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## FCC PART 15 SUBPART C TEST REPORT

### FCC PART 15C

**Report Reference No.**.....: **CTL120312175-W**

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Date of issue.....: March 20, 2012

**Testing Laboratory Name** .....: **Shenzhen CTL Electromagnetic Technology Co., Ltd.**

Address.....: Zone B, 4/F, Block 20, Guangqian Industrial Park, Longzhu Road Nanshan, Shenzhen 518055 China.

**Test Firm**.....: **Bontek Compliance Testing Laboratory Ltd**

Address.....: 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

**Applicant's name**.....: **Shenzhen Lutuo Technology Co.,Ltd**

Address.....: Suite806, Sangtai Building, University Town, Lishan Road, Nanshan District, Shenzhen 518055, China

#### Test specification:

Standard .....: **FCC Part 15C**

**ANSI C63.4: 2003**

TRF Originator.....: Shenzhen CTL Electromagnetic Technology Co., Ltd.

Master TRF.....: Dated 2011-01

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**Test item description** .....: Precision Multi-function Occupany Sensor

Operation Frequency.....: 315MHz

Modulation mode: .....: ASK

Trade Mark .....: Lutuo

Model/Type reference.....: LTHB315

Listed Models .....: LTHC315

Power Supply.....: DC 3V

Antenna Type.....: Integral without external RF Port

Result.....: **Positive**

**FCC ID**.....: **COP-LTHB315**

**TEST REPORT**

<b>Test Report No. :</b> CTL120312175-W	March 20, 2012 Date of issue
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Equipment under Test : Precision Multi-function Occupany Sensor

Model /Type : LTHB315(Under test in the report)

Listed Models : LTHC315

**Applicant** : Shenzhen Lutuo Technology Co.,Ltd

Address : Suite806, Sangtai Building, University Town, Lishan Road,  
Nanshan District, Shenzhen518055, China

**Manufacturer** : Shenzhen Lutuo Technology Co.,Ltd

Address : Suite806, Sangtai Building, University Town, Lishan Road,  
Nanshan District, Shenzhen518055, China

**Test Result** according to the  
standards on page 4:

**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

## Contents

<b>1.</b>	<b><u>TEST STANDARDS .....</u></b>	<b><u>4</u></b>
<b>2.</b>	<b><u>SUMMARY .....</u></b>	<b><u>5</u></b>
2.1.	General Remarks	5
2.2.	Equipment Under Test	5
2.3.	Short description of the Equipment under Test (EUT)	5
2.4.	EUT operation mode	5
2.5.	EUT configuration	5
2.6.	Related Submittal(s) / Grant (s)	6
2.7.	Modifications	6
2.8.	Test Result Summary	6
<b>3.</b>	<b><u>TEST ENVIRONMENT .....</u></b>	<b><u>7</u></b>
3.1.	Address of the test laboratory	7
3.2.	Test Facility	7
3.3.	Environmental conditions	7
3.4.	Configuration of Tested System	7
3.5.	Statement of the measurement uncertainty	8
3.6.	Equipments Used during the Test	8
<b>4.</b>	<b><u>TEST CONDITIONS AND RESULTS .....</u></b>	<b><u>9</u></b>
4.1.	Radiated Emission Test	9
4.2.	Occupied Bandwidth	12
<b>5.</b>	<b><u>TEST SETUP PHOTOS OF THE EUT .....</u></b>	<b><u>15</u></b>
<b>6.</b>	<b><u>EXTERNAL AND INTERNAL PHOTOS OF THE EUT .....</u></b>	<b><u>16</u></b>

## **1. TEST STANDARDS**

The tests were performed according to following standards:

[FCC Rules Part 15 Subpart C Section 15.231](#)

[ANSI C63.4-2003](#)



## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample : March 12, 2012

Testing commenced on : March 14, 2012

Testing concluded on : March 16, 2012

### 2.2. Equipment Under Test

#### Power supply system utilised

Power supply voltage : ☐ 120V / 60 Hz ☐ 115V / 60Hz  
☒ 3 V DC ☐ 24 V DC  
☐ Other (specified in blank below)  
Not applicable

### 2.3. Short description of the Equipment under Test (EUT)

315MHz Wireless Transmitter

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

### 2.4. EUT operation mode

The EUT has been tested under typical operating condition.

