



**Report No. : E86.12.292.006**

**This Test Report is Prepared for**

**Gobiz Electronics Limited**

Rm 201, 2/F, Hi-Tech Centre, 9 Choi Yuen Road, Sheung Shui, N.T., Hong Kong .

Product Name: Tire Pressure Monitoring System

Model No.: SC, SE, SG, SH, SI, SM, SN, SK, SO

Brand Name: N/A

Applicable standards: FCC Part 15.231(e)

Test result: The FCC testing has been performed on the submitted samples and found in compliance with ANSI 63.4-2003 and FCC Part15.231(e)

Prepared by :

Shirley Xu Assistant

Reviewer :

Mary Huang/Supervisor

Approved & Authorized Signer :

Mike Wang/ Manager

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Test Report Conclusion

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## 1. General Information

### 1.1 Details of Applicant

Name: Gobiz Electronics Limited

Address: Rm 201, 2/F, Hi-Tech Centre, 9 Choi Yuen Road, Sheung Shui, N.T., Hong Kong .

### 1.2 Application Details

Date of Receipt of Application: August 9, 2012

Date of Receipt of Test Item: August 9, 2012

Date of Test: August 8, 2012~ August 30 2012

### 1.3 General Description of EUT

Product Name:	Tire Pressure Monitoring System
Model No.:	SE, SG, SH, SI, SM, SN, SK, SO
Brand Name;	N/A
Operation Frequency:	433.92MHz
Modulation Technology:	ASK
Antenna Type:	Integral Antenna
Power supply:	DC3V
Remark:	Only the basic model No. SC was tested. The other models are identical in the same PCB layout, interior structure and electrical circuits with the basic model. The only difference is the model name for commercial purpose.
FCC ID:	VMKTPMSSC

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2.0	Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2012-04-26	2013-04-25
System Controller	CT	SC100	-	2012-04-26	2013-04-25
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2012-04-26	2013-04-25
3m OATS	--	--	N/A	2012-04-26	2013-04-25
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2012-04-26	2013-04-25
Pre-amplifier	EM	EM30265	2727A05017	2012-04-26	2013-04-25
Pre-amplifier	HP	8447D	2727A05017	2012-04-26	2013-04-25

### 3.0 Technical Details

#### 3.1 Summary of test results

The EUT has been tested according to the following specifications:			
Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	Conducted Emission Test	<b>PASS</b>	N/A
FCC Part 15, Paragraph 15.209	General Requirement	<b>PASS</b>	Compliant
FCC Part 15, Paragraph 15.231 (b) (e)	Radiated Emission Test	<b>PASS</b>	Compliant
FCC Part 15, Paragraph 15.231 (c)	20dB Bandwidth Testing	<b>PASS</b>	Compliant
FCC Part 15, Paragraph 15.231 (e)	Deactivate Testing	<b>PASS</b>	Compliant
FCC PART 15, Paragraph 15.203	Antenna Requirement	<b>PASS</b>	Compliant

#### 3.2 Test Standards

##### FCC Part 15 Subpart C, Paragraph 15.231

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#### 4.0 Test Lab Details

**Name: SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD**

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

FCC Registration Number: 899988

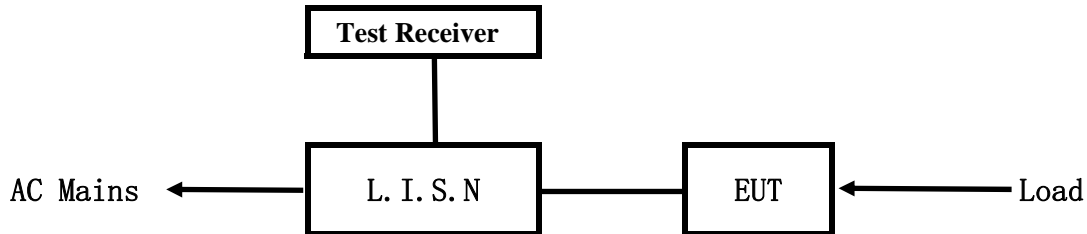
Note: All tests were done at SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

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**5. Power Line Conducted Emission Test**

5.1 Schematics of the test

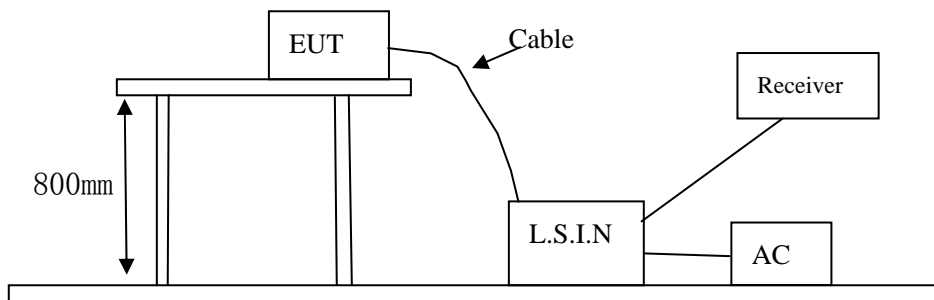


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model	FCC ID
Tire Pressure Monitoring System	Gobiz Electronics Limited	SC	VMKTPMSSC

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable

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N/A				

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency (MHz)	Class A Limits (dB $\mu$ V)		Class B Limits (dB $\mu$ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

- Notes: 1. \*Decreasing linearly with logarithm of frequency.  
 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz. (The average detector is necessary when the Quasi-peak emission level beyond the average Limit.)

