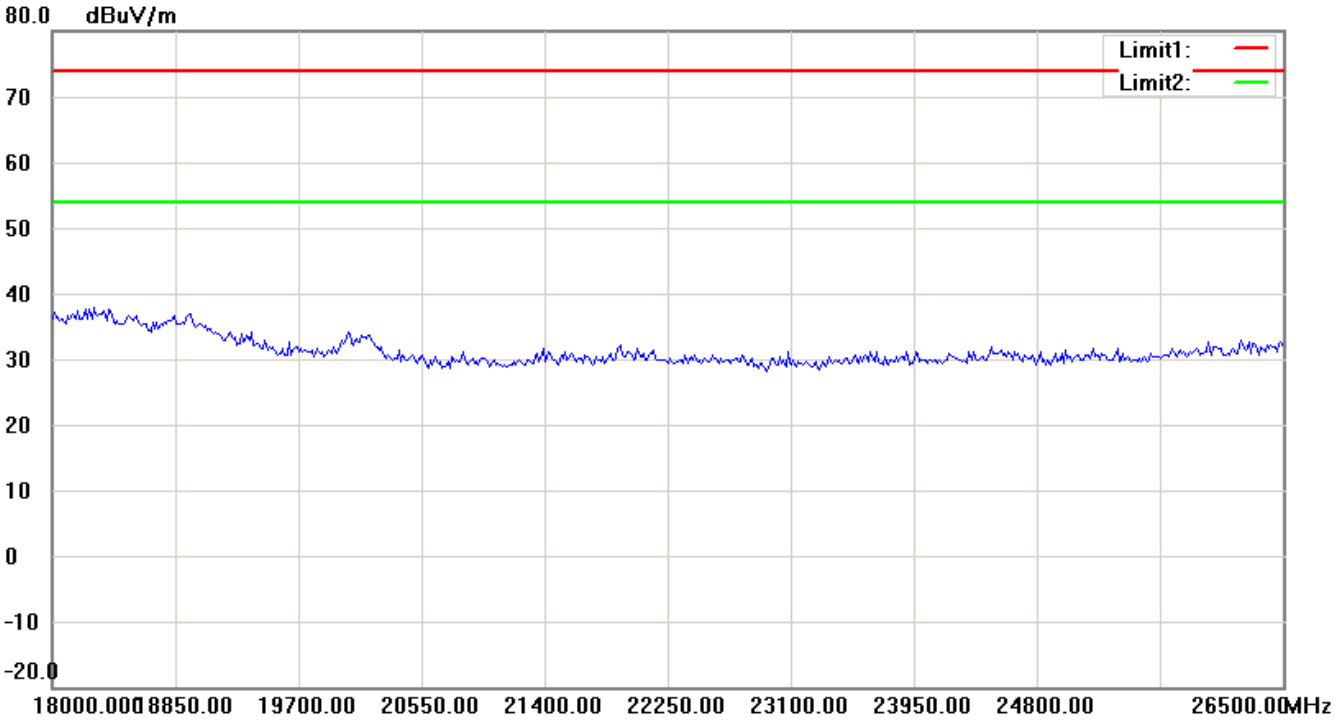


Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

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: W6M21102-11224-C-1
FCC ID: WLQSB4000IHTTX