### 2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

☐ - supplied by the manufacturer

☐ - supplied by the lab

☐ Length (m) : /

Shield : /

Detachable : /

☐ Manufacturer : /

Model No. : /

## 2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: COP-LTHB315** filing to comply with the FCC Part 15, Subpart C Rules.

## 2.7. Modifications

No modifications were implemented to meet testing criteria.

## 2.8. Test Result Summary

Test Item	Test Requirement	Standard Paragraph	Result
Radiated Emission (9kHz to 4000MHz)	FCC PART 15	Section 15.231(b)	PASS
Occupied Bandwidth	FCC PART 15	Section 15.231(c)	PASS
Dwell Time	FCC PART 15	Section 15.231(a)	PASS





### **3. TEST ENVIRONMENT**

#### **3.1. Address of the test laboratory**

Bontek Compliance Testing Laboratory Ltd  
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

There is one 3m semi-anechoic chamber and two line conducted labs for final test.  
The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements

#### **3.2. Test Facility**

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

##### **FCC-Registration No.: 338263**

Bontek Compliance Testing Laboratory Ltd 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 338263, March 24, 2008.

##### **IC Registration No.: 7631A**

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2011.

#### **3.3. Environmental conditions**

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>15-35 ° C</u>
Humidity:	<u>30-60 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

#### **3.4. Configuration of Tested System**

**Fig. 2-1 Configuration of Tested System**



**Table 2-1 Equipment Used in Tested System**

### 3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Bontek Compliance Testing Laboratory Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Bontek laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~12.75GHz	4.32dB	(1)

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

### 3.6. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Last Cal.	Due. Date
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	2011/04/14	2012/04/13
2	Radio Communication Tester	ROHDE & SCHWARZ	CMU200	2011/04/14	2012/04/13
3	Dual Directional Coupler	Agilent	778D	2011/04/14	2012/04/13
4	10dB attenuator	SCHWARZBECK	MTAIMP-136	2011/04/14	2012/04/13
5	Tunable Bandreject filter	K&L	3TNF-800	2011/04/14	2012/04/13
6	Tunable Bandreject filter	K&L	5TNF-1700	2011/04/14	2012/04/13
7	High-Pass Filter	K&L	9SH10-2700/X12750-O/O	2011/04/14	2012/04/13
8	High-Pass Filter	K&L	41H10-1375/U12750-O/O	2011/04/14	2012/04/13
9	Coaxial Cable	Huber+Suhner	AC4-RF-H	2011/04/14	2012/04/13
10	AC Power Supply	IDRC	CF-500TP	2011/04/14	2012/04/13
11	DC Power Supply	IDRC	CD-035-020PR	2011/04/14	2012/04/13
12	RF Current Probe	FCC	F-33-4	2011/04/14	2012/04/13
13	Temperature /Humidity Meter	zhicheng	ZC1-2	2011/04/14	2012/04/13
14	MICROWAVE AMPLIFIER	HP	8349B	2011/04/14	2012/04/13
15	Amplifier	HP	8447D	2011/04/14	2012/04/13
16	SIGNAL GENERATOR	HP	8647A	2011/04/14	2012/04/13
17	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	2011/04/14	2012/04/13
18	Horn Antenna	Schwarzbeck	BBHA9120A	2011/04/14	2012/04/13
19	EMI Test Receiver	R&S	ESPI	2011/04/14	2012/04/13

