

# FCC REPORT

**Applicant:** Computime Limited

**Address of Applicant:** 17/F, Great Eagle Centre, 23 Harbour Road, Wanchai, Hong Kong

**Equipment Under Test (EUT)**

Product Name: Transmitter

Model No.: RCST

**FCC ID:** DI2RCST-TX

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.231:2010

**Date of sample receipt:** May 07, 2012

**Date of Test:** Jul. 22-30, 2012

**Date of report issued:** August 29, 2012

**Test Result :** PASS \*

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

Authorized Signature:

A circular blue stamp with the text "GLOBAL UNITED TECHNOLOGY SERVICES CO., LTD." around the perimeter and "GTS GLOBAL TESTING" in the center. A handwritten signature in black ink is written across the stamp.

Robinson Lo  
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. 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. Any mention of GTS International Electrical Approvals or testing done by GTS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by GTS International Electrical Approvals in writing.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only."

## 2 Version

Version No.	Date	Description
00	August 29, 2012	Original

**Prepared By:** Oscear. Li **Date:** August 29, 2012  
**Project Engineer**

**Check By:** Hans. Hu **Date:** August 29, 2012  
**Reviewer**

## 3 Contents

	Page
1 COVER PAGE.....	1
2 VERSION.....	2
3 CONTENTS.....	3
4 TEST SUMMARY.....	4
5 GENERAL INFORMATION.....	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF E.U.T.....	5
5.3 TEST MODE.....	6
5.4 TEST FACILITY.....	6
5.5 TEST LOCATION.....	6
5.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	6
5.7 TEST INSTRUMENTS LIST.....	7
6 TEST RESULTS AND MEASUREMENT DATA.....	8
6.1 ANTENNA REQUIREMENT:.....	8
6.2 RADIATED EMISSION METHOD.....	9
6.2.1 <i>Field Strength of The Fundamental Signal</i> .....	11
6.2.2 <i>Spurious emissions</i> .....	13
6.3 20dB OCCUPY BANDWIDTH.....	16
6.4 DWELL TIME:.....	17
7 TEST SETUP PHOTO.....	18
8 EUT CONSTRUCTIONAL DETAILS.....	19

## 4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.231 (b)	Pass
Spurious emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231 (c)	Pass
Dwell time	15.231 (a)	Pass

*Pass: The EUT complies with the essential requirements in the standard.*

## 5 General Information

### 5.1 Client Information

Applicant:	Computime Limited
Address of Applicant:	17/F, Great Eagle Centre, 23 Harbour Road, Wanchai, Hong Kong
Manufacturer:	Computime Limited
Address of Manufacturer	17/F, Great Eagle Centre, 23 Harbour Road, Wanchai, Hong Kong
Factory:	Computime Electronics (shenzhen) Company Limited
Address of Factory:	Computime Technology Park, DanZhuTou Cun, Buji, Longgang Region, Shenzhen, China

### 5.2 General Description of E.U.T.

Product Name:	Transmitter
Model No.:	RCST
Operation Frequency:	350.477MHz
Modulation technology:	ASK
Antenna Type:	PCB antenna
Antenna gain:	2dBi (declare by Manufacturer)
Power supply:	DC 4.5V(3*1.5V for "AAA" Size)

### 5.3 Test mode

Transmitting mode	Keep the EUT in transmitting continuously mode.
-------------------	---

#### Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	74.69	76.66	75.18

#### Final Test Mode:

According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”:

Y axis (see the test setup photo)

### 5.4 Test Facility

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

- **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen 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 600491, July 20, 2010.

- **Industry Canada (IC)**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. Has been

Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-1.

### 5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China

Tel: 0755-27798480

Fax: 0755-27798960

### 5.6 Other Information Requested by the Customer

None.