Up Line: Peak Limit Line Down Line: Ave Limit Line
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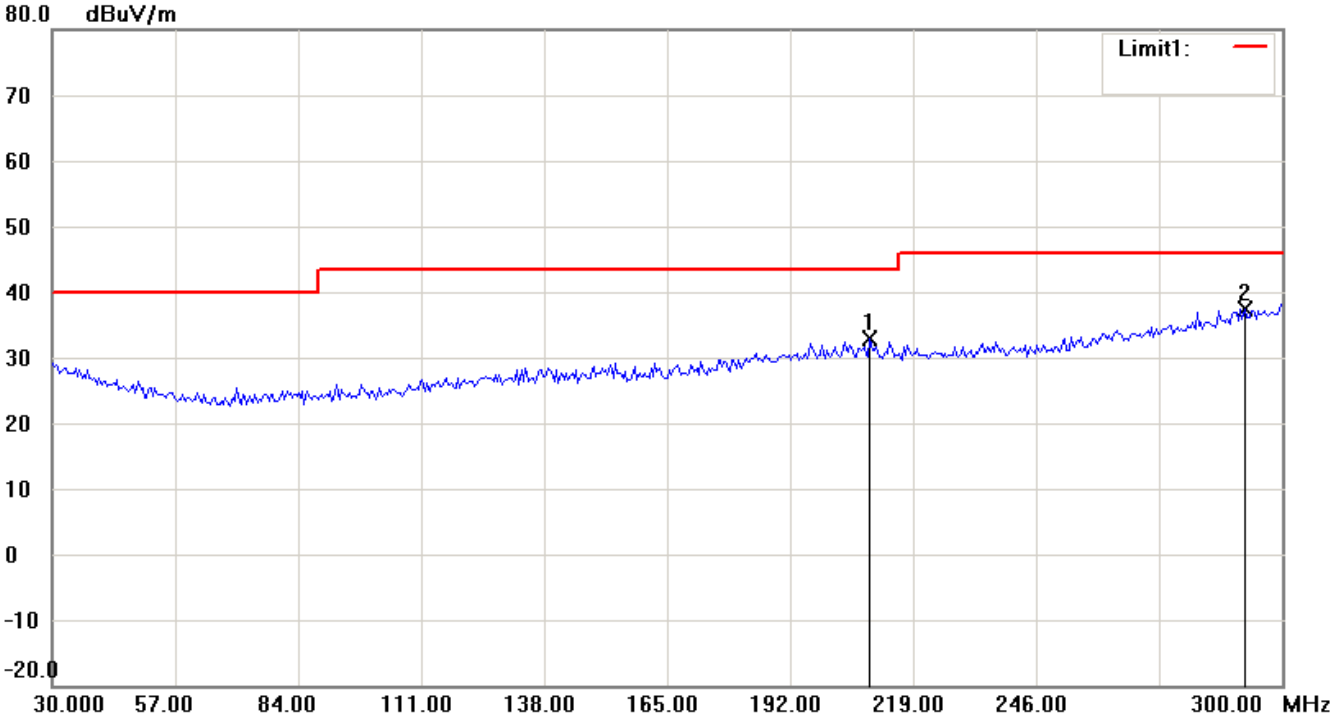
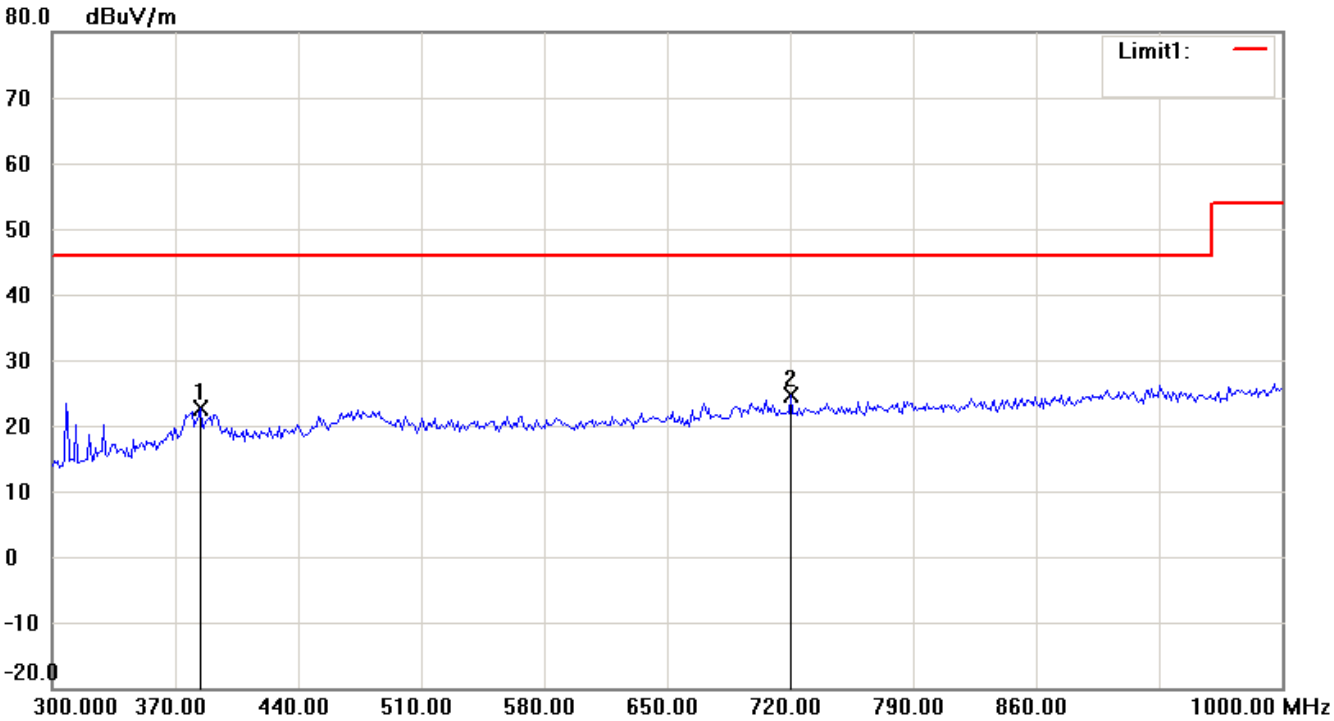
FCC ID: WLQSB4000IHTTX

