

FCC TEST REPORT**REPORT NO.:** FCI1111060R**MODEL NO.:** DT430(RFID)**RECEIVED:** Nov 03, 2011**TESTED:** Nov 03, 2011 to Nov 10, 2011**APPLICANT:** Group Sense Mobile-Tech Limited**ADDRESS:** 6th Floor, Enterprise Place, Hong Kong Science Park, Shatin, Hong Kong**ISSUED BY:** Shenzhen SETEK Technology Co., Ltd.**LAB LOCATION:** 1003, C Bldg, Fuyuan Business Trade Center, 44 District Bao'an, Shenzhen, China

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Prepared for : Group Sense Mobile-Tech Limited

Address : 6th Floor, Enterprise Place, Hong Kong Science Park, Shatin, Hong Kong

Product : RFID Module

Model No(s). : DT430(RFID)

Trademark : Xplore

Test Standard : FCC Part 15 B

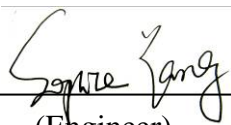
Prepared by : Shenzhen SETEK Technology Co., Ltd.

Address : 1003, C Bldg, Fuyuan Business Trade Center, 44 District Bao'an, Shenzhen, China
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Test Lab : Shenzhen Timeway Technology Co., Ltd

Address : East 5/Block 4, Anhua Industrial Zone, No.8,Tairan Rd. CheGongMiao, FuTian District, Shenzhen, China

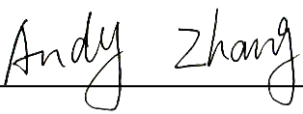
FCC R.N. : FCC Registration Number: 899988

Prepared by : 

(Engineer)

Reviewer by : 

(Project Engineer)

Approved by : 

(Manager)

Report Number : FCI1111060R

Date of Test : Nov 03, 2011 to Nov 10, 2011

Date of Report : Nov. 12, 2011

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1. GENERAL INFORMATION

1.1 Description of Device (EUT)

Applicant : Group Sense Mobile-Tech Limited

Address : 6th Floor, Enterprise Place, Hong Kong Science Park, Shatin, Hong Kong

Manufacturer : Group Sense Mobile-Tech Limited

Address : 6th Floor, Enterprise Place, Hong Kong Science Park, Shatin, Hong Kong

EUT : RFID Module

Model Number(s) : DT430(RFID)

Power Supply : DC4.2V

Operational Frequency: 13.56MHz

FCC ID: VRI-B148

Received : Nov 03, 2011

Date of Test : Nov 03, 2011 to Nov 10, 2011

Note: Main unit (Model: DT430) used as Auxiliary Equipment with FCC ID: VRI-B134

1.2 Test Summary

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.207	Conducted Emission	Not applicant
§15.209 and 15.225(a)	Radiated Emission	Compliant
§15.225 (d)	Radiated Spurious Emission Measurements, Out of Band	Compliant
§15.225 (e)	Frequency Tolerance of carrier signal	Compliant
§15.225 (c)	20dB Bandwidth	Compliant

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1.3. Description of Support Device

The EUT has been tested as an independent unit.

1.4. Standards Applicable for Testing

The customer requested FCC tests for a RFID Module. The standards used were FCC Part 15.225 and FCC Part 15.209 of the Federal Communication Commissions rules.

1.5. List of Measuring Equipments Used

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4408B	MY44210575	May 27,2011	1 Year
2.	Test Receiver	Rohde & Schwarz	ESIB26	100234	May 27,2011	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	May 27,2011	1 Year
4.	Loop Antenna	EMCO	6502	00042960	May 27,2011	1 Year
5.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	May 27,2011	1 Year
6.	Cable	Schwarzbeck	AK9513(1m)	CR RX2	May 27,2011	1 Year
7.	Cable	Schwarzbeck	AK9513(10m)	AC RX1	May 27,2011	1 Year
8.	Cable	Rosenberger	N/A(6m)	CR RX1	May 27,2011	1 Year
9.	Cable	Rosenberger	N/A(10m)	FP2RX2	May 27,2011	1 Year
9.	DC Power Filter	MPE	23872C	N/A	May 27,2011	1 Year
10.	Single Phase Power Line Filter	MPE	23332C	N/A	May 27,2011	1 Year
11.	3 Phase Power Line Filter	MPE	23333C	N/A	May 27,2011	1 Year
12.	Signal Generator	HP	8648A	3625U00573	May 27,2011	1 Year
13.	Test Receiver	Rohde & Schwarz	ESCS30	100350	May 27,2011	1 Year
14.	L.I.S.N.	Rohde & Schwarz	ESH2-Z5	834549/005	May 27,2011	1 Year
15.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 27,2011	1 Year
16.	RF Cable	FUJIKURA	RG-55/U	LISN Cable	May 27,2011	1 Year
17.	Spectrum Analyzer	Agilent	E4446A	MY43360126	May 27,2011	1 Year
18.	Spectrum Analyzer	Agilent	E7405A	US41160416	May 27,2011	1 Year
19.	Horn Antenna	Rohde & Schwarz	HF906	100039	May 27,2011	1 Year
20.	Horn Antenna	Schwarzbeck	BBHA9170	154	May 27,2011	1 Year

1.6. Test Facility

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

FCC – Registration No.: 899988

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD, the EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission.

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2. CONDUCTED EMISSION TEST

2.1 Standard Applicable

According to FCC 15.207 Conducted margin for a Class B device

2.2 Test Equipment

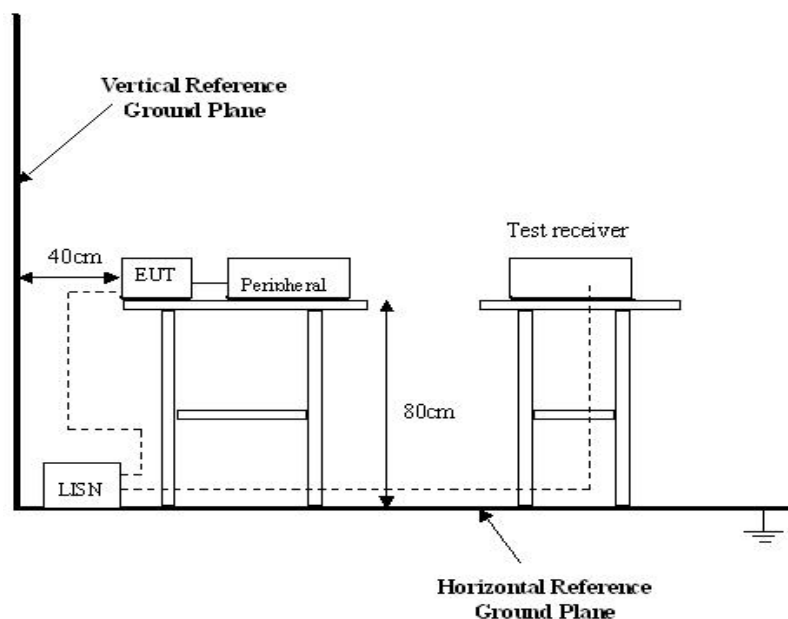
Please refer to Section 1.5. this report.