**Note: Due to DC operation, this test item not applicable.**

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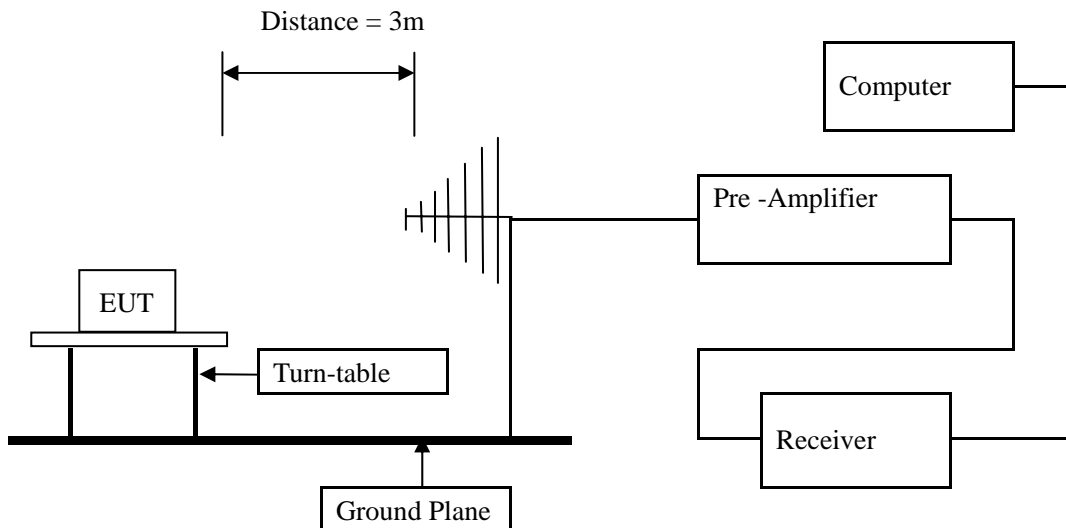


## 6 Radiated Emission Test

### 6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.  
For Fundamental Radiated Emission measurement, set RBW=500kHz
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

### Block diagram of Test setup



### 6.2 Configuration of The EUT

Same as section 5.3 of this report

### 6.3 EUT Operating Condition

Same as section 5.4 of this report.

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6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

**A FCC Part 15 Subpart C Paragraph 15.231(e) Limit**

Fundamental Frequency (MHz)	Field Strength of Fundamental		Field Strength of Spurious Emission	
	uV/m	dBuV/m	uV/m	dBuV/m
40.66-40.70	1000	60.00	100	40.00
70-130	500	53.98	50	33.98
130-174	500-1500	53.98-63.52	50-150	33.98-43.52
174-260	1500	63.52	150	43.52
260-470	1500-5000	63.52-73.98	150-500	43.52-53.98
Above 470	5000	73.98	500	53.98

- Note:
1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)
  2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
  3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.
  4. Linear interpolations for frequency ranges 130-174MHz and 260-470MHz
  5. the above field strength limits are specified at a distance of 3-meters and the tighter limits apply at the band edges
  6. New batteries were installed in the equipment under test for radiated emission testing.

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**B. Frequencies in restricted band are complied to limit on Paragraph 15.209.**

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

- Note:
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
  2. In the Above Table, the tighter limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
  4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-5G, the final emission level got using PK detector. And Average = peak(dBuV/m) – duty cycle(dB)

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**6.5 Test result**

**A Fundamental Radiated Emission Data**

Product:	Tire Pressure Monitoring System	Test Mode:	Tx transmitting
Test Item:	Fundamental Radiated Emission and Spurious Emission Data	Temperature:	25°C
Test Voltage:	DC 3V	Humidity:	56%
Test Result:	Pass		

Frequency (MHz)	Emission PK/AV (dBuV/m)	Horiz / Vert	Limits PK/AV (dBuV/m)	Margin(dB)
433.92	58.53(PK)	Horizontal	92.87/72.87	-14.34
433.92	70.27(PK)	Vertical	92.87/72.87	-2.60
867.84	36.98(PK)	Horizontal	72.87/52.87	-15.89
867.84	44.29(PK)	Vertical	72.87/52.87	-8.58
1301.760	42.00(PK)	Horizontal	72.87/52.87	-10.87
1301.760	48.00(PK)	Vertical	72.87/52.87	-4.87
1735.680	41.34(PK)	Horizontal	72.87/52.87	-11.50
1735.680	46.84(PK)	Vertical	72.87/52.87	-6.03
2169.500	--	Horizontal	72.87/52.87	--
2169.500	45.50(PK)	Vertical	72.87/52.87	-7.37
3037.440	45.11(PK)	Horizontal	72.87/52.87	-7.76
3037.440	46.11(PK)	Vertical	72.87/52.87	-6.76

**Note:1. Average = peak(dBuV/m) – duty cycle(dB). Due to the measure PK emission level less than the AV limit value. No necessary to take down the AV emission level.**  
**2. The EUT is in continuous transmitting during Radiated Emissions Test. So PDCF is not needed.**

