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# FCC Test Report

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Report No.: AGC00Y121002F2

**FCC ID** : YI6RL-R31

**PRODUCT DESIGNATION** : Emergency Button

**BRAND NAME** : RL

**TEST MODEL** : RL-R31

**CLIENT** : GUANGDONG ROULE ELECTRONICS CO.,LTD

**DATE OF ISSUE** : Oct. 30, 2012

**STANDARD(S)** : FCC Part 15 Rules

**Attestation of Global Compliance(Shenzhen) Co., Ltd.**

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**1. VERIFICATION OF COMPLIANCE**

Applicant:	GUANGDONG ROULE ELECTRONICS CO.,LTD
Applicant Address:	No.12,Pingdong 3rd Road,Nanping Industry Community,Zhuhai City,Guangdong,China
Manufacturer:	GUANGDONG ROULE ELECTRONICS CO.,LTD
Manufacturer Address:	No.12,Pingdong 3rd Road,Nanping Industry Community,Zhuhai City,Guangdong,China
Product Description:	Emergency Button
Brand Name:	RL
Model Name:	RL-R31
FCC ID:	YI6RL-R31
Report Number:	AGC00Y121002F2
Date of Test:	Oct.22,2012-Oct.26,2012

**WE HEREBY CERTIFY THAT:**

The above equipment was tested by Attestation of Global Compliance(Shenzhen) Co., Ltd. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2003. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

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

Prepared By Wall  
Wall Huang Oct.30, 2012

Checked By Forrest Lei  
Forrest Lei Oct.30, 2012

Authorized By Solger Zhang  
Solger Zhang Oct.30, 2012

## 2. GENERAL INFORMATION

### 2.1. PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)

EUT Designation:	Emergency Button
Brand Name:	RL
Model Name:	RL-R31
Rated Voltage:	DC3V
Frequency :	433.92MHz
Modulation Type:	FSK
Type of Antenna:	Integrated Antenna
<p><b>**Note:</b> For more information refer to the circuit diagram form and the user's manual. The EUT will cease transmit when stop audio signal.</p>	

### 2.2. TEST STANDARDS

The following report of is prepared on behalf of the Attestation of Global Compliance Co., Ltd. in accordance with FCC Part 15, Subpart C, and section 15.231, 15.203 and 15.209 of the Federal Communication Commission rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.231, 15.203 and 15.209 of the Federal Communication Commission rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

### 2.3. RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for **FCC ID: YI6RL-R31** filing to comply with Section 15.231 of the FCC Part 15, Subpart C Rules.

### 2.4. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test

modes were adapted accordingly in reference to the Operating Instructions. The EUT was tested in all three orthogonal planes and the worse case was showed.

## 2.5. TEST FACILITY

All measurement facilities used to collect the measurement data are located at

### **Attestation of Global Compliance (Shenzhen) Co., Ltd.**

(1&2F, No.2 Building, Huafeng No.1 Technical, Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen, China)

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.

FCC register No.: 259865

## 2.6. EUT EXERCISE SOFTWARE

The EUT exercise program used during the testing was designed to exercise the system components. The test software is started while the EUT system is on.

## 2.7. ACCESSORIES EQUIPMENT LIST AND DETAILS

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
--	--	--	--	--	--

## 2.8. EUT PORT&CABLE LIST AND DETAILS

I/O Port Type	Q'TY	Cable	Tested with
--	--	--	--

Note:—"means it's not applicable.

### 3. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.203 Antenna Requirement	Compliant
§15.207 Conducted Emission	N/A
§15.209 General Requirement	Compliant
§15.231 (c) Emission Bandwidth	Compliant
§15.231 (e) Radiated Emission	Compliant
§15.231 (e) Deactivation Testing	Compliant

### 4 TEST MODES

No.	Test modes
1	433.92MHZ TX
Above mode have been performed at maximum emission conditions. 3 axis were chosen for testing for test modes.	

## **5. § 15.203 - ANTENNA REQUIREMENT**

### **5.1. STANDARD APPLICABLE**

According to FCC 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

### **5.2. TEST RESULT**

This product has a PCB antenna, fulfill the requirement of this section.



## 6.§15.209, §15.231 (e)- RADIATED EMISSION

### 6.1. 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 +/-3.2 dB.

### 6.2. Limit

Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) and may be employed for any type of operation, including operation prohibited in paragraph (a), provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this Section, except the field strength table in paragraph (b) is replaced by the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emission (microvolts/meter)
40.66 - 40.70	1,000	100
70 - 130	500	50
130 - 174	500 to 1,500 **	50 to 150 **
174 - 260	1,500	150
260 - 470	1,500 to 5,000 **	150 to 500 **
Above 470	5,000	500

\*\* linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz,  $\text{uV/m at 3 meters} = 22.72727(F) - 2454.545$ ; for the band 260-470 MHz,  $\text{uV/m at 3 meters} = 16.6667(F) - 2833.3333$ . The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

**AV Limit**= $16.6667(433.92)-2833.3333=4398.681164\text{uV/m}=72.87\text{dBuV/m}$

**PEAK Limit**=AV limit+20=92.87dBuV/m

### 6.3. TEST EQUIPMENT LIST AND DETAILS

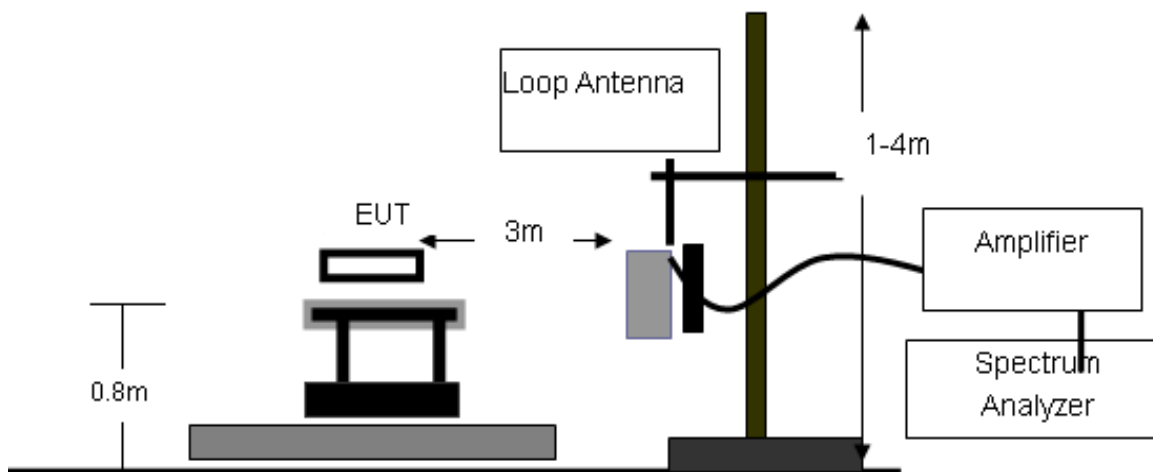
Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/18/2012	07/17/2013
LOOP ANTENNA	A.H.	SAS-521-4	128	07/18/2012	07/17/2013
BROADBAND ANTENNA	A.H.	EHA-51B	N/A	07/18/2012	07/17/2013
HORN ANTENNA	EM	EM-AH-10180	N/A	07/18/2012	07/17/2013
AMPLIFIER	EM	EM30180	0607030	07/18/2012	07/17/2013
COAXIAL CABLE	SCHWARZBECK	AK9513	9513-10	07/18/2012	07/17/2013
POSITIONING CONTROLLER	MF	MF-7802	MF780208147	07/18/2012	07/17/2013

