# TEST REPORT

## FCC ID: OF6EIMWRC04

For

EXPEDITE INTERNATIONAL,INC.

Remote control

| | | |
|---|---|---|
| Model No. | : | ITEM #20215-9 |
| Trade Name | : | N/A |
| Prepared for | : | EXPEDITE INTERNATIONAL,INC. |
| Address | : | 1950 8th Ave. Baldwin, WI 54002, USA. |
| Prepared by | : | Shenzhen Alpha Product Testing Co., Ltd. |
| Address | : | Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road, Bao'an, Shenzhen, China |
| Report No. | : | T1861641 01 |
| Date of Receipt | : | August 18, 2016 |
| Date of Test | : | August 18-August 25, 2016 |
| Date of Report | : | August 26, 2016 |
| Version Number | : | REV0 |

# Contents

# DECLARATION

| | | |
|---|---|---|
| Applicant | : | EXPEDITE INTERNATIONAL,INC. |
| Manufacturer | : | MW PRODUCTS LTD. |
| Product | : | Remote control |
| | (A)Model No. | : ITEM #20215-9 |
| | (B)Trade Name | : N/A |
| | (C)Power supply | : DC 3*1.5V from AA battery |

Measurement Standard Used:

**FCC Rules and Regulations Part 15 Subpart C Section 15.231: 2016, ANSI C63.10-2013 ;ANSI C63.4-2014**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Class B limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests. After the test, our opinion is that EUT compliance with the requirement of the above standards.
This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

| | | |
|---|---|---|
| Tested by (name + signature).....…..: | Reak Yang<br>Test Engineer | Reak Yang |
| Approved by (name + signature)…....: | Simple Guan<br>Project Manager | |
| Date of issue…… ……...: | | August 26, 2016 |

# 1. General Information

## 1.1. Description of Device (EUT)

| | |
|---|---|
| EUT | : Remote control |
| Model No. | : ITEM #20215-9 |
| DIFF. | : N/A |
| Trade Name | : N/A |
| Power supply | : DC 3*1.5V from AA battery |
| Operation frequency | : 434MHz |
| Modulation | : FSK |
| Hardware Version | : N/A |
| Software Version | : N/A |
| Antenna Type | : Internal antenna, max gain 0dBi. |
| Applicant | : EXPEDITE INTERNATIONAL,INC. |
| Address | : 1950 8th Ave. Baldwin, WI 54002, USA. |
| Manufacturer | MW PRODUCTS LTD. |
| Address | 2D, Effort Ind., Bldg 2-8 Kung Yip St., Kwai Chung, Hong Kong. |

## 1.2. Accessories of device (EUT)

| | | |
|---|---|---|
| Accessories | : | N/A |
| Model | | N/A |
| Input | | N/A |
| Output | | N/A |
| Accessories2 | : | N/A |
| Model | | N/A |

## 1.3. Test Lab information

Shenzhen Alpha Product Testing Co., Ltd.

Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road, Bao'an, Shenzhen, China

March 25, 2015 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

# 2. Summary of test

## 2.1. Summary of test result

| Description of Test Item | Standard | Results |
|---|---|---|
| Spurious Emission | Section 15.231&15.209 | PASS |
| Conduction Emission | Section 15.207 | N/A |
| Occupied bandwidth | Section 15.231 | PASS |
| Transmission time | Section 15.231 a1 | PASS |
| Band Edge | Section 15.231 | N/A |
| Antenna Requirement | Section 15.203 | PASS |
| Note : Test according to ANSI C63.10-2013, The EUT has been tested as an independent unit. And Continual Transmitting in maximum power. | | |

## 2.2. Assistant equipment used for test

| | | |
|---|---|---|
| Description | : | N/A |
| Manufacturer | : | N/A |
| Model No. | : | N/A |
| Remark: N/A | | |

## 2.3. Block Diagram

1. EUT was placed on a turn table , which is 0.8 meter high above ground for blew 1GHz, 1.5 meter high above ground for above 1GHz. All the X,Y,Z position of EUT were for test. EUT was set into test mode before test. New battery is used during all test.

**TX Mode:**


## 2.4. Test mode

EUT work in Continuous TX mode, and select test channel, wireless mode,

| Tested mode, channel, and data rate information | | |
|---|---|---|
| Mode | Channel | Frequency (MHz) |
| FSK | CH1 | 434 |

Note: The EUT is tested by X,Y,Z position and for each of the buttons, this report only list the worst position Z and button “down” data.

## 2.5. Test Conditions

| | |
|---|---|
| Temperature range | 21-25℃ |
| Humidity range | 40-75% |
| Pressure range | 86-106kPa |

## 2.6. Measurement Uncertainty (95% confidence levels, k=2)

| Item | MU | Remark |
|---|---|---|
| Uncertainty for Power point Conducted Emissions Test | 2.71dB | |
| Uncertainty for Radiation Emission test in 3m chamber (below 30MHz) | 2.13 dB | Polarize: V |
| | 2.57dB | Polarize: H |
| Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz) | 3.90dB | Polarize: V |
| | 3.92dB | Polarize: H |
| Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz) | 4.28dB | Polarize: H |
| | 4.26dB | Polarize: V |
| Uncertainty for radio frequency | 1×10-9 | |
| Uncertainty for conducted RF Power | 0.16dB | |
| Uncertainty for temperature | 0.2℃ | |
| Uncertainty for humidity | 1% | |
| Uncertainty for DC and low frequency voltages | 0.06% | |