2.3 Test Procedure

1. The EUT was tested according to ANSI C63.4: 2009. The frequency spectrum from 150kHz to 30MHz was investigated.
2. The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

2.4 Conducted Test Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2009, The specification used in this report was the FCC Part15 Paragraph 15.207 limits.



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2.5 Environmental Conditions

Test Voltage:	DC4.2V
Mode:	Normal Operation
Temperature:	21 °C
Humidity:	52%RH

2.6 Summary of Test Results

N/A

Not: Because of DC operation, this test item not applicable

3. FIELD STRENGTH OF SPURIOUS EMISSIONS

3.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is 4.7 dB.

3.2 Standard Applicable

According to §15.109, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Section 15.209:

30 - 88 MHz 40 dBuV/m @3M

88 -216 MHz 43.5 dBuV/m @3M

216 -960 MHz 46 dBuV/m @3M

Above 960 MHz 54dBuV/m @3M

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

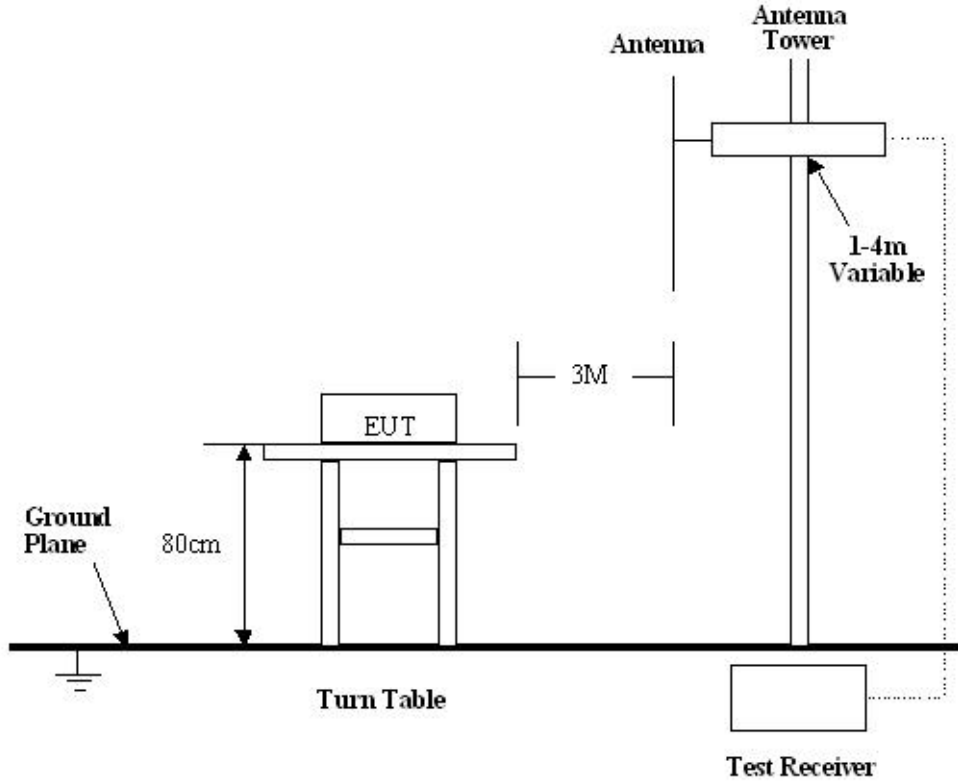
3.3 Test Equipment List and Details

Please refer to Section 1.5. this report.

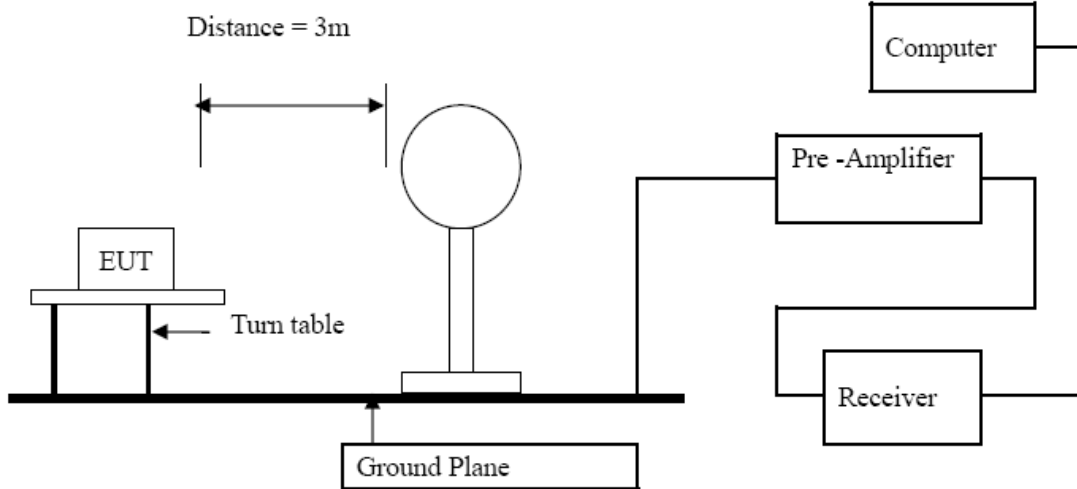
3.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.209 and 15.225 Limit. The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

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Test Configure Below 30MHz:



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3.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

3.6 Environmental Conditions

Test Voltage:	DC 4.2V
Mode:	TX On
Temperature:	21 °C
Humidity:	52%RH

3.7 Summary of Test Results/Plots

According to the data below, the FCC Part 15.225 and 15.209 standards, and had the worst margin of: 12.75dB

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

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
0.009 – 0.490	3	20log 2400/F (kHz) + 80
0.490 – 1.705	3	20log 24000/F (kHz) + 40
1.705 – 30.00	3	20log 30 + 40
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0

