



TEST REPORT

Report No.:	Z09J0249103	Page 1 of 15
Applicant:	HUIZHOU FORYOU GENERAL ELECTRONICS CO.,LTD.	
Applicant Address:	NO.6 Zhongkai Songshan Industrial District Huizhou, Guangdong.	
Sample Description:	Tire Pressure Monitoring System	
Model:	TPMAI1DIC1	
FCC ID	VIPTPMAI1DIC1-T	
Test Location:	EMC Laboratory of Guangzhou GRG Metrology and Test Technology Co., Ltd.	
Test Specification:	FCC PART 15 :2008	
Test Date:	2009-05-24 to 2009-05-27	
Test Result:	<i>According to the kind and extend of tests performed the test item passed test specification.</i>	
Tested By:	Reviewed By:	Approved By:
Tian Fengyi / Test Engineer	Yang Dengfang / Reviewer	Frank Chen / Director
		
Date: 28 th May. 2009	Date: 28 th May. 2009	Date: 2009-06-04
Other Aspects:		
None		
Abbreviations: ok / P = passed; fail / F = failed; n.a. / N = not applicable		
The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.		

1 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Radiated Emission	FCC PART 15 :2008	Section 15.231(b)	PASS
Restricted Band	FCC PART 15 :2008	Section 15.209 Section 15.205	PASS
Antenna Requirement	FCC PART 15 :2008	Section 15.203	PASS
Active Time	FCC PART 15 :2008	Section 15.231(a)	PASS
Bandwidth of Emission	FCC PART 15 :2008	Section 15.231(c)	PASS
Conducted Emission	FCC PART 15 :2008	Section 15.207	* N/A

* The device is powered by DC 3.6V(transmitter) and DC 12V(receiver) battery.

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2 General Information

2.1 Client Information

Applicant: HUIZHOU FORYOU GENERAL ELECTRONICS CO.,LTD.
Address of Applicant: NO.6 Zhongkai Songshan Industrial District Huizhou, Guangdong.

2.2 Manufacturer Information

Manufacturer: HUIZHOU FORYOU GENERAL ELECTRONICS CO.,LTD.
Address of Applicant: NO.6 Zhongkai Songshan Industrial District Huizhou, Guangdong.

2.3 E.U.T. General Description

Product Name: Tire Pressure Monitoring System
Model: TPMAI1DIC1
Trade Name: FORYOU
Working Frequency: 433.920MHz
Antenna Type: Integral
Power Supply: DC 3.6V battery for Transmitter, DC 12V battery for Receiver

2.4 Characteristics of E.U.T.

Transmitter:
Dimensions: 73 × 67 × 20mm
Operating Temp. Range: -40 ~ 105
Operating Humidity Range: 95RH
Produce Life: > 6 years
Pressure Monitoring Range: 0kPa ~ 800 kPa
Transmit Frequency: 433.920MHz

2.5 Standards Applicable for Testing

The standard used was FCC PART 15 Subpart C: 2008. ANSI C63.4:2003.

2.6 Test Location

All tests were performed at:
EMC Laboratory of Guangzhou GRG Metrology and Test Technology Co., Ltd.
No tests were sub-contracted.

2.7 Other Information Requested by the Customer

None.

2.8 Test Facility

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC Listed Lab No. 688188
China	CNAS No.L0446
China	DILAC No.DL175
VCCI	VCCI No.2914

3 Antenna Requirement

3.1 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. 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.

3.2 EUT Antenna

The antenna is integrated on the main PCB and no consideration of replacement.



Antenna of the transmitter

Test result: The device does meet the FCC requirements.

