

FCC PART 15 SUBPART C TEST REPORT
for
The Wrist Transmitter
Model No.: WTRM

of

Applicant: **AlarmForce Industries Inc.**
Address: **675 Garyray Dr. North York ON M9L 1R2 Canada**

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.: 1983.02

PTCRB Accredited Type Certification Test House

FCC ID: SJLWTRM315

Report No.: W6M20711-8712-C-1

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Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

TABLE OF CONTENTS

| | |
|---|-----------|
| 1 GENERAL INFORMATION | 2 |
| 1.1 NOTES | 2 |
| 1.2 TESTING LABORATORY | 3 |
| 1.2.1 Location | 3 |
| 1.2.2 Details of accreditation status | 3 |
| 1.3 DETAILS OF APPROVAL HOLDER | 3 |
| 1.4 APPLICATION DETAILS | 4 |
| 1.5 TEST ITEM | 4 |
| 1.6 TEST STANDARDS | 5 |
| 2 TECHNICAL TEST | 5 |
| 2.1 SUMMARY OF TEST RESULTS | 5 |
| 2.2 TEST ENVIRONMENT | 5 |
| 2.3 TEST MODE | 5 |
| 2.4 TEST EQUIPMENT UTILIZED | 6 |
| 2.5 GENERAL TEST PROCEDURE | 8 |
| 3 TEST RESULTS (ENCLOSURE) | 9 |
| 3.1 TRANSMISSION REQUIREMENTS | 10 |
| 3.1.1 Limit of Transmission Time | 10 |
| 3.1.2 Active Time | 10 |
| 3.2 OUTPUT POWER (FIELD STRENGTH) | 11 |
| 3.3 OUT OF BAND RADIATED EMISSIONS | 12 |
| 3.4 TRANSMITTER RADIATED EMISSIONS IN RESTRICTED BANDS | 13 |
| 3.5 SPURIOUS EMISSION RADIATED, TRANSMITTER | 14 |
| 3.6 CHANNEL BANDWIDTH | 16 |
| 3.7 ANTENNA REQUIREMENT | 17 |
| 3.8 DUTY CYCLE | 18 |
| 3.9 CONDUCTED MEASUREMENT AT (AC) POWER LINE | 19 |
| APPENDIX | 20 |

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems. The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

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Tester:

November 27, 2007

Jay Chaing



Date

ETS-Lab.

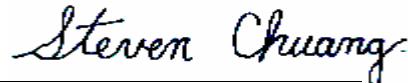
Name

Signature

Technical responsibility for area of testing:

November 27, 2007

Steven Chuang



Date

ETS

Name

Signature

Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

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: 1983.02

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: AlarmForce Industries Inc.
Street: 675 Garyray Dr. North York ON M9L 1R2
Town: ./.
Country: Canada
Telephone: 1-416-445-1547
Fax: 1-416-445-9381

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

1.4 Application details

Date of receipt of test item: November 23, 2007
Date of test: from November 23, 2007 to November 26, 2007

1.5 Test item

Description of test item: The Wrist Transmitter

Type identification: WTRM

Brand name: AlarmForce

Multi-listing model number: without

Transmitting frequency: 315 MHz

Operation mode: simplex

Voltage supply: CR2032 3V Lithium battery

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

Highest clock frequency: 315 MHz

Antenna type: PCB antenna

Photos: see Appendix

Manufacturer (if applicable)

Name: ./

Street: ./

Town: ./

Country: ./

Additional information: ./

Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

1.6 Test standards

Technical standard : FCC RULES PART 15 SUBPART C § 15.231 (a) (2007-09)

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: CR2032 3V Lithium battery

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.

Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

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 | 2007/10/23 | 2009/10/22 |
| 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 | 2007/11/2 | 2009/11/1 |
| 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 | 2007/10/29 | 2008/10/28 |
| ETSTW-RE 002 | Function Generator | 33220A | MY43004982 | Agilent | 2007/10/12 | 2009/10/11 |
| ETSTW-RE 004 | EMI TEST RECEIVER | ESI 40 | 832427/004 | R&S | 2007/10/29 | 2008/10/28 |
| 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 | 2007/11/7 | 2010/11/6 |
| 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 | 2009/10/15 |
| 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 047 | ESA-E SERIES SPECTRUM ANALYZER | E4445A | MY46181369 | Agilent | 2007/7/19 | 2008/7/18 |
| ETSTW-RE 048 | Triple Loop Antenna | HXYZ 9170 | HXYZ 9170-134 | Schwarzbeck | 2005/3/22 | 2008/3/21 |

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

| | | | | | | |
|--------------|-------------------------------------|-------------|------------|-------------|---------------|-----------|
| 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 |

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

2.5 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 5.2 using a 50 μ H LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

RADIATION INTERFERENCE: The test procedure used was 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 dB μ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

| | |
|------------|--|
| Freq (MHz) | METER READING + ACF + CABLE LOSS (to the receiver) = FS |
| 33 | 20 dB μ V + 10.36 dB/m + 6 dB = 36.36 dB μ V/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.

Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

3 Test results (enclosure)

1st test test after modification production test

| TEST CASE | Para. Number | Required | Test passed | Test failed |
|--|---------------|-------------------------------------|-------------------------------------|--------------------------|
| Transmission Requirements | FCC 15.231(a) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Radiated Emission | FCC 15.231(b) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Bandwidth of Emission | FCC 15.231(c) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Frequency Tolerance | FCC 15.231(d) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Period Alternate Field Strength Requirements | FCC 15.231(e) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Antenna Requirement | FCC 15.203 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Conducted Measurement at (AC) Power Line | FCC 15.207 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The follows is intended to leave blank.

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

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 _____ms of being released.
- This transmitter is operated by automatic activation and active will cease transmission in 1.230769 s after activation.

Explanation: See attached appendix.

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

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

3.2 Output Power (Field Strength)

Model: WTRM Date: 2007/11/23
 Mode: TX POWER Temperature: 26 °C Engineer: Danny
 Polarization: Horizontal Humidity: 60 %

| Frequency (MHz) | Reading (dB μ V) Peak | Factor (dB) Corr. Duty | Result @3m (dB μ V/m) Peak Ave. | Limit @3m (dB μ V/m) Peak Ave. | Margin (dB) | Table Degree (Deg.) | Ant. High (cm) |
|--------------------|---------------------------------|------------------------------|---|--|----------------|---------------------------|-------------------|
| 315 | 54.7575 | 15.71 -18.94 | 70.47 51.53 | 95.62 75.62 | -24.09 | 145 | 150 |

Polarization: Vertical

| Frequency (MHz) | Reading (dB μ V) Peak | Factor (dB) Corr. Duty | Result @3m (dB μ V/m) Peak Ave. | Limit @3m (dB μ V/m) Peak Ave. | Margin (dB) | Table Degree (Deg.) | Ant. High (cm) |
|--------------------|---------------------------------|------------------------------|---|--|----------------|---------------------------|-------------------|
| 315 | 36.4275 | 15.71 -18.94 | 52.14 33.2 | 95.62 75.62 | -42.42 | 150 | 150 |

Limit 15.231(b)

| Fundamental Frequency (MHz) | Field strength of fundamental, limit μ V/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** (315 MHz: 75.62 dB μ V/m = 6041.6772 μ V/m) |
| Above 470 | 12,500 |

** linear interpolation

Explanation: See attached appendix.

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

ETSTW-RE 043

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

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

75.62 dB μ V/m- 20 dB= 55.62 dB μ V/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 = $20 \log (\text{dwell time}/100\text{ms})$

For frequencies above 1GHz (Peak measurements).

