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Report No.: GZEM121100483601

Page: 1 of 18

FCC ID: RGO6809

TEST REPORT

Application No.:	GZEM1211004836RF
Applicant:	Product Vision International Limited
FCC ID:	RGO6809
Product Name:	Speed Tracker
Product Description:	Wireless remote control with 2.4 GHz as carrier
Model No.:	6809
Standards:	47 CFR PART 15 Subpart C: 2011 section 15.249
Date of Receipt:	2012-12-17
Date of Test:	2012-12-17 to 2012-12-20
Date of Issue:	2012-12-21
Test Result :	Pass*

* In the configuration tested, the EUT complied with the standards specified above.



The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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Report No.: GZEM121100483601

Page: 2 of 18 FCC ID: RGO6809

2 Version

Revision Record									
Version Chapter Date Modifier Remark									
00		2012-12-21		Original					

Authorized for issue by:		
Tested By	Rycm Yary (Ryan Yang) / Project Engineer	2012-12-17 to 2012-12-20 Date
Prepared By	(Ryan Yang) / Project Engineer	2012-12-20 Date
	(Hydin rang) / Froject Engineer	Bute
Checked By	Strong you	2012-12-21
	Strong Yao/ Reviewer	Date



Report No.: GZEM121100483601

Page: 3 of 18 FCC ID: RGO6809

3 Test Summary

TEST	TEST REQUIREMENT	TEST METHOD	RESULT	
Field Strength of Fundamental	FCC PART 15 C	ANSI C63.10: Clause 6.6	PASS	
Tundamental	section 15.249 (a)			
Field Strength of Unwanted Emissions	FCC PART 15 C ANSI C63.10: section 15.249 (a) Clause 6.4, 6.6 and section 15.249 (d) 6.7		PASS	
Band Edges	FCC PART 15 C section 15.249 (d)	ANSI C63.10: Clause 6.9.2	PASS	
Occupied Bandwidth	FCC PART 15 C section 15.215(c)	ANSI C63.10: Clause 6.9.1	PASS	

Remark:

EUT: In this whole report EUT means Equipment Under Test.

Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radio Frequency.

ANSI C63.10: the detail version is ANSI C63.10:2009 in the whole report.



Report No.: GZEM121100483601

Page: 4 of 18 FCC ID: RGO6809

4 Contents

1	COVE	ER PAGE	1					
2	VERS	SION						
3		SUMMARY						
3	1531	SUMMARY	J					
4	CONTENTS							
5	GENE	ERAL INFORMATION	5					
	5.1	Client Information	5					
	5.2	General Description of E.U.T.						
	5.3	Details of E.U.T.						
	5.4	Description of Support Units	5					
	5.5	Other Information Requested by the Customer	5					
	5.6	Deviation from Standards	5					
	5.7	Test Location	5					
6	EQUI	PMENT USED DURING TEST	7					
7	TEST	RESULTS	8					
	7.1	E.U.T. Operation	8					
	7.2	Antenna Requirement						
	7.3	Field Strength of Fundamental& Field Strength of Unwanted Emissions& Band Edge	10					
	7.4	Occupied Bandwidth						



Report No.: GZEM121100483601

Page: 5 of 18 FCC ID: RGO6809

5 General Information

5.1 Client Information

Applicant: Product Vision International Limited

Address of Applicant: Room 1603, Saxon Tower, 7 Cheung Shun Street, Lai Chi Kok Hong Kong

5.2 General Description of E.U.T.

Product Name: Speed Tracker

Model No.: 6809

5.3 Details of E.U.T.

Operating Frequency 2440.001MHz

Type of Modulation: GFSK

Number of Channels

Antenna Type Integral

Antenna gain: 0 dBi

Function: 2440.001MHz is fixed channel for data transfer.

Power Supply: DC 4..5 V button cell LR44 x 3 for Tx.

Power cord: N/A

5.4 Description of Support Units

None.

5.5 Other Information Requested by the Customer

None.

5.6 Deviation from Standards

Biconical and log periodic antennas were used instead of dipole antennas.