Receiver _ CH 16

Antenna Polarization H





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

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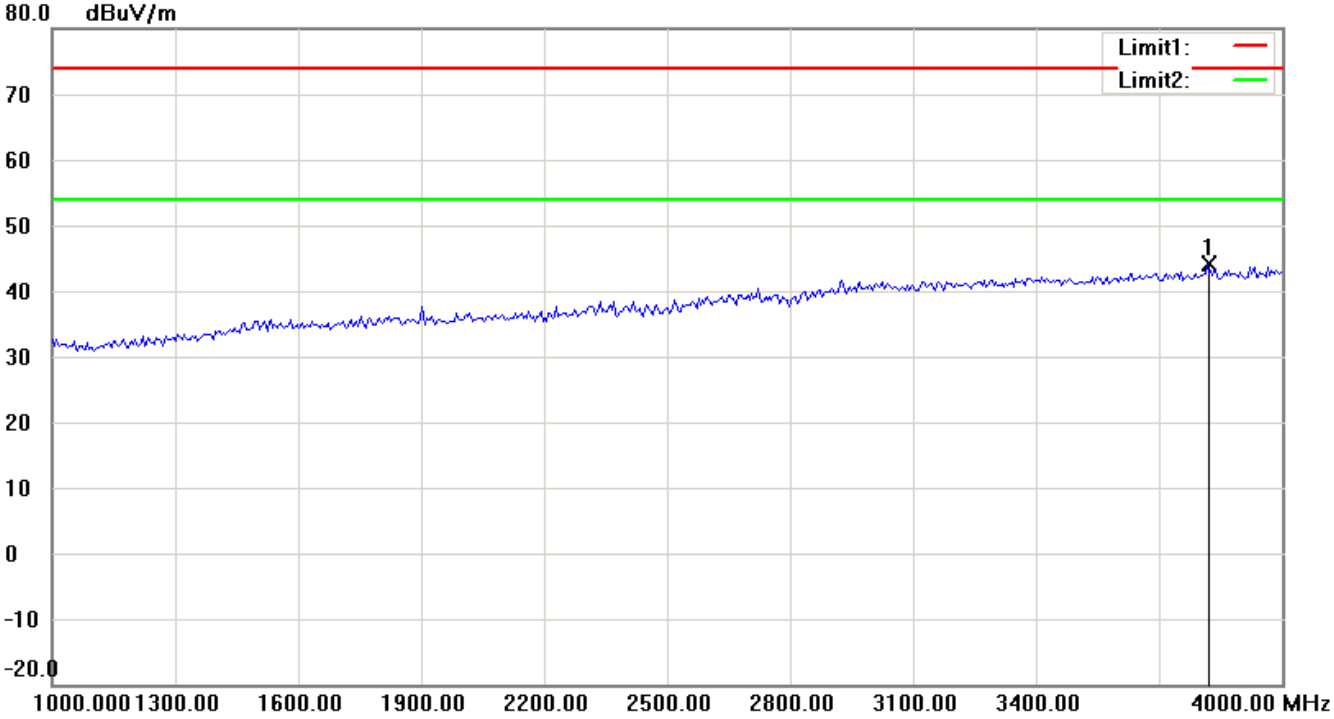
