FCC TEST REPORT

for

USB Wireless Transceiver

Model No.: CHY 80TR

of

Applicant: **CHY FIREMATE CO., LTD.**
Address: **No.3, SHENG-LI 1 STREET, HSIN TIEN VILLAGE, JEN-TE HSIANG, TAINAN HSIEN TAIWAN, R.O.C.**

Tested and Prepared
by

ETS Product Service (Taiwan) Co., Ltd.

FCC Registration No.: 930600

Industry Canada filed test laboratory Reg. No. IC 5679

A2LA Accredited No.: 2300.01

PTCRB Accredited Type Certification Test House

FCC ID: VEA80TR

Report No.: W6M20706-8159-P-15

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: ets@ets-bzt.com.tw

Registration number: W6M20706-8159-P-15
FCC ID: VEA80TR

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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.
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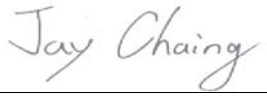
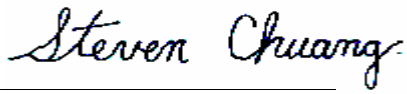
Tester:

August 27, 2007		Jay Chaing	
Date	ETS-Lab.	Name	Signature

Technical responsibility for area of testing:

August 27, 2007		Steven Chuang	
Date	ETS	Name	Signature

Registration number: W6M20706-8159-P-15
FCC ID: VEA80TR

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
ETS Product Service (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: 2300.01

FCC filed test laboratory Reg. No. 930600

Industry Canada filed test laboratory Reg. No. IC 5679

PTCRB Accredited Type Certification Test House

1.3 Details of approval holder

Name:	CHY FIREMATE CO., LTD.
Street:	No.3, SHENG-LI 1 STREET, HSIN TIEN VILLAGE, JEN-TE HSIANG,
Town:	TAINAN HSIEN
Country:	TAIWAN, R.O.C.
Telephone:	+886-6-279-4811
Fax:	+886-6-249-2316
Teletex:	./.

Registration number: W6M20706-8159-P-15
FCC ID: VEA80TR

1.4 Application details

Date of receipt of test item : June 08, 2007
Date of test : From June 09, 2007 to August 27, 2007

1.5 General information of Test item

Type of test item : USB Wireless Transceiver

Model Number : CHY 80TR

Photos : see Annex

Technical data

Frequency band : 910-920MHz

Operation Frequency : 910-920MHz

Frequency 1 : 910 MHz

Frequency 2 : 915 MHz

Frequency 3 : 920 MHz

Operation modes : duplex

Modulation Type : FSK

Antenna type : Spiral antenna

Power supply : 5VDC (power on PC)

Registration number: W6M20706-8159-P-15
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Manufacturer:
(if different from applicant)

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

Additional information : --

1.6 Test standards

Technical standard : FCC RULES PART 15 SUBPART B / SUBPART C § 15.249 (2007-05)

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
Details Power supply	: 5VDC (power on PC)
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	2006/10/16	2007/10/15
ETSTW-CE 002	PREREULATOR MODE DC POWER SUPPLY	None	None		Function Test	
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2006/10/16	2007/10/15
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2006/10/16	2007/10/15
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	In House Certificate	
ETSTW-CE 008	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2005/10/24	2007/10/23
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2007/8/2	2008/8/1
ETSTW-CE 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2005/12/8	2007/12/7
ETSTW-CE 014	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T2-02	20241	FCC	2005/12/7	2007/12/6
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2006/11/7	2008/11/6
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2006/11/21	2007/11/20
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	2005/10/14	2007/10/13
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2006/10/20	2007/10/19
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2006/10/30	2007/10/29
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2006/10/12	2007/10/11
ETSTW-RE 010	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070181	MOTECH	Function Test	
ETSTW-RE 011	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070165	MOTECH	Function Test	
ETSTW-RE 017	Log-Periodic Antenna	HL025	352886/001	R&S	2006/5/4	2008/5/3
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2004/11/8	2007/11/7
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2006/10/11	2007/10/10
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	EMCO	In House Certificate	
ETSTW-RE 028	Log-Periodic DipoleArray Antenna	3148	34429	EMCO	2006/5/26	2008/5/25
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2006/5/26	2008/5/25
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2006/5/3	2008/5/2
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2006/10/11	2007/10/10
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2005/10/17	2007/10/16
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2007/1/11	2009/1/10
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2006/5/8	2008/5/7
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2006/5/29	2008/5/28
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2005/3/22	2008/3/21

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ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2007/5/2	2009/5/1
ETSTW-RE 055	SPECTRUM ANALYZER	FSU-26	200074	R&S	2007/7/16	2008/7/15
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2007/7/2	2009/7/1

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

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The EUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings.
Measurements were made by ETS Product Service (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.

3 Test results (enclosure)

TEST CASE	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.249 (a)	☒	☒	☐
Spurious Emissions radiated – Transmitter operating	15.249 (e)	☒	☒	☐
Spurious Emissions conducted – Transmitter operating	15.249 (e)	☐	☐	☐
Radiated Emission from Digital Part	15.109	☒	☒	☐
Out of Band Spurious Emission, Band edge-Transmitter operating	15.249 (e)	☒	☒	☐
Power Line Conducted Emission	15.207	☒	☒	☐

The follows is intended to leave blank.

3.1 Peak Output Power (transmitter)

FCC Rule: 15.249 (b)

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).

Model: CHY 80TR Date: 2007/8/15
Mode: 910.2MHz Temperature: 26 °C Engineer: Michael
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)	Note
909.956	65.89	QP	26.46	92.35	94	-1.65	237	125	

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)	Note
909.956	54.45	peak	26.46	80.91	94	-13.09	226	115	

Mode: 915MHz
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)	Note
914.788	66.12	peak	26.58	92.7	94	-1.3	177	150	

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)	Note
914.748	53.08	peak	26.58	79.66	94	-14.34	194	160	

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Mode: 920MHz
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)	Note
919.946	65.63	peak	26.71	92.34	94	-1.66	274	155	

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)	Note
919.994	53.41	peak	26.71	80.12	94	-13.88	263	155	

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

Explanation: The diagrams for the field strength measurements are included in appendix.

3.2 Equivalent isotropic radiated power

Because using an permanent antenna there are no deviations from the radiated test results according 3.1.

3.3 RF Exposure Compliance Requirements

Not applicable for this USB Wireless Transceiver for the low power level.

3.4 Out of Band Radiated Emissions

FCC Rule: 15.249 (d)(e), 15.35(b)
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.
For frequency above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

Limits:

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	46.5
Above 960	500	54.0

For frequencies above 1 GHz (Peak measurements).

Limit + 20 dB
54.0 dBµV/m + 20 dB= 74dBµV/m

Or

Must be antenuatted at least 50dB below the level of fundament
Test equipment used: ETSTW-RE 003 ETSTW-RE 004 ETSTW-RE 017 ETSTW-RE 028
ETSTW-RE 029 ETSTW-RE 030 ETSTW-RE 042 ETSTW-RE 043
ETSTW-RE 044

Explanation: Please see attached diagram as appendix.

3.5 Spurious emission (tx)

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

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.
For frequencies above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

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

The peak and average spurious emission plots was measured with the average limits.
The critical peak value listed in the table agree with the above calculated limits.

Summary table with radiated data of the test plots

Model: CHY 80TR Date: 2007/8/16
Mode: 910.2MHz Temperature: 26 °C Engineer: Michael
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)	Note
200.441	18.12	peak	12.15	30.27	43.5	-13.23	222	305	
716.633	13.97	peak	23.89	37.86	46	-8.14	253	310	

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)	Note
166.353	19.88	peak	15.15	35.03	43.5	-8.47	234	155	
499.198	19.41	peak	19.80	39.21	46	-6.79	221	165	
716.633	15.29	peak	23.89	39.18	46	-6.82	244	205	

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Polarization: Horizontal

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)	Note
1817.635	54.49	---	-8.43	46.06	---	74	54	-27.94	245	125	
2731.463	43.61	---	-3.94	39.67	---	74	54	-34.33	265	135	
3645.291	52.8	38.03	-0.40	52.4	37.63	74	54	-16.37	276	145	
5458.918	61.68	46.91	2.29	65.97	51.2	74	54	-2.80	209	135	
6372.745	47.76	32.99	3.99	53.75	38.98	74	54	-15.02	231	150	
7278.557	57.69	42.28	1.82	61.51	46.1	74	54	-7.9	256	165	
8180.862	26.51	---	21.61	42.12	---	74	54	-31.88	225	165	
9094.689	28.31	---	24.06	46.37	---	74	54	-27.63	267	145	

Polarization: Vertical

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)	Note
1817.635	45.85	---	-8.43	37.42	---	74	54	-36.58	220	140	
2731.463	41.92	---	-3.94	37.98	---	74	54	-36.02	227	155	
3639.279	49.14	---	-0.47	48.67	---	74	54	-25.33	211	150	
5458.918	52.52	37.75	2.29	54.81	40.04	74	54	-13.96	210	170	
6372.745	42.51	---	3.99	46.5	---	74	54	-27.5	244	165	
7278.557	56.67	41.8	1.82	58.49	43.62	74	54	-10.38	255	150	
8180.862	26.55	---	21.61	42.16	---	74	54	-31.84	277	150	
9094.689	28.08	---	24.06	46.14	---	74	54	-27.86	291	130	

Model: CHY 80TR Date: 2007/8/16
Mode: 915MHz Temperature: 26 °C Engineer: Michael
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)	Note
200.441	18.57	peak	12.15	30.72	43.5	-12.78	322	315	
499.198	18.97	peak	19.80	38.77	46	-7.23	287	155	
716.633	15.62	peak	23.89	39.51	46	-6.49	271	175	

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)	Note
177.715	22.24	peak	14.23	36.47	43.5	-7.03	311	170	
500.601	14.17	peak	19.82	33.99	46	-12.01	303	315	
782.565	12.80	peak	24.87	37.67	46	-8.33	298	330	

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Polarization: Horizontal

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)	Note
1829.659	56.76	---	-8.38	48.38	---	74	54	-25.62	277	150	
2743.487	45.34	---	-3.88	41.46	---	74	54	-32.54	311	175	
3663.327	48.74	---	-0.20	48.54	---	74	54	-25.46	302	165	
5490.982	62.18	47.41	2.61	66.79	52.02	74	54	-1.98	267	155	
7318.637	57.78	43.01	1.84	61.62	46.85	74	54	-7.15	284	175	
8228.457	28.55	---	21.34	43.89	---	74	54	-30.11	237	145	
9142.285	32.44	---	24.18	50.62	---	74	54	-23.38	266	175	

Polarization: Vertical

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)	Note
1823.647	47.44	---	-8.41	39.03	---	74	54	-34.97	261	165	
3639.279	50.37	---	-0.47	49.9	---	74	54	-24.1	259	155	
5458.918	53.55	38.78	2.29	55.84	41.07	74	54	-12.93	223	160	
6372.745	44.13	---	3.99	48.12	---	74	54	-25.88	276	150	
7278.557	57.03	44.26	1.82	58.85	46.08	74	54	-7.92	256	155	
8180.862	25.31	---	21.61	40.92	---	74	54	-33.08	241	145	
9094.689	26.98	---	24.06	45.04	---	74	54	-28.96	311	160	

Model: CHY 80TR Date: 2007/8/16
Mode: 920MHz Temperature: 26 °C Engineer: Michael
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)	Note
230.742	19.74	peak	13.09	32.83	46	-13.17	311	305	
499.198	17.27	peak	19.80	37.07	46	-8.93	302	175	
716.633	15.11	peak	23.89	39	46	-7	277	210	

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)	Note
166.353	19.28	peak	15.15	34.43	43.5	-9.07	266	215	
500.601	13.42	peak	19.82	33.24	46	-12.76	233	320	
716.633	13.11	peak	23.89	37	46	-9	269	305	

Polarization: Horizontal

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)	Note
1835.671	59.9	45.13	-8.36	51.54	36.77	74	54	-17.23	225	155	
2761.523	45.56	---	-3.79	41.77	---	74	54	-32.23	246	170	
3681.363	51.14	36.37	-0.01	51.13	36.36	74	54	-17.64	276	165	
5523.046	60.12	45.35	2.75	64.87	50.1	74	54	-3.9	264	165	
6436.874	46.28	31.51	4.06	52.34	37.57	74	54	-16.43	293	155	
7366.734	58.92	44.15	1.93	62.85	48.08	74	54	-5.92	278	175	
8276.052	27.03	---	21.25	42.28	---	74	54	-31.72	289	175	
9199.399	30.94	---	24.30	49.24	---	74	54	-24.76	276	170	

Polarization: Vertical

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)	Note
1835.671	50.39	---	-8.36	42.03	---	74	54	-31.97	267	165	
3681.363	46.96	---	-0.01	46.95	---	74	54	-27.05	310	180	
5523.046	50.75	35.98	2.75	53.5	38.73	74	54	-15.27	222	145	
6436.874	40.89	---	4.06	44.95	---	74	54	-29.05	266	160	
7366.734	57.52	42.75	1.93	59.45	44.68	74	54	-9.32	244	175	
9199.399	26.22	---	24.30	44.52	---	74	54	-29.48	299	180	

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.**

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

Test equipment used: ETSTW-RE 003 ETSTW-RE 004 ETSTW-RE 055

Explanation: Please see attached diagram as appendix.

3.6 Radiated Emissions from Digital Part

Model: CHY 80TR Date: 2007/8/21
Mode: Temperature: 26 °C Engineer: Michael
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)	Note
82.485	14.55	peak	9.93	24.48	40	-15.52	261	310	
178.798	15.07	peak	14.13	29.2	43.5	-14.3	277	300	
259.960	14.09	peak	14.08	28.17	46	-17.83	291	325	
335.070	14.73	peak	16.23	30.96	46	-15.04	289	185	
497.796	15.89	peak	19.79	35.68	46	-10.32	313	220	
716.633	17.31	peak	23.89	41.2	46	-4.8	207	215	

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)	Note
31.082	17.91	peak	13.03	30.94	40	-9.06	281	150	
123.066	11.31	peak	13.63	24.94	43.5	-18.56	302	175	
200.441	22.03	peak	12.15	34.18	43.5	-9.32	315	180	
401.002	14.32	peak	17.81	32.13	46	-13.87	301	310	
500.601	18.81	peak	19.82	38.63	46	-7.37	279	315	
716.633	17.72	peak	23.89	41.61	46	-4.39	317	325	

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

Explanation: Please see attached diagram as appendix.

3.7 Radiated Emission on the band edge

From the following plots, they show that the fundamental emissions are confined in the specified band and hey at least 50 dB below the carrier level at band edge (2400 and 2483.5 MHz). It meets the requirement of section 15.249(d).

Test conditions Tnom = 23°C, Vnom = 5V Frequency [MHz]	Transmitter field strength of Radiated Emission (Peak Detector) [dBμV/m]	Transmitter field strength of Radiated Emission (Average Detector) [dBμV/m]
902	48.05	--
928	41.15	--

Limit:

Frequency Range (MHz)	Limit (dBμV/m)	
902 – 928 2400 – 2483.5 5725 – 5875 24000 - 24250	Peak	Average
	74	54

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

Explanation: Please see attached diagram as appendix.

3.8 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: CHY 80TR Date: 2007/8/27
Mode: Temperature: 26 °C
Polarization: N Humidity: 60 % Engineer: Michael

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)	Note
0.1504	35.66	--	10.10	45.76	--	65.98	--	-20.22	
0.2682	32.62	--	10.10	42.72	--	61.17	--	-18.45	
0.53	25.07	--	10.10	35.17	--	56	--	-20.83	
1.405	20.86	--	10.10	30.96	--	56	--	-25.04	
5.2778	19.13	--	10.10	29.23	--	60	--	-30.77	
17.8888	22.08	--	10.10	32.18	--	60	--	-27.82	

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)	Note
0.1504	35.36	--	10.10	45.46	--	65.98	--	-20.52	
0.2678	30.66	--	10.10	40.76	--	61.19	--	-20.43	
0.535	25.35	--	10.10	35.45	--	56	--	-20.55	
1.605	21.14	--	10.10	31.24	--	56	--	-24.76	
5.8333	16.31	--	10.10	26.41	--	60	--	-33.59	
16.3888	21.98	--	10.10	32.08	--	60	--	-27.92	

Note: 1. The formula of measured value as: Test Result = Reading + Correction Factor
2. The Correction Factor = Cable Loss + LISN Insertion Loss
3. Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average
4. All not in the table noted test results are more than 20 dB below the relevant limits.
5. Explanation: Please see attached diagram as appendix.

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Limits:

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

Test equipment used: ETSTW-CE 001 ETSTW-CE 003 ETSTW-CE 004 ETSTW-CE 006 ETSTW-CE 011

Appendix

A Measurement diagrams

1. Fundamental Field Strength

2 . Spurious Emissions radiated

(The measurement diagrams plots attached below are preliminary wideband scan with a peak detector for reference only. The final test results are listed on section 3.5)

3. Radiated Emission from Digital Part

(The measurement diagrams plots attached below are preliminary wideband scan with a peak detector for reference only. The final test results are listed on section 3.6)

4. Radiated Emission on the band edge

5. Power Line Conducted Emission

(The measurement diagrams plots attached below are preliminary wideband scan with a peak and average detector for reference only. The final test results are listed on section 3.8)

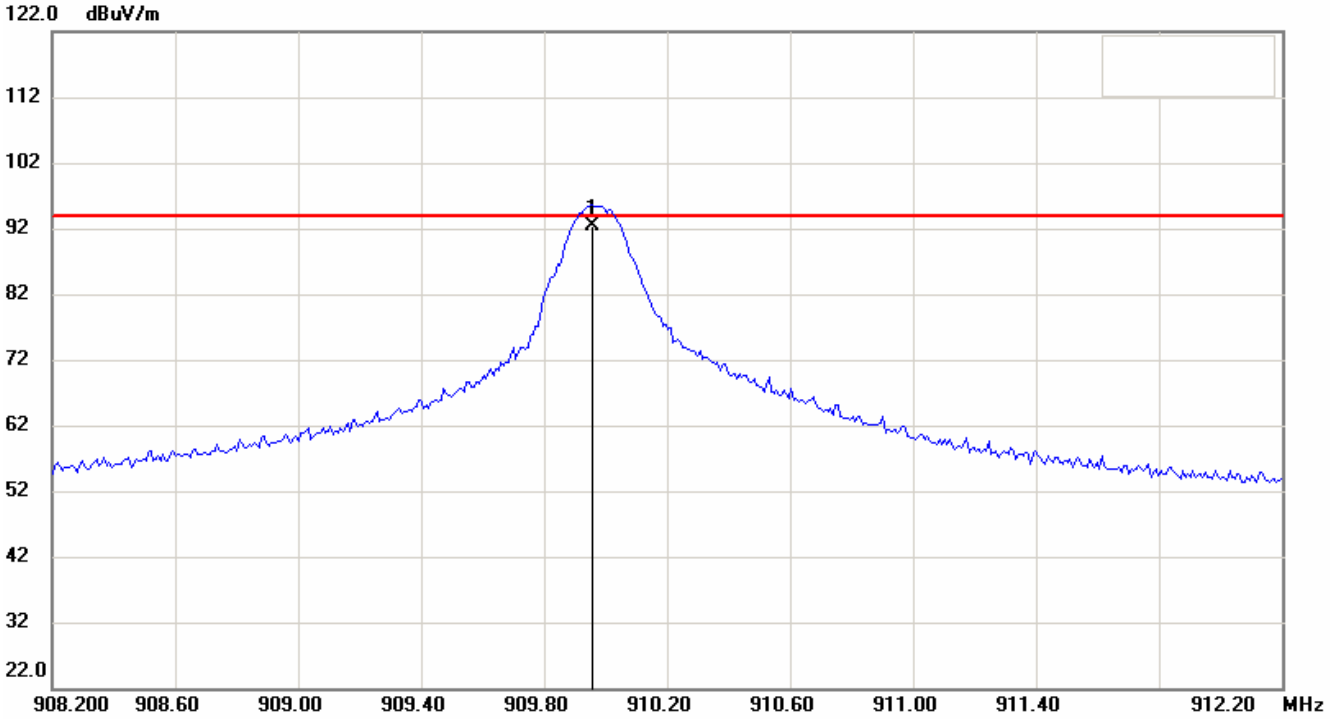
B Photos

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

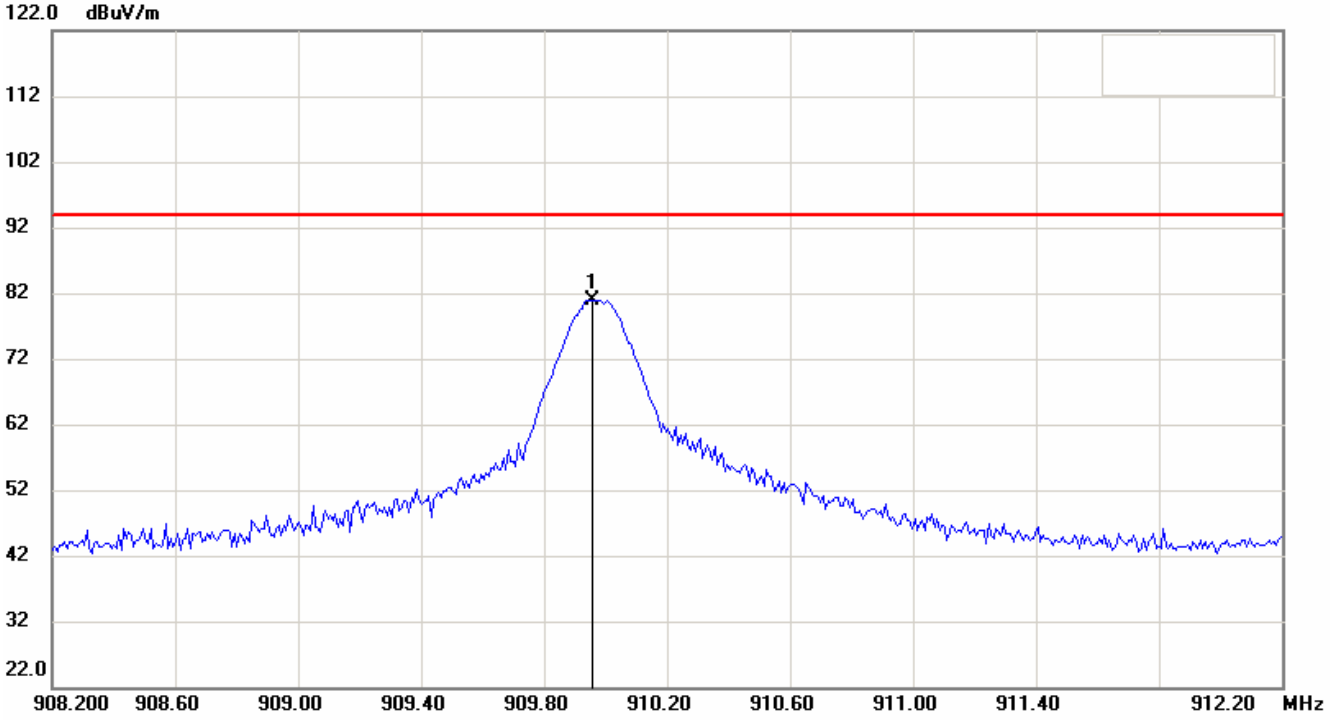
Registration number: W6M20706-8159-P-15
FCC ID: VEA80TR