## 2.7. Test Equipment

| Equipment | Manufacture | Model No. | Serial No. | Due cal. | Cal Interval |
|---|---|---|---|---|---|
| 3m Semi-Anechoic | CHENYU | N/A | N/A | 2018.01.18 | 2Year |
| Spectrum analyzer | Agilent | E4407B | MY46185649 | 2017.01.16 | 1Year |
| Receiver | R&S | ESPI | 101873 | 2017.01.16 | 1Year |
| Receiver | R&S | ESCI | 101165 | 2017.01.16 | 1Year |
| Bilog Antenna | SCHWARZBECK | VULB 9168 | VULB9168-438 | 2018.01.18 | 2Year |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | BBHA 9120 D(1201) | 2017.01.20 | 2Year |
| L.I.S.N.#1 | Schwarzbeck | NSLK8126 | 8126466 | 2017.01.16 | 1 Year |
| L.I.S.N.#2 | ROHDE&SCHWARZ | ENV216 | 101043 | 2017.01.16 | 1 Year |
| Cable | Resenberger | N/A | No.1 | 2017.01.16 | 1Year |
| Cable | SCHWARZBECK | N/A | No.2 | 2017.01.16 | 1Year |
| Cable | SCHWARZBECK | N/A | No.3 | 2017.01.16 | 1Year |
| Pre-amplifier | HP | HP8347A | 2834A00455 | 2017.01.18 | 1Year |
| Pre-amplifier | Agilent | 8449B | 3008A02664 | 2017.01.18 | 1Year |
| vector Signal Generator | Agilent | N5182A | MY49060042 | 2016.11.16 | 1 Year |
| vector Signal Generator | Agilent | E4438C | US44271917 | 2016.11.16 | 1 Year |
| X-series USB Peak and Average Power Sensor | Agilent | U2021XA | MY54080020 | 2016.11.16 | 1 Year |
| X-series USB Peak and Average Power Sensor | Agilent | U2021XA | MY54110001 | 2016.11.16 | 1 Year |
| Signal Analyzer | Agilent | N9020A | MY48030494 | 2016.11.16 | 1 Year |

# 3. Radiation Emission

## 3.1. Radiation Emission Limits(15.209&231)

| **Frequency (MHz)** | **Field Strength Limits at 3 metres (watts, e.i.r.p.)** | | |
|---|---|---|---|
| | uV/m | dB uV/m | Measurement distance(m) |
| 0.009-0.490 | 2400/F(kHz) | XX | 300 |
| 0.490-1.705 | 24000/F(kHz) | XX | 30 |
| 1.705-30 | 30 | 29.5 | 30 |
| 30~88 | 100(3nW) | 40 | 3 |
| 88~216 | 150(6.8nW) | 43.5 | 3 |
| 216~960 | 200(12nW) | 46 | 3 |
| Above960 | 500(75nW) | 54 | 3 |
| Carrier Frequency（434） | | 80.8(AV) | 3 |

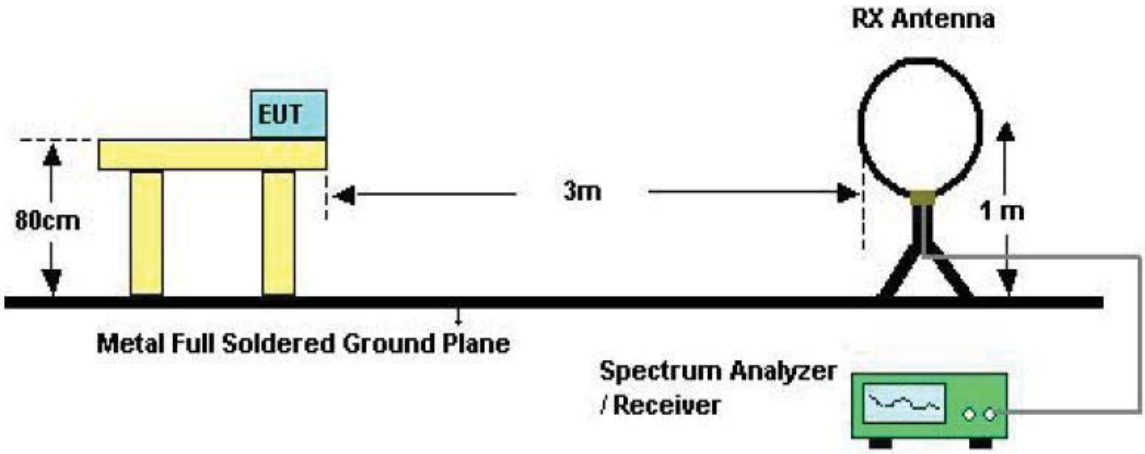
**NOTE:**

a) The tighter limit applies at the band edges.

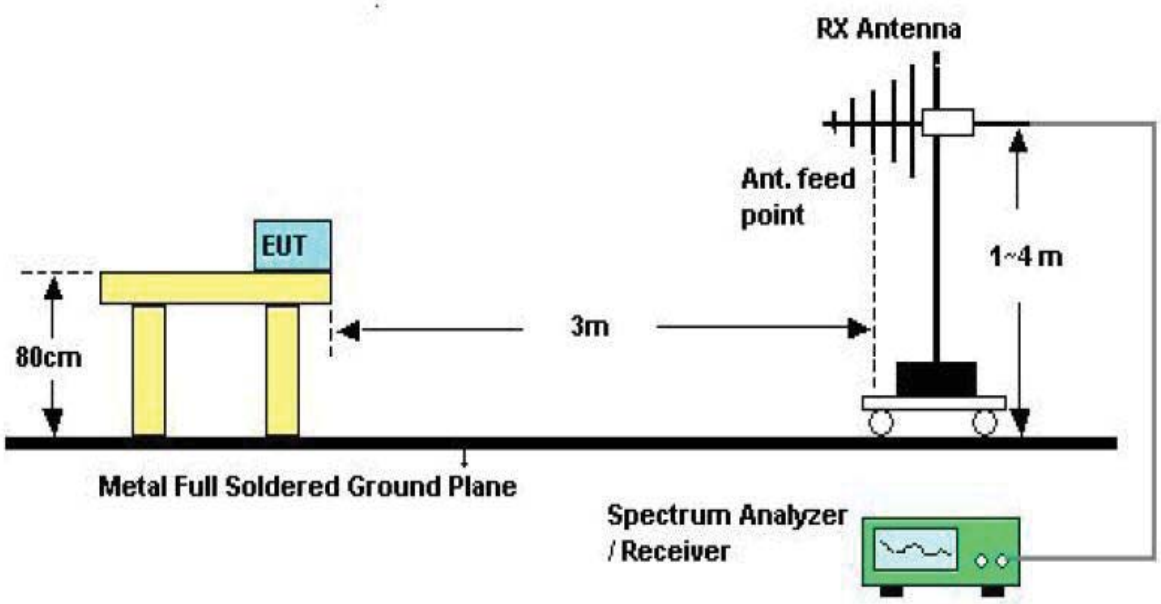
b) Emission Level(dB uV/m)=20log Emission Level(Uv/m)

