FCC TEST REPORT

for

Lightning Switch LVDC Wire-In System Extender
Model No.: E-WDC2

of

Applicant: PulseSwitch Systems
Address: 427 W 35th Street Norfolk, VA 23508 USA

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: VHS-EWDC2

Report No.: W6M20709-8562-P-15

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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:

Date	ETS-Lab.	Name	Signature
October 11, 2007		Jay Chaing	Jay Chaing

Technical responsibility for area of testing:

Date	ETS	Name	Signature
October 11, 2007		Steven Chuang	Steven Chuang

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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
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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

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

1.3 Details of approval holder

Name	:	PulseSwitch Systems
Street	:	427 W 35th Street Norfolk,
Town	:	./.
Country	:	VA 23508 USA
Telephone	:	1-757-624-2134
Fax	:	1-757-624-2128

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1.4 Application details

Date of receipt of test item : October 2, 2007
Date of test : from October 3, 2007 to October 5, 2007

1.5 Test item

Description of test item : Lightning Switch LVDC Wire-In System Extender

Type identification : E-WDC2

Brand name : Lightning Switch

Multi-listing model number : ./.

Transmitting frequency : 433.92 MHz

Operation mode : simplex

Voltage supply : 6 ~ 30 VDC

(If the device is using battery, please check if the device is tested under fresh battery condition.)

Highest clock frequency : 433.92 MHz

Antenna type : PCB antenna

Photos : see Annex

Manufacturer
(if applicable)

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

Additional information : ./.

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1.6 Test standards

Technical standard : FCC RULES PART 15 SUBPART B / SUBPART C § 15.231 (a) (2007-05)
IC RULES RSS-210 and ISSUE No.: 7, June 2007

2 Technical test

2.1 Summary of test results

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

or

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

2.2 Test environment

Temperature	: 23 °C
Relative humidity content	: 20 ... 75 %
Air pressure	: 86 ... 103 kPa
Details of power supply	: 6 ~ 30 VDC

2.3 Test Mode

This EUT is the portable device. So the EUT was tested on three different axes. Please see assessment test results as section 3 of this test report.

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2.4 Test equipment utilized

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2007/10/15	2008/10/14
ETSTW-CE 002	PREREULATOR MODE DC POWER SUPPLY	None	None		Function Test	
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2007/10/15	2008/10/14
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2007/10/15	2008/10/14
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	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	2007/10/13	2009/10/12
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	2007/10/11	2008/10/12
ETSTW-RE 010	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070181	MOTECH	Function Test	
ETSTW-RE 011	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070165	MOTECH	Function Test	
ETSTW-RE 017	Log-Periodic Antenna	HL025	352886/001	R&S	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	2007/10/9	2008/10/8
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	2007/10/9	2008/10/8
ETSTW-RE 033	WaveRunner 6000A Serise Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	2007/7/9	2008/7/8
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2007/10/16	2008/10/15
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2007/1/11	2009/1/10
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	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

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2.5 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 5.2 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 6.4 using a spectrum analyzer. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was the 100 kHz and the video bandwidth was 300 kHz.

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/m + 6 dB = 36.36 dBµV/m @3m

ANSI STANDARD C63.4-2003 6.2.1 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The UUT 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. 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.

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3 Test results (enclosure)

☒ 1st test ☐ test after modification ☐ production test

TEST CASE	Para. Number	Required	passed	failed
Transmission Requirements	FCC 15.231(a)	☒	☒	☐
Radiated Emission	FCC 15.231(b)	☒	☒	☐
Bandwidth of Emission	FCC 15.231(c)	☒	☒	☐
Frequency Tolerance	FCC 15.231(d)	☐	☐	☐
Period Alternate Field Strength Requirements	FCC 15.231(e)	☐	☐	☐
Antenna Requirement	FCC 15.203	☒	☒	☐
Radiated Emission from Receiver Part	FCC 15.109	☒	☒	☐
Conducted Measurement at (AC) Power Line	FCC 15.207	☐	☐	☐

The follows is intended to leave blank.

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3.1 Transmission Requirements

FCC 15.231(a)

3.1.1 Limit of Transmission Time

☒ According to 15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

☐ According to 15.231(a)(2), a transmitter activated automatically shall cease transmission within 5 seconds after activation.

3.1.2 Active Time

☒ This manually operated transmitter employs a switch that automatically deactivate the transmitter within 1.076923 s of being released.

☐ This transmitter is operated by automatic activation and active will cease transmission in __ ms after activation..

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

Explanation: See attached diagrams in the Appendix.

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3.2 Output Power (Field Strength)

Model: E-WDC2 Date: 2007/10/3
Mode: Temperature: 26 ˚C Engineer: Derek
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV) Peak	Factor (dB) Corr.	Factor (dB) Duty	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)
433.930	67.27	18.58	-11.39	85.85	74.46	100.80	80.80	-6.34	50	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV) Peak	Factor (dB) Corr.	Factor (dB) Duty	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)
433.934	61.41	18.58	-11.39	79.99	68.60	100.80	80.80	-12.20	50	150

Limit 15.231(b)

Fundamental Frequency (MHz)	Field strength of fundamental, limit µV/m
40.66 – 40.70	2,250
70 – 130	1,250
130 – 174	1,250 to 3,750
174 – 260	3,750
260 – 470	3,750 to 12,500** (433.92 MHz: 80.8 dBµV/m = 10,965 µV/m)
Above 470	12,500

** linear interpolation

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

Explanation: See attached diagrams in the Appendix.

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3.3 Out of Band Radiated Emissions

FCC Rule: 15.231(b) , 15.35
For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Limits:
For frequencies below 1GHz :
Max permitted average Limits = Max. reading – 20 dB

80.80 dBµV/m- 20 dB= 60.80 dBµV/m

Guidance on Measurement of pulsed emission: 815.231 (b), §15.35(c)
"If the emission is pulsed, modify the unit for continues operation , use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation." Here the correction was added to the limit instead subtracted from the reading.

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

For frequencies above 1GHz (Peak measurements).
Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)

80.80 dBµV/m

For frequencies above 1GHz (Average measurements).
Correction factor conform 15.35 (c) (Average measurements)
Duty cycle correction :
Max. reading – 20 dB – duty cycle correction

No duty cycle correction was added to the reading:

80.80 dBµV/m- 20 dB= 60.80 dBµV/m

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: See attached diagrams in the Appendix.

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3.4 Transmitter Radiated Emissions in restricted Bands

FCC Rules: 15.231 (b), 15.205, 15.209, 15.35
Radiated emission measurements were performed from 30 MHz to 8000 MHz.
For radiated emission tests, the analyzer setting was as followings:
RES BW VID BW
Frequency <1 GHz 100 kHz 100 kHz (Peak measurements)
Frequency >1 GHz 1 MHz 1 MHz (Peak measurements)
1 MHz 1 MHz (Average measurements)
Limits:

For frequencies below 1GHz :

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

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

For frequencies above 1GHz (Average measurements).

The correction factor, based on the channel dwell tine 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)
No duty cycle correction was added to the reading

Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)

Above 960 MHz
For mode DSSS CW: 54 dBµV/m + 20 dB = 74 dBµV/m

Explanation: See attached diagrams in the Appendix.

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3.5 Spurious Emission radiated

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

The limits on the field strength of the spurious emission in the table § 15.231(b) are based on the fundamental frequency of the intentional radiator. Spurious emission shall be attenuated to the average (or alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.
In addition, radiated emission which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).
SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance to point 2.3.

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

The peak and average spurious emission plots was measured with the average limits.
In the Table being listed the critical peak and average value an exhibit the compliance with the above calculated Limits.

Summary table with radiated data of the test plots
Transmitter Part

Model: E-WDC2 Date: 2007/10/2
Mode: Temperature: 26 ˚C Engineer: Derek
Polarization: Horizontal Humidity: 60 %

Frequency	Reading (dBuV)	Factor (dB)		Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Corr.	Duty	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
451.503	22.00	18.95	-11.39	40.95	29.56	74.00	54.00	-24.44	50	135
868.136	19.38	25.70	-11.39	45.08	33.69	74.00	54.00	-20.31	50	105
1302.605	57.69	-11.86	-11.39	45.83	34.44	74.00	54.00	-19.56	50	150
1737.475	55.43	-10.29	-11.39	45.14	33.75	74.00	54.00	-20.25	50	150
3038.076	53.00	-6.04	-11.39	46.96	35.57	74.00	54.00	-18.43	50	150

Polarization: Vertical

Frequency	Reading (dBuV)	Factor (dB)		Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Corr.	Duty	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
451.503	14.55	18.95	-11.39	33.50	22.11	74.00	54.00	-31.89	50	325
868.136	9.59	25.70	-11.39	35.29	23.90	74.00	54.00	-30.10	50	300
1300.601	55.87	-11.86	-11.39	44.01	32.62	74.00	54.00	-21.38	50	150
1735.471	55.41	-10.30	-11.39	45.11	33.72	74.00	54.00	-20.28	50	150
3042.084	52.58	-6.03	-11.39	46.55	35.16	74.00	54.00	-18.84	50	150

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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.**

All other not noted test plots do not contain significant test results in relation to the limits
Test results: The unit meet the FCC requirements.

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: See attached diagrams in the Appendix.

3.6 Channel Bandwidth

Measurement of Necessary Bandwidth (BN)

Used frequency	Bandwidth	Limit
433.939 MHz	144.231 kHz	1.0848 MHz

Limits:

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

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

Explanation: The bandwidth fulfills the requirements of FCC § 15.231, see attached diagrams.

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3.7 Antenna requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

The equipment meets the requirements	yes ☒	no ☐

Explanation: This PCB antenna is integral antenna which passes antenna requirement.