Band Edge Limit

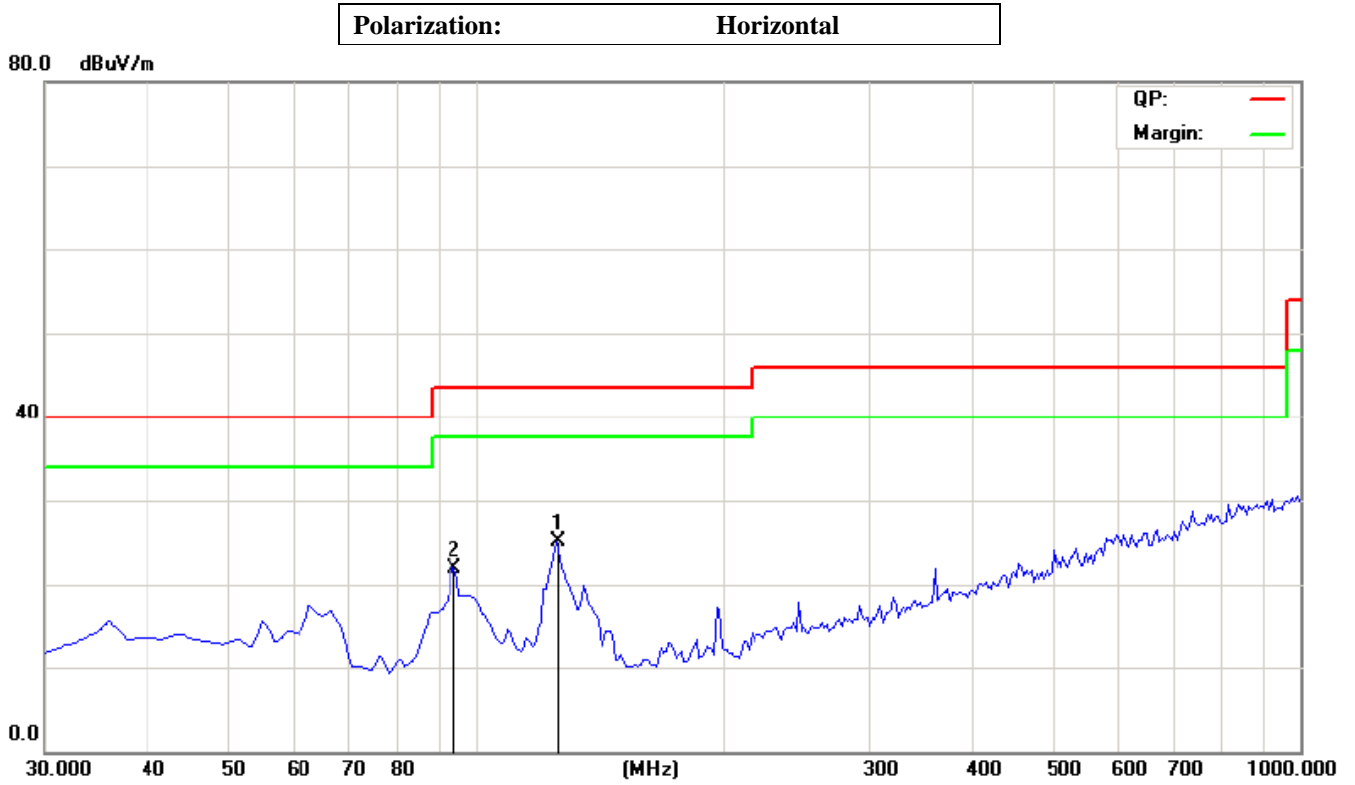
(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

- 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. If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula $Ld1 = Ld2 * (d2/d1)$
 5. This is a handheld device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
 6. RBW=VBW=100Hz for frequency between 0.009-0.15MHz; RBW=VBW=10kHz for frequency between 0.15-30MHz; RBW=VBW=120kHz for frequency between 30-1000MHz;
- Test Uncertainly:4.7dB

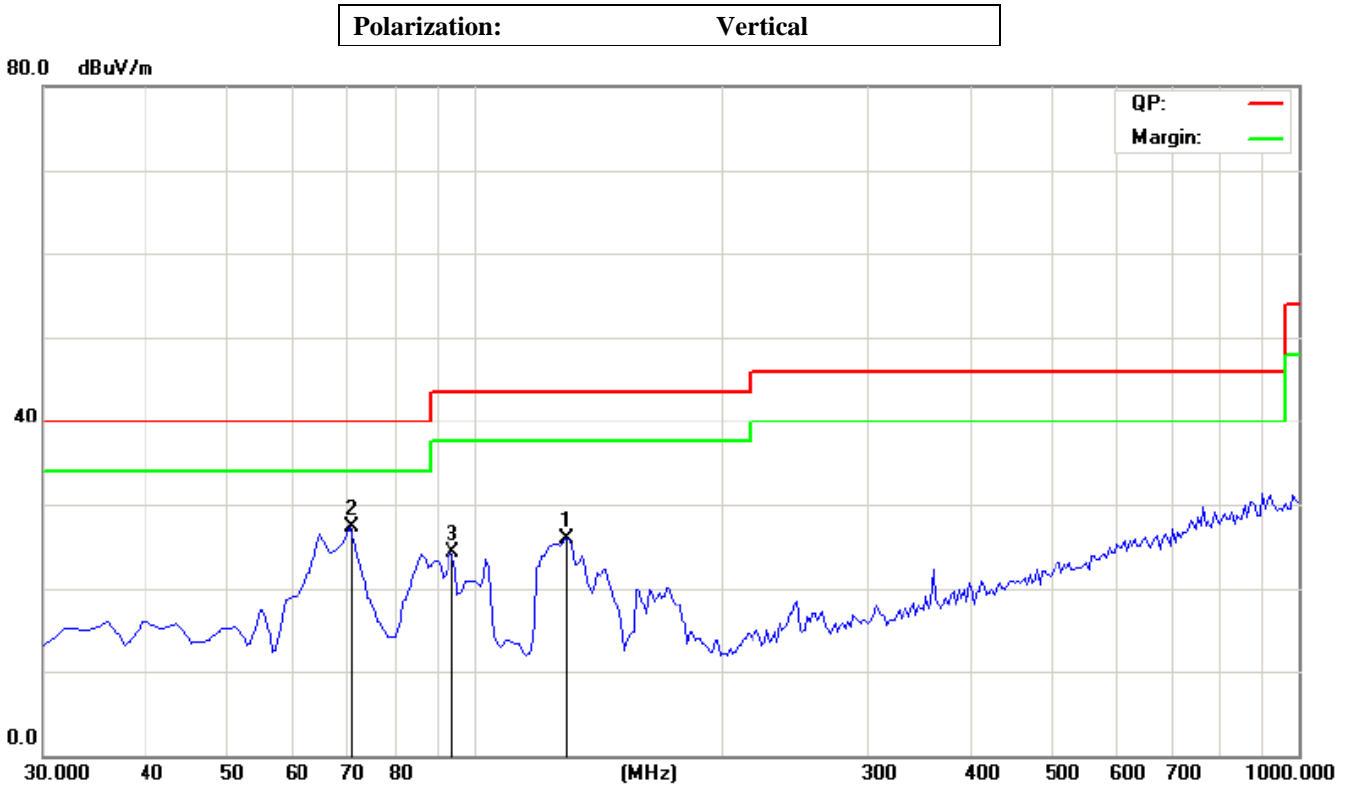
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Spurious Emission From 30 MHz to 1 GHz
 Test mode: Normal Operation