Fundamental Field Strength

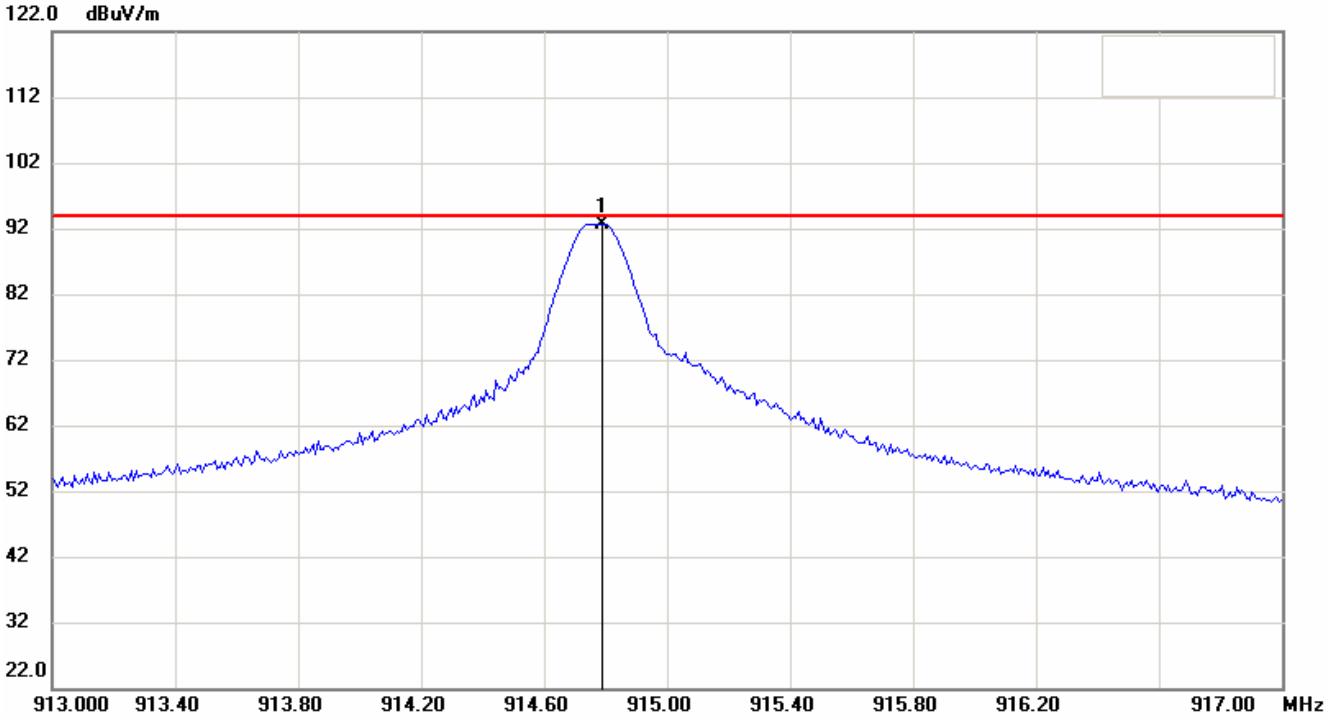
Antenna Polarization H_low channel



Antenna Polarization V



Antenna Polarization H_middle channel



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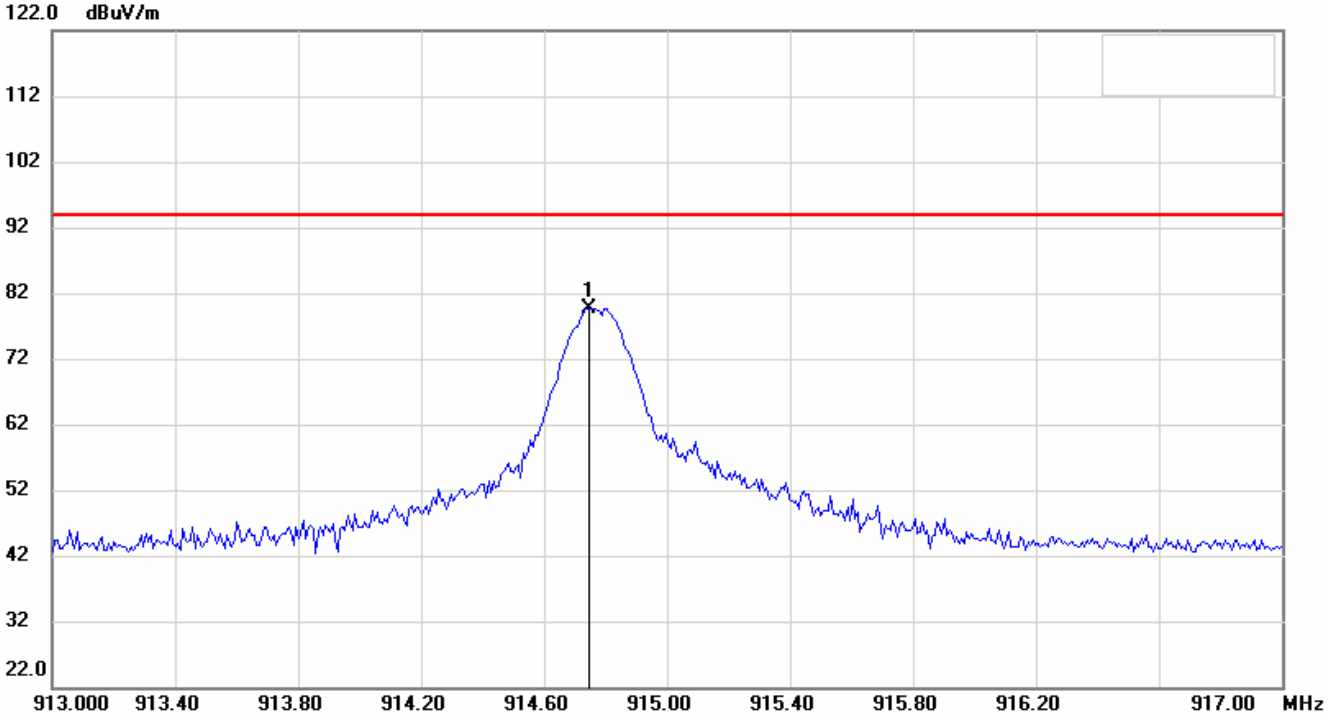
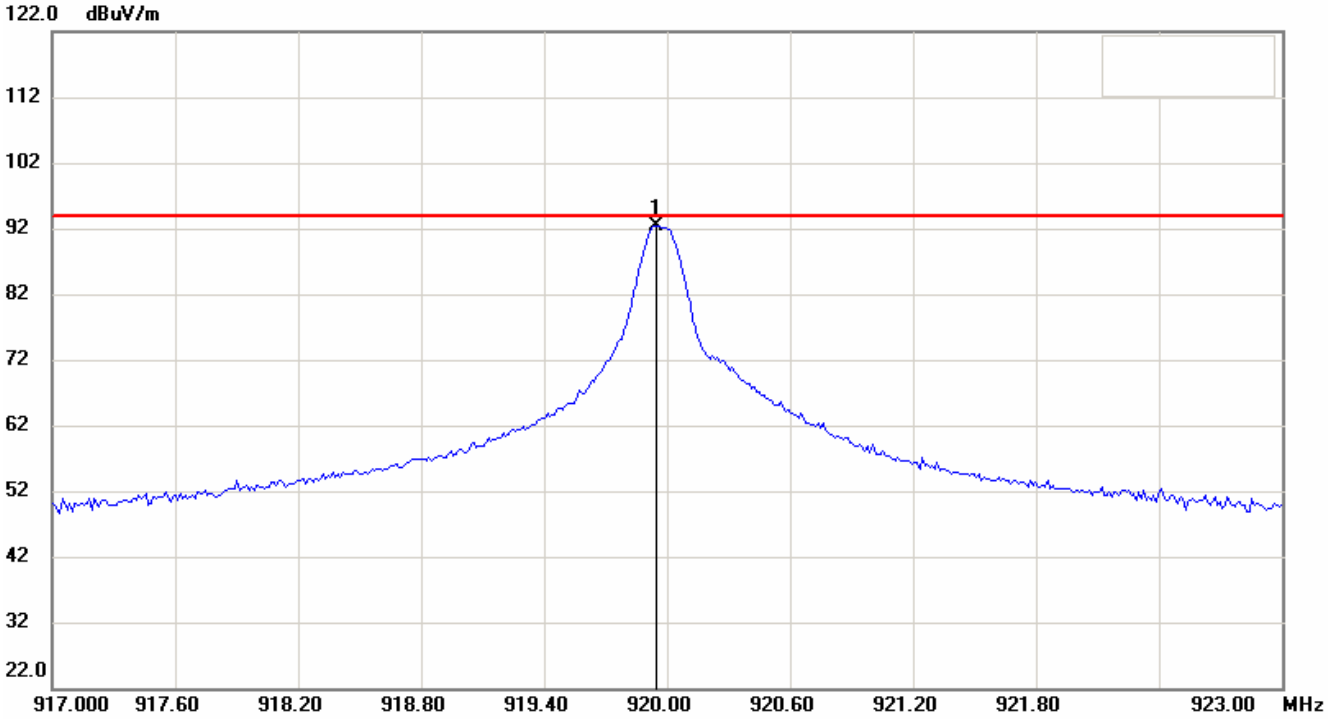
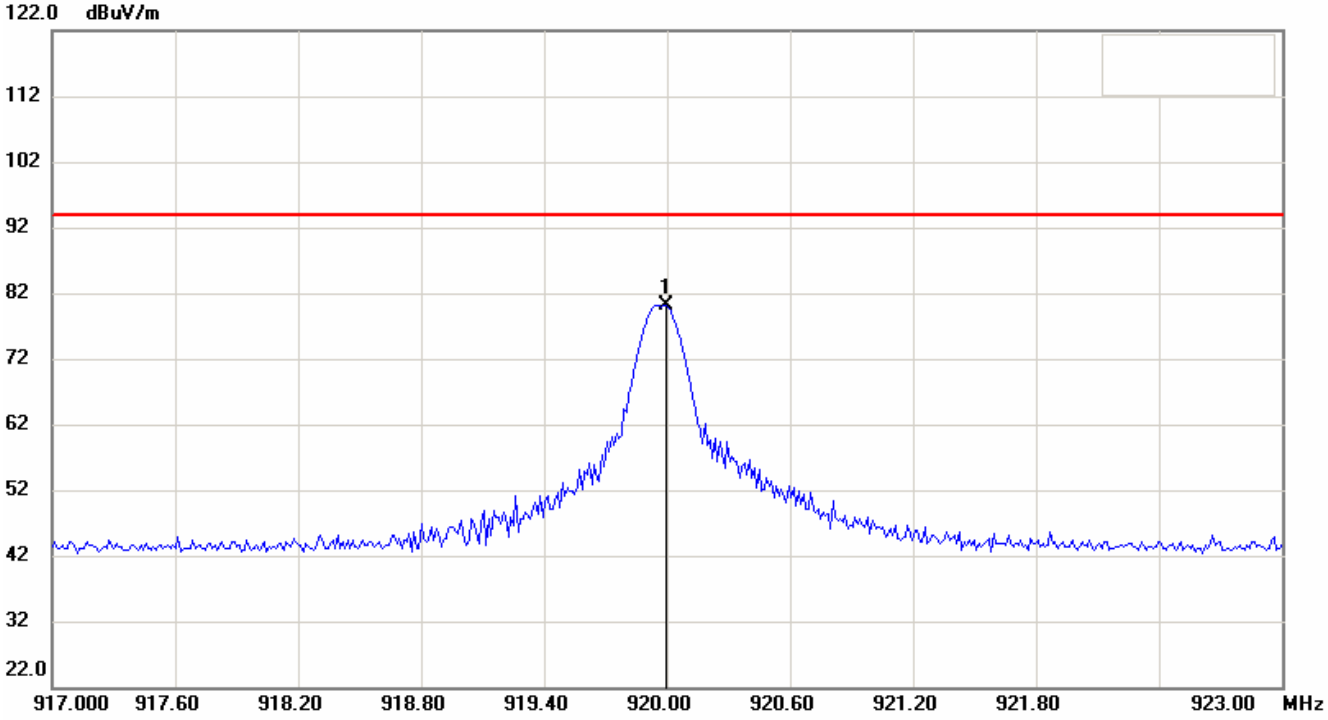


Antenna Polarization H_high channel

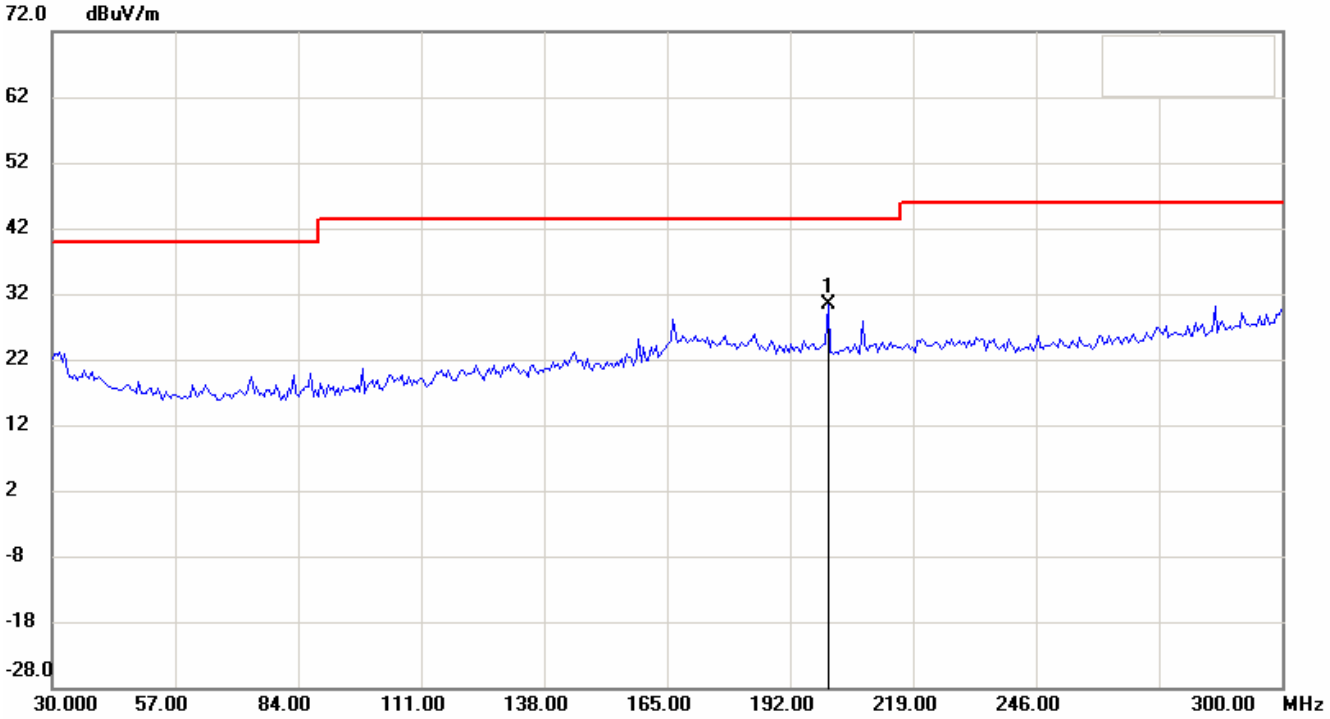


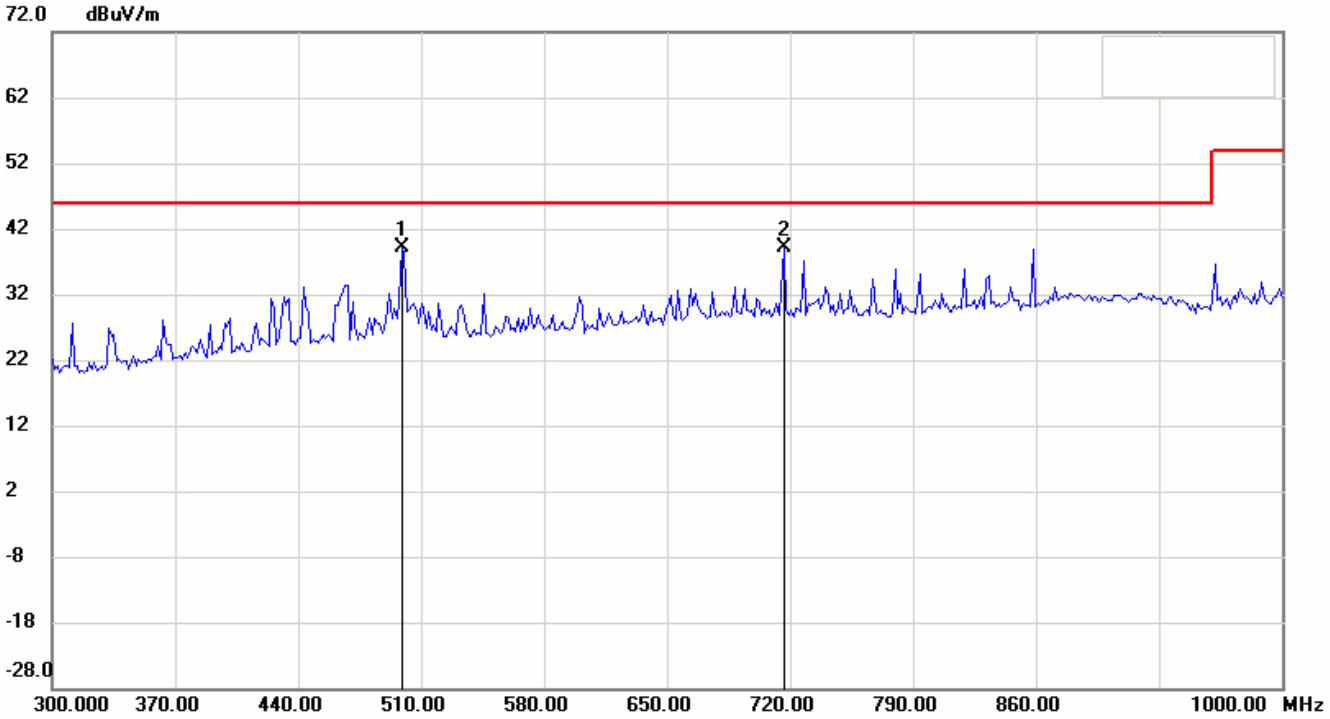
Antenna Polarization V



Registration number: W6M20706-8159-P-15
FCC ID: VEA80TR

Spurious Emissions radiated
Antenna Polarization H_low channel





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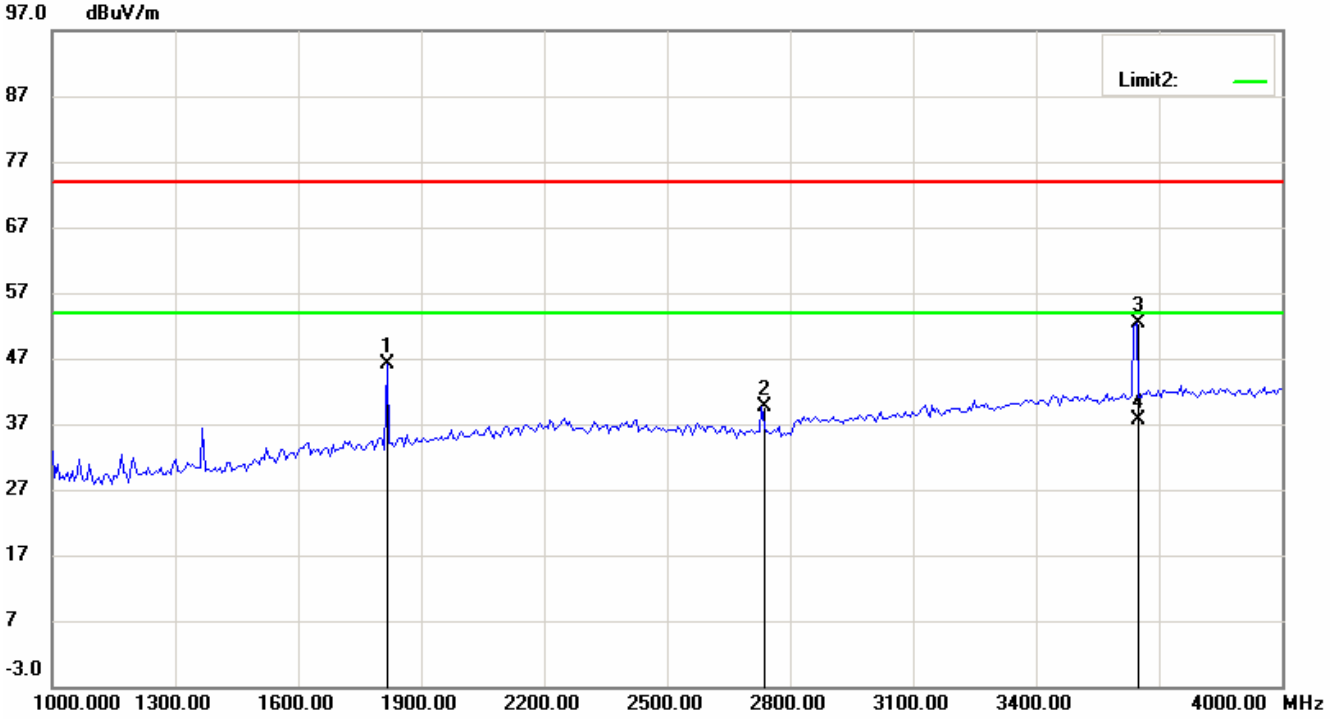