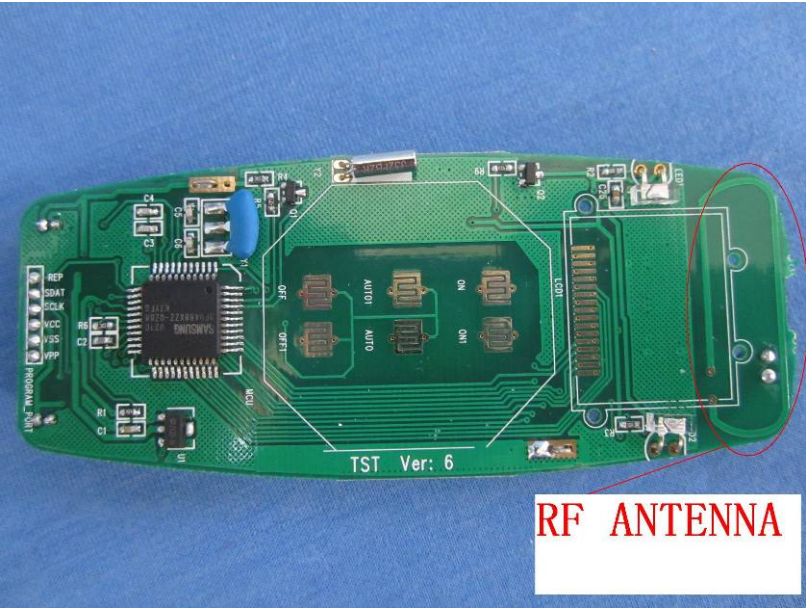
## 5.7 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 30 2011	Mar. 29 2013
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 03 2012	Jul. 02 2013
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Mar. 10 2012	Mar. 09 2013
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	Mar. 10 2012	Mar. 09 2013
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 10 2012	Mar. 09 2013
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Jul. 03 2012	Jul. 02 2013
9	Coaxial Cable	GTS	N/A	GTS211	Jul. 03 2012	Jul. 02 2013
10	Coaxial cable	GTS	N/A	GTS210	Jul. 03 2012	Jul. 02 2013
11	Coaxial Cable	GTS	N/A	GTS212	Jul. 03 2012	Jul. 02 2013
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 03 2012	Jul. 02 2013
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 03 2012	Jul. 02 2013
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 29 2012	June 28 2013
15	Band filter	Amindeon	82346	GTS219	Mar. 31 2012	Mar. 30 2013
16	D.C. Power Supply	Instek	PS-3030	GTS232	Mar. 31 2012	Mar. 30 2013
17	Thermo meter	KTJ	TA328	GTS256	Jul. 06 2012	Jul. 05 2013

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	Barometer	ChangChun	DYM3	GTS257	July 10 2012	July 09 2013

## 6 Test results and Measurement Data

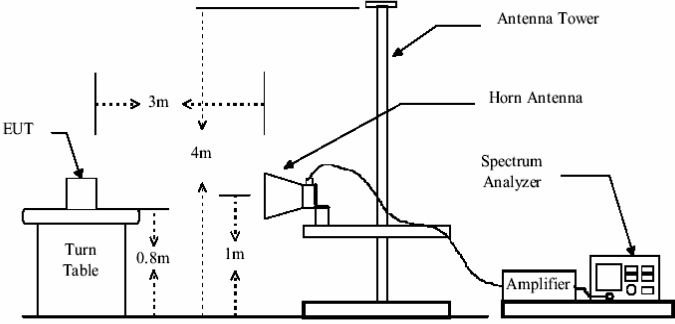
### 6.1 Antenna requirement:

<b>Standard requirement:</b>	FCC Part15 C Section 15.203
<p><b>15.203 requirement:</b></p> <p>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, 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.</p>	
<p><b>E.U.T Antenna:</b></p>	
<p>The EUT make use of a PCB antenna, the typical gain of the antenna is 2dBi.</p> 	



## 6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.231(b)				
Test Method:	ANSI C63.4: 2003				
Test Frequency Range:	30MHz to 4GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit: (Field strength of the fundamental signal)	Frequency		Limit (dBuV/m @3m)		Remark
	350.477MHz		77.50		Average Value
			97.50		Peak Value
Limit: (Spurious Emissions)	Frequency		Limit (dBuV/m @3m)		Remark
	30MHz-88MHz		40.00		Quasi-peak Value
	88MHz-216MHz		43.50		Quasi-peak Value
	216MHz-960MHz		46.00		Quasi-peak Value
	960MHz-1GHz		54.00		Quasi-peak Value
	Above 1GHz		54.00		Average Value
		74.00		Peak Value	
Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits a higher field strength.					
Test setup:	Below 1GHz				
Above 1GHz					

	 <p>The diagram illustrates the test setup. An EUT (Equipment Under Test) is placed on a turn table that is 0.8 meters high. The turn table is positioned 3 meters away from an antenna tower. The antenna tower is a variable-height structure with a horn antenna mounted on top. The antenna height is varied from 1 meter to 4 meters above the ground. The test receiver system, including a spectrum analyzer and an amplifier, is connected to the antenna tower.</p>
<p>Test Procedure:</p>	<ol style="list-style-type: none"> <li>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</li> </ol>
<p>Test Instruments:</p>	<p>Refer to section 5.7 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.3 for details</p>
<p>Test results:</p>	<p>Pass</p>