No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	125.2505	25.08	43.50	-18.42	peak
2	94.1483	22.00	43.50	-21.50	peak

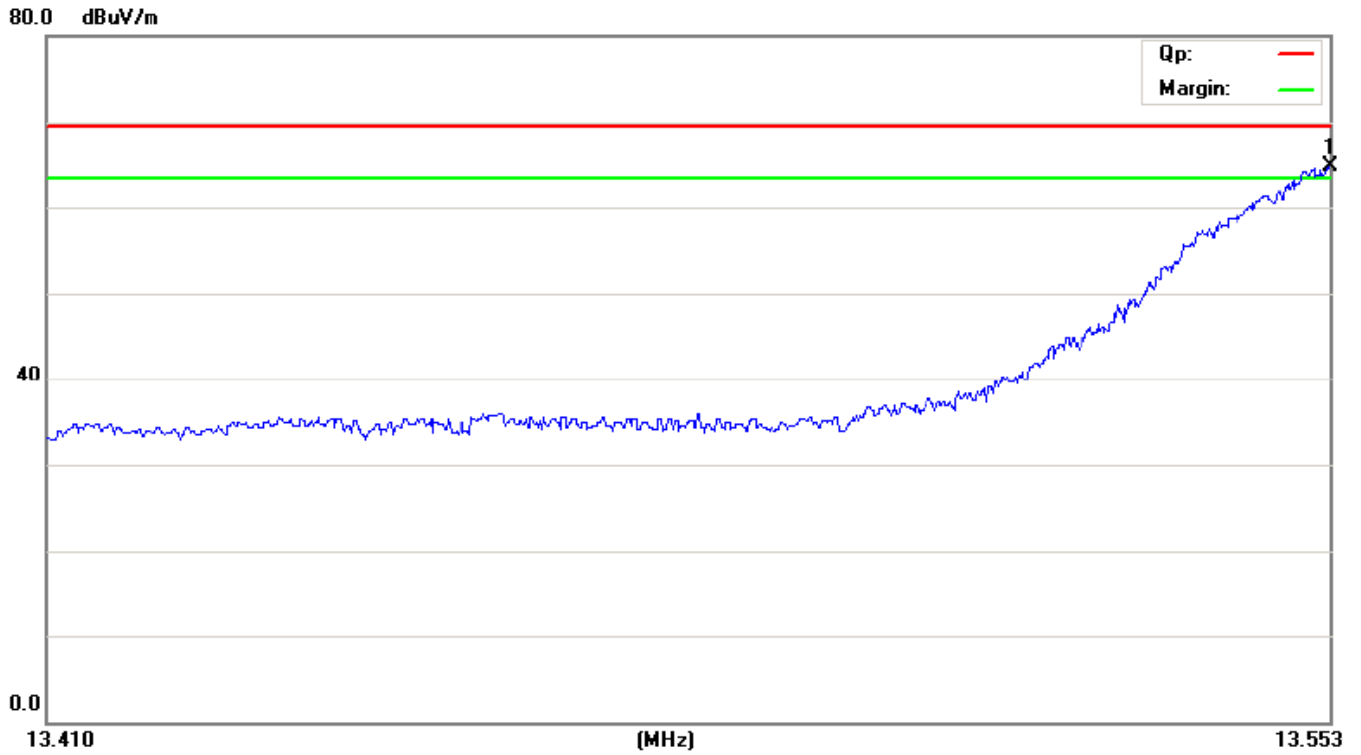
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No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	129.1383	25.99	43.50	-17.51	peak
2	70.8215	27.25	43.00	-12.75	peak
3	94.1483	24.22	43.50	-19.28	peak

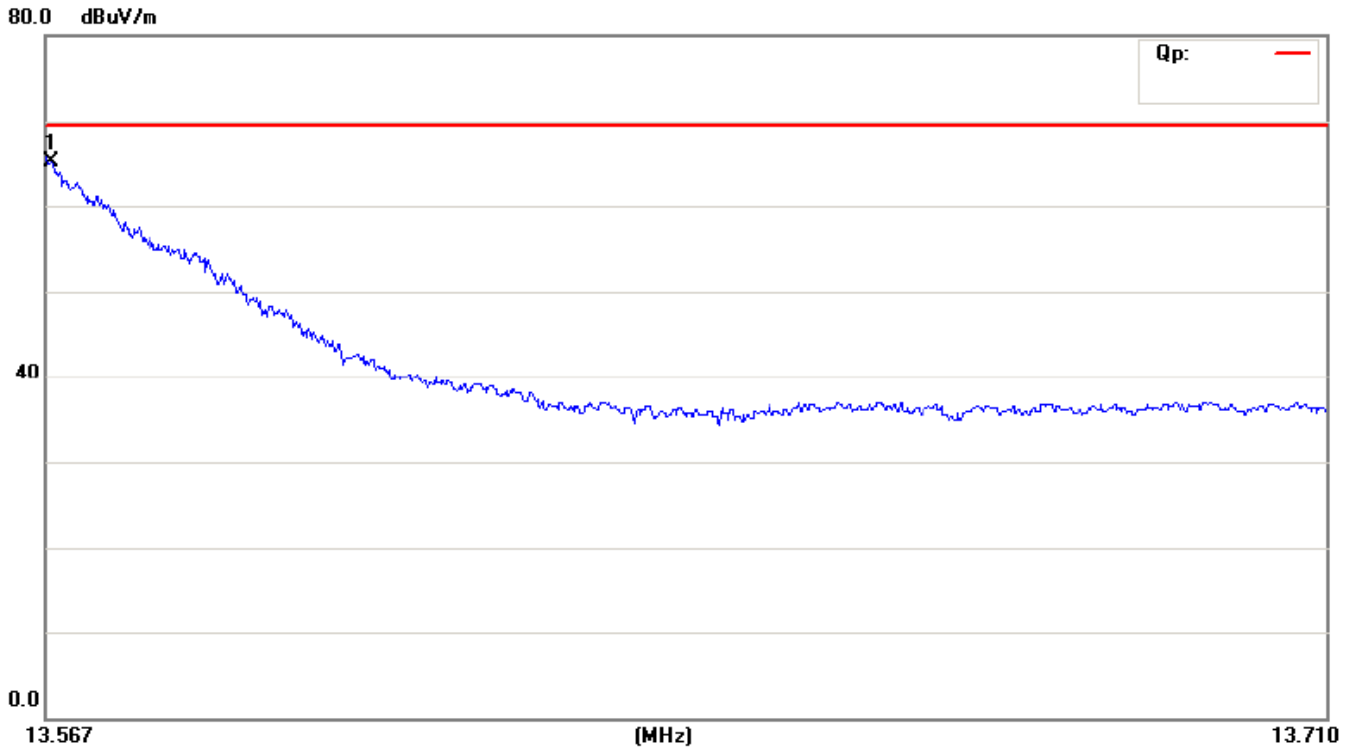
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Band Edge test according to part 15.225 (b) and (c)



