

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT INTENTIONAL RADIATOR CERTIFICATION

Product Name : Wireless Digital Microscope
Model Number : 738
Trade Name : N/A
FCC ID : YPR73801
Report Number : SZEE100727118405-1
Date : Aug. 23, 2010

Standards	Results
<input checked="" type="checkbox"/> 47 CFR FCC Part 15 Subpart C 15.249	PASS

Prepared for

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Prepared by

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CENTRE TESTING INTERNATIONAL (SHENZHEN) CORPORATION**

Building C, Hongwei Industrial Zone, Baoan 70 District, Shenzhen

TABLE OF CONTENTS

1. GENERAL INFORMATION	3
2. TEST SUMMARY	4
3. MEASUREMENT UNCERTAINTY	4
4. PRODUCT INFORMATION	4
5. TEST EQUIPMENT LIST	5
6. SUPPORT EQUIPMENT LIST	5
7. 20DB BANDWIDTH MEASUREMENT	6
7.1 LIMITS	6
7.2 BLOCK DIAGRAM OF TEST SETUP	6
7.3 TEST PROCEDURE	6
7.4 TEST RESULT	6
8. RADIATED EMISSIONS MEASUREMENT	9
8.1 LIMITS	9
8.2 BLOCK DIAGRAM OF TEST SETUP	9
8.4 TEST RESULT	11
9. BAND EDGE EMISSION MEASUREMENT	14
9.1 LIMITS	14
9.2 BLOCK DIAGRAM OF TEST SETUP	14
9.3 TEST PROCEDURE	14
9.4 TEST RESULT	14
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP	16
APPENDIX 2 PHOTOGRAPHS OF EUT	18

(Note: N/A means not applicable)

1. GENERAL INFORMATION

Applicant: Zhongshan Sunpet Plastics & Electronics Mfy. Ltd.
109 Zhongshan Port Avenue, Zhongshan Torch Development Zone, Zhongshan City, Guangdong Province, China, 528437

Manufacturer: Zhongshan Sunpet Plastics & Electronics Mfy. Ltd.
109 Zhongshan Port Avenue, Zhongshan Torch Development Zone, Zhongshan City, Guangdong Province, China, 528437

Sample Description: Wireless Digital Microscope

Technical Date: DC 3.7V by recharge battery

Model Name: 738

Trade Name: N/A

FCC ID: YPR73801

Report Number: SZEE100727118405-1

Date of Test: Jul. 27, 2010 to Aug. 23, 2010

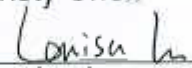
The above equipment was tested by CENTRE TESTING INTERNATIONAL (SHENZHEN) CORPORATION for compliance with the requirements set forth in FCC Rules and the measurement procedure according to ANSI C63.4-2009.

The test results of this report relate only to the tested sample identified in this report.

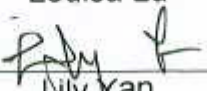
Prepared by :


Christy Chen

Reviewed by :


Louisa Lu

Approved by :


Lily Yan
Supervisor

Date

:

Aug. 23, 2010



2. TEST SUMMARY

The complete list of measurements is given below:

Clause	Test Item	Rule	Result
7	20dB Bandwidth	FCC 15.215(c)	PASS
8	Radiated Emission	FCC 15.209 FCC 15.249(a) (d)	PASS
9	Out of Band Emission	FCC 15.249 (d)	PASS

3. MEASUREMENT UNCERTAINTY

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement items	Uncertainty
Radiated Emissions / Band edge Emission	4.6 dB

4. PRODUCT INFORMATION

Items	Description
Rating	DC 3.7V by recharge battery (The EUT is charged via USB connector and the device stops transmitting during the charging.)
Intentional Transceiver	Intentional Transceiver
Modulation	GFSK
Frequency Range	2404.125 ~ 2478.375 MHz
Channel Number	64 (at intervals of 1.125MHz)
Type	PCB Antenna
Connector	fixed on board
Gain	1.6dBi

Channels	Frequency
0~63	2404.125MHz; 2405.25MHz; 2406.375MHz; 2407.5MHz; 2408.625MHz; 2409.75MHz; 2410.875MHz; 2412MHz; 2413.125MHz; 2414.25MHz; 2415.375MHz; 2416.5MHz; 2417.625MHz; 2418.75MHz; 2419.875MHz; 2421MHz; 2423.25MHz; 2424.375MHz; 2425.5MHz; 2426.625MHz; 2427.75MHz; 2428.875MHz; 2430MHz; 2431.125MHz; 2432.25MHz; 2433.375MHz; 2434.5MHz; 2435.625MHz; 2436.75MHz; 2437.875MHz; 2439MHz; 2440.125MHz; 2442.375MHz; 2443.5MHz; 2444.625MHz; 2445.75MHz; 2446.875 MHz; 2448 MHz; 2449.125MHz; 2450.25MHz; 2451.375MHz; 2452.5MHz; 2453.625MHz; 2454.75MHz; 2455.875MHz; 2457MHz; 2458.125MHz; 2459.25MHz; 2461.5MHz; 2462.625MHz; 2463.75MHz; 2464.875MHz; 2466MHz; 2467.125MHz; 2468.25MHz; 2469.375MHz; 2470.5MHz; 2471.625MHz; 2472.75MHz; 2473.875MHz; 2475MHz; 2476.125MHz; 2477.25MHz; 2478.375MHz

5. TEST EQUIPMENT LIST

Equipment	Manufacturer	Model Number	Serial Number	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	01/19/2011
Spectrum Analyzer	Agilent	E4443A	MY46185649	01/19/2011
Biconilog Antenna	ETS-LINGREN	3142C	920250	01/19/2011
Multi device Controller	ETS-LINGREN	2090	00057230	01/19/2011
Horn Antenna	ETS-LINDGREN	3117	00057407	07/31/2011
Loop Antenna	ETS-LINDGREN	6502	00071730	08/24/2011

6. SUPPORT EQUIPMENT LIST

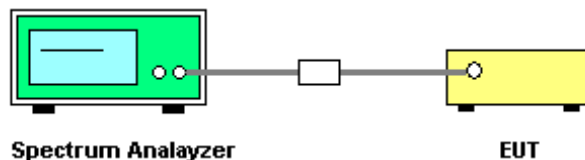
No special auxiliary equipment used.