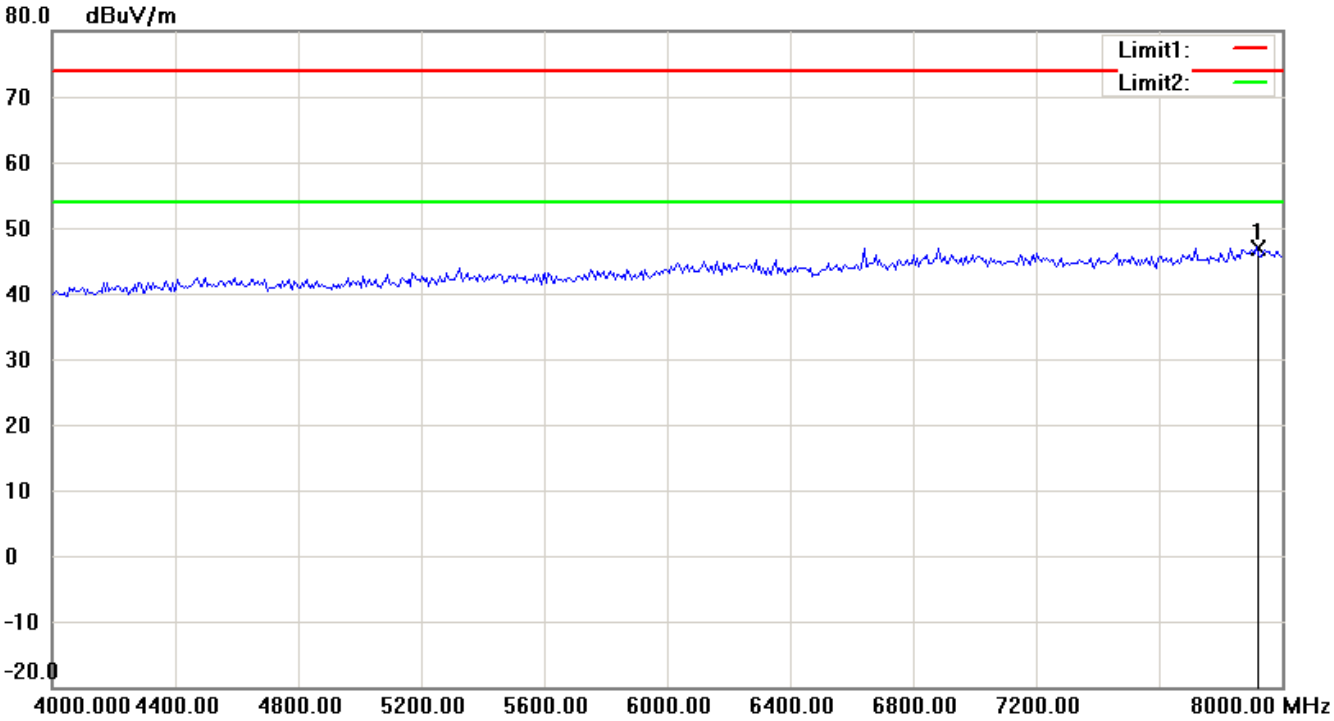
FCC ID: WLQSB4000IHTTX





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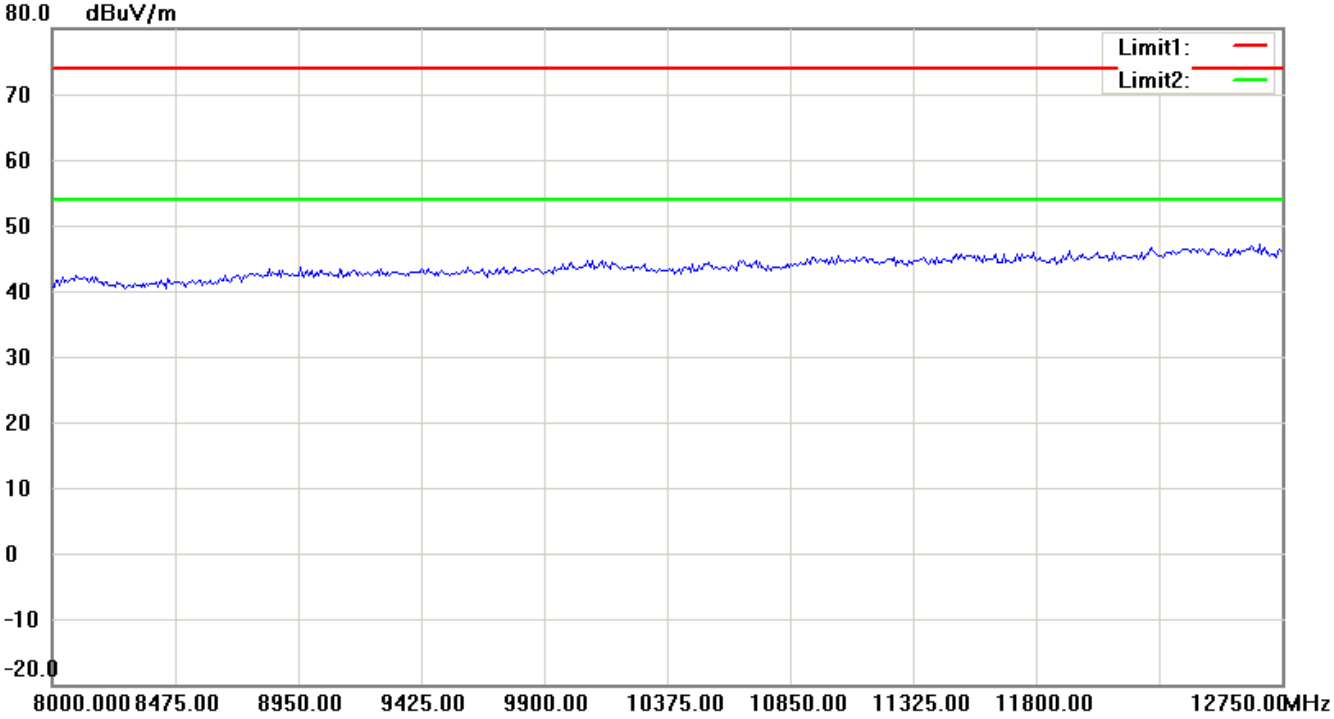

