



TEST REPORT

FCC ID: 2AEEA23110700

Applicant : SEA S.p.A.
Address : Zona Industriale S. Atto Teramo 64100 Italy

Equipment under Test (EUT):

Name : F306
Model : 23110700

Standards : FCC PART 15, SUBPART C : 2014 (Section 15.231)

Report No. : A1850082 01

Date of Test : February 02- March 13, 2015

Date of Issue : March 13, 2015

| | |
|----------------------|---------------|
| Test Result : | PASS * |
|----------------------|---------------|

* In the configuration tested, the EUT complied with the standards specified above

Authorized Signature

(Mark Zhu)
General Manager

The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Alpha Product Testing Laboratory Or test done by Alpha Product Testing Laboratory Approvals in connection with, distribution or use of the product described in this report must be approved by Alpha Product Testing Laboratory Approvals in writing.

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1 General Information

1.1 Description of Device (EUT)

Trade Name : N/A

EUT : F306

Model No. : 23110700

Type of Antenna : Integrated antenna, Max Gain 0dBi.

Operation Frequency : 300MHz

Channel number : 1

Modulation type : OOK

Power Supply : DC 9V Supply by battery

Applicant : SEA S.p.A.

Address : Zona Industriale S. Atto Teramo 64100 Italy

Manufacturer : Shenzhen Chuangyao Technology Co., LTD

Address : 5th Floor block 27, Lianchuang Technical Zone, bulan road,
Longgang district, Shenzhen, China.

1.2 Description of Test Facility

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

August 11, 2014 File on Federal Communication Commission
 Registration Number: 203110

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

2 EMC Equipment List

| Equipment | Manufacture | Model No. | Serial No. | Last cal. | Cal Interval |
|------------------------|--------------|-----------------|----------------------|-----------|--------------|
| 3m Semi-Anechoic | ETS-LINDGREN | N/A | SEL0017 | 2015.1.19 | 1 Year |
| Spectrum analyzer | Agilent | E4407B | MY49510055 | 2015.1.19 | 1 Year |
| Receiver | R&S | ESCI | 101202 | 2015.1.19 | 1 Year |
| Bilog Antenna | SCHWARZBECK | VULB 9168 | 9168-438 | 2015.1.19 | 1 Year |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | BBHA 9120 D(1201) | 2015.1.19 | 1 Year |
| Active Loop Antenna | Beijing Daze | ZN30900A | SEL0097 | 2015.1.19 | 1 Year |
| Pre-amplifier | SCHWARZBECK | BBV9743 | 9743-019 | 2015.1.19 | 1 Year |
| Pre-amplifier | Quietek | AP-180C | CHM-0602012 | 2015.1.19 | 1 Year |
| Cable | Resenberger | SUCOFLEX 104 | MY6562/4 | 2015.1.19 | 1 Year |
| Cable | Resenberger | SUCOFLEX 104 | 309972/4 | 2015.1.19 | 1 Year |
| Cable | Resenberger | SUCOFLEX 104 | 329112/4 | 2015.1.19 | 1 Year |

3 Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The test procedure used was ANSI Standard C63.4-2009 using a 50 u H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25°C with a humidity of 58%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard C63.4-2009 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 25°C with a humidity of 58%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF + CABLE = FS

33.20 dBuV + 10.36 dB + 0.9 dB= 44.46 dBuV/m @ 3m

ANSI STANDARD C63.4-2009 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard C63.4-2009 10.1.7 with the EUT 40 cm from the vertical ground wall.

4 Summary of Measurement

4.1 Summary of test result

| Test Item | Test Requirement | Standard Paragraph | Result |
|---------------------|--------------------|-----------------------------|----------------|
| Spurious Emission | FCC PART 15: 2014 | Section 15.231(a)(1)&15.209 | Compliance |
| Conduction Emission | FCC PART 15: 2014 | Section 15.207 | Not applicable |
| Occupied bandwidth | FCC PART 15: 2014 | Section 15.231(a)(1) | Compliance |
| Transmission time | FCC PART 15: 2014 | Section 15.231(a)(1) | Compliance |
| Band Edge | FCC PART 15: 2014 | Section 15.231(a)(1) | Not applicable |
| Antenna Requirement | FCC PART 15 : 2014 | Section 15.203 | Compliance |

Note: 1. All buttons of the EUT have been tested and only worst case reported. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power (The new battery be used during Test)

2. we also estimated location of the XYZ 3 axis, the Z axis is the worst mode.