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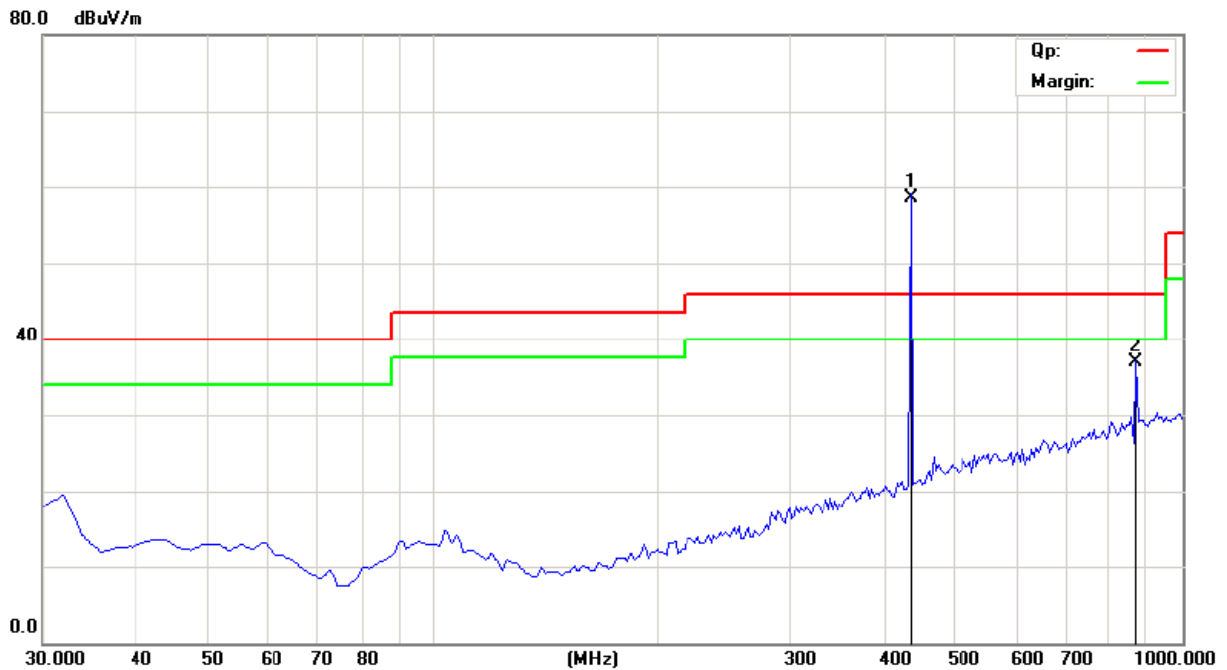
**B. General Radiated Emission Data and Harmonics Radiated Emission Data**

**Radiated Emission In Horizontal (30MHz----1000MHz)**

EUT set Condition: Tx Transmitting

**Results: Pass**

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
--	--	H	--

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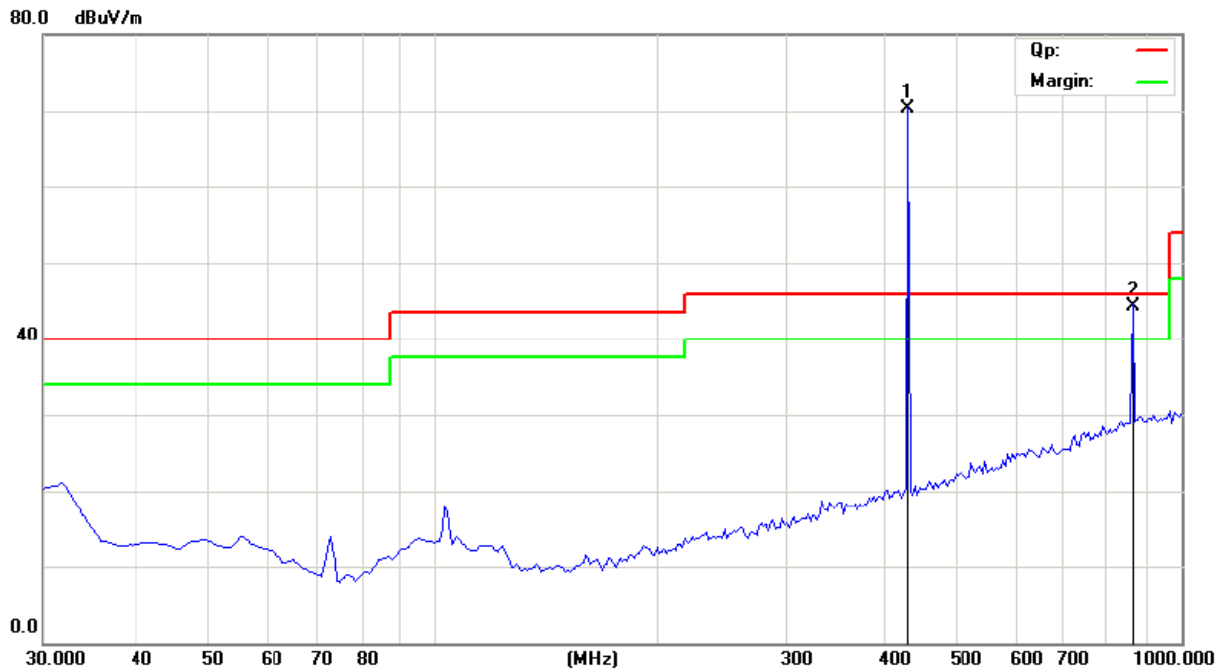
**B. General Radiated Emission Data and Harmonics Radiated Emission Data**