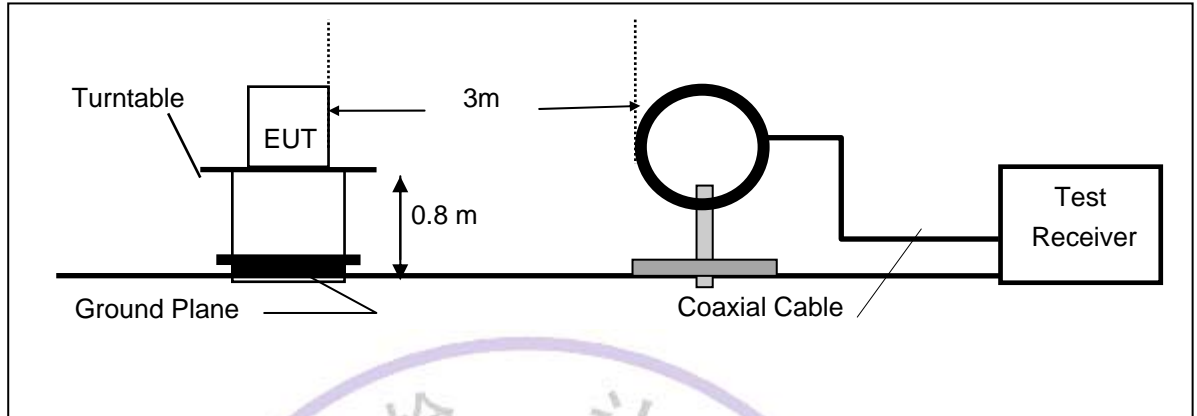


## 4. TEST CONDITIONS AND RESULTS

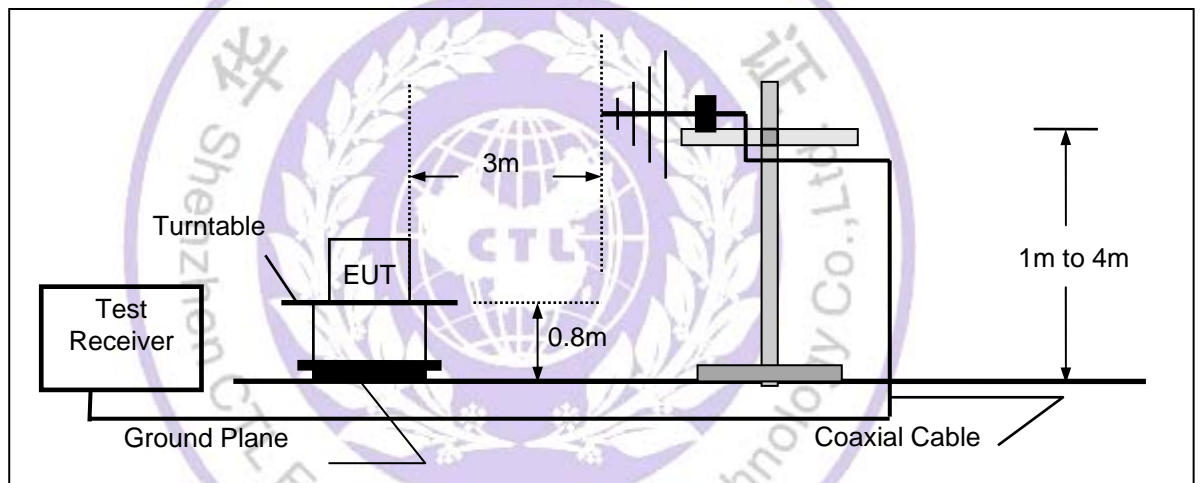
### 4.1. Radiated Emission Test

#### Test Configuration

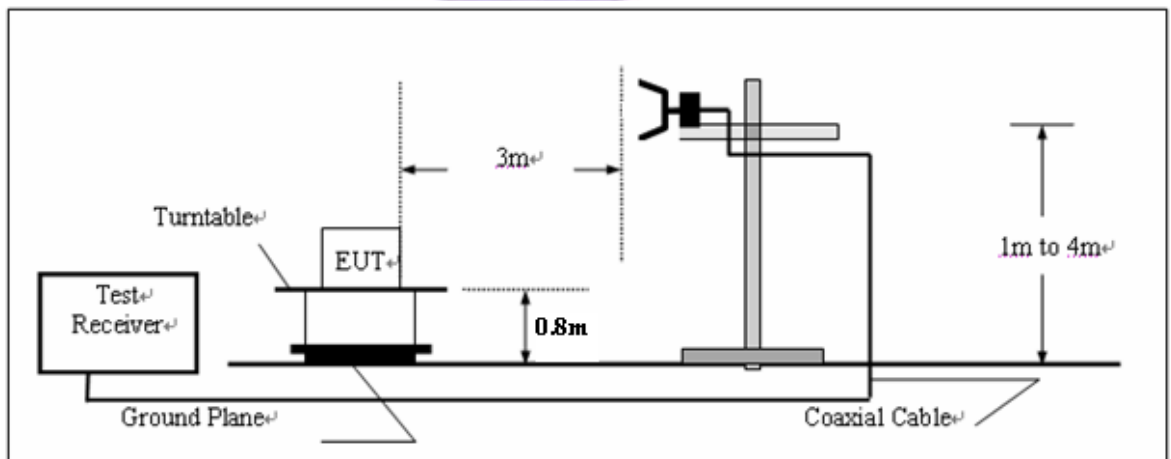
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



### **Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

### **Radiation Limit**

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

### **Test Procedure**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

#### **Note:**

Three axes are chosen for pretest, the Z axis is the worst mode for final test.

For battery operated equipment, the equipment tests shall be performed using a new battery.

**Radiation Test Result**

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
315.00	V	Peak	54.90	13.80	68.70	75.60	-6.90	F
315.00	H	Peak	60.40	13.80	74.20	75.60	-1.40	F