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3.8 Duty Cycle

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

Average Reading = Peak Reading (dBuV/m) + Duty Cycle Correction

Duty Cycle Correction = 20 log (Cycle)
In order to determine the Duty Cycle, the EUT is measured as:

Testing Mode	T period (ms)	T on (ms)	Duty Cycle	Duty Cycle Correction 20*log(Duty Cycle)
Mode	18.958	5.11	26.95	-11.387

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

Explanation: See attached diagrams in the Appendix.

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3.9 Radiated Emission from Receiver Part

Summary table with radiated data of the test plots

Model: E-WDC2 Date: 2007/10/3
Mode: Temperature: 26 ˚C Engineer: Derek
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)
195.030	12.82	peak	12.45	25.27	43.50	-18.23	260	305
297.836	13.11	peak	15.20	28.31	46.00	-17.69	155	330
647.896	6.09	peak	22.74	28.83	46.00	-17.17	300	100
879.359	6.16	peak	25.82	31.98	46.00	-14.02	255	130

Frequency	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
2268.537	43.42	---	-5.69	37.73	---	74.00	54.00	-36.27	100	150
3975.952	41.71	---	1.13	42.84	---	74.00	54.00	-31.16	250	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
199.359	12.89	peak	12.18	25.07	43.50	-18.43	310	120
297.295	13.39	peak	15.19	28.58	46.00	-17.42	240	145
574.950	6.86	peak	21.43	28.29	46.00	-17.71	190	300
891.984	7.71	peak	26.07	33.78	46.00	-12.22	280	330

Frequency	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
2094.188	44.57	---	-6.85	37.72	---	74.00	54.00	-36.28	245	150
3885.772	42.48	---	0.86	43.34	---	74.00	54.00	-30.66	110	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.**

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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 017 ETSTW-RE 028
ETSTW-RE 029 ETSTW-RE 030 ETSTW-RE 042 ETSTW-RE 043
ETSTW-RE 044 ETSTW-RE 064

Explanation: See attached diagrams in the Appendix.

3.10 Conducted Measurement at (AC) Power Line

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	
	quasi-peak (dBµV/m)	average (dBµV/m)
-- kHz	--	--

Limits:

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

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

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

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Appendix

A Measurement diagrams

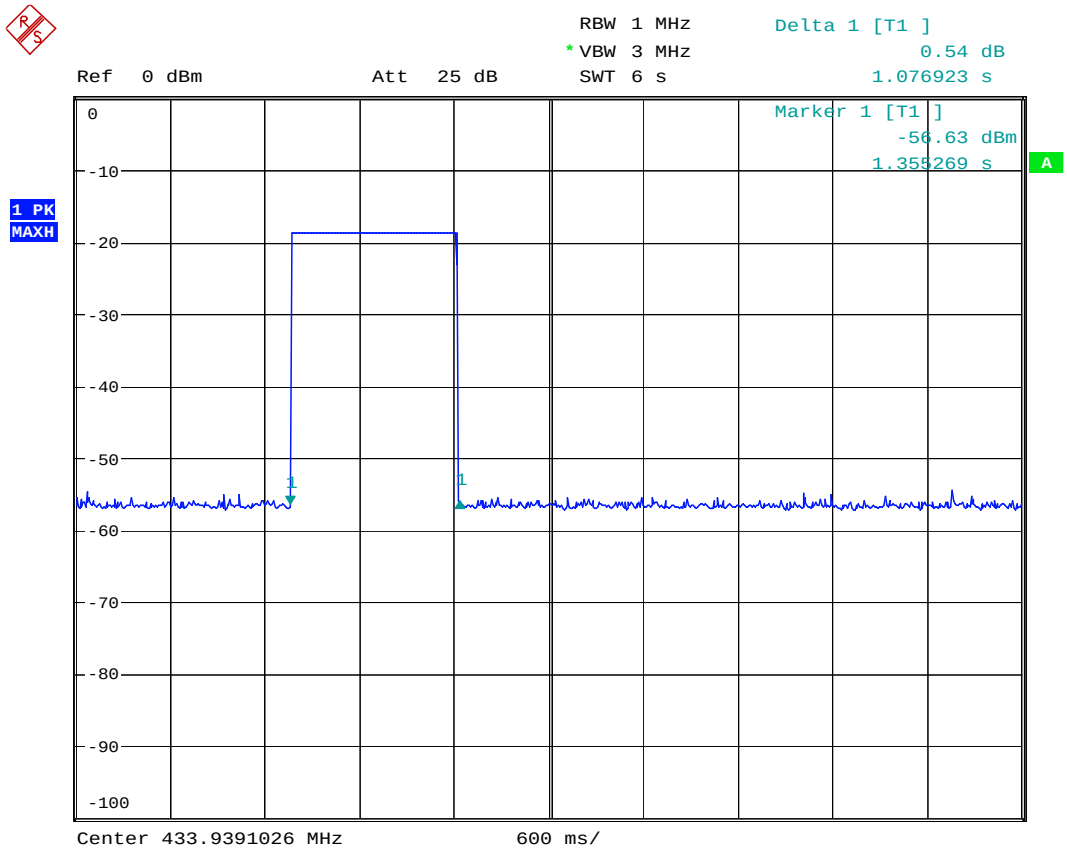
1. Active Time
2. Output Power
3. Spurious Emissions radiated_Transmitter
   (The measurement diagrams plots attached below are preliminary wideband scan with a peak detector for reference only. The final test results are listed on section 3.5)
4. Bandwidth
5. Duty Cycle
6. Spurious Emissions radiated_Receiver
   (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 3.9)