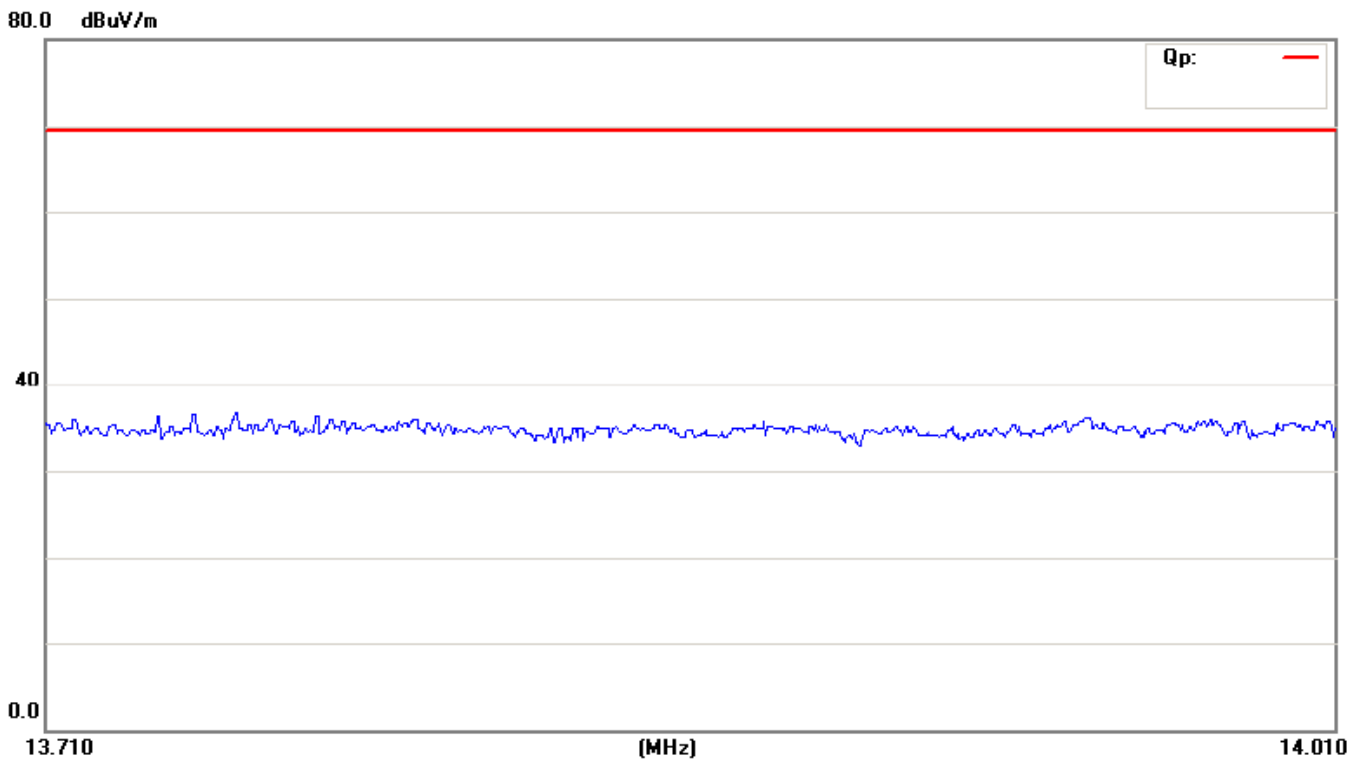
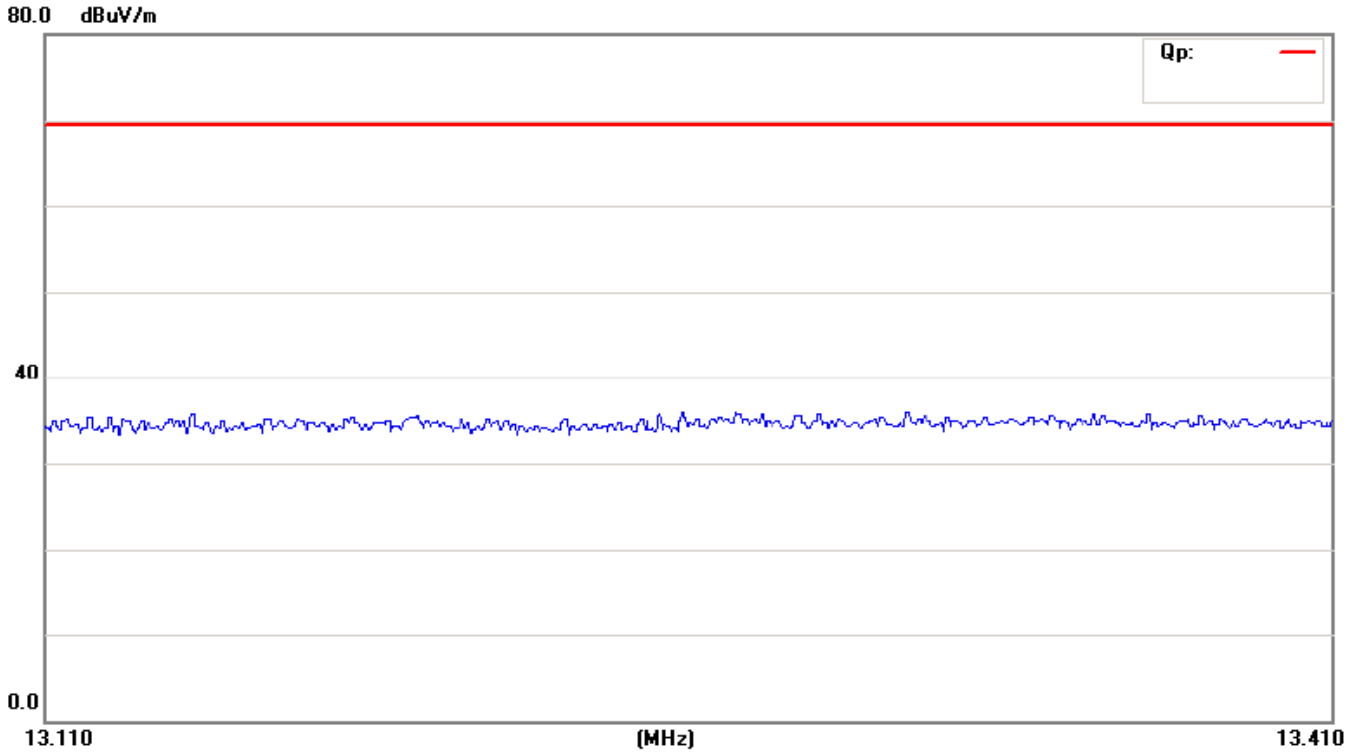
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	13.553	64.97	70.50	-5.53	peak