7. 20DB BANDWIDTH MEASUREMENT

7.1 LIMITS

None

7.2 BLOCK DIAGRAM OF TEST SETUP



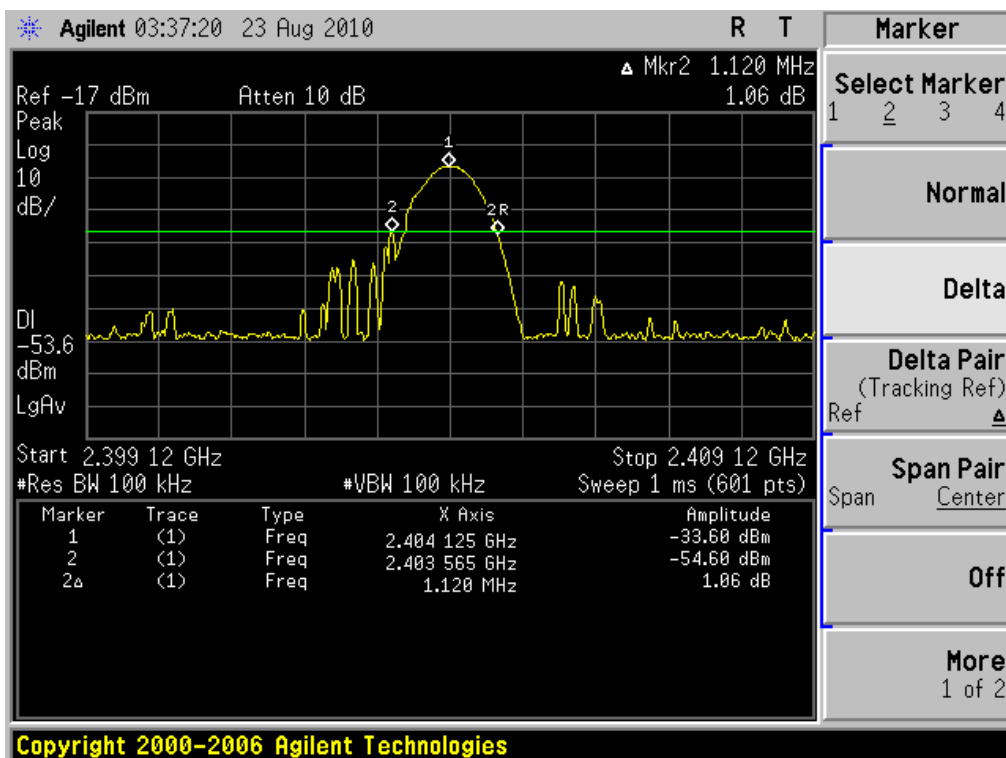
7.3 TEST PROCEDURE

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set spectrum analyzer's RBW and VBW to applicable value with Peak in Max Hold.
3. A PEAK output reading was taken, a DISPLAY line was drawn 20 dB lower than PEAK level.
4. The 20dB bandwidth was determined from where the channel output spectrum intersected the display line.