B Photos

1. External Photos
2. Internal Photos
3. Set Up Photos

Registration number: W6M20709-8562-P-15
FCC ID: VHS-EWDC2

Active Time

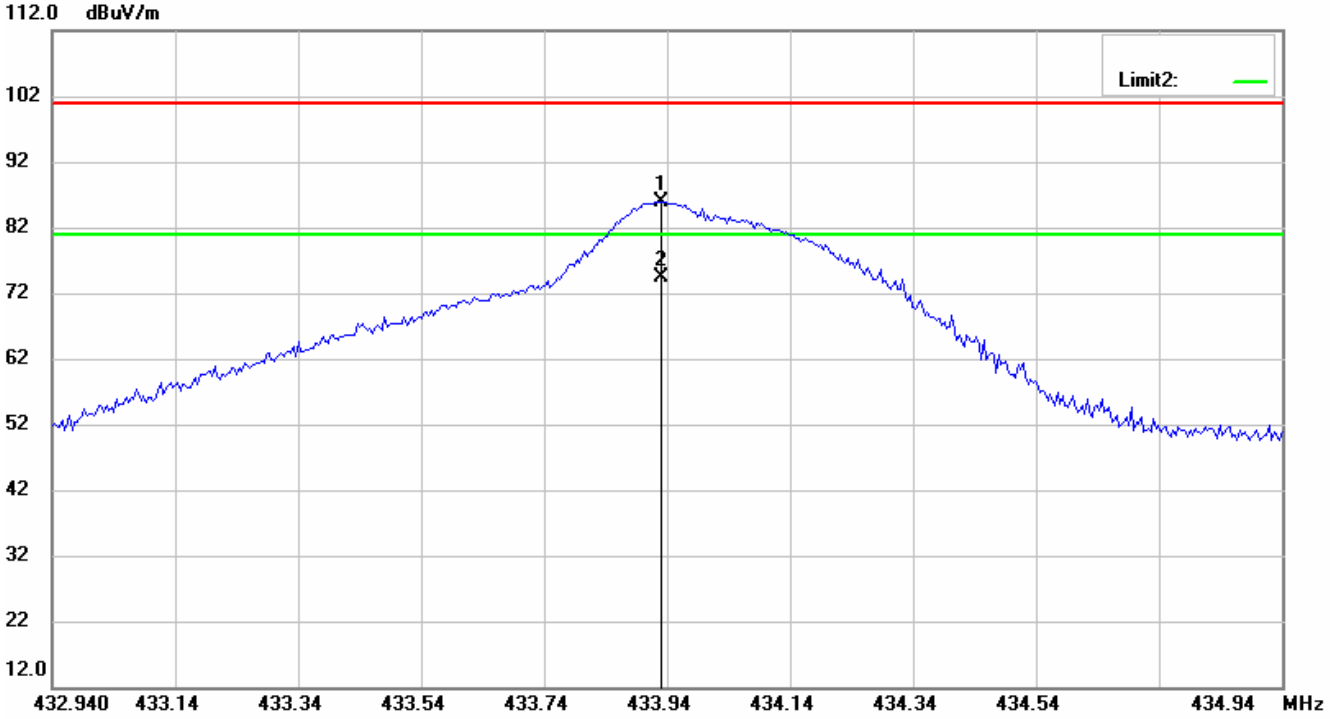


DURATION TIME
Date: 2.OCT.2007 18:56:51

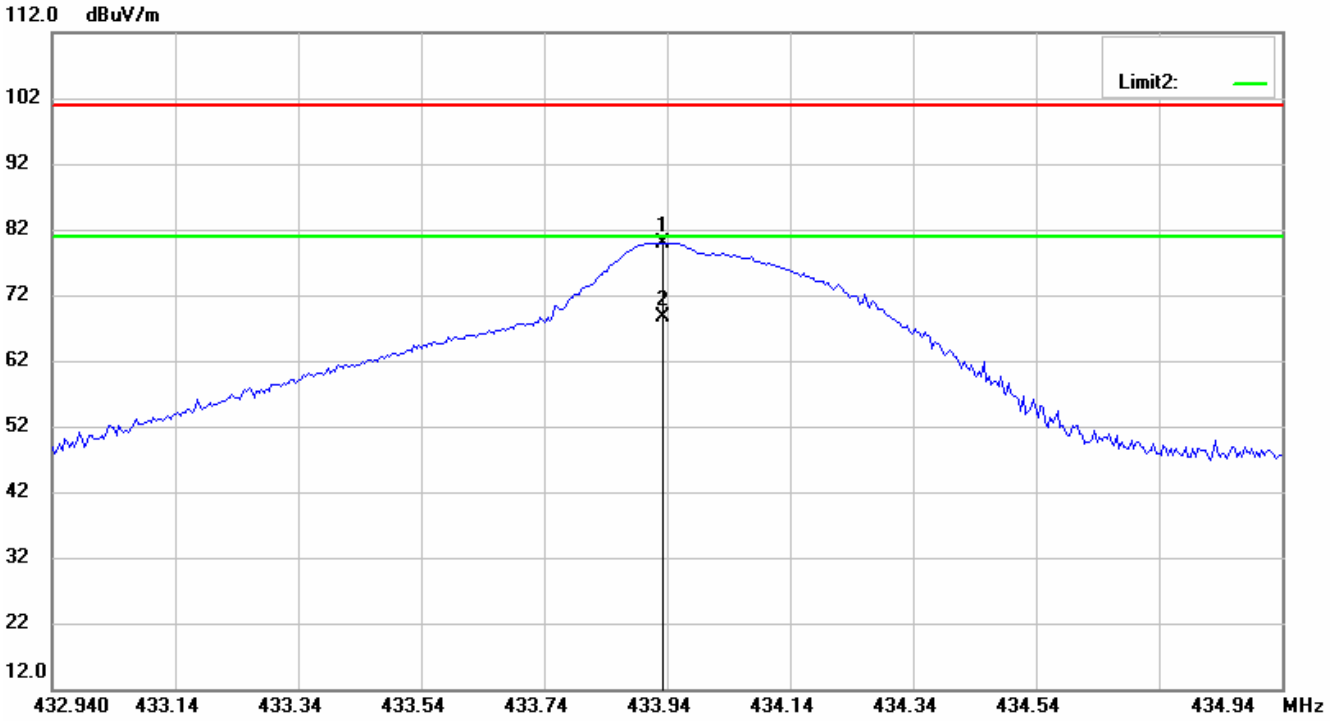
Registration number: W6M20709-8562-P-15
FCC ID: VHS-EWDC2

