FCC PART 15 SUBPART C / IC RSS-210 TEST REPORT

for

TPMS

Model No.: TP1-001

FCC ID: XVBW1C01

IC: 9368A-W1C01

of

Applicant: Standard Motor Products, Inc Address: 37-18 Northern Boulevard, Long Island City, New York 11101, United States

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1

A2LA Accredited No.: 2732.01





Report No.: W6M21212-12905-C-1

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



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

TABLE OF CONTENTS

1	General Information	2
1.1	Notes	2
1.2	Testing laboratory	3
1.	1.2.1 Location	3
1.	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	4
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	10
3	Test results (enclosure)	11
3.1	Transmission Requirements	12
3.	3.1.1 Limit of Transmission Time	12
3.	3.1.2 Results for the duration and silent period measurement	12
3.2	Output Power (Field Strength)	13
3.3	Out of Band Radiated Emissions	14
3.4	Transmitter Radiated Emissions in restricted Bands	15
3.5	Spurious Emission radiated, Transmitter	16
3.6	Channel Bandwidth	18
3.7	Antenna requirement	19
3.8	Duty Cycle	20
3.9	Conducted Measurement at (AC) Power Line	21
3.10	0 Equipment Modification	22

Appendix: Diagrams and photos



FCC ID: XVBW1C01 IC: 9368A-W1C01

1 General Information

1.1 Notes

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

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

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

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

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

The test report may only be reproduced or published in full.

Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services (Taiwan) Co., Ltd.

Tester:

January 10, 2013		Leon Chueh	leon	Chueh
Date	WTS-Lab.	Name	Signatur	e

Technical responsibility for area of testing:

January 10, 2013		Danny Sung	Danky Sung
Date	WTS	Name	Signature



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

1.2 Testing laboratory

1.2.1 Location

OATS

No.5-1, Lishui, Shuang Sing Village, Wanli Dist., New Taipei City 207,

Taiwan (R.O.C.)

3 meter semi-anechoic chamber

No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

TEL:886-2-6613-0228 FAX:886-2-2791-5046

Company

Worldwide Testing Services(Taiwan) Co., Ltd. 6F, NO. 58, LANE 188, RUEY-KUANG RD. NEIHU, TAIPEI 114, TAIWAN R.O.C.

Tel : 886-2-66068877 Fax : 886-2-66068875

1.2.2 Details of accreditation status

Accredited testing laboratory
A2LA accredited number: 2732.01
FCC filed test laboratory Reg. No. 930600
Industry Canada filed test laboratory Reg. No. IC 5679A-1





1.3 Details of approval holder

Name: Standard Motor Products, Inc. Street: 37-18 Northern Boulevard,

Town: Long Island City, New York 11101

 Country:
 United States

 Telephone:
 718-316-4571

 Fax:
 718-786-8247



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

1.4 Application details

Date of receipt of test item: December 04, 2012

Date of test from December 05, 2012 to January 09, 2013

1	5	T	est	ite	m
			-JL	11.	7 I I I

Description of test item: TPMS

Type identification: TP1-001

Brand name: Standard Motor Products, Inc.

Multi-listing model number: TP1-002, TP1-004, TP1-005, TP1-006

Transmitting frequency: 315 MHz

Operation mode: simplex

Voltage supply: Battery 3VDC

(The device is tested under fresh battery condition.)

Highest clock frequency: 315 MHz

Antenna type: Monopole antenna

Photos: see Annex

Manufacturer (if applicable)

 Name:
 ./.

 Street:
 ./.

 Town:
 ./.

 Country:
 ./.

Additional information: ./.