4 Equipments Used during Test

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Semi-anechoic chamber	ETS-LINGGREN	RFD-F/A-100	3730	2010-04-10
Test Receiver	ROHDE & SCHWARZ	ESU 40	100012	2009-06-02
Log period antenna	ETS-LINGGREN	3142C	00075971	2009-08-03
Horn antenna	ETS.LINDGREN	3117C	00075824	2009-08-03
Coaxial	GRGT	Cable 2	N/A	2009-07-01

5 Radiated Spurious Emissions

Test Requirement: FCC 15.231(b)
 Test Method: ANSI C63.4 chapter13
 Test Date: 2009-05-26
 Test Status: Transmitting Mode
 Test site: Measurement Distance: 3m (Semi-Anechoic Chamber)
 Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz – 1000 MHz). 1MHz resolution bandwidth and Peak detector apply (1000 MHz – 5GHz).
 Receive antenna scan height 1 m – 4 m, polarization: Vertical / Horizontal
Power supply: DC 3.6V battery(transmitter)

Radiated Emission Limits:

According to 15.231, Periodic operation in the band 40.66-40.70 MHz and above 70MHz, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental(μV/m)	Field Strength of spurious emissions (μV/m)
40.66-40.70	2250	225
70-130	1250	125
130-174	1,250 to 3,750 *	125 to 375 *
174-260	3750	375
260-470	3,750 to 12,500 *	375 to 1250 *
Above 470	12500	1250

* linear interpolations

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209,as following table:

Fundamental frequency (MHz)	Field Strength of spurious emissions	
	(μV/m)	dB (μV/m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

Test Configuration:

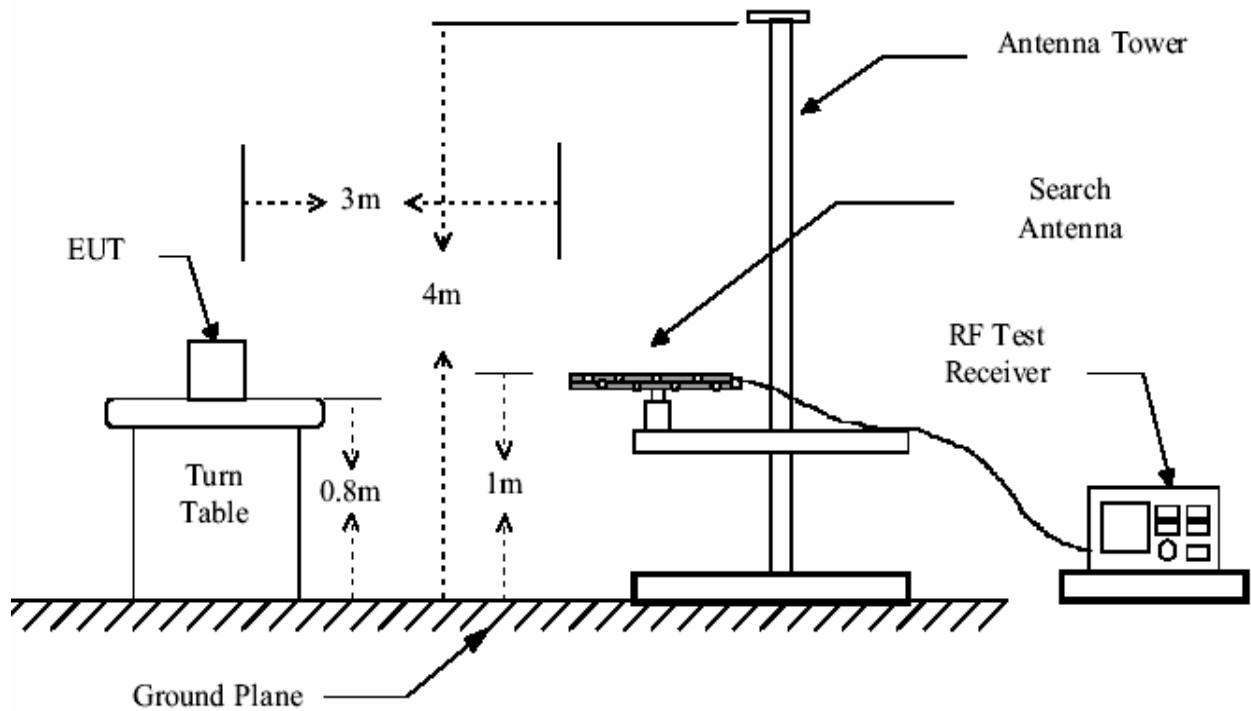


Figure1. 30MHz to 1GHz radiated emissions test configuration

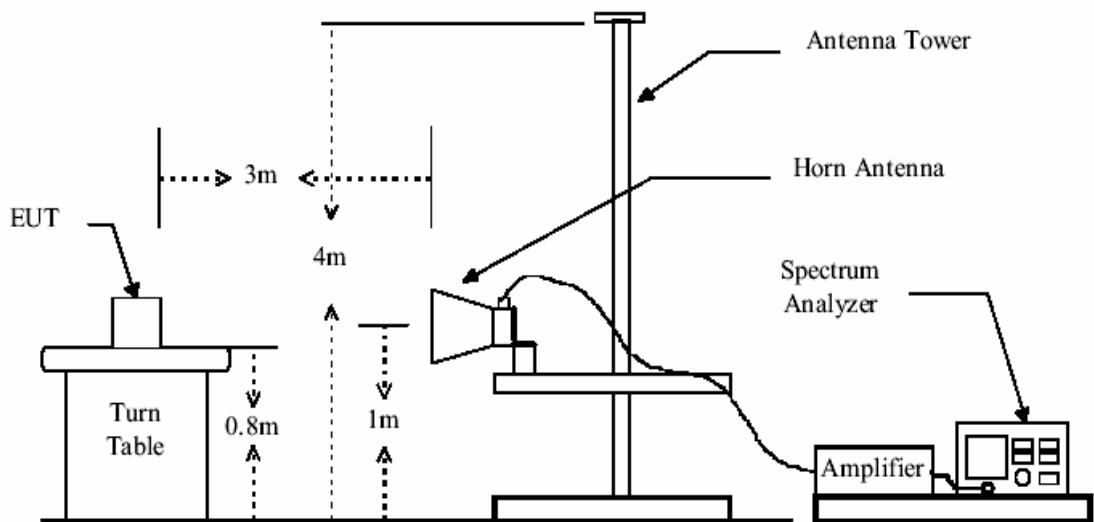
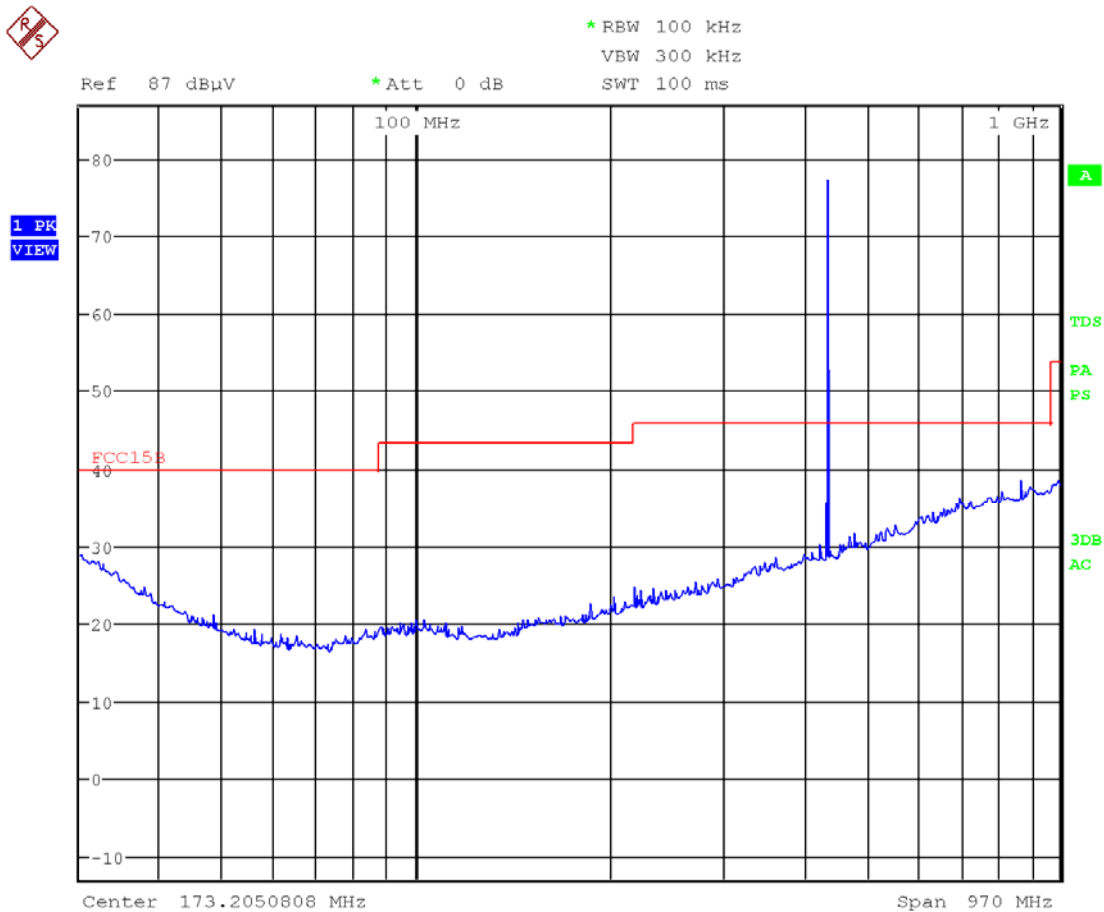