4.2 Block Diagram



4.3 Assistant equipment used for test

Description : N/A
 Manufacturer : N/A
 Model No. : N/A

4.4 Test Conditions

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

4.5 Measurement Uncertainty (95% confidence levels, k=2)

| Item | MU | Remark |
|--|--------|-------------|
| Uncertainty for Power point Conducted Emissions Test | 2.70dB | |
| 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) | 4.26dB | Polarize: H |
| | 4.28dB | Polarize: V |

5 Radiation Emission

5.1 Radiation Emission Limits(15.209&231)

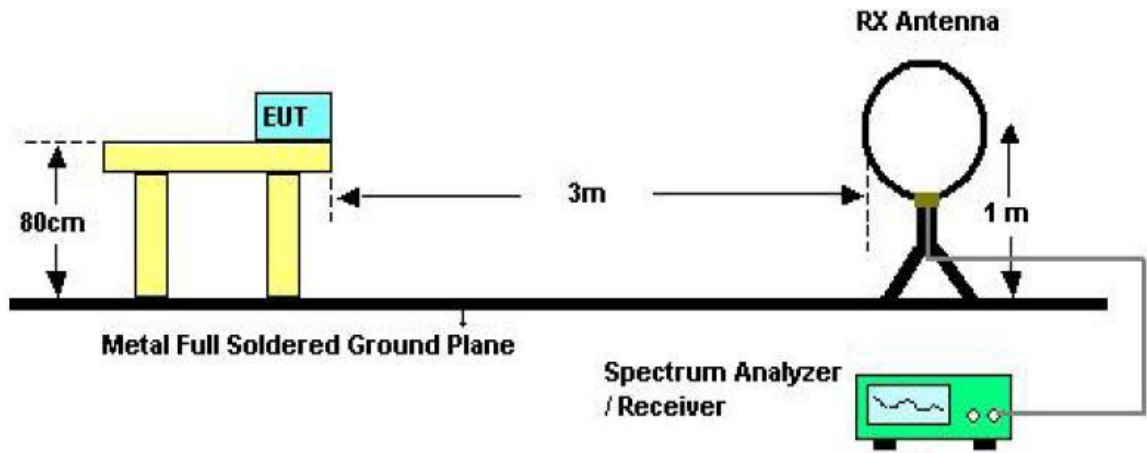
| Frequency (MHz) | Field Strength Limits at 3 metres (watts, e.i.r.p.) | | |
|----------------------|--|-----------|----------------------------|
| | uV/m | dB uV/m | Measurement distance(m) |
| 0.009-0.490 | 2400/F(kHz) | XX | 300 |
| 0.490-1.705 | 24000/F(kHz) | XX | 30 |
| 1.705-30 | 30 | 29.5 | 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 | | 74.68(AV) | 3 |
| Carrier frequency | | 94.68 PK) | 3 |

NOTE:

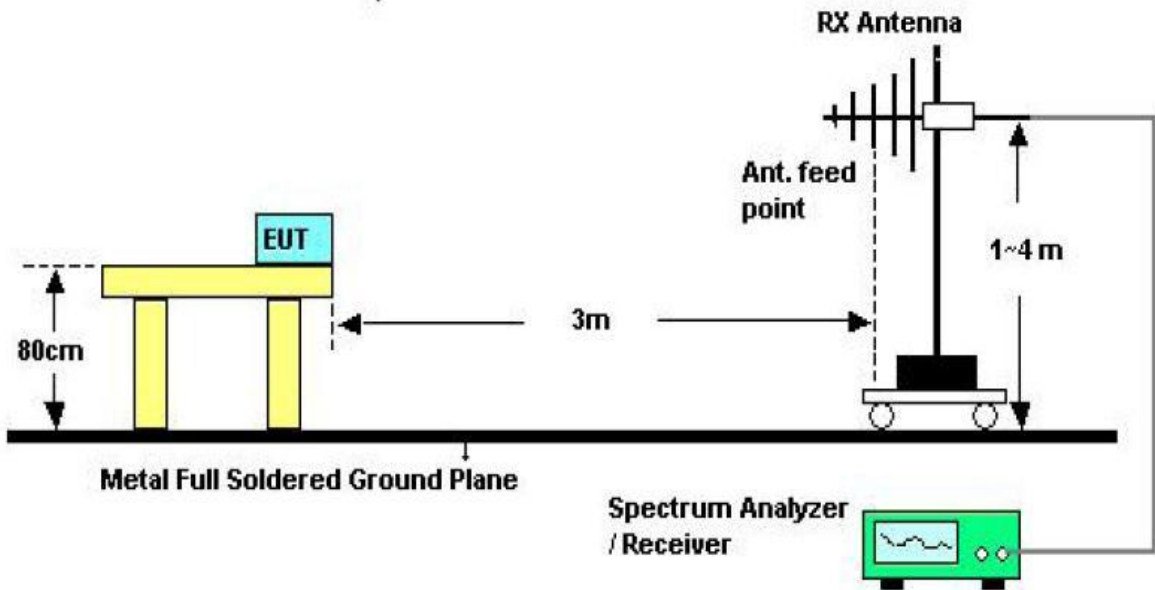
- a) The tighter limit applies at the band edges.
- b) Emission Level(dB uV/m)=20log Emission Level(Uv/m)

5.2 Test Setup

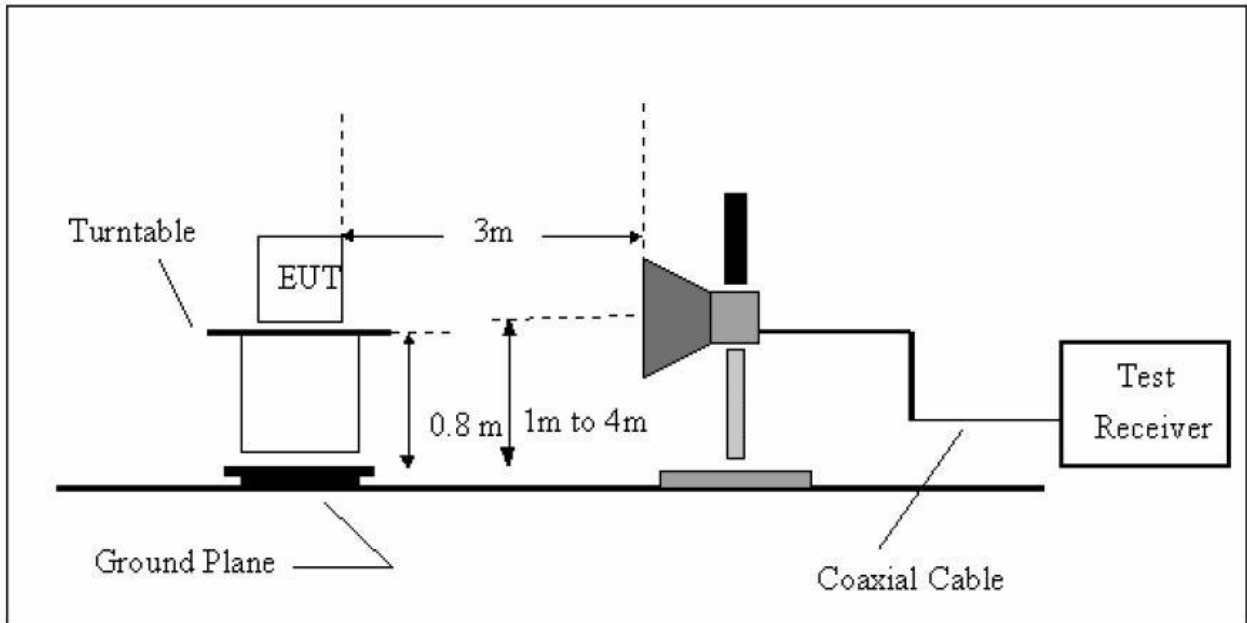
See the next page.