## 3.2. Test Setup

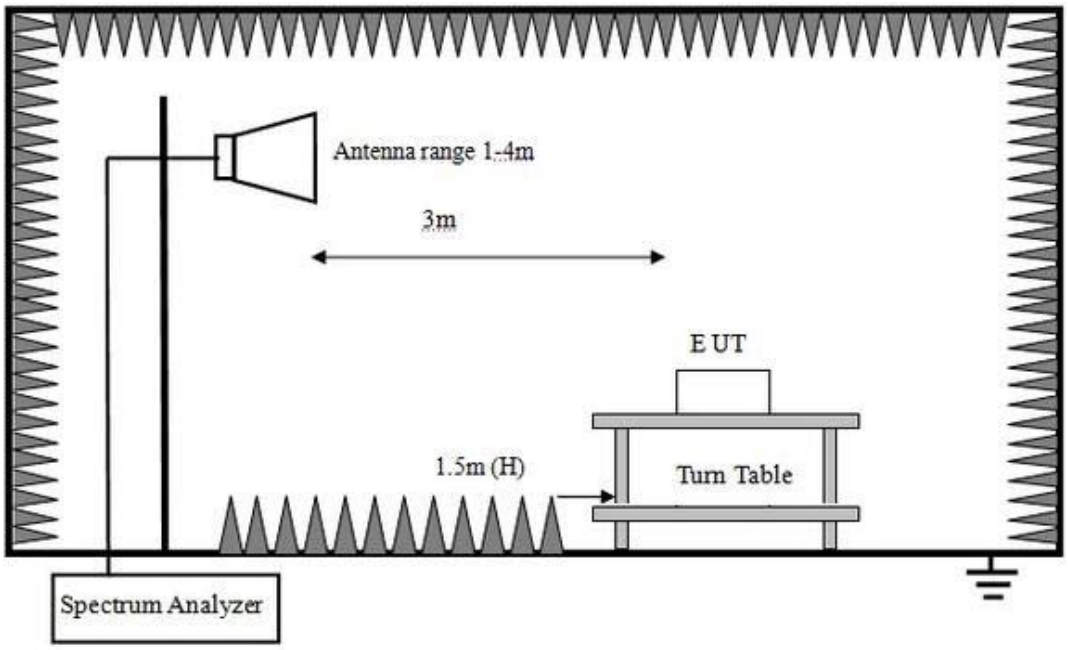
See the next page.




Below 30MHz Test Setup




Above 30MHz Test Setup




Above 1GHz Test Setup

3.3. Test Procedure

a) The measureing distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high above ground for above 1GHz,The table was rotated 360 degrees to determine the position of the highest radiation
b) The Test antenna shall vary between 1m and 4m,Both Horizontal and Vertical antenna are set to make measurement, For above 1GHz test, keeping the horn antenna aimed at the source of emissions at each frequency of significant emissions The horn antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane..
c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significent Peaks are then marked. and then Qusia Peak Detector mode remeasured
d) If Peak value comply with QP limit Below 1GHz.The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
e) For the actual test configuration, please see the test setup photo.

3.4. Test Equipment Setting For emission test.

| | | |
|---|---|---|
| 9KHz~150KHz | RBW 200Hz | VBW1KHz |
| 150KHz~30MHz | RBW 9KHz | VBW 30KHz |
| 30MHz~1GHz | RBW 120KHz | VBW 300KHz |
| Above 1GHz | RBW 1MHz | VBW 3MHz |

3.5. Test Condition

Continual Transmitting in maximum power(The new battery be used during Test)

3.6. Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: **PASS**

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

**Notes**: 1 --Means other frequency and mode comply with standard requirements and at least have 20dB margin.
Correct Factor=Cable Loss+Antenna Factor-Amplifier Gain
Measurement Result=Reading + Correct Factor
Margin=Measurement Result-Limit
2 –Spectrum setting:
a. Peak setting 30MHz-1GHz, RBW=100KHz, VBW=300KHz.
3- PK measure result values is less than the AVG limit values, so AV measure result values test not applicable.

Radiated Emissions Result of Inside band

| EUT | Remote control | Model Name | ITEM #20215-9 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3*1.5V from AA battery |
| Test Mode | TX CH1 | Test by | Reak |

| Channel (434MHz Below 1GHz) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Fre. MHz | Plority H/V | Reading dBuV | Antenna Factor dB | Cable Loss dB | Amplifier Gain dB | Correct Factor dB | Measure Result dBuV/m | Limit dBuV/m | Margin dB | Remark |
| 434 | H | 83.29 | 15.58 | 0.67 | 27.22 | -10.97 | 72.32 | 80.8 | 8.48 | Peak |
| 868 | H | 56.33 | 21.26 | 0.67 | 27.22 | -5.29 | 51.04 | 60.8 | 9.76 | Peak |
| | | | | | | | | | | |
| 434 | V | 80.57 | 15.58 | 0.67 | 27.22 | -10.97 | 69.6 | 80.8 | 11.2 | Peak |
| 868 | V | 55.92 | 21.26 | 0.67 | 27.22 | -5.29 | 50.63 | 60.8 | 10.17 | Peak |

| EUT | Remote control | Model Name | ITEM #20215-9 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3*1.5V from AA battery |
| Test Mode | TX CH1 | Test by | Reak |

| Channel (434MHz Above 1GHz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs Peak (dBuV/m) | Peak Limit (dBuV/m) | Margin (dB) | Remark |
| 1302 | V | 56.13 | --- | -10.41 | 45.72 | 74.00 | -28.28 | Peak |
| -- | V | -- | --- | -- | -- | -- | -- | -- |
| | | | | | | | | |
| 1302 | H | 56.85 | --- | -10.41 | 46.44 | 74.00 | -27.56 | Peak |
| -- | H | -- | --- | -- | -- | -- | -- | -- |