**Radiated Emission In Horizontal (30MHz----1000MHz)**

EUT set Condition: Tx Transmitting

**Results: Pass**

Please refer to following diagram for individual



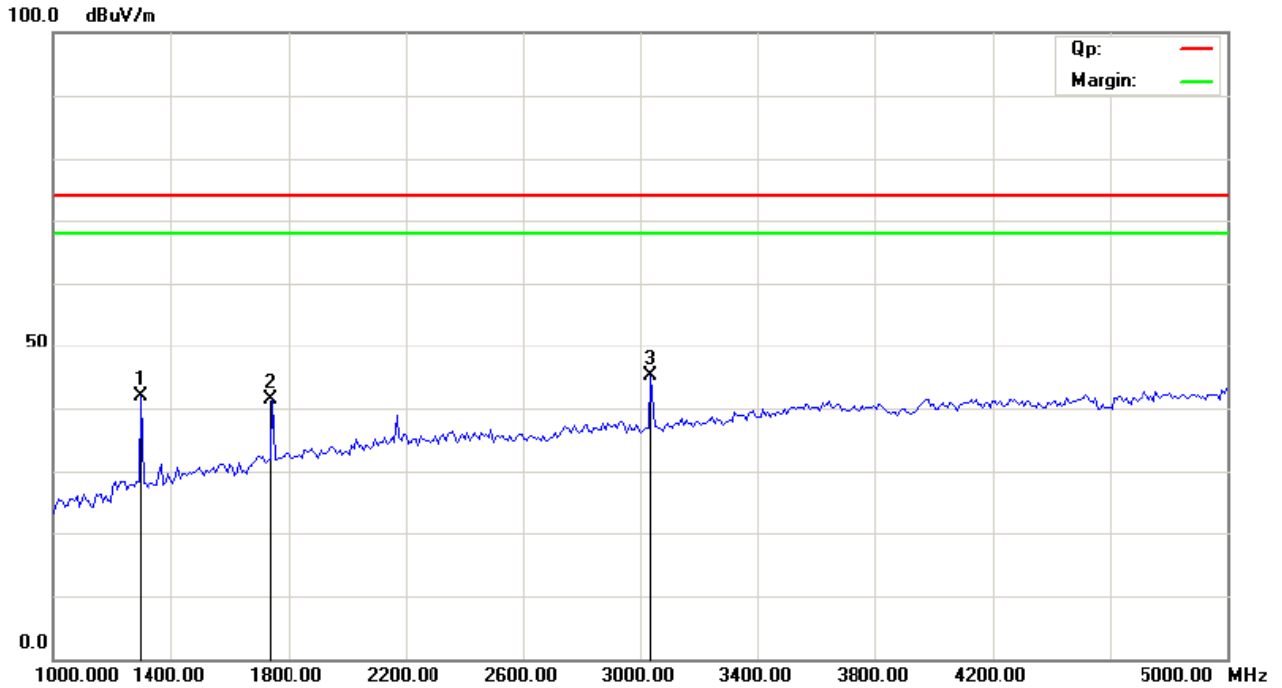
Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
--	--	V	--
--	--	V	--

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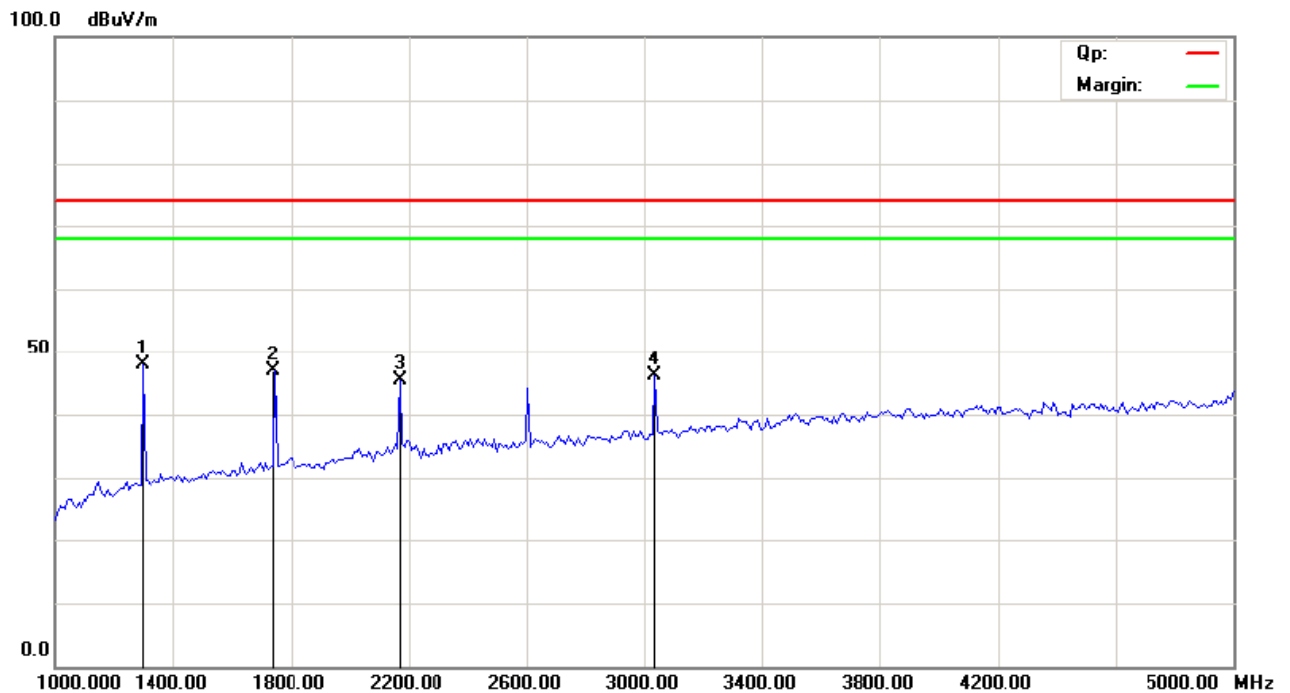