1.6 Test standards

Technical standard: FCC RULES PART 15 SUBPART C § 15.231 (e) (2011-10)

IC RSS-210 Issue 8 December 2010 IC RSS-Gen Issue 3 December 2010

FCC ID: XVBW1C01 IC: 9368A-W1C01

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: Battery 3VDC

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: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

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	2012/9/5	2013/9/4
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function	on Test
ETSTW-CE 004	ZWEILEITER-V- NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2012/12/21	2013/12/20
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2012/9/26	2013/9/25
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2012/3/5	2013/3/4
ETSTW-CE 007	SPECTRUM ANALYZER 5GHz	FSB	849670/001	R&S	Pre-te	st Use
ETSTW-CE 008	HF-EICHLEITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function	on Test
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2012/7/3	2013/7/2
ETSTW-CE 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2012/9/6 2013/9/	
ETSTW-CE 024	IMPEDANCE STABILIZATION NETWORK	ISN T800	29454	TESEQ	2013/1/7	2014/1/6
ETSTW-CS 004	COUPLING AND DECOUPLING NETWORK	CDN M016	20053	SCHAFFNER	2012/8/10 2013/8/0	
ETSTW-CS 005	RF Power Amplifier	100A250A	306547	AR	Function Test	
ETSTW-CS 010	6 dB Attenuator	SA3N1007-06	None	AISI	Function test	
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2012/8/10	2013/8/09
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2012/9/5	2013/9/4
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2012/9/5	2013/9/4
ETSTW-RE 010	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2012/9/5	2013/9/4
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function	on Test
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function	on Test
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2012/10/12	2013/10/11
ETSTW-RE 019	MICROWAVE HORN ANTENNA	22240-25	121074	FM	2012/4/03	2013/4/02
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Functi	on Test
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2012/8/01 2013/7/31	
ETSTW-RE 028	Log-Periodic Dipole Array Antenna	3148	34429	EMCO	Functi	on Test
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	Functi	on Test
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2012/2/21	2013/2/20
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2012/10/5	2013/10/4
ETSTW-RE 033	WaveRunner 6000A Serise Oscilloscope	WAVERUNNER 6100A	LCRY0604P1450 8	LeCroy	Functi	on Test
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2012/10/5	2013/10/4
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2013/1/7	2014/1/6
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2012/4/13	2013/4/12



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

IC: 9368A-W			1			
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2012/4/06	2013/4/05
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-te	st Use
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2012/8/28	2013/8/27
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2012/3/23	2013/3/22
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2012/3/3	2013/3/2
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2012/3/3	2013/3/2
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2012/3/3	2013/3/2
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2012/5/29	2013/5/28
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2012/3/3	2013/3/2
ETSTW-RE 061	Amplifier Module	CHC 1	None	ETS	2012/5/17	2013/5/16
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2012/11/28	2013/11/27
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function	on Test
ETSTW-RE 065	Amplifier	AMF-6F-18002650- 25-10P	941608	MITEQ	2012/4/6	2013/4/5
ETSTW-RE 069	Double-Ridged Guide Horn Antenna	3117	00069377	EMCO	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2012/10/5	2013/10/4
ETSTW-RE 073	Power Meter	N1911A	MY45100769	Agilent	2013/1/7	2014/1/6
ETSTW-RE 074	Power Sensor	N1921A	MY45241198	Agilent	2013/1/7	2014/1/6
ETSTW-RE 088	SOLID STATE AMPLIFIER	KMA180265A01	99057	KMIC	2012/10/12 2013/10	
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2012/3/5 2013/3/-	
ETSTW-RE 105	2.4GHz Notch Filter	NO124411	39555	MICROWAVE CIRCUITS, INC.	2012/3/5 2013/3/4	
ETSTW-RE 106	Humidity Temperature Meter	TES-1366	091011113	TES	2012/12/4	2013/12/3
ETSTW-RE 111	TRILOG Super Broadband test Antenna	VULB 9160	9160-3309	Schwarz beck	2012/12/13	2013/12/12
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	None	T-Power	Functi	on test
ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2012/1/12	2013/1/11
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	Functi	on test
ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2012/7/3	2013/7/2
ETSTW-RE 125	5GHz Notch filter	5NSL11- 5200/E221.3-O/O	1	K&L Microwave	2012/8/18	2013/8/17
ETSTW-RE 126	5GHz Notch filter	5NSL11- 5800/E221.3-O/O	1	K&L Microwave	2012/8/18	2013/8/17
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2012/3/3	2013/3/2
ETSTW-EMI 001	HARMONICS 1000	HAR1000-1P	093	EMC-PARTNER	2012/8/10	2013/8/09
ETSTW-EMS 001	BASELSTRASSE 160 CH- 4242 LAUFEN	CN-EFT1000	354	EMC-PARTNER	Function	on Test
ETSTW-EMS 002	Frequency Converter	YF-6020	0308014	None	Function	on Test
ETSTW-EMS 003	EMC Immunity Test System	TRA2000IN6	579	EMC-PARTNER	2012/11/6	2013/11/5
ETSTW-EMS 009	Magnetic Field Antenna	MF1000-1	104	EMC-PARTNER	Function	on Test
ETSTW-EMS 010	Coupling De-coupling Network	CDN-UTP8	014	EMC-PARTNER	Function	on Test
ETSTW-EMS 012	EM Injection Clamp	F-203I-23MM	476	FCC	2012/5/29	2013/5/28