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No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	13.5677	65.39	70.50	-5.11	peak

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4. FREQUENCY TOLERANCE

4.1 Test Method and test Procedure

Frequency Stability vs. Temperature: the equipment under test was connected to an external DC Power supply and

The RF output was connected to a spectrum analyzer via feed-through attenuators. The EUT was placed inside

The temperature chamber. The DC leads and RF output cable exit the chamber through an opening made for the purpose

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum analyzer

Frequency Stability vs. Voltage: An external variable DC power supply source. The voltage was set to 115% of The nominal value and was the decreased until the transmitter light no longer illuminated; i.e., the end point.

The output frequency was recorded for each voltage.

4.2 Frequency Tolerance Limit

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Assigned Frequency	13.56MHz	
Temperature (0°C)	Measured Frequency	Limit
-20	13.560561	13.558644 < f < 13.561356 MHz
-10	13.560372	
0	13.560296	
10	13.560162	
20	13.560529	
30	13.560580	
40	13.560358	
50	13.560322	
85% End-point at 20°C	13.560801	
115% End-point at 20°C	13.560719	

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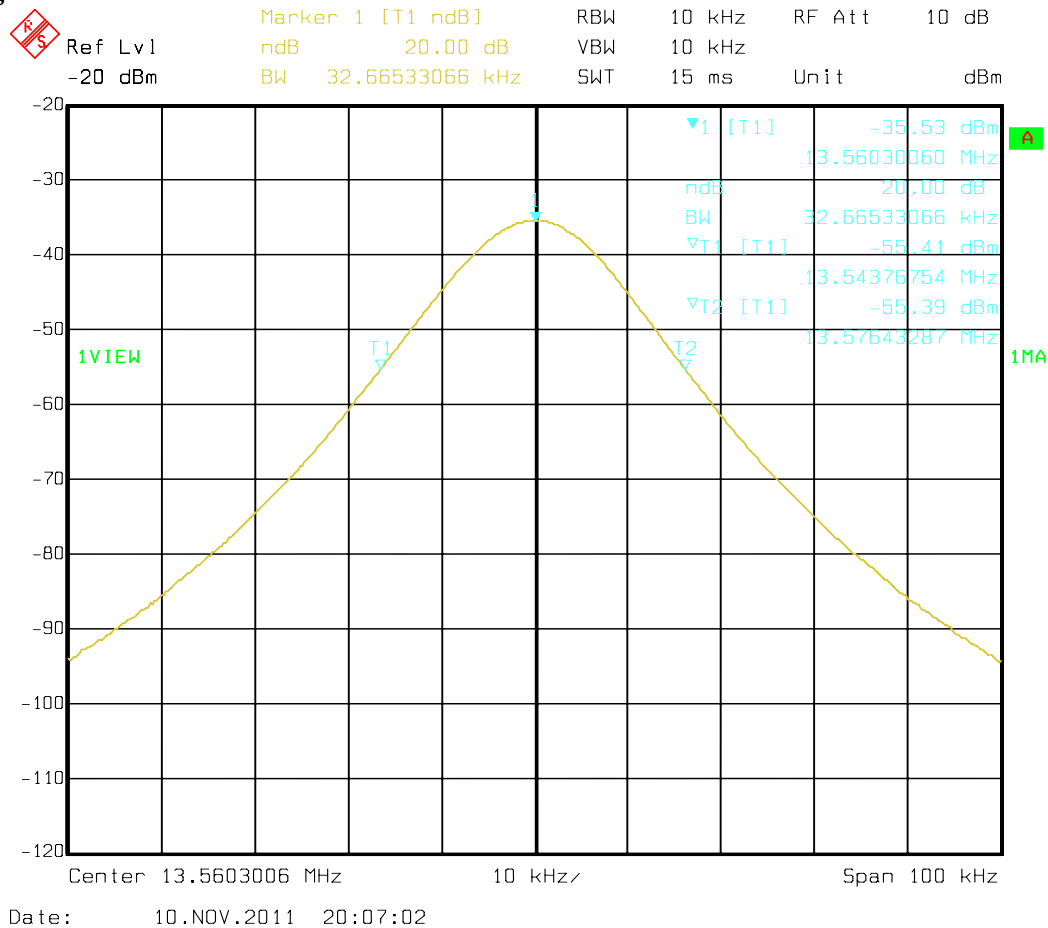
5. 20DB BANDWIDTH REQUIREMENT