5.7 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,

Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



Report No.: GZEM121100483601

Page: 6 of 18 FCC ID: RGO6809

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

NVLAP (Lab Code: 200611-0)

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

ACMA

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

• SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

• CNAS (Lab Code: L0167)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

• FCC (Registration No.: 282399)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

Industry Canada (Registration No.: 4620B-1)

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460, C-2584, G-449 and T-1179 respectively.

CBTL (Lab Code: TL129)

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01:2006-10 and Rules of procedure IECEE 02:2006-10, and the relevant IECEE CB-Scheme Operational documents.



Report No.: GZEM121100483601

Page: 7 of 18 FCC ID: RGO6809

6 Equipment Used during Test

RE in Cha	amber					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date	Calibration
NO.	rest Equipment	Manufacturei	woder No.	Serial No.	(YYYY-MM-DD)	Interval
EMC0525	Compact Semi- Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2014-08-30	2Y
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2013-06-29	1Y
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2013-03-12	1Y
EMC0528	RI High frequency Cable	SGS	20 m	N/A	2013-06-01	1Y
EMC2025	Trilog Broadband SCHW		VULB 9163	9163-450	2013-12-17	2Y
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2013-11-27	2Y
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2013-03-26	2Y
EMC2026	Horn Antenna 1-18GHz	SCHWARZBECK MESS- ELEKTRONIK	BBHA 9120D	9120D-841	2013-11-28	2Y
EMC0518	Horn Antenna	Rohde & Schwarz	HF906	100096	2014-07-01	2Y
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2013-03-12	1Y
EMC0049	Amplifier	Agilent	8447D	2944A10862	2013-03-12	1Y
EMC0075	310N Amplifier	Sonama	310N	272683	2013-03-12	1Y
EMC0523	Active Loop Antenna	EMCO	6502	42963	2014-04-07	2Y
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS- ELEKTRONI	BBHA 9170	9170-375	2014-06-01	3Y
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	2014-04-27	2Y

General used equipment								
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date	Calibratio		
INO.	rest Equipment	Wallulacturei	woder No.	Serial No.	(YYYY-MM-DD)	n Interval		
EMC0006	DMM	Fluke	73	70681569	2013-11-5	1Y		
EMC0007	DMM	Fluke	73	70671122	2013-11-5	1Y		



Report No.: GZEM121100483601

Page: 8 of 18 FCC ID: RGO6809

Test Results

E.U.T. Operation

Test Voltage: DC 4..5 V button cell LR44 x 3

Temperature: 20.0 -25.0 °C **Humidity:** 38-50 % RH

Atmospheric Pressure: 1000 -1010 mbar

Test frequencies and

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if frequency range:

required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band

specified in the following table:

According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency

shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which	Number of	Location in frequency range		
device operates	frequencies	of operation		
1 MHz or less	1	Middle		
1 MHz to 10 MHz	2	1 near top and 1 near bottom		
Marathan 10 MHz	2	1 near top, 1 near middle and 1		
More than 10 MHz	3	near bottom		

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement			
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz,			
	whichever is lower			
At or above 10 GHz to below	5th harmonic of highest fundamental frequency or to 100 GHz,			
30 GHz	whichever is lower			
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz,			
At or above 30 GHz	whichever is lower, unless otherwise specified			



Report No.: GZEM121100483601

Page: 9 of 18 FCC ID: RGO6809

7.2 Antenna Requirement

Standard requirement

15.203 requirement:

For intentional device. According to 15.203. 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.

EUT Antenna

The antenna is an integral antenna integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0 dBi.



Test result: The unit does meet the FCC requirements.



Report No.: GZEM121100483601

Page: 10 of 18 FCC ID: RGO6809

7.3 Field Strength of Fundamental& Field Strength of Unwanted Emissions& Band Edge

Test Requirement: FCC Part15 C section 15.249

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBµV/m @ 3m)	Field Strength of Harmonics (dBµV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Limits:

The fundamental frequency rang is in the frequency band of the EUT is

2440.001MHz.

The limit for Average field strength $dB\mu V/m$ for the fundamental frequency = 94.0 $dB\mu V/m$.

54.0 UDμ V/III. The limit for Peak fie

The limit for Peak field strength $dB\mu V/m$ for the fundamental frequency = 114.0 $dB\mu V/m$.