### 6.4. TEST PROCEDURE

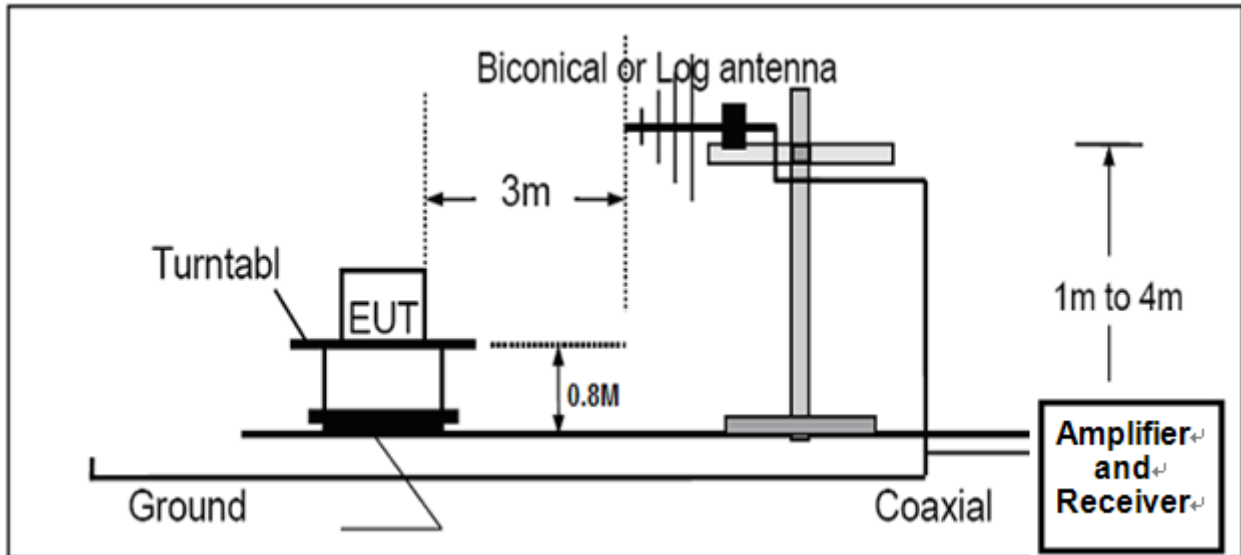
The setup of EUT is according with per ANSI C63.4-2003 measurement procedure.

### 6.5. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

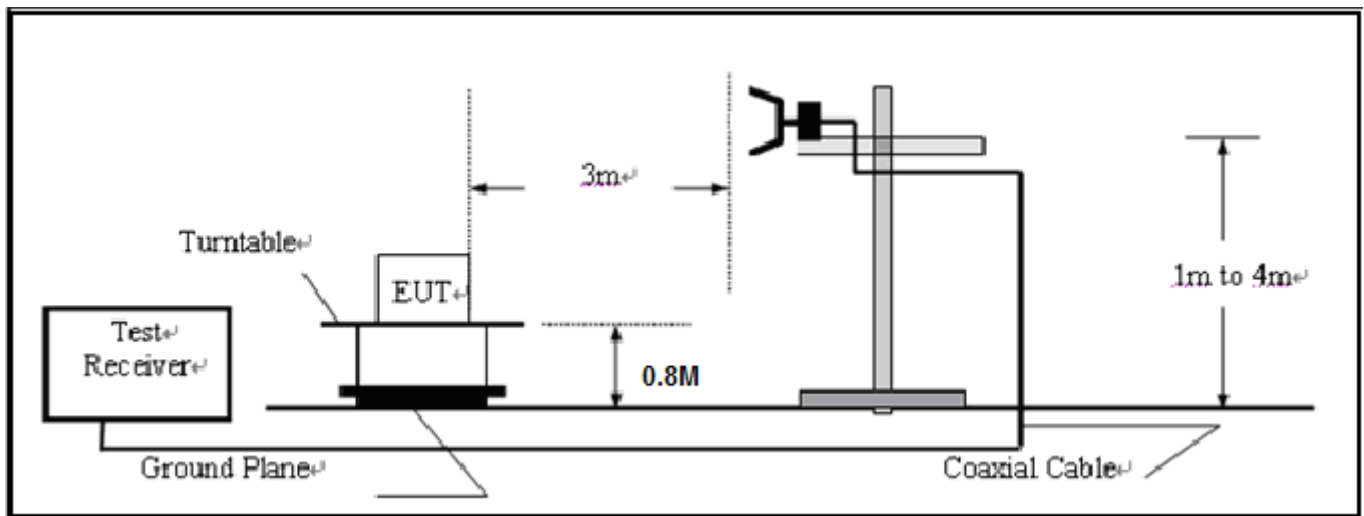
BELOW 30MHz:



**30MHz-1000MHz:**



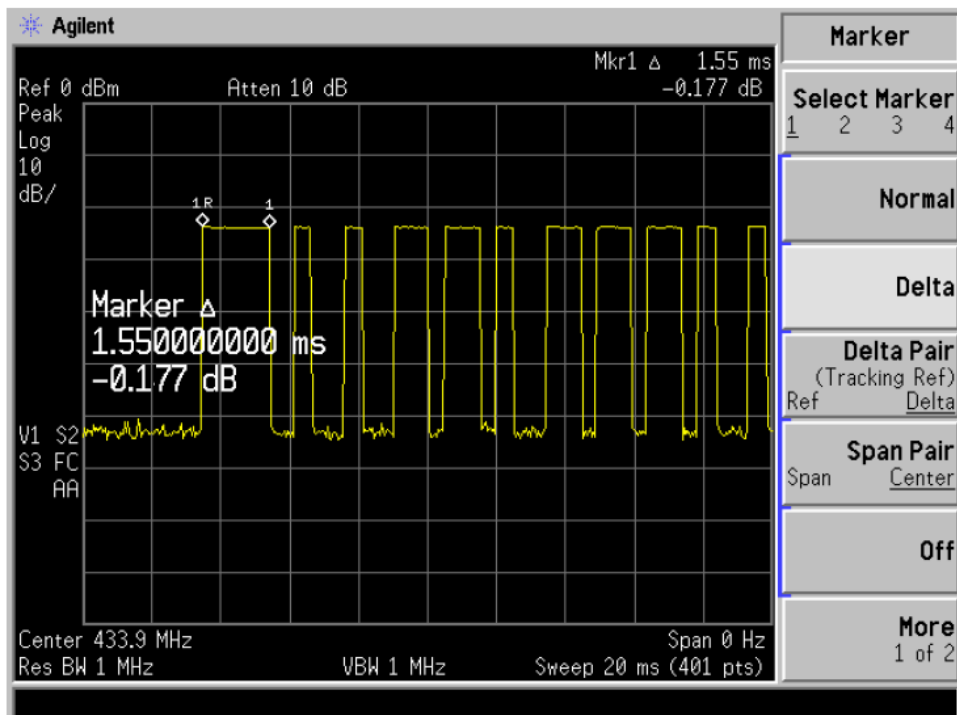
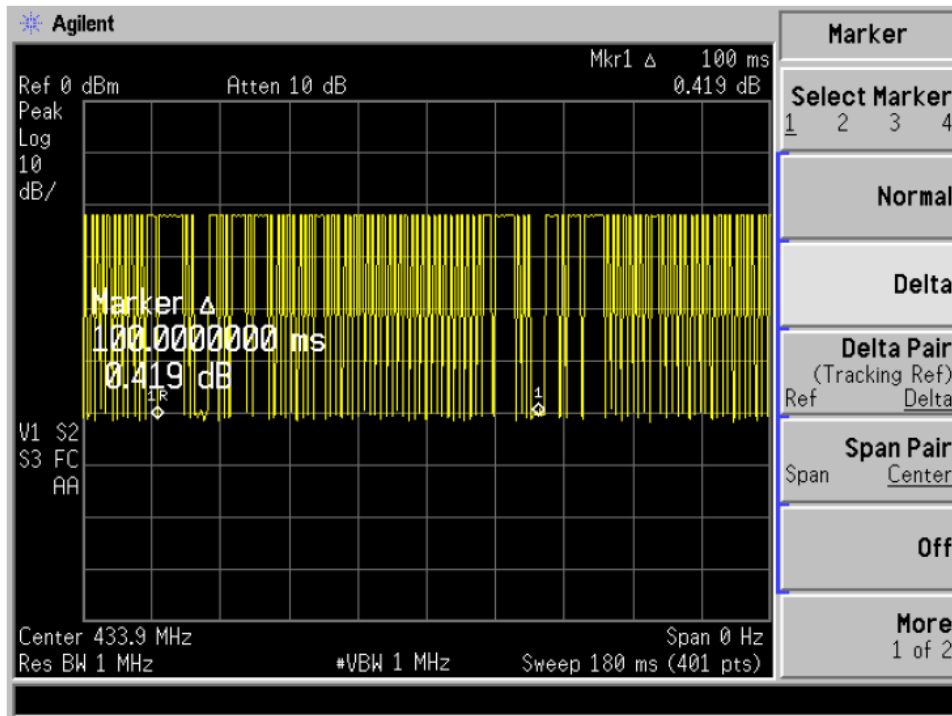
**ABOVE 1000MHz:**