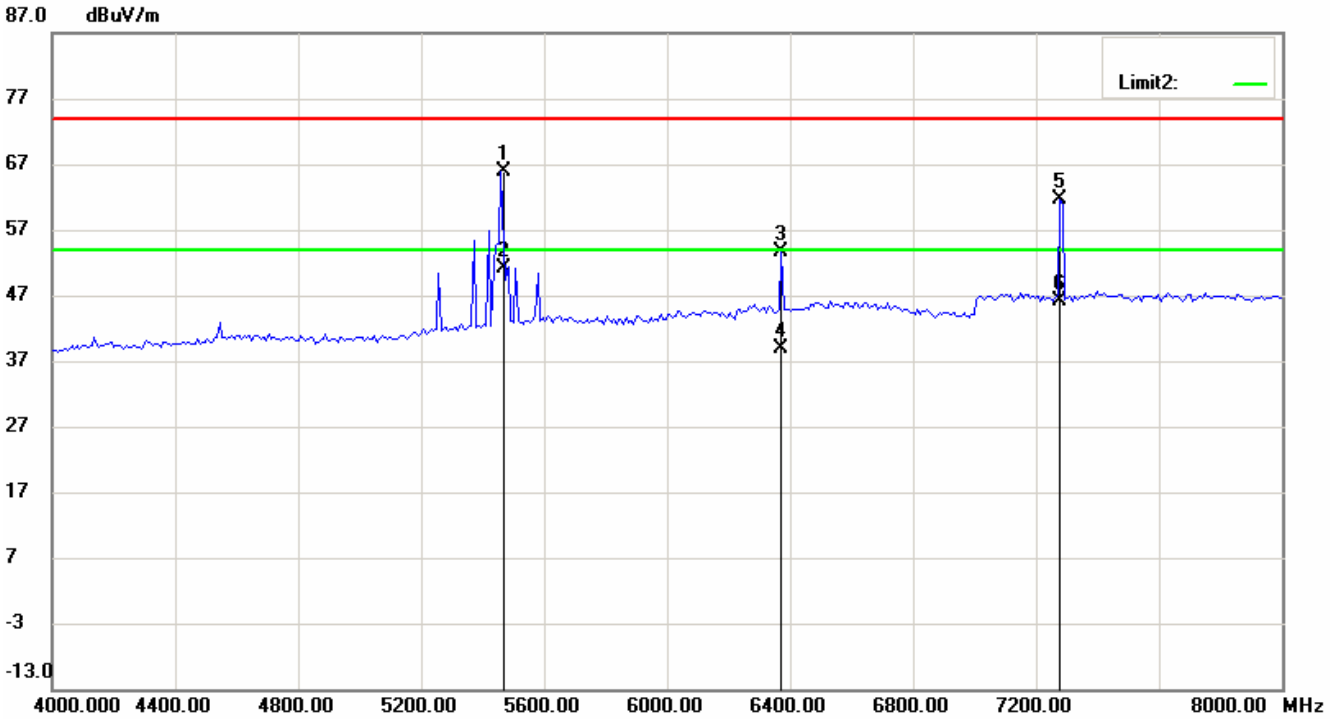

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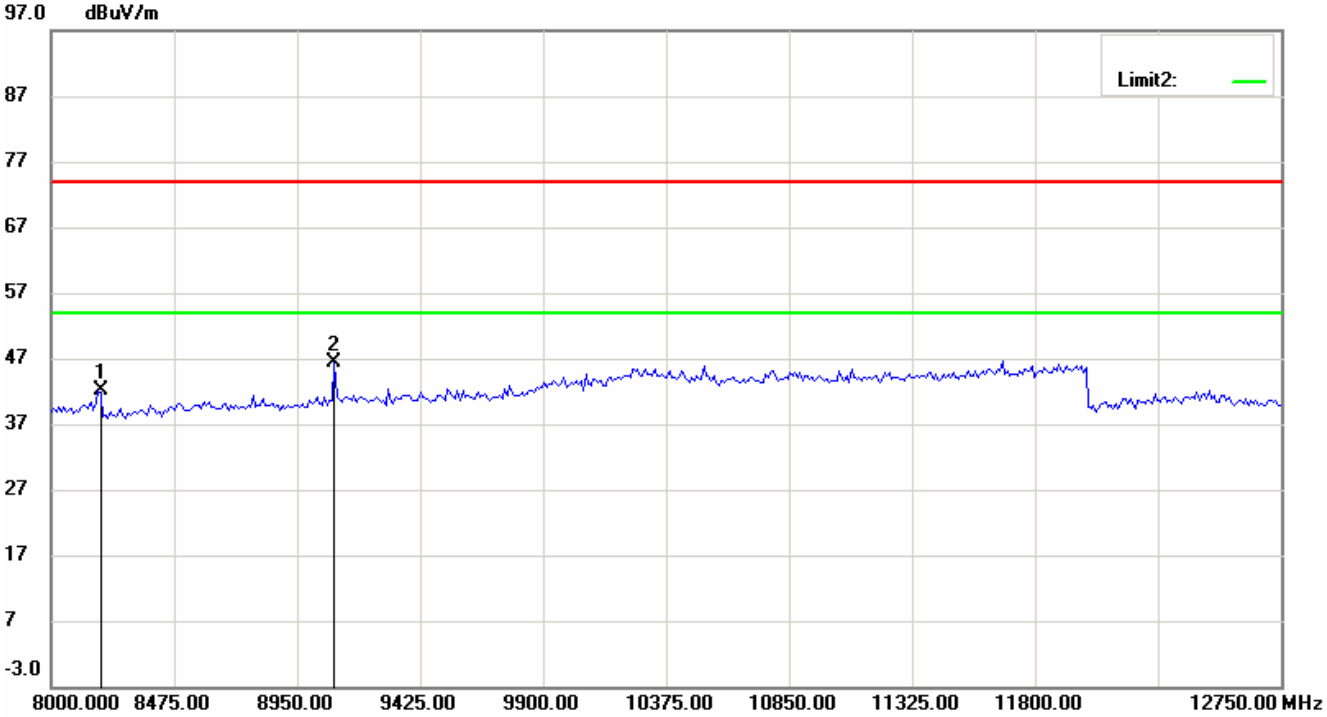

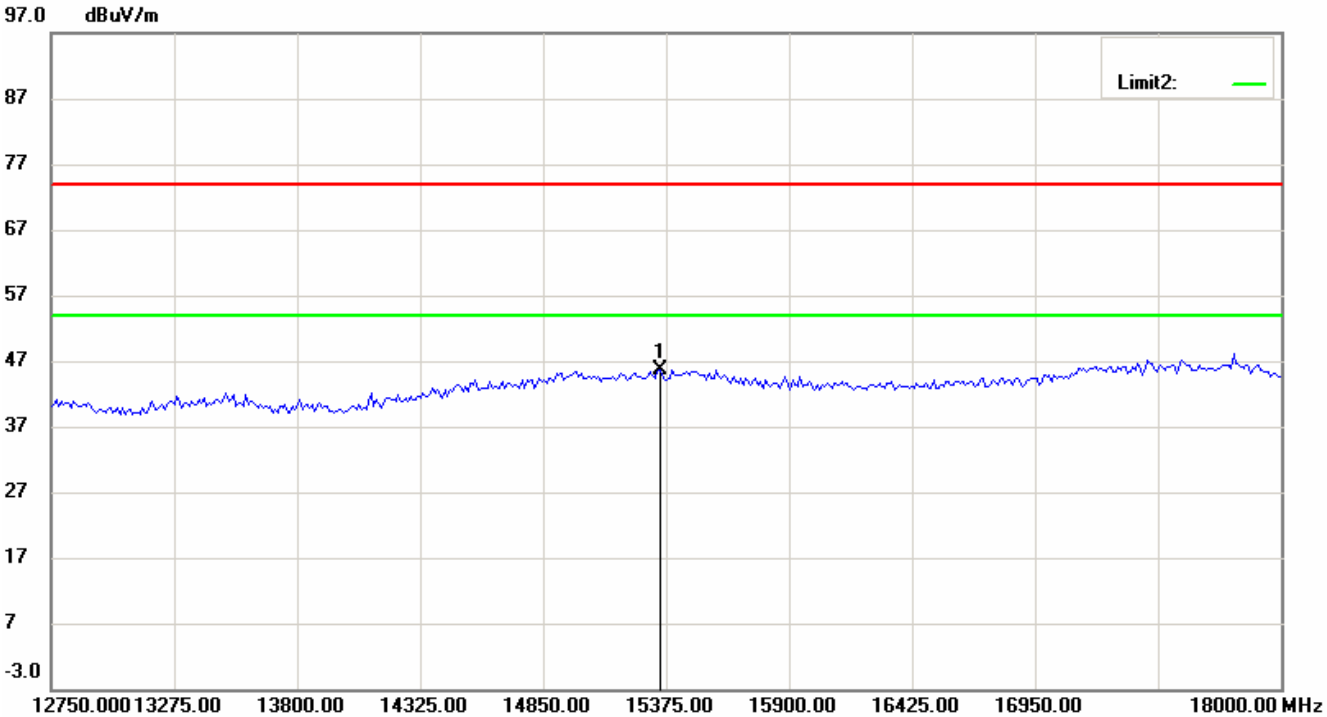

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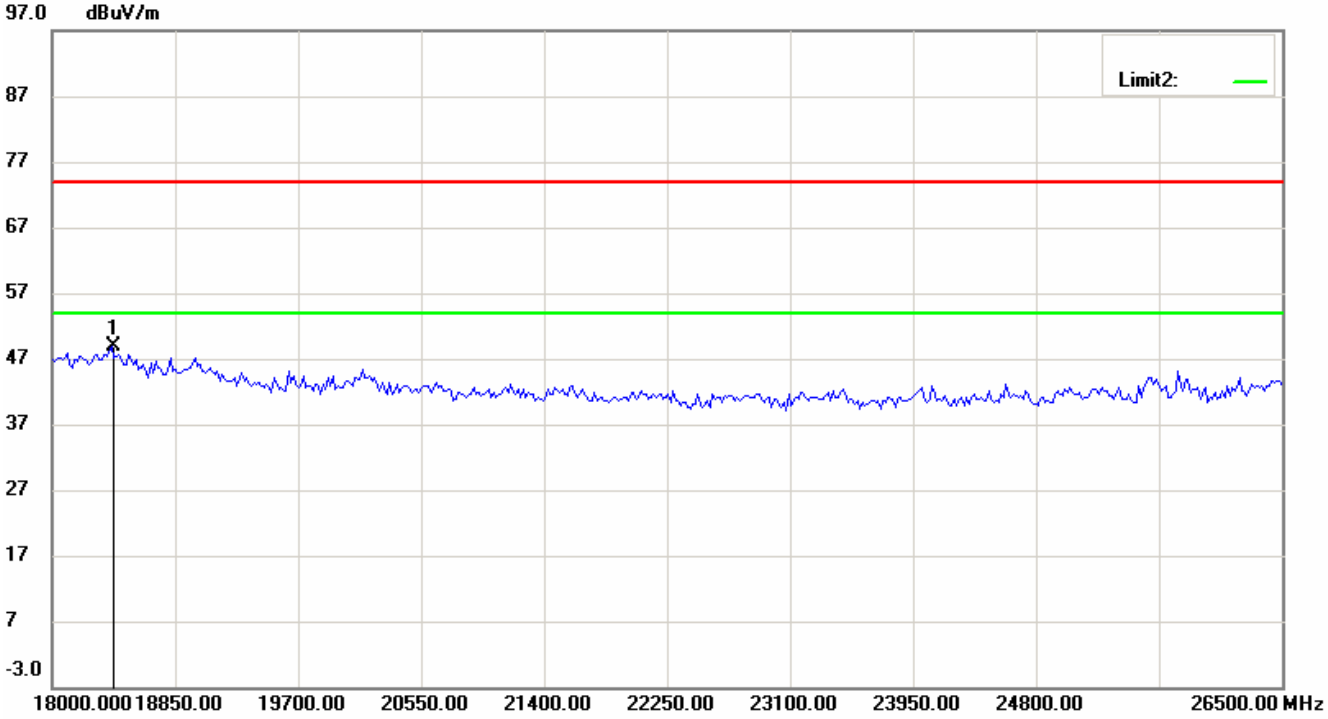
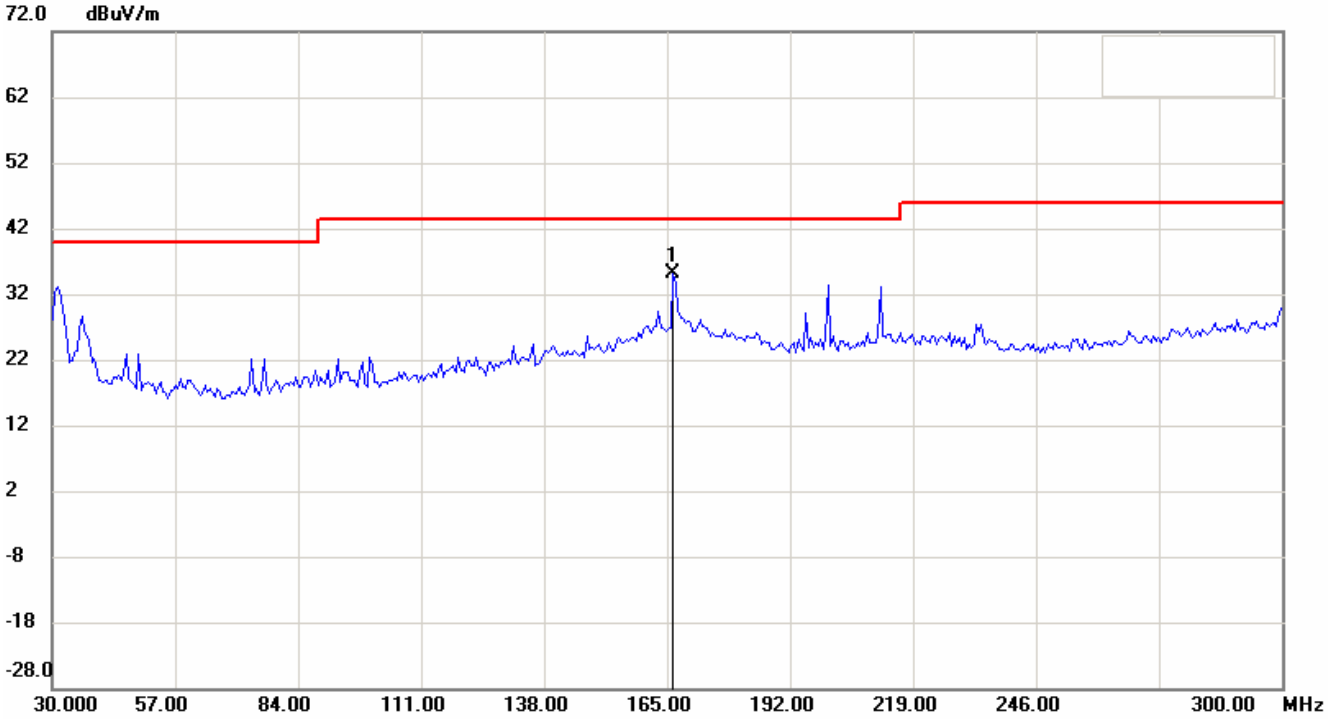


Antenna Polarization V



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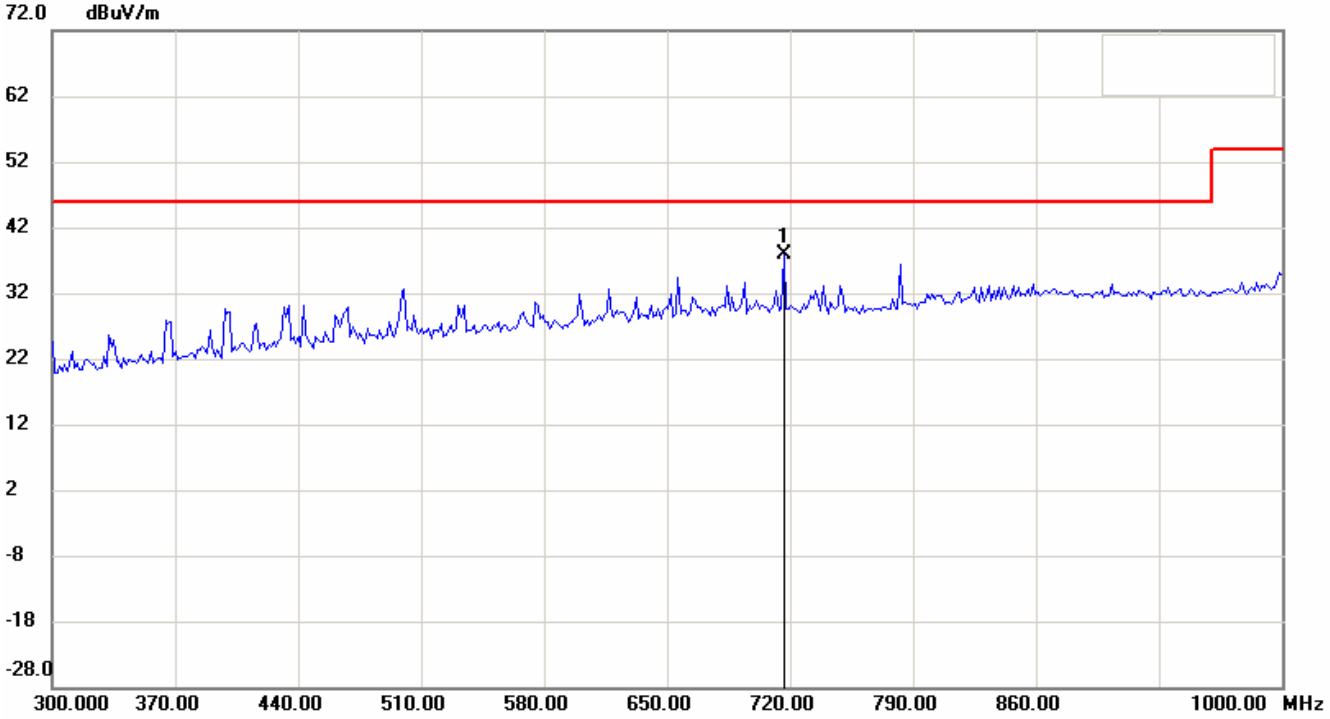

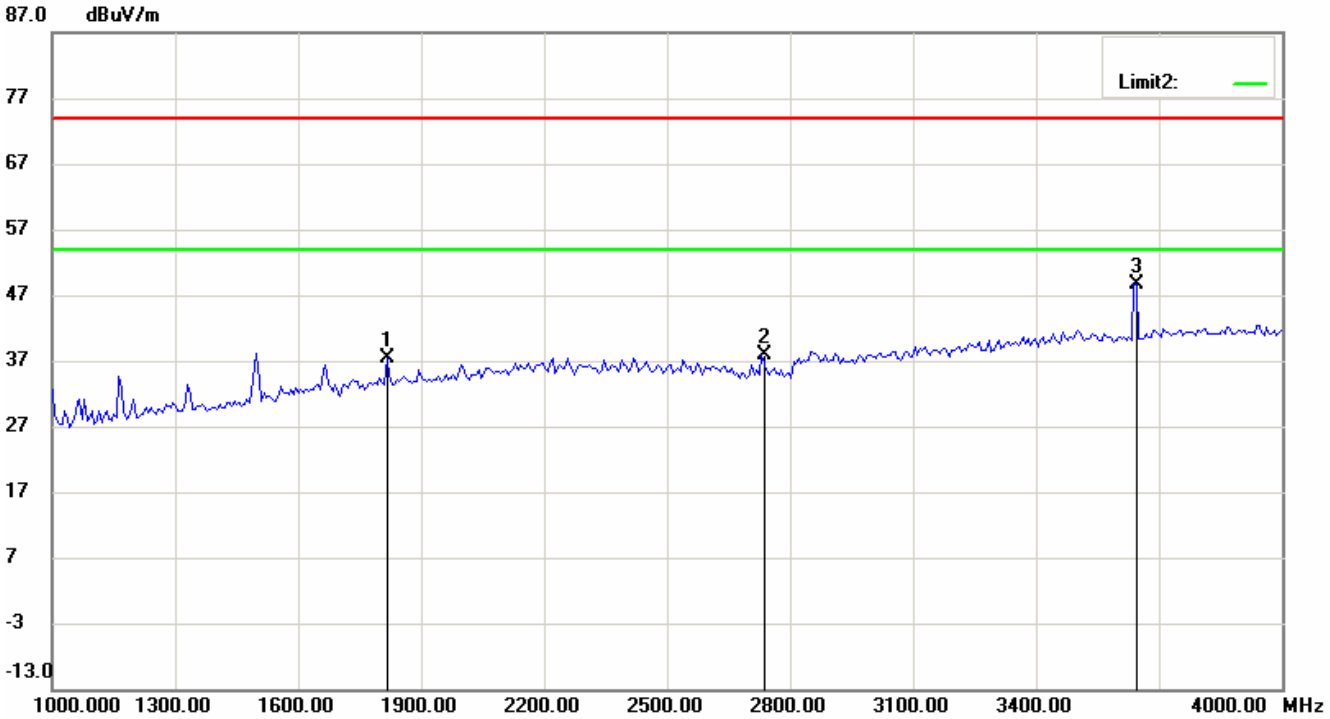

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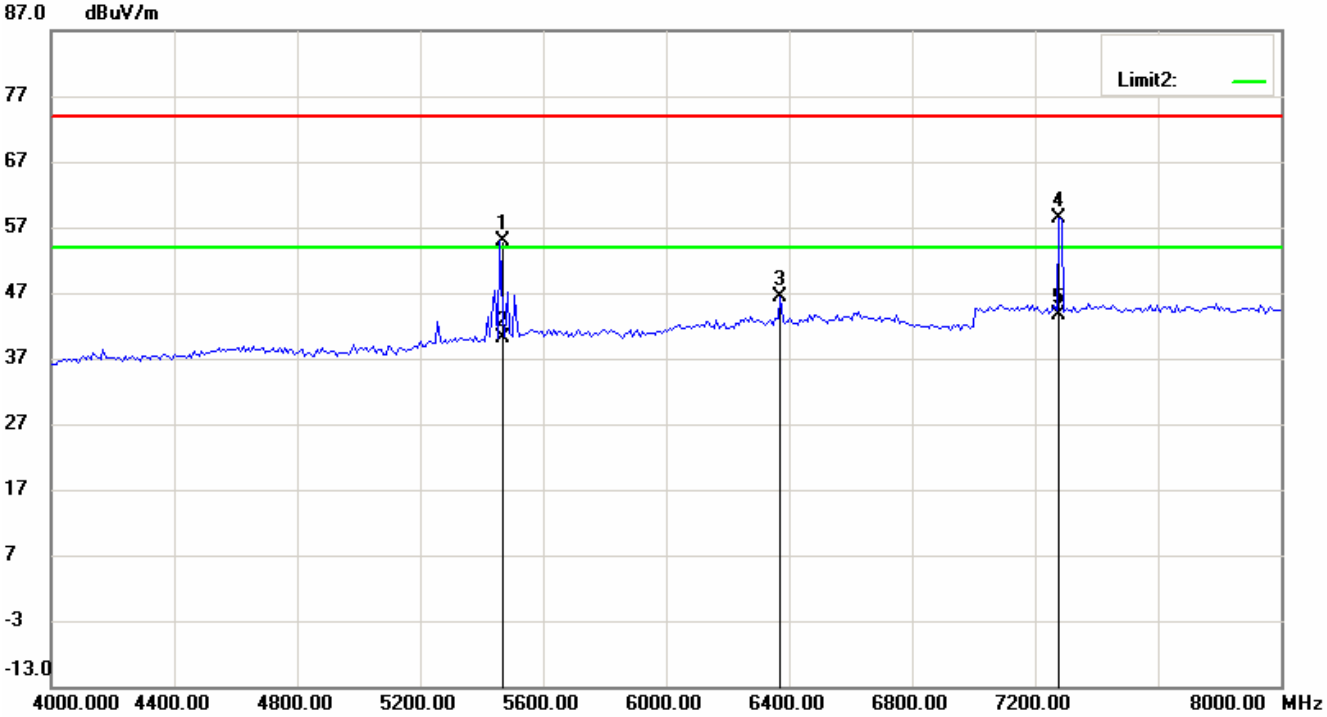