Figure2. Above 1GHz radiated emissions test configuration

Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receiver was scanned from 30MHz to 5GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

5.1 Harmonic and other spurious emissions

E.U.T	Transmitter		
Environment	Tem:25 Hum:55%	Test Engineer:	Tian Fengyi
Site :	3M chamber	Limit	FCC 15.209
Note :	Continuous Transmit(ANT Horizontal)		



Detected Peaks:

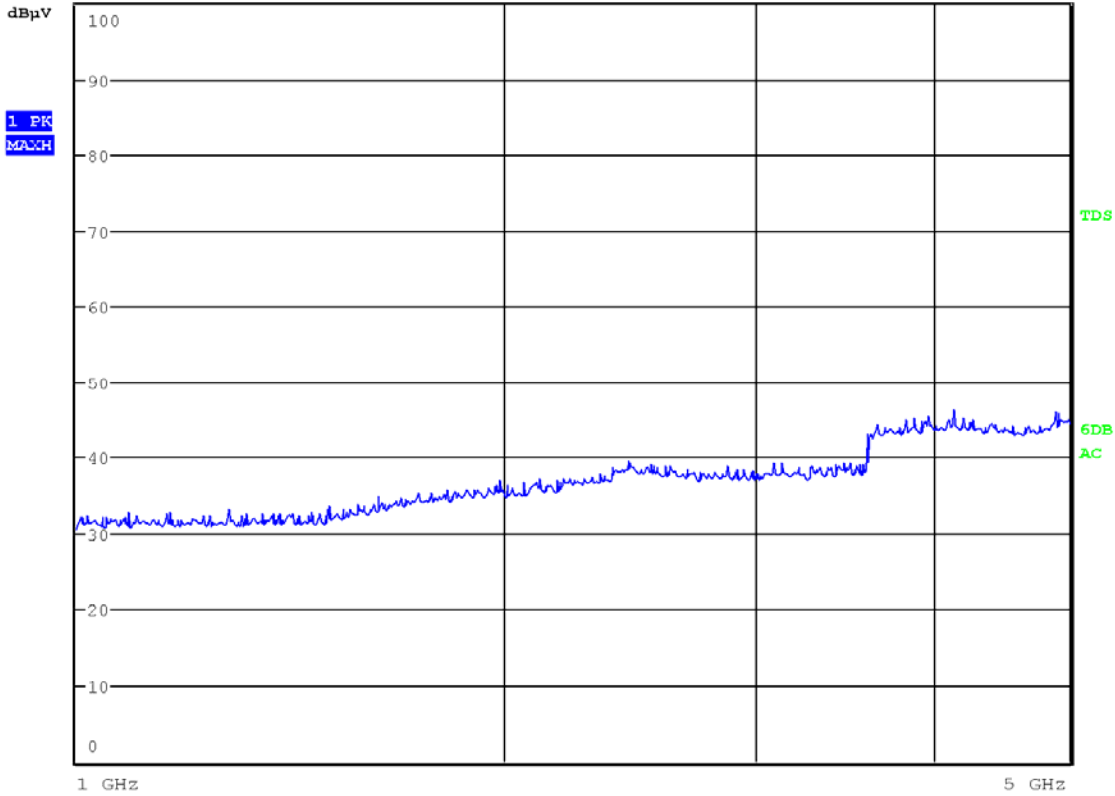
No.	Frequency (MHz)	Reading dB(μV/m)	QP Limit dB(μV/m)	Margin dB(μV/m)	Angle (degrees)	Height (m)	Result	H/V	Remark
1	30.800	28.5	40.0	11.5	0	1	Pass	H	Others
2	38.440	25.6	40.0	16.4	0	1	Pass	H	Others
3	340.560	27.0	46.0	19.0	0	1	Pass	H	Others
4	433.934	77.3	80.8	3.5	180	1.5	Pass	H	Fundamental
5	716.680	34.0	46.0	12.0	0	1	Pass	H	Others
6	888.280	35.8	46.0	10.2	90	1	Pass	H	Others