No fundamental is allowed in the restricted bands.

The limit for average field strength dB μ V/m for the harmonics = 54.0 dB μ V/m. The limit for peak field strength dB μ V/m for the harmonics = 74.0 dB μ V/m. Emission radiated outside of the specified frequency bands, except for

harmonics, shall be attenuated by at least 50dB below the level of the fundamental or 54.0 dB μ V/m in 15.209. Here the limit for the other emission is 54.0 dB ν V/m

is 54.0 $dB\mu V/m$.

Test Method: ANSI C63.10: Clause 6.4, 6.6 and 6.7 for Field Strength of Fundamental&

Field Strength of Unwanted Emissions ANSI C63.10: Clause 6.9.2 for Band Edge

Status Pre-test the EUT in continuous transmitting mode with setup as stand-alone

in X, Y, Z threes axes, found the worst case is X axes and report the data.

Measurement Distance:

3m (Semi-Anechoic Chamber)

Frequency range

9 kHz – 25 GHz for transmitting mode.

Test instrumentation resolution bandwidth

9 kHz (9 kHz - 30 MHz), 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 MHz –

25 GHz)



Report No.: GZEM121100483601

Page: 11 of 18 FCC ID: RGO6809

Test Procedure:

1)9 kHz to 30 MHz emissions:

For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.10. The centre of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT, During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2)30 MHz to 1 GHz emissions:

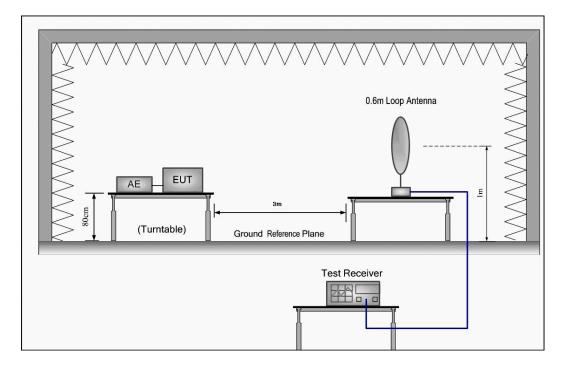
For testing performed with the bi-log type antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

3)1 GHz to 25 GHz emissions:

For testing performed with the horn antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360°, the antenna height scan between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

Test Configuration:

1) 9 kHz to 30 MHz emissions:

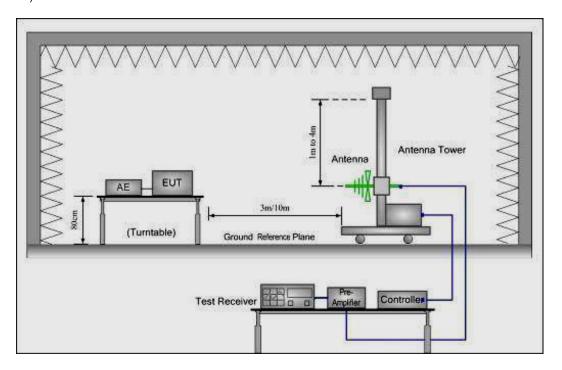




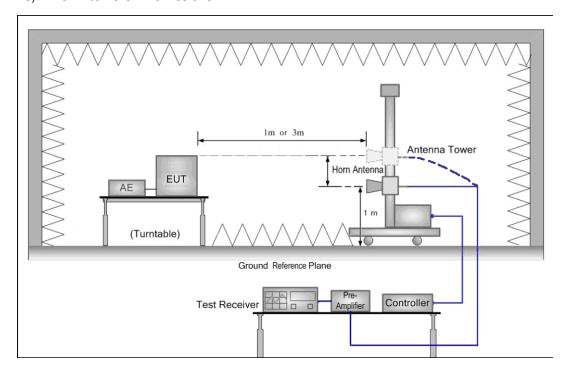
Report No.: GZEM121100483601

Page: 12 of 18 FCC ID: RGO6809

2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 25 GHz emissions:



The field strength is calculated by adding the Antenna Factor, Cable Loss & Per-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Loss - Preamplifier Factor