Test Plot above 1G

### Horizontal



### Vertical



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## 7.0 20dB Bandwidth Testing

### 7.1 Requirement

Per 15.231(c), 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. Bandwidth is determined at the points 20 dB down from the modulated carrier.

### 7.2 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.

### 7.3 Test Data

A: EUT set Condition: Periodic Tx Transmitting

Frequency (MHz)	20dB Bandwidth Emission (kHz)	Limit (kHz)	Result
433.92	379	1084.80	Pass

$$\text{Limit} = \text{Frequency} \times 0.25\% = 433.92 \times 0.25\% = 1084.80\text{kHz}$$

Refer to attached plots:



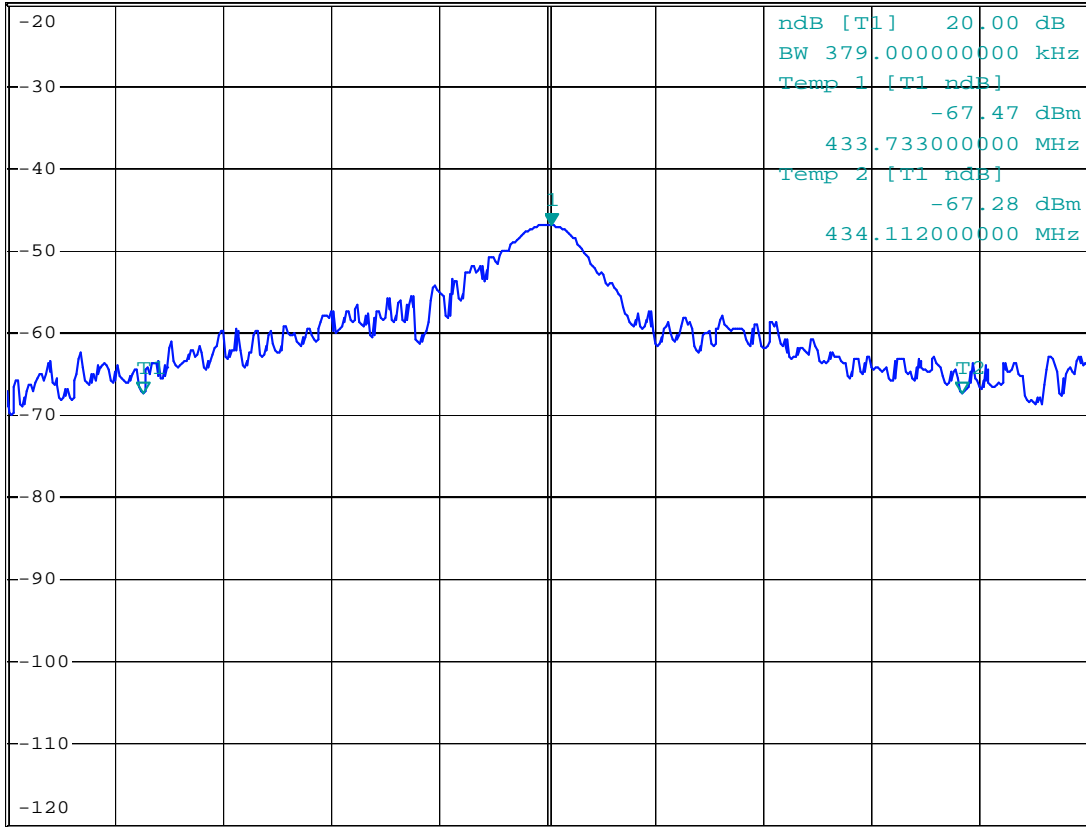
**Tx Transmitting**



**MARKER 1**  
 433.922 MHz  
 Ref -20 dBm Att 10 dB

\*RBW 30 kHz Marker 1 [T1 ]  
 \*VBW 100 kHz -46.87 dBm  
 SWT 2.5 ms 433.922000000 MHz