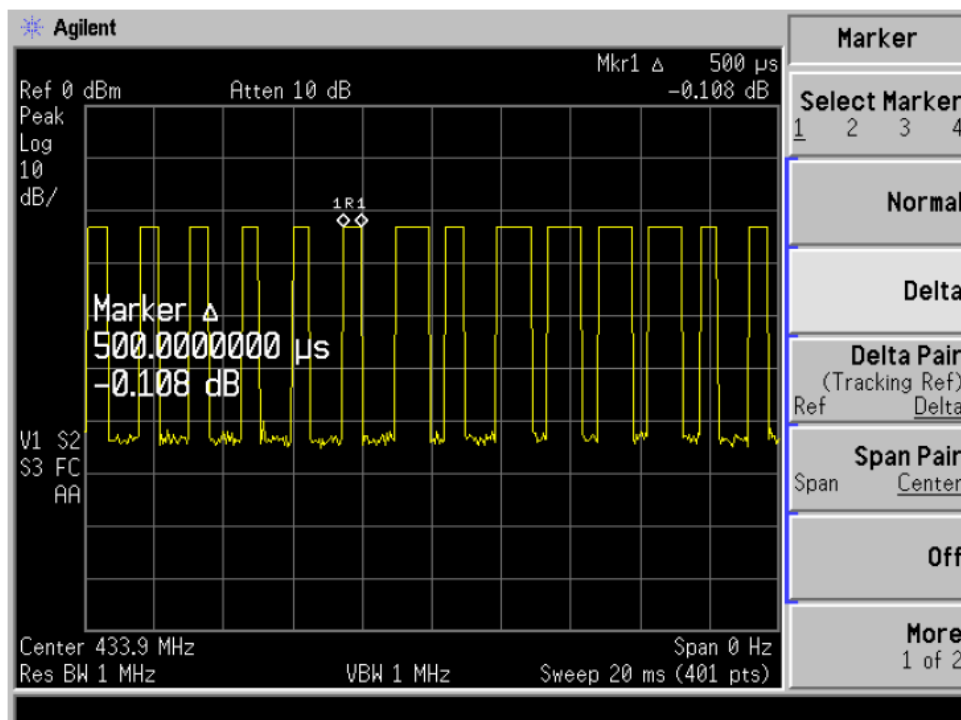
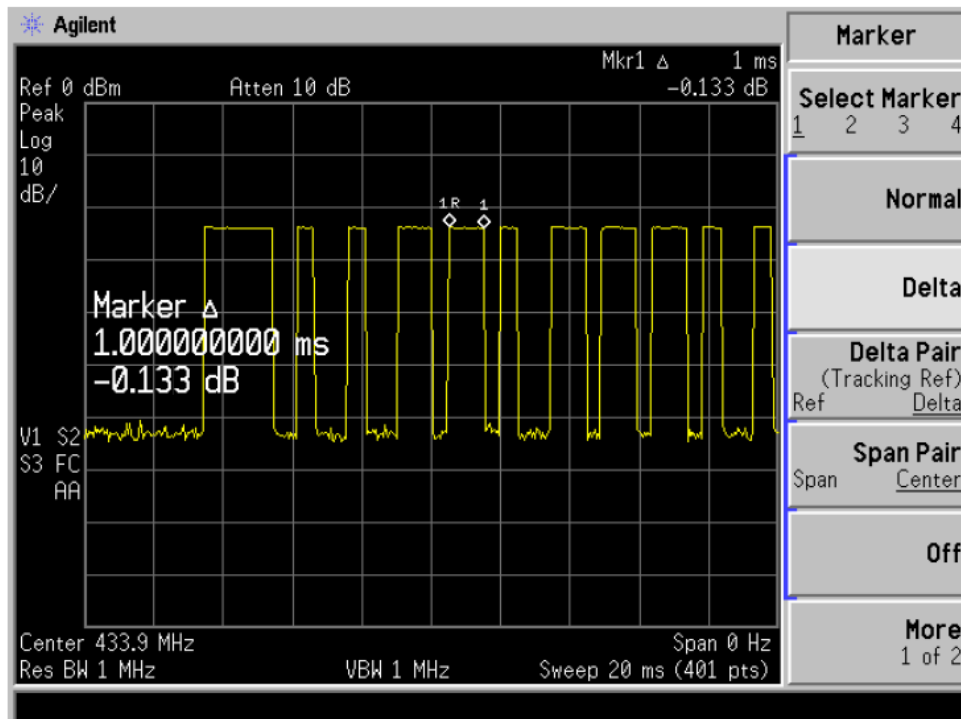


### 6.6. TEST RESULTS/PLOTS

#### AV FACTOR CALCULATION

$$AV \text{ FACTOR} = 20\log(\text{Duty Cycle}) = 20\log[(1.55\text{ms} \cdot 2 + 1\text{ms} \cdot 4 + 0.5\text{ms} \cdot 50) / 100\text{ms}] = -9.8\text{dB}$$