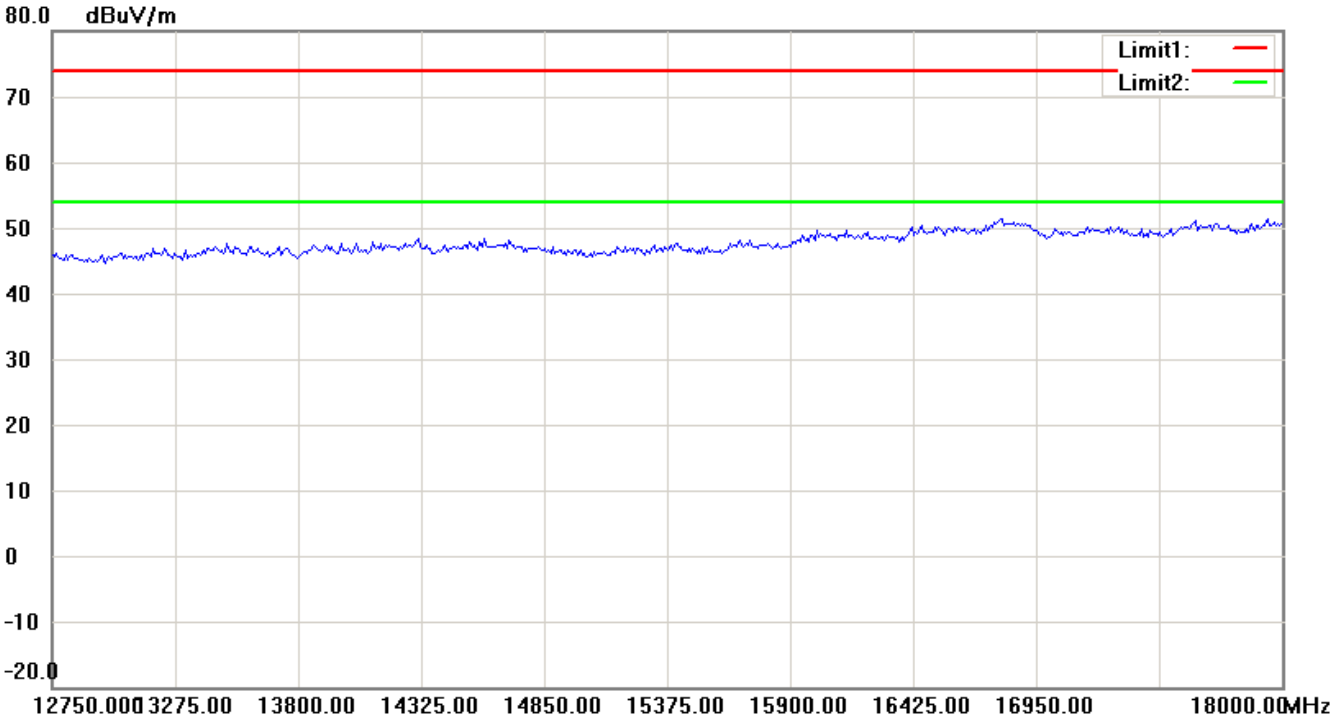

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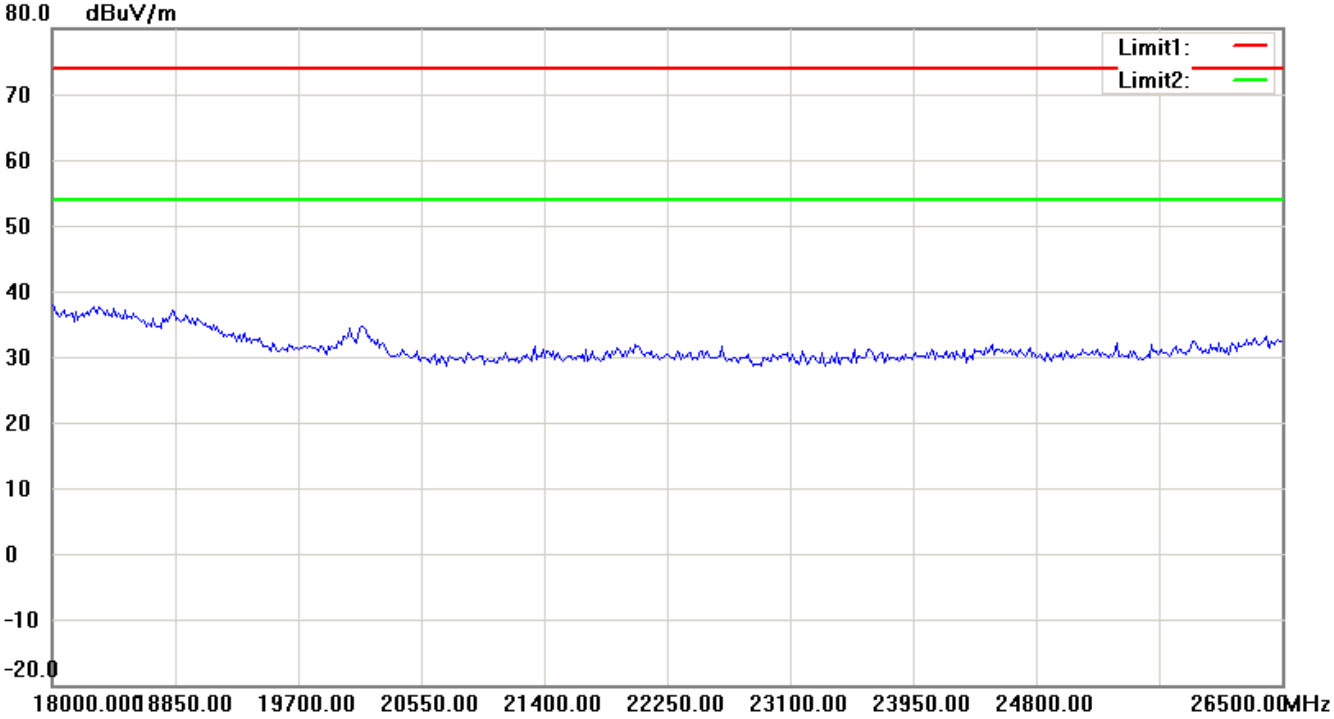
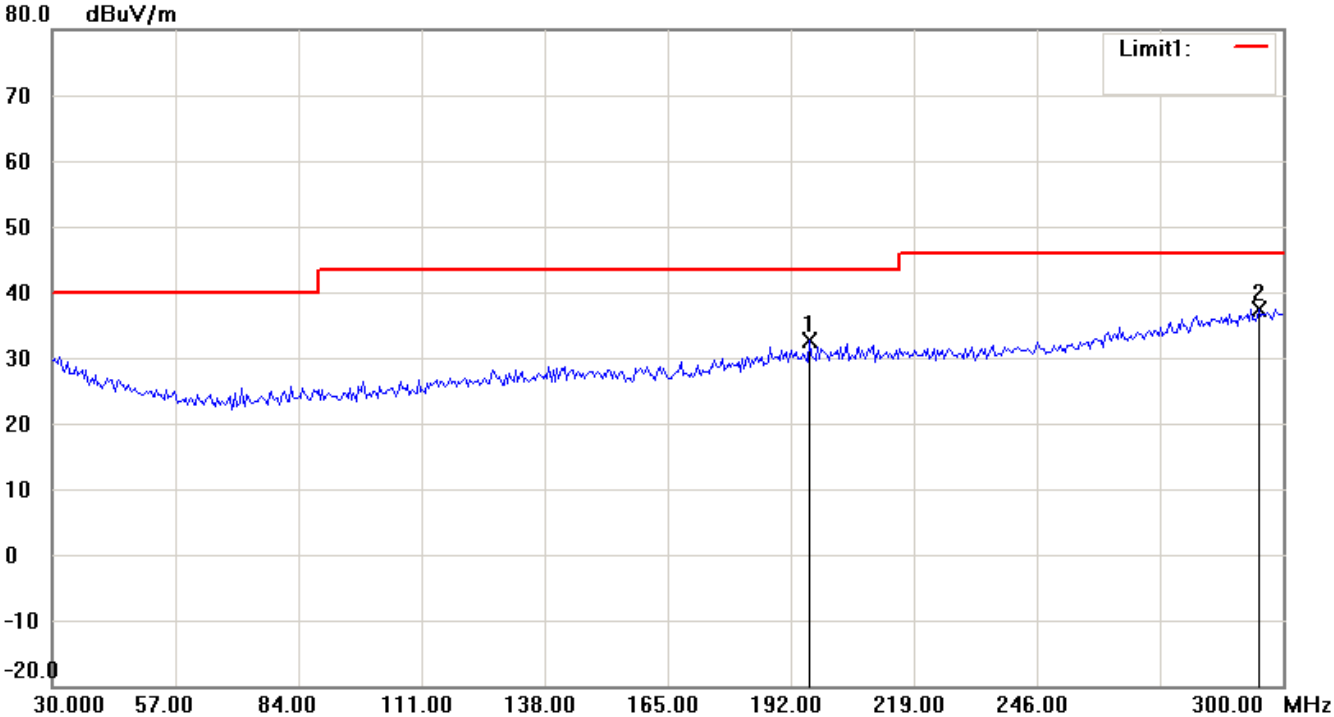