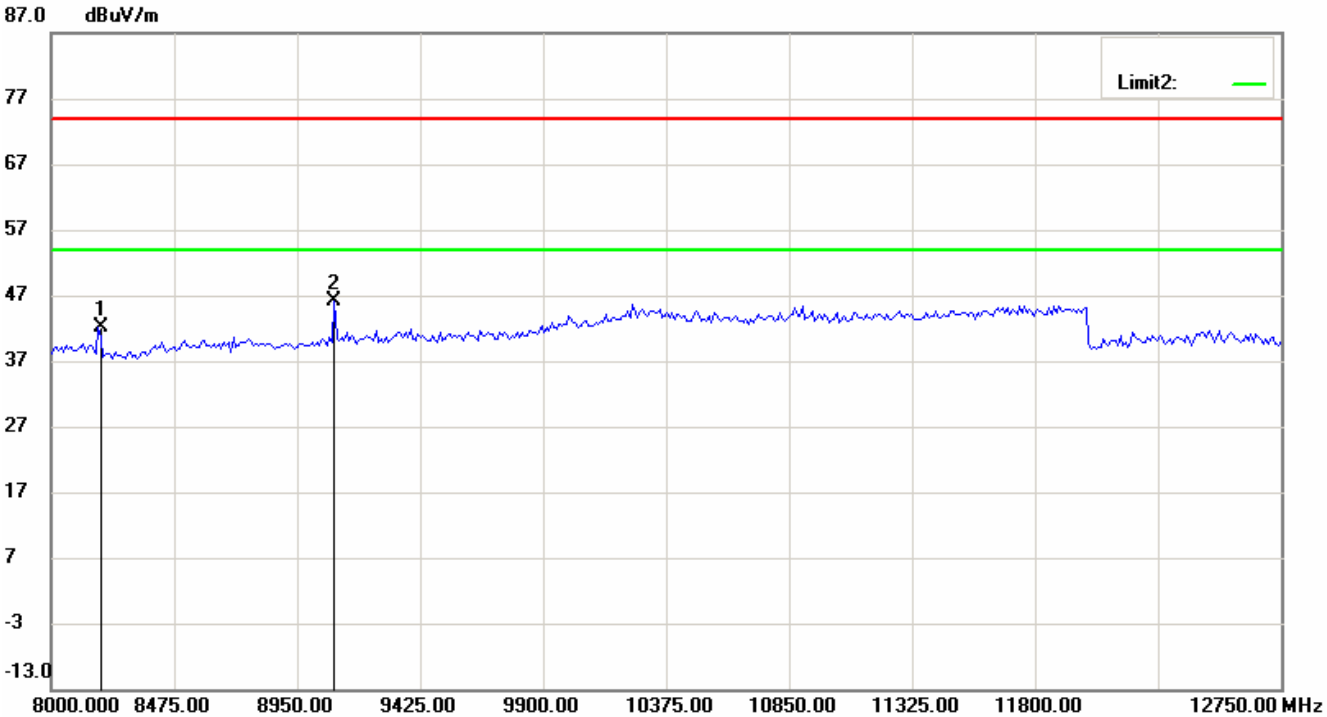

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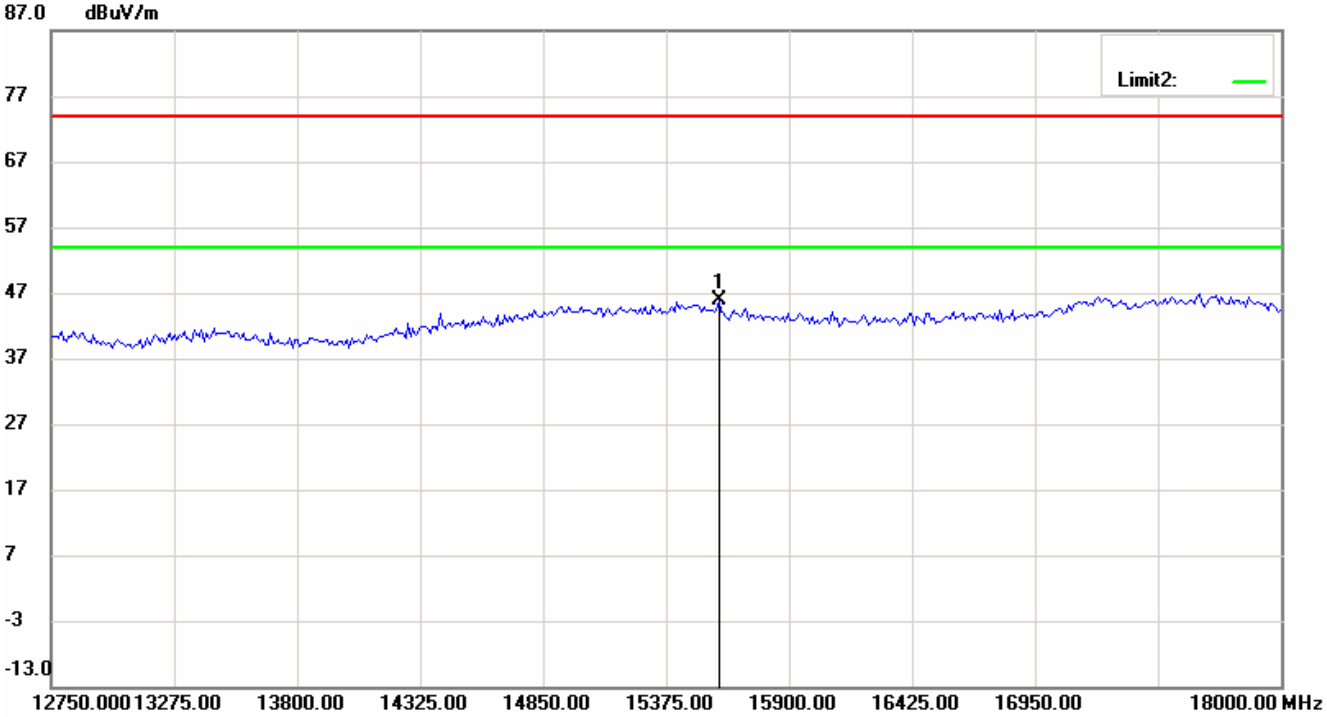

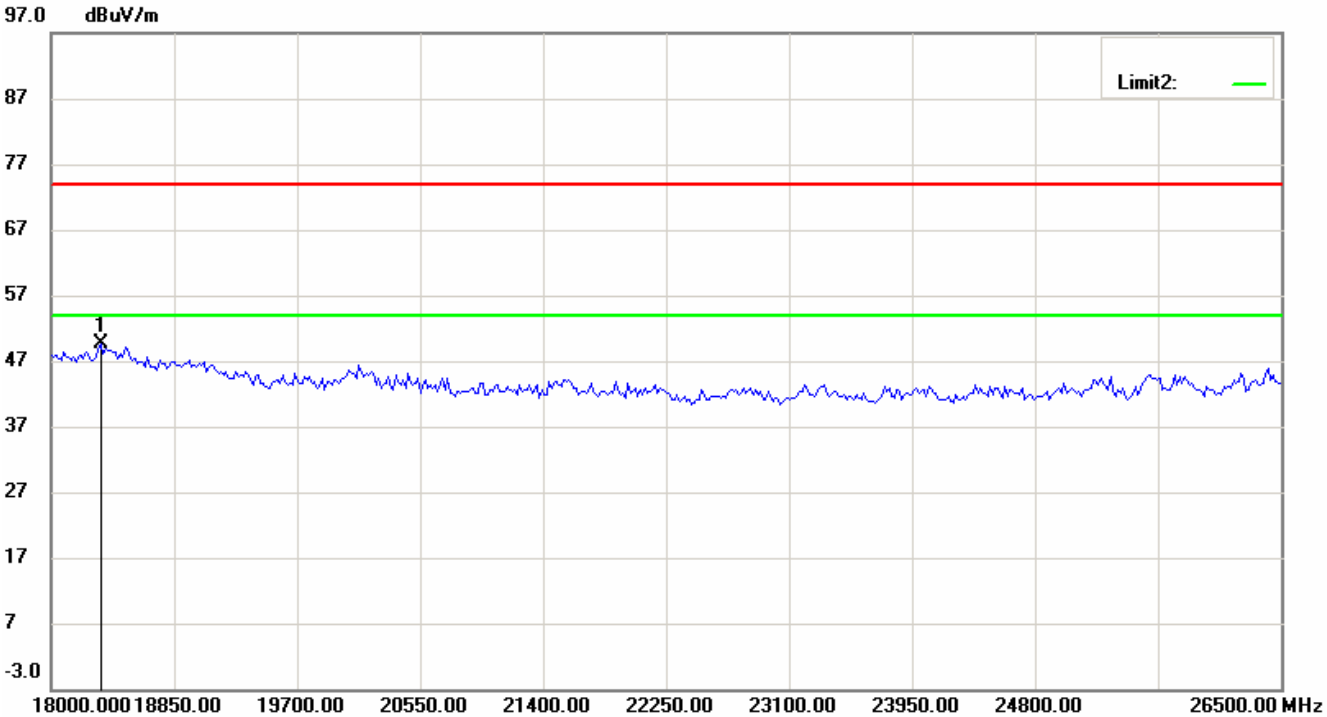

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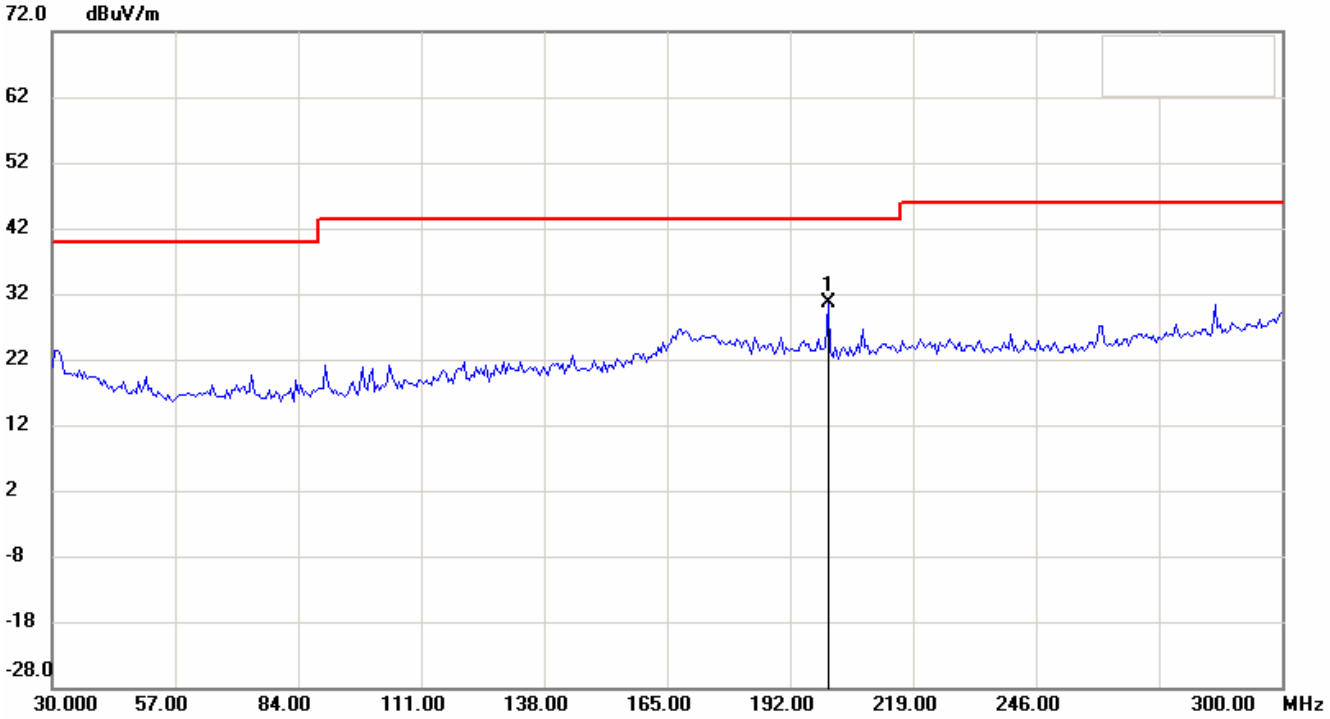
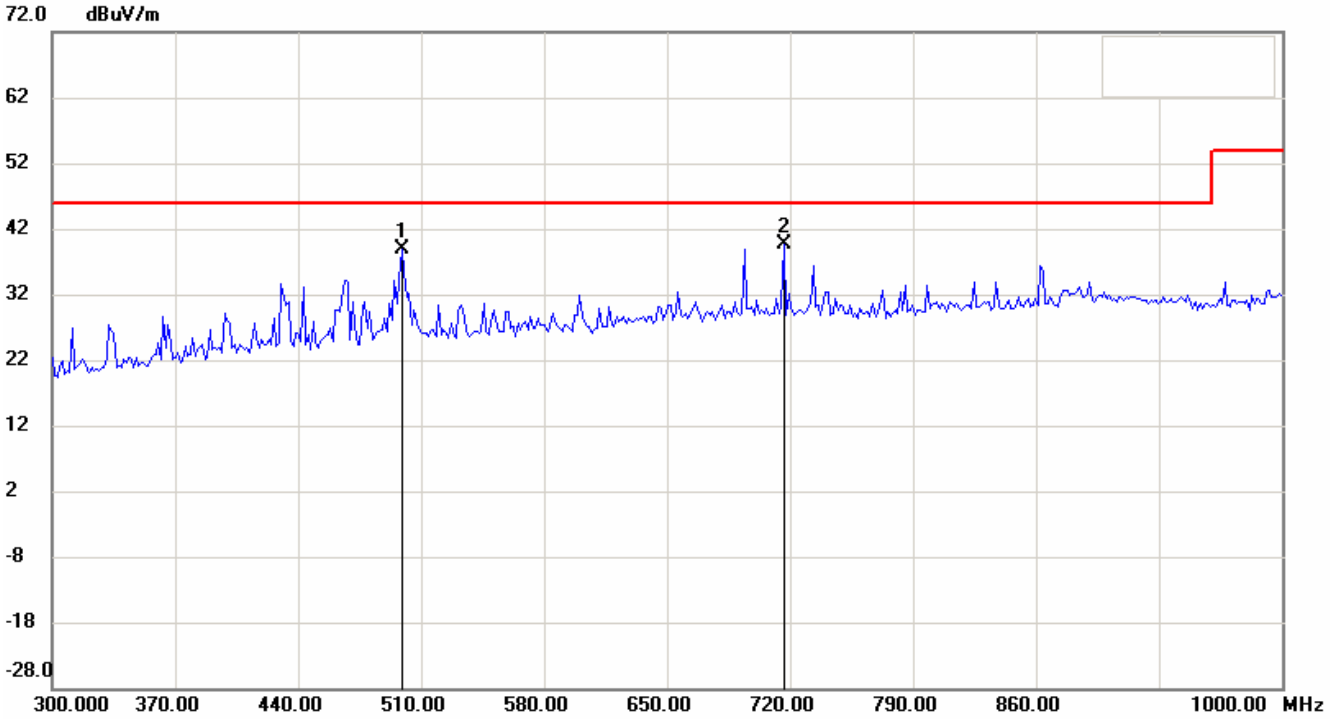
Antenna Polarization H_middle channel





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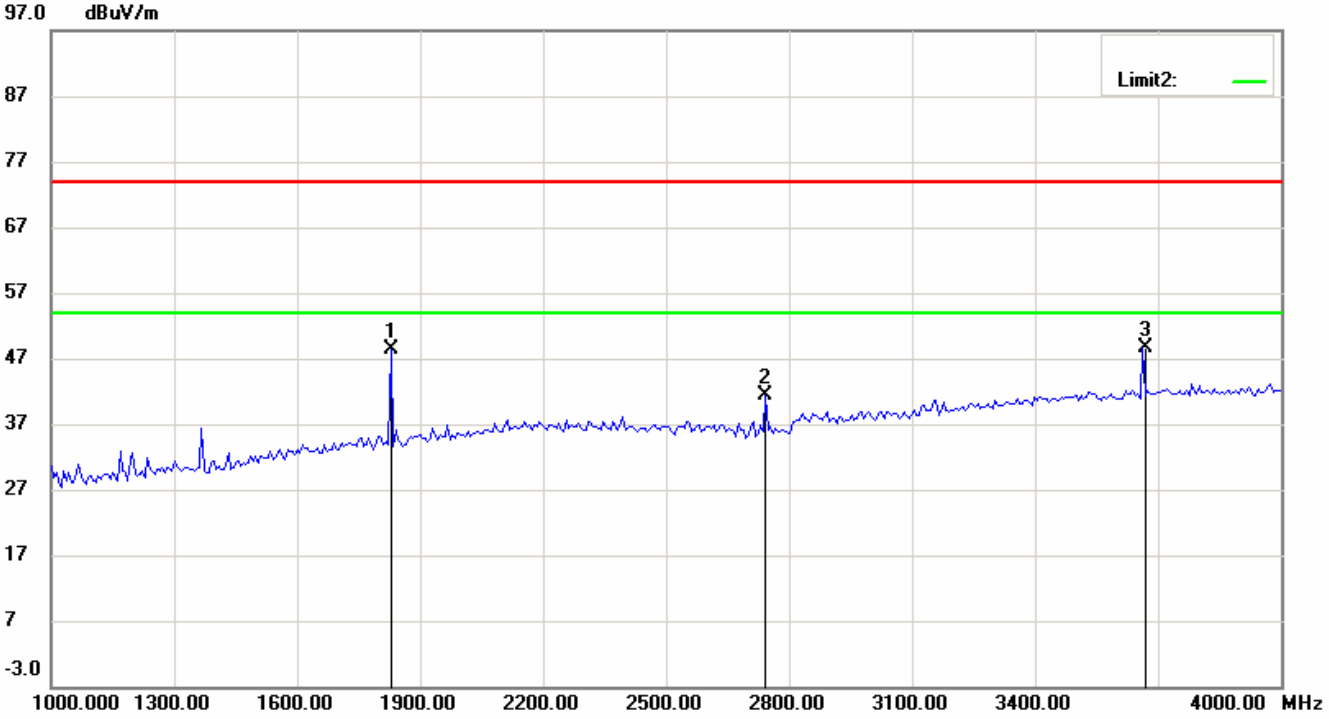

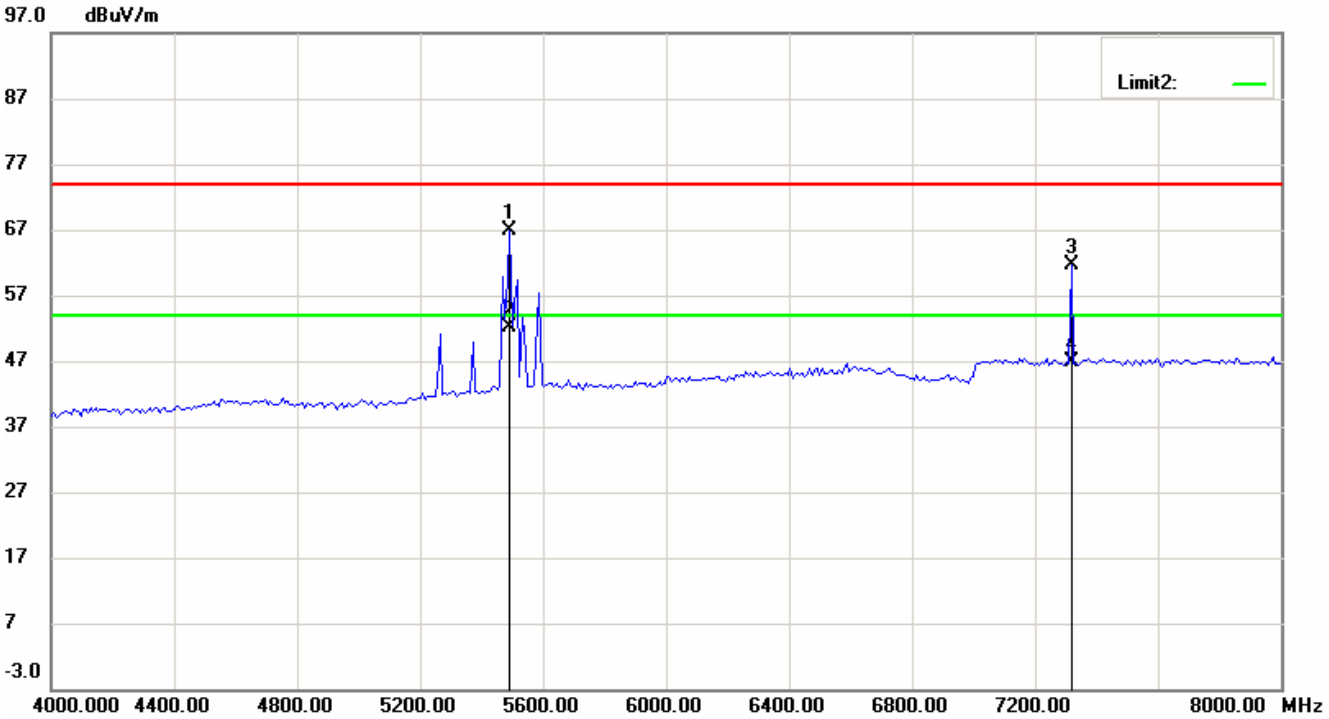

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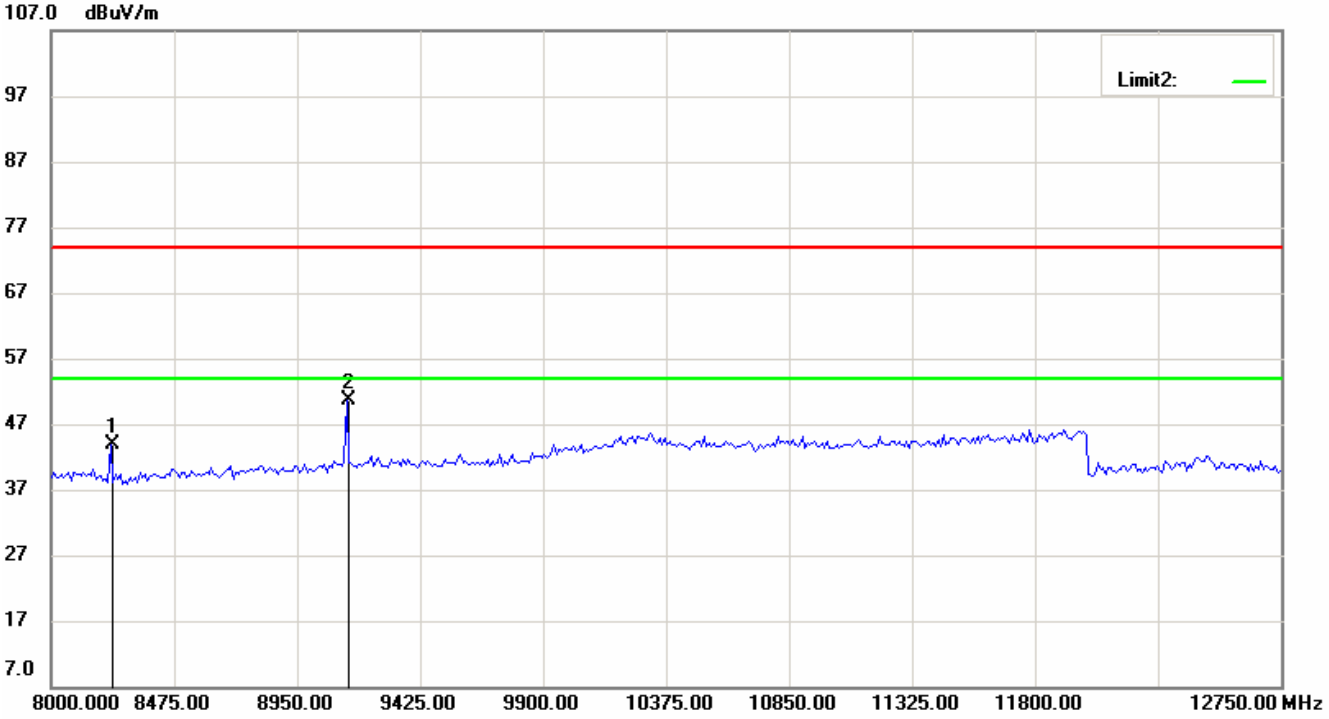