Output Power

Antenna Polarization H

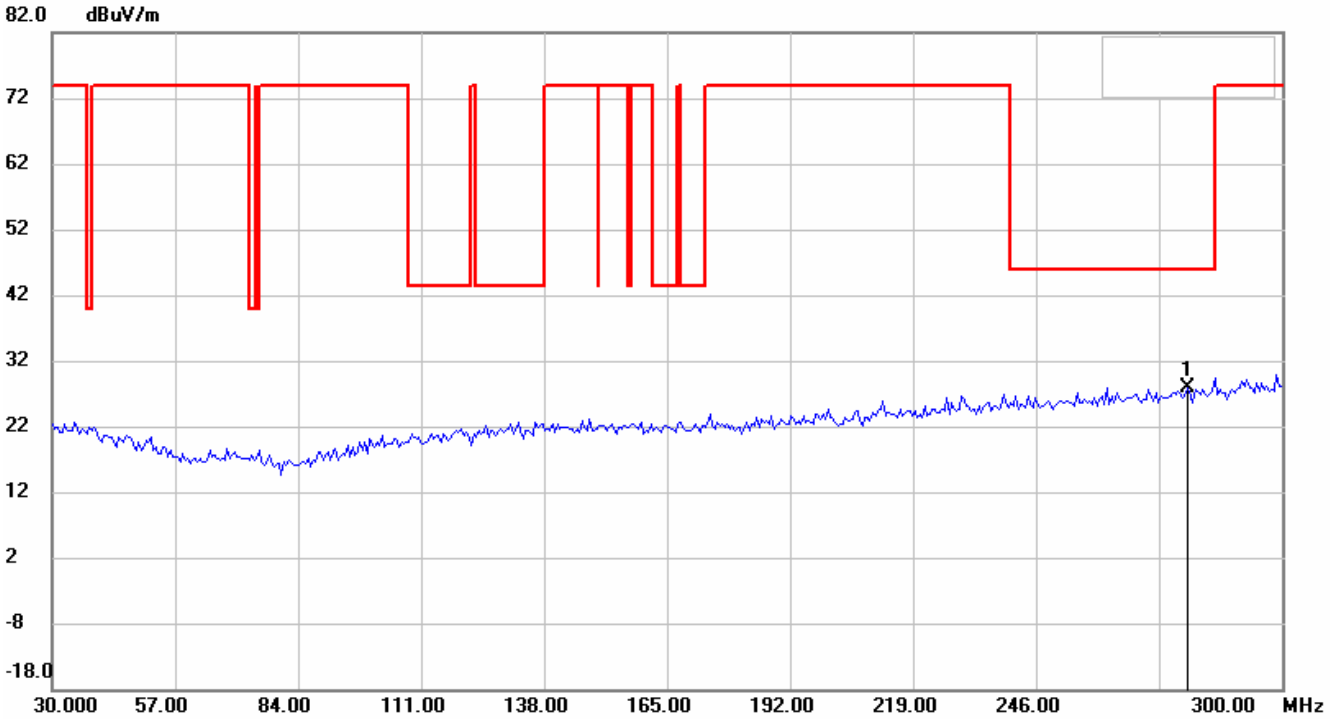


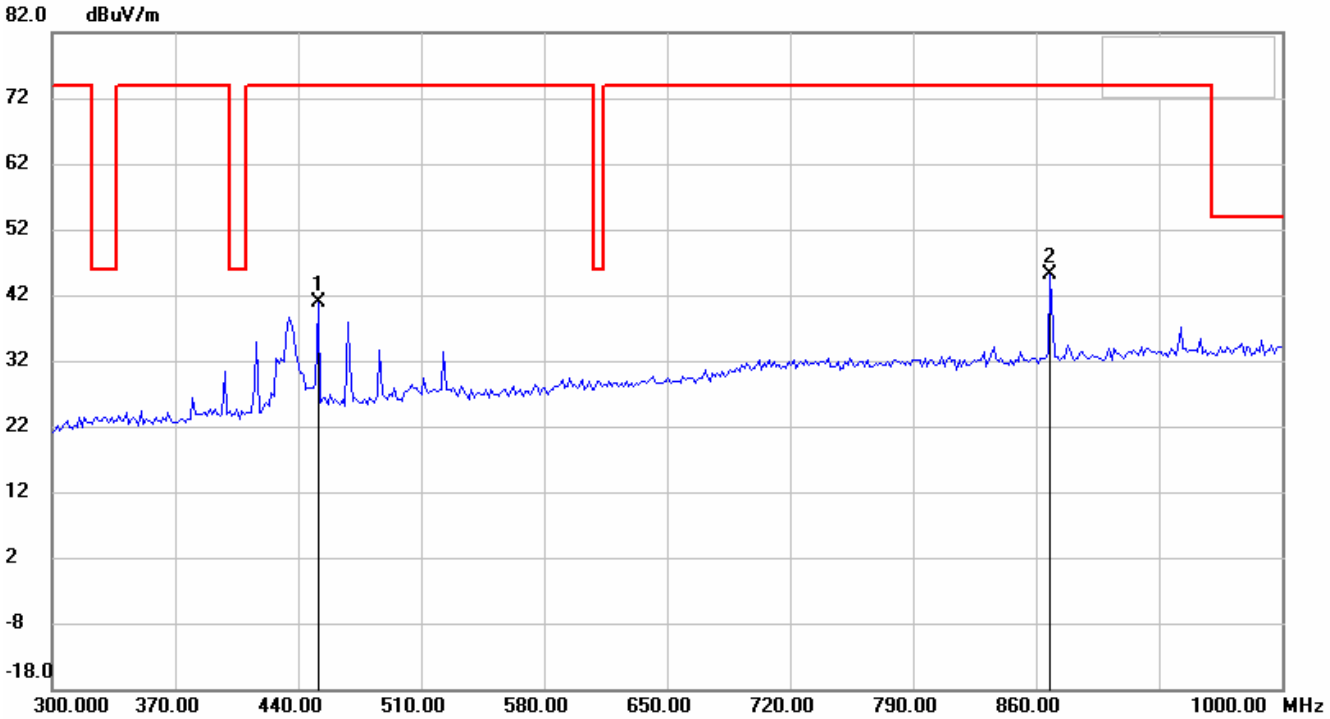
Antenna Polarization V



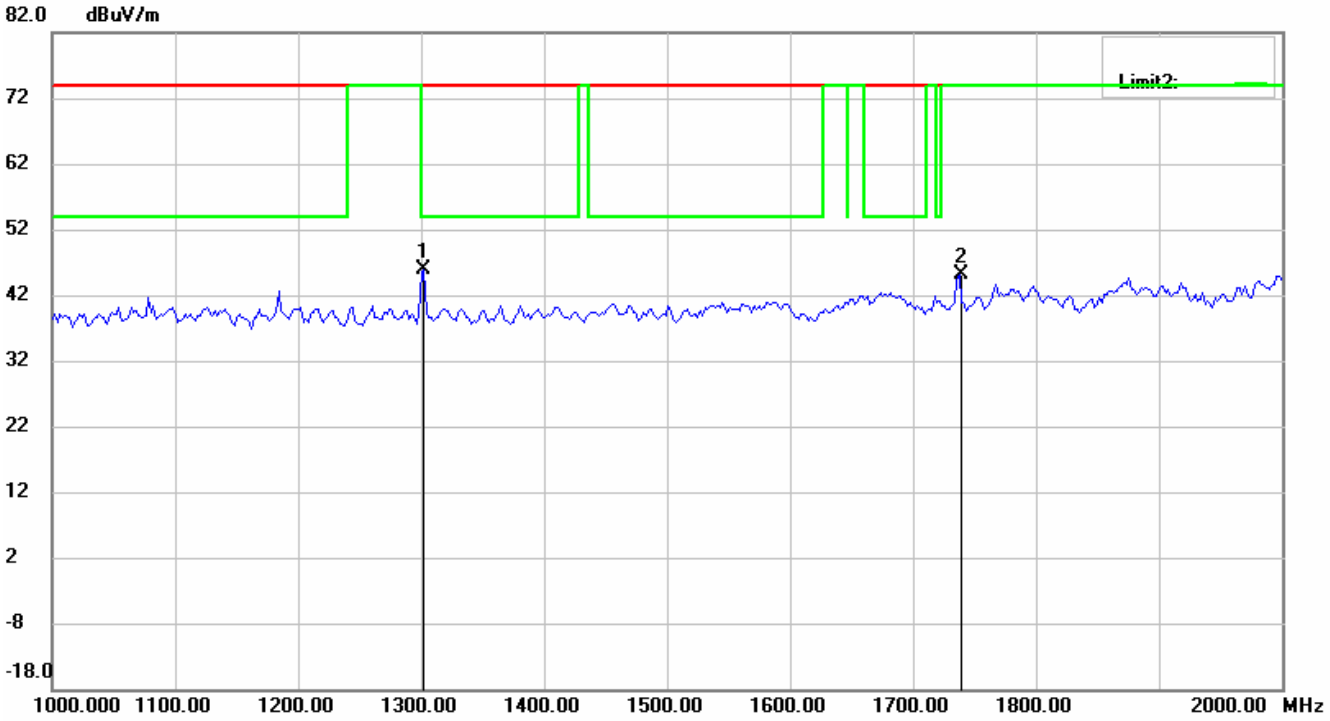
Registration number: W6M20709-8562-P-15
FCC ID: VHS-EWDC2

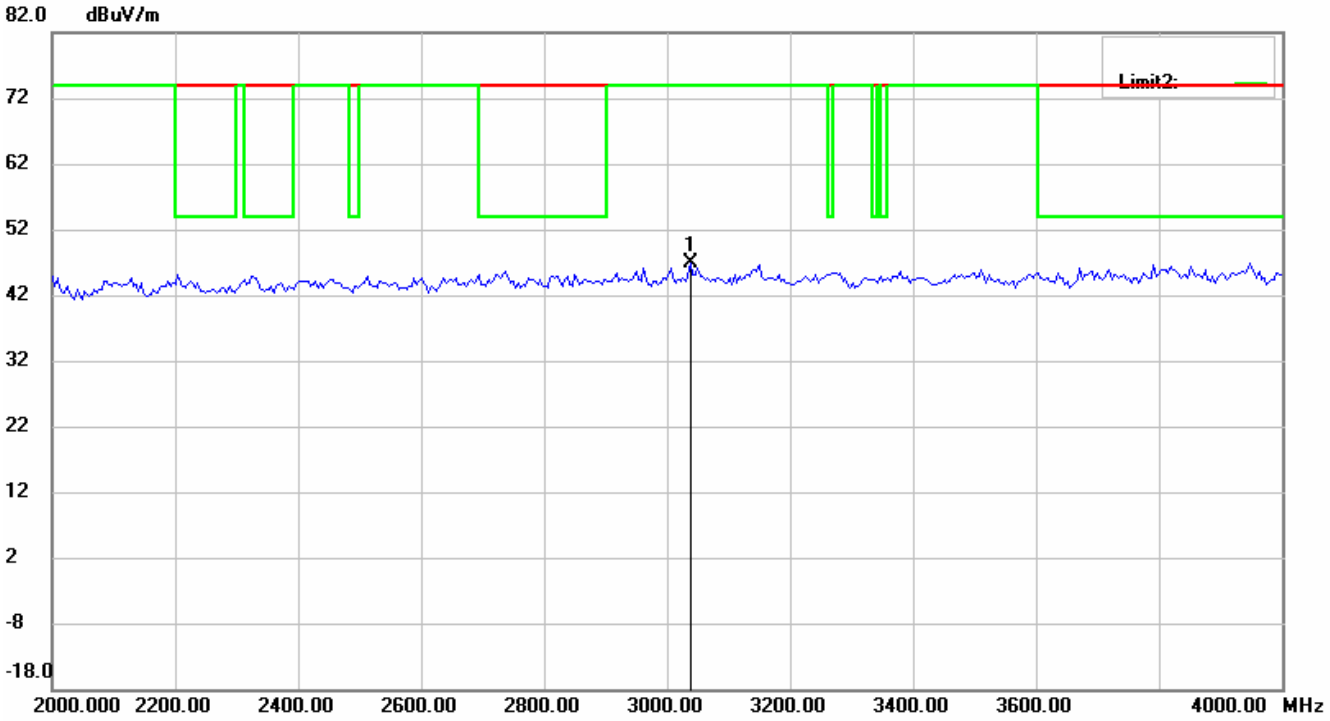
Spurious Emissions radiated_Transmitter
Antenna Polarization H





Registration number: W6M20709-8562-P-15
FCC ID: VHS-EWDC2





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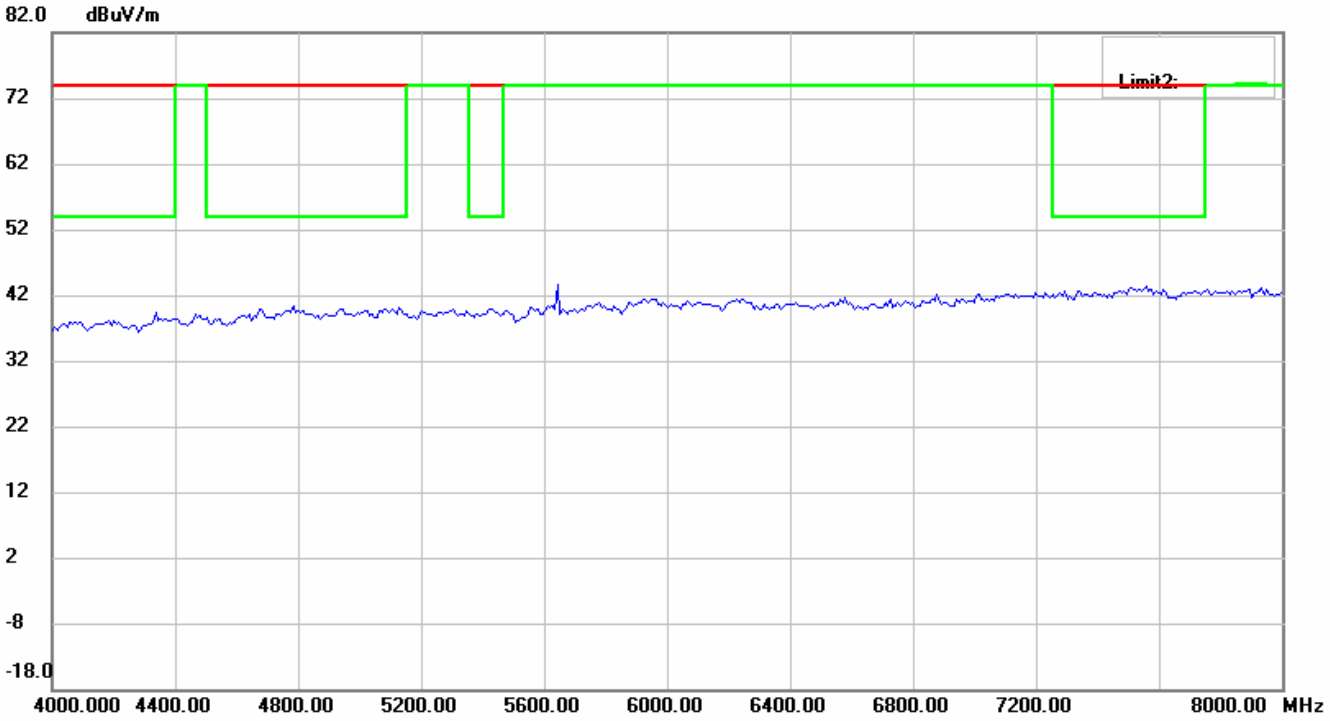
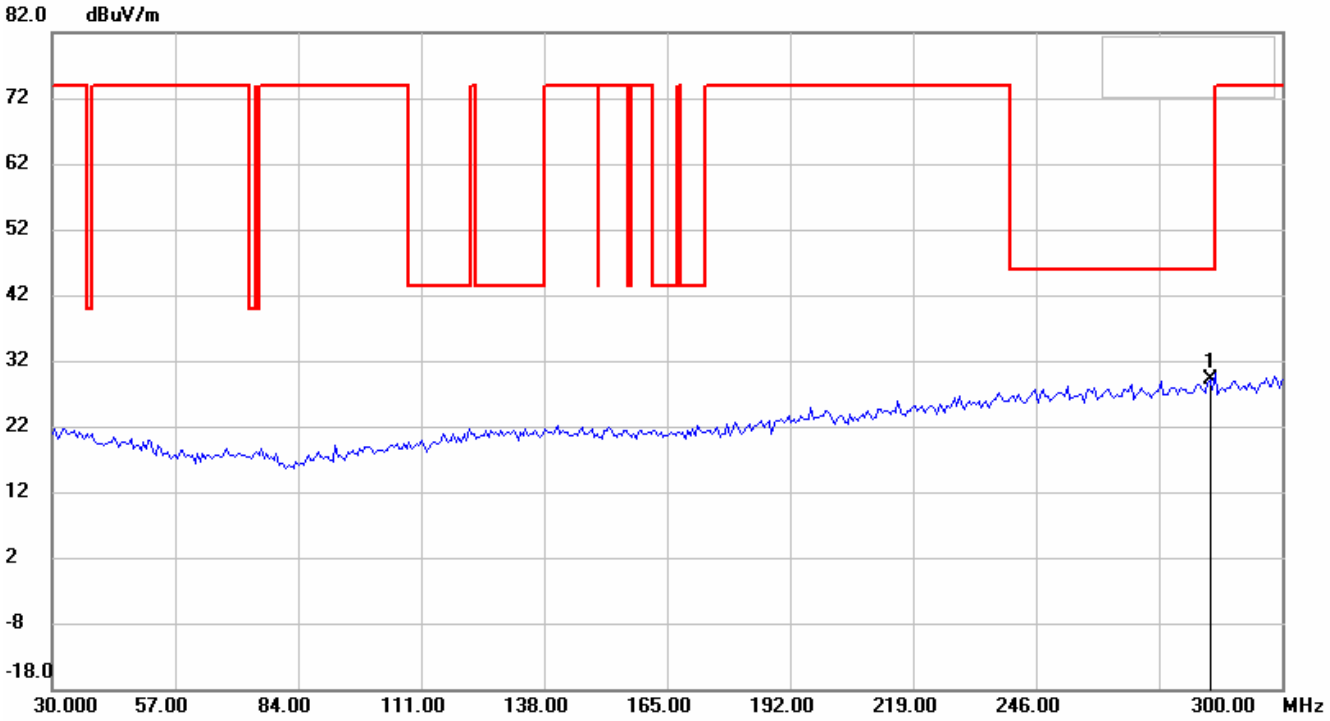
FCC ID: VHS-EWDC2