Antenna Polarization V



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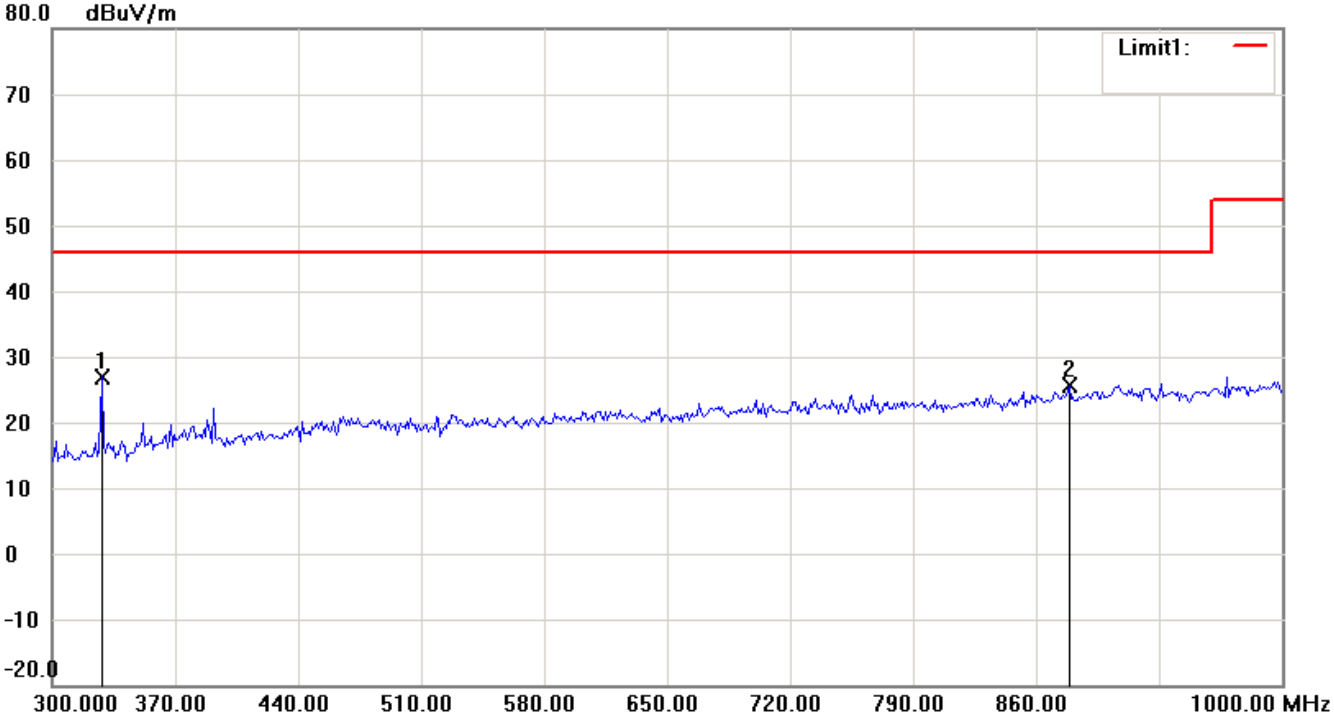