Measurement data:

## 6.2.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
350.477	77.32	16.30	2.62	32.02	64.22	97.50	-33.28	Horizontal
350.477	89.76	16.30	2.62	32.02	76.66	97.50	-20.84	Vertical

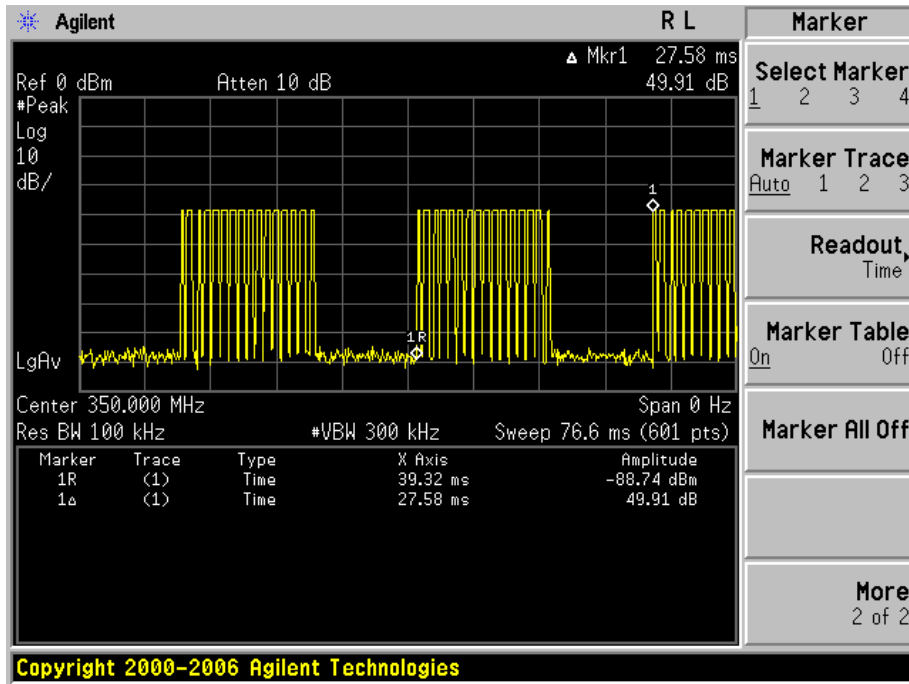
Average value:

Frequency (MHz)	Peak Value (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
350.477	64.22	-9.26	54.96	77.50	-22.54	Horizontal
350.477	76.66	-9.26	67.40	77.50	-10.10	Vertical

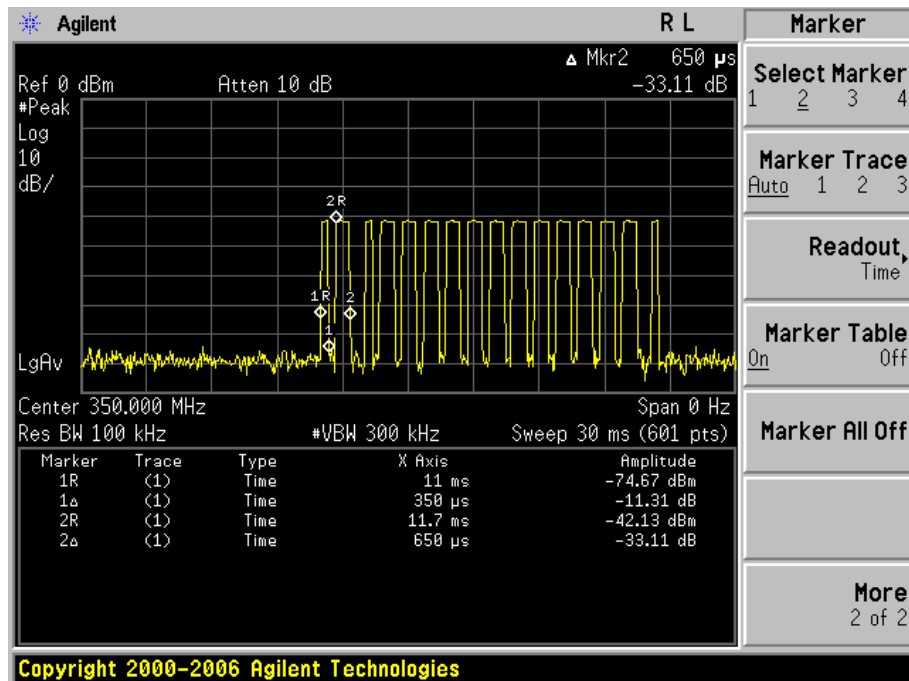
Average value:	
Calculate Formula:	Average value=Peak value + Duty Cycle Factor
	Duty cycle factor=20 log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	Ton time =0.35*3+0.65*13=9.5ms
	T period =27.58ms
	Duty cycle= 34.44%
	duty cycle factor= -9.26