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

5.3 Test Procedure

- a) The measuring 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, 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.
- c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Quasi 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.

5.4 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 |

5.5 Test Condition

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

5.6 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.

| | | | |
|--------------------|--------|-----------------------------|---------------------|
| EUT | F306 | Model Name | 23110700 |
| Temperature | 25°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 9V From battery |
| Test Mode | TX | Antenna polarization | Horizontal/Vertical |

| Channel (300MHz) | | | | | | | | | |
|-------------------------|----------------|----------------|----------------|--------------|------------------|----------------|---------------|---------------|-----------------|
| Fre. | Plority | Reading | Antenna | Cable | Amplifier | Measure | Limit | Margin | Detector |
| MHz | H/V | dBuV | Factor | Loss | Gain | Result | dBuV/m | dB | (PK/AV/ |
| | | | dB | dB | dB | dBuV/m | | | QP) |
| 30.85 | H | 41.81 | 13.22 | 0.07 | 32.05 | 23.05 | 43.5(QP) | 20.45 | QP |
| 600 | H | 53.04 | 18.32 | 1.00 | 29.41 | 42.95 | 54.68(AV) | 11.73 | PK |
| 900 | H | 58.32 | 21.67 | 1.31 | 29.19 | 52.11 | 54.68 (AV) | 2.57 | PK |
| 114.51 | V | 38.99 | 11.68 | 0.41 | 31.33 | 19.75 | 43.5(QP) | 23.75 | QP |
| 600 | V | 50.14 | 18.32 | 1 | 29.41 | 40.05 | 54.68 (AV) | 14.63 | PK |
| 900 | V | 54.77 | 21.67 | 1.31 | 29.19 | 48.56 | 54.68 (AV) | 6.12 | PK |

Note: Due to the PK results are all lower than AV limit already, the AV measurement is not required.

Radiated Emissions Result of Inside band (300MHz)

| | | | |
|--------------------|--------|-----------------------------|-------------------------|
| EUT | F306 | Model Name | 23110700 |
| Temperature | 25°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 9V Supply by battery |
| Test Mode | TX | Antenna polarization | Horizontal/Vertical |

| Channel (300MHz) | | | | | | | | | |
|------------------|----------------|-----------------|-------------------------|---------------------|-------------------------|-----------------------------|----------------------------|--------------|----------------------------|
| Fre. MHz | Plority H/V | Reading dBuV | Antenna Factor dB | Cable Loss dB | Amplifier Gain dB | Measure Result dBuV/m | Average Limit dBuV/m | Margin dB | Detector (PK/AV/ QP) |
| 300.00 | H | 84.50 | 12.80 | 0.69 | 30.57 | 67.42 | 74.68 | 7.62 | PK |
| -- | H | -- | -- | -- | -- | -- | -- | -- | -- |
| -- | H | -- | -- | -- | -- | -- | -- | -- | -- |
| 300.00 | V | 76.69 | 12.80 | 0.69 | 30.57 | 59.61 | 74.68 | 15.07 | PK |
| -- | V | -- | -- | -- | -- | -- | -- | -- | -- |
| -- | V | -- | -- | -- | -- | -- | -- | -- | -- |

Note: Due to the PK results are all lower than AV limit already, the AV measurement is not required.

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:

Peak setting 30MHz-1GHz, RBW=100KHz,VBW=300KHz.

3 PK level is less than the average limit, then average test is not apply.

4: Limit table:

| | |
|-------------------------------|---|
| Fundamental Frequency(MHz) | Field strength of fundamental (microvolts/meter) |
| 260-470 | 3750-12500 |
| Note: Linear Interpolations | |