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission,

20dB Bandwidth Test Result As follows

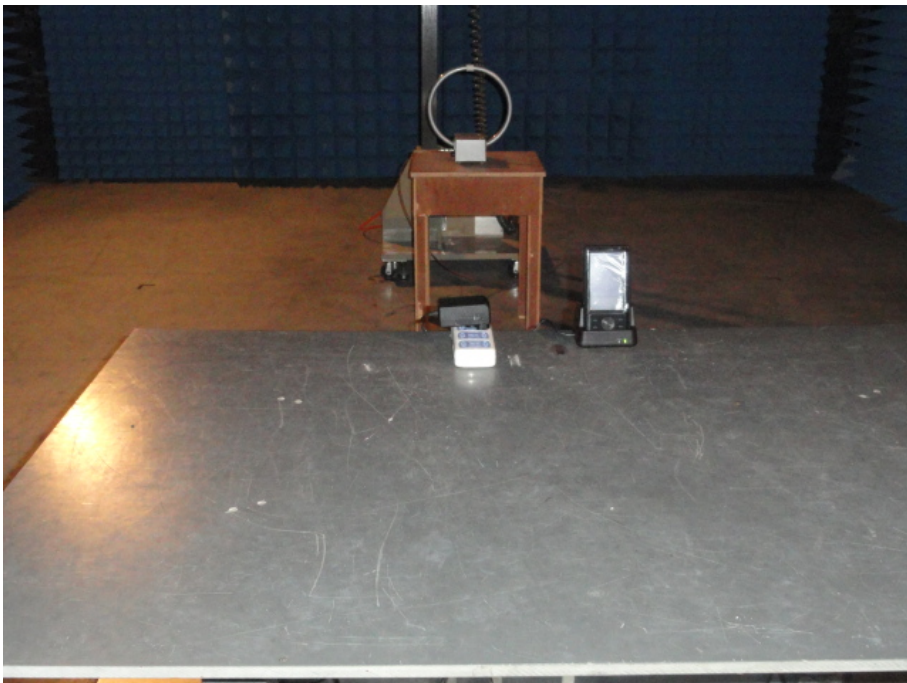
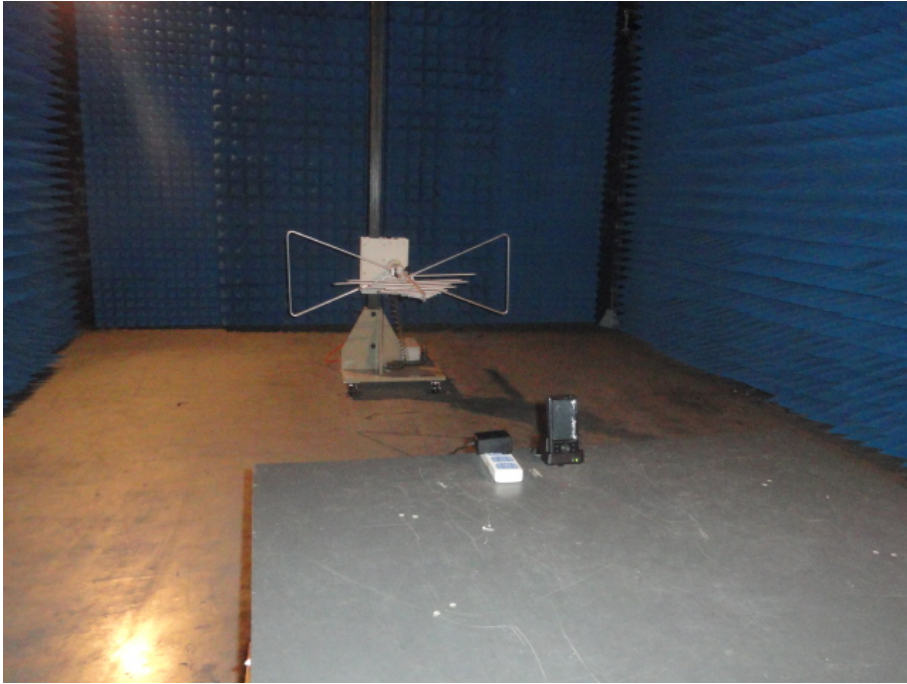
Product:	RFID Module	Test Mode:	Transmitting
Test Item:	20dB Bandwidth	Temperature:	25°C
Test Voltage:	DC4.2V	Humidity:	56%
Bandwidth	32.7kHz	Test Result:	Pass

Test Figure:



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6. PHOTOGRAPHS OF TEST SETUP