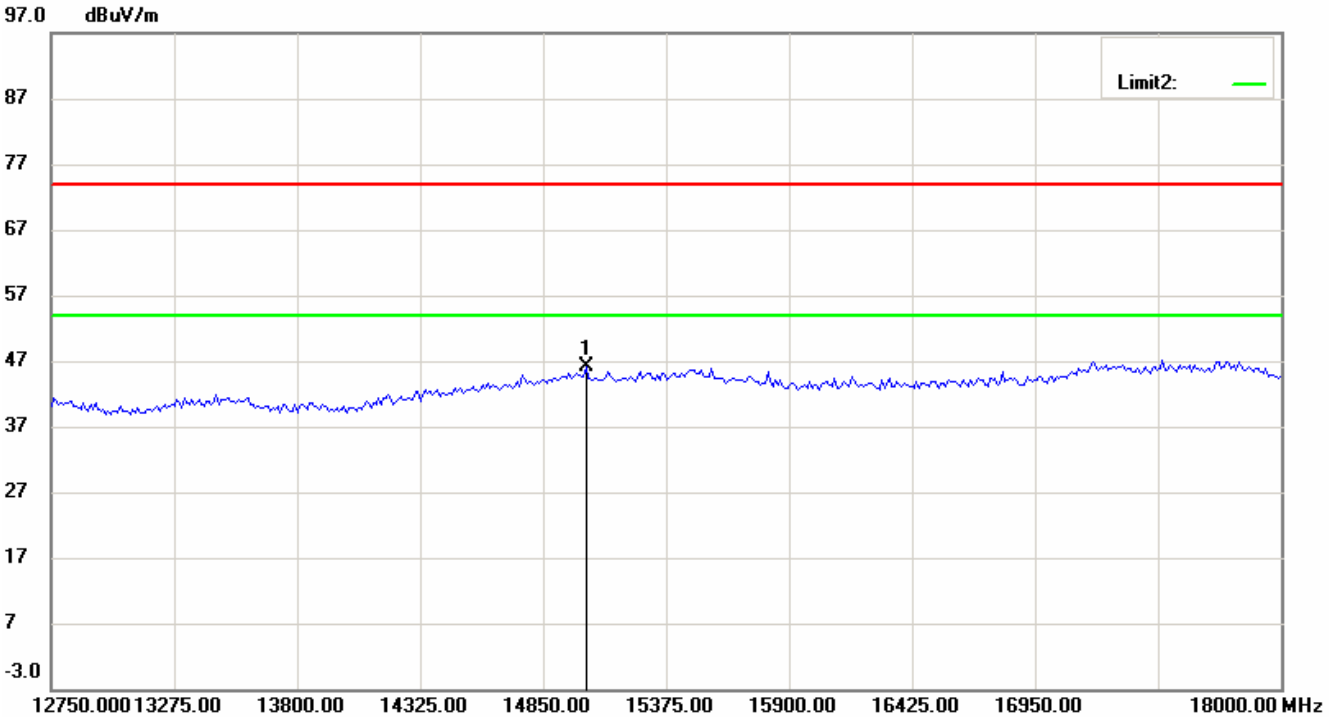

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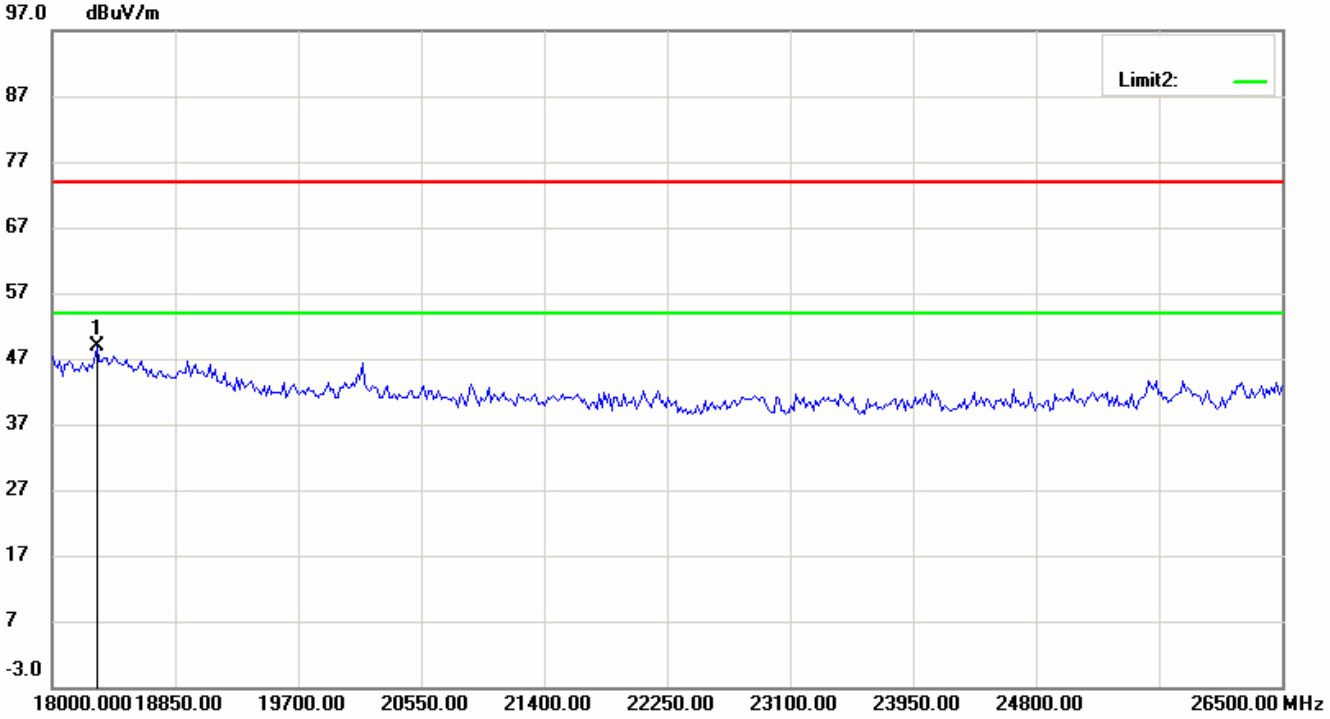
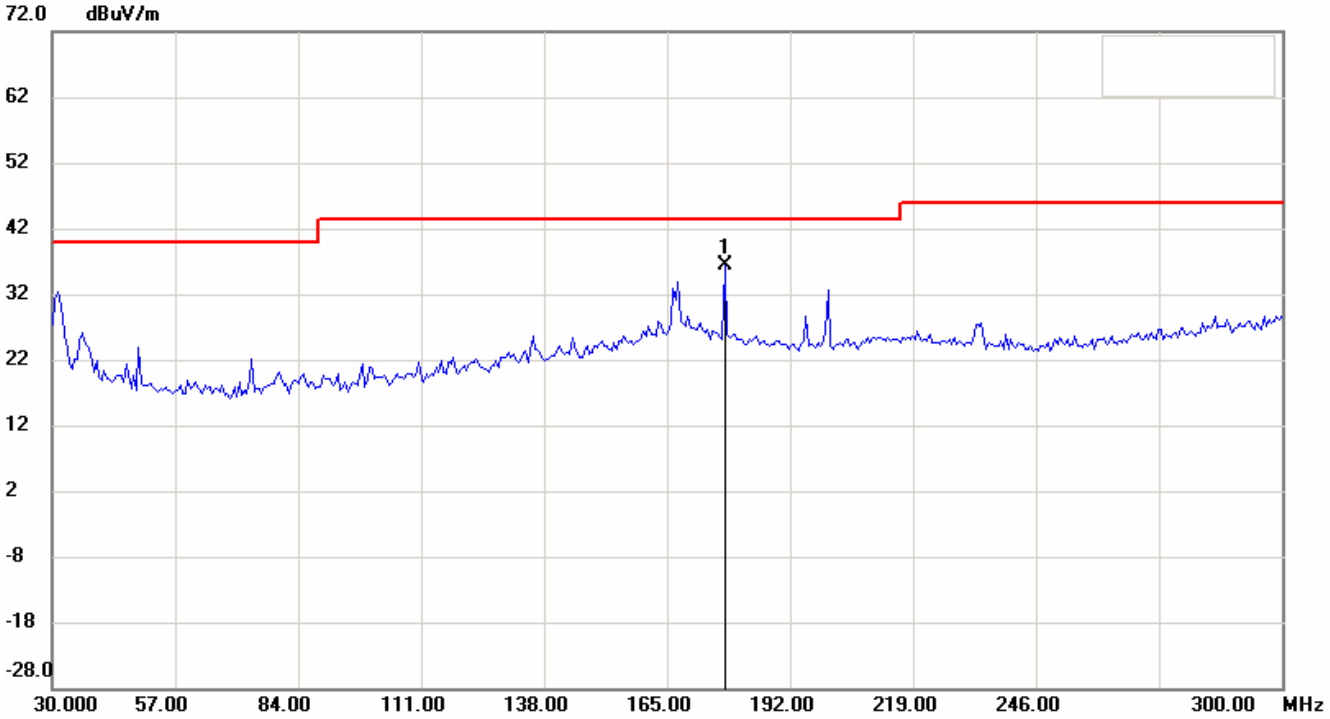


Antenna Polarization V



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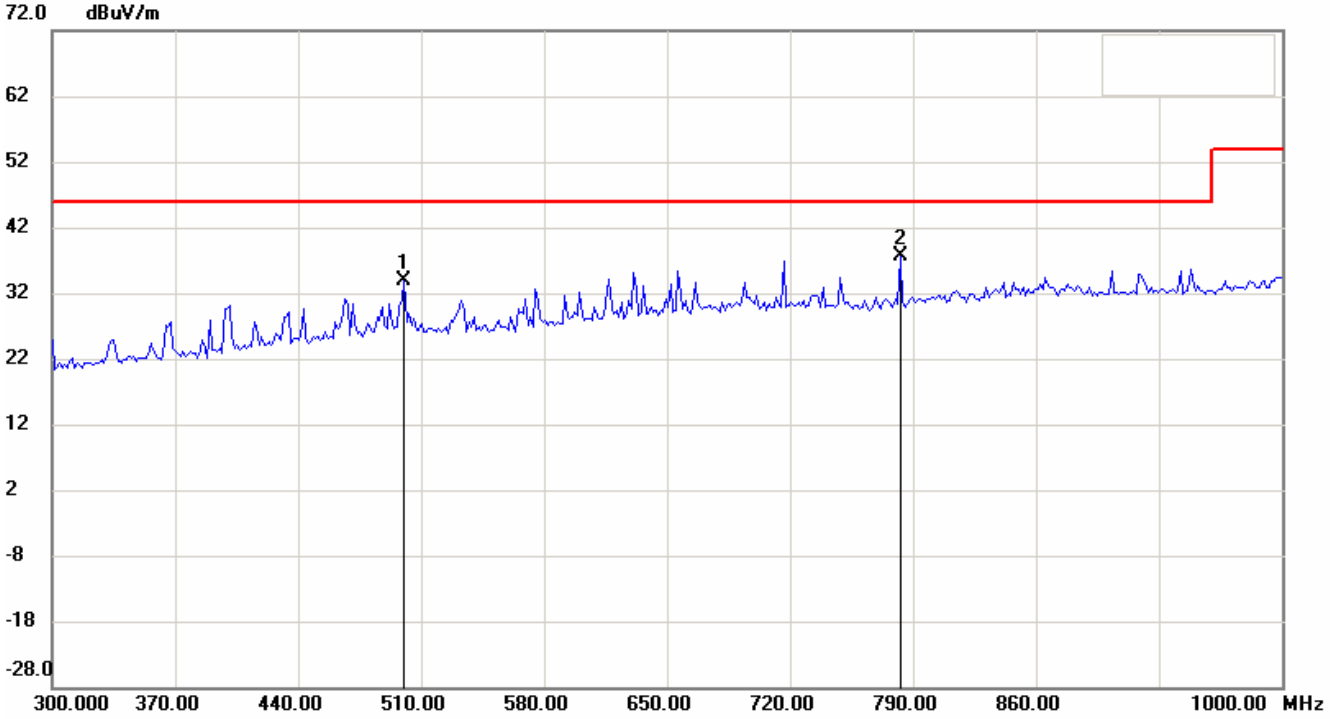

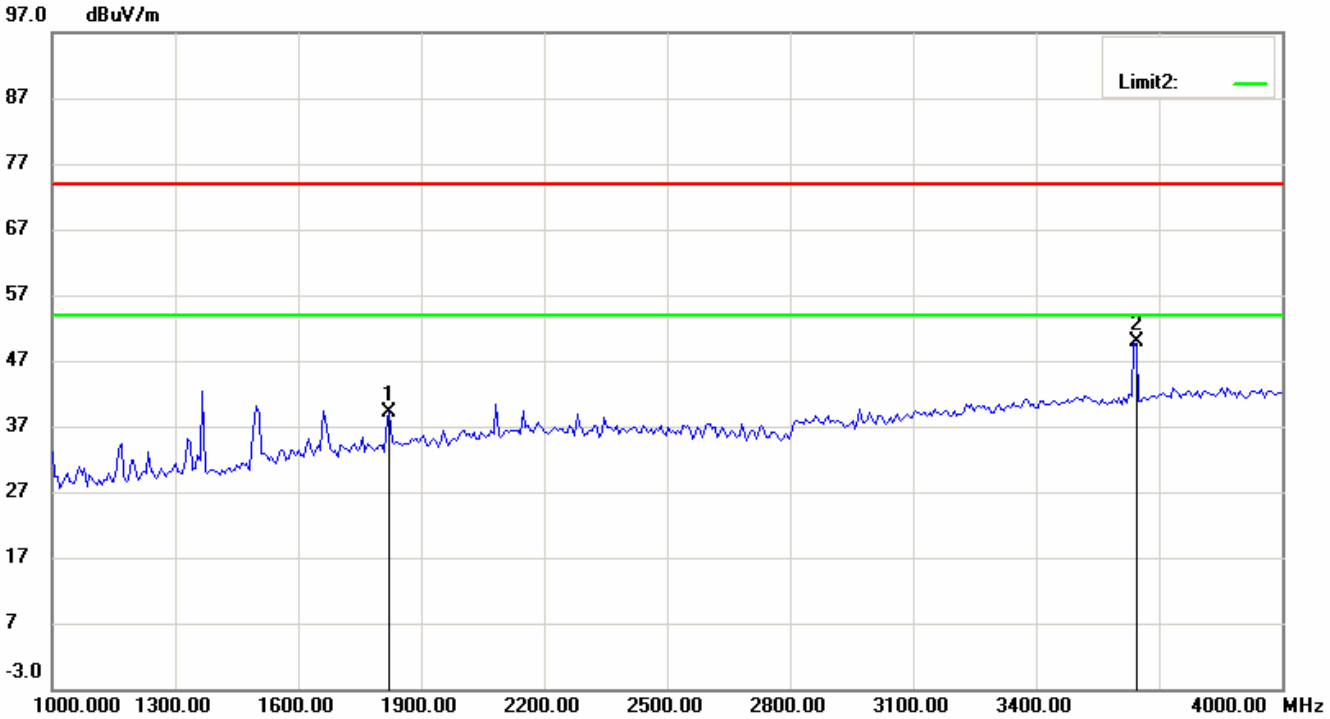

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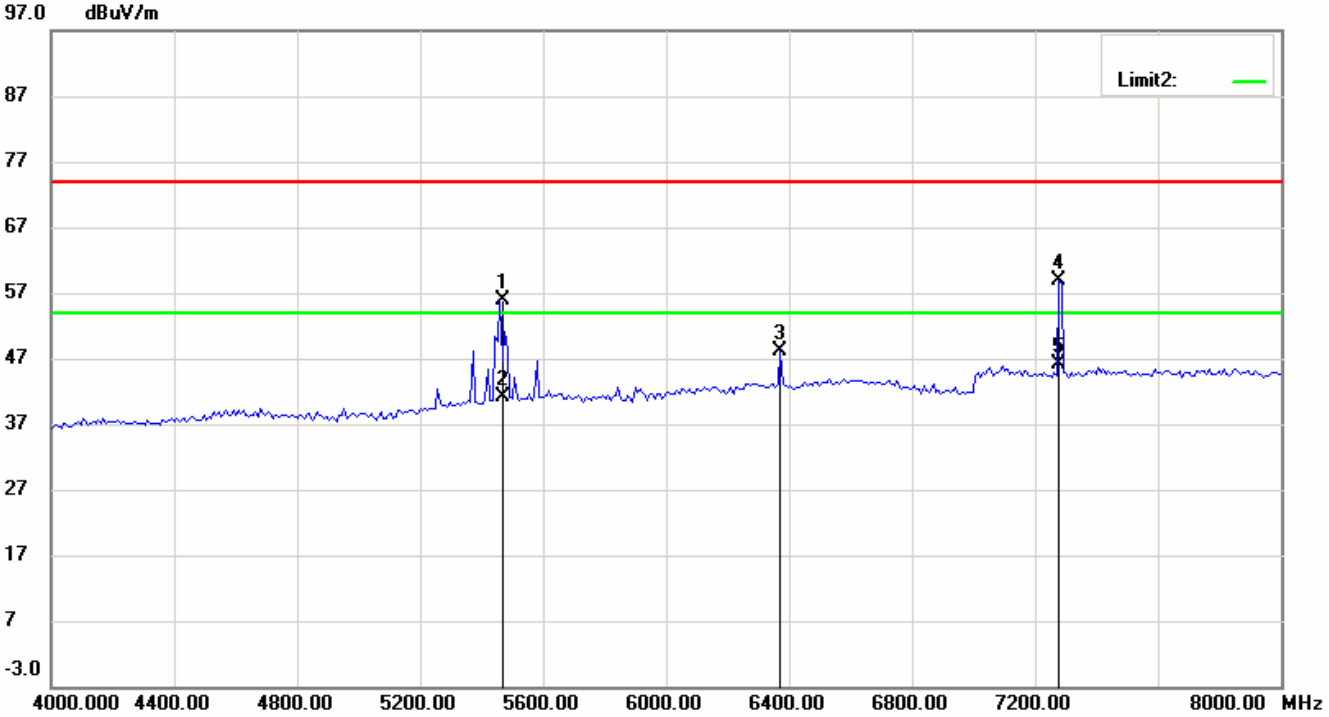

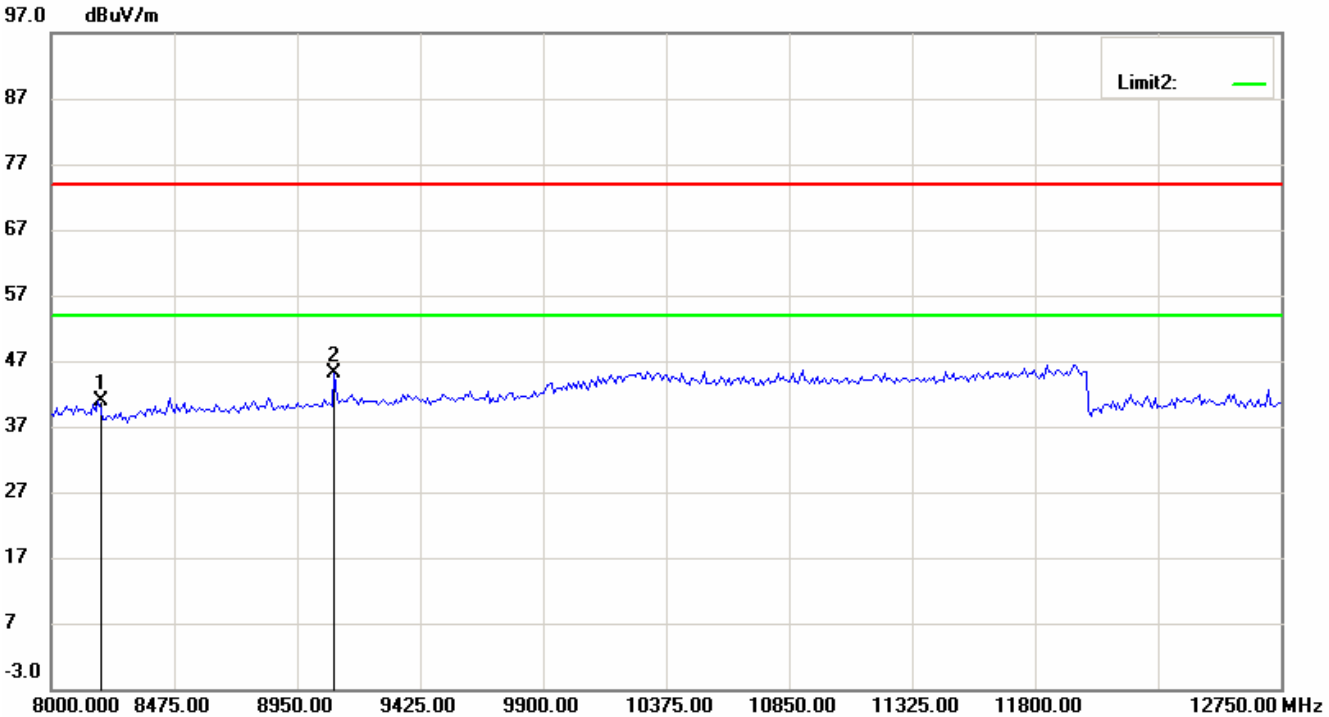

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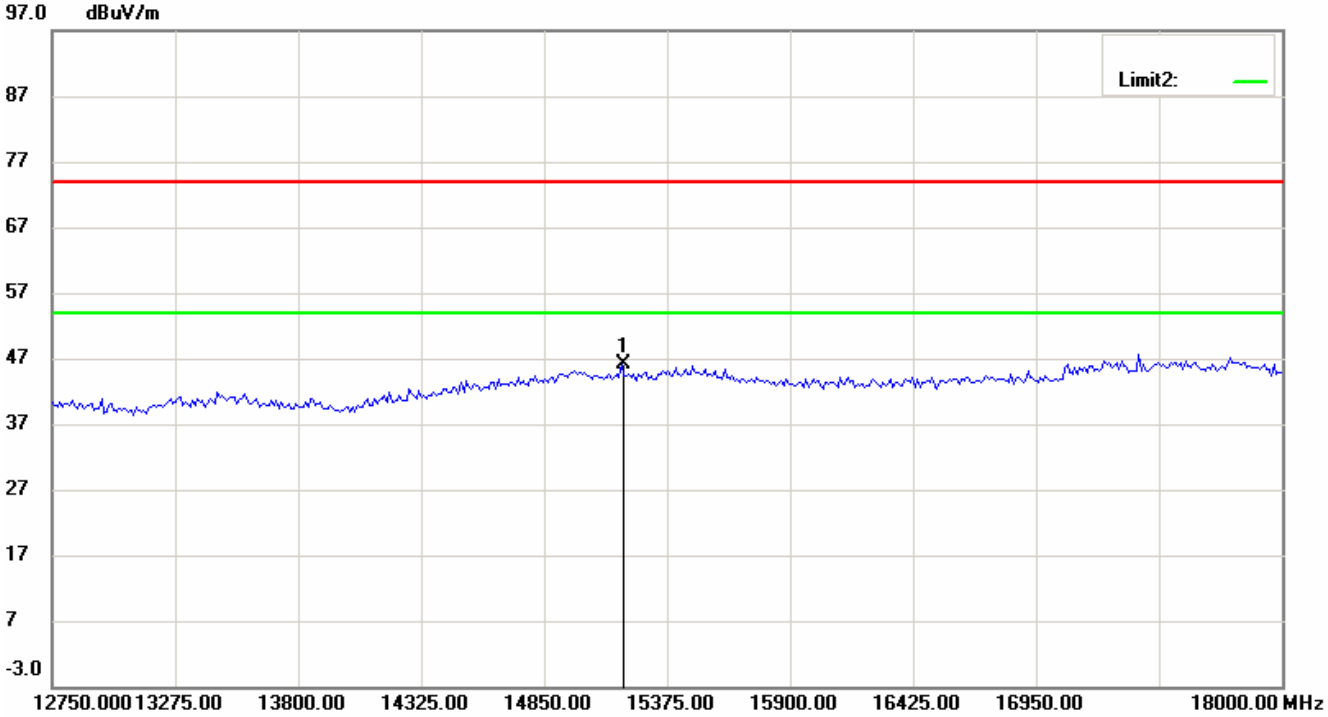
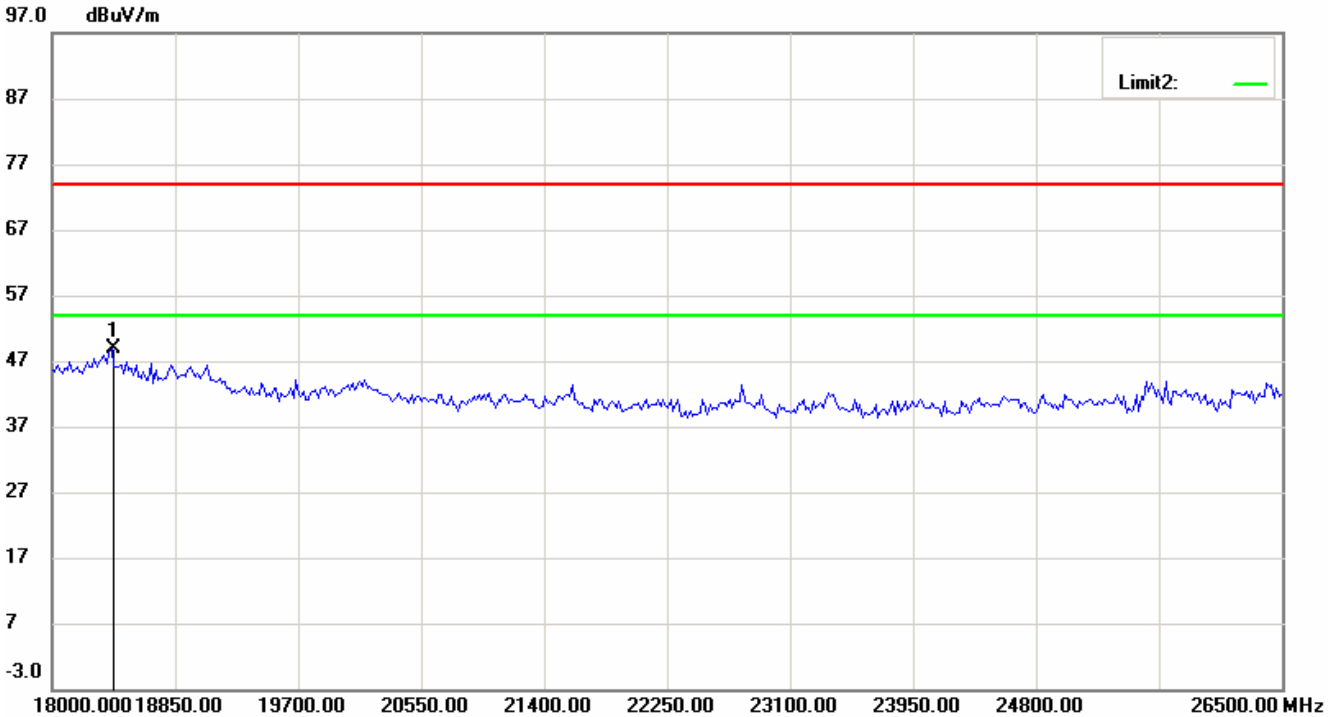
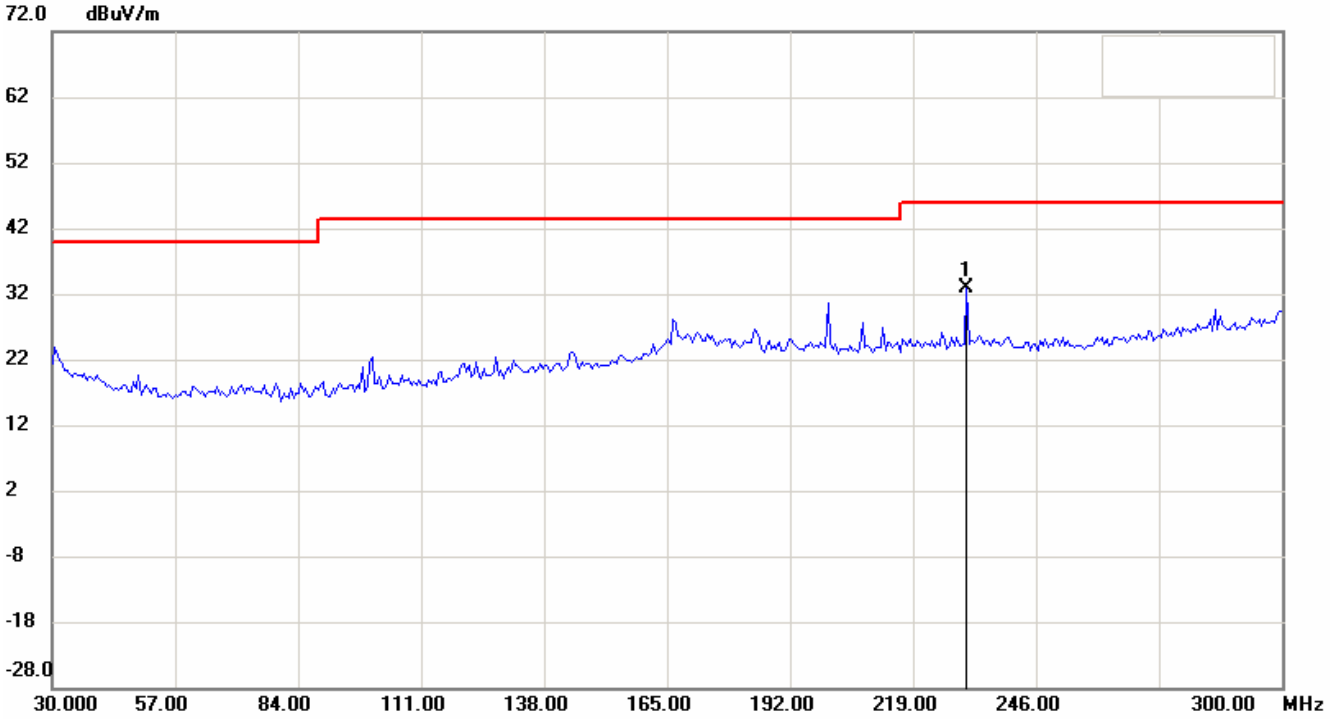
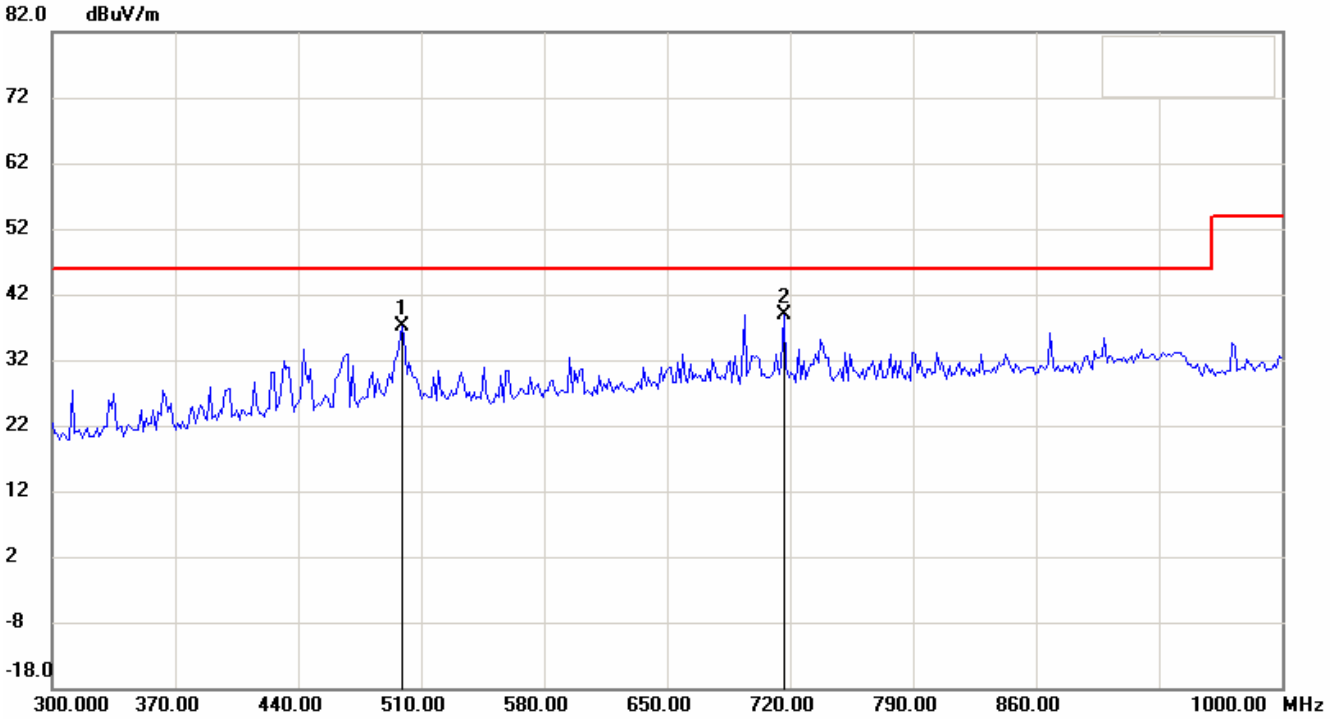




Registration number: W6M20706-8159-P-15
FCC ID: VEA80TR

Antenna Polarization H_high channel





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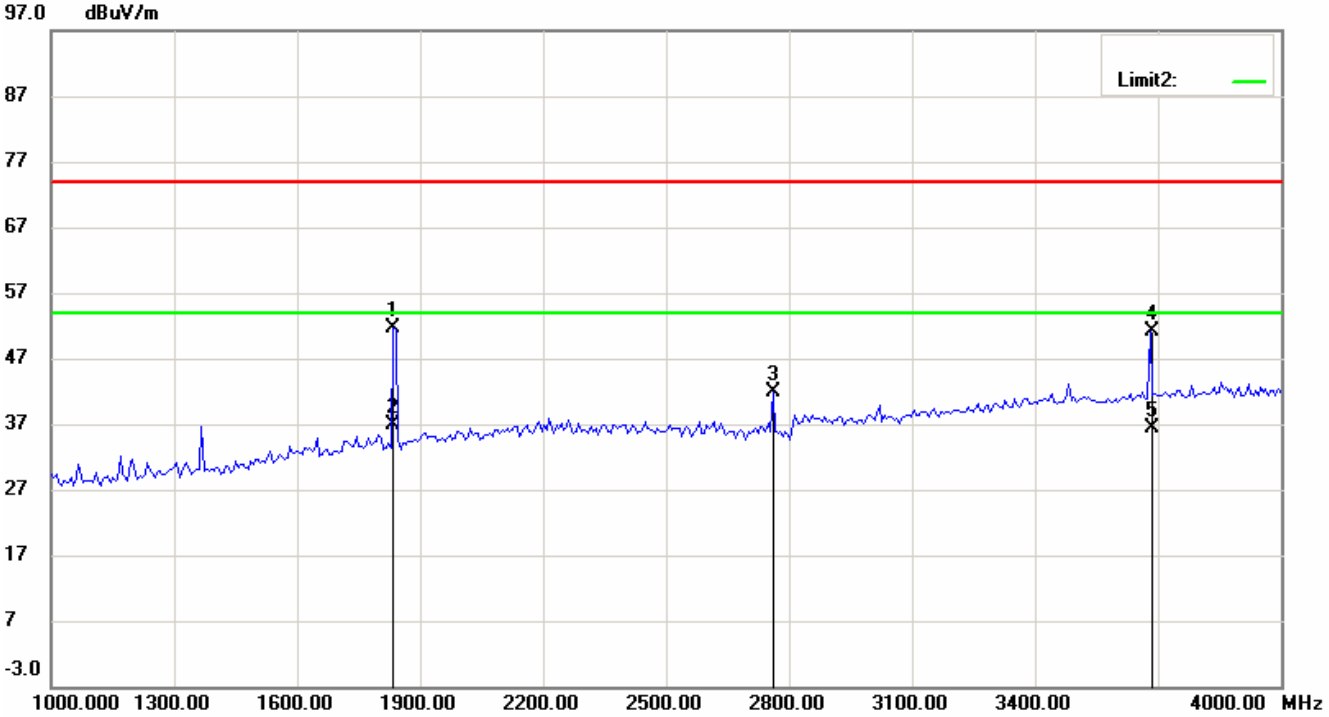

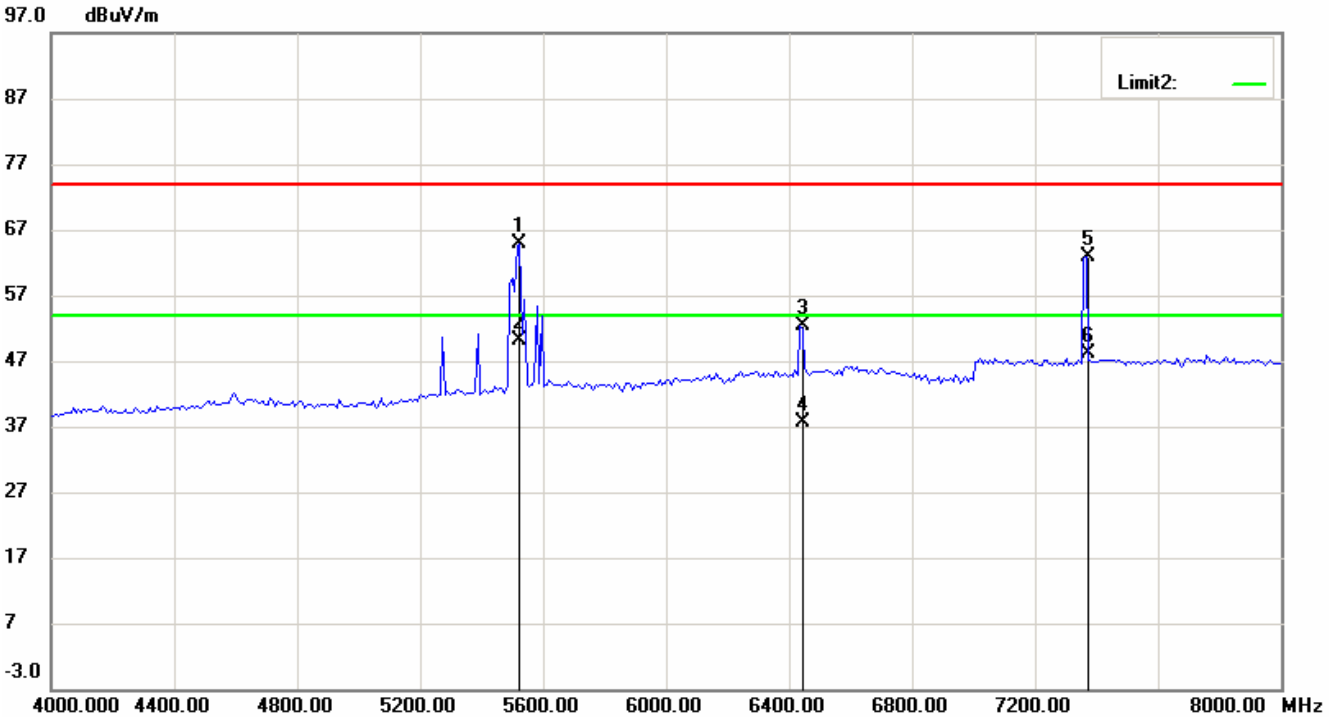

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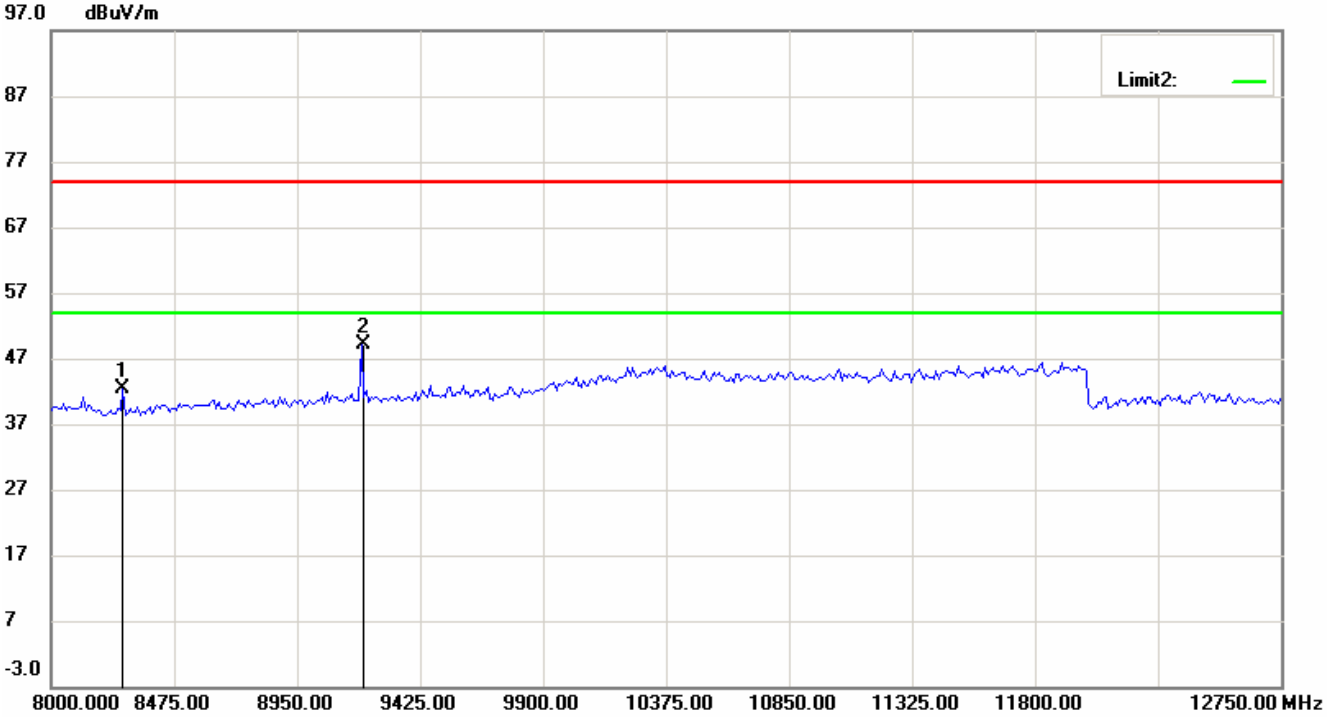

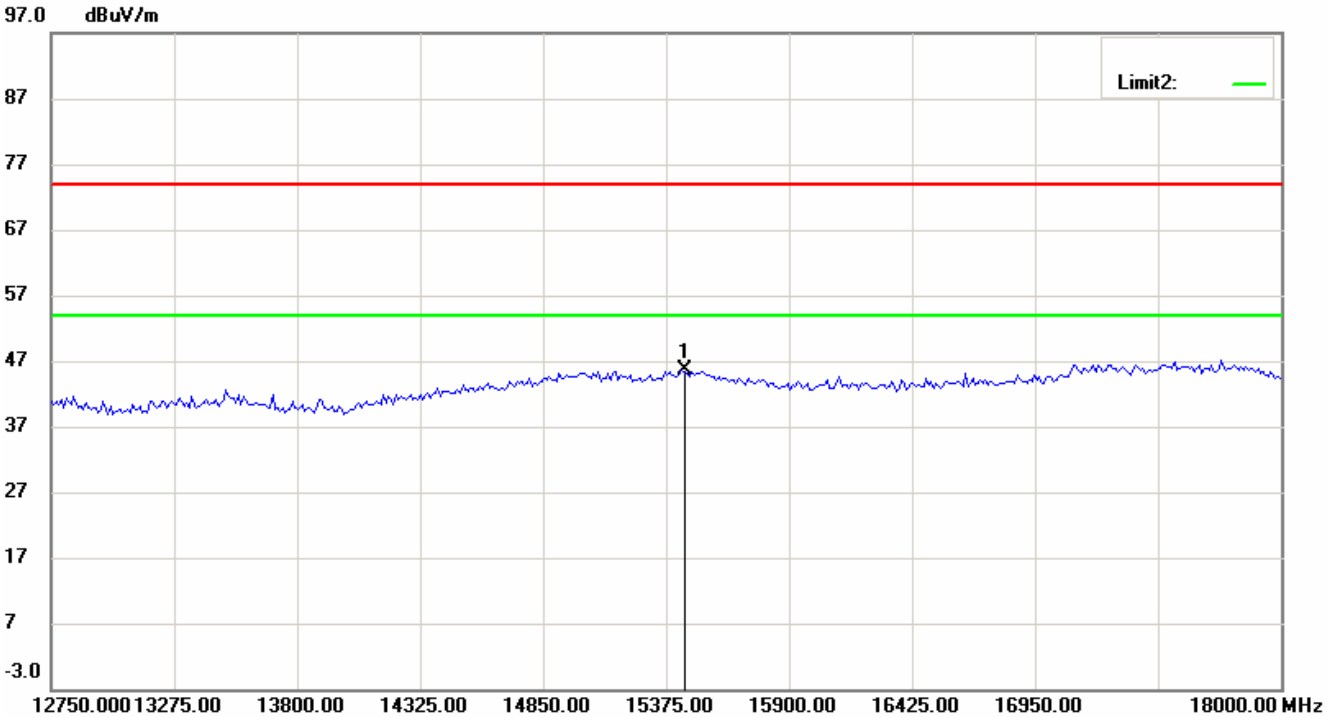

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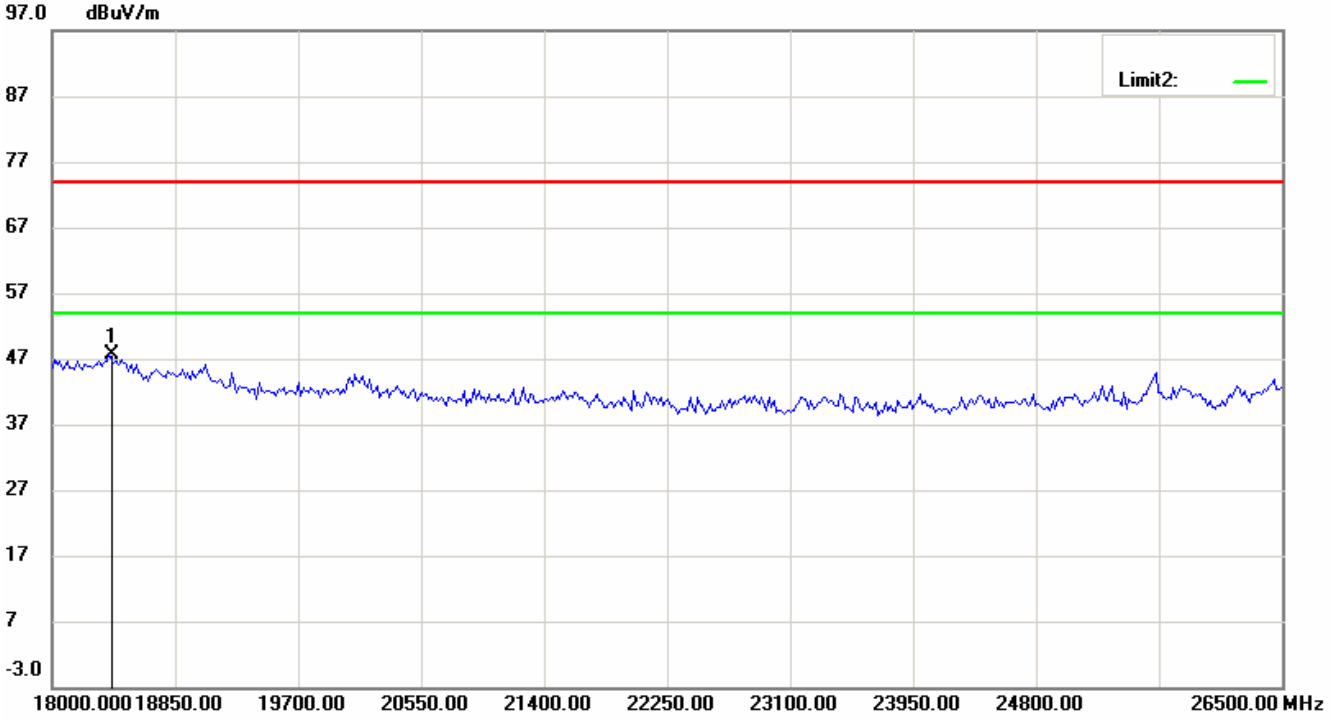
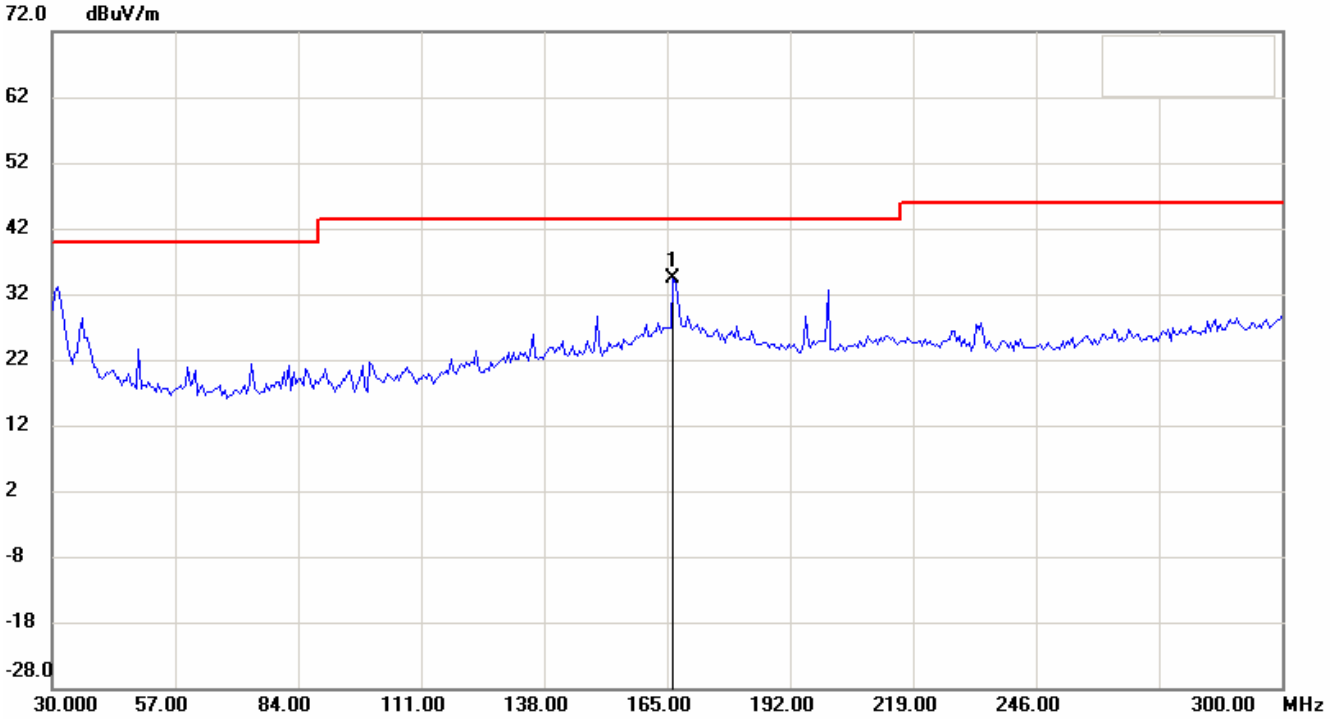


Antenna Polarization V



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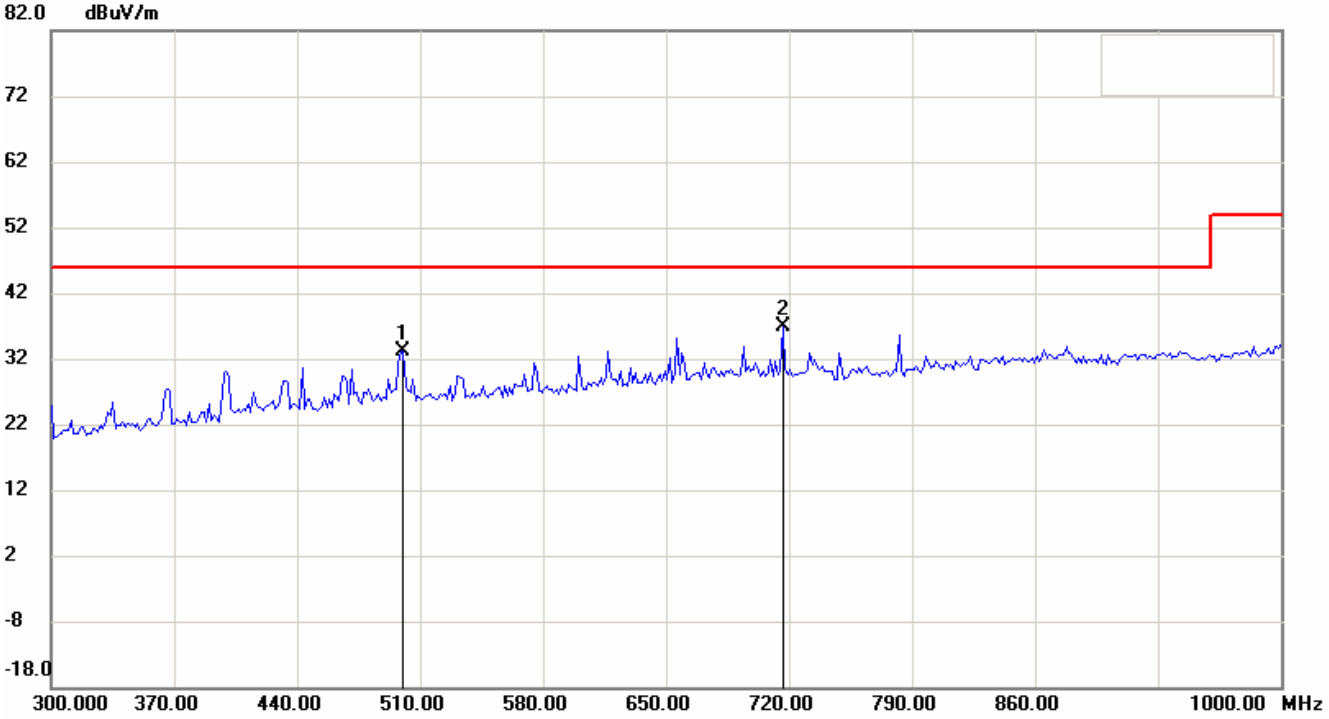

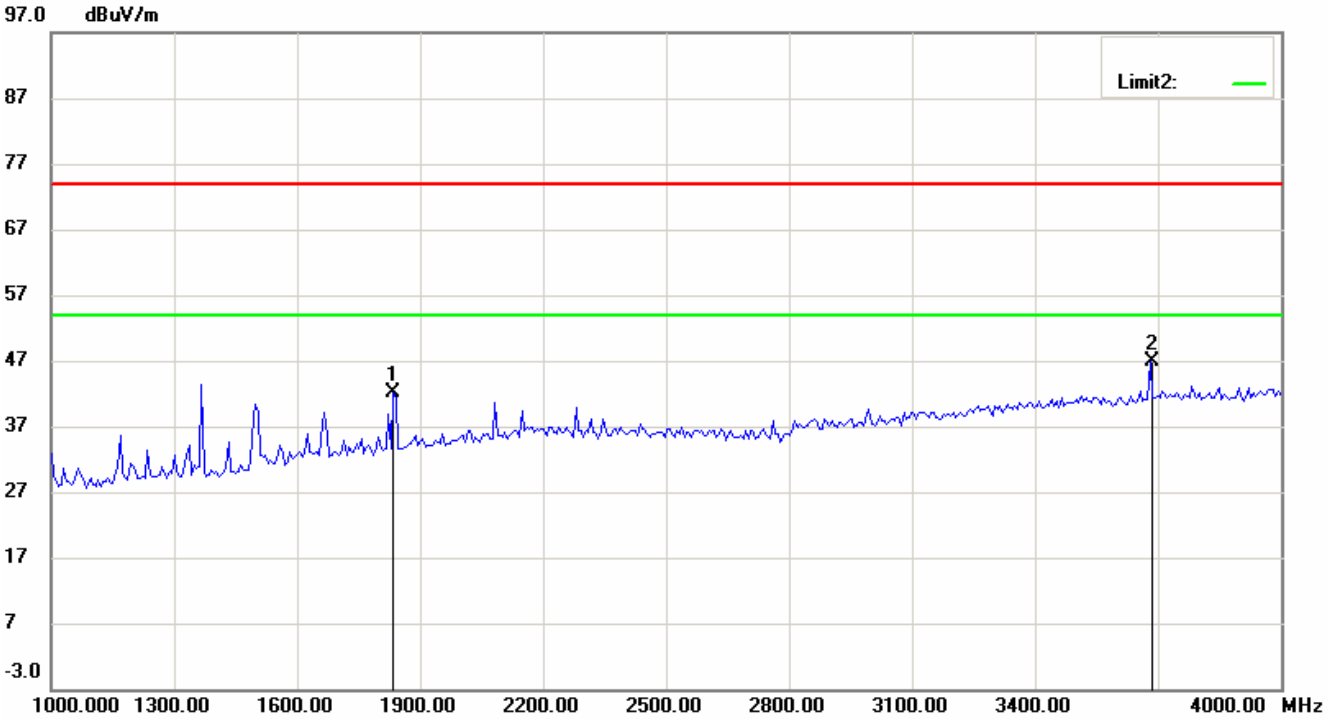

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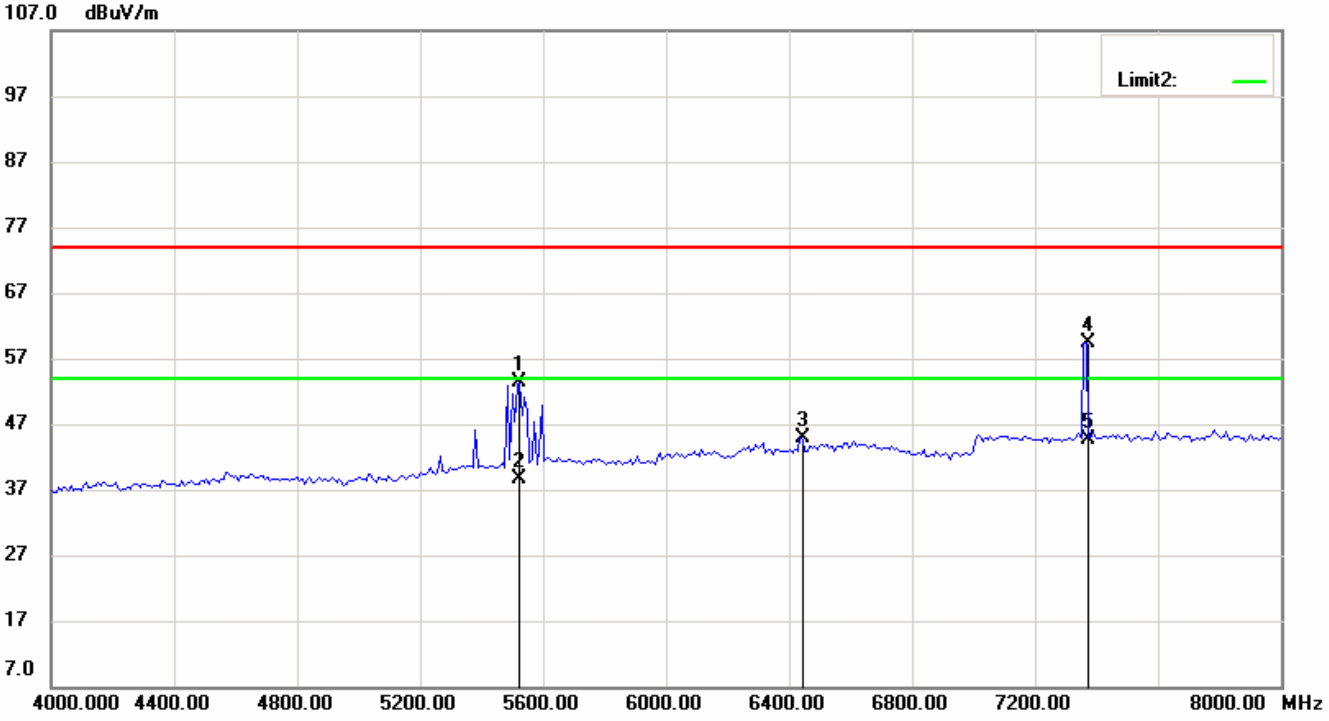

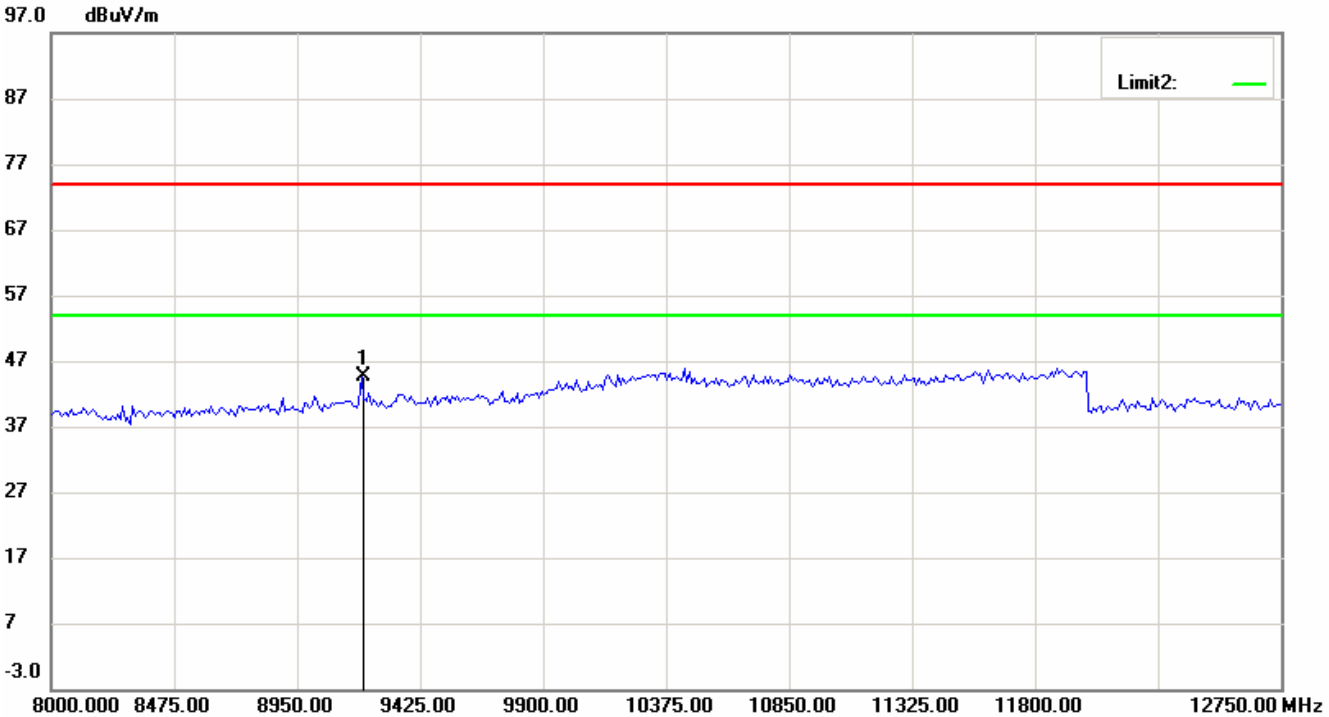

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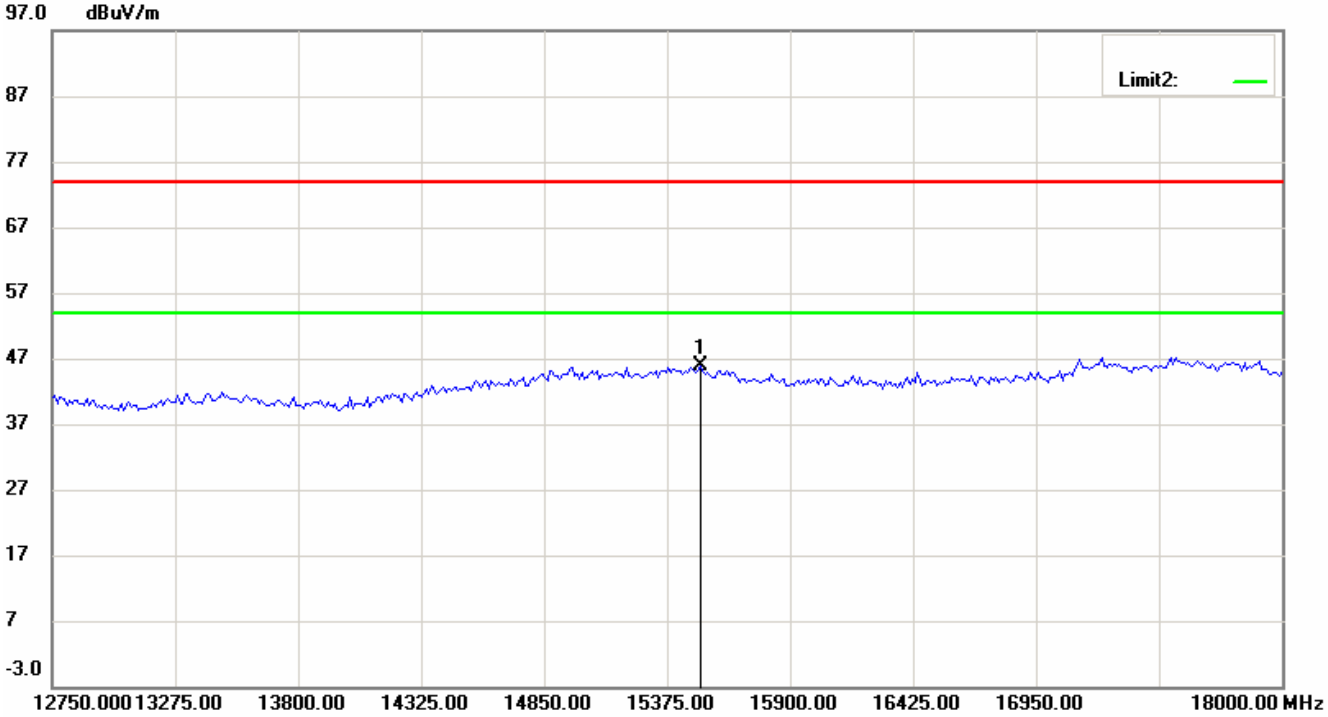

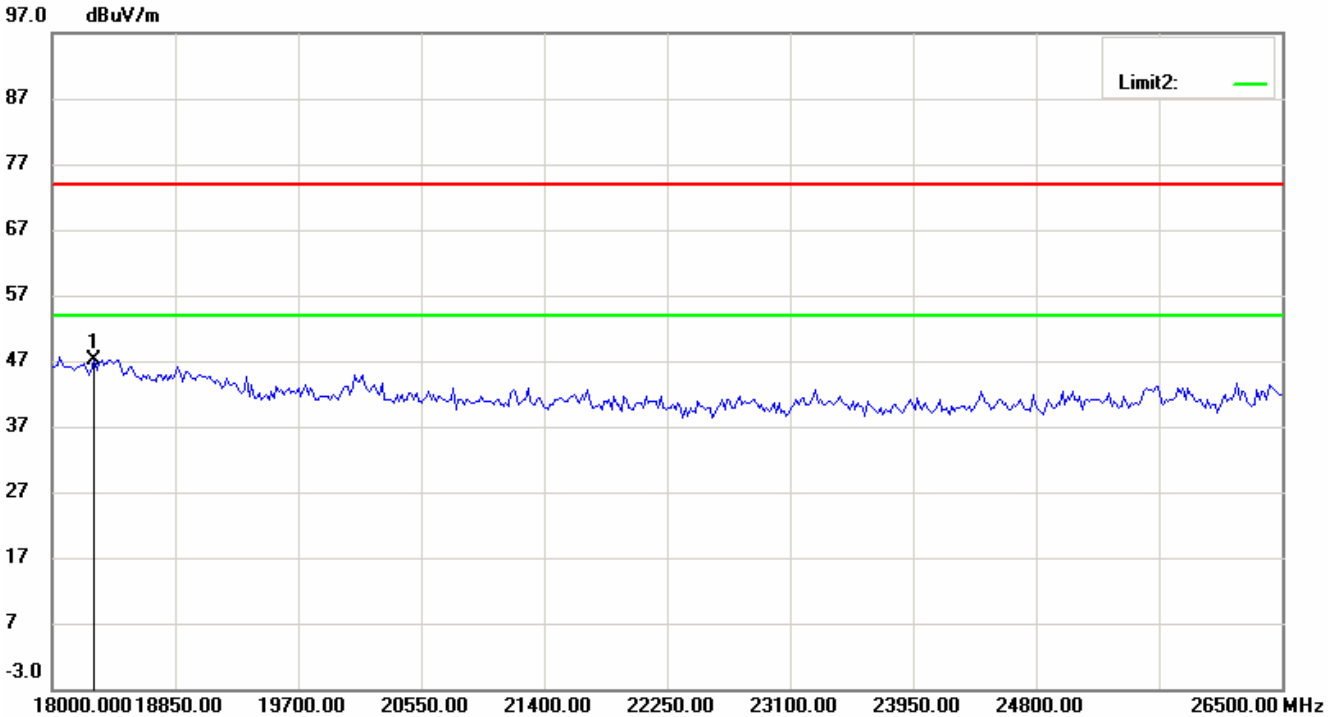

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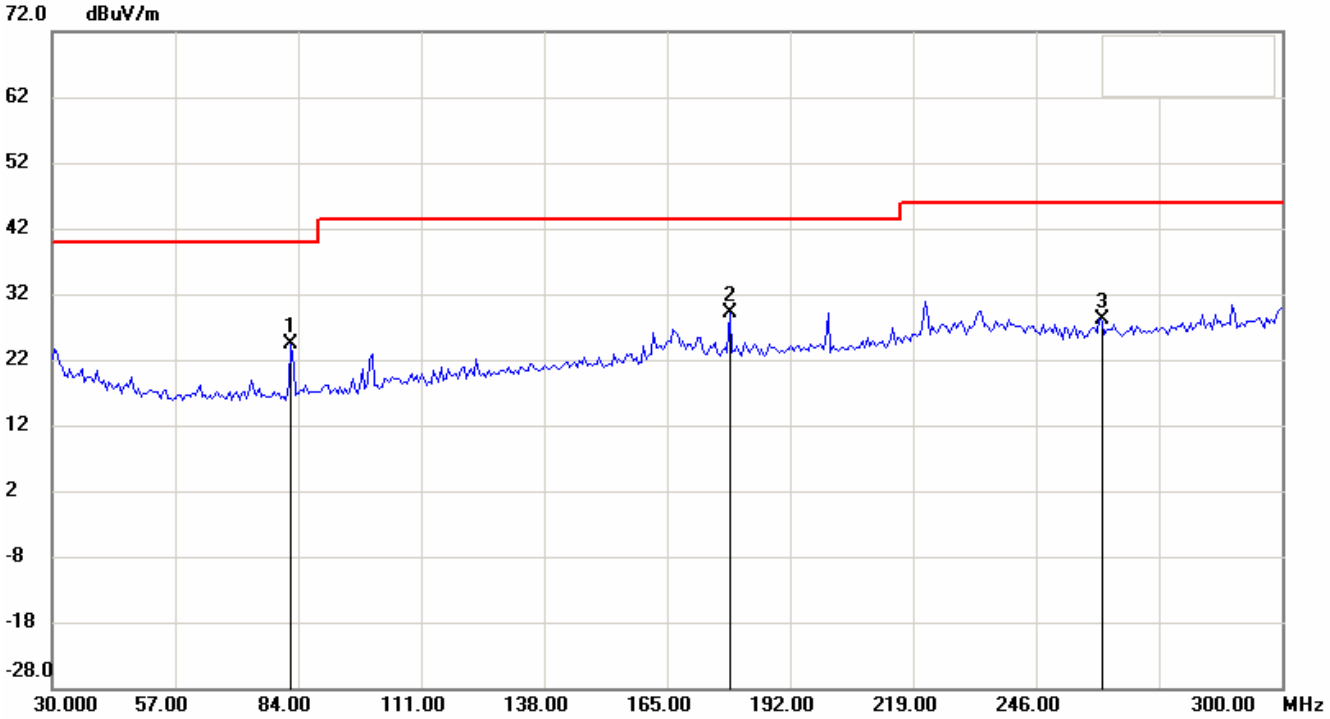
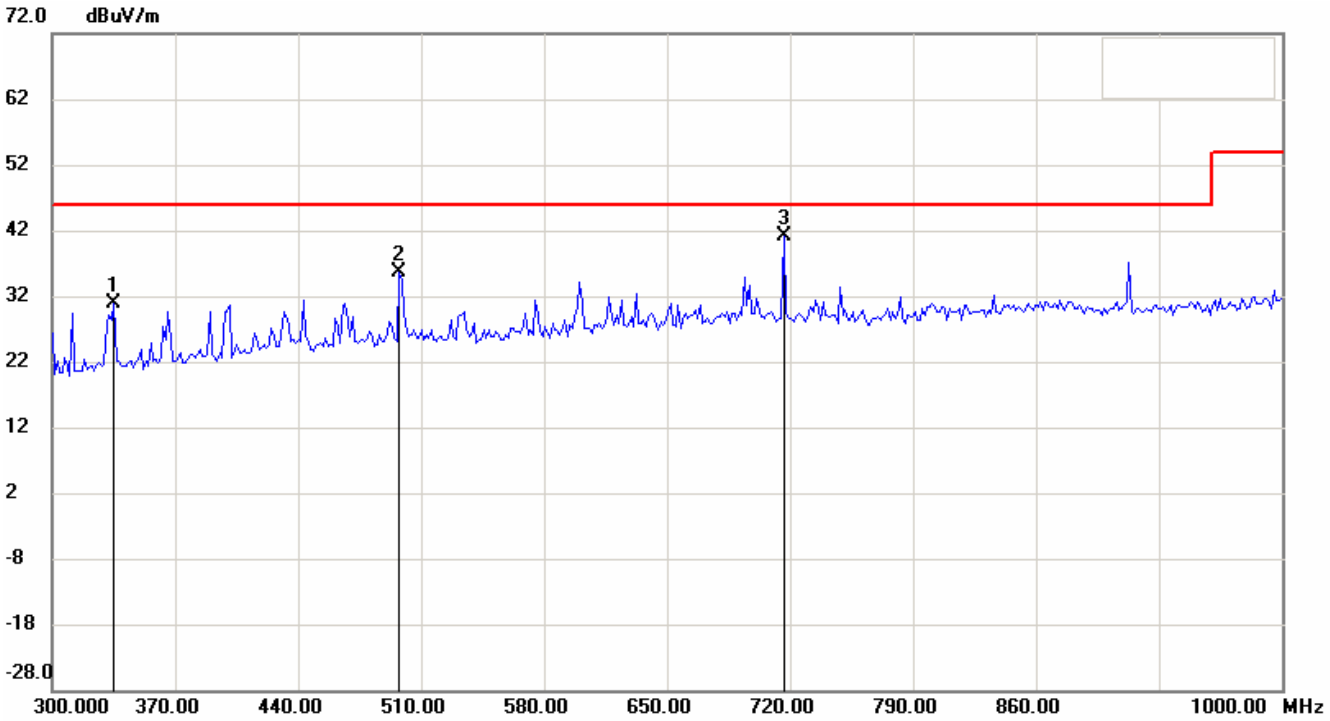
Radiated Emission from Digital Part_ Antenna Polarization H





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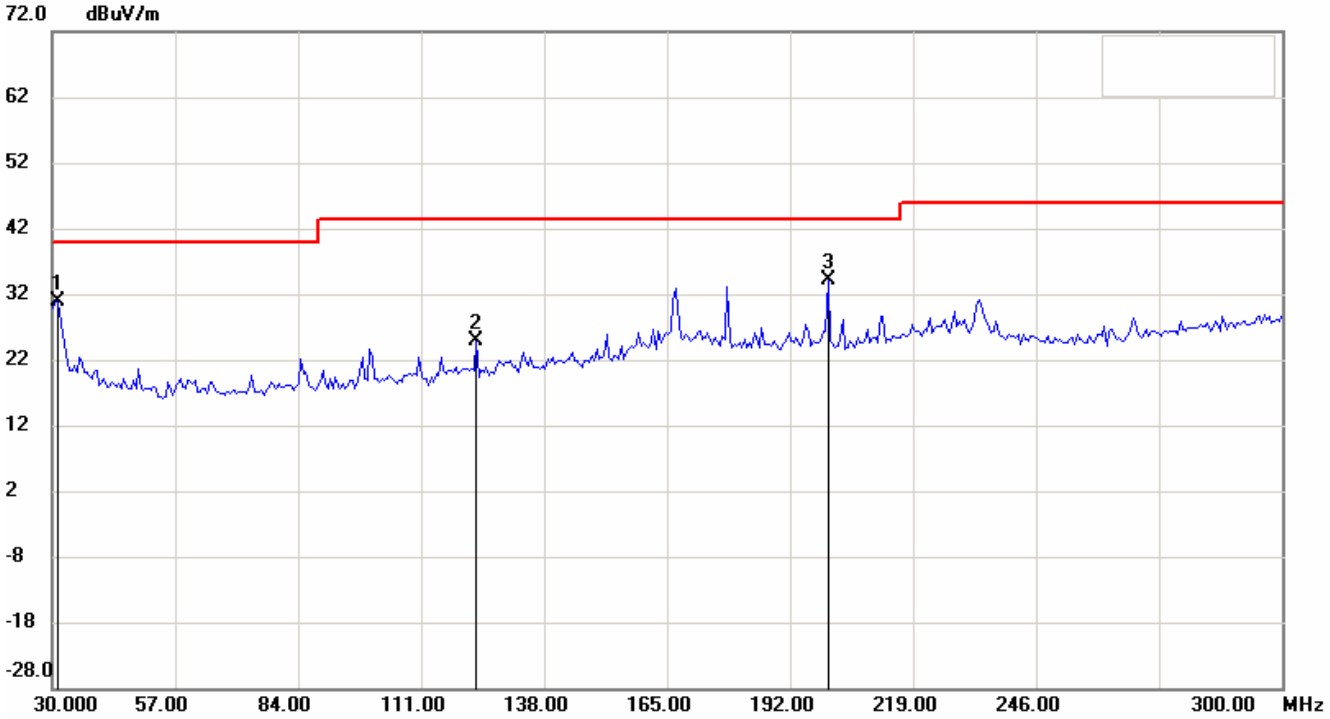
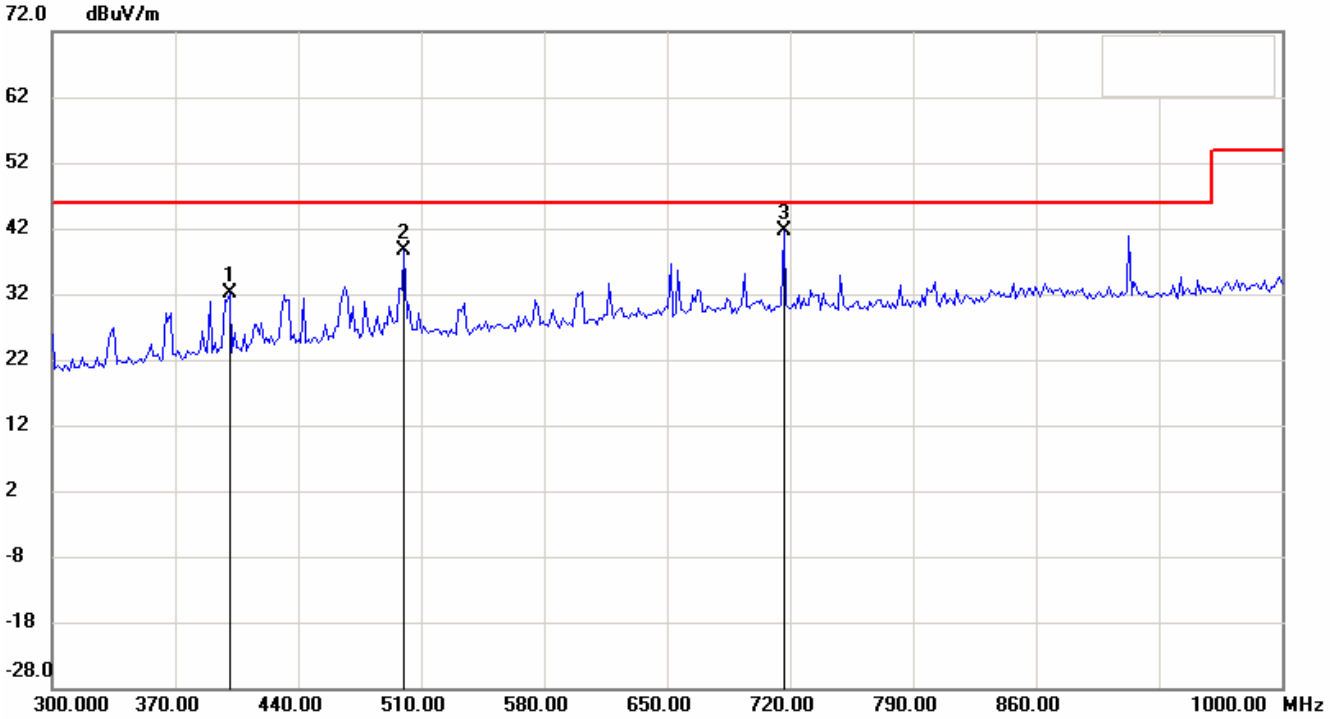
Antenna Polarization V





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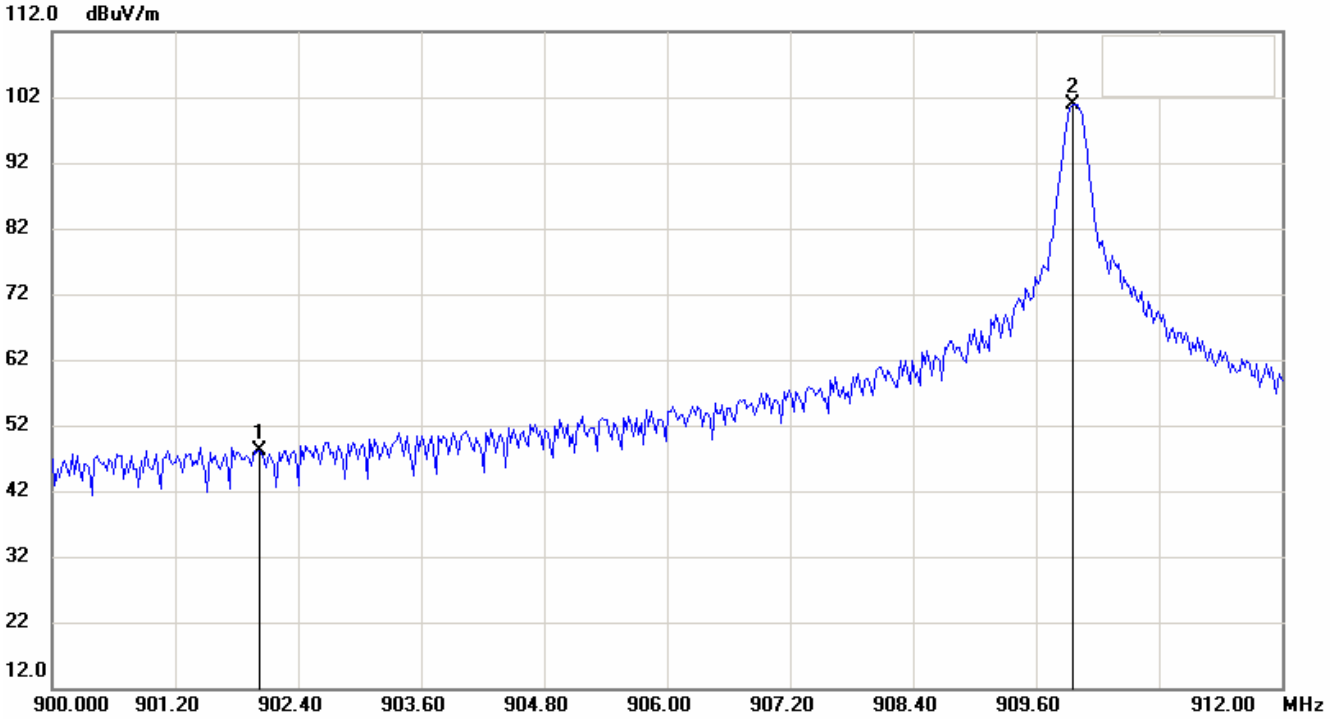
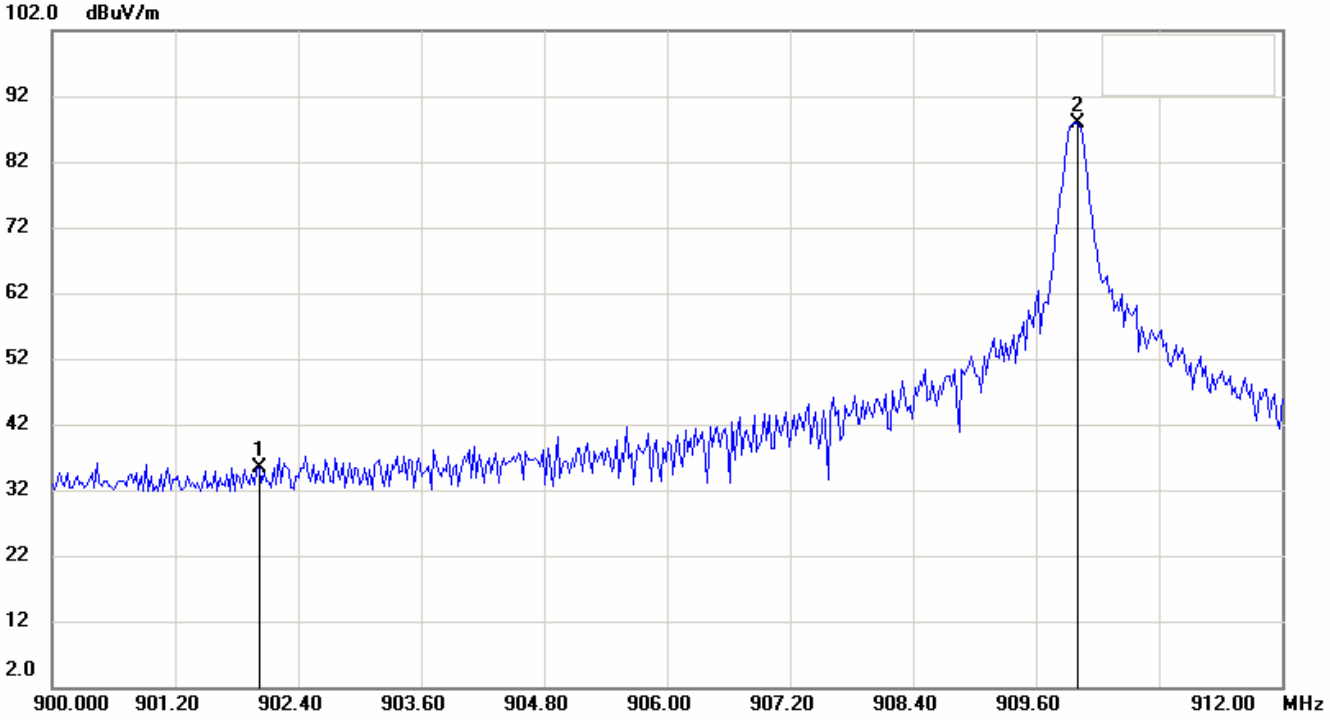
Band edge_ low channel_ Antenna Polarization H



Antenna Polarization V



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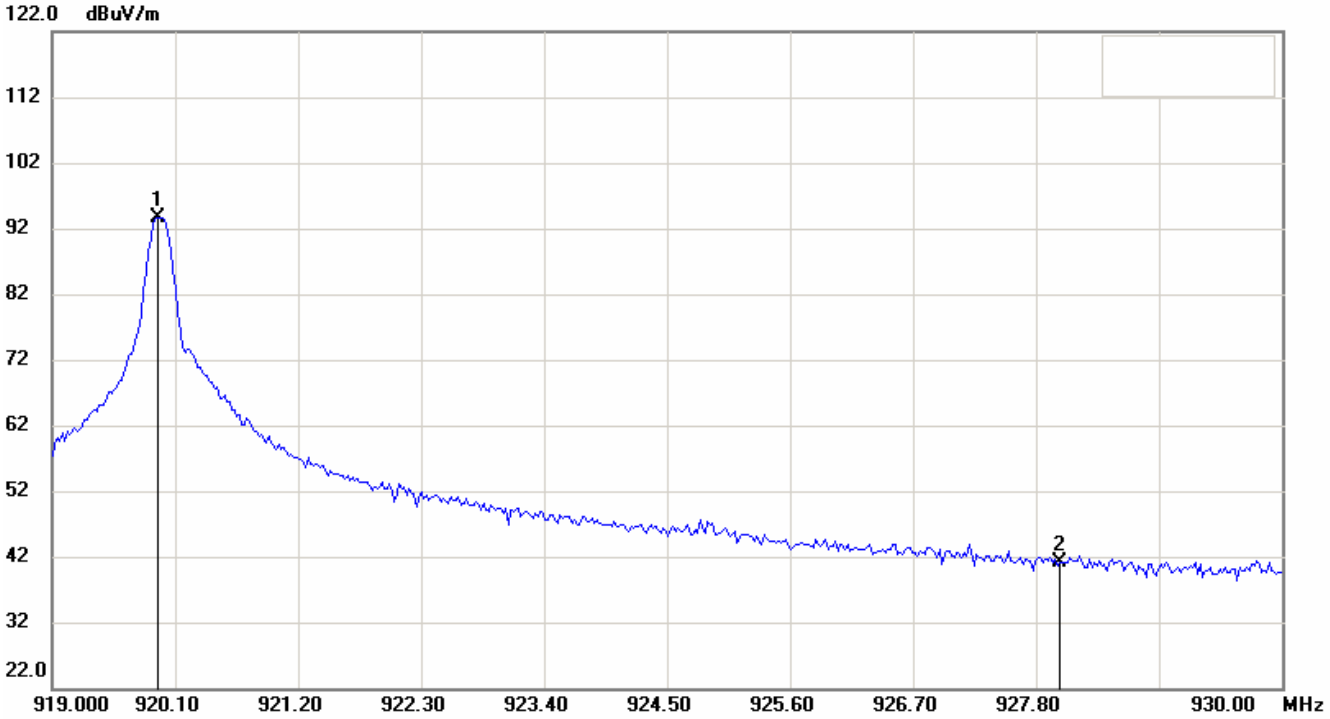
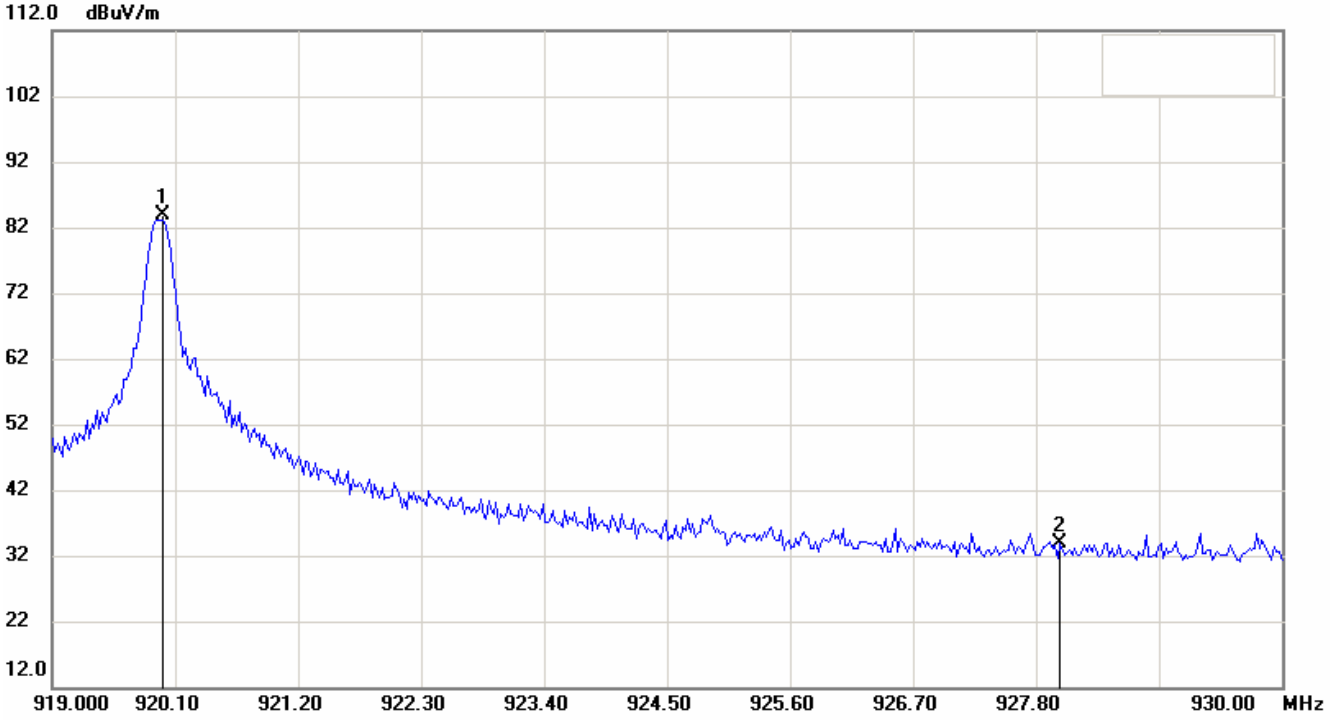
Band edge_ high channel_ Antenna Polarization H



Antenna Polarization V



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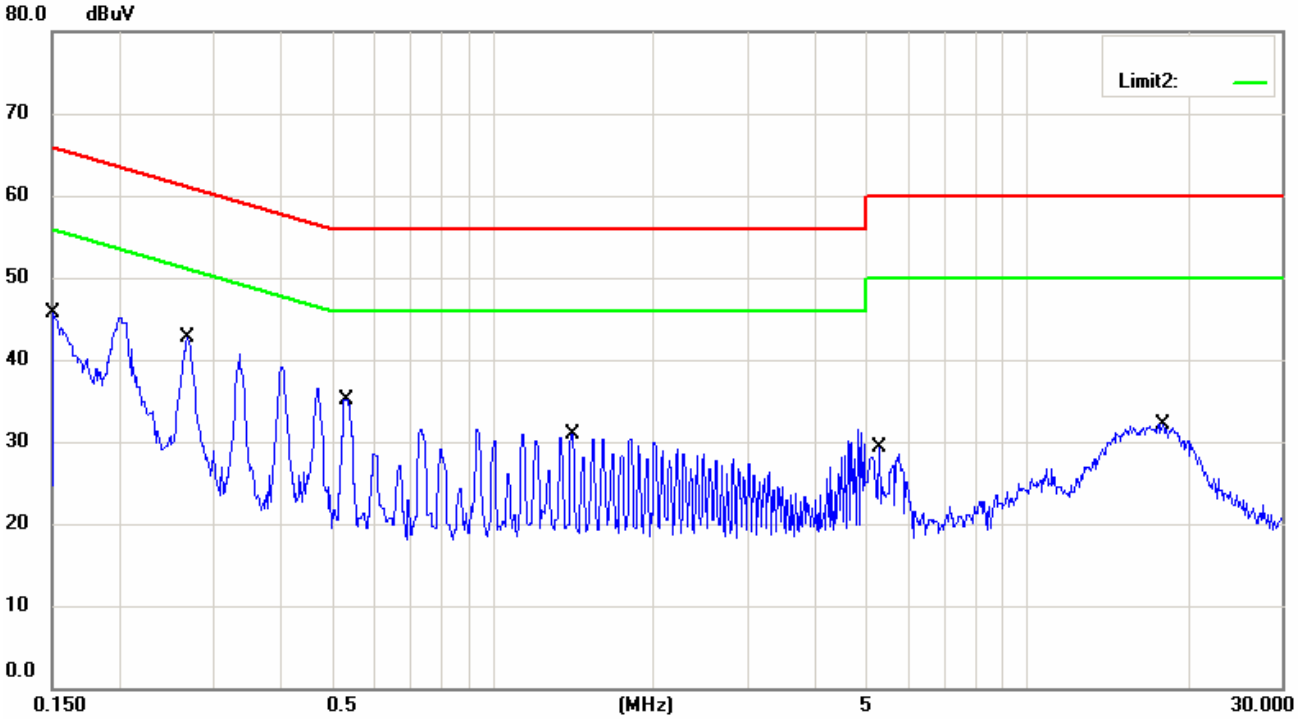
Power Line Conducted Emission _LISN N



LISN L1