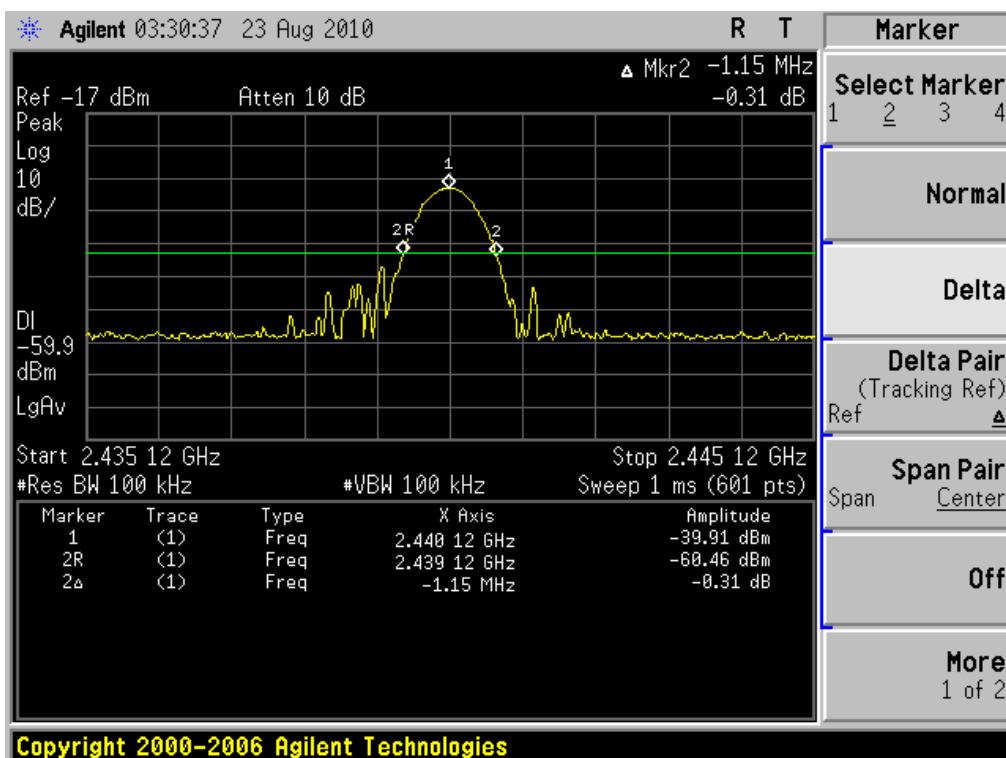
7.4 TEST RESULT

Worst case-- Modulation Type: GFSK

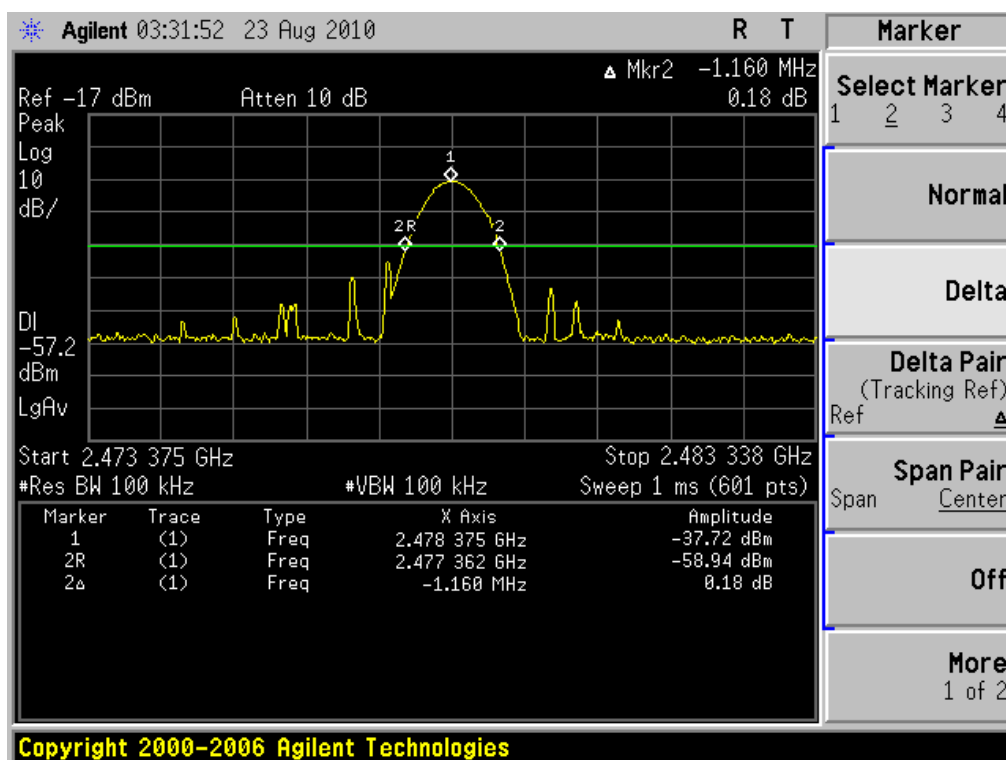
Channel	Frequency (MHz)	20 dB BW (MHz)	Result
CH0	2404.125	1.12	1.16MHz
CH31	2440.125	1.15	
CH63	2478.375	1.16	



Channel 0



Channel 31



Channel 63

8. RADIATED EMISSIONS MEASUREMENT

8.1 LIMITS

(1) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/ meter)	Field strength of harmonics (microvolts/ meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

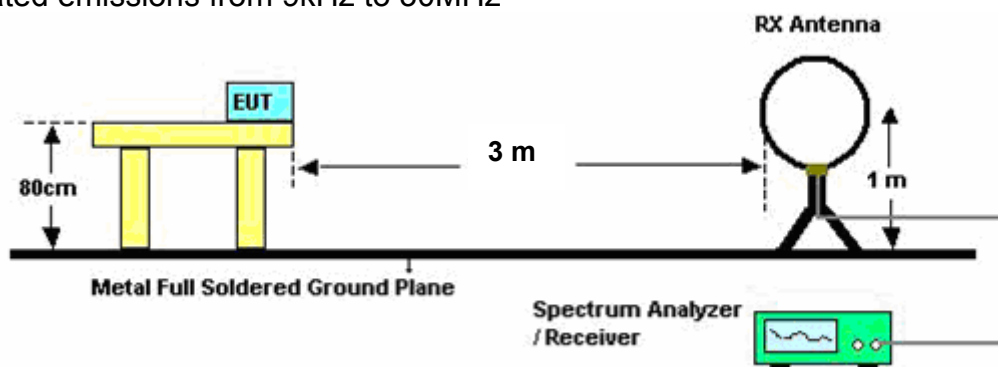
(2) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209 as the following , whichever is the lesser attenuation.

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

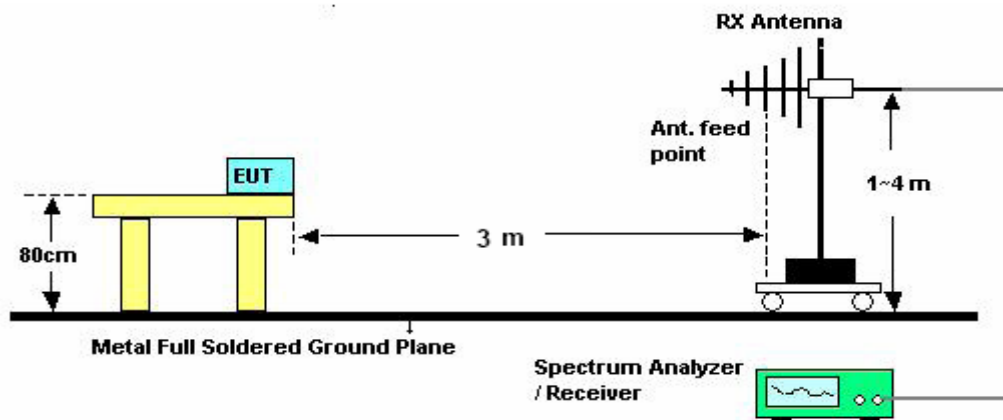
Note: the tighter limit applies at the band edges.

8.2 BLOCK DIAGRAM OF TEST SETUP

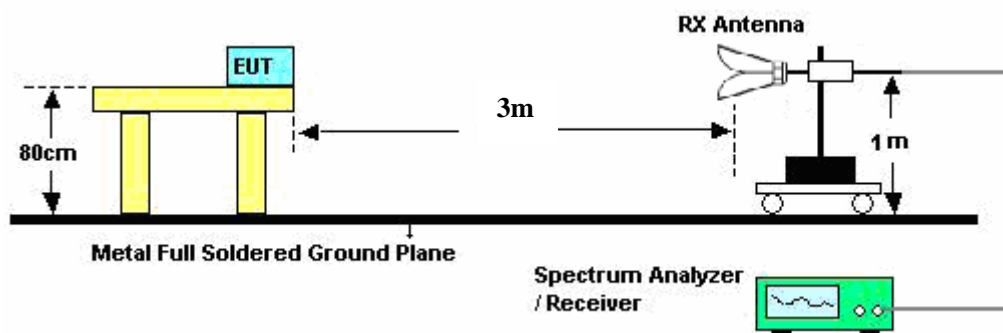
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30 - 1000MHz



For radiated emissions from 1GHz to 25GHz



8.3 TEST PROCEDURE

A. Above 30MHz

- The EUT was placed on the top of a turntable 0.8 meters above the ground in the chamber, 3 meters away from the antenna (wideband antenna), which was mounted on the top of a variable-height antenna tower. The maximum values of the field strength are recorded by adjusting the polarizations of the test antenna and rotating the turntable.
- 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 turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test frequency analyzer system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

B. Below 30MHz

- The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 1 meter away from the antenna (loop antenna). The maximum values of the field strength are recorded by adjusting the polarizations of the test antenna and rotating the turntable.
- For each suspected emission, the EUT was arranged to its worst case and then turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test frequency analyzer system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