Antenna Polarization V



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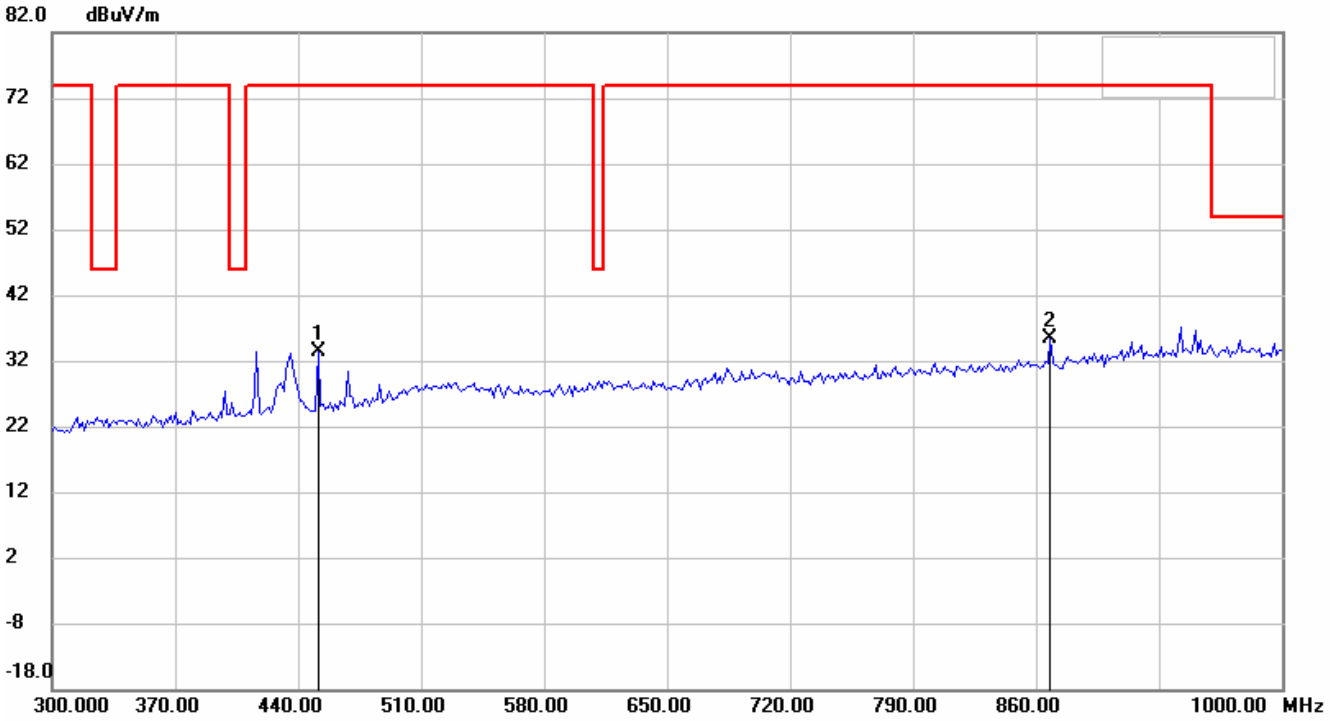