1 PK  
 MAXH



Center 433.92 MHz 50 kHz/ Span 500 kHz

Date: 21.AUG.2012 16:34:21

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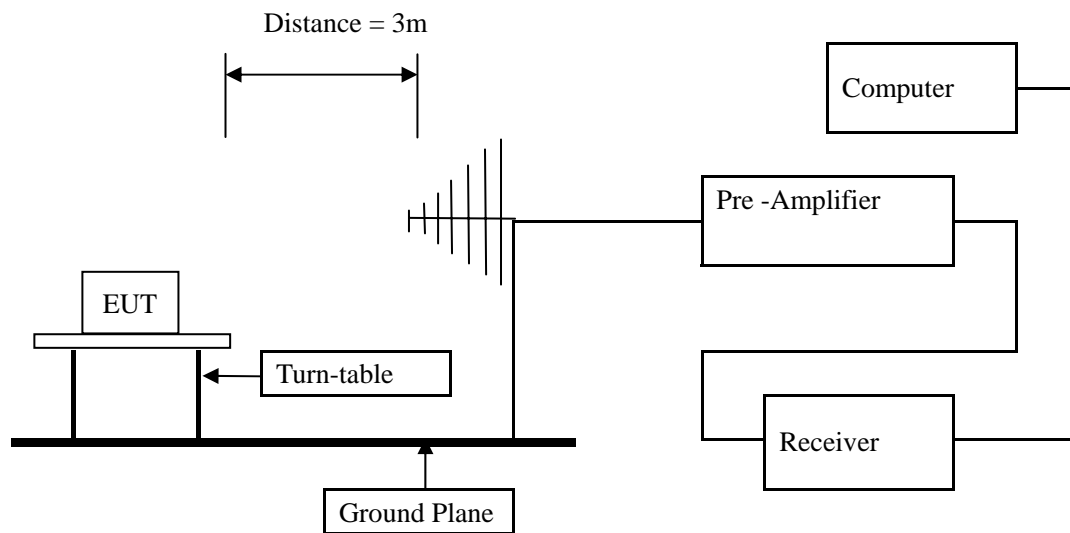
## 8.0 Deactivate Test

### 8.1 Requirement

Per 15.231(e)

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.

### 8.2 Radiated Test Setup



For the actual test configuration , please refer to the related items – Photos of Testing

The deactivation test was performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC 15.231(e) limits.

### 8.3 Test Procedure

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



### 8.4 Test Data

Refer to attached plots:

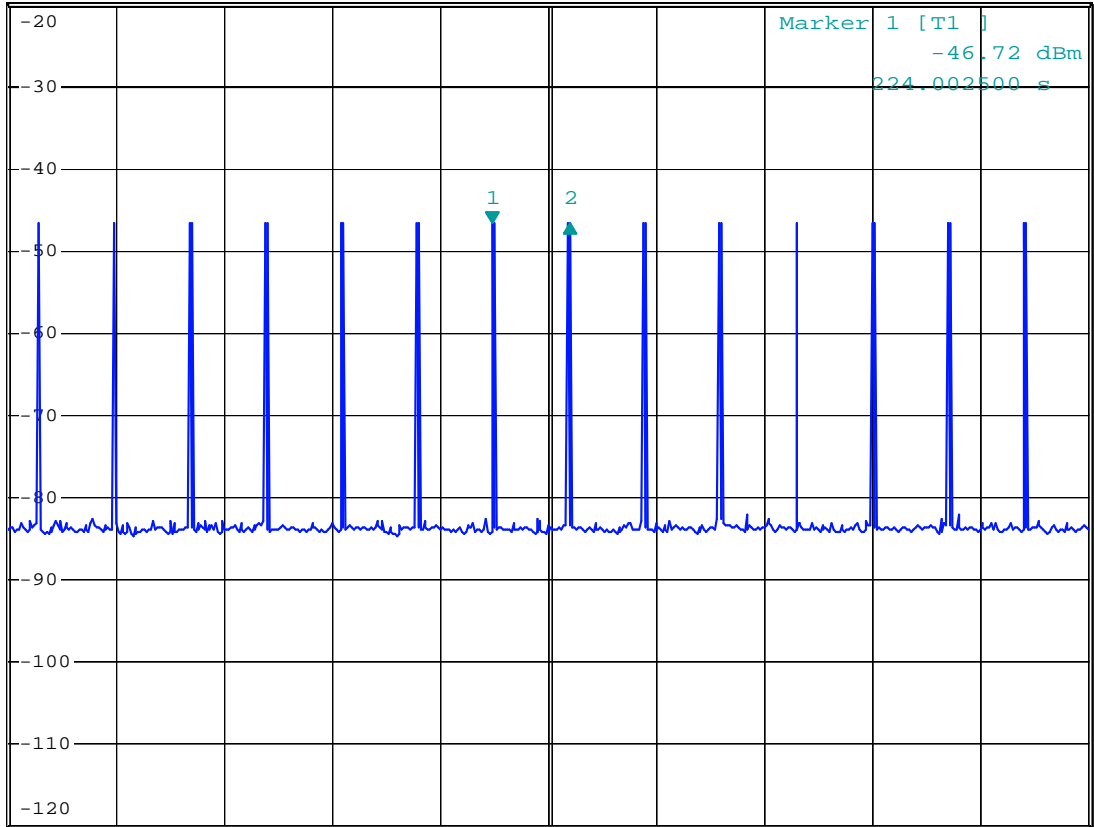
Test Mode: Tx Transmitting



**DELTA MARKER 2**  
35.9975 s  
Ref -20 dBm Att 10 dB

RBW 100 kHz Delta 2 [T1 ]  
\*VBW 100 kHz 0.03 dB  
SWT 500 s 35.997500 s

1 PK  
VIEW



Center 433.92 MHz 50 s/

Date: 21.AUG.2012 16:12:14

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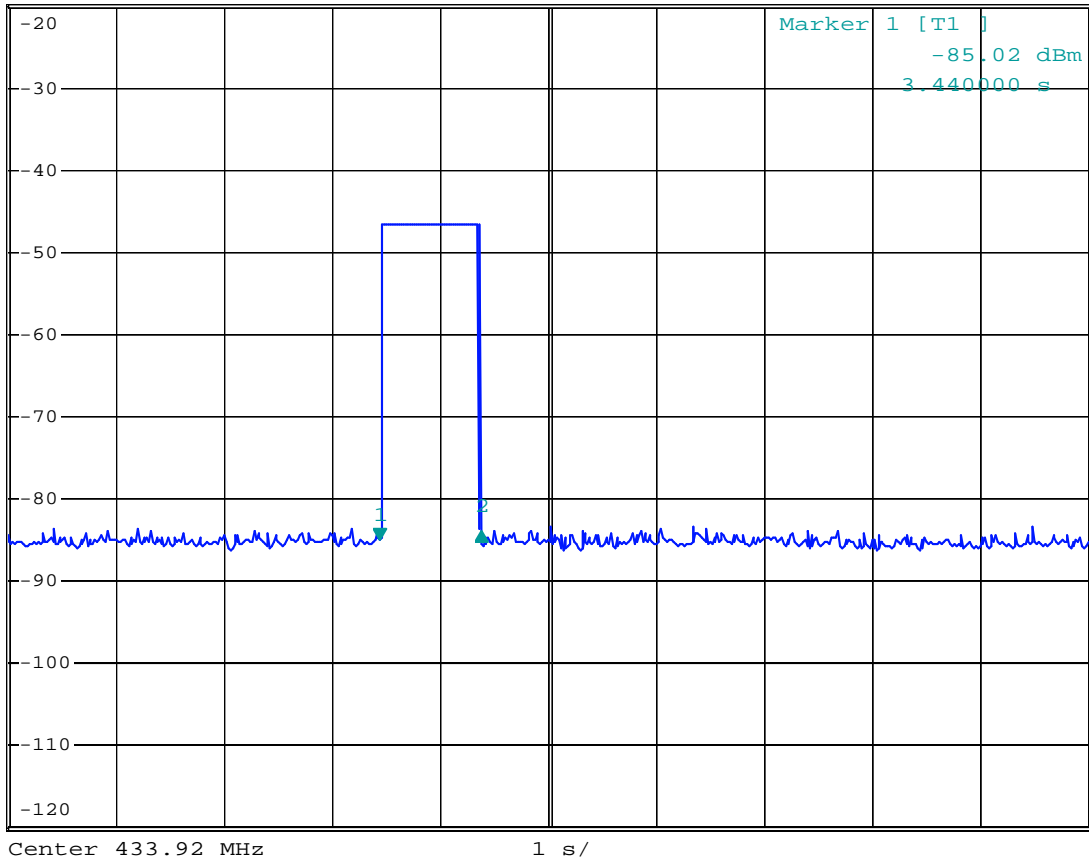
**Tx Transmitting**



**DELTA MARKER 2**  
940 ms  
Ref -20 dBm Att 10 dB

RBW 100 kHz Delta 2 [T1 ]  
\*VBW 100 kHz 1.17 dB  
SWT 10 s 940.000000 ms

1 PK  
VIEW



Date: 21.AUG.2012 16:14:23

**8.5 Test result: there is one transmission every 36s. And the duration of each transmission is 940ms.  
So the EUT meet the FCC Part 15.231 (e) rule**

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## 9.0 Duty Cycle

### 9.1 Limit

Nil (No dedicated limit specified in the Rules).

### 9.2 Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer=operating frequency.
4. Set the spectrum analyzer as
  1. RBW, VBW=100kHz, Span=0Hz, Adjust Sweep=500s.
  2. RBW, VBW=100kHz, Span=0Hz, Adjust Sweep=10s.
5. Repeat above procedures until all frequency measured were complete.

### 9.3 Test Data

**There is one transmission every 36s. And the duration of each transmission is 940ms.**

**So**

$T_p = 36s$

$T_{on} = 940ms$

$Factor = 20 * \log (T_{on} / T_p) = 20 * \log (0.94/36) = -31.66dB$



### **10.0 Antenna Requirement according to Part 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.

**Result:**

Integral antenna, designed as an indispensable part of the EUT. And it meets the FCC requirement.