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

55.62 dB μ V/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:

75.62 dB μ V/m- 20 dB= 55.62 dB μ V/m

Test equipment used: ETSTW-RE 004, ETSTW-RE 017, ETSTW-RE 028, ETSTW-RE 029,

ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043, ETSTW-RE 044

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

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 follows:

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 time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

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

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: $54 \text{ dB}\mu\text{V/m} + 20 \text{ dB} = 74 \text{ dB}\mu\text{V/m}$

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

3.5 Spurious Emission radiated, Transmitter

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

| Model: | WTRM | Date: | 2007/11/23 | | | | | | |
|--------------------|---------------------------|-----------------|--------------------|--------------------|-------------------|-------------------|----------------|---------------------------|-------------------|
| Mode: | TX | Temperature: | 26 °C | | | | | Engineer: Danny | |
| Polarization: | Horizontal | Humidity: | 60 % | | | | | | |
| Frequency (MHz) | Reading Peak (dBuV) | Factor Corr. | Result @3m Peak | Result @3m Ave. | Limit @3m Peak | Limit @3m Ave. | Margin (dB) | Table Degree (Deg.) | Ant. High (cm) |
| 630.167 | 15.21 | 22.39 | -18.94 | 37.60 | 18.66 | 75.62 | 55.62 | -36.96 | 140 |
| 945.167 | 13.03 | 27.17 | -18.94 | 40.20 | 21.26 | 75.62 | 55.62 | -34.36 | 135 |
| 1260.000 | 76.56 | -12.58 | -18.94 | 63.98 | 45.04 | 75.62 | 55.62 | -10.58 | 140 |
| 1260.000 | 57.62 | -12.58 | -18.94 | 45.04 | 26.10 | 75.62 | 55.62 | -29.52 | 140 |
| 1575.000 | 72.60 | -9.90 | -18.94 | 62.70 | 43.76 | 74.00 | 54.00 | -10.24 | 145 |
| 1575.000 | 53.66 | -9.90 | -18.94 | 43.76 | 24.82 | 74.00 | 54.00 | -29.18 | 145 |
| 1890.000 | 66.59 | -8.14 | -18.94 | 58.45 | 39.51 | 75.62 | 55.62 | -16.11 | 150 |
| 1890.000 | 47.65 | -8.14 | -18.94 | 39.51 | 20.57 | 75.62 | 55.62 | -35.05 | 150 |
| 2203.333 | 65.31 | -5.89 | -18.94 | 59.42 | 40.48 | 74.00 | 54.00 | -13.52 | 150 |
| 2203.333 | 46.37 | -5.89 | -18.94 | 40.48 | 21.54 | 74.00 | 54.00 | -32.46 | 150 |
| 2520.000 | 61.03 | -4.96 | -18.94 | 56.07 | 37.13 | 75.62 | 55.62 | -18.49 | 145 |
| 2520.000 | 42.09 | -4.96 | -18.94 | 37.13 | 18.19 | 75.62 | 55.62 | -37.43 | 145 |
| 2836.667 | 59.57 | -3.45 | -18.94 | 56.12 | 37.18 | 74.00 | 54.00 | -16.82 | 140 |
| 2836.667 | 40.63 | -3.45 | -18.94 | 37.18 | 18.24 | 74.00 | 54.00 | -35.76 | 140 |
| 3150.000 | 59.49 | -2.35 | -18.94 | 57.14 | 38.2 | 75.62 | 55.62 | -17.42 | 140 |
| 3150.000 | 40.55 | -2.35 | -18.94 | 38.2 | 19.26 | 75.62 | 55.62 | -36.36 | 150 |
| 2203.333 | 65.31 | -5.89 | -18.94 | 59.42 | 40.48 | 74.00 | 54.00 | -13.52 | 150 |

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

Polarization: Vertical

| Frequency (MHz) | Reading Peak | Factor (dB) | | Result @3m Peak Ave. | | Limit @3m Peak Ave. | | Margin (dB) | Table Degree (Deg.) | Ant. High (cm) |
|--------------------|-----------------|----------------|--------|-------------------------|-------|------------------------|-------|----------------|---------------------------|-------------------|
| | | Corr. | Duty | Peak | Ave. | Peak | Ave. | | | |
| 630.167 | 21.88 | 22.39 | -18.94 | 44.27 | 25.33 | 75.62 | 55.62 | -30.29 | 135 | 150 |
| 945.167 | 6.88 | 27.17 | -18.94 | 34.05 | 15.11 | 75.62 | 55.62 | -40.51 | 140 | 150 |
| 1260.000 | 74.66 | -12.58 | -18.94 | 62.08 | 43.14 | 75.62 | 55.62 | -12.48 | 145 | 150 |
| 1260.000 | 55.72 | -12.58 | -18.94 | 43.14 | 24.20 | 75.62 | 55.62 | -31.42 | 145 | 150 |
| 1575.000 | 64.51 | -9.90 | -18.94 | 54.61 | 35.67 | 74.00 | 54.00 | -18.33 | 140 | 150 |
| 1575.000 | 45.57 | -9.90 | -18.94 | 35.67 | 16.73 | 74.00 | 54.00 | -37.27 | 140 | 150 |
| 1890.000 | 64.90 | -8.14 | -18.94 | 56.76 | 37.82 | 75.62 | 55.62 | -17.80 | 135 | 150 |
| 1890.000 | 45.96 | -8.14 | -18.94 | 37.82 | 18.88 | 75.62 | 55.62 | -36.74 | 135 | 150 |
| 2203.333 | 68.66 | -5.89 | -18.94 | 62.77 | 43.83 | 74.00 | 54.00 | -10.17 | 150 | 150 |
| 2203.333 | 49.72 | -5.89 | -18.94 | 43.83 | 24.89 | 74.00 | 54.00 | -29.11 | 150 | 150 |
| 2520.000 | 60.45 | -4.96 | -18.94 | 55.49 | 36.55 | 75.62 | 55.62 | -19.07 | 150 | 150 |
| 2520.000 | 41.51 | -4.96 | -18.94 | 36.55 | 17.61 | 75.62 | 55.62 | -38.01 | 150 | 150 |
| 2836.667 | 55.95 | -3.45 | -18.94 | 52.50 | 33.56 | 74.00 | 54.00 | -20.44 | 145 | 150 |
| 3150.000 | 53.12 | -2.35 | -18.94 | 50.77 | 31.83 | 75.62 | 55.62 | -23.79 | 140 | 150 |

Note

- 1. Correction Factor = Antenna factor + Cable loss - Preamplifier**
- 2. The formula of measured value as: Test Result = Reading + Correction Factor**
- 3. Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
- 4. All not in the table noted test results are more than 20 dB below the relevant limits.**
- 5. See attached diagrams as appendix.**

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

Test results: The unit meets the FCC requirements.

Test equipment used: ETSTW-RE 004, ETSTW-RE 017, ETSTW-RE 028, ETSTW-RE 029,

ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043, ETSTW-RE 044

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

3.6 Channel Bandwidth

Measurement of Necessary Bandwidth (BN)

| Used frequency | Bandwidth | Limit |
|----------------|------------------|------------|
| 315 MHz | 53.846153846 kHz | 0.7875 MHz |

Explanation: The bandwidth fulfills the requirements of FCC § 15.231,
See attached appendix.

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 004, ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 042, ETSTW-RE 043

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

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.

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

| | | |
|--------------------------------------|--|--------------------------------|
| The equipment meets the requirements | yes <input checked="" type="checkbox"/> | no <input type="checkbox"/> |
|--------------------------------------|--|--------------------------------|

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

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 = $20 \log (\text{Cycle})$

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 $20 * \log(\text{Duty Cycle})$ |
|--------------|---------------|-----------|------------|---|
| Mode | 100 | 11.295 | 0.11295 | -18.94 |

Explanation: See attached appendix.

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

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

3.9 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 below 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 transacted 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 (dB μ V/m) | average (dB μ V/m) |
| -- kHz | -- | -- |

Limits:

| Frequency of Emission (MHz) | Conducted Limit (dB μ V) | |
|-----------------------------|------------------------------|----------|
| | Quasi Peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| | 56 | 46 |
| | 60 | 50 |

Explanation: This test is not required because the sample uses a battery.