630.00	V	Peak	26.40	22.90	49.30	55.60	-6.30	H
630.00	H	Peak	30.60	22.90	53.50	55.60	-2.10	H
945.00	V	Peak	20.80	25.40	46.20	55.60	-9.40	H
945.00	H	Peak	25.90	25.40	51.30	55.60	-4.30	H
1260.00	V		---					H
1260.00	H		---					H
247.40	H	Peak	21.60	15.60	37.20	46.00	-8.80	
247.40	V	Peak	20.10	15.60	35.70	46.00	-10.30	
Others			---					

**Remark:**

- (1) Measuring frequencies from 9KHz to the 4GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 25MHz to 1GHz was 120KHz and 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

## 4.2. Occupied Bandwidth

### Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Based on FCC Part15 C Section 15.231: RBW= 100KHz, VBW= 300KHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

### Test SET-UP (Block Diagram of Configuration)

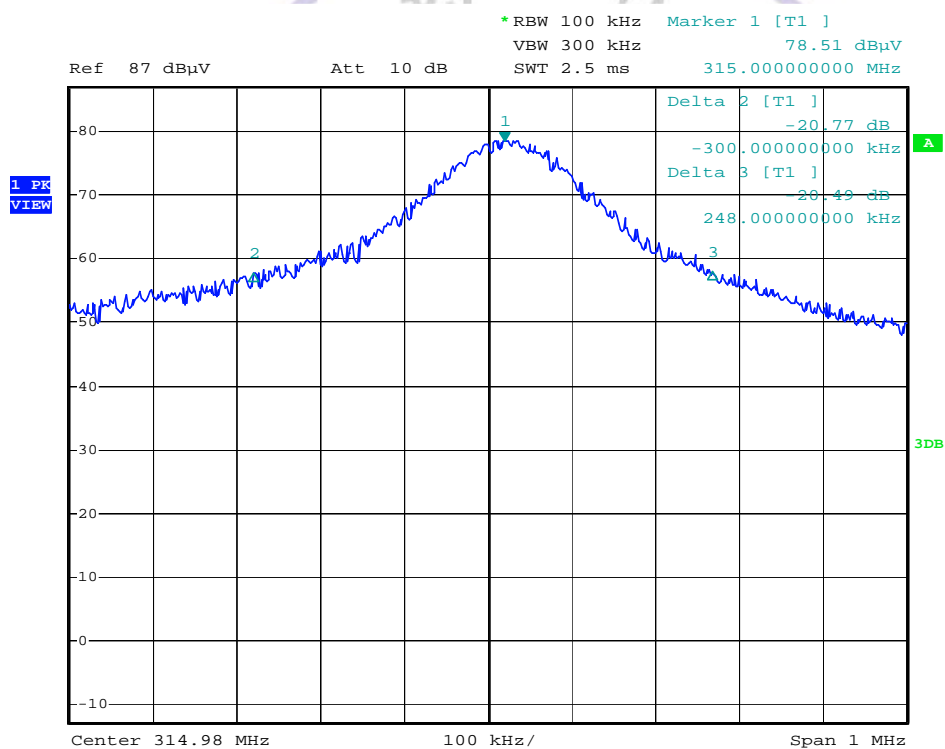
Same as Radiated Emission Measurement.