Report No.: GZEM121100483601

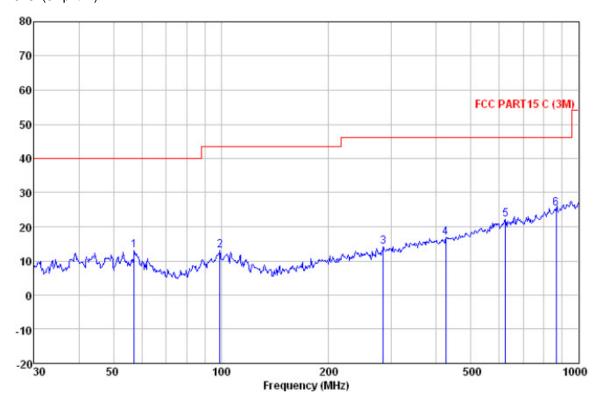
Page: 13 of 18 FCC ID: RGO6809

Test in transmitting status

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions.Quasi-Peak Measurement Vertical:

Peak scan Level (dBµV/m)



Quasi-peak measurement

Freq		Antenna Factor			Level	0∨er Limit	Limit Line	Remark
MHz	dBu∀	dB/m	dB	dB	dBu√/m	dB	dBu∀/m	
57.191	28.60	12.87	1.09	29.54	13.02	-26.98	40.00	QP
99.180	28.26	13.13	1.42	29.70	13.11	-30.39	43.50	QP
283.979	28.60	12.75	2.29	29.59	14.05	-31.95	46.00	QP
425.028	28.17	15.49	2.82	29.57	16.91	-29.09	46.00	QP
625.078	29.48	18.54	3.37	29.37	22.02	-23.98	46.00	QP
866.088	29.22	20.78	4.04	28.59	25.45	-20.55	46.00	QP

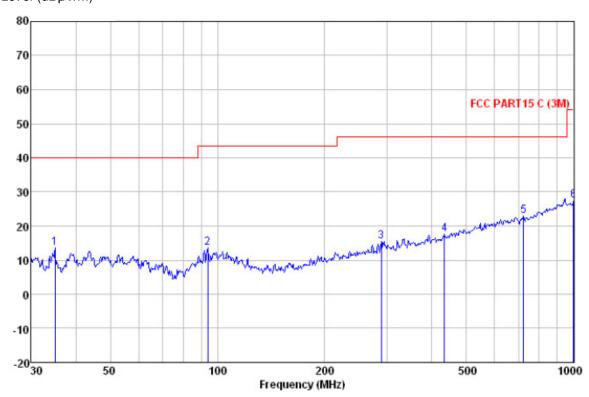


Report No.: GZEM121100483601

Page: 14 of 18 FCC ID: RGO6809

Horizontal:

Peak scan Level (dBµV/m)



Quasi-peak measurement

Freq		Antenna Factor				0∨er Limit		Remark
MHz	dBu∀	dB/m	dB	dB	dBu√/m	dB	dBu∀/m	
35.005	30.02	12.30	0.88	29.50	13.70	-26.30	40.00	QP
93.768	29.34	12.58	1.37	29.68	13.61	-29.89	43.50	QP
287.990	30.03	12.84	2.30	29.59	15.58	-30.42	46.00	QP
434.065	28.79	15.53	2.86	29.56	17.62	-28.38	46.00	QP
724.261	29.58	19.10	3.62	29.27	23.03	-22.97	46.00	QP
1000.000	28.67	21.74	4.44	27.50	27.35	-26.65	54.00	OP



Report No.: GZEM121100483601

Page: 15 of 18 FCC ID: RGO6809

1~25 GHz Field Strength of Fundamental & Field Strength of Unwanted Emissions.