**TEST RESULT OF RADIATED EMISSION TEST (9KHZ-30MHZ)**

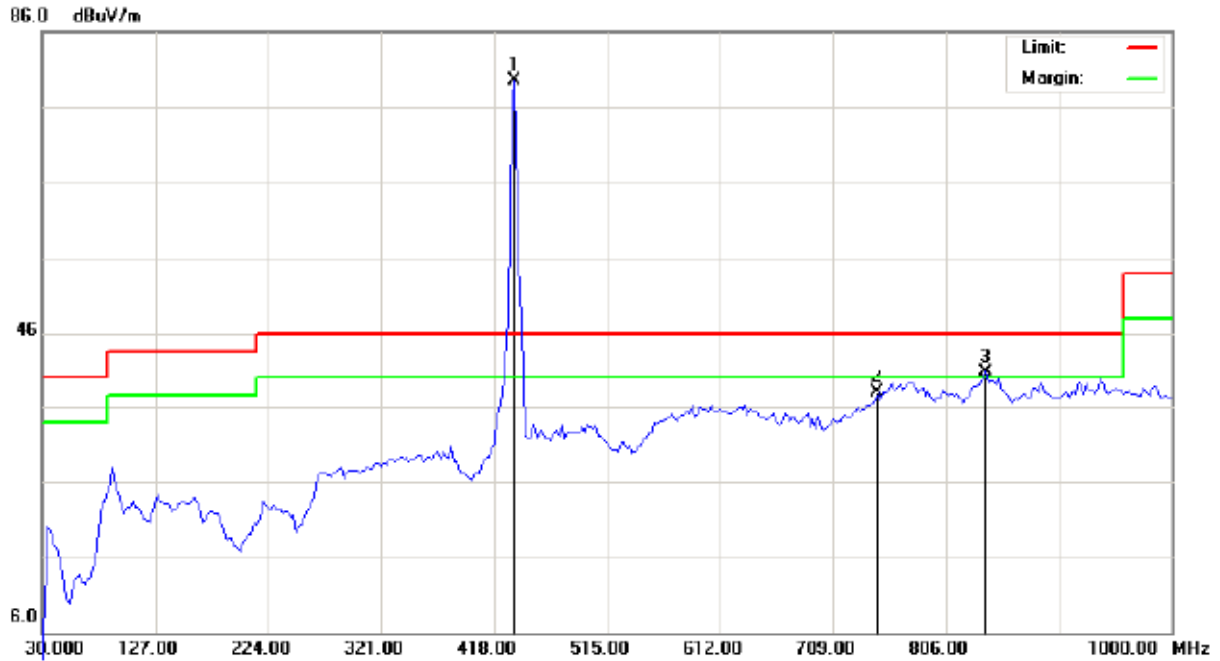
Freq. (MHz)	Level (dB uV)	Over Limit (dB)	Limit Line (dB uV)	Remark
--	--	--	--	Seen Note

**\*\*Note:**

*The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be report.*

**TEST RESULT OF RADIATED EMISSION TEST (30MHZ-1GHZ)**

**Radiated Emission Measurement**



Site: site #1  
 Limit: FCC Class B 3M Radiation  
 EUT: Emergency Button  
 M/N: RL-R31  
 Mode:TX  
 Note:

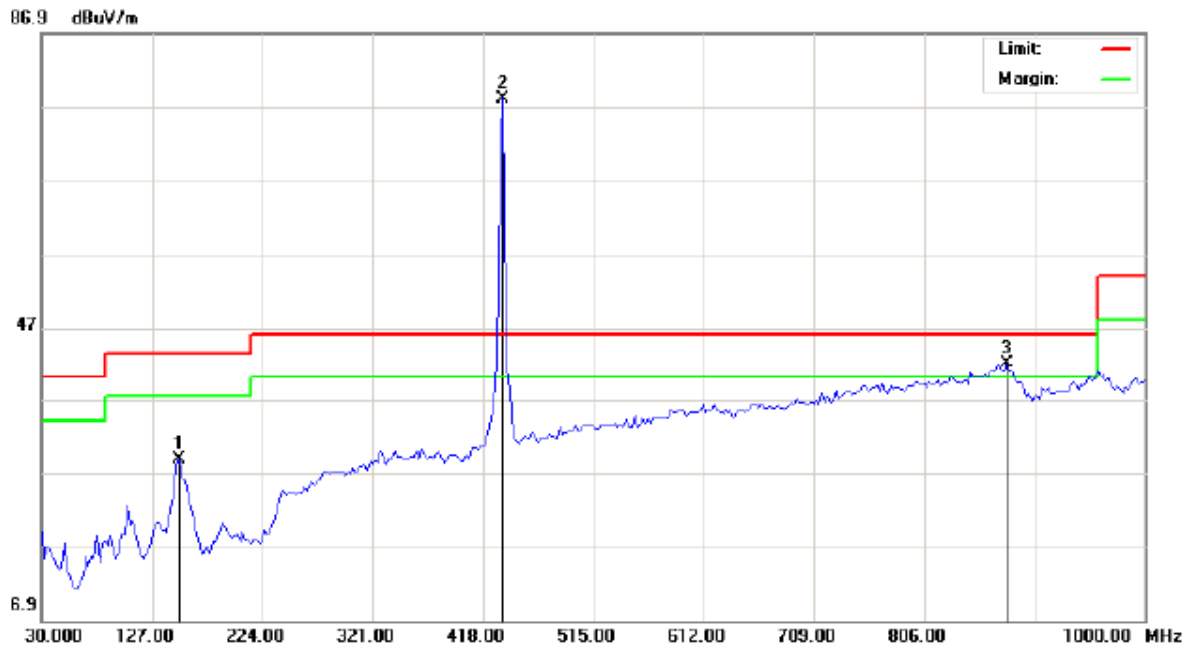
Polarization: *Horizontal*  
 Power:  
 Distance: 3m

Temperature: 26  
 Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	434.9750	58.28	21.22	79.50	92.87	-13.37	peak			
2		747.7998	11.72	26.28	38.00	46.00	-8.00	peak			
3	!	839.9500	9.35	31.34	40.69	46.00	-5.31	peak			

Frequency	Peak	AV Factor	AV Result	Limit	Margin
433.92	79.5	-9.8	69.7	72.87	-3.17

Radiated Emission Measurement



Site: site #1  
 Limit: FCC Class B 3M Radiation  
 EUT: Emergency Button  
 M/N: RL-R31  
 Mode:TX  
 Note:

Polarization: *Vertical*  
 Power:  
 Distance: 3m

Temperature: 26  
 Humidity: 60 %

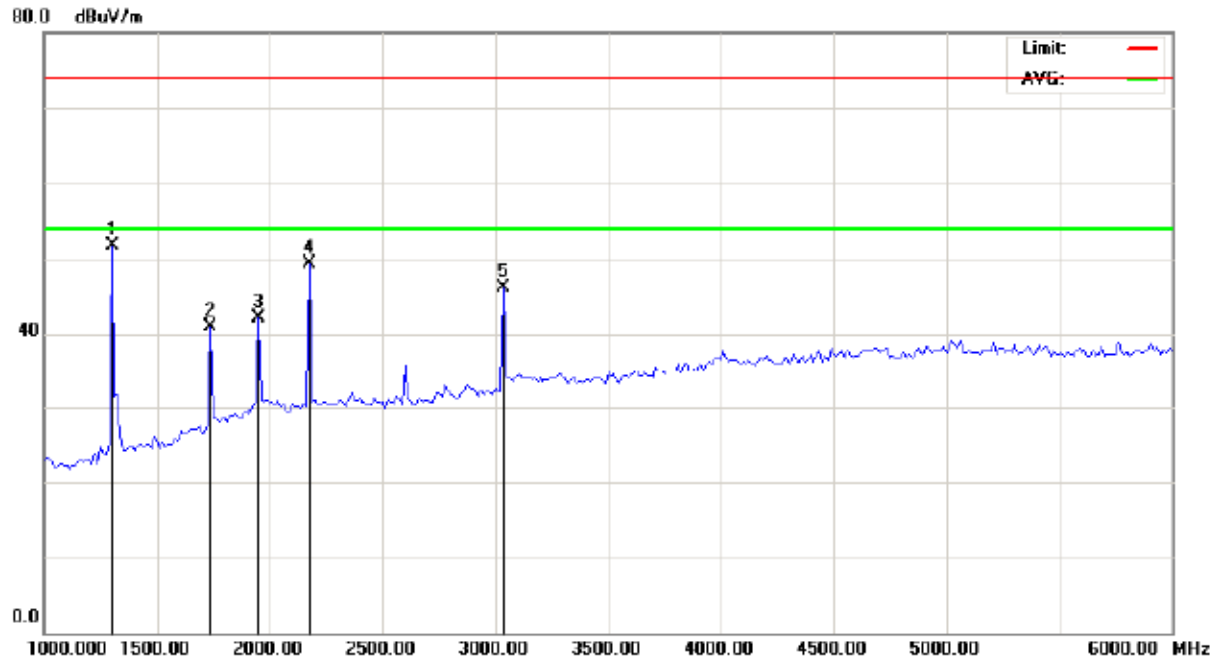
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		151.2500	10.22	18.55	28.77	43.50	-14.73	peak			
2	*	434.9750	56.63	21.47	78.10	92.87	-14.77	peak			
3	!	878.7500	11.57	30.36	41.93	46.00	-4.07	peak			

Frequency	Peak	AV Factor	AV Result	Limit	Margin
433.92	78.1	-9.8	68.3	72.87	-4.57



**TEST RESULT OF RADIATED EMISSION TEST (ABOVE 1000MHZ)**

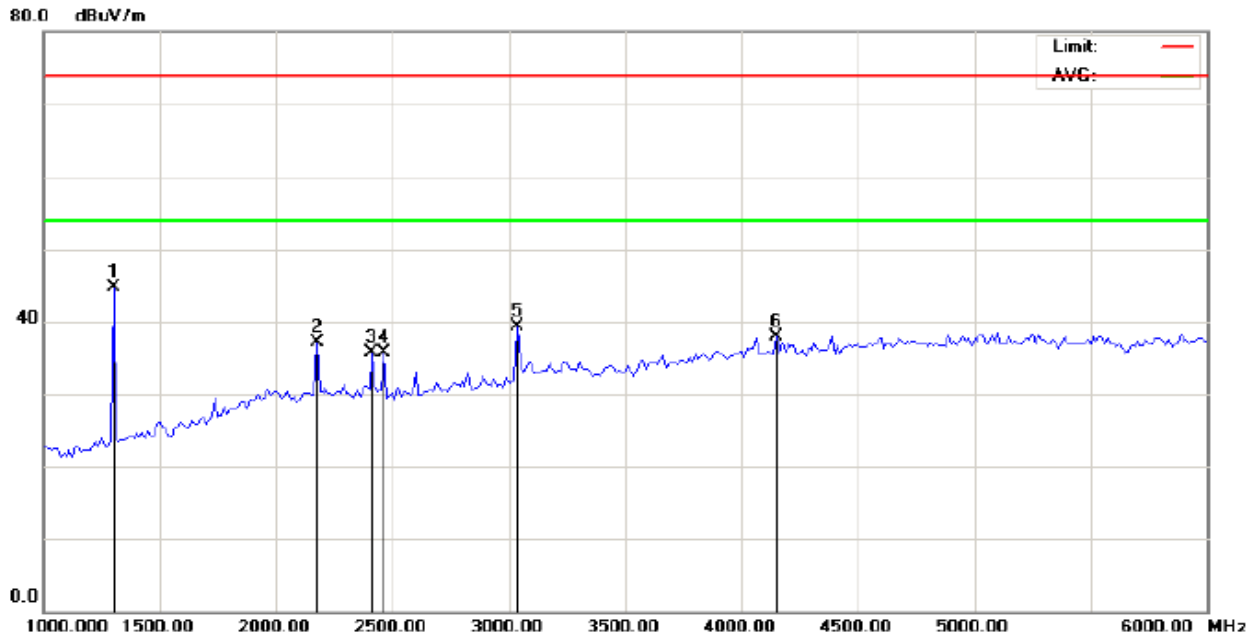
**Radiated Emission Measurement**



Site: site #1 Polarization: *Horizontal* Temperature: 26  
 Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
 EUT: Emergency Button Distance: 3m  
 M/N: RL-R31  
 Mode:TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	1300.000	67.26	-15.46	51.80	74.00	-22.20	peak			
2		1737.500	53.82	-12.88	40.94	74.00	-33.06	peak			
3		1950.000	52.85	-10.65	42.20	74.00	-31.80	peak			
4		2175.000	59.29	-9.93	49.36	74.00	-24.64	peak			
5		3037.500	54.40	-8.32	46.08	74.00	-27.92	peak			

Radiated Emission Measurement



Site: site #1 Polarization: **Vertical** Temperature: 26  
 Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
 EUT: Emergency Button Distance: 3m  
 M/N: RL-R31  
 Mode: TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	1300.000	60.17	-15.46	44.71	74.00	-29.29	peak			
2		2175.000	47.08	-9.93	37.15	74.00	-36.85	peak			
3		2412.500	45.31	-9.67	35.64	74.00	-38.36	peak			
4		2462.500	45.32	-9.61	35.71	74.00	-38.29	peak			
5		3037.500	47.64	-8.32	39.32	74.00	-34.68	peak			
6		4150.000	42.13	-4.30	37.83	74.00	-36.17	peak			

Freq. (MHz)	Level (dB uV)	Over Limit (dB)	Limit Line (dB uV)	Remark
--	--	--	--	Seen to Note

\*\*Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be report

## 7. §15.231(c) EMISSION BANDWIDTH TESTING

### 7.1. STANDARD APPLICABLE

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.