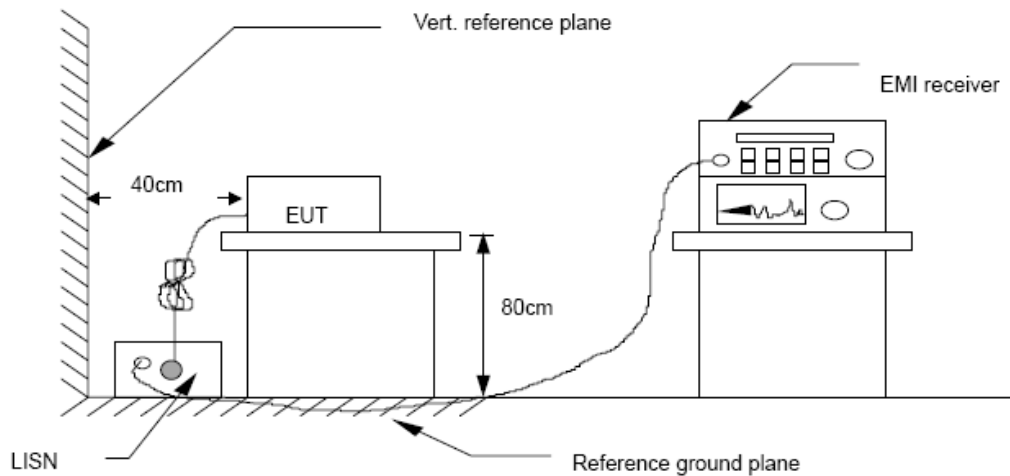
6 POWER LINE CONDUCTED EMISSION

6.1 Conducted Emission Limits(15.209)

| Frequency MHz | Limits dB(μ V) | |
|------------------|---------------------|---------------|
| | 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.

6.2 Test Setup



6.3 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 C63.4-2009 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

6.4 Test Results

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

7 Occupied bandwidth

7.1 Test limit

Please refer section 15.231

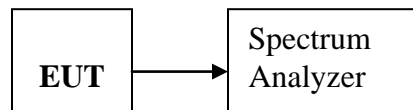
According to §15.231(C), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

7.2 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 100KHz, VBW set 300KHz, Sweep time set auto.

7.3 Test Setup

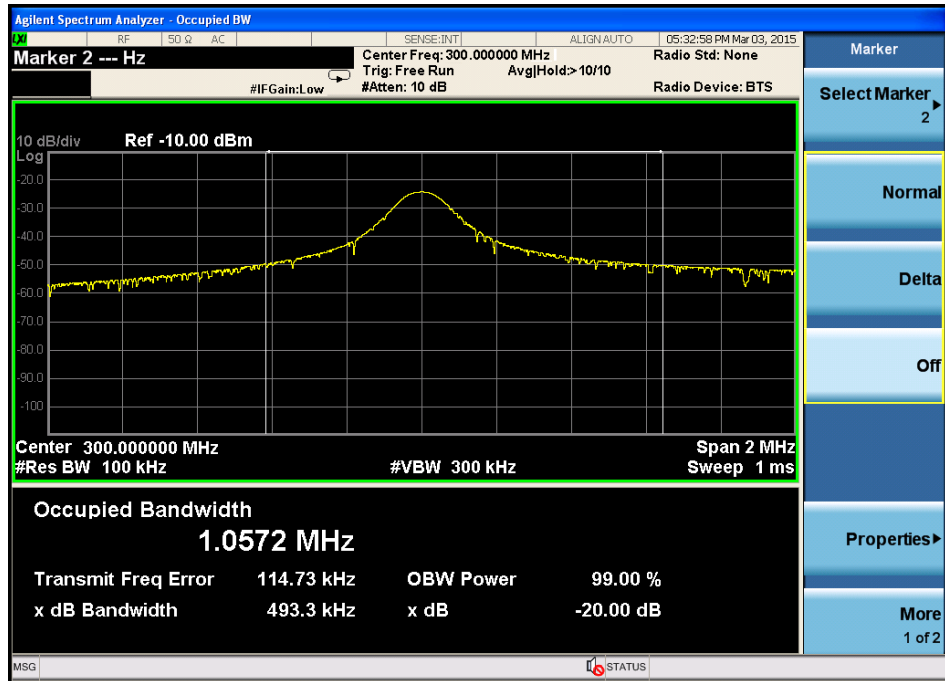


7.4 Test Results

PASS.