8.4 TEST RESULT

Note: Limit dB μ V/m @3m = Limit dB μ V/m @300m+ 80

Limit dB μ V/m @3m = Limit dB μ V/m @30m + 40

Test Results-(Measurement Distance: 3m)_Channel 0								
Frequency (MHz)	Measurement value			Limit			Antenna (H/V)	Result (P/F)
	PK (dB μ V/m)	QP (dB μ V/m)	AV (dB μ V/m)	PK (dB μ V/m)	QP (dB μ V/m)	AV (dB μ V/m)		
165.0000	22.66	----	----	----	43.5	----	H	P
287.0500	26.19	----	----	----	46	----	H	P
699.3000	33.44	----	----	----	46	----	H	P
*2404.125	92.01	----	----	114	----	94	H	P
**4808.250	54.69	----	42.63	74	----	54	H	P
**7212.375	46.96	----	----	94	----	74	H	P
7453.333	46.32	----	----	74	----	54	H	P
11450.00	48.96	----	----	74	----	54	H	P
238.5500	22.24	----	----	----	46	----	V	P
416.3833	29.48	----	----	----	46	----	V	P
699.3000	35.86	----	----	----	46	----	V	P
*2404.125	92.02	----	----	114	----	94	V	P
**4808.250	54.69	----	43.02	74	----	54	V	P
**7212.375	48.26	----	----	94	----	74	V	P
10325.66	49.99	----	----	74	----	54	V	P

*: fundamental frequency

** : harmonics frequency

Note:

1. The test data below 30MHz are very low, so they are not recorded.
2. The harmonics inside restricted bands meet the limits of FCC part 15.209.

Test Results-(Measurement Distance: 3m)_Channel 31								
Frequency (MHz)	Measurement value			Limit			Antenna	Result
	PK (dB μ V/m)	QP (dB μ V/m)	AV (dB μ V/m)	PK (dB μ V/m)	QP (dB μ V/m)	AV (dB μ V/m)	(H/V)	(P/F)
165.0000	24.63	----	----	----	43.5	----	H	P
287.0500	25.66	----	----	----	46	----	H	P
699.3000	34.02	----	----	----	46	----	H	P
*2440.125	91.02	----	----	114	----	94	H	P
**4880.250	55.66	----	43.63	74	----	54	H	P
**7320.375	48.21	----	----	74	----	54	H	P
8021.667	47.23	----	----	74	----	54	H	P
9708.333	48.99	----	----	74	----	54	H	P
238.5500	25.36	----	----	----	46	----	V	P
416.3833	28.12	----	----	----	46	----	V	P
699.3000	36.02	----	----	----	46	----	V	P
*2440.125	90.22	----	----	114	----	94	V	P
**4880.250	57.26	----	44.66	74	----	54	V	P
**7320.375	50.22	----	----	74	----	54	V	P
9020.667	47.52	----	----	74	----	54	V	P

*: fundamental frequency

** : harmonics frequency

Note:

1. The test data below 30MHz are very low, so they are not recorded.
2. The harmonics inside restricted bands meet the limits of FCC part 15.209.

Test Results-(Measurement Distance: 3m)_Channel 63								
Frequency (MHz)	Measurement value			Limit			Antenna	Result
	PK (dB μ V/m)	QP (dB μ V/m)	AV (dB μ V/m)	PK (dB μ V/m)	QP (dB μ V/m)	AV (dB μ V/m)	(H/V)	(P/F)
165.0000	23.63	----	----	----	43.5	----	H	P
287.0500	26.21	----	----	----	46	----	H	P
699.3000	33.02	----	----	----	46	----	H	P
*2478.375	90.89	----	----	114	----	94	H	P
**4956.750	57.99	----	43.63	74	----	54	H	P
**7435.125	50.22	----	----	74	----	54	H	P
8700.333	47.00	----	----	74	----	54	H	P
10460.00	49.23	----	----	74	----	54	H	P
238.5500	24.33	----	----	----	46	----	V	P
416.3833	27.62	----	----	----	46	----	V	P
699.3000	35.22	----	----	----	46	----	V	P
*2478.375	91.02	----	----	114	----	94	V	P
**4956.750	47.12	----	----	74	----	54	V	P
**7435.125	46.91	----	----	74	----	54	V	P
9891.667	47.02	----	----	74	----	54	V	P

*: fundamental frequency

**: harmonics frequency

Note:

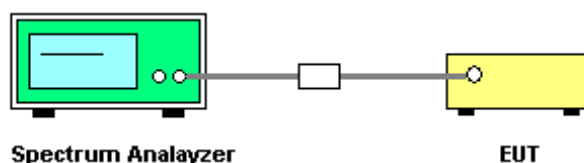
1. The test data below 30MHz are very low, so they are not recorded.
2. The harmonics inside restricted bands meet the limits of FCC part 15.209.

9. BAND EDGE EMISSION MEASUREMENT

9.1 LIMITS

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 § 15.209, whichever is the lesser attenuation.