### Measurement Equipment Used:

Same as Radiated Emission Measurement.

### Measurement Results:

The graph as below, represents the emissions take for this device.



Date: 15.MAR.2012 14:10:58

Note: Limit= Fundamental frequency×0.25%=315×0.25%=787.5KHz

### 4.3. RELEASE TIME MEASUREMENT

#### Measurement Procedure

Release Time Measurement According To FCC Part 15 Section 15.231(a).

1. Set SPA Center Frequency = Fundamental frequency, RBW = 100 kHz, VBW = 300 kHz, Span = 0Hz. Sweep time = 20seconds.
2. Set EUT as normal operation and press Transmitter button.
3. Set SPA View. Delta Mark time.

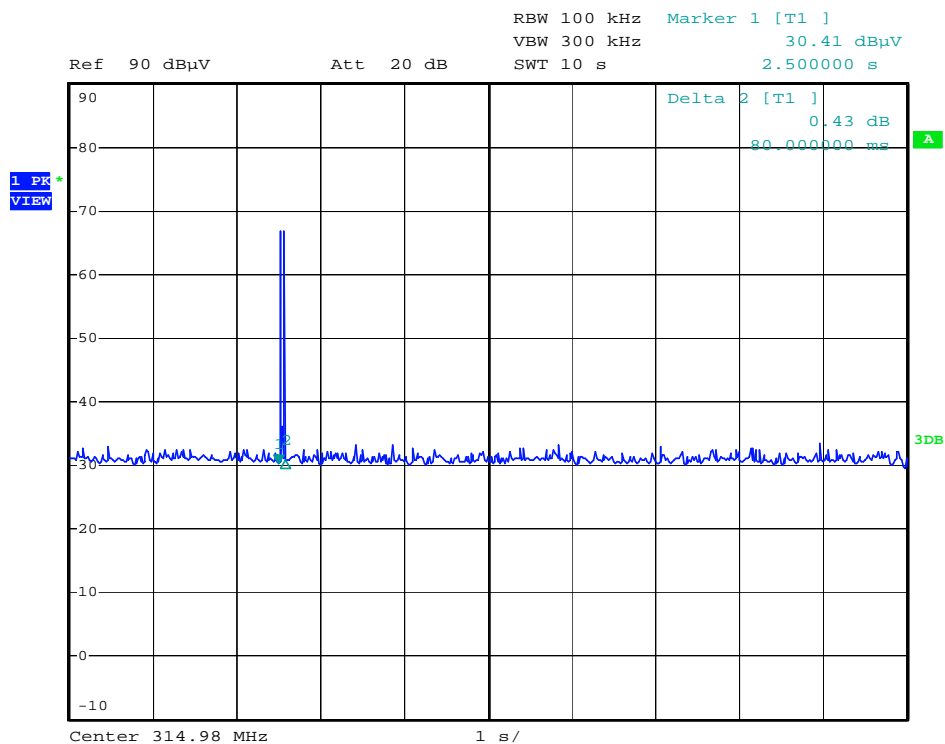
#### Test SET-UP (Block Diagram of Configuration)

Same as 5.2 Radiated Emission Measurement.