# 4. POWER LINE CONDUCTED EMISSION

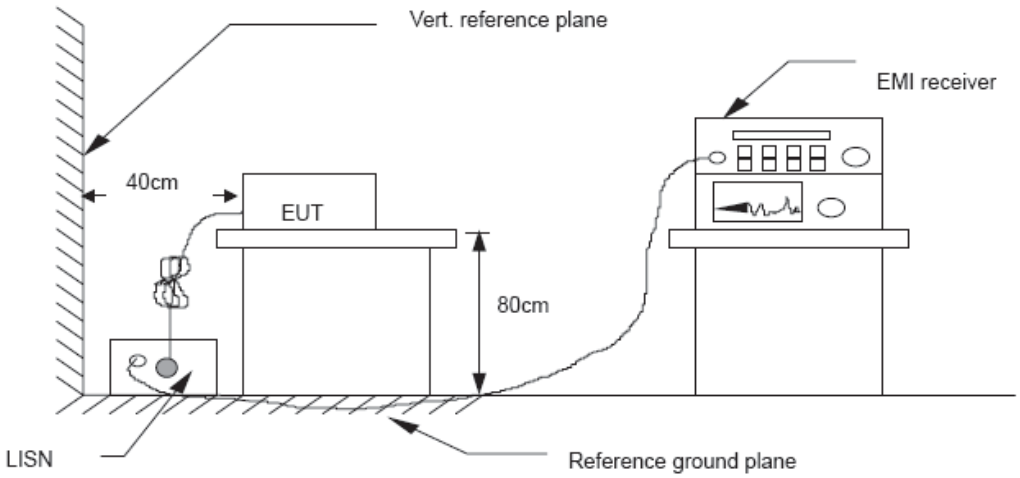
## 4.1. Conducted Emission Limits (15.209)

| Frequency MHz | Limits dB(μV) | |
|---|---|---|
| | Quasi-peak Level | Average Level |
| 0.15 -0.50 | 66 -56* | 56 - 46* |
| 0.50 -5.00 | 56 | 46 |
| 5.00 -30.00 | 60 | 50 |

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

## 4.2. Test Setup



## 4.3. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10-2013 on Conducted Emission Measurement.
The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

## 4.4. Test Results

EUT power supply by battery, so the test not applicable.

# 5. Occupied bandwidth

## 5.1. Test limit

Please refer sectionRSS-210 & 15.231

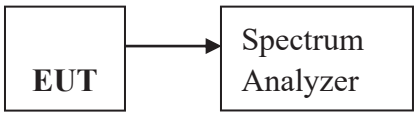
According to§15.231(C), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

## 5.2. Method of measurement

a)The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

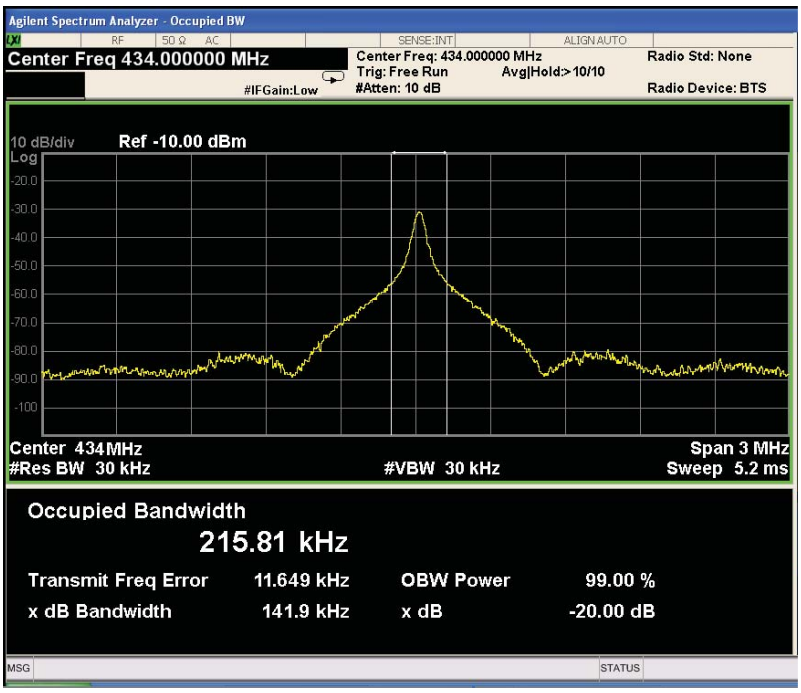
b)The test receiver RBW set 30KHz,VBW set 30KHz,PK detector

## 5.3. Test Setup




## 5.4. Test Results

| EUT: Remote control | | | | | |
|---|---|---|---|---|---|
| M/N: ITEM #20215-9 | | | | | |
| Test Mode: Keeping TX mode | | | | | |
| Test date: 2016-08-24 | | Test site: RF site | | Tested by: Reak | |
| Mode | Freq (MHz) | 20dB Bandwidth (KHz) | 99% Bandwidth | Limit (kHz) | Conclusion |
| FSK | 434 | 141.9 | / | 1085 | PASS |


Agilent Spectrum Analyzer - Occupied BW
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
Center Freq 434.000000 MHz
#IFGain:Low
Center Freq: 434.000000 MHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
10 dB/div
Log
Ref -10.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Center 434 MHz
#Res BW 30 kHz
#VBW 30 kHz
Span 3 MHz
Sweep 5.2 ms
Occupied Bandwidth
215.81 kHz
Transmit Freq Error 11.649 kHz
OBW Power 99.00 %
x dB Bandwidth 141.9 kHz
x dB -20.00 dB
MSG
STATUS

# 6. Transmission time

## 6.1. Test limit

Please refer section 15.231

According to §15.231(a)(1), A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

## 6.2. Method of measurement

6.2.1. Place the EUT on the table and set it in transmitting mode.

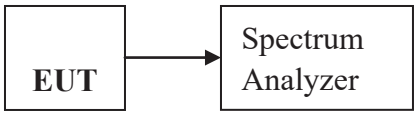
6.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