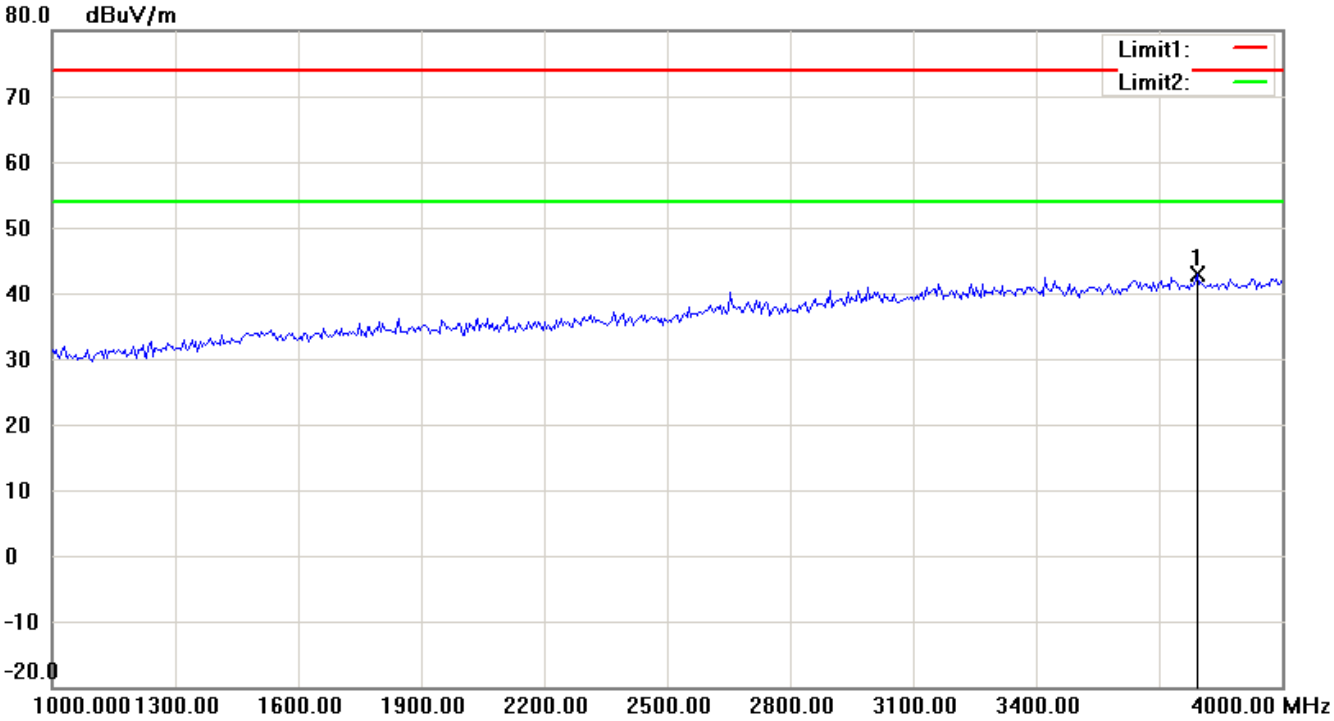

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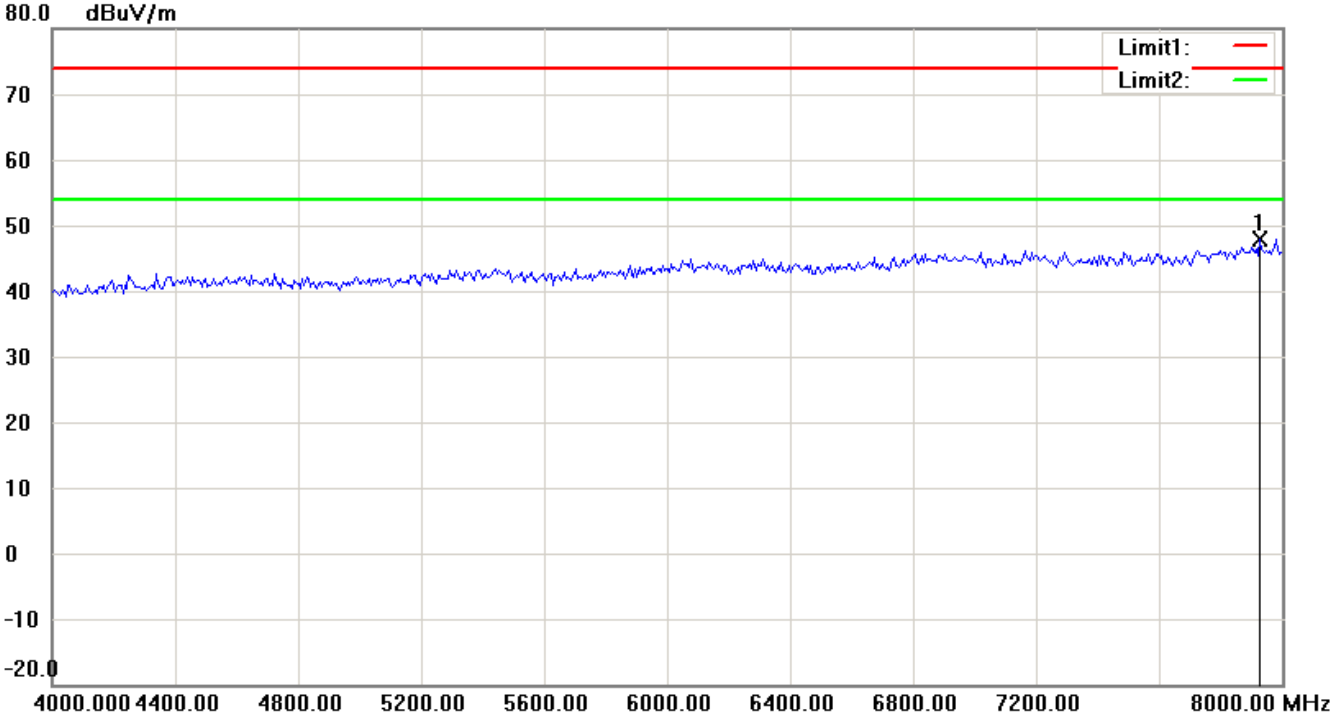