Peak & Average Measurement

Peak Meas	urement:						
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Limit (dBμV/m)	Antenna polarization
2440.001	27.57	6.81	49.43	105.00	89.95	114.00	V
4880.002	31.57	11.24	49.30	60.64	54.15	74.00	V
7320.004	36.50	13.28	49.71	53.07	53.14	74.00	V
9760.008	38.46	15.05	49.89	50.16	53.78	74.00	V
2440.001	27.57	6.81	49.43	104.51	89.46	114.00	Н
4880.002	31.57	11.24	49.30	60.60	54.11	74.00	Н
7320.004	36.50	13.28	49.71	54.33	54.40	74.00	Н
9760.008	38.46	15.05	49.89	50.75	54.37	74.00	Н
Average M	leasurement	t:					
Frequency (MHz)	PeaK Value (dBμV/m)		20*log(dwell time / duty cycle) (dB)		Emission Level (dBµV/m)	Limit (dBμV/m)	Antenna polarization
2440.001	8	9.95	-4.63		85.32	94.00	V
4880.002	5	54.15		-4.63		54.00	V
7320.004	5:	53.14		-4.63		54.00	V
9760.008	53.78		-4.63		49.15	54.00	V
2440.001	89.46		-4.63		84.83	94.00	Н
4880.002	54.11		-4.63		49.48	54.00	Н
7320.004	54.40		-4.63		49.77	54.00	Н
9760.008	54.37		-4.63		49.74	54.00	Н



Report No.: GZEM121100483601

Page: 16 of 18 FCC ID: RGO6809

Band Edge:

Peak Measurement:							
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Limit (dBμV/m)	Antenna polarization
2400.00	27.58	6.56	49.44	57.51	42.21	74.00	V
2483.50	27.55	6.99	49.42	58.37	43.49	74.00	V
2400.00	27.58	6.56	49.44	59.54	44.24	74.00	Н
2483.50	27.55	6.99	49.42	59.41	44.53	74.00	Н

Average Measurement:

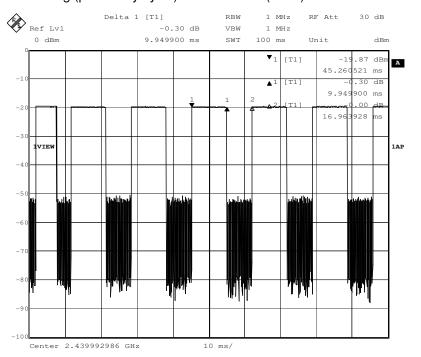
Frequency (MHz)	PeaK Value (dBμV/m)	20*log(dwell time / duty cycle) (dB)	Emission Level (dBµV/m)	Limit (dBμV/m)	Antenna polarization
2400.00	42.21	-4.63	37.58	54.00	V
2483.50	43.49	-4.63	38.86	54.00	V
2400.00	44.24	-4.63	39.61	54.00	Н
2483.50	44.53	-4.63	39.90	54.00	Н

Remark:

1).

 $20log \; (pulse/duty \; cycle) = 20*log(9.9499/16.9639) = -4.6342dB;$

Average = Peak value + 20log (pulse/duty cycle)= Peak value + (-4.63)





Report No.: GZEM121100483601

Page: 17 of 18 FCC ID: RGO6809

2). The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Loss - Preamplifier Factor.

- 3). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 4). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

Test result: The unit does meet the FCC requirements.



Report No.: GZEM121100483601

Page: 18 of 18 FCC ID: RGO6809

7.4 Occupied Bandwidth

Test Requirement: FCC Part 15 C section 15.249

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209,

whichever is the lesser attenuation.

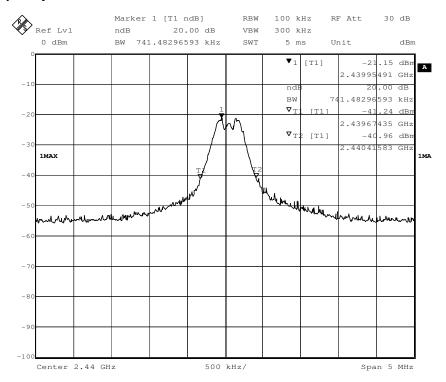
Test Method: ANSI C63.10: Clause 6.9.1

Operation within the band 2.400 to 2.4835 GHz

Method of measurement: A small sample of the transmitter output was fed into the Spectrum

Analyzer and the attached plot was taken.

Test in frequency 2440.001 MHz



The results: The unit does meet the FCC requirements.

-- End of the report--