E.U.T	Transmitter		
Environment	Tem:25 Hum:55%	Test Engineer:	Tian Fengyi
Site :	3M chamber	Limit	FCC 15.209
Note :	Continuous Transmit(ANT Horizontal)		



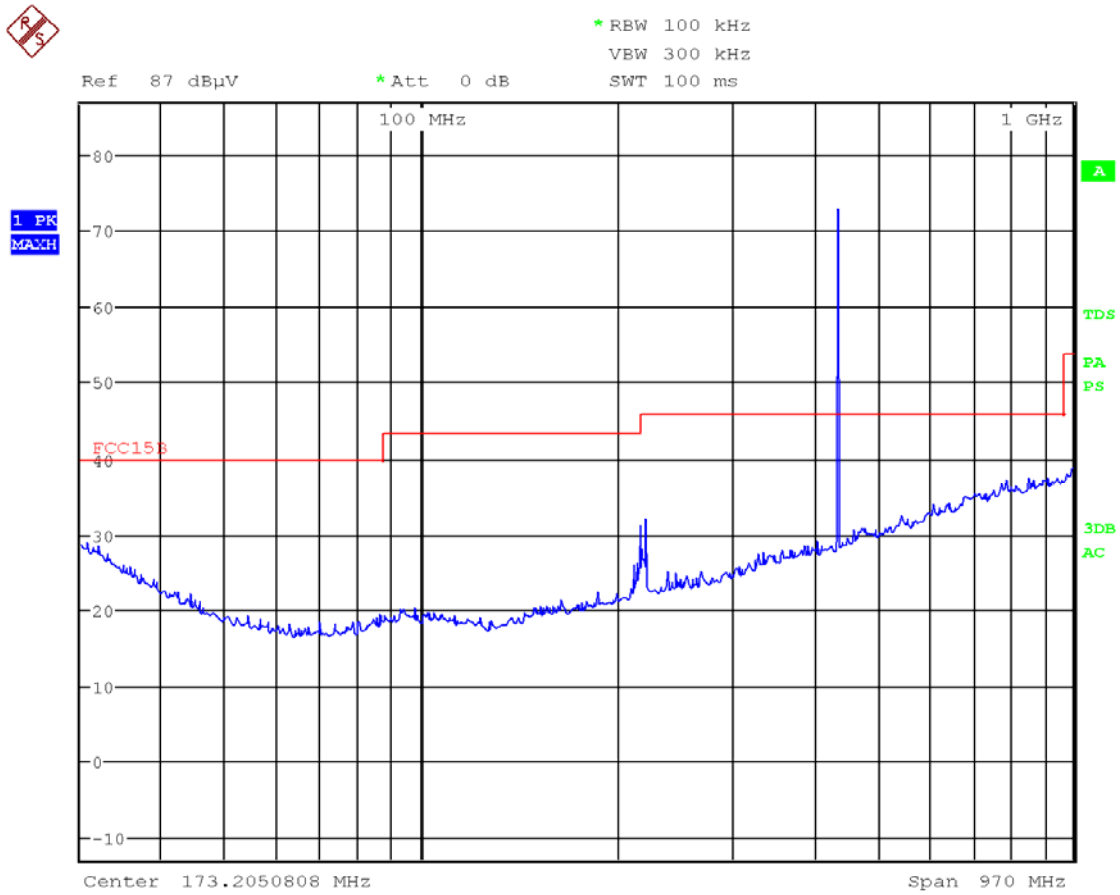
RBW 1 MHz
MT 2 ms
PREAMP OFF

Att 0 dB



Detected Peaks: /

E.U.T	Transmitter		
Environment	Tem:25 Hum:55%	Test Engineer:	Tian Fengyi
Site :	3M chamber	Limit	FCC 15.209
Note :	Continuous Transmit(ANT Vertical)		