9.2 BLOCK DIAGRAM OF TEST SETUP



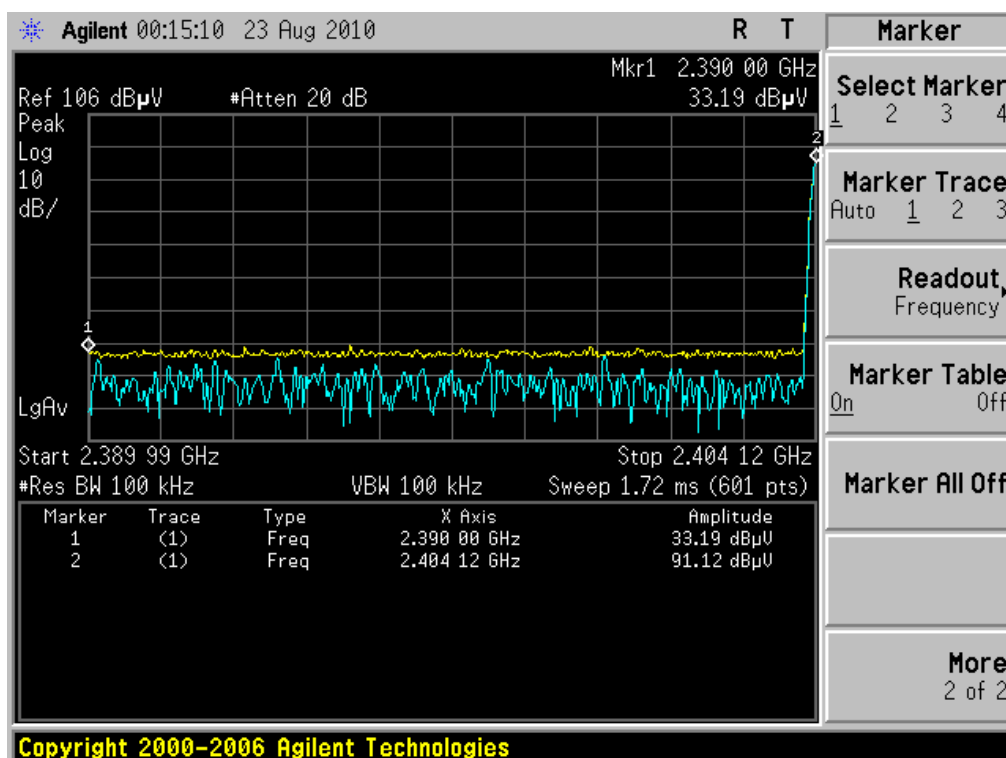
9.3 TEST PROCEDURE

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set spectrum analyzer's RBW and VBW to applicable value with Peak in Max Hold.
3. Record the emission drops at the band-edge relative to the highest fundamental emission level.
4. Use the marker-delta method to determine band-edge compliance as required.

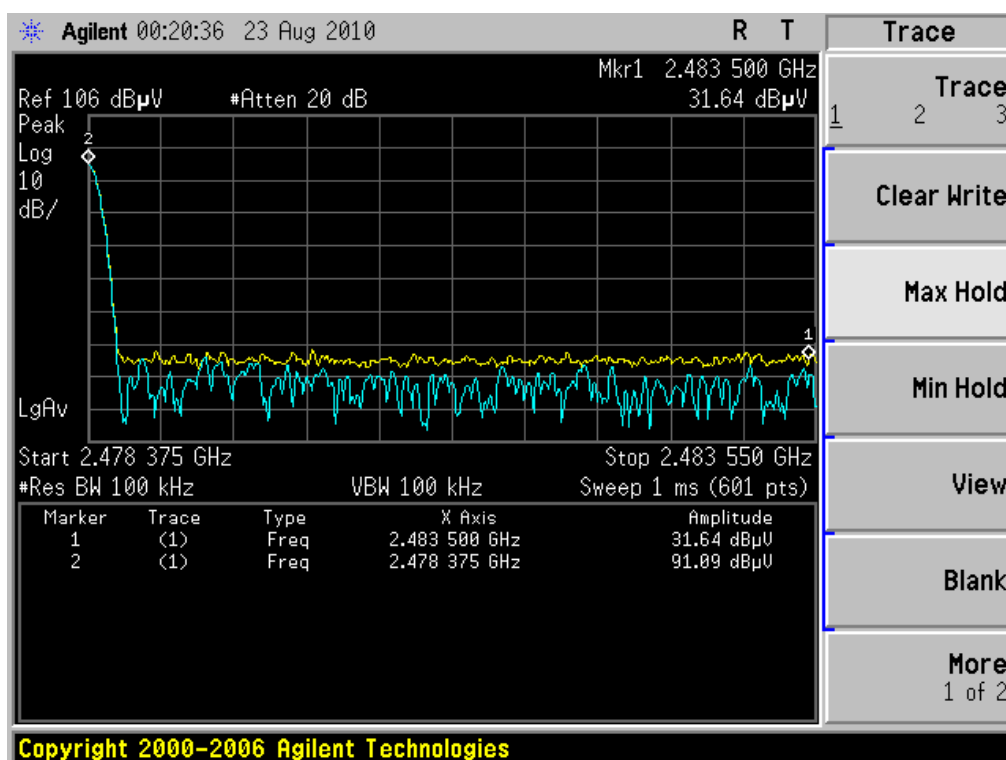
9.4 TEST RESULT

Worst case-- Modulation Type: GFSK

Channel Frequency (MHz)	Fundamental Emission (dB μ V/m)	Final Emission (dB μ V/m)	Result (Pass / Fail)
CH0 _ 2404.125	91.12	33.19	Pass
CH63_ 278.375	91.19	31.64	Pass



CH0 _ 2404.125MHz



CH63 _ 2478.375MHz

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

TEST SETUP OF RADIATED EMISSION (Below 30MHz)



TEST SETUP OF RADIATED EMISSION (30MHz~1GHz)



TEST SETUP OF RADIATED EMISSION (Above 1GHz)