Test plot as follows:

T period:



T on time slot:



## 6.2.2 Spurious emissions

■ Below 1GHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
31.40	47.87	15.70	0.57	32.06	32.08	40.00	-7.92	Vertical
38.62	48.88	16.51	0.65	32.06	33.98	40.00	-6.02	Vertical
82.94	44.37	12.25	1.05	31.75	25.92	40.00	-14.08	Vertical
155.91	39.58	11.58	1.60	32.00	20.76	43.50	-22.74	Vertical
239.99	39.34	15.07	2.07	32.16	24.32	46.00	-21.68	Vertical
942.13	37.61	23.95	5.01	31.21	35.36	46.00	-10.64	Vertical
31.40	49.46	15.70	0.57	32.06	33.67	40.00	-6.33	Horizontal
40.28	38.13	16.58	0.66	32.06	23.31	40.00	-16.69	Horizontal
60.07	39.64	15.70	0.86	31.94	24.26	40.00	-15.74	Horizontal
102.72	37.51	15.98	1.22	31.77	22.94	43.50	-20.56	Horizontal
290.02	38.94	15.89	2.31	32.18	24.96	46.00	-21.04	Horizontal
968.93	38.21	23.84	5.11	31.22	35.94	54.00	-18.06	Horizontal

■ Above 1GHz

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1051.43	49.21	24.62	4.34	31.30	46.87	74.00	-27.13	Vertical
1401.91	50.79	25.58	4.61	31.66	49.32	74.00	-24.68	Vertical
1752.39	49.99	25.07	4.83	31.39	48.50	77.50	-29.00	Vertical
2102.86	47.65	26.97	5.08	31.26	48.44	77.50	-29.06	Vertical
2453.34	49.95	27.46	5.44	31.79	51.06	77.50	-26.44	Vertical
2803.82	51.84	28.42	5.76	30.97	55.05	74.00	-18.95	Vertical
3154.29	51.46	28.87	6.25	29.25	57.33	77.50	-20.17	Vertical
3504.77	53.26	28.96	6.95	28.09	61.08	77.50	-16.42	Vertical
1051.43	47.22	24.62	4.34	31.30	44.88	74.00	-29.12	Horizontal
1401.91	49.17	25.58	4.61	31.66	47.70	74.00	-26.30	Horizontal
1752.39	49.20	25.07	4.83	31.39	47.71	77.50	-29.79	Horizontal
2102.86	48.36	26.97	5.08	31.26	49.15	77.50	-28.35	Horizontal
2453.34	49.78	27.46	5.44	31.79	50.89	77.50	-26.61	Horizontal
2803.82	50.52	28.42	5.76	30.97	53.73	74.00	-20.27	Horizontal
3154.29	51.83	28.87	6.25	29.25	57.70	77.50	-19.80	Horizontal
3504.77	54.00	28.96	6.95	28.09	61.82	77.50	-15.68	Horizontal