Detected Peaks:

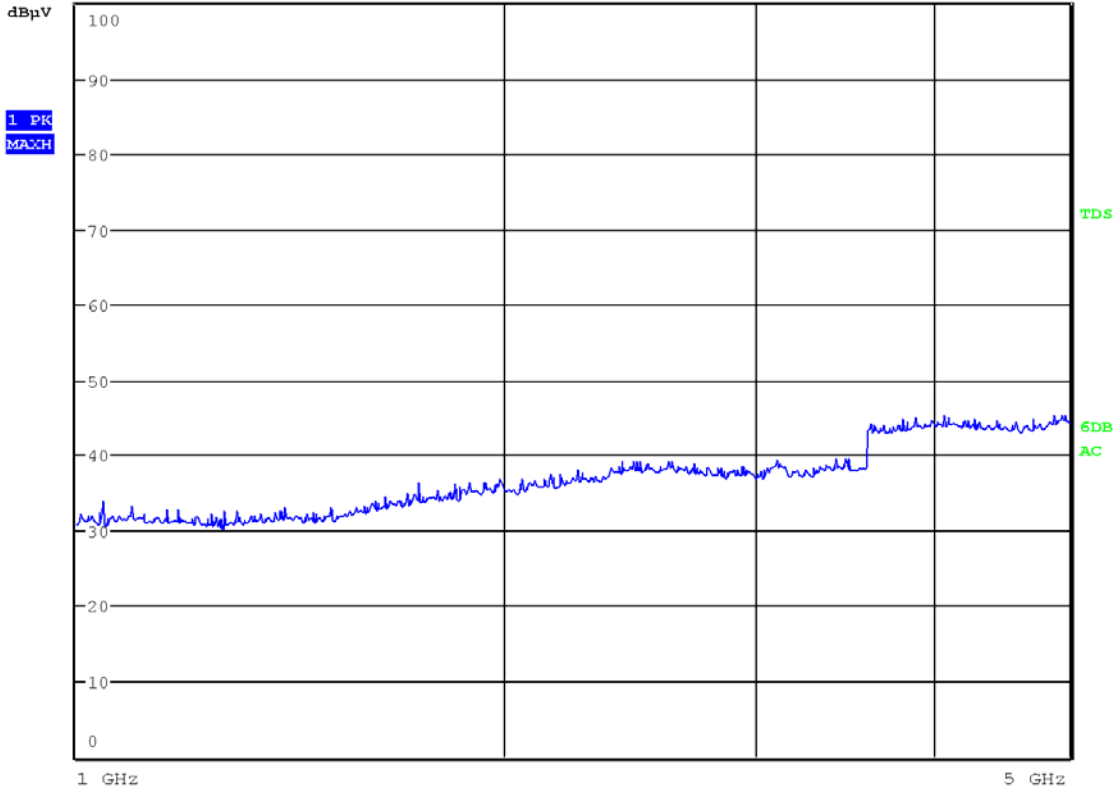
No.	Frequency (MHz)	Reading dB(µV/m)	QP Limit dB(µV/m)	Margin dB(µV/m)	Angle (degrees)	Height (m)	Result	H/V	Remark
1	30.16	33.5	40.0	6.5	180	2.5	Pass	V	Others
2	213.68	27.4	43.5	16.1	180	3	Pass	V	Others
3	221.52	28.2	46.0	17.8	0	3	Pass	V	Others
4	433.934	72.8	80.8	8	160	3	Pass	V	Fundamental
5	697.520	39.6	46.0	6.4	180	3	Pass	V	Others
6	867.880	42.1	46.0	3.9	180	3	Pass	V	Others