6.2.3. Set spectrum analyzer Center=434MHz, Span = 0MHz, Sweep = 10s.

6.2.4. Set the spectrum analyzer as RBW, VBW=1MHz,

6.2.5. Max hold, view and count how many channel in the band.

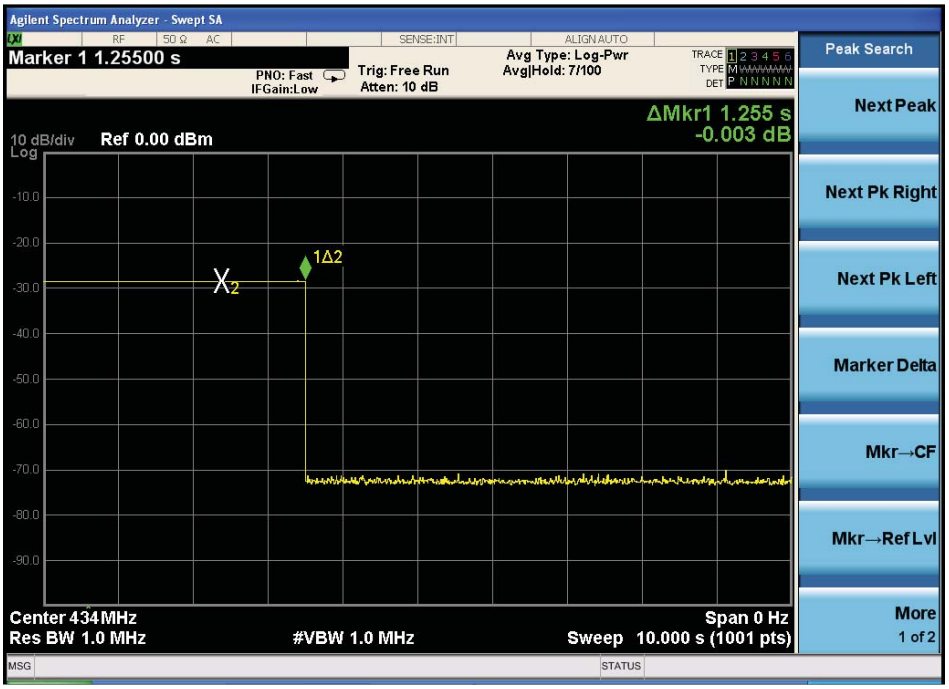
## 6.3. Test Setup



## 6.4. Test Results

| EUT: Remote control | | | |
|---|---|---|---|
| M/N: ITEM #20215-9 | | | |
| Test Mode: Keeping TX mode | | | |
| Test date: 2016-08-24 | Test site: RF site | Tested by: Reak | |
| Freq (MHz) | Test Result(s) | Limit (s) | Conclusion |
| 434 | 1.255 | < 5s | PASS |

EUT After Release the button, EUT emission Continue 1.255 seconds, Compliance with 15.231 a(1) section.



# 7. Antenna Requirement

## 7.1. Standard Requirement

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.

## 7.2. Antenna Connected Construction

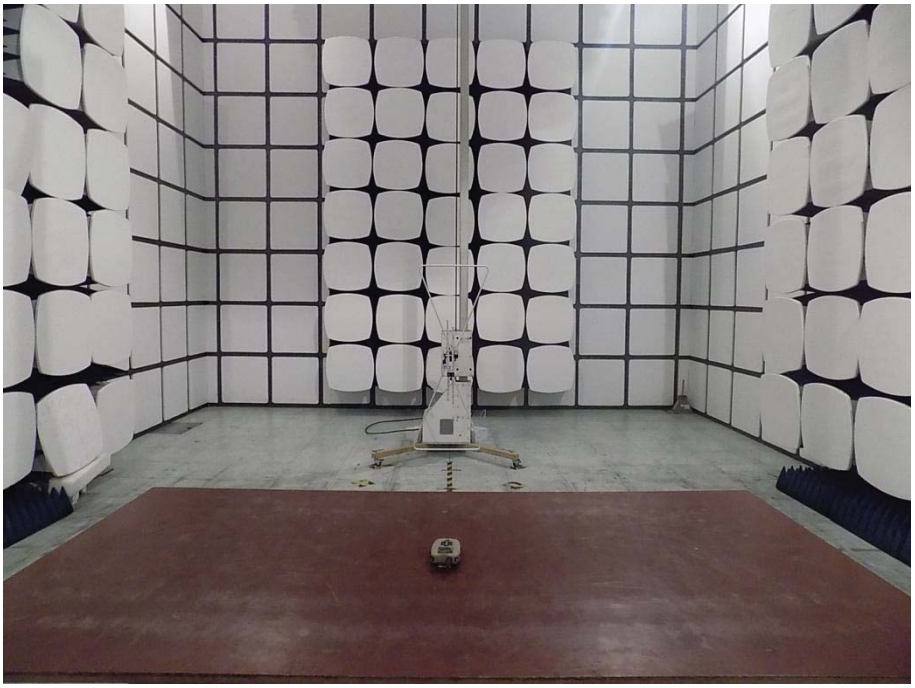
The directional gain of antenna used for transmitting is 0dBi, and no consideration of replacement. Please see EUT photo for details.

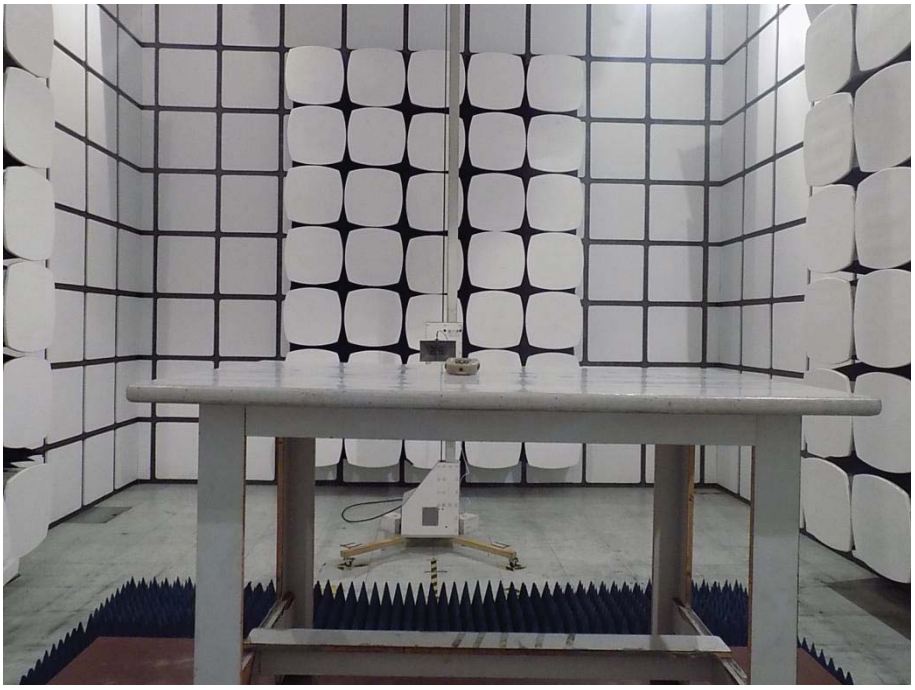
## 7.3. Result

The EUT antenna is Integral antenna. It comply with the standard requirement.