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

IC: 9368A-W1				1		
ETSTW-EMS 016	EMF Tester	1390	071208732	TES	2012/10/5	2013/10/4
ETSTW-EMS 017	Multimeter	DM-1220	518614	HOLA	2012/8/10	2013/8/09
ETSTW-EMS 019	Electrostatic Discharge Simulator	ESS-2002	ESS06Y6300	NoiseKen	2012/10/5	2013/10/4
ETSTW-EMS 020	Humidity Temperature Meter	TES-1366	091011116	TES	2012/12/24	2013/12/23
ETSTW-RS 003	RF Power Amplifier	30S1G3	306933	AR	Functi	on Test
ETSTW-RS 004	RF Power Amplifier	150W1000	307009	AR	Functi	on Test
ETSTW-RS 006	SIGNAL GENERATOR	SML03	101551	R&S	2012/2/29	2013/2/28
ETSTW-RS 007	14" COLOR VIDEO MONITOR	HS-CM145A	0512011548	None	Function	on Test
ETSTW-RS 009	SIGNAL GENERATOR	8648C	3642U01656	НР	2012/2/20	2013/2/19
ETSTW-RS 010	Broadband Field Meter	NBM-520	C-0195	Narda	2012/9/24	2013/9/23
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2012/10/5	2013/10/4
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849- 822/851-40 /12+9SS	3	WI	2012/1/13	2013/1/12
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748- 1743/1752-32/5SS	1	WI	2012/1/13	2013/1/12
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5 -1875.5/1884.5- 32/5SS	3	WI	2012/1/13	2013/1/12
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1- 904.25-50/8SS	1	WI	2012/1/13	2013/1/12
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2012/9/18	2013/9/17
ETSTW-Cable 002	Microwave Cable	SUCOFLEX 104 (S_Cable 7)	238093	HUBER+SUHNER	2012/5/17	2013/5/16
ETSTW-Cable 003	Microwave Cable	SUCOFLEX 104 (S_Cable 11)	209953	HUBER+SUHNER	2012/5/17	2013/5/16
ETSTW-Cable 010	BNC Cable	5 M BNC Cable	None	JYE BAO CO.,LTD.	2012/3/5	2013/3/4
ETSTW-Cable 011	BNC Cable	BNC Cable 1	None	JYE BAO CO.,LTD.	Pre-test	Use NCR
ETSTW-Cable 012	N TYPE To SMA Cable	Cable 012	None	JYE BAO CO.,LTD.	2012/3/5	2013/3/4
ETSTW-Cable 013	Microwave Cable	SUCOFLEX 104 (S_Cable 5)	232345	HUBER+SUHNER	Function	on Test
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2012/3/3	2013/3/2
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2012/3/3	2013/3/2
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2012/3/3	2013/3/2
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2012/3/3	2013/3/2
ETSTW-Cable 022	N TYPE Cable	5006	0002	JYE BAO CO.,LTD.	2012/4/6	2013/4/5
ETSTW-Cable 026	Microwave Cable	SUCOFLEX 104	279075	HUBER+SUHNER	2012/3/5	2013/3/4
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2012/3/5	2013/3/4
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2012/10/12	2013/10/11
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2012/10/12	2013/10/11
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 (S_Cable 9)	279067	HUBER+SUHNER	2012/3/5	2013/3/4
ETSTW-Cable 031	Microwave Cable	SUCOFLEX 104 (S_Cable 10)	238092	HUBER+SUHNER	2012/11/28	2013/11/27
ETSTW-Cable 032	Microwave Cable	SUCOFLEX 104 (S_Cable 12)	237301	HUBER+SUHNER	Function	on Test
ETSTW-Cable 039	Microwave Cable	SUCOFLEX 104 (S_Cable 19)	316739	HUBER+SUHNER	2012/5/17	2013/5/16
ETSTW-Cable 040	Microwave Cable	SUCOFLEX 104 (S_Cable 20)	316738	HUBER+SUHNER	Function	on Test