#### Measurement Equipment Used:

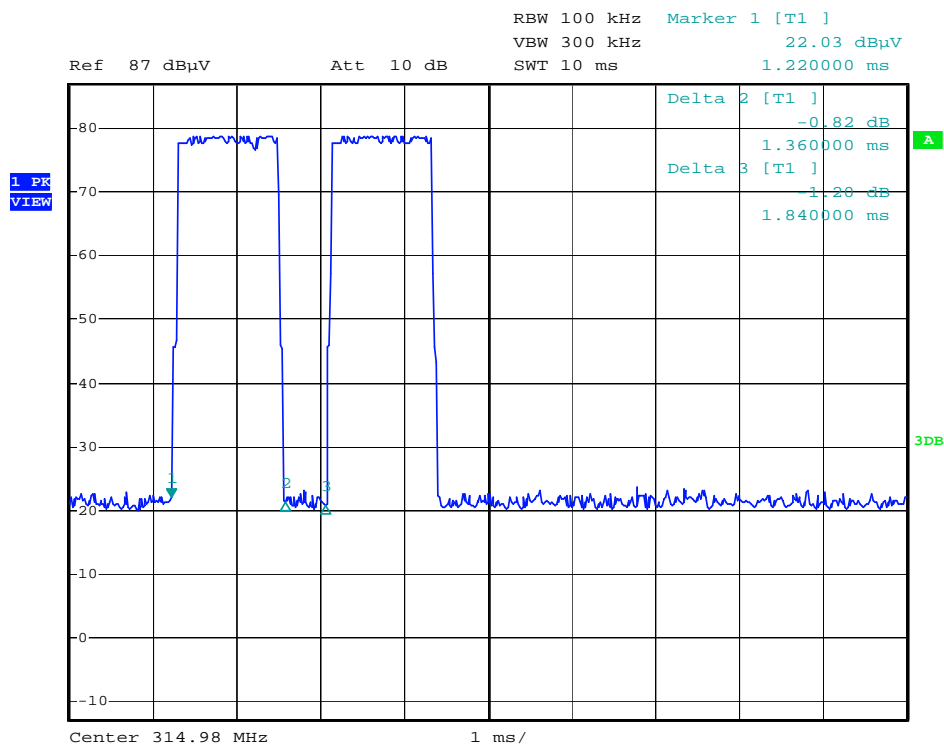
Same as 5.2 Radiated Emission Measurement.

#### Measurement Results:



Date: 15.MAR.2012 14:19:59





Date: 15.MAR.2012 14:16:47



## 5. Test Setup Photos of the EUT



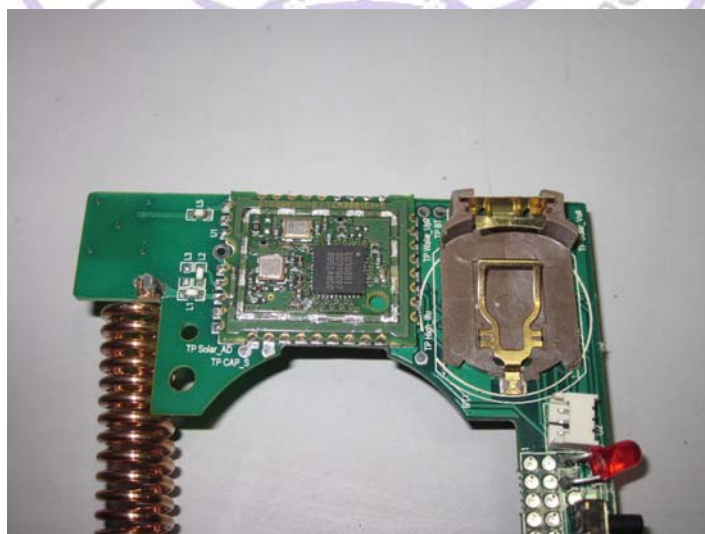
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## 6. External and Internal Photos of the EUT

### External Photos



Internal Photos



.....End of Report.....