The Limit is 1.0848MHz

### 7.2. TEST EQUIPMENT LIST AND DETAILS

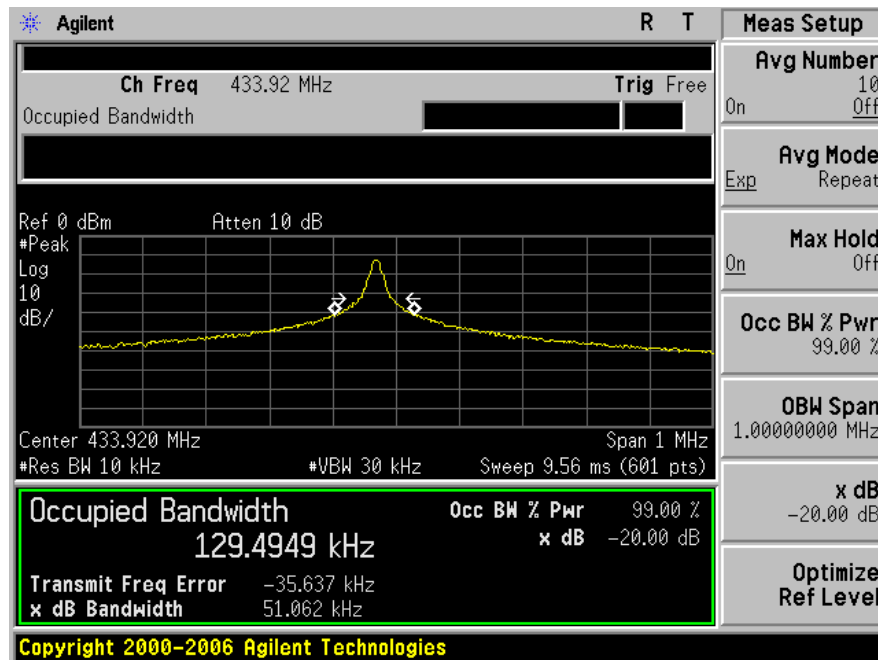
Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/18/2012	07/17/2013
RECEIVER ANTENNA	ETS	2175	57337	07/18/2012	07/17/2013
COAXIAL CABLE	ETS	SUCOFLEX 104	25498514	07/18/2012	07/17/2013

### 7.3. 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.

### 7.4. SUMMARY OF TEST RESULTS/PLOTS

PASS



## 8. § DEACTIVATION TESTING

### 8.1. STANDARD APPLICABLE

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. TEST EQUIPMENT LIST AND DETAILS

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/18/2012	07/17/2013
BICONICAL ANTENNA	A.H.	SAS-521-4	128	07/18/2012	07/17/2013
POSITIONING CONTROLLER	MF	MF-7802	MF780208147	07/18/2012	07/17/2013
AMPLIFIER	EM	EM30180	0607030	07/18/2012	07/17/2013

### 8.3. TEST PROCEDURE

1. The deactivation test was performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 (2009). The specification used was the FCC 15.231(e) limits.
2. Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

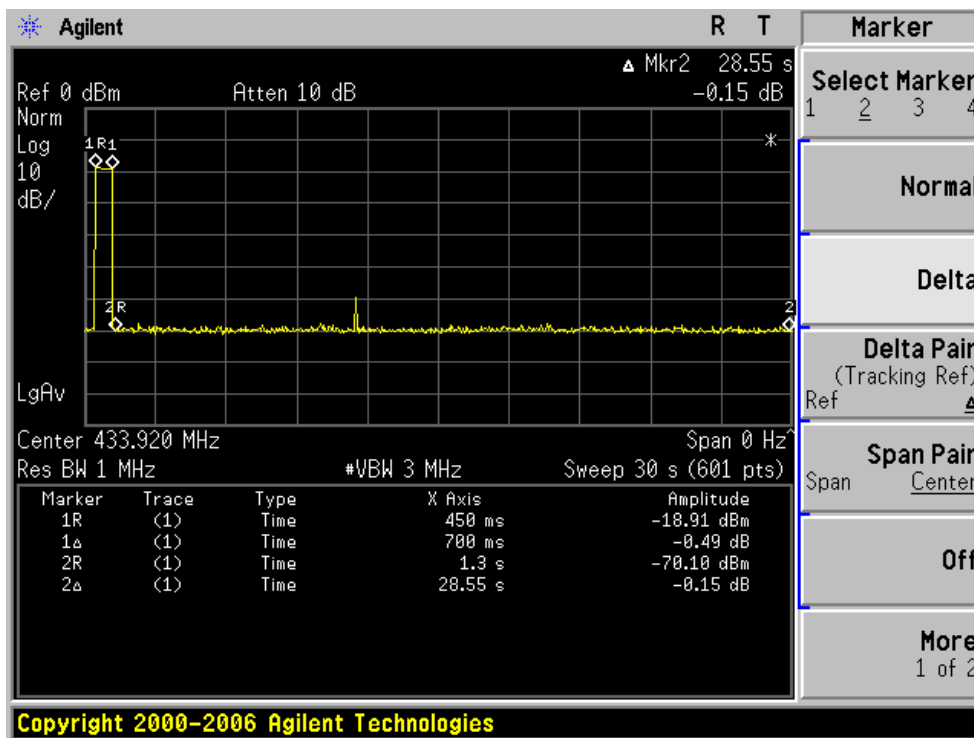
### 8.4. TEST RESULTS

Transmitter Time

Measurement	Limit	Result
0.7s	1s	PASS

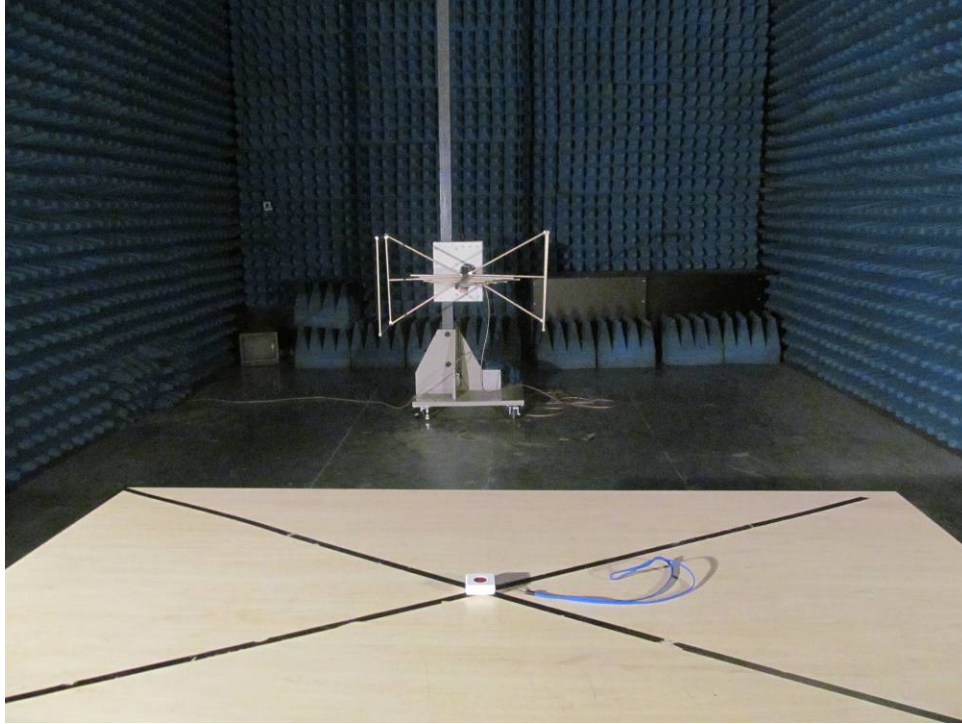
At least 30\*Ton but in no case less than 10s:

Measurement	Limit	Result
0.7*30=21s	>10s	PASS

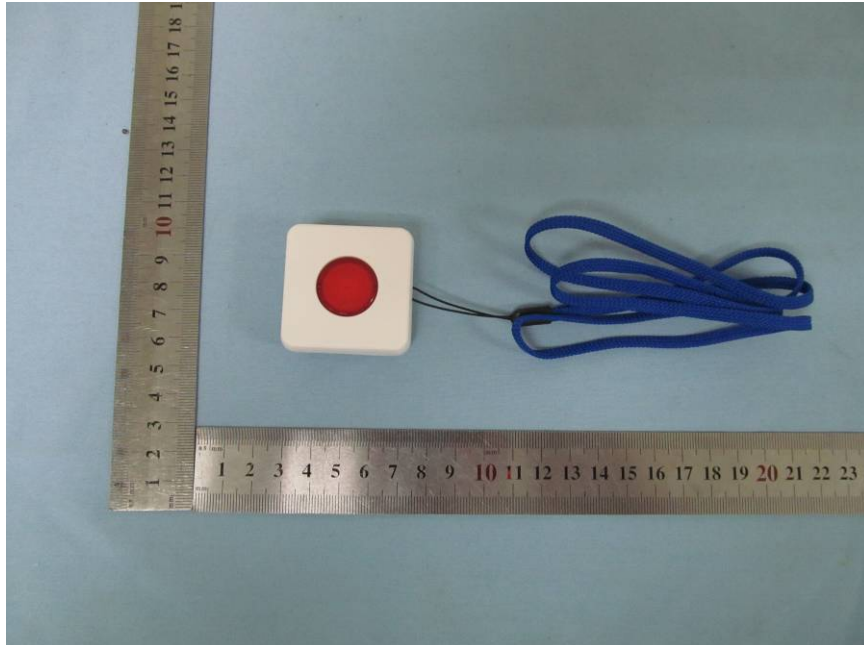


Transmitter Time

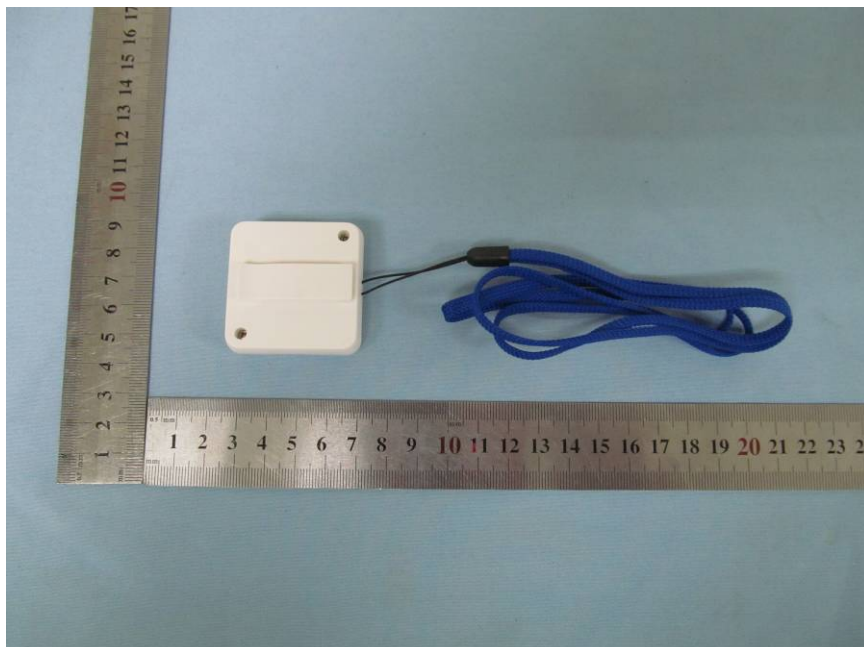
## APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



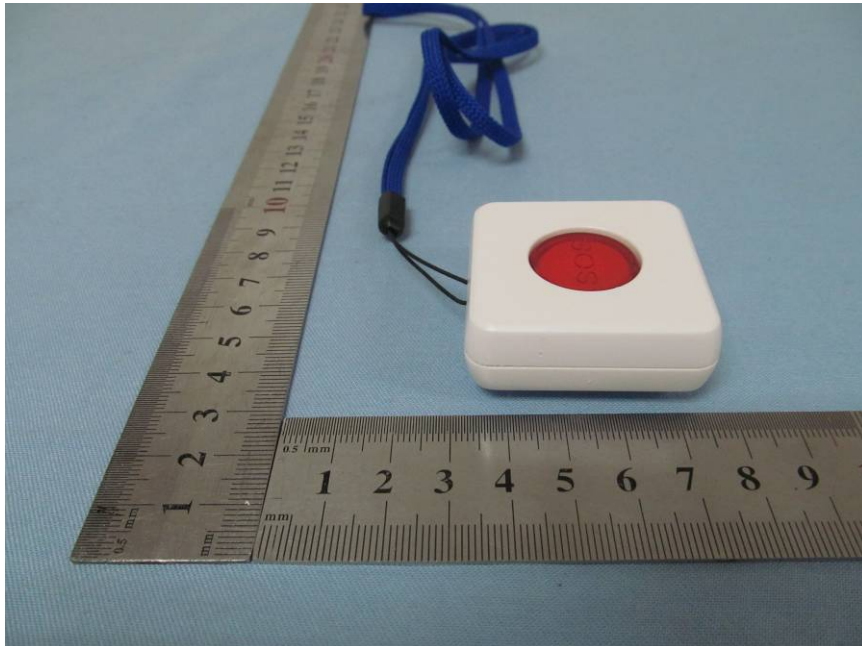
**APPENDIX 2**  
**PHOTOGRAPHS OF EUT**  
TOP VIEW OF EUT