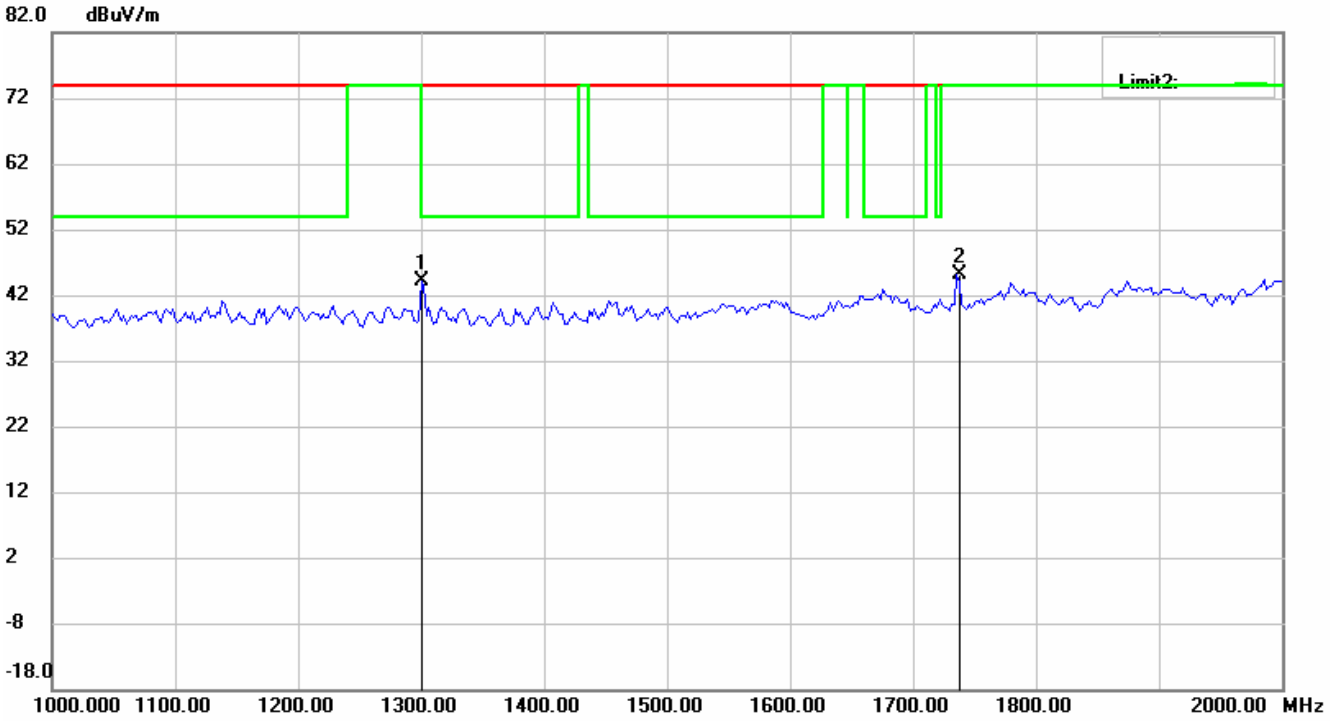

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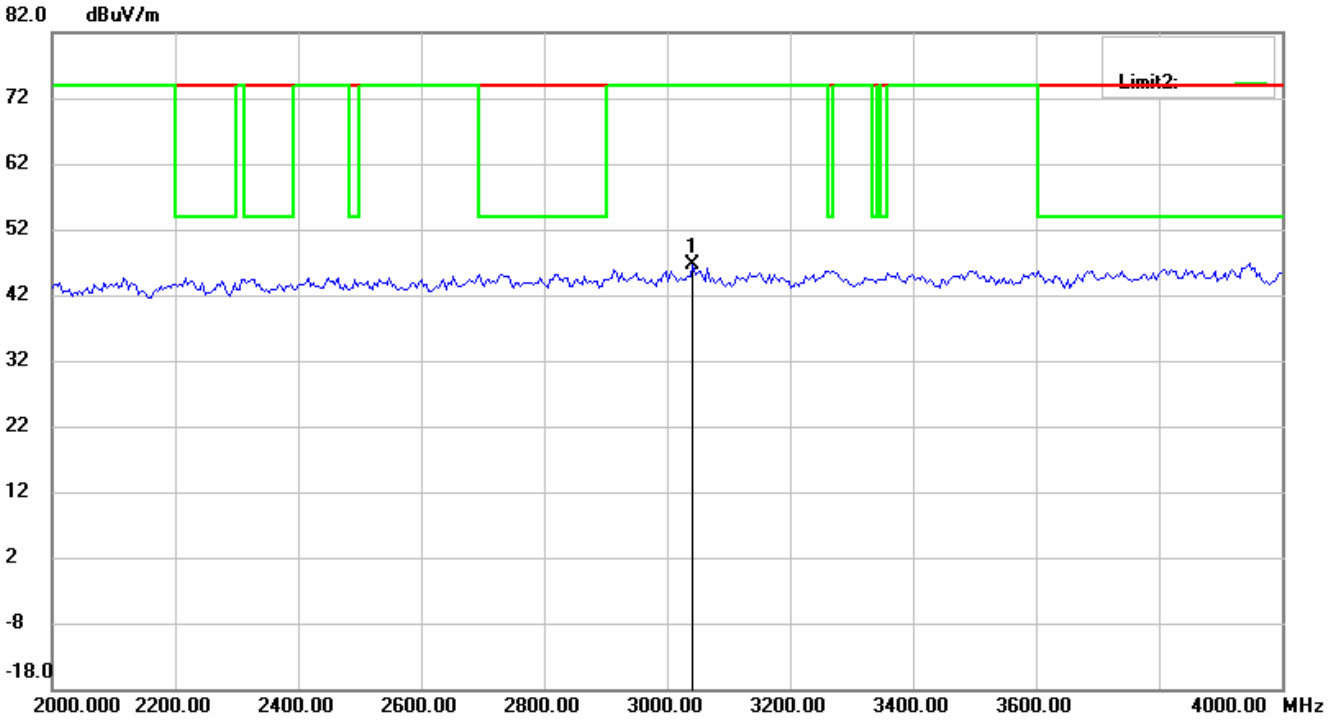
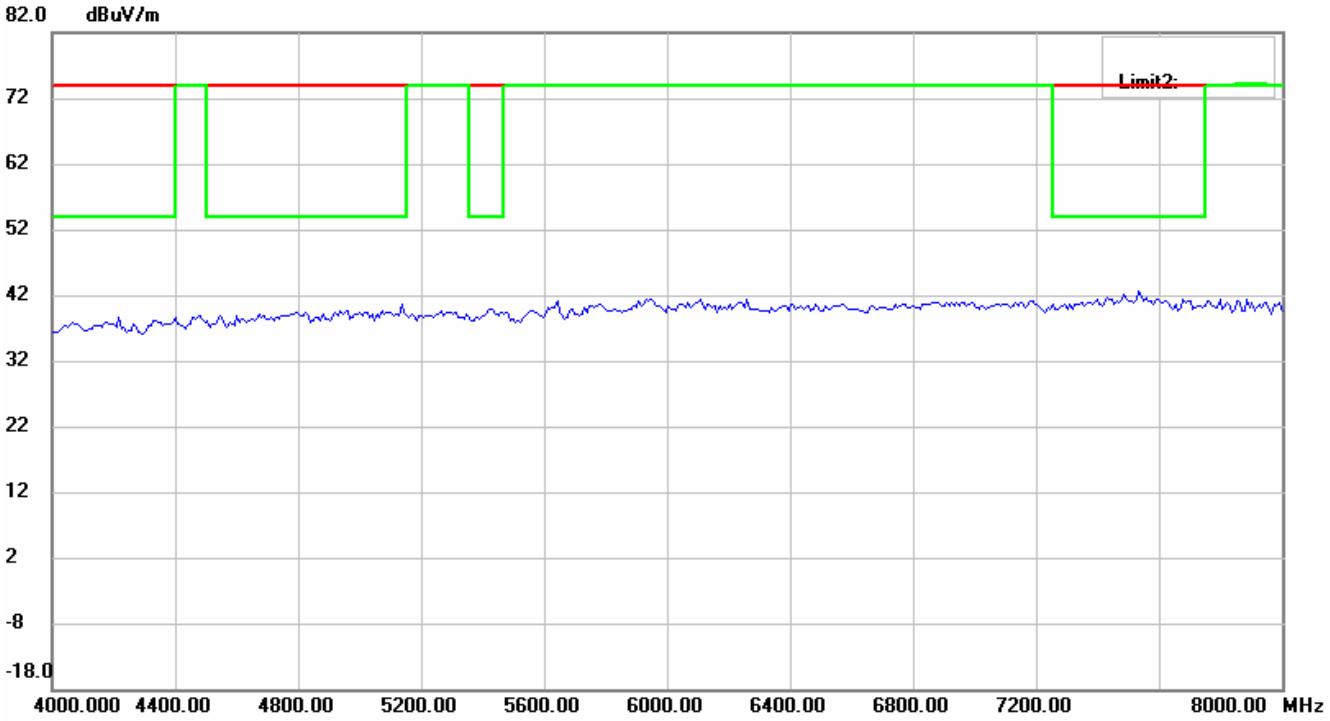
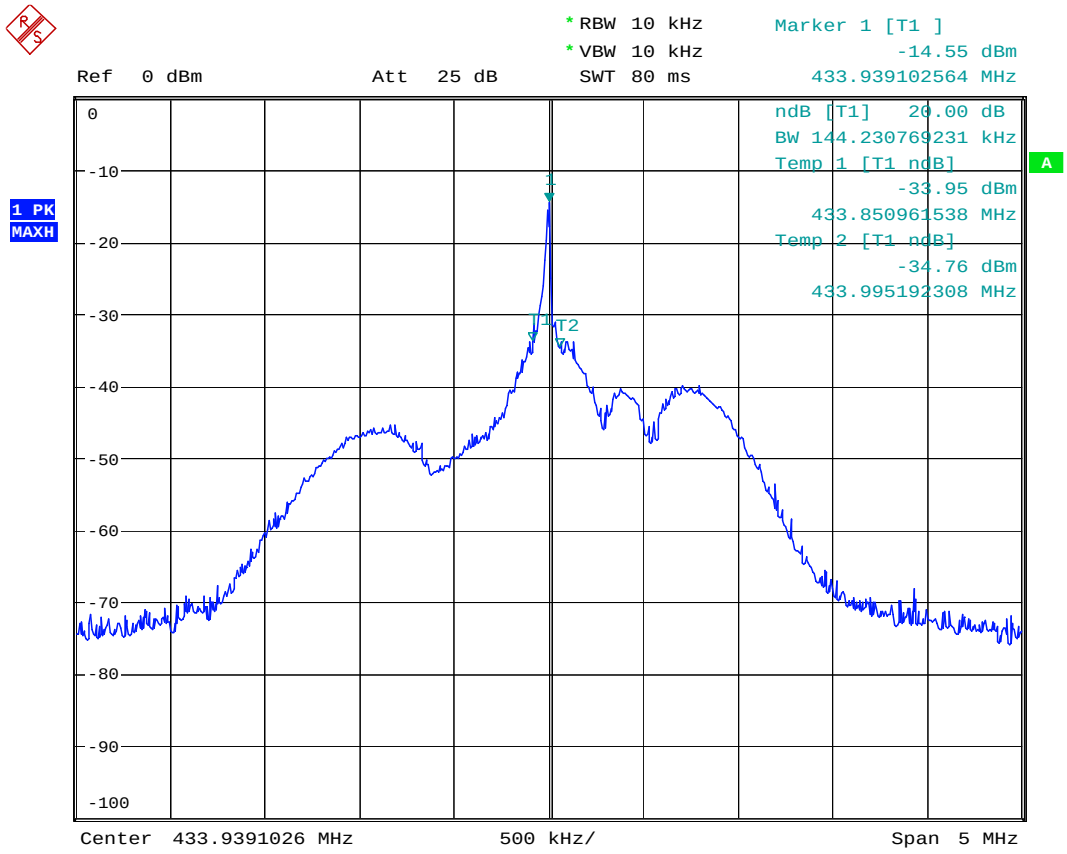




Registration number: W6M20709-8562-P-15
FCC ID: VHS-EWDC2

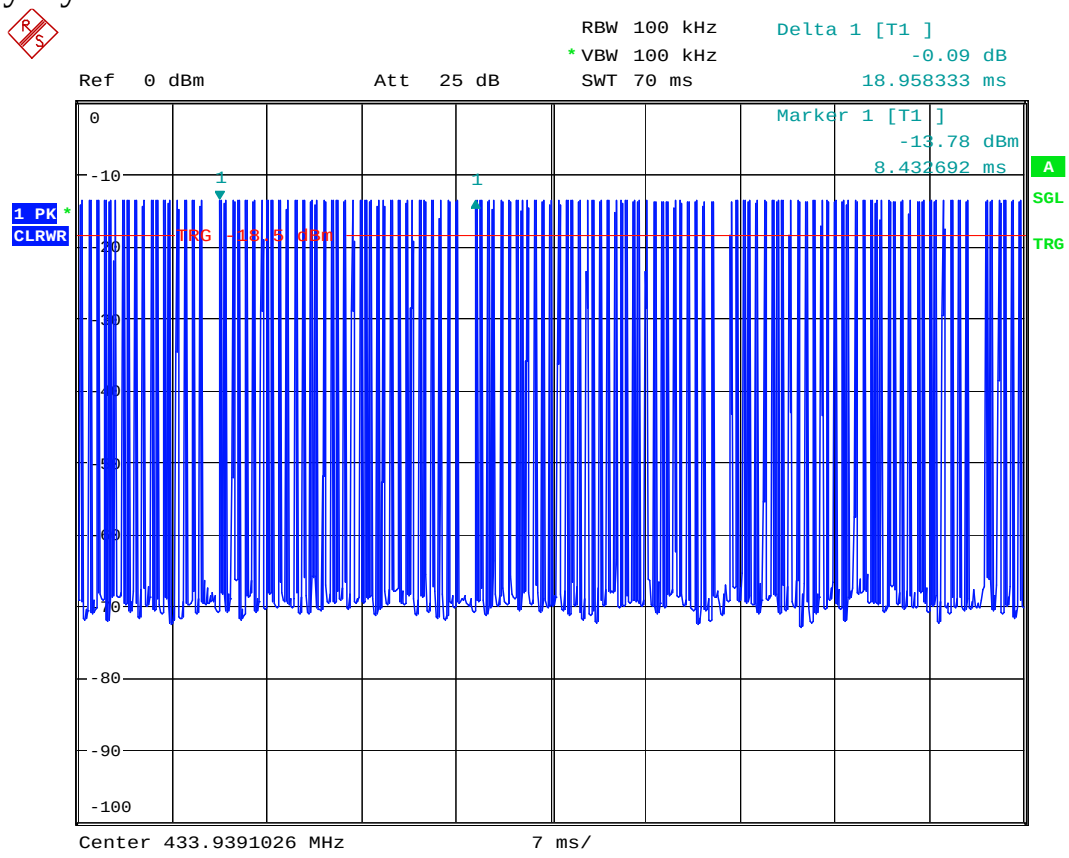
Bandwidth



20dB BANDWIDTH
Date: 2.OCT.2007 18:54:39

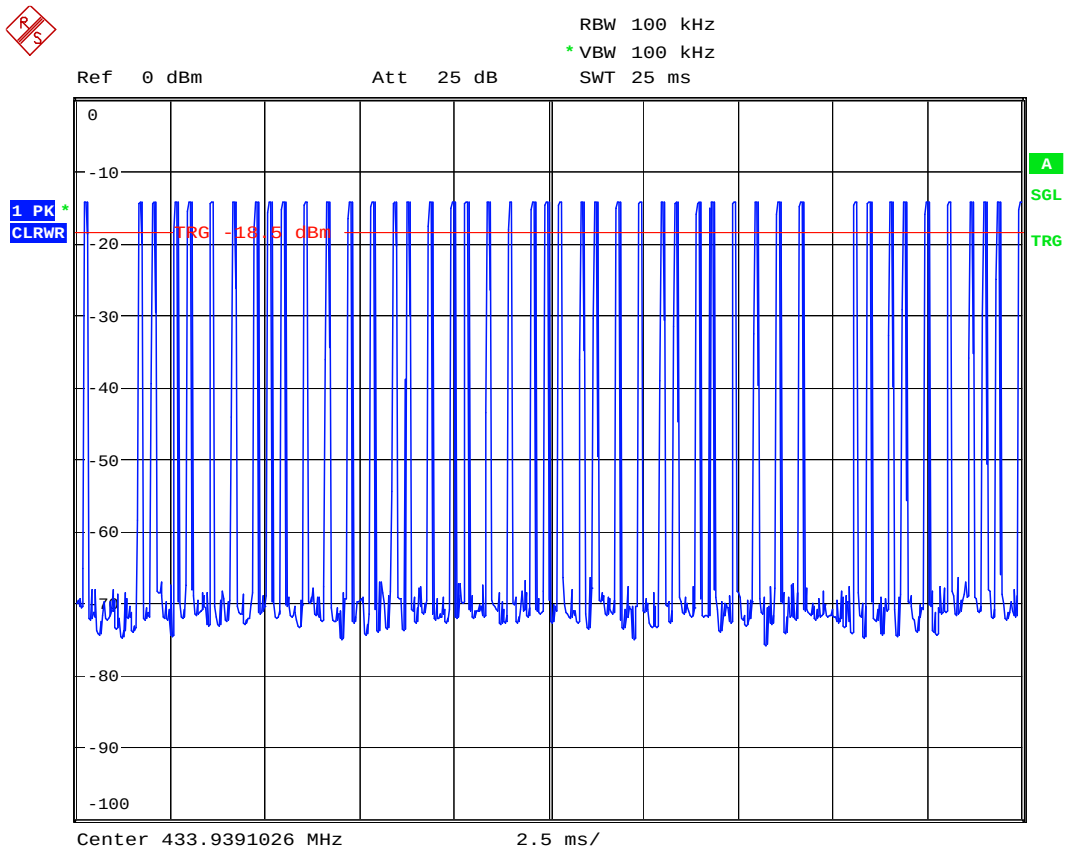
Registration number: W6M20709-8562-P-15
FCC ID: VHS-EWDC2

Duty Cycle



DUTY FACTOR
Date: 2.OCT.2007 18:49:17

Registration number: W6M20709-8562-P-15
FCC ID: VHS-EWDC2



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Date: 2.OCT.2007 18:50:51

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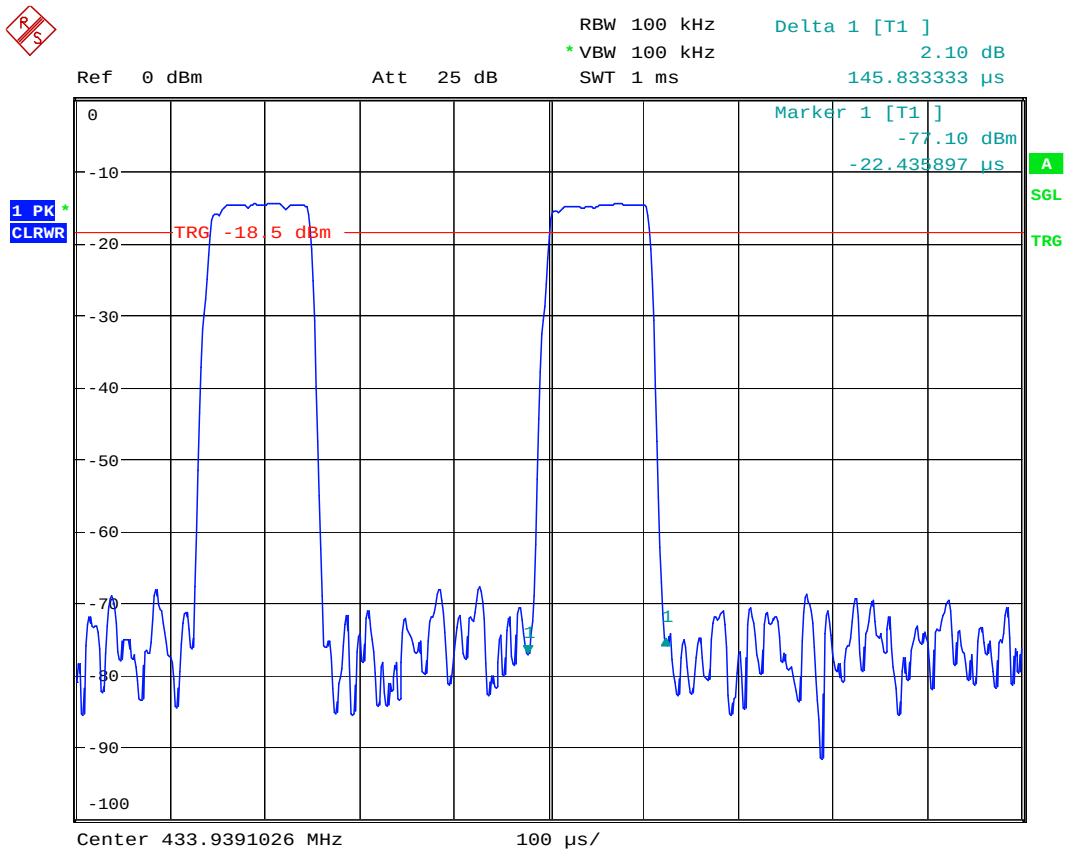
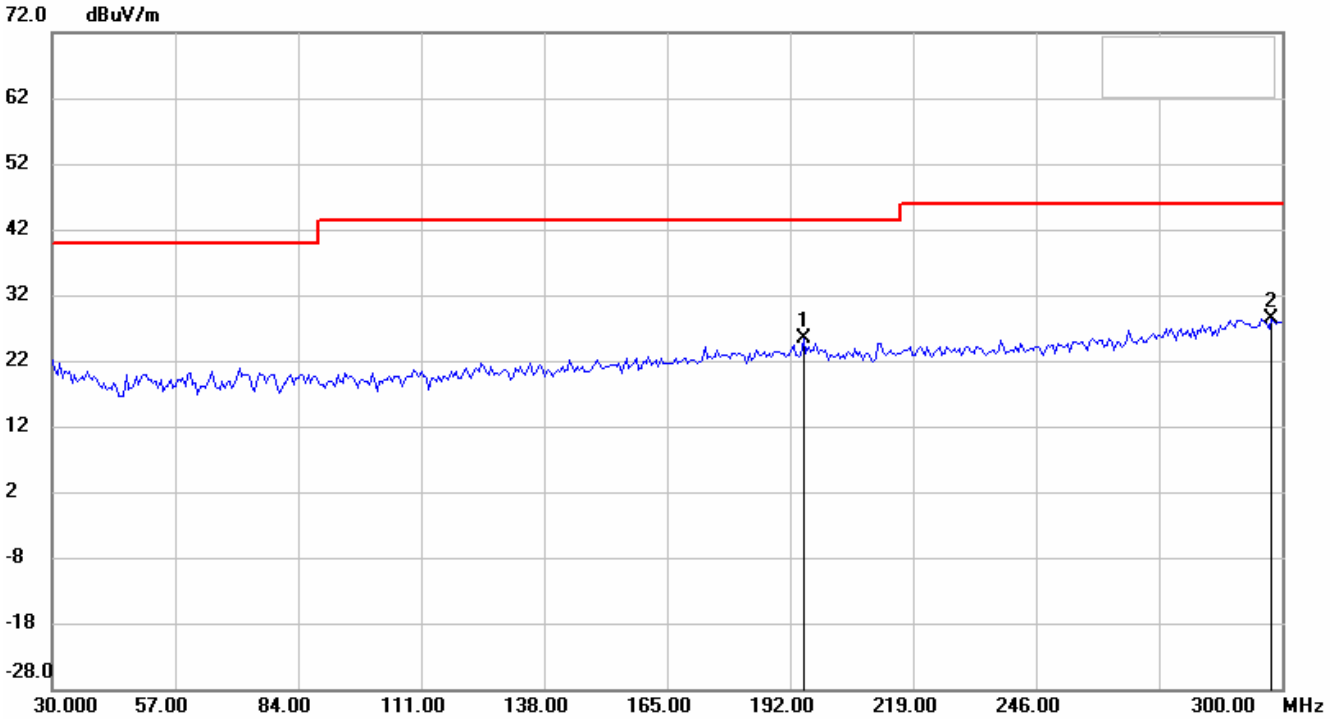