Detailed information please see the following page.

| Frequency | Test Result | Limit | Result |
|-----------|-------------|---------|--------|
| 300MHz | 493.3KHz | <750KHz | Pass |



8 Transmission time

8.1 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.

8.2 Method of measurement

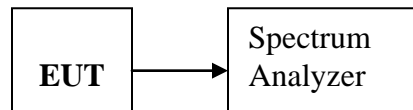
7.2.1. Place the EUT on the table and set it in transmitting mode.

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

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

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

8.3 Test Setup



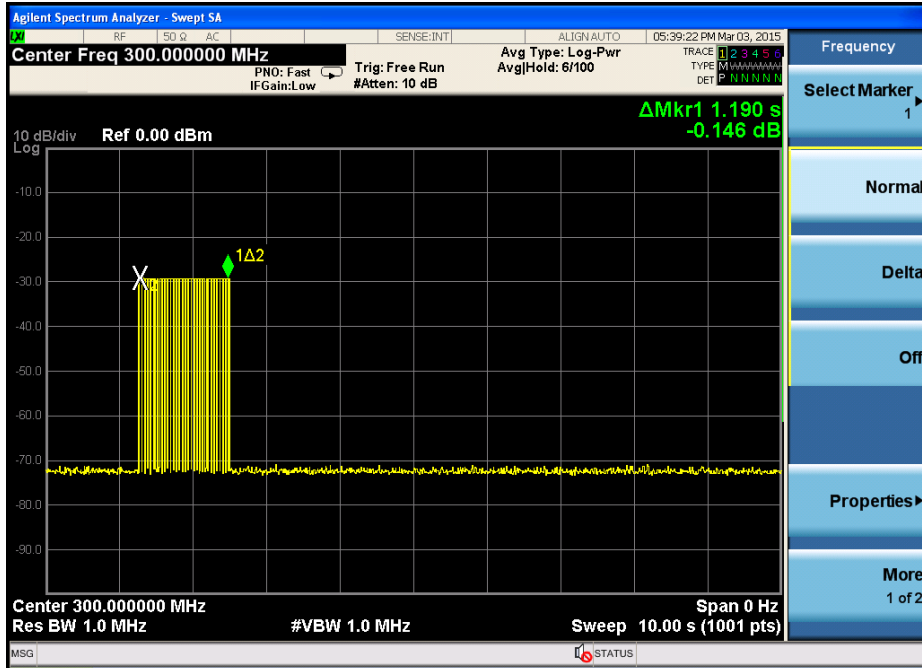
8.4 Test Results

PASS.

Detailed information please see the following page.

| Frequency | Test Result | Limit | Result |
|-----------|-------------|-------|--------|
| 300MHz | 1.190s | < 5s | Pass |

After Release the button, EUT emission Continue 1.190 seconds



9 Band Edge Check

9.1 Test limit

Please refer section 15.231 and section 15.205.

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 Section 15.209, whichever is the lesser attenuation.

9.2 Test Procedure

- 11.2.1 Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission
- 11.2.2 Turning to Low and High frequency, then reduced 50dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency.
- 11.2.3 Check the spurious emissions out of band.
- 11.2.4 RBW, VBW Setting, please see the following test plot.

9.3 Test Setup

Same to 5.2

9.4 Test Result

The Restricted bands is 240 - 285MHz and 322 - 335.4MHz, The EUT operation frequency is 300MHz and the Occupied bandwidth is 493.3KHz, so the test is not applicable.

10 Antenna Requirement

10.1 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.