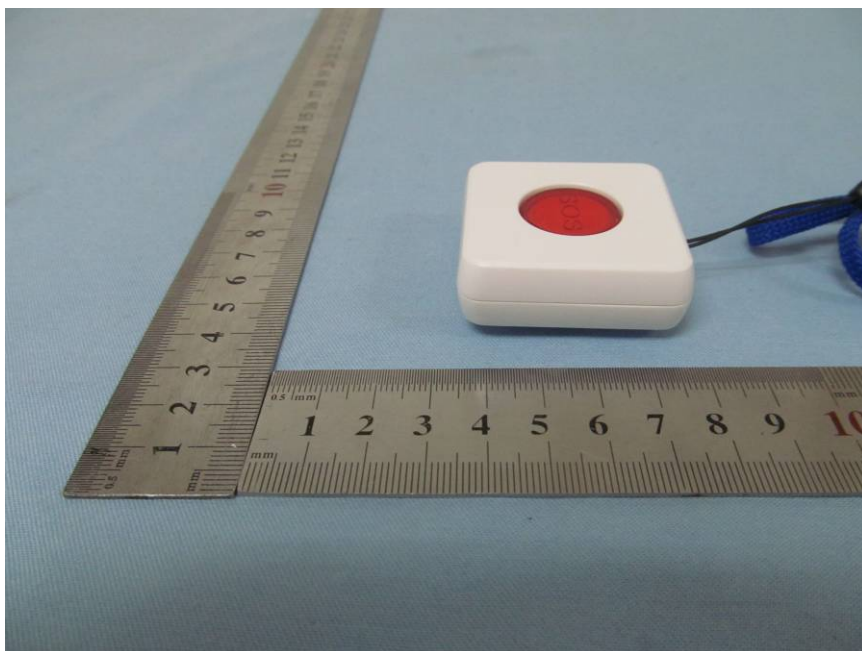
**BOTTOM VIEW OF EUT**



RIGHT VIEW OF EUT



LEFT VIEW OF EUT

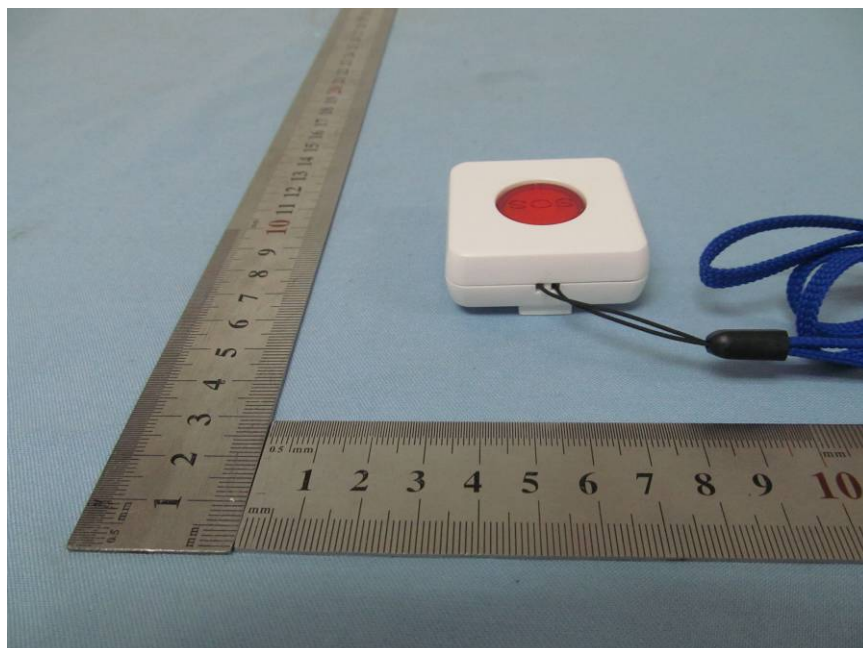




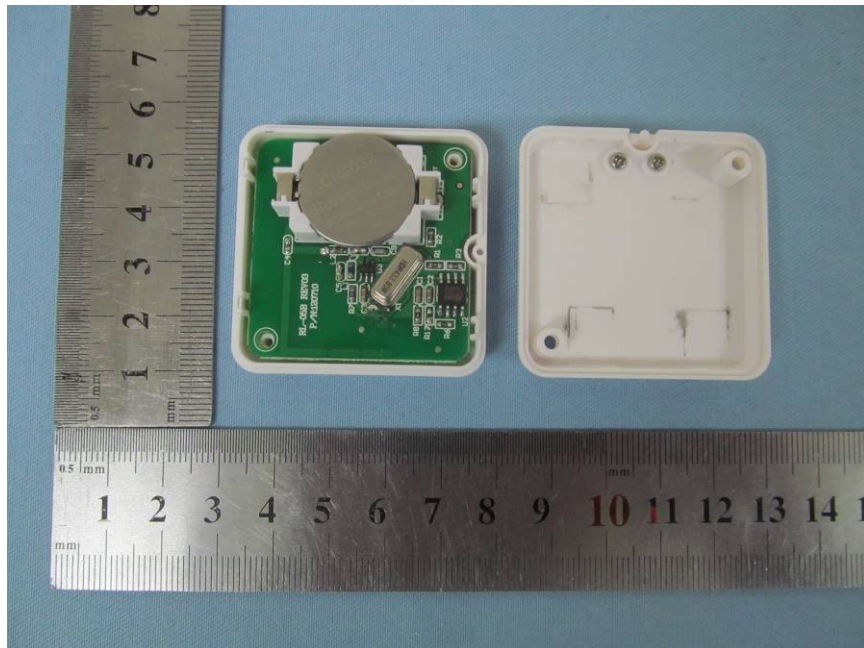
FRONT VIEW OF EUT



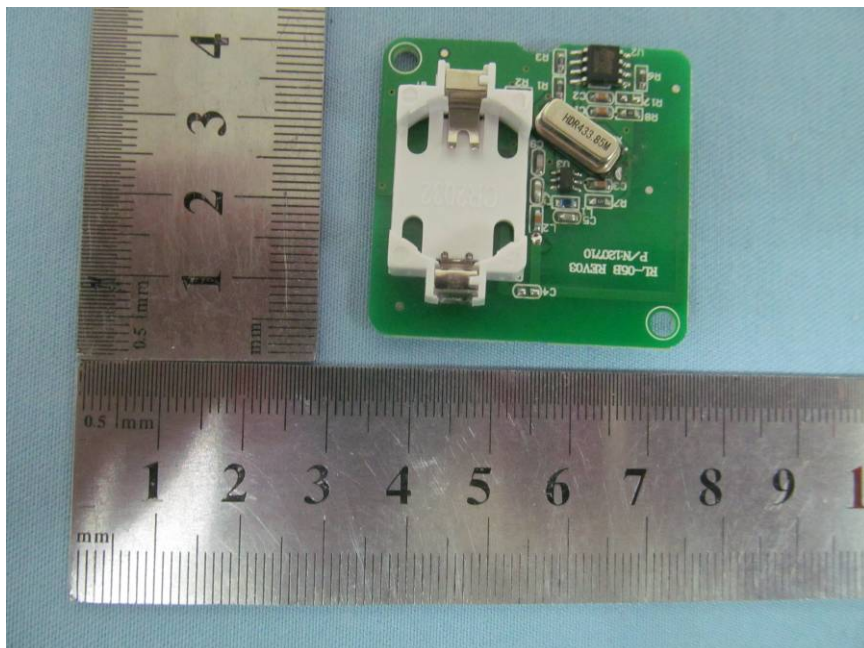
BACK VIEW OF EUT



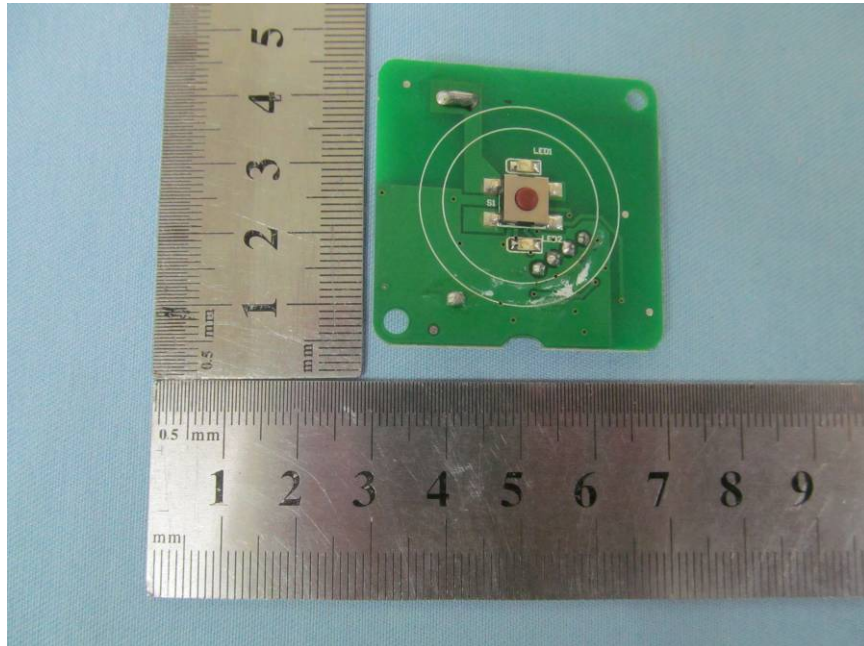
OPEN VIEW OF EUT-1



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----- END OF REPORT-----