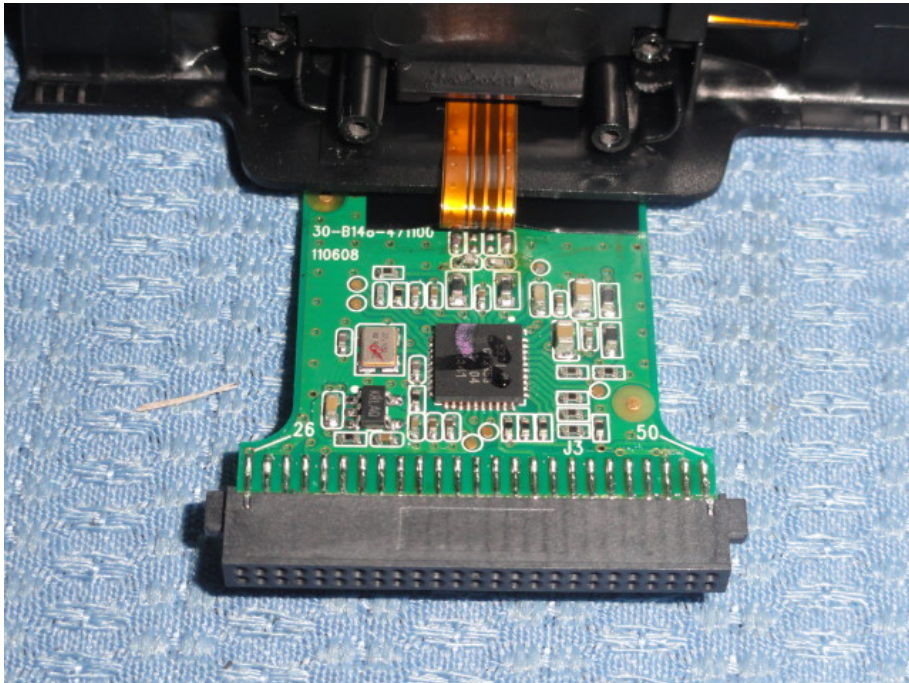
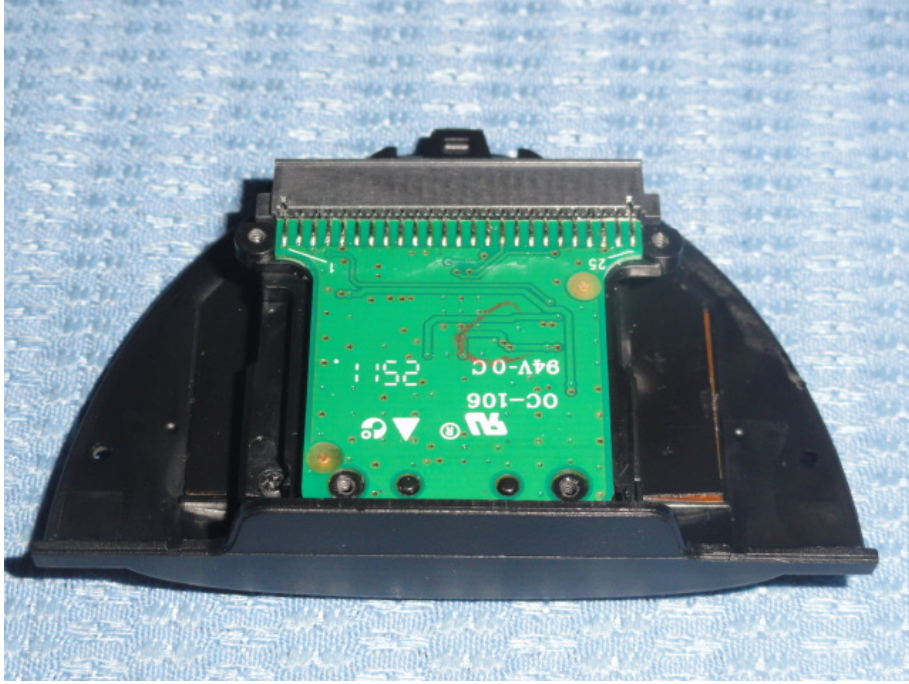


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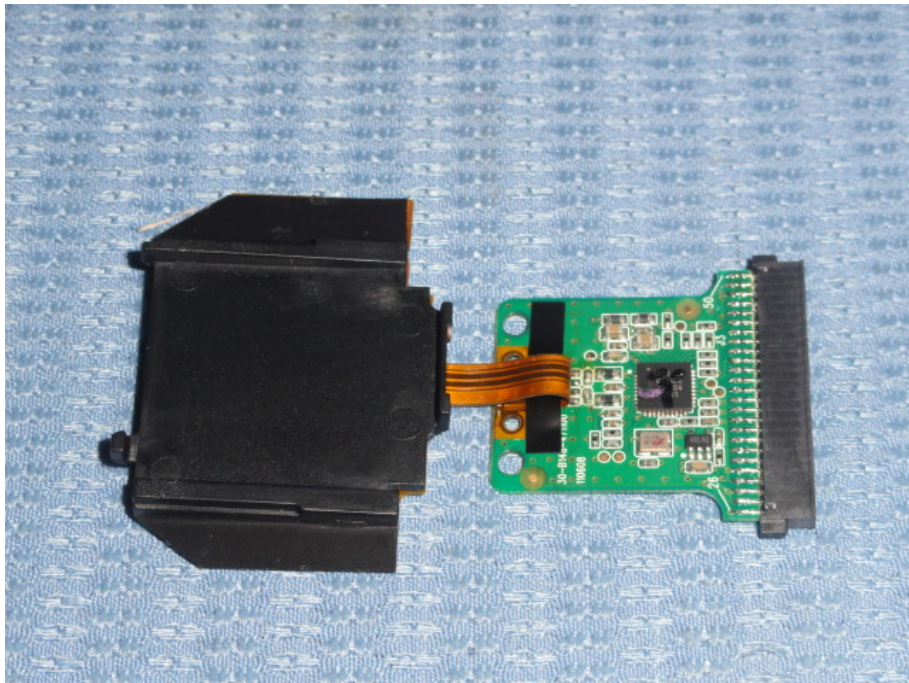
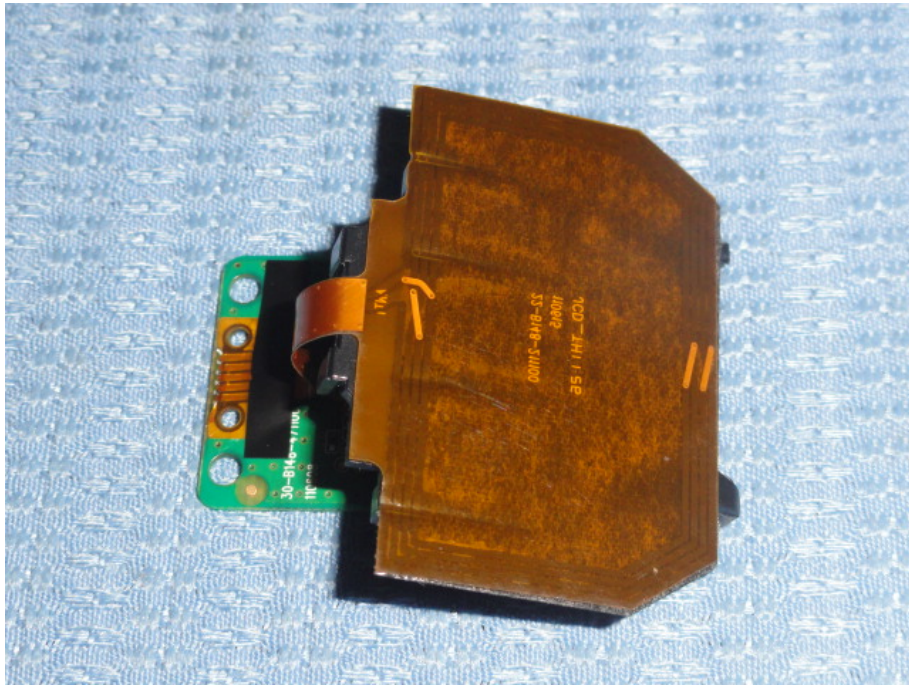
7. PHOTOGRAPHS OF EUT



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8. FCC ID LABEL

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 FCC ID number must be put on the EUT shown on the following picture.

The Label warning statement is put in the user manual because of the small size of EUT



FCC ID number Location

END of the Report

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