10.2 Antenna Connected Construction

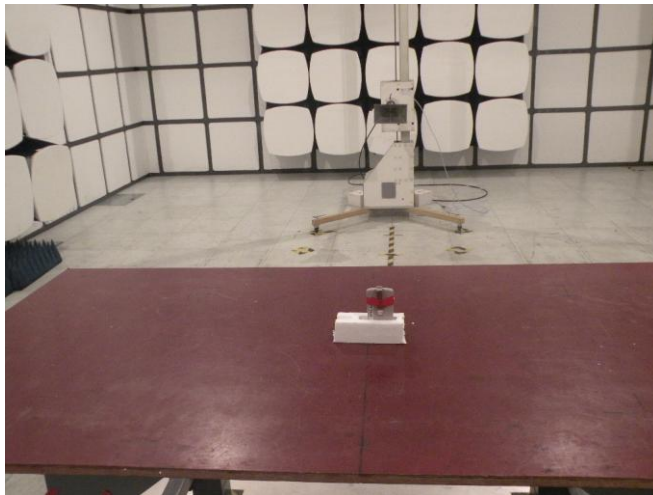
The directional gains of antenna used for transmitting is 0dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

10.3 Result

The EUT antenna is integral antenna, so it comply with the standard requirement.

11 Photographs of Test Setup

Photographs-Radiated Emission Test Setup in Chamber

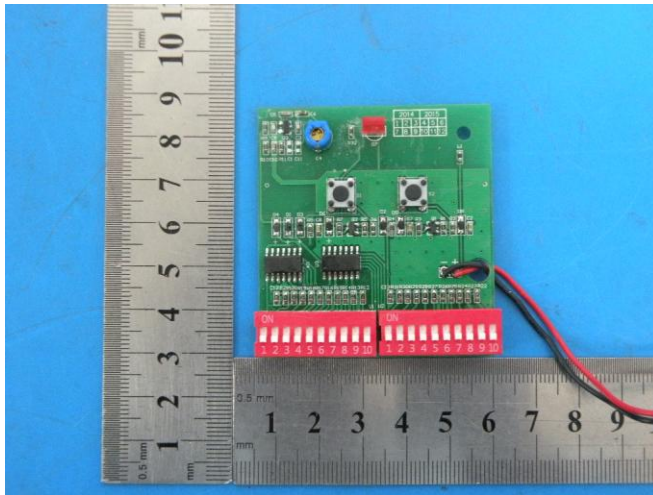
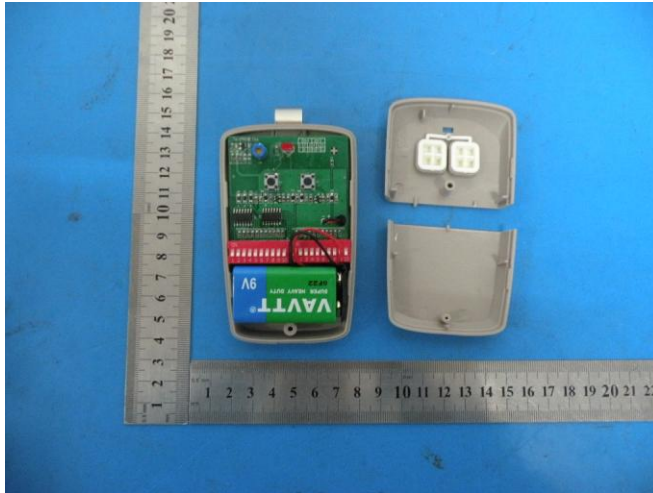


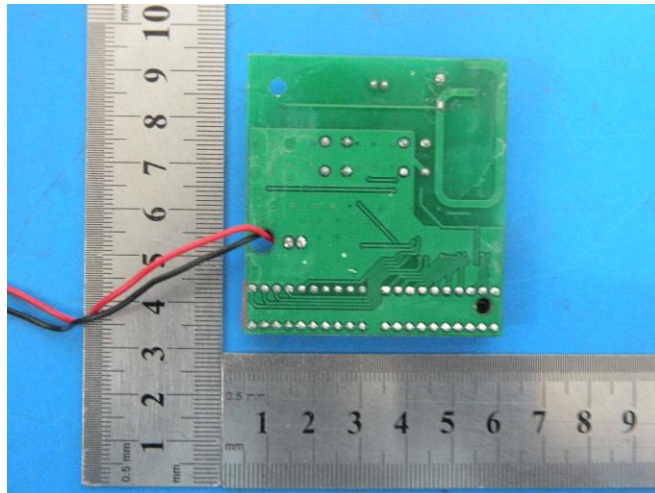
12 Photographs of EUT











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