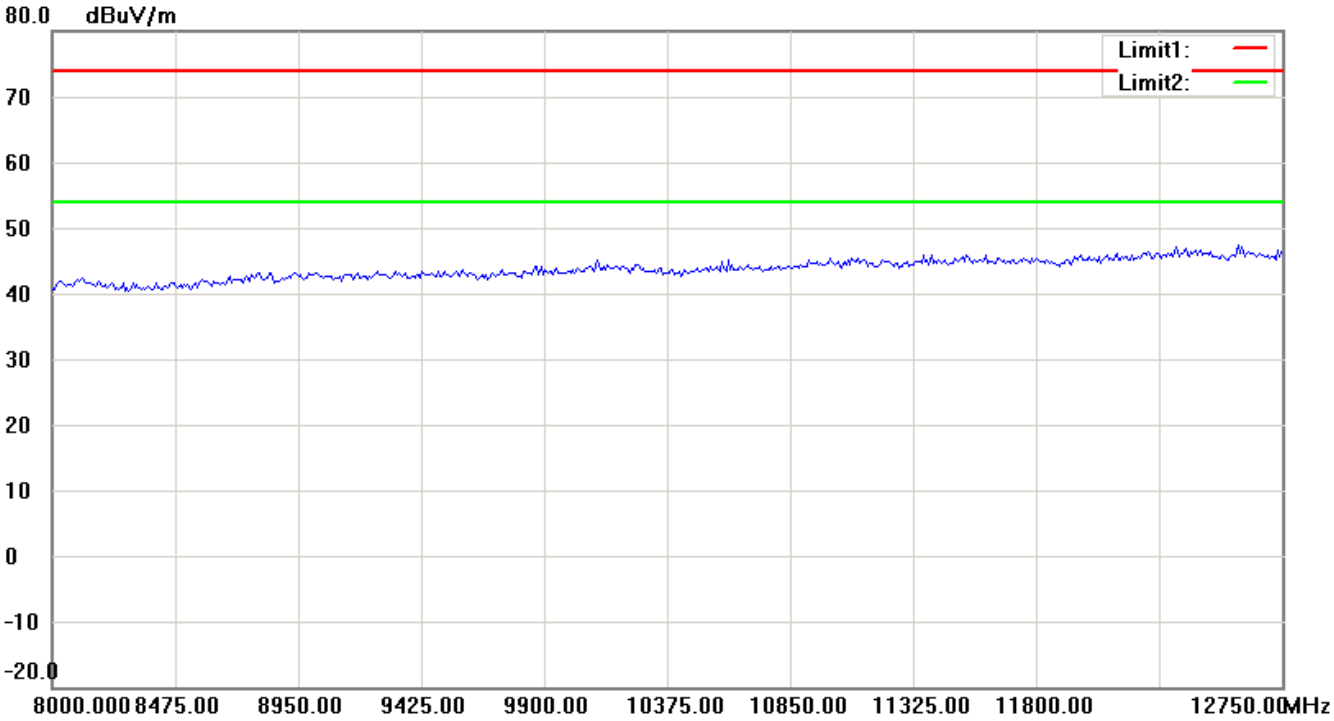

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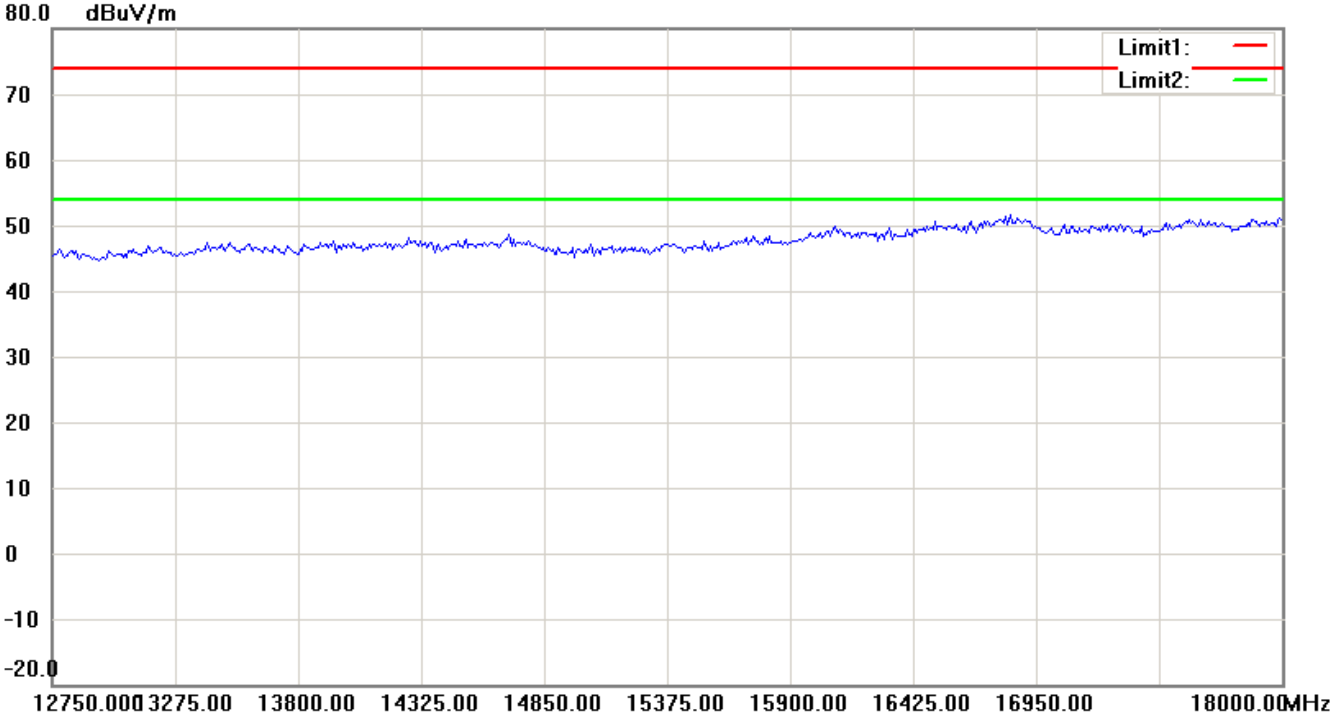

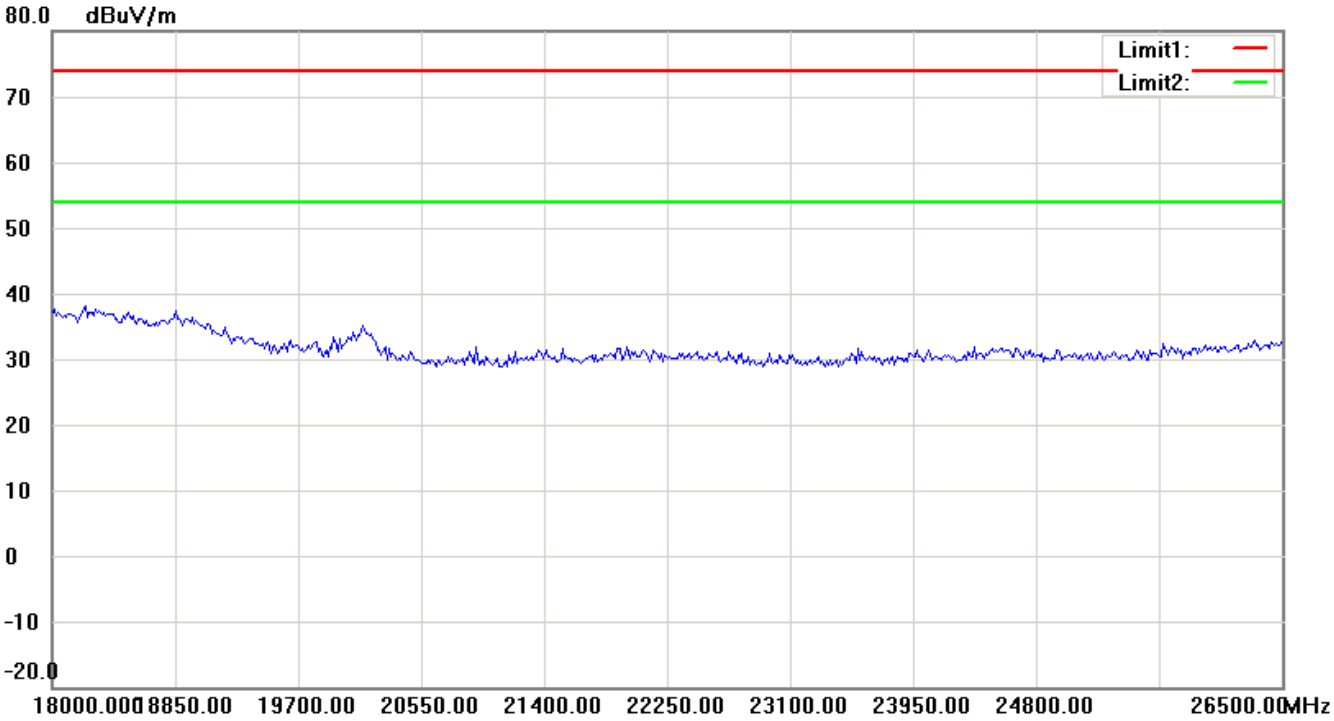

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