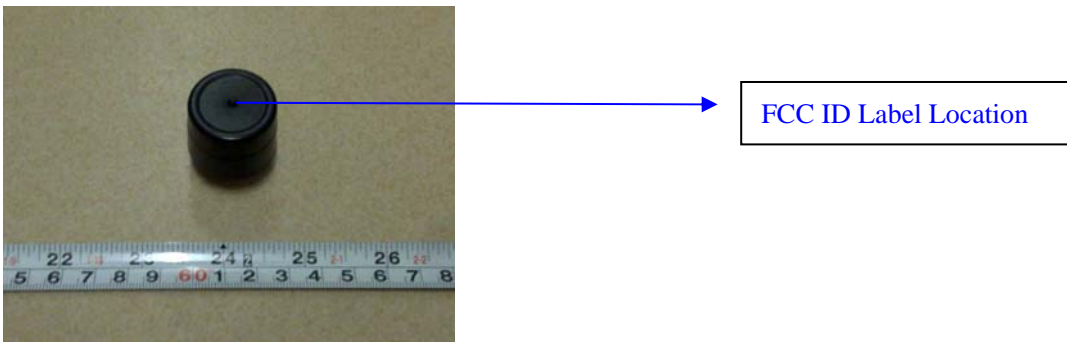
### 11.0 FCC ID Label

#### FCC ID: VMKTPMSSC

**This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.**

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

#### Mark Location:



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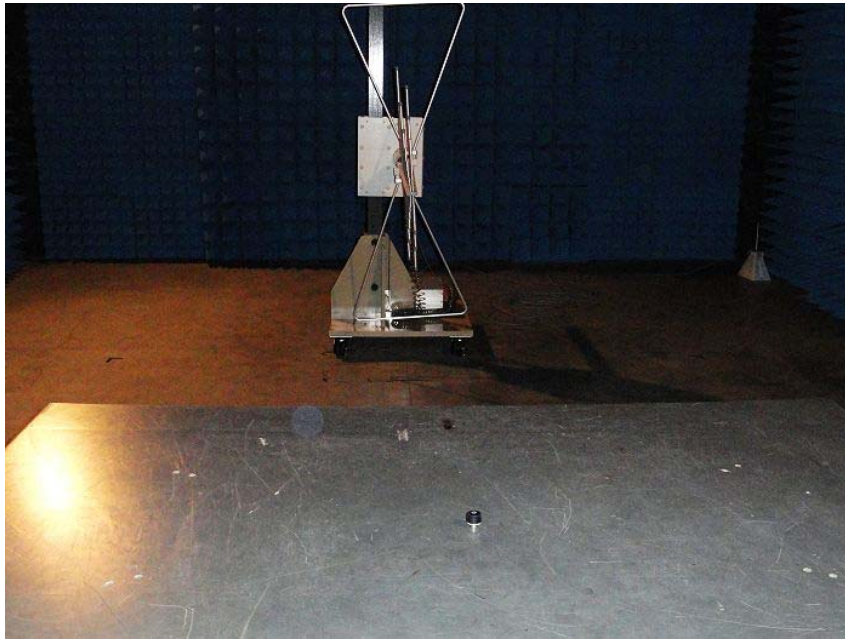


**12.0 Photo of testing**

12.1 Conducted test View--

N/A

12.2 Emission Radiated test View



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12.3 Photo for the EUT

Outside View



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Outside View



Inside View



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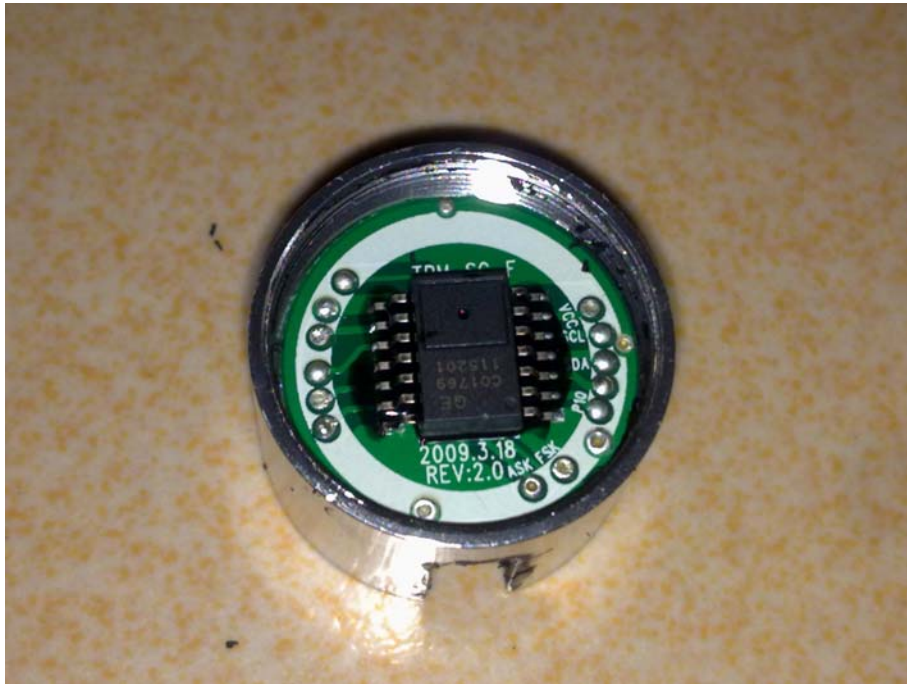


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### **End of the report**

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