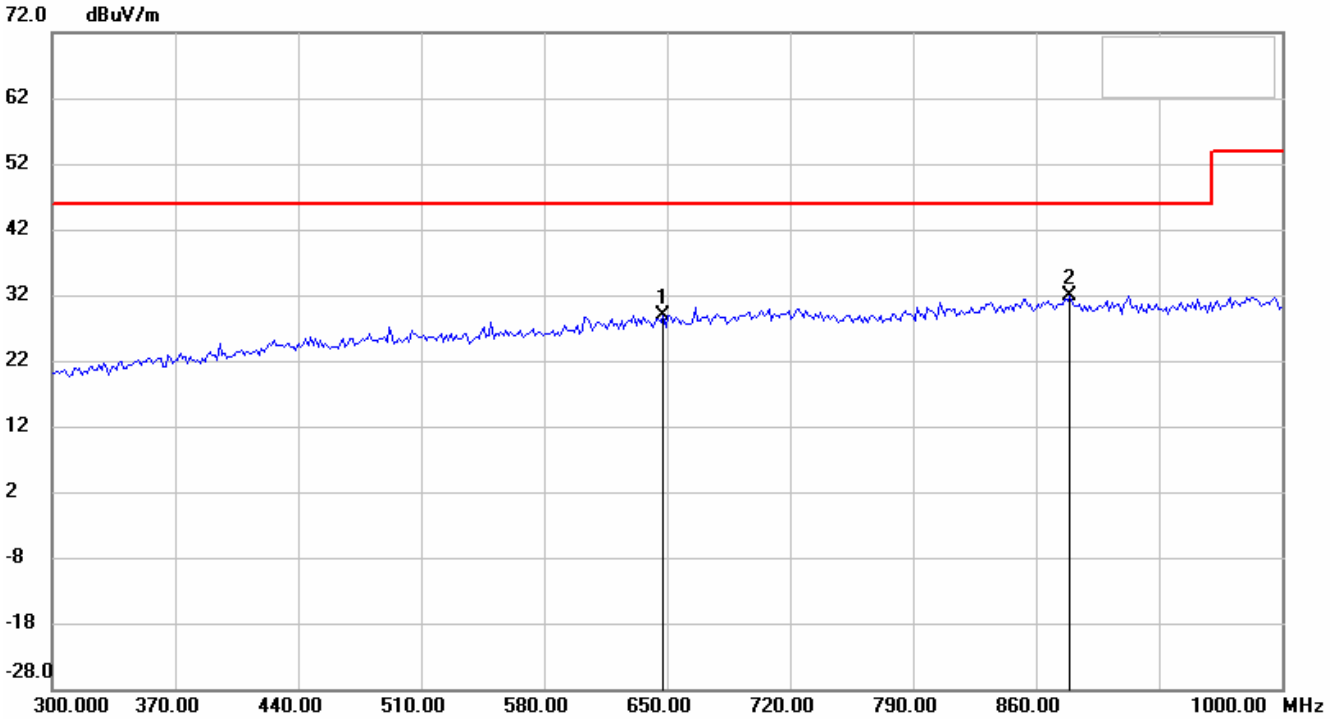
DUTY FACTOR

Date: 2.OCT.2007 18:51:40

Registration number: W6M20709-8562-P-15
FCC ID: VHS-EWDC2

Spurious Emissions radiated_Receiver
Antenna Polarization H





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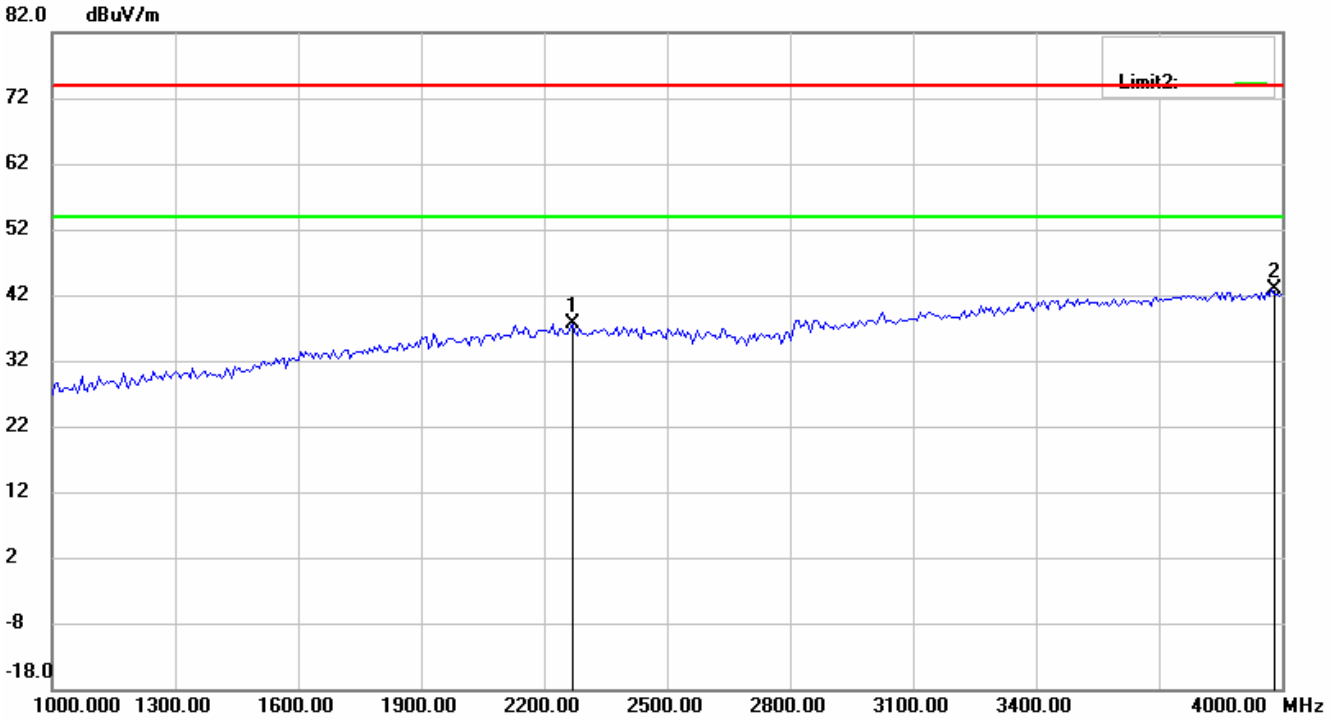
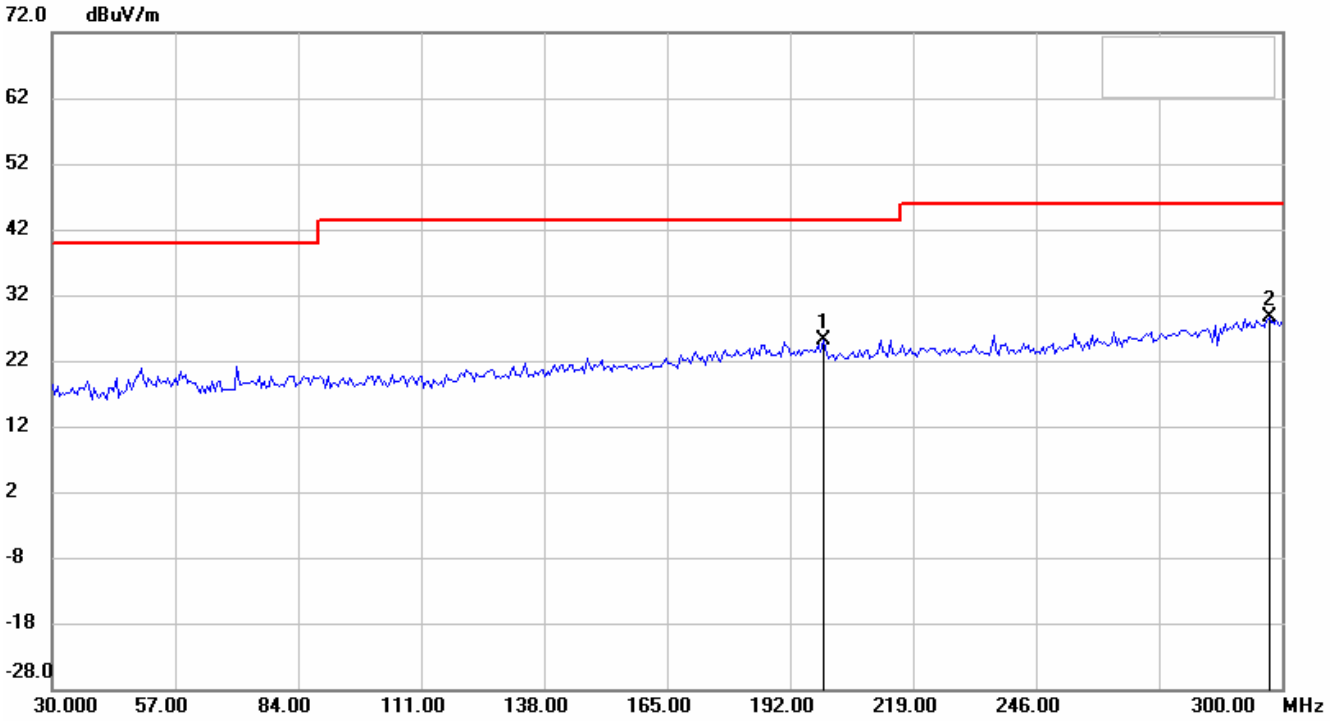


Antenna Polarization V



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