# 8. Test setup photo

Photos of Radiated emission

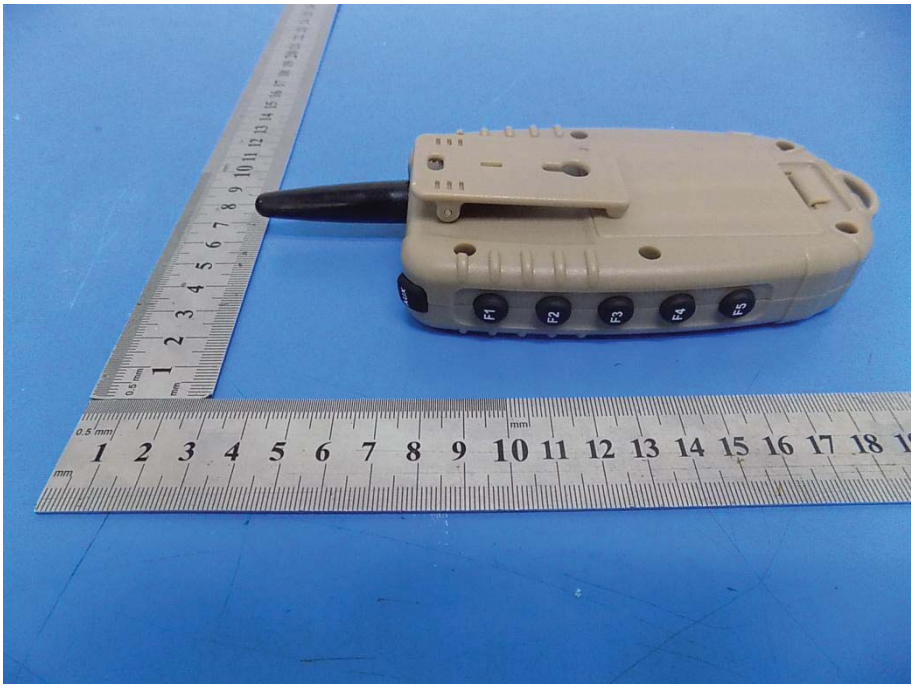




# 9. Photos of EUT

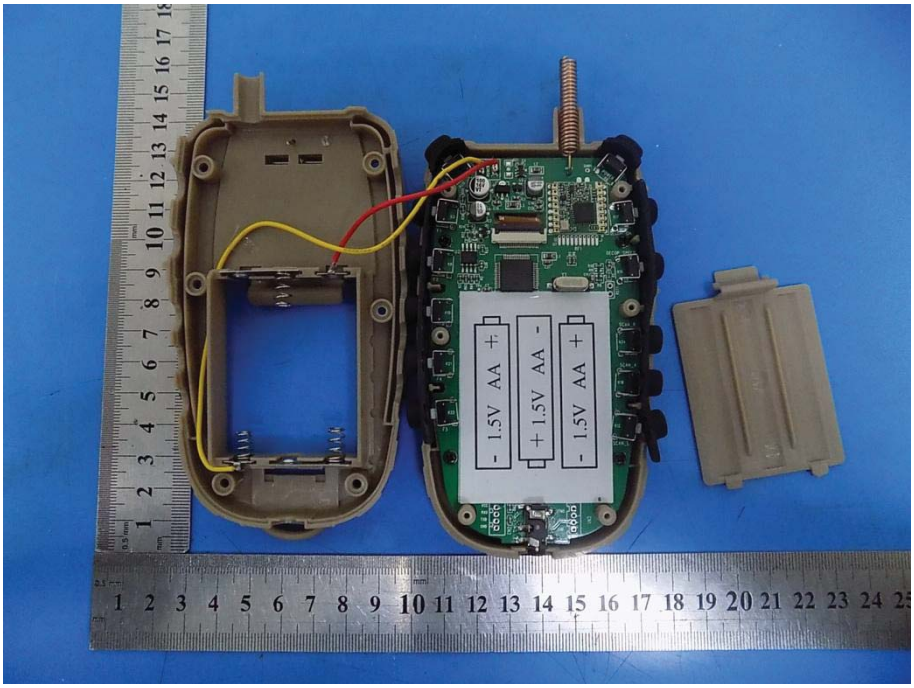


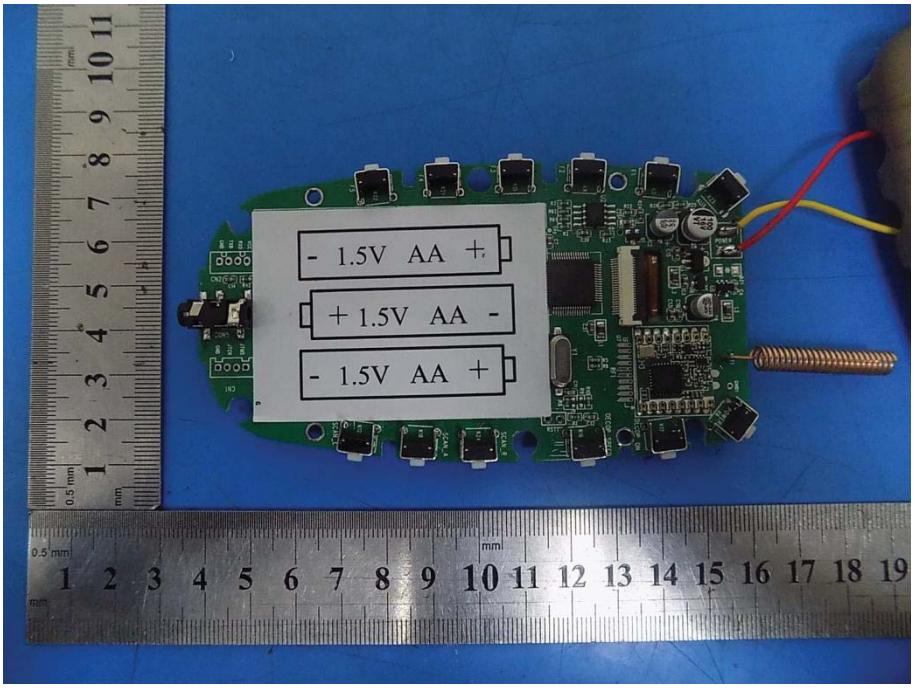
VOL-
VOL+
BACK
RECALL
REC