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

Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

Appendix

A Measurement diagrams

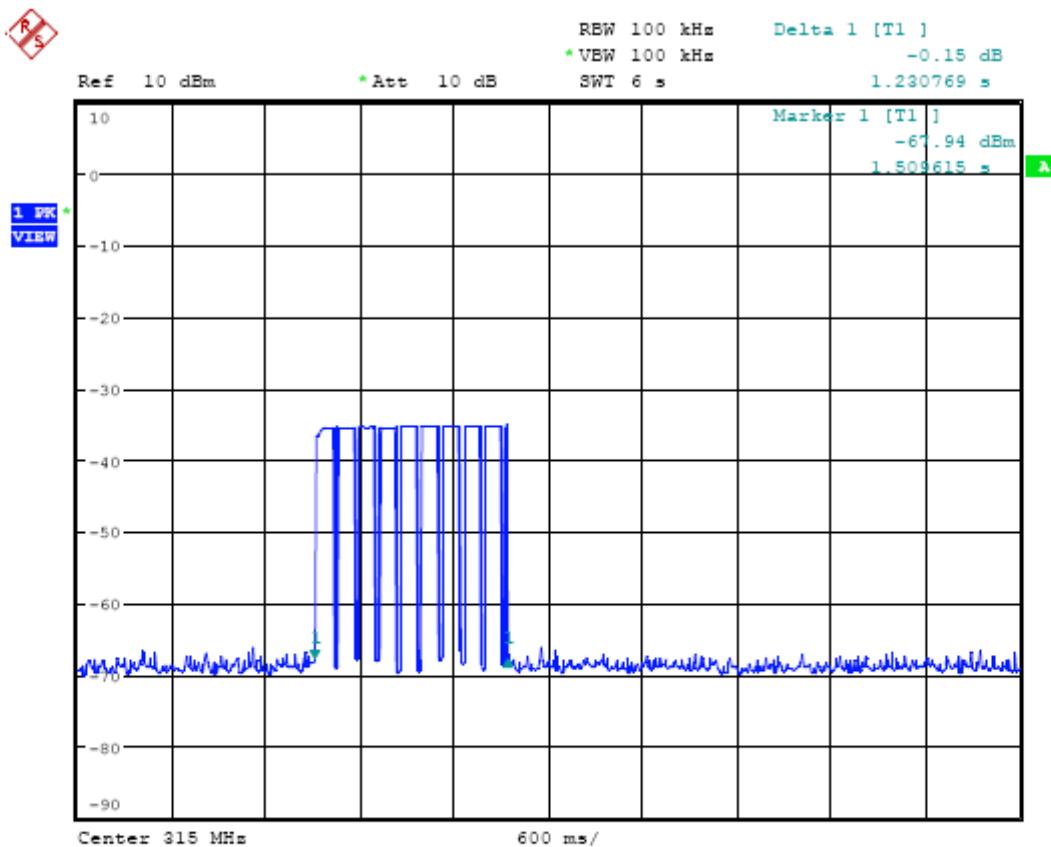
1. Active Time
2. Output Power
3. Spurious Emissions radiated
4. Bandwidth
5. Duty Cycle

B Photos

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

Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

Active Time

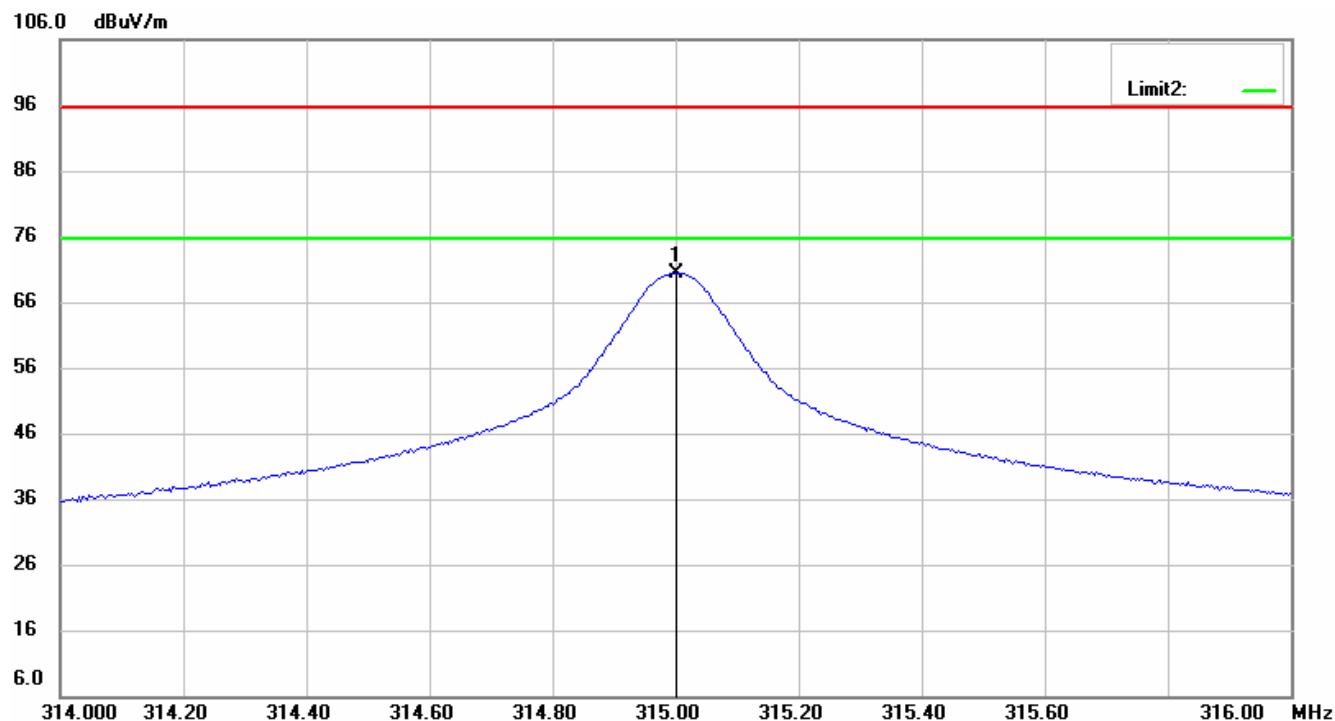


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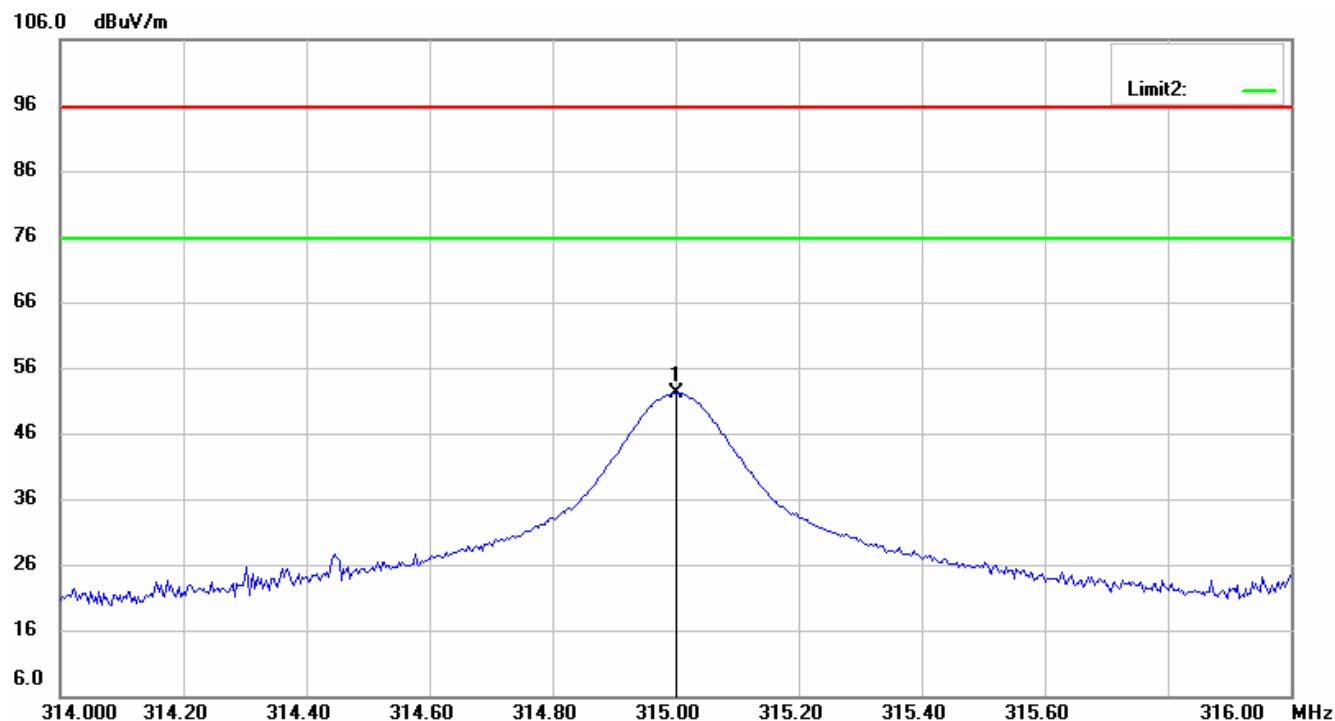
Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

Output Power

Antenna Polarization H

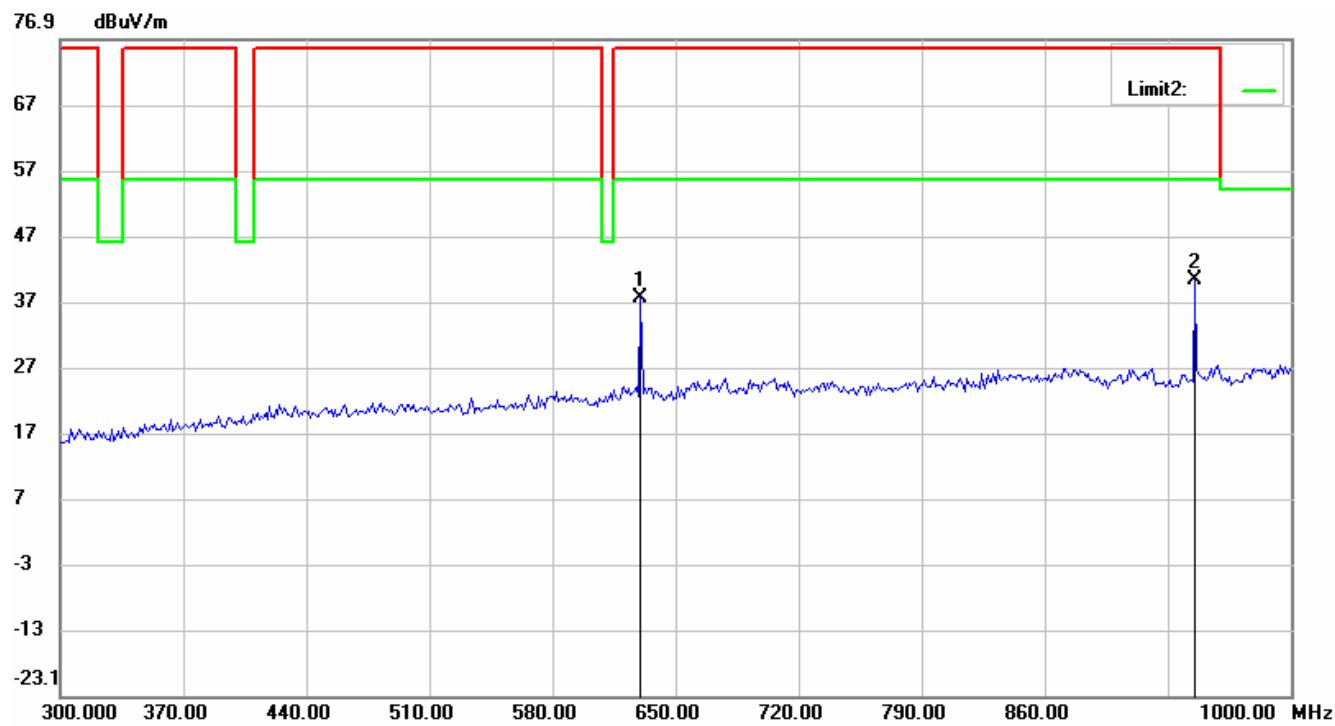
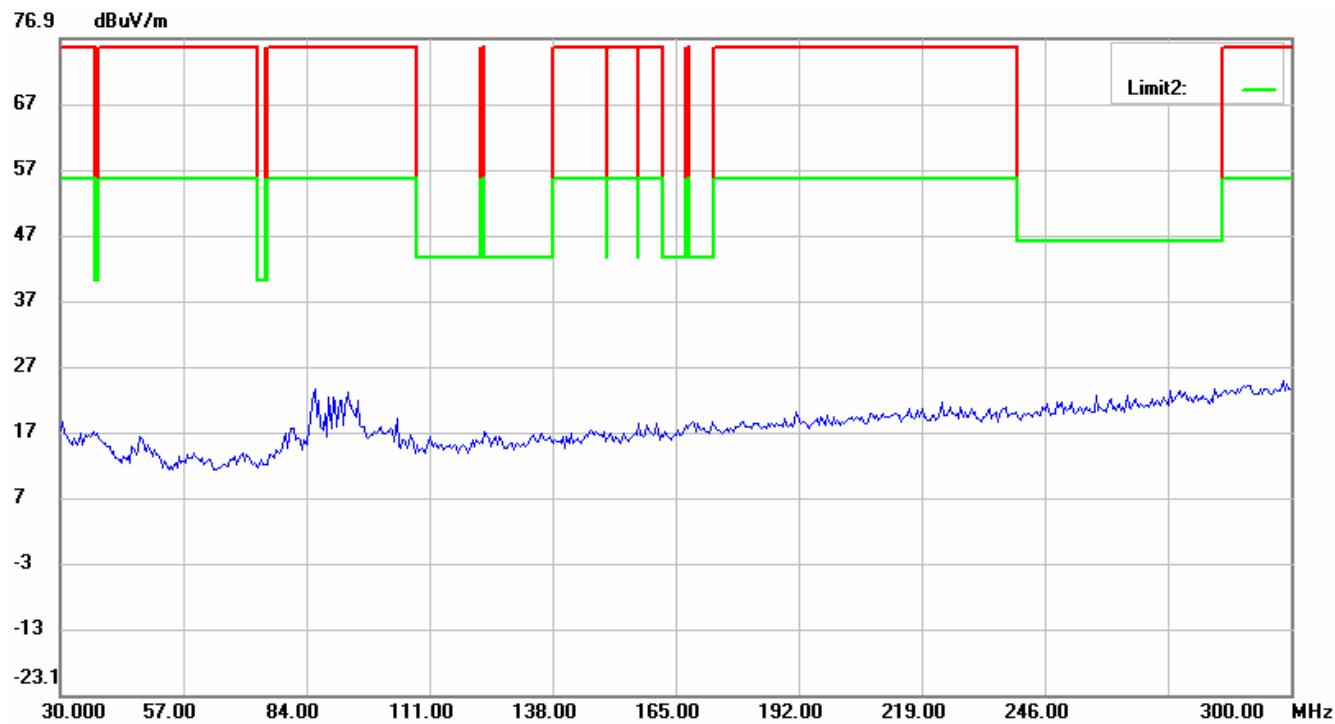


Antenna Polarization V

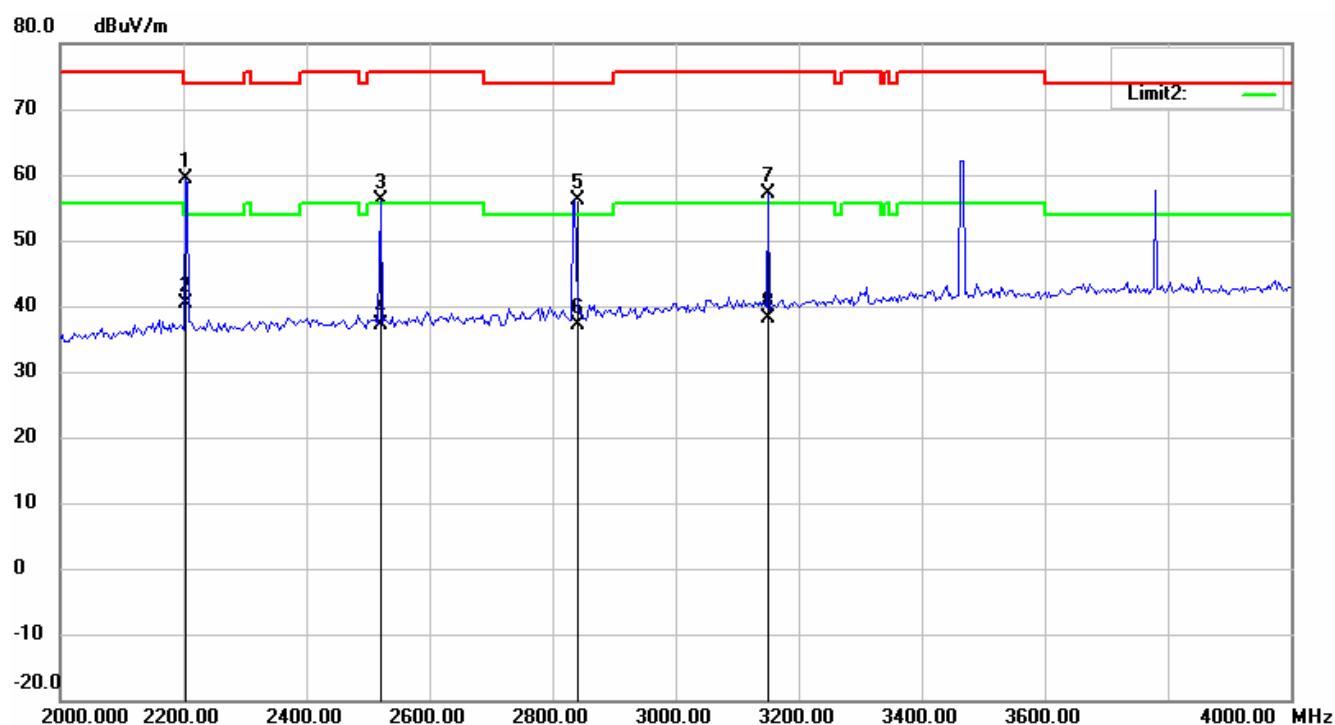
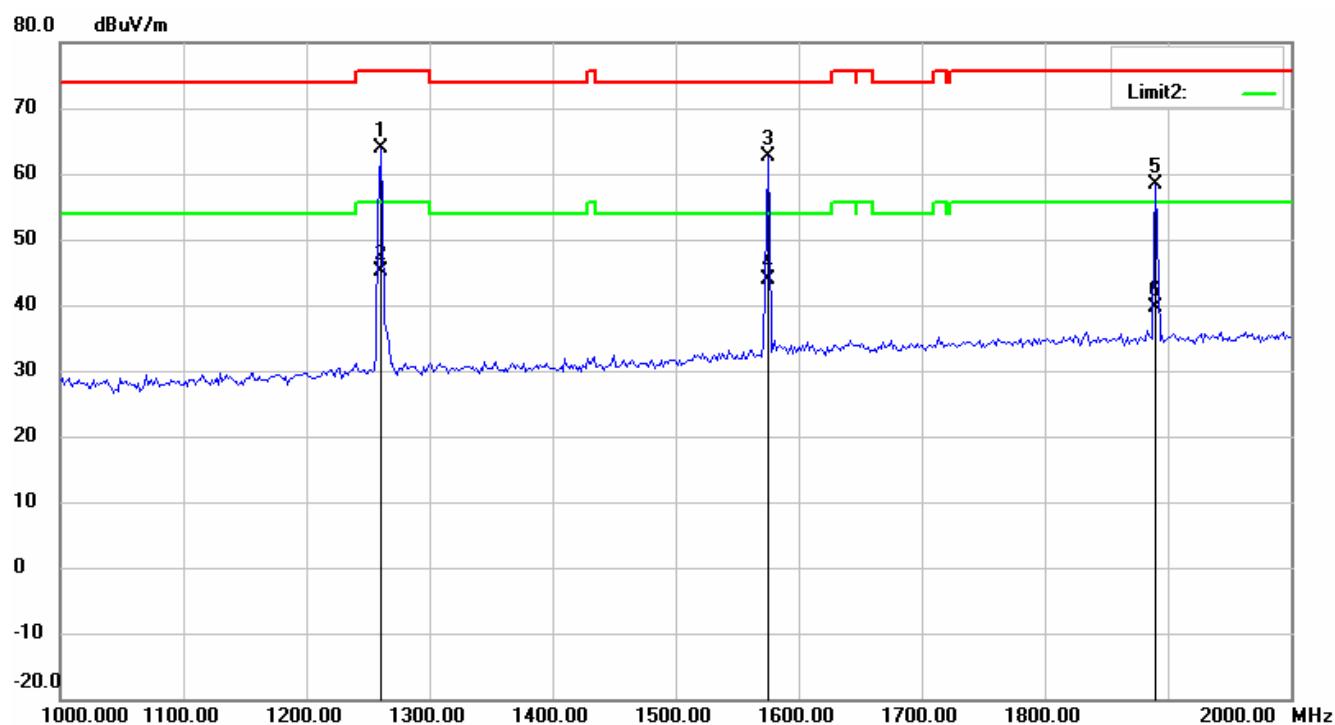


Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

Spurious Emissions radiated
Antenna Polarization H

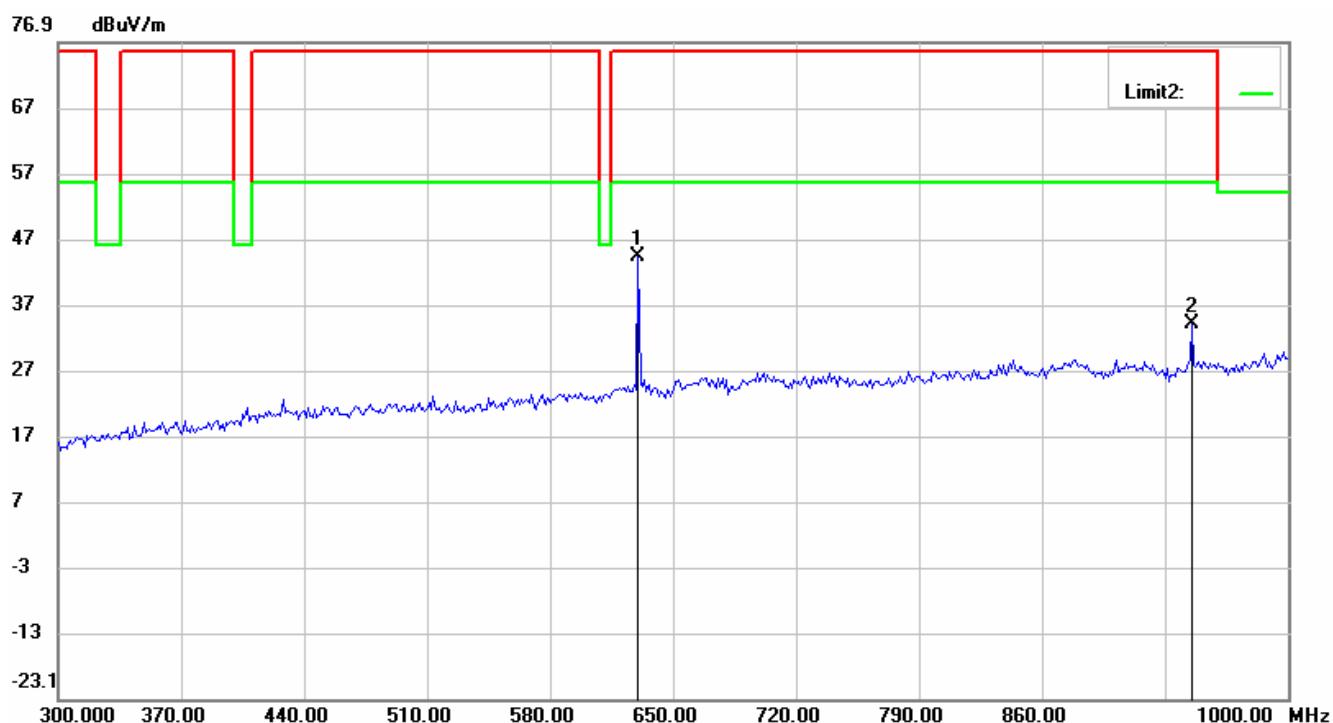
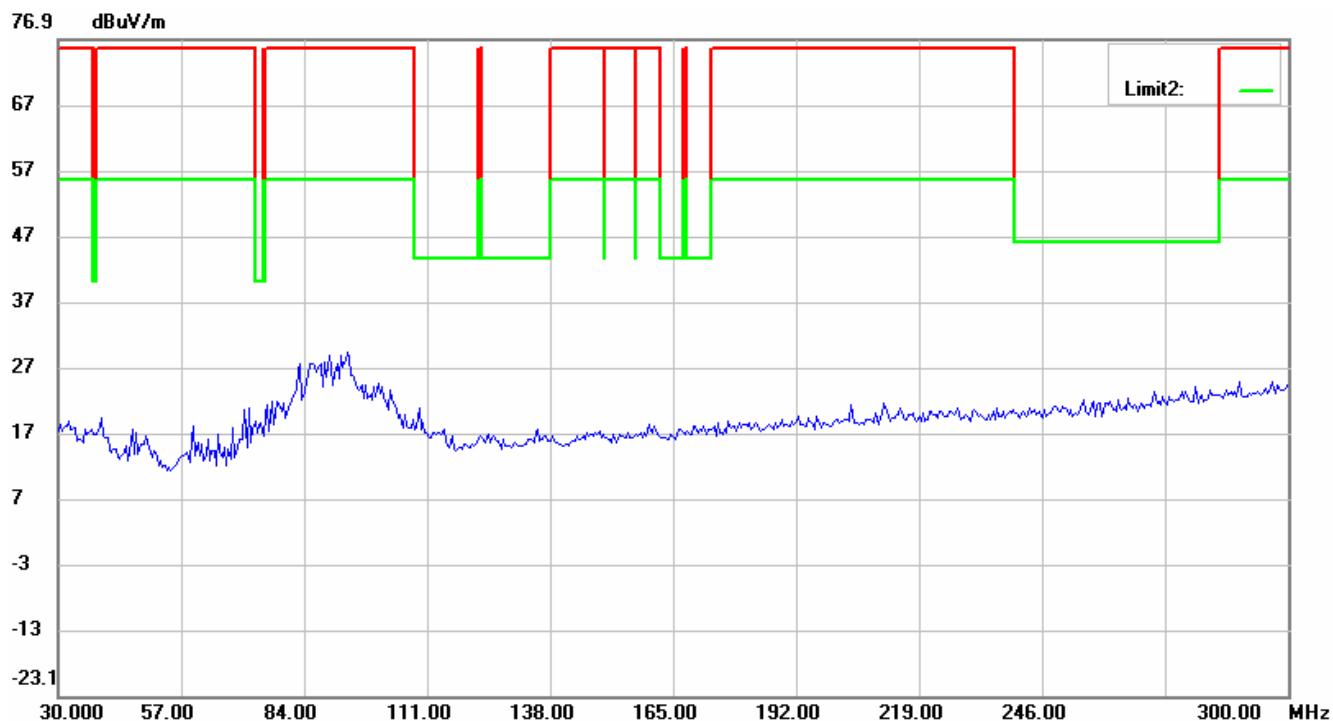


Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

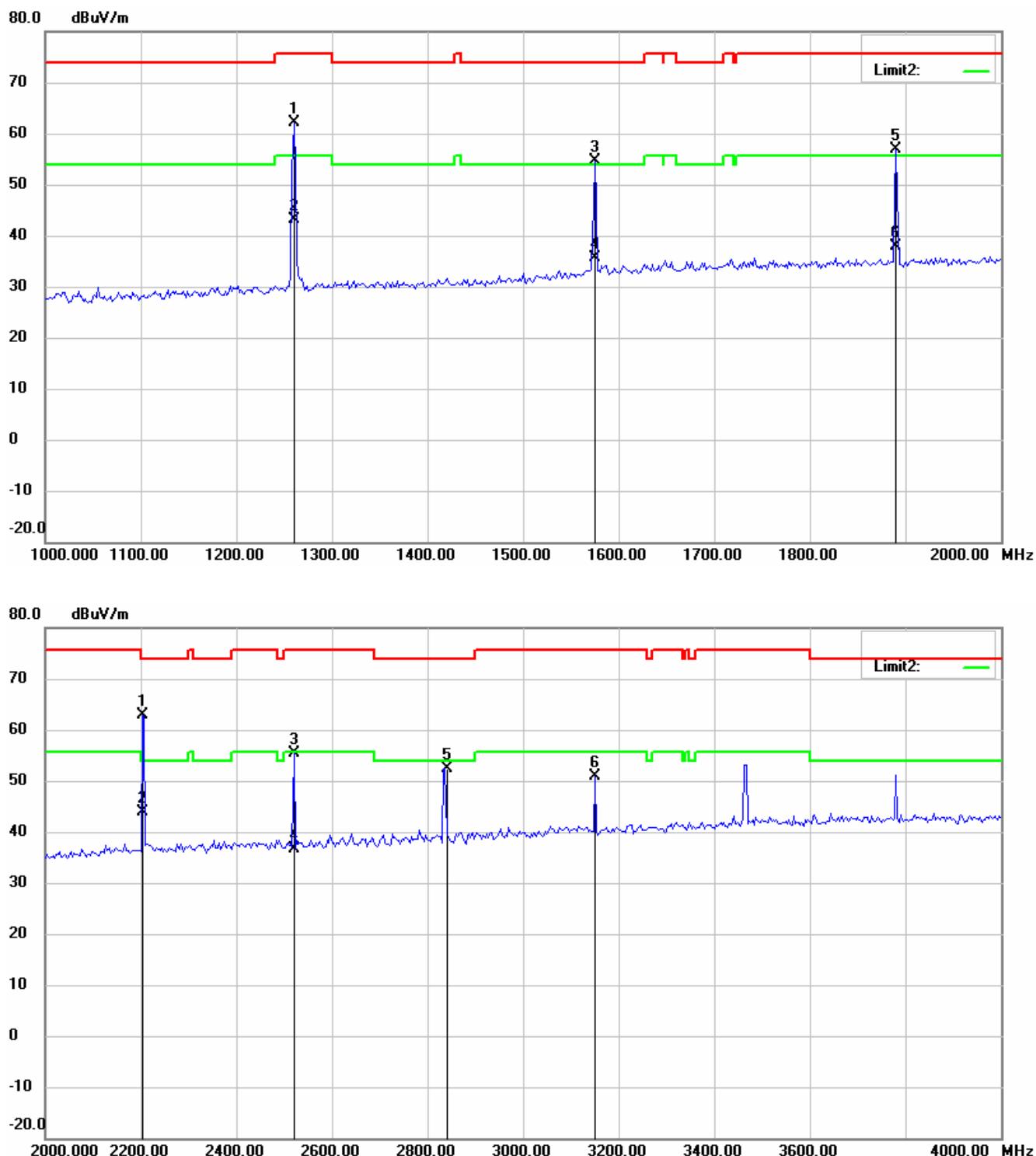


Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

Antenna Polarization V



Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315



Up Line: Peak Limit Line

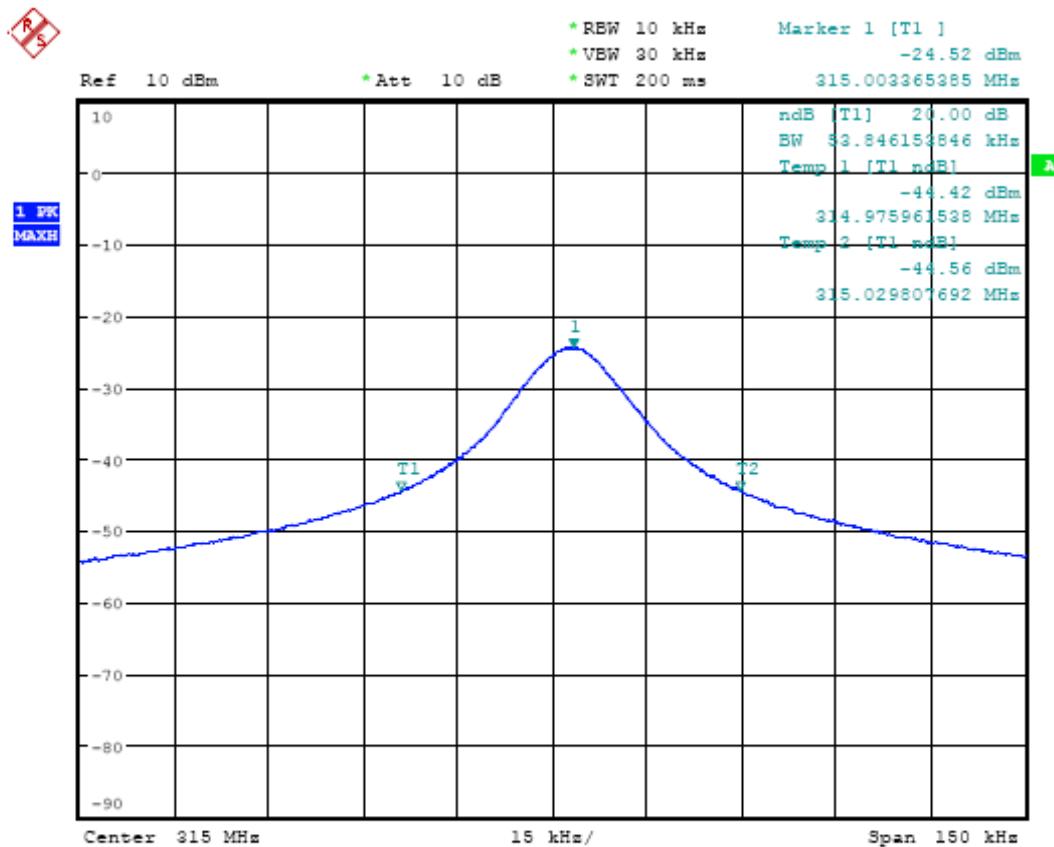
Down Line: Ave Limit Line

Note:

1. The plots are pre-scanned data for determining the tested points and for reference only.
2. The exact test result is shown in the data table of Radiated emission test of this test report.

Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

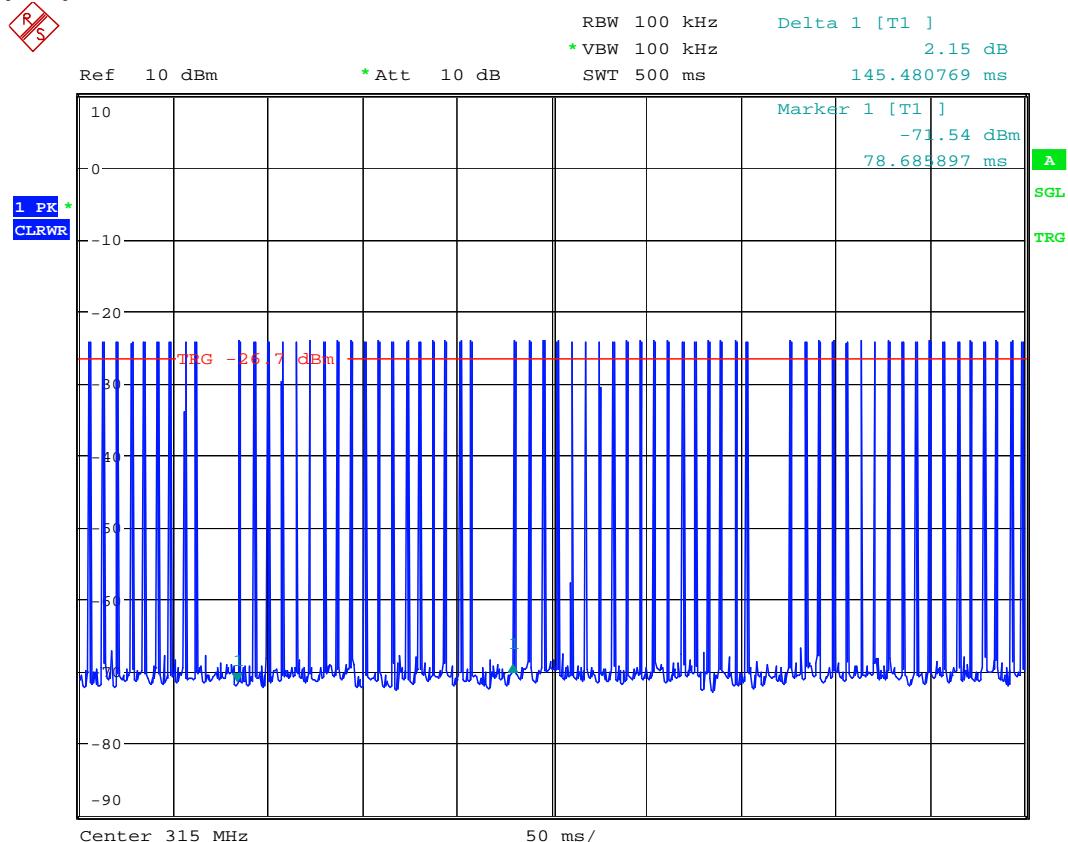
Bandwidth



20DB BANDWITH
Date: 23.NOV.2007 19:24:58

Registration number: W6M20711-8712-C-1
FCC ID: SJLWTRM315

Duty Cycle

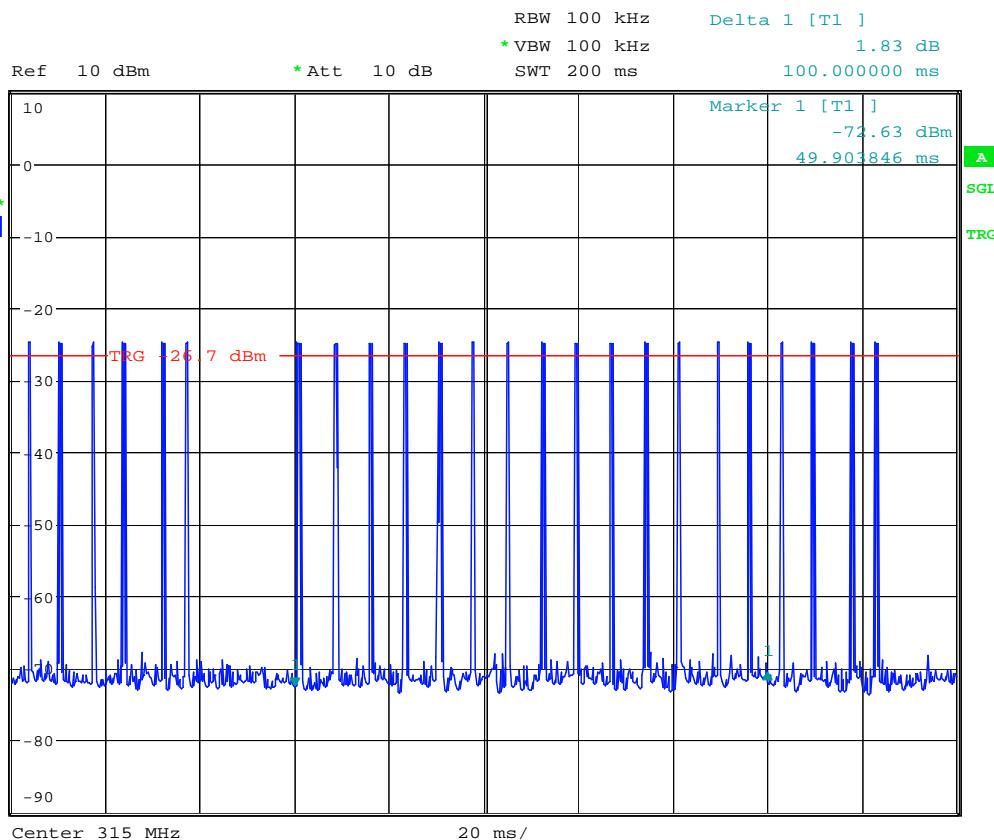


DUDY CYCLE

Date: 23.NOV.2007 19:20:55

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

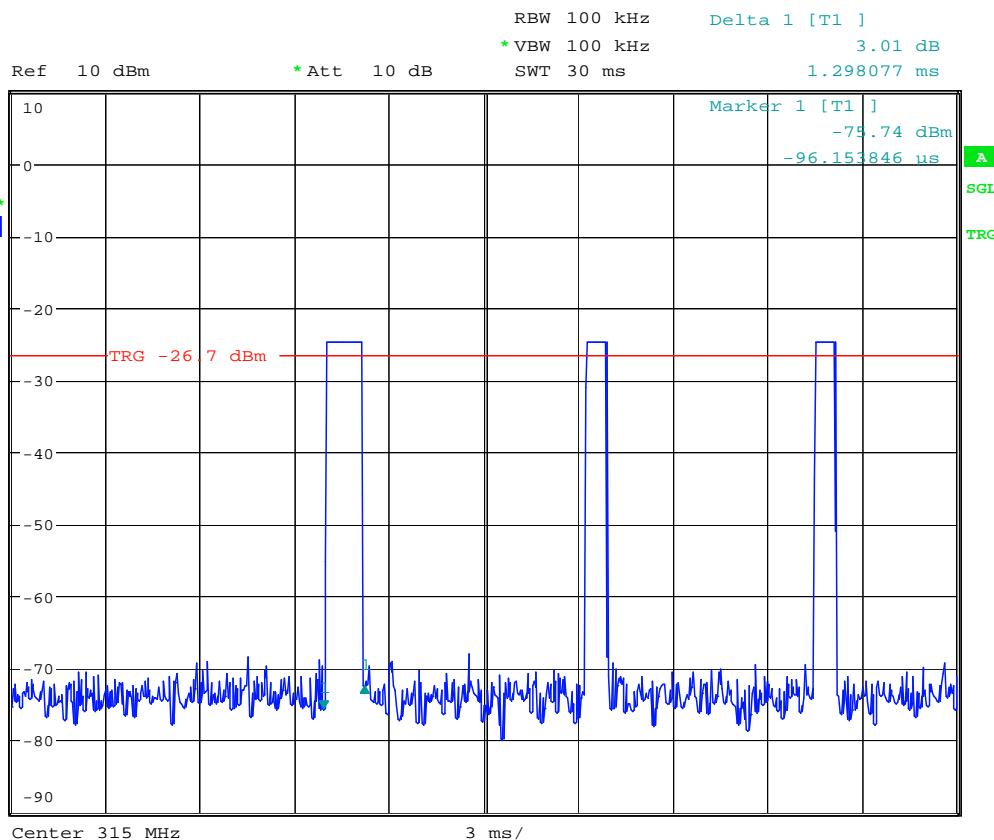
RS

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Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

RS

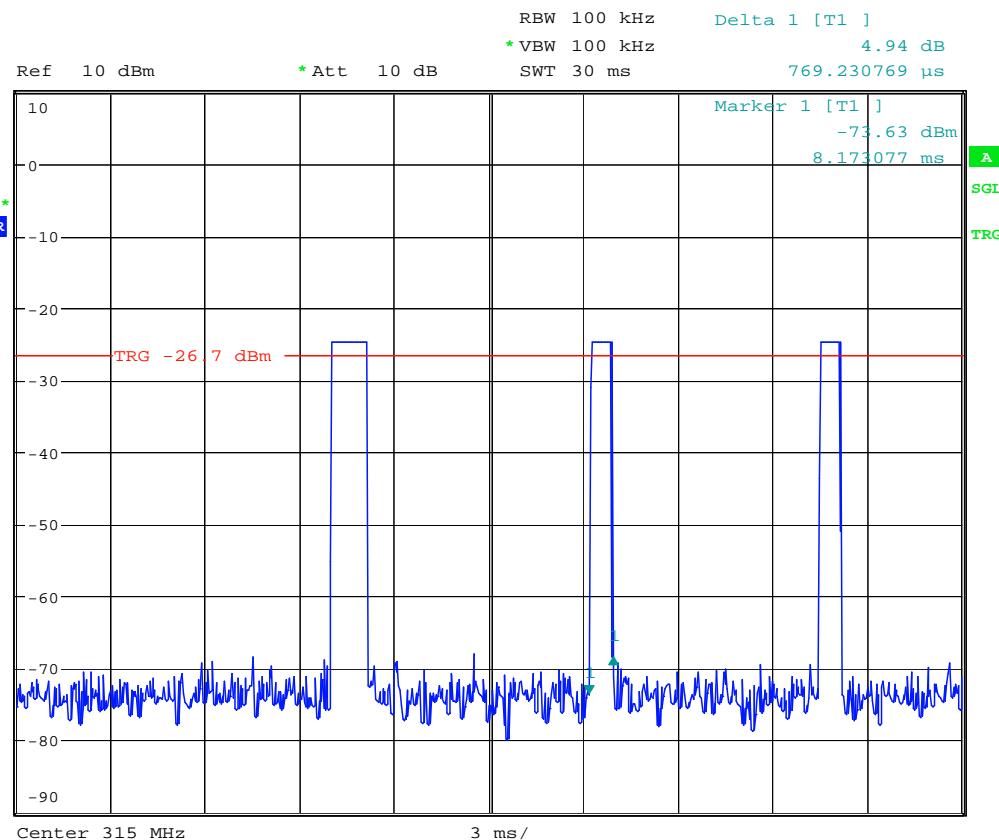
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Date: 23.NOV.2007 19:23:27

Registration number: W6M20711-8712-C-1

FCC ID: SJLWTRM315

RS



DUDY CYCLE

Date: 23.NOV.2007 19:23:45