APPENDIX 2 PHOTOGRAPHS OF EUT



View of external EUT-1



View of external EUT-2



View of external EUT-3



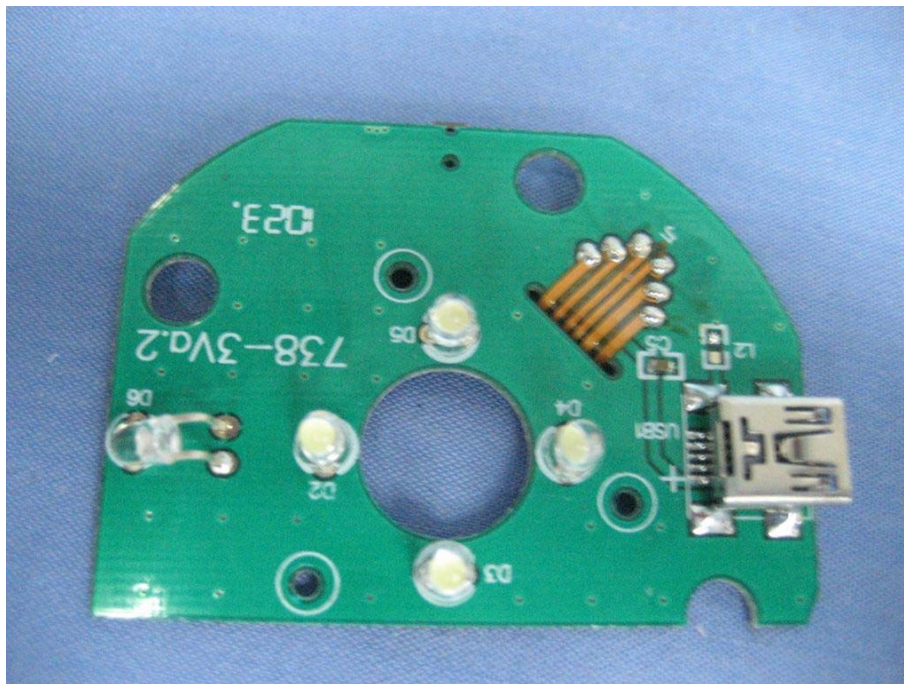
View of internal EUT-1



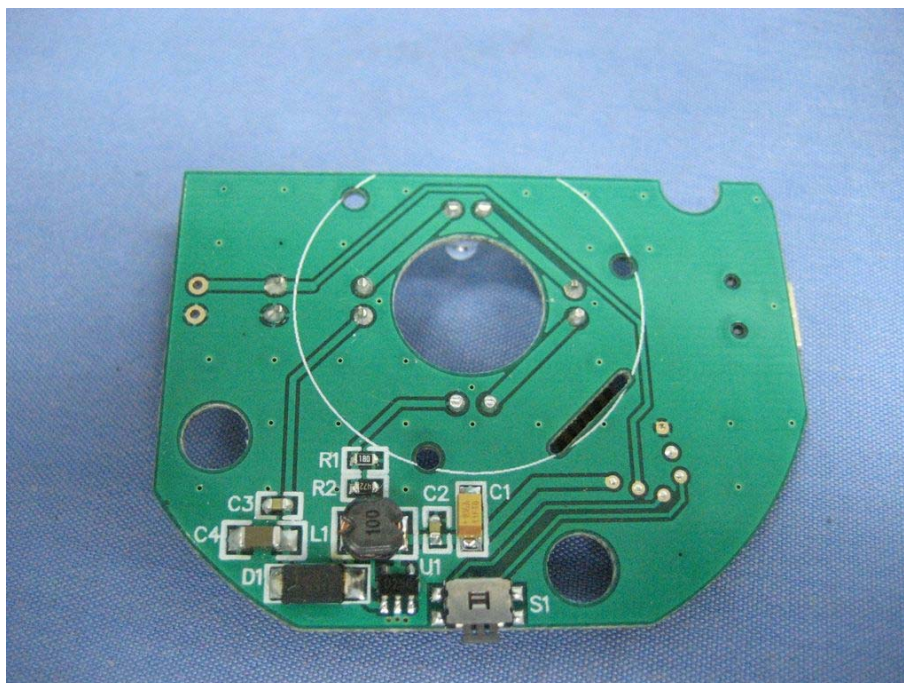
View of internal EUT-2



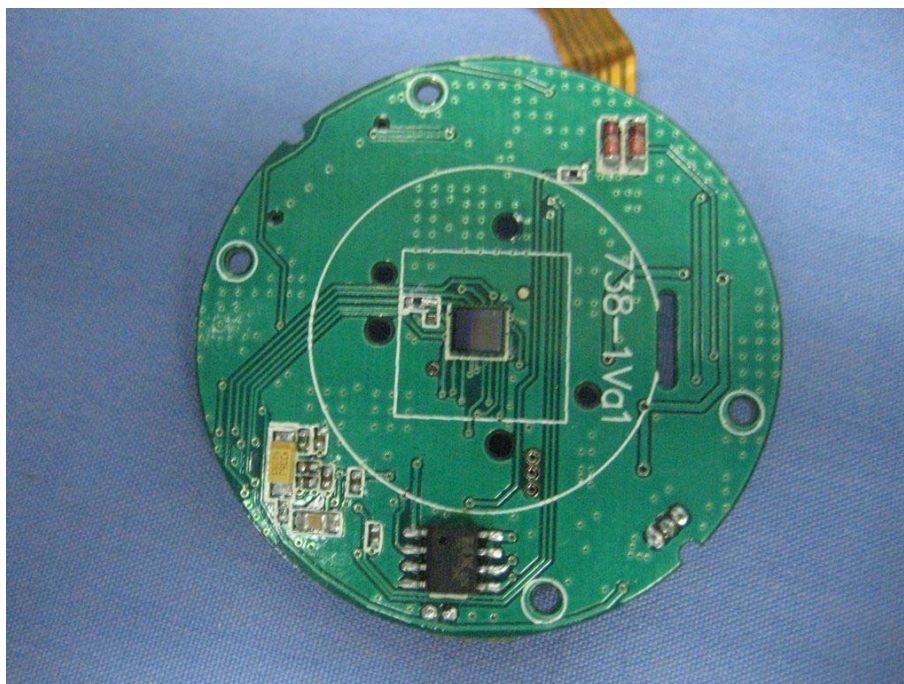
View of internal EUT-3