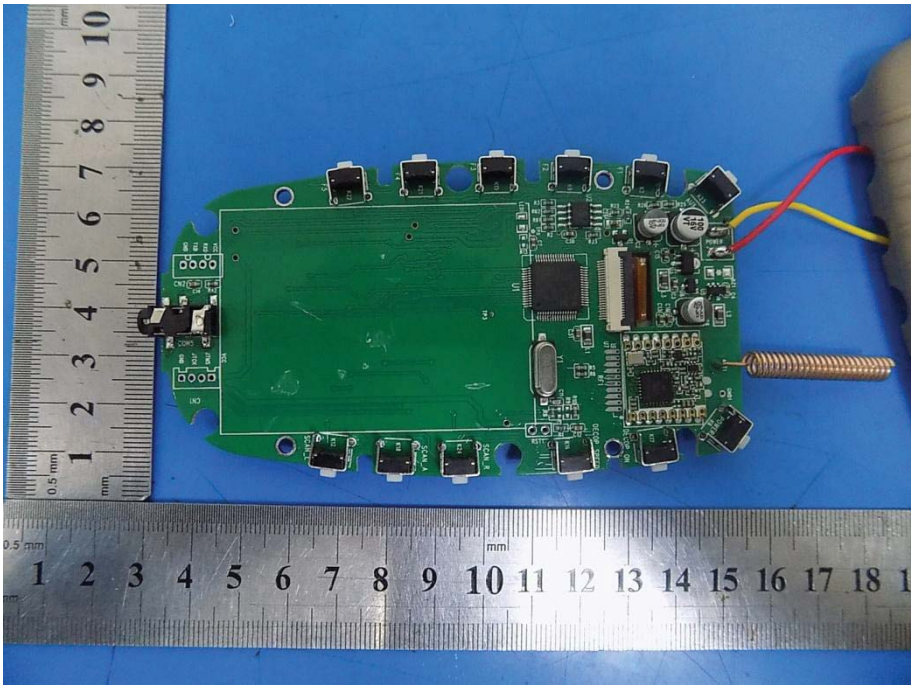

F1
F2
F3
F4
F5

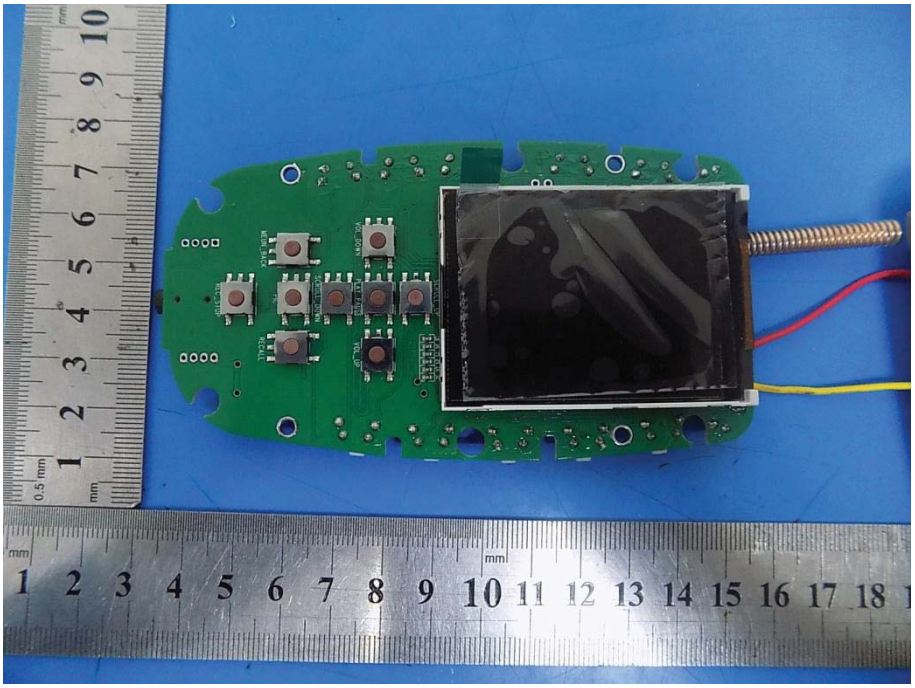

G
G
G
S
D

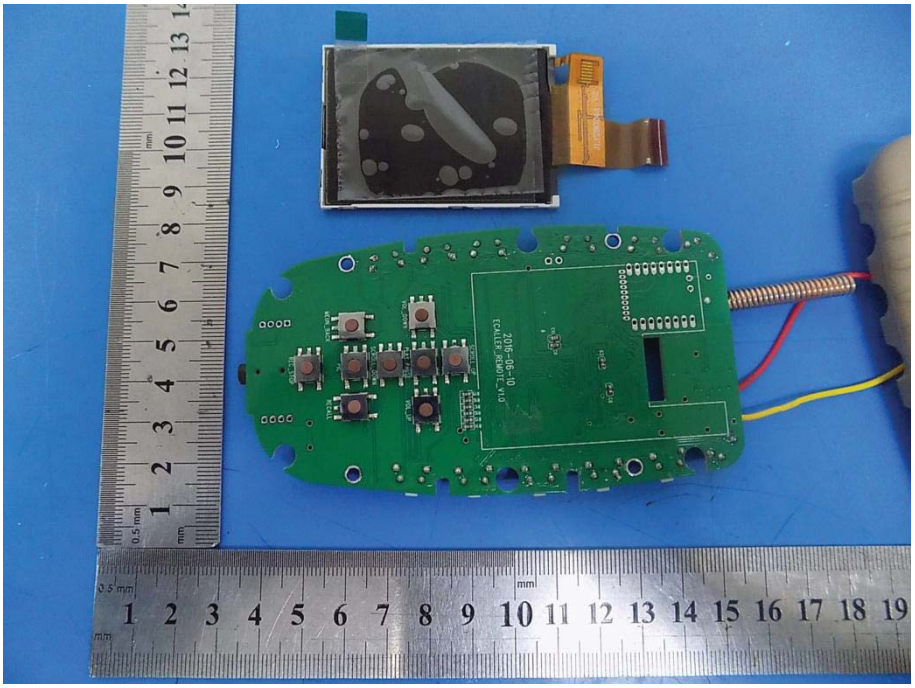

+ 1.5V AA
+ 1.5V AA
+ 1.5V AA

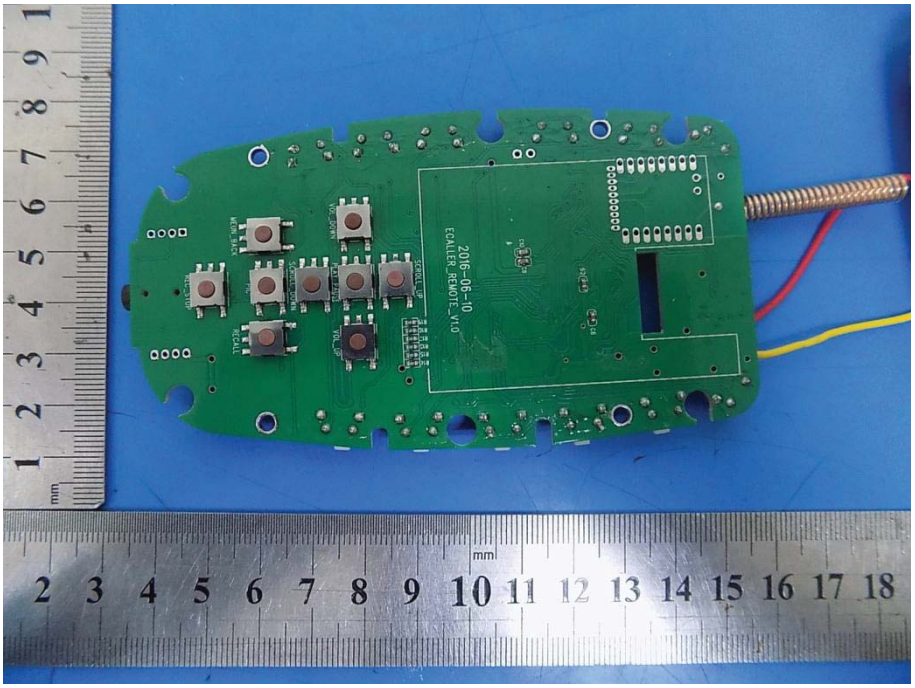

- 1.5V AA +
+ 1.5V AA -