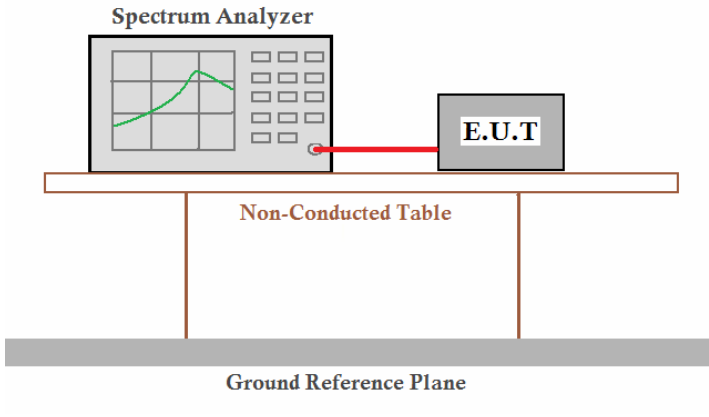
**Average value:**

Frequency (MHz)	Level (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1051.43	46.87	-9.26	37.61	54.00	-16.39	Vertical
1401.91	49.32	-9.26	40.06	54.00	-13.94	Vertical
1752.39	48.50	-9.26	39.24	57.50	-18.26	Vertical
2102.86	48.44	-9.26	39.18	57.50	-18.32	Vertical
2453.34	51.06	-9.26	41.80	57.50	-15.70	Vertical
2803.82	55.05	-9.26	45.79	54.00	-8.21	Vertical
3154.29	57.33	-9.26	48.07	57.50	-9.43	Vertical
3504.77	61.08	-9.26	51.82	57.50	-5.68	Vertical
1051.43	44.88	-9.26	35.62	54.00	-18.38	Horizontal
1401.91	47.70	-9.26	38.44	54.00	-15.56	Horizontal
1752.39	47.71	-9.26	38.45	57.50	-19.05	Horizontal
2102.86	49.15	-9.26	39.89	57.50	-17.61	Horizontal
2453.34	50.89	-9.26	41.63	57.50	-15.87	Horizontal
2803.82	53.73	-9.26	44.47	54.00	-9.53	Horizontal
3154.29	57.70	-9.26	48.44	57.50	-9.06	Horizontal
3504.77	61.82	-9.26	52.56	57.50	-4.94	Horizontal

*Remark:*

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *Average value = Peak value + Duty cycle factor*
3. *“\*\*”, means this data is the too weak instrument of signal is unable to test.*

### 6.3 20dB Occupy Bandwidth

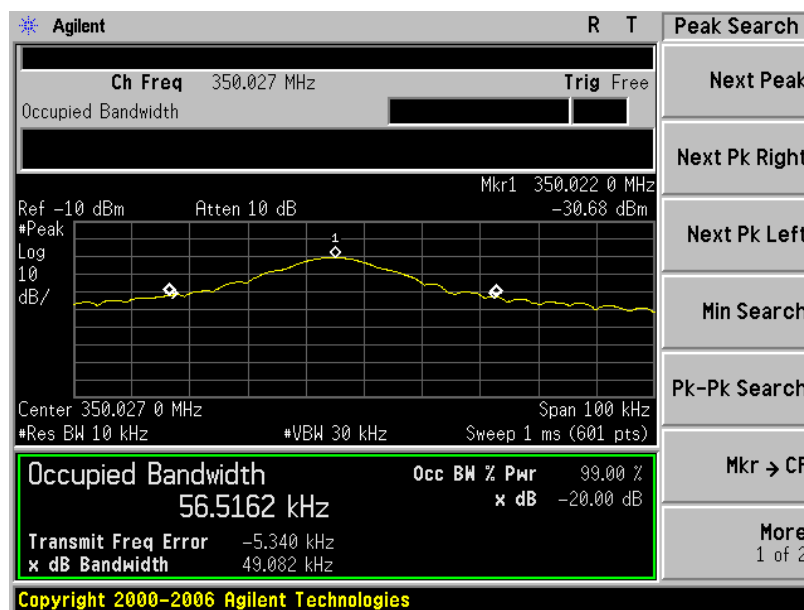
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.4:2003
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

#### Measurement Data

Test Frequency (MHz)	20dB bandwidth (MHz)	Limit (MHz)	Result
350.477	0.04908	0.8762MHz	Pass

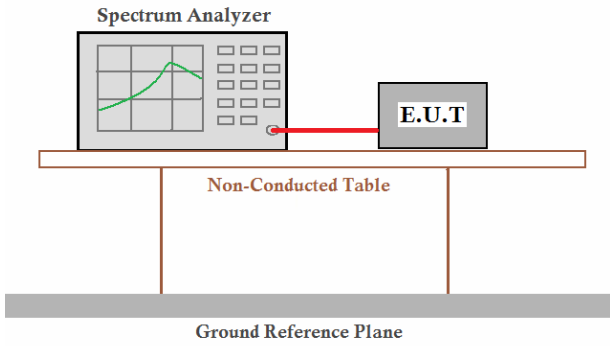
Note: Limit= Fundamental frequency×0.25%=350.477×0.25%=0.8762MHz

Test plot as follows:





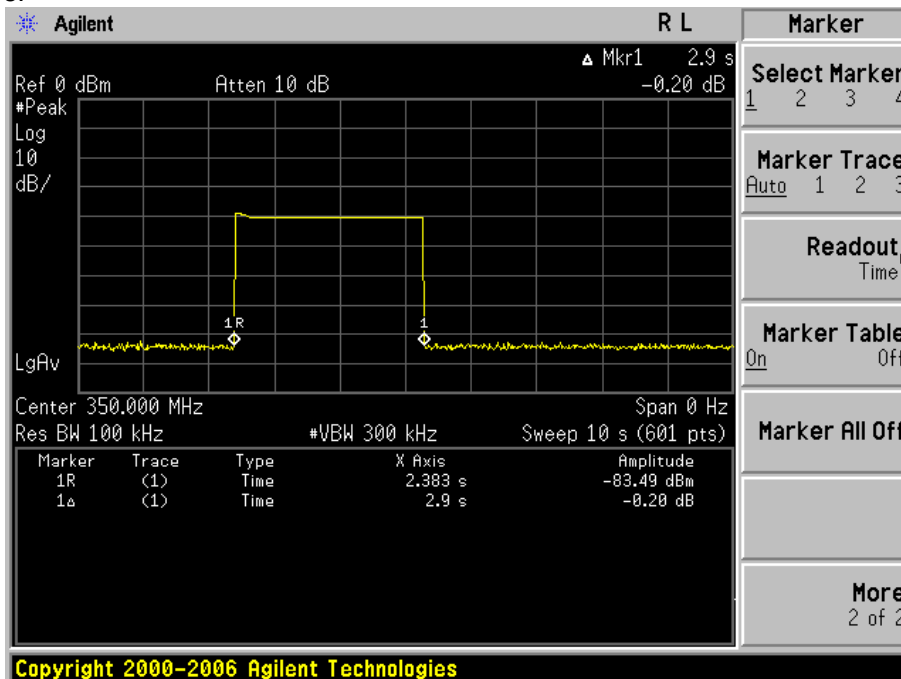
## 6.4 Dwell time:

Test Requirement:	FCC Part15 C Section 15.231 (a)
Test Method:	ANSI C63.4:2003
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

### Measurement data:

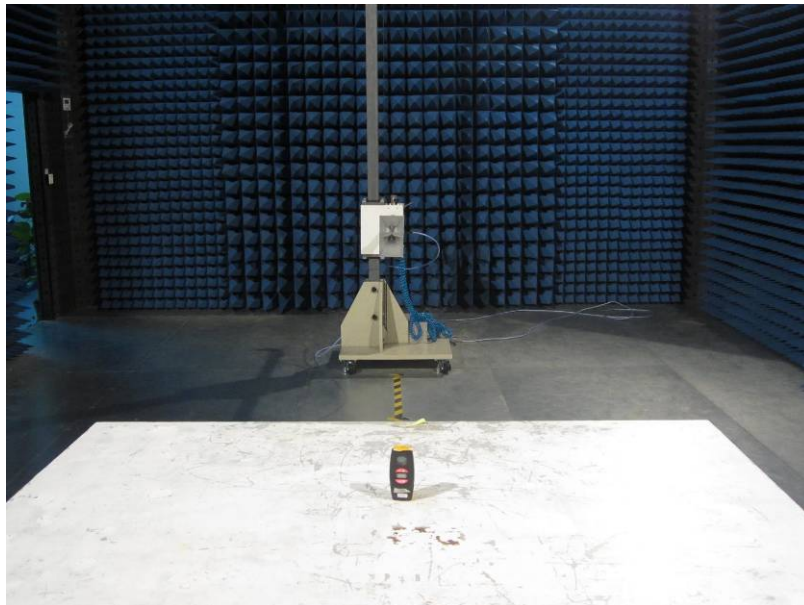
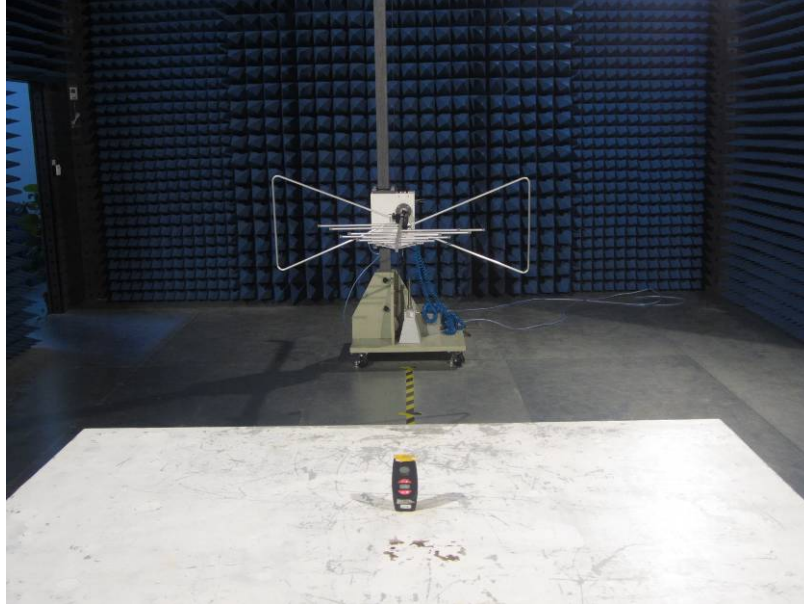
Dwell time (second)	Limit (second)	Result
2.9	<5.0	Pass

### Test plot as follows:

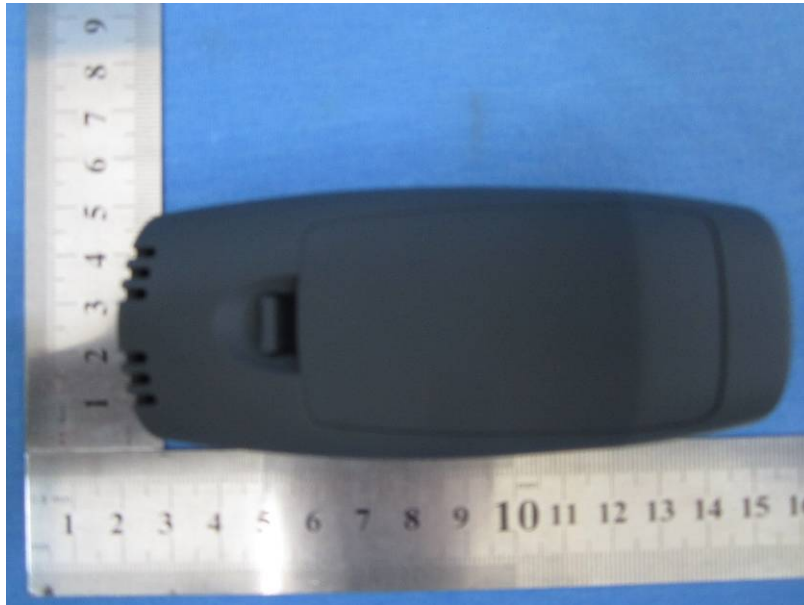


## 7 Test Setup Photo

Radiated Emission

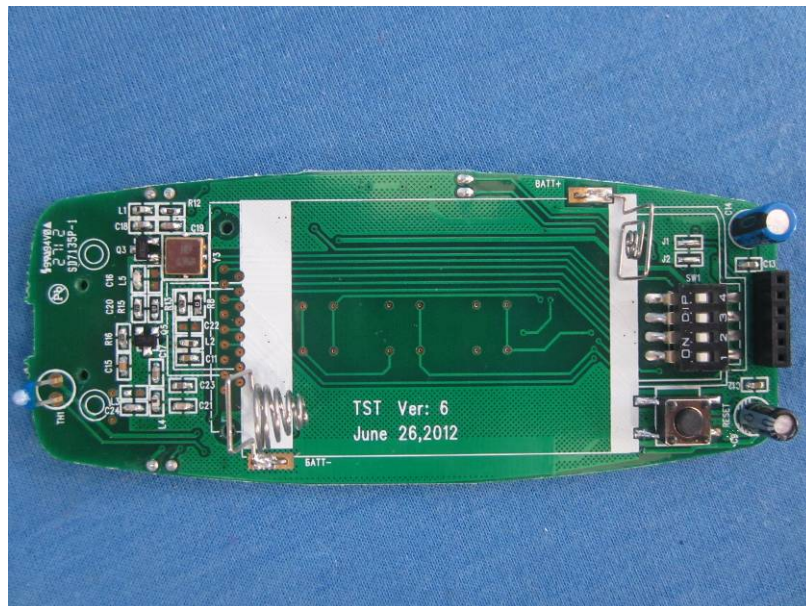
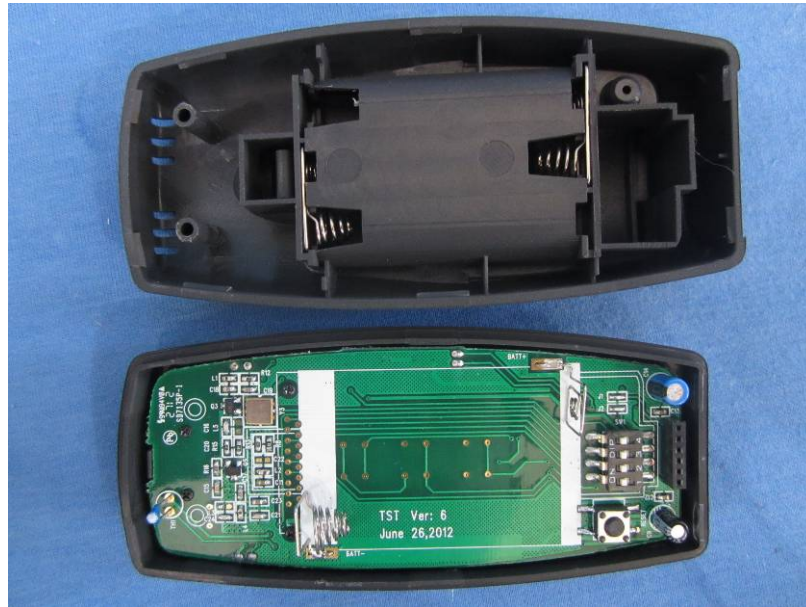


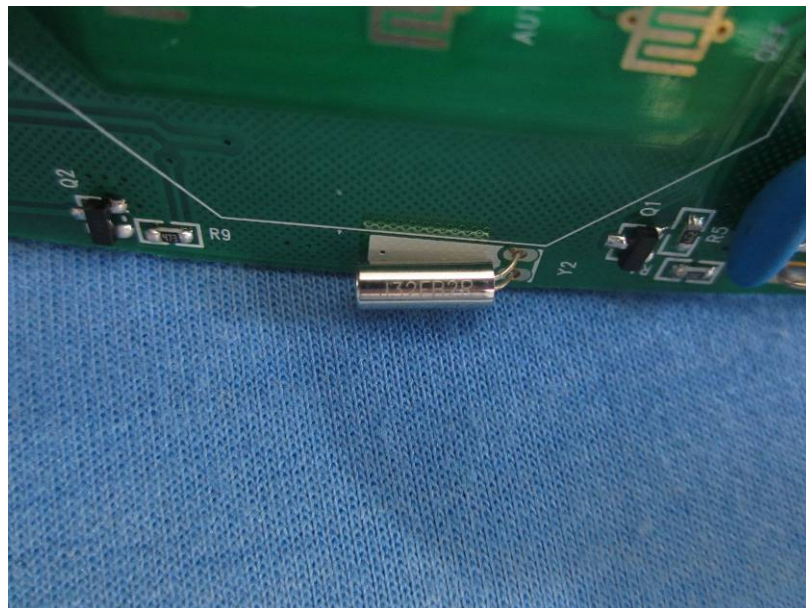
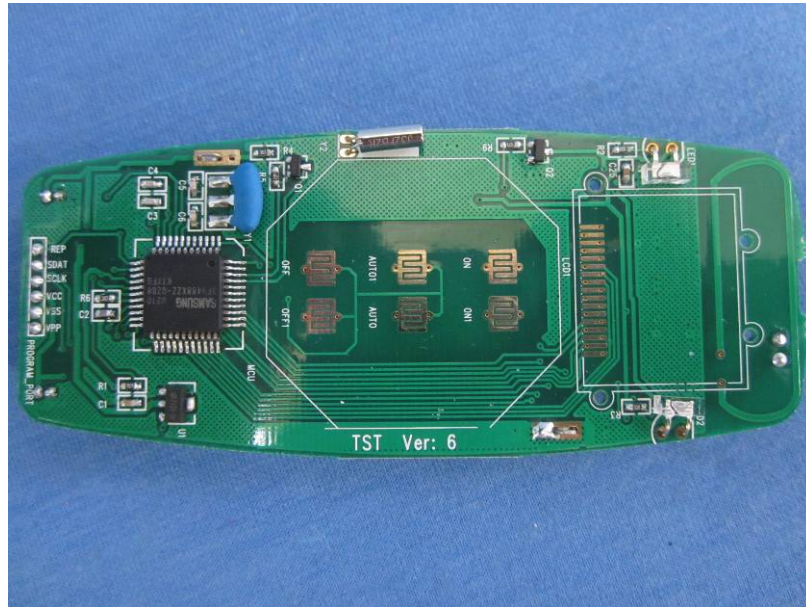
## 8 EUT Constructional Details











----- End -----