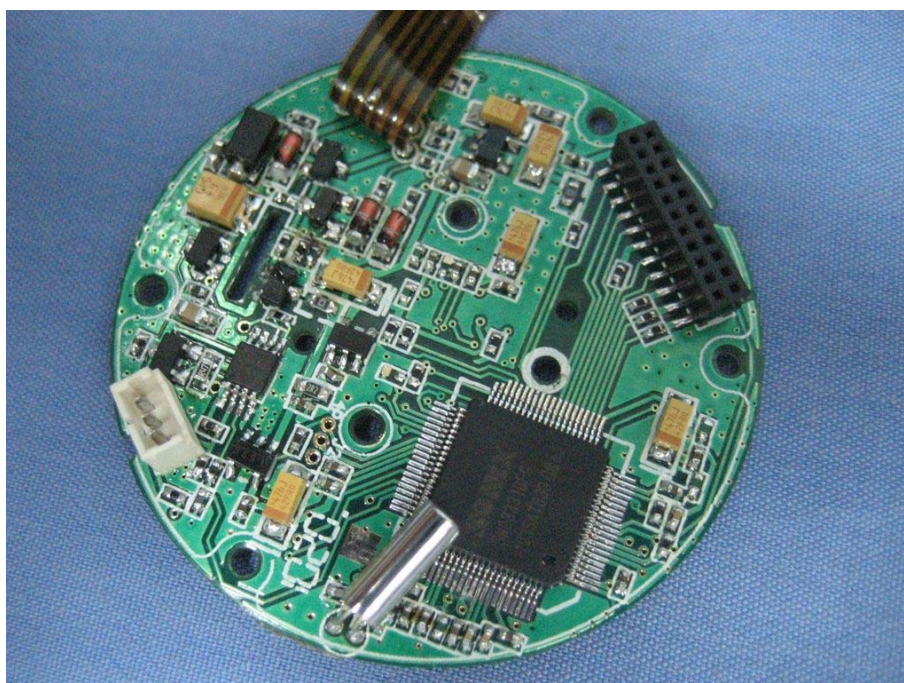
View of internal EUT-4



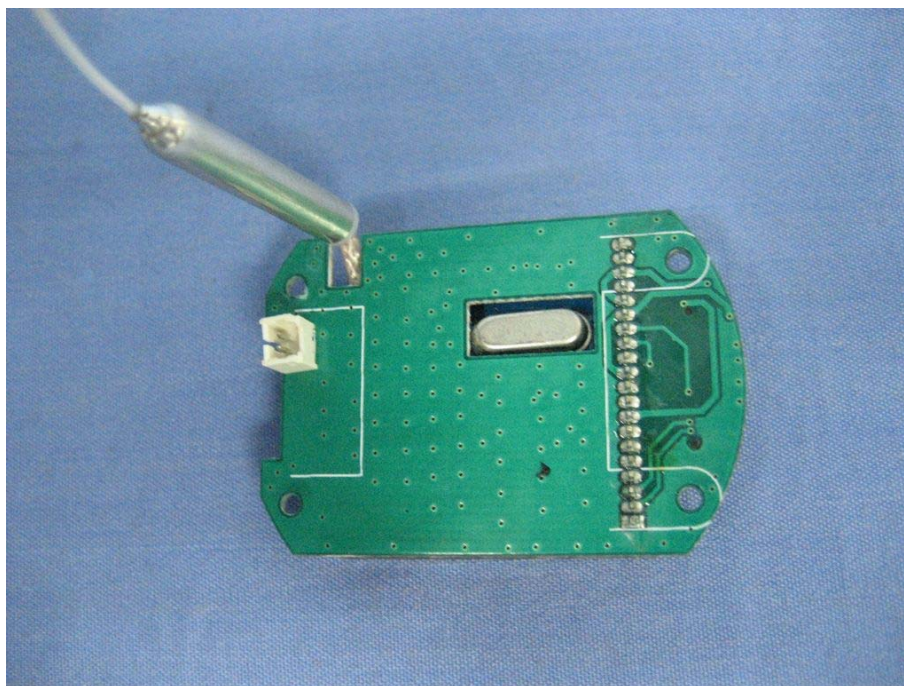
View of internal EUT-5



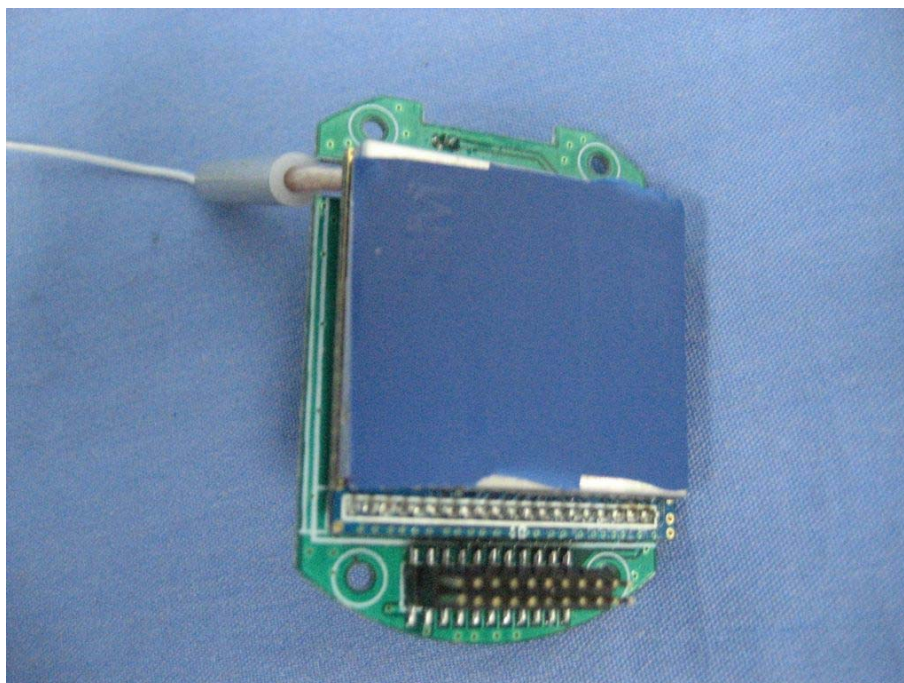
View of internal EUT-6



View of internal EUT-7



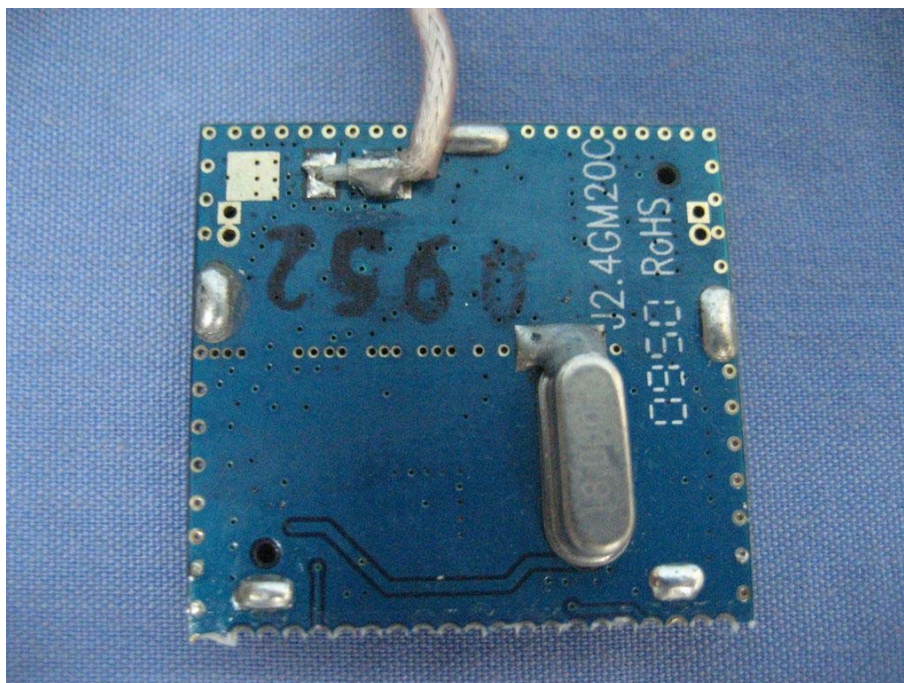
View of internal EUT-8