- 1.5V AA +

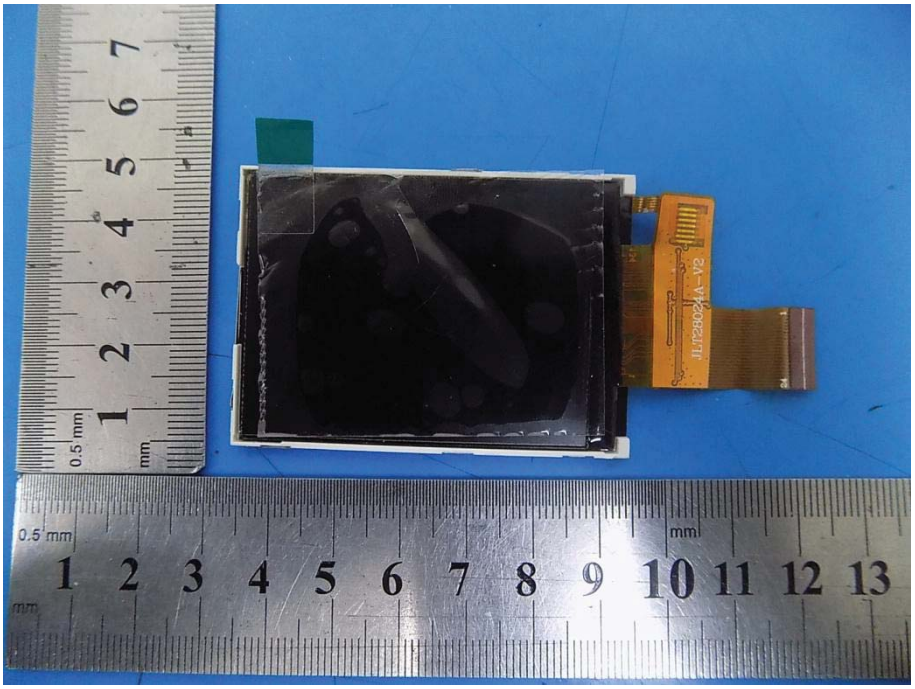

- 1.5V AA +
+ 1.5V AA -
- 1.5V AA +

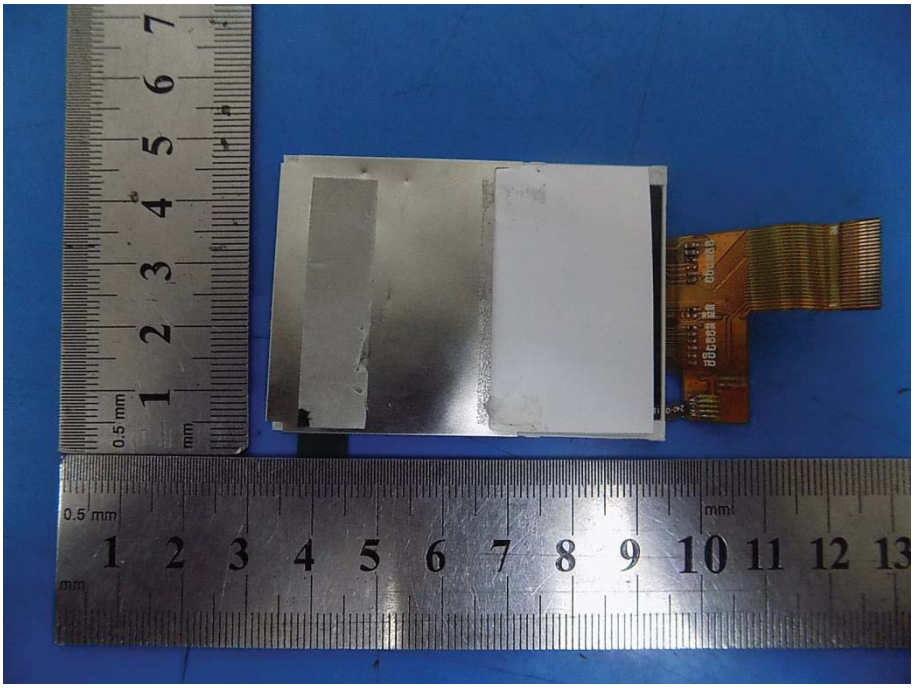







2016-06-10
ECALLER_REMOTE_V1.0
mm


0.5 mm
mm




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