E.U.T	Transmitter		
Environment	Tem:25 Hum:55%	Test Engineer:	Tian Fengyi
Site :	3M chamber	Limit	FCC 15.209
Note :	Continuous Transmit(ANT Vertical)		



RBW 1 MHz
MT 2 ms
PREAMP OFF

Att 0 dB



Detected Peaks: /

6 Active Time

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.231(a)(2)

Test Date: 2009-05-26

Test requirements:

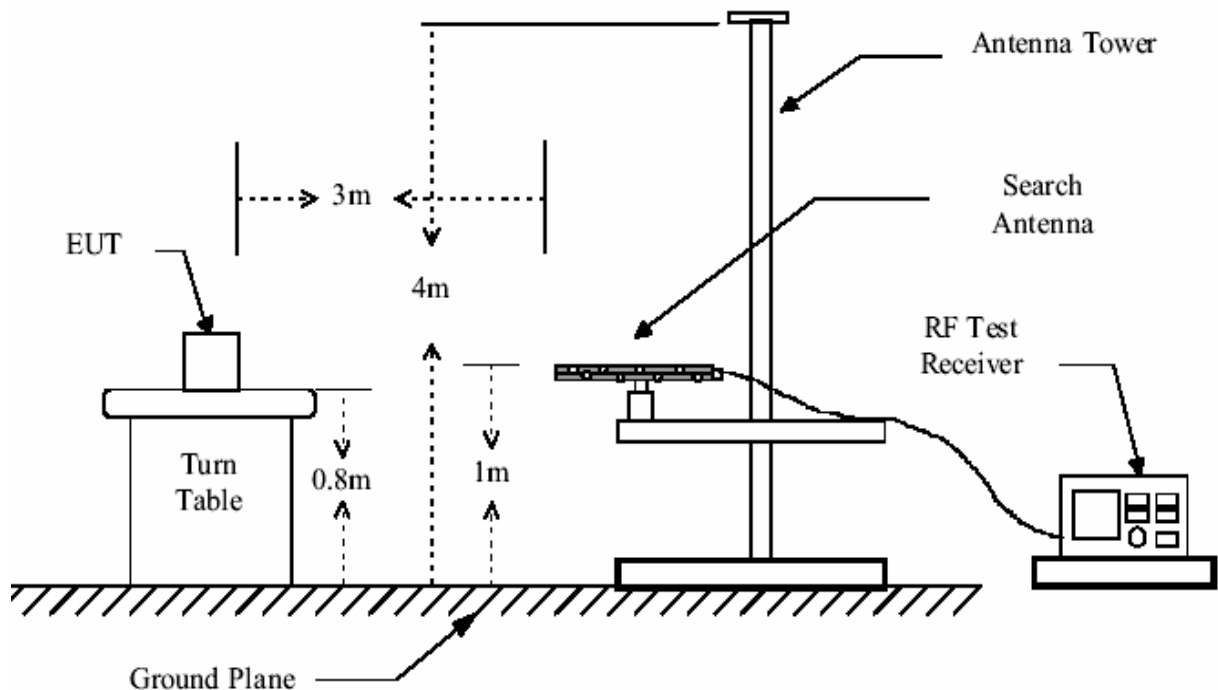
-) According to 15.251(a)(2), a transmitter activated automatically shall ceases transmission within 5 seconds after activation.
-) According to 15.251(a)(3), polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

Test Status: Test in continuous transmitting operating mode.