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

1C. 750071-W1	C01						
ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2012/11/28 2013/11		
ETSTW-Cable 047	Microwave Cable	SUCOFLEX 104	325518	HUBER+SUHNER	2012/11/28 2013/11/2		
ETSTW-Cable 051	BNC Cable	BNC Cable 6	None	JYE BAO CO.,LTD.	2012/3/30	2013/3/29	
ETSTW-Cable 052	BNC Cable	Clamp Cable	None	Schwarz beck	2012/3/30 2013/3/2		
ETSTW-Cable 053	N TYPE To SMA Cable	RG142	None	JYE BAO CO.,LTD.	2012/4/6	2013/4/5	
ETSTW-Cable 054	BNC To SMA Cable	RG142	None	JYE BAO CO.,LTD.	2012/4/6	2013/4/5	
ETSTW-Cable 055	NTYPE Cable	N30N30-JBY240- 80CM	20110621-1.1	JYE BAO CO.,LTD.	Function Test		
ETSTW-Cable 056	N TYPE Cable	N30N30-JBY240- 80CM	20110621-1.0	JYE BAO CO.,LTD.	Function Test		
ETSTW-Cable 057	N TYPE Cable	N30N30-JBY240- 80CM	20110621-1.1	JYE BAO CO.,LTD.	Function Test		
WTSTW-SW 001	EMI TEST SOFTWARE	Harmonics-1000	None	EMC PARTNER	HARCS Version 4.16 Firmware Version 2.18		
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMC	None	Farad	Version E	Version ETS-03A1	
WTSTW-SW 003	EMS TEST SOFTWARE	i2	None	AUDIX	Version 3.2	Version 3.2007-8-17b	



FCC ID: XVBW1C01 IC: 9368A-W1C01

2.5 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2009 5.2 using a $50\mu H$ 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 C63.4-2009 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 $dB\mu V$) 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

 $20 \text{ dB}\mu\text{V} + 10.36 \text{ dB/m} + 6 \text{ dB} = 36.36 \text{ dB}\mu\text{V/m} \text{ @3m}$

ANSI STANDARD C63.4-2009 6.3.1 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 Worldwide Testing Services(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.

ANSI STANDARD C63.4-2009 10.2.7: Any measurements that utilize special test software shall be indicated and referenced in the test report. During testing, test software 'EZ EMC' was used for setting up different operation modes.



☐ test after modification

Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

3	Test results	(enclosure)

≥ 1st test

TEST CASE	Para. Number	Required	Test passed	Test failed
Transmission Requirements	FCC 15.231(e)		×	
	IC RSS-210 Annex 1 A1.1.5			
Radiated Emission	FCC 15.231(e)	×	×	
	IC RSS-210 A1.1.5			
Bandwidth of Emission	FCC 15.231(c)	×	×	
	IC RSS-210 A1.1.3			ı
Frequency Tolerance	FCC 15.231(d)			
	IC RSS-210 A1.1.4			
Period Alternate Field Strength Requirements	FCC 15.231(e)			
	IC RSS-210 2.7 Table 5			
Antenna Requirement	FCC 15.203	×	×	

IC RSS-Gen

FCC 15.207

IC RSS-Gen

The following is intentionally left blank.

Conducted Measurement at (AC) Power Line

□ production test

FCC ID: XVBW1C01 IC: 9368A-W1C01

3.1 Transmission Requirements

FCC 15.231(e)

3.1.1 Limit of Transmission Time

Devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

3.1.2 Results for the duration and silent period measurement
☐ This manually operated transmitter employs software to control the duration of each transmission and silent period between transmissions. The real measured result for the duration of each transmission is ms, and the result for silent period between transmissions is second.
This transmitter is operated by automatic activation, and the duration of each transmission and silent period between transmissions will be controlled by software. The real measured result for the duration of each transmission is 9.819639 ms, and the result for silent period between transmissions is 197.418036 second.

Explanation: See attached diagrams in appendix.

Test equipment used: ETSTW-RE 003 ETSTW-RE 004 ETSTW-RE 111



Engineer: Leon

Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

3.2 Output Power (Field Strength)

Model: TP1-001 Date: 2012/12/25 Mode: power Temperature: 24 °C

Polarization: Horizontal Humidity: 60 %

i dianzadon, monzontai		Hullilalt	у.	00	70					
Frequency	Rea	ding	Factor	Resul	t @3m	Limit	@3m	Margin	Table	Ant.
	(dB	uV)	(dB)	(dBu	V/m)	(dBu	V/m)		Degree	High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
314.9613	60.93	15.96	-20.16	76.89	56.73	87.66	67.66	-10.93	90	100

Polarization: Vertical

Frequency	Rea	ding	Factor	Resul	t @3m	Limit	@3m	Margin	Table	Ant.
	(dB	uV)	(dB)	(dBu	ıV/m)	(dBu	V/m)		Degree	High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
315.0255	45.07	15.96	-20.16	61.03	40.87	87.66	67.66	-26.79	0	100

Limit 15.231(e)

Fundamental Frequency	Field strength of fundamental, limit
(MHz)	$\mu V/m$
40.66 - 40.70	1,000
70 – 130	500
130 – 174	500 to 1,500
174 - 260	1,500
260 – 470	1,500 to 5,000**
	$(315 \text{ MHz: } 67.66 \text{ dB}\mu\text{V/m} = 2416.677 \mu\text{V/m})$
Above 470	5,000

^{**} linear interpolation

Explanation: See attached diagrams in appendix.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 111



FCC ID: XVBW1C01 IC: 9368A-W1C01

3.3 Out of Band Radiated Emissions

FCC Rule: 15.231(e), 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.

Guidance on Measurement of pulsed emission: 15.35(c)

"the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value."

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

Limits:

For frequencies (Average measurements)

Correction factor conform 15.35 (c) (Average measurements)

Duty cycle correction:

Max. Peak reading – duty cycle correction

Max permitted average Limits = Max permitted Fundamental limit -20 dB

For example for 315 fundamental carrier:

Max permitted average Limit: 67.66 dBµV/m - 20 dB= 47.66 dBµV/m

For frequencies above 1GHz (Peak measurements).

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

FCC ID: XVBW1C01 IC: 9368A-W1C01

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

Explanation: See attached diagrams.

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC ID: XVBW1C01 IC: 9368A-W1C01

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(e) 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: TP1-001 Date: 2012/12/25

Mode: 315 MHz Temperature: 24 °C Engineer: Leon

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)
256.1723	6.24	peak	14.12	20.36	46.00	-25.64	155	100

Polarization: Horizontal

Frequency		ding uV)	Factor (dB)		: @3m V/m)		@3m V/m)	Margin	Table Degree	Ant. High
(MHz)	Peak	Áve.	Corr.	Peak	Áve.	Peak	Ave.	(dB)	(Deg.)	(cm)
629.6593	42.92	22.89	-20.16	65.81	45.65	67.66	47.66	-2.01	230	100
945.2906	31.53	27.36	-20.16	58.89	38.73	67.66	47.66	-8.93	110	100
1258.5170	67.00	-10.01	-20.16	56.99	36.83	74.00	54.00	-17.17	230	100
1571.1420	79.64	-9.24	-20.16	70.40	50.24	74.00	54.00	-3.76	140	100
1889.7800	73.73	-7.03	-20.16	66.70	46.54	74.00	54.00	-7.46	20	100
2521.0420	67.36	-5.47	-20.16	61.89	41.73	74.00	54.00	-12.27	300	100
2833.6670	59.24	-4.72	-20.16	54.52	34.36	74.00	54.00	-19.64	170	100
3783.5670	59.06	-2.85	-20.16	56.21	36.05	74.00	54.00	-17.95	90	100



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

Polarization: Vertical

_									
	Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	150.1202	2.96	peak	15.08	18.04	67.66	-49.62	180	100

Polarization: Vertical

Frequency	Rea	ding	Factor	Result	@3m	Limit	@3m	Margin	Table	Ant.
	(dB	uV)	(dB)	(dBu	V/m)	(dBu	V/m)		Degree	High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
629.6593	33.58	22.89	-20.16	56.47	36.31	67.66	47.66	-11.35	250	100
945.2906	22.38	27.36	-20.16	49.74	29.58	67.66	47.66	-18.08	110	100
1258.5170	62.25	-10.01	-20.16	52.24	32.08	74.00	54.00	-21.92	130	100
1571.1420	74.79	-9.24	-20.16	65.55	45.39	74.00	54.00	-8.61	200	100
1889.7800	60.50	-7.03	-20.16	53.47	33.31	74.00	54.00	-20.69	280	100
2521.0420	60.98	-5.47	-20.16	55.51	35.35	74.00	54.00	-18.65	70	100
2833.6670	59.30	-4.72	-20.16	54.58	34.42	74.00	54.00	-19.58	310	100
3783.5670	56.81	-2.85	-20.16	53.96	33.80	74.00	54.00	-20.20	60	100

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. Measurement uncertainty for 3m measurement : 30-1000 MHz = \pm 3.72 dB, 1-18 GHz = \pm 5.56dB, 18-40 GHz= \pm 3.46 dB ; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.
- 6. See attached diagrams in appendix.

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 030, ETSTW-RE 111

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FCC ID: XVBW1C01 IC: 9368A-W1C01

3.6 Channel Bandwidth

Measurement of Necessary Bandwidth (BN)

Used frequency	Bandwidth	Limit
315 MHz	124.24849699 kHz	0.7875 MHz

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

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 055, ETSTW-RE 003, ETSTW-RE 004

Explanation: See attached diagrams in appendix.

FCC ID: XVBW1C01 IC: 9368A-W1C01

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 Monopole antenna is integral antenna which passes antenna requirement.

The equipment meets the	yes	no
requirements	×	

FCC ID: XVBW1C01 IC: 9368A-W1C01

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)
Transmitting mode	100	9.819639	0.09819639	-20.16

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

Explanation: See attached diagrams in appendix.



FCC ID: XVBW1C01 IC: 9368A-W1C01

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 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

Explanation: This test is not required because the sample is battery-used.

Test equipment used: ETSTW-CE 001, ETSTW-CE 003, ETSTW-CE 004, ETSTW-CE 006, ETSTW-RE045

FCC ID: XVBW1C01 IC: 9368A-W1C01

3.10 Equipment Modification

No modification was made to pass all tests.

FCC ID: XVBW1C01 IC: 9368A-W1C01

Appendix

A Measurement diagrams

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

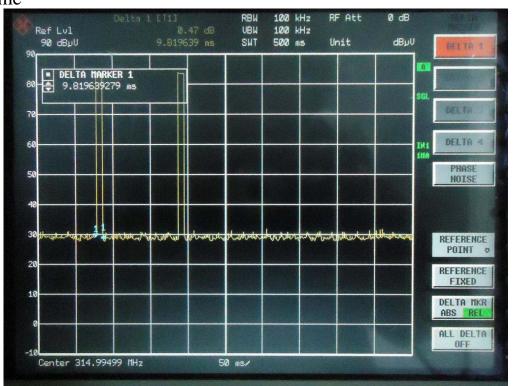
B Photos

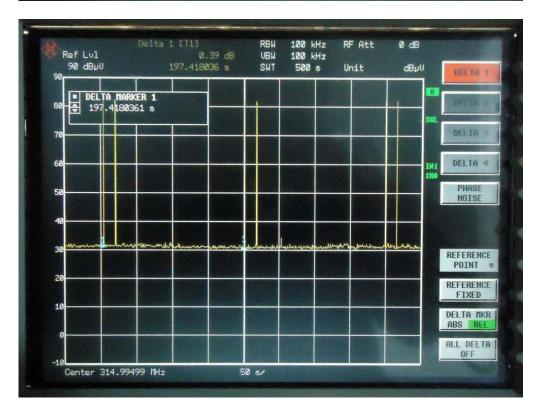
- 1. External Photos
- 2. Internal Photos
- 3. Set Up Photos of Radiated emission



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01 Active Time





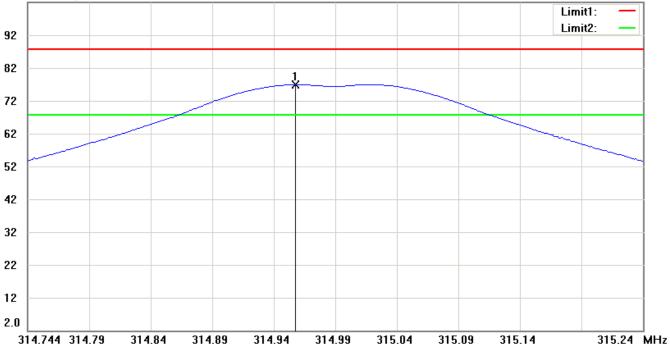


Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01 Output Power

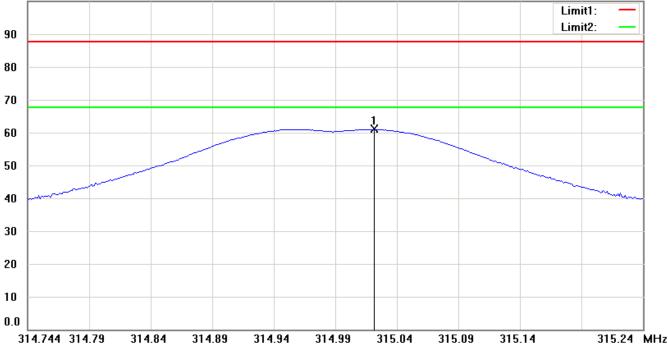
Antenna Polarization H





Antenna Polarization V

100.0 dBuV/m



Note:

- 1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
- 2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
- 3. For corrected test results are listed in the relevant table of Field Strength test data of this test report.

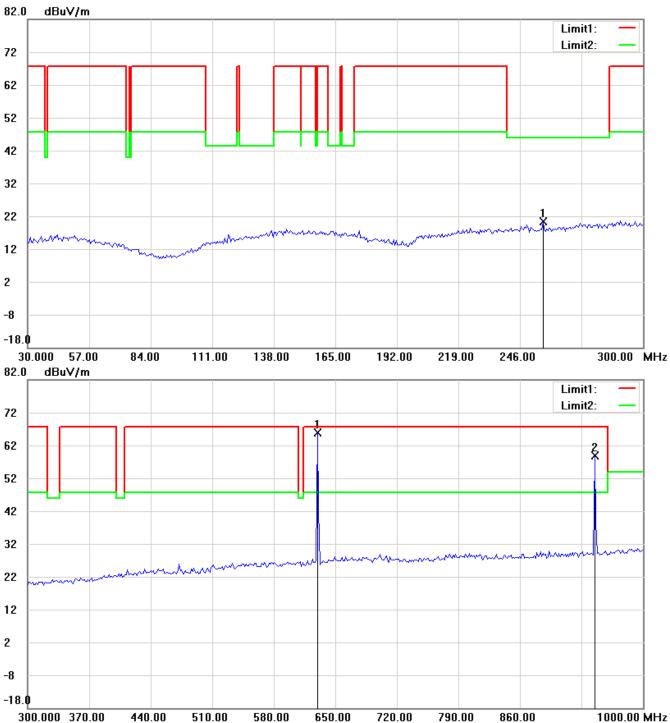


Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01

Spurious Emissions radiated

Antenna Polarization H



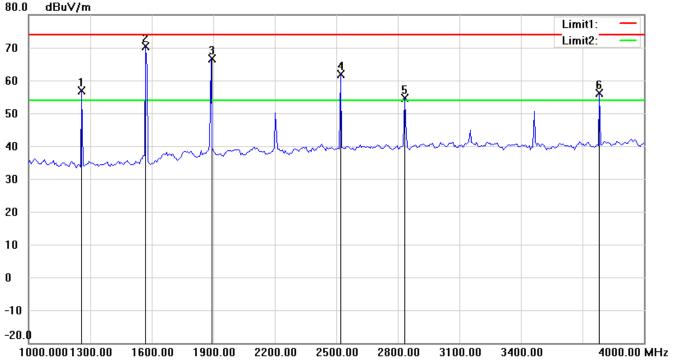
Note:

- 1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
- 2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
- 3. For corrected test results are listed in the relevant table of radiated test data of this test report.

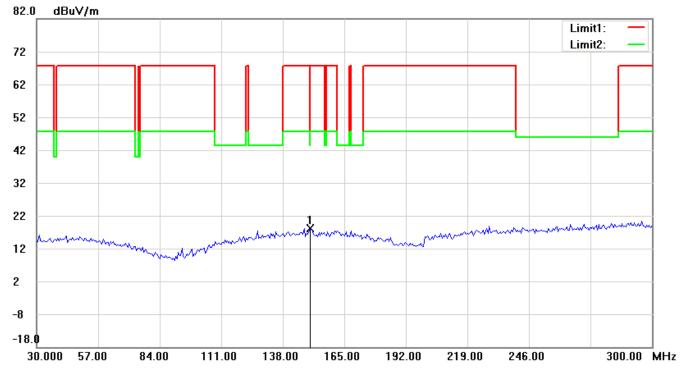


Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01



Antenna Polarization V



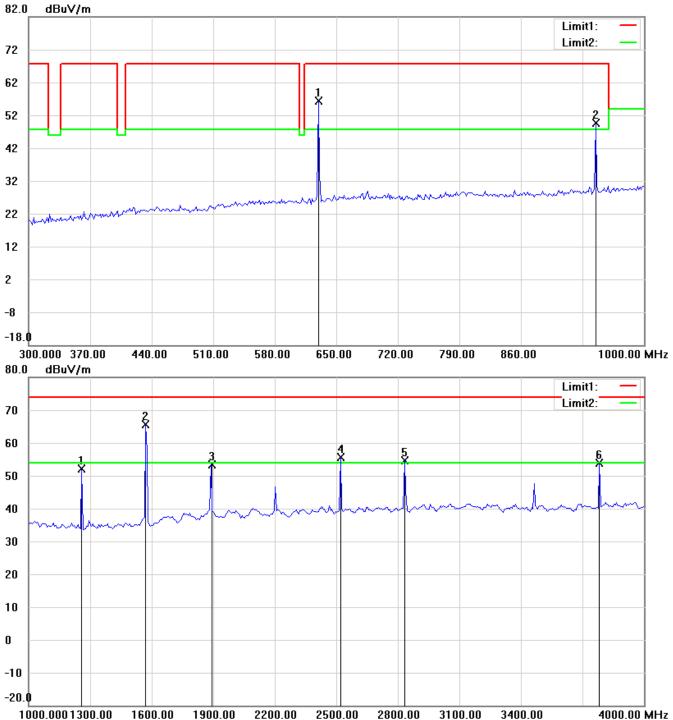
Note:

- 1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
- 2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
- 3. For corrected test results are listed in the relevant table of radiated test data of this test report.



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01



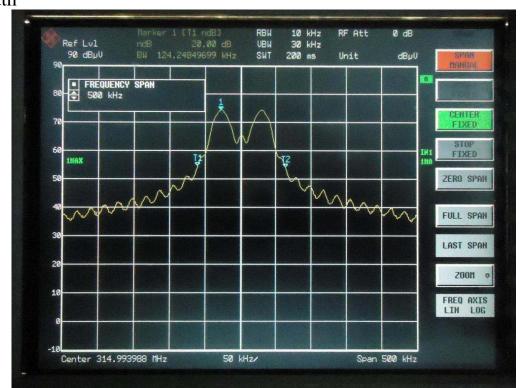
Note:

- 1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
- 2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
- 3. For corrected test results are listed in the relevant table of radiated test data of this test report.



Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01 Bandwidth





Registration number: W6M21212-12905-C-1

FCC ID: XVBW1C01 IC: 9368A-W1C01 Duty Cycle