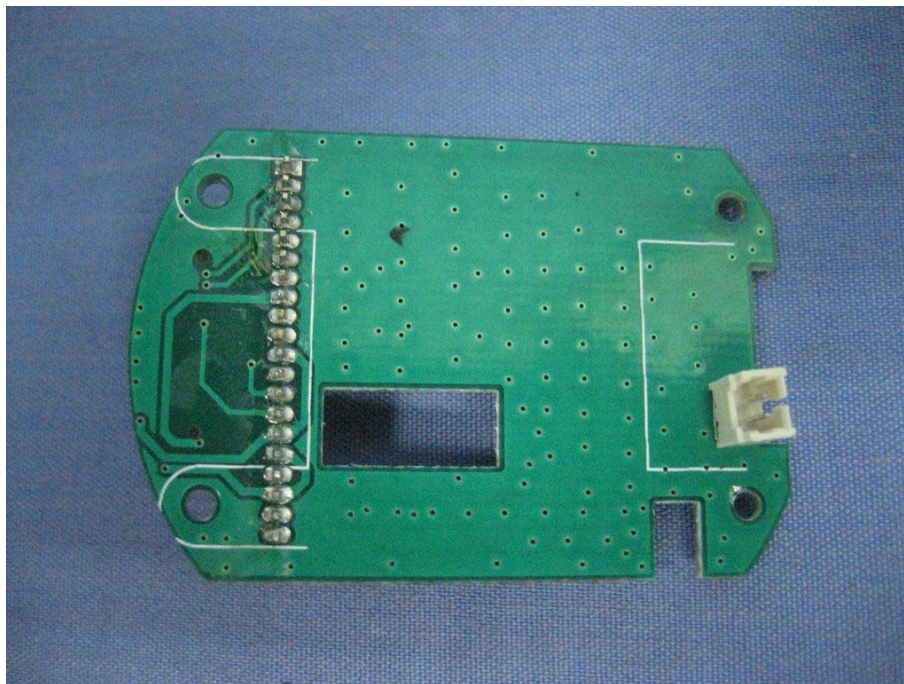
View of internal EUT-9



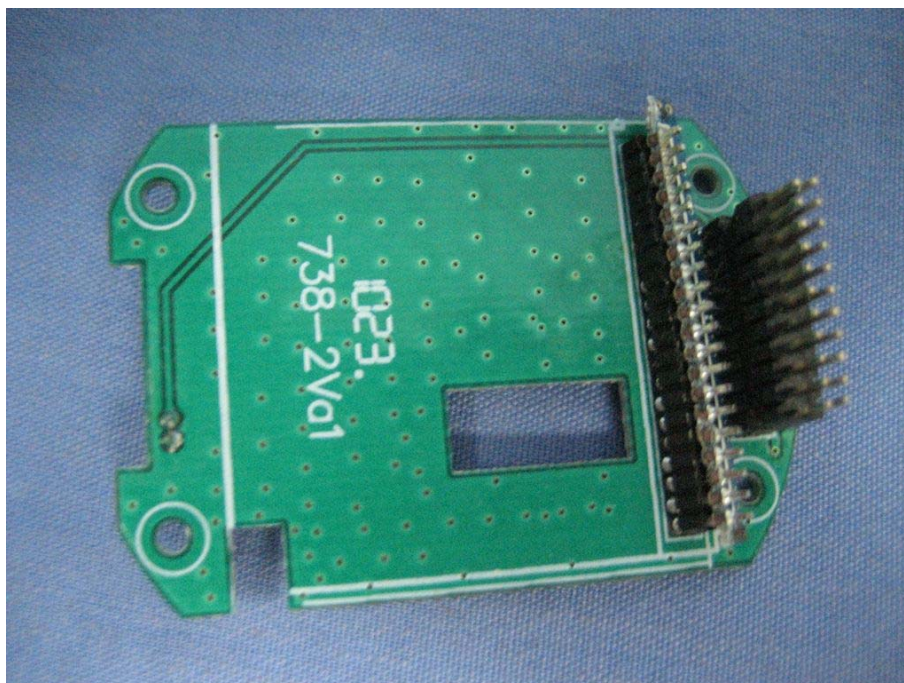
View of internal EUT-10



View of internal EUT-11



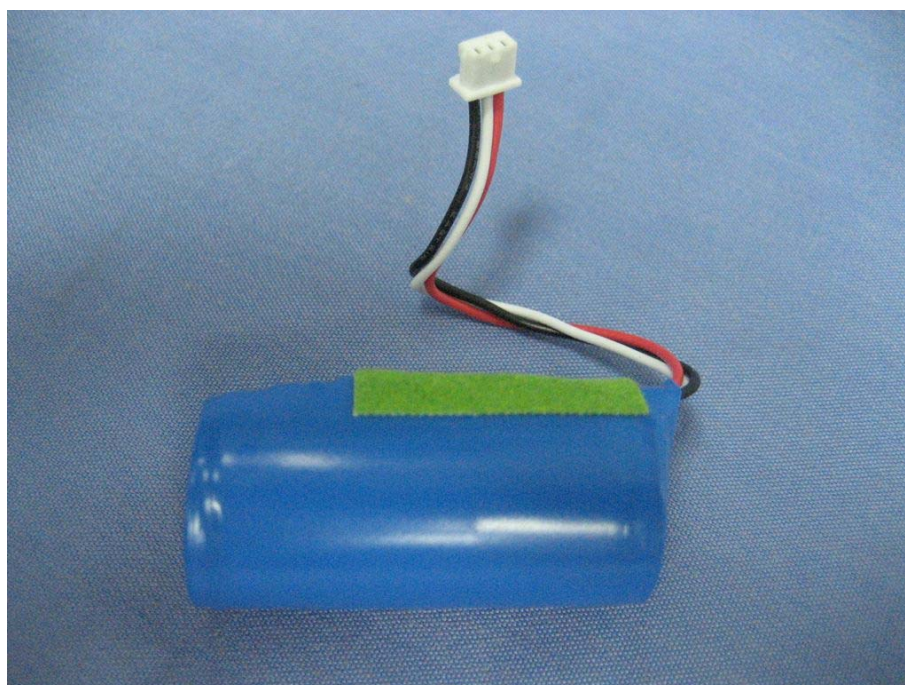
View of internal EUT-12



View of internal EUT-13



View of battery-1



View of battery-2

----- End of report -----