Power supply: DC 3.6V battery

Test Procedure:
Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

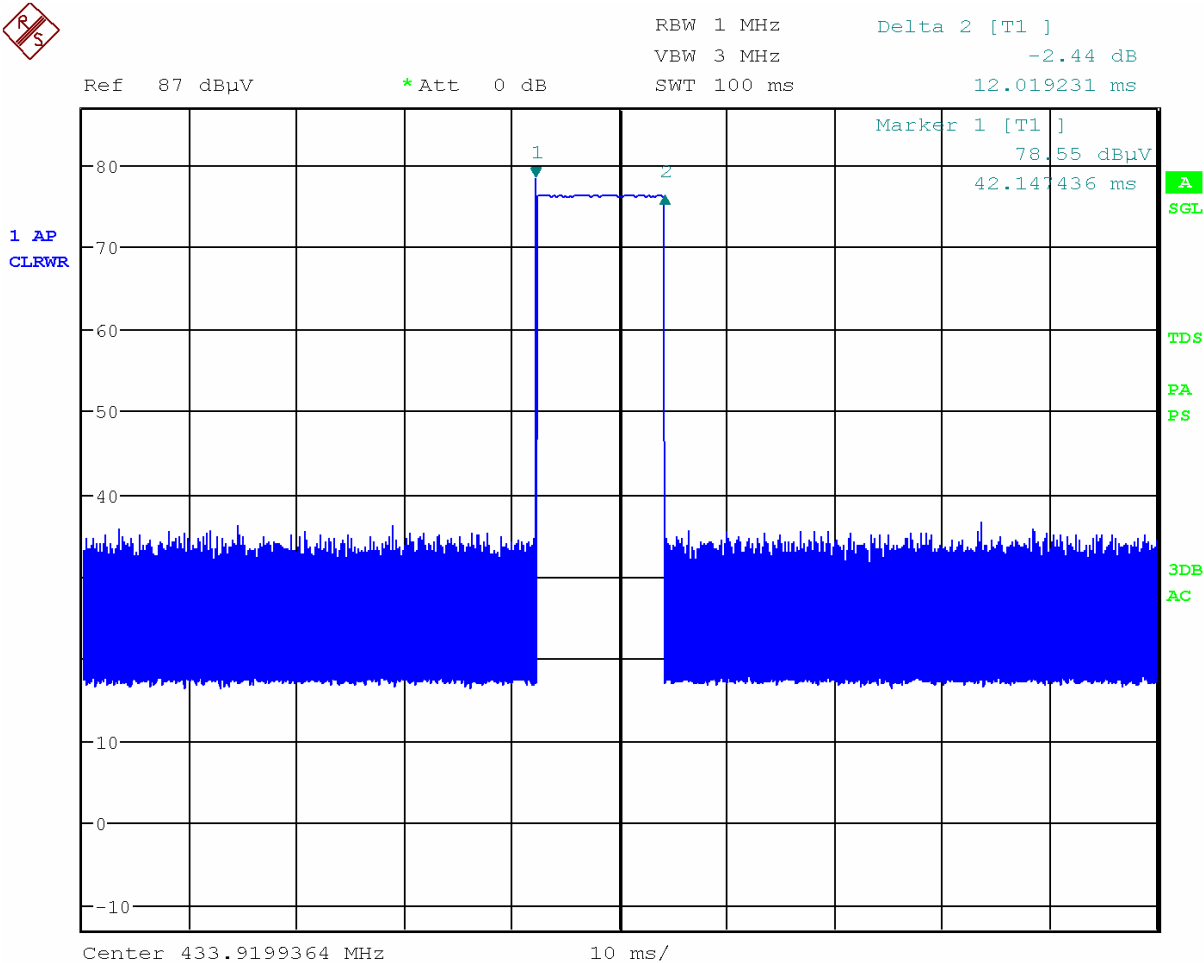
Test Configuration:



Test Mode: Transmitting

Frequency (MHz)	Transmitting Time (Second)		Limit (Second)	Result
433.92	T _{on}	0.0120	2	PASS
Remark:)The EUT activated automatically and the transmitting time is 12.019ms that comply with 15.251(a)(2);) The EUT transmits 17.6ms in every 4minutes that comply with 15.251(a)(3).				

Result plot as follows:



7 Bandwidth of Emission

Test Requirement: FCC Part 15 C
Test Method: Based on FCC Part15 C Section 15.231(c)
Test Date: 2009-05-26
Test Status: Test in fixing operating frequency of 433.920MHz
Power supply: DC 3.6V battery
Test requirements: 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 Procedure:

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

Test result:

Frequency (MHz)	20dB Bandwidth (kHz)	bandwidth	Result
433.92	1084.80	312kHz	Pass
Remark: Limit=Frequencyx0.25%= 433.92x0.25%= 1084.80 kHz			

Result plot as follows:

