



# FCC RADIO TEST REPORT

## FCC ID: JRMSK005

**Product :** Transmitter

**Trade Name :** N/A

**Model Name :** T410

**Serial Model :** N/A

**Report No. :** BZT13070274-2ER

### **Prepared for**

Shingki Inc. DBA Micro Alarm Systems

4825 South Soto Street, Vernon, California 90058, United States

### **Prepared by**

BZT Testing Technology Co., Ltd

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street,  
Bao'an District, Shenzhen P.R. China.

## TEST RESULT CERTIFICATION

**Applicant's name** ..... : Shingki Inc. DBA Micro Alarm Systems  
**Address** ..... : 4825 South Soto Street, Vernon, California 90058, United States  
**Manufacturer** ..... : Beijing Jia An Electronics Technology Co., Ltd.  
**Address** ..... : No.19 GuCheng West Street, Shi Jing Shan District, Beijing 100043, CHINA

**Product description**

**Product name** ..... : Transmitter

**Model and/or type reference** : T410

**Serial Model** : N/A

**Rating(s)** ..... : DC 12V

**Standards** ..... : FCC Part15.231

**Test procedure** ..... : ANSI C63.4-2003

This device described above has been tested by BZT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of BZT, this document may be altered or revised by BZT, personal only, and shall be noted in the revision of the document.

**Date of Test** ..... :

**Date (s) of performance of tests** ..... : 05 Jul. 2013 ~18 Jul. 2013

**Date of Issue** ..... : 19 Jul. 2013

**Test Result** ..... : **Pass**

Testing Engineer : Apple Huang  
(Apple Huang)

Technical Manager : Tom Zhang  
(Tom Zhang)

Authorized Signatory : Bovey Yang  
(Bovey Yang)

| Table of Contents  | Page      |
|--|-----------|
| <b>1 . SUMMARY OF TEST RESULTS</b>                                 | <b>4</b>  |
| <b>1.1 TEST FACILITY</b>   | <b>5</b>  |
| <b>1.2 MEASUREMENT UNCERTAINTY</b>                                 | <b>5</b>  |
| <b>2 . GENERAL INFORMATION</b>                                     | <b>6</b>  |
| <b>2.1 GENERAL DESCRIPTION OF EUT</b>                              | <b>6</b>  |
| <b>2.2 DESCRIPTION OF TEST MODES</b>                               | <b>7</b>  |
| <b>2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED</b> | <b>8</b>  |
| <b>2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)</b>            | <b>9</b>  |
| <b>2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS</b>                      | <b>10</b> |
| <b>3 . ANTENNA REQUIREMENT</b>                                     | <b>11</b> |
| <b>3.1 STANDARD REQUIREMENT</b>                                    | <b>11</b> |
| <b>3.2 EUT ANTENNA</b>   | <b>11</b> |
| <b>3.3 CONDUCTED EMISSION MEASUREMENT</b>                          | <b>12</b> |
| <b>3.3.1 POWER LINE CONDUCTED EMISSION LIMITS</b>                  | <b>12</b> |
| <b>3.3.2 TEST PROCEDURE</b>  | <b>13</b> |
| <b>3.3.3 DEVIATION FROM TEST STANDARD</b>                          | <b>13</b> |
| <b>3.3.4 TEST SETUP</b>  | <b>13</b> |
| <b>3.2.5 TEST RESULT</b>   | <b>14</b> |
| <b>3.3.5 TEST RESULTS</b>  | <b>14</b> |
| <b>3.4 RADIATED EMISSION MEASUREMENT</b>                           | <b>15</b> |
| <b>3.4.1 RADIATED EMISSION LIMITS</b>                              | <b>15</b> |
| <b>3.4.2 TEST PROCEDURE</b>  | <b>16</b> |
| <b>3.4.3 DEVIATION FROM TEST STANDARD</b>                          | <b>16</b> |
| <b>3.4.4 TEST SETUP</b>  | <b>17</b> |
| <b>3.4.5 TEST RESULTS (BELOW 30MHZ)</b>                            | <b>19</b> |
| <b>3.4.6 TEST RESULTS (BETWEEN 30 – 1000 MHZ)</b>                  | <b>20</b> |
| <b>4 . BANDWIDTH TEST</b>  | <b>23</b> |
| <b>4.1 TEST PROCEDURE</b>  | <b>23</b> |
| <b>4.2 DEVIATION FROM STANDARD</b>                                 | <b>23</b> |
| <b>4.3 TEST SETUP</b>  | <b>23</b> |
| <b>4.4 TEST RESULTS</b>  | <b>24</b> |
| <b>5 . TRANSMITTER TIMEOUT</b>                                     | <b>25</b> |
| <b>5.1 REQUIREMENTS</b>  | <b>25</b> |
| <b>6 . EUT TEST PHOTO</b>  | <b>27</b> |
| <b>APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS</b>          |           |

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15, Subpart C (15.231) |                            |          |         |
|--------------------------------|----------------------------|----------|---------|
| Standard Section               | Test Item                  | Judgment | Remark  |
| 15.207                         | Conducted Emission         | N/A      | Note(1) |
| 15.203                         | Antenna Requirement        | Pass     |         |
| 15.231                         | Radiated Spurious Emission | Pass     |         |
| 15.231                         | Occupied Bandwidth         | Pass     |         |
| 15.231                         | Transmitter Timeout        | Pass     |         |

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report.

## 1.1 TEST FACILITY

BZT Testing Technology Co., Ltd

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration No.: 701733

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$  , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$  , providing a level of confidence of approximately 95 % .

| No. | Item                         | Uncertainty             |
|-----|------------------------------|-------------------------|
| 1   | Conducted Emission Test      | $\pm 1.38\text{dB}$     |
| 2   | RF power,conducted           | $\pm 0.16\text{dB}$     |
| 3   | Spurious emissions,conducted | $\pm 0.21\text{dB}$     |
| 4   | All emissions,radiated(<1G)  | $\pm 4.68\text{dB}$     |
| 5   | All emissions,radiated(>1G)  | $\pm 4.89\text{dB}$     |
| 6   | Temperature                  | $\pm 0.5^\circ\text{C}$ |
| 7   | Humidity                     | $\pm 2\%$               |

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                      |  |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
|----------------------|--|--|--------------|--|----------------------|------------|------------------|-----|-------------------|------|----------------------|------------------|--------------------|------|---------------|------------------------|
| Equipment            | Transmitter  |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Trade Name           | N/A  |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Model Name           | T410   |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Serial Model         | N/A  |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Model Difference     | N/A  |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Product Description  | <p>The EUT is a Transmitter</p> <table border="1"> <tr> <td>Product Type</td> <td>Low Power Communication Device Transmitter</td> </tr> <tr> <td>Operation Frequency:</td> <td>434.116MHz</td> </tr> <tr> <td>Modulation Type:</td> <td>OOK</td> </tr> <tr> <td>Number Of Channel</td> <td>1CH.</td> </tr> <tr> <td>Antenna Designation:</td> <td>internal Antenna</td> </tr> <tr> <td>Antenna Gain(Peak)</td> <td>2dBi</td> </tr> <tr> <td>Output Power:</td> <td>71.23 dBuV/m (AV Max.)</td> </tr> </table> <p>More details of EUT technical specification, please refer to the User's Manual.</p> |  | Product Type | Low Power Communication Device Transmitter | Operation Frequency: | 434.116MHz | Modulation Type: | OOK | Number Of Channel | 1CH. | Antenna Designation: | internal Antenna | Antenna Gain(Peak) | 2dBi | Output Power: | 71.23 dBuV/m (AV Max.) |
| Product Type         | Low Power Communication Device Transmitter   |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Operation Frequency: | 434.116MHz   |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Modulation Type:     | OOK  |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Number Of Channel    | 1CH.   |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Antenna Designation: | internal Antenna   |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Antenna Gain(Peak)   | 2dBi   |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Output Power:        | 71.23 dBuV/m (AV Max.)   |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Channel List         | N/A  |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Adapter              | N/A  |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |
| Battery              | DC 12V   |  |              |  |                      |            |                  |     |                   |      |                      |                  |                    |      |               |                        |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Table for Filed Antenna

| Ant | Brand | Model Name | Antenna Type     | Connector | Gain (dBi) | NOTE    |
|-----|-------|------------|------------------|-----------|------------|---------|
| 1   | N/A   | N/A        | Internal Antenna | N/A       | 2          | Antenna |

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|--------------|-------------|
| Mode 1       | TX          |

| For Conducted Emission |             |
|------------------------|-------------|
| Final Test Mode        | Description |
| Mode 1                 | TX          |

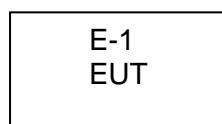
| For Radiated Emission |             |
|-----------------------|-------------|
| Final Test Mode       | Description |
| Mode 1                | TX          |

Note:

- (1) The EUT use new battery.
- (2) The EUT is set to Continuous emission by short sensor.

**2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED**

Radiated Spurious Emission Test:



**2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)**

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment   | Mfr/Brand | Model/Type No. | Series No. | Note |
|------|-------------|-----------|----------------|------------|------|
| E-1  | Transmitter | N/A       | T410           | N/A        | EUT  |
|      |             |           |                |            |      |
|      |             |           |                |            |      |
|      |             |           |                |            |      |
|      |             |           |                |            |      |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation Test equipment

| Item | Kind of Equipment  | Manufacturer | Type No.     | Serial No.  | Last calibration | Calibrated until | Calibration period |
|------|--------------------|--------------|--------------|-------------|------------------|------------------|--------------------|
| 1    | Spectrum Analyzer  | Agilent      | E4407B       | 160400005   | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 2    | Test Receiver      | R&S          | ESPI         | 101318      | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 3    | Bilog Antenna      | TESEQ        | CBL6111 D    | 31216       | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 4    | 50Ω Coaxial Switch | Anritsu      | MP59B        | 620026441 6 | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 5    | Spectrum Analyzer  | ADVANTEST    | R3132        | 150900201   | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 6    | Horn Antenna       | EM           | EM-AH-1 0180 | 2011071402  | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 7    | Horn Ant           | Schwarzbeck  | BBHA 9170    | 9170-181    | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 8    | Amplifier          | EM           | EM-3018 0    | 060538      | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 9    | Loop Antenna       | ARA          | PLA-103 0/B  | 1029        | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 10   | Power Meter        | R&S          | NRVS         | 100696      | 2013.07.06       | Jul. 06. 2014    | 1 year             |

### Conduction Test equipment

| Item | Kind of Equipment     | Manufacturer | Type No. | Serial No.  | Last calibration | Calibrated until | Calibration period |
|------|-----------------------|--------------|----------|-------------|------------------|------------------|--------------------|
| 1    | Test Receiver         | R&S          | ESCI     | 101160      | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 2    | LISN                  | R&S          | ENV216   | 101313      | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 3    | LISN                  | EMCO         | 3816/2   | 00042990    | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 4    | 50Ω Coaxial Switch    | Anritsu      | MP59B    | 620026441 7 | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 5    | Passive Voltage Probe | R&S          | ESH2-Z3  | 100196      | 2013.07.06       | Jul. 06. 2014    | 1 year             |
| 6    | Absorbing clamp       | R&S          | MOS-21   | 100423      | 2013.07.06       | Jul. 06. 2014    | 1 year             |

### **3. ANTENNA REQUIREMENT**

#### **3.1 STANDARD REQUIREMENT**

15.203 requirement: For intentional device, according to 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.

#### **3.2 EUT ANTENNA**

The EUT antenna is integral Antenna. It comply with the standard requirement.

### 3.3 CONDUCTED EMISSION MEASUREMENT

#### 3.3.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Class A (dBuV) |         | Class B (dBuV) |           | Standard |
|-----------------|----------------|---------|----------------|-----------|----------|
|                 | Quasi-peak     | Average | Quasi-peak     | Average   |          |
| 0.15 -0.5       |                |         | 66 - 56 *      | 56 - 46 * | CISPR    |
| 0.50 -5.0       |                |         | 56.00          | 46.00     | CISPR    |
| 5.0 -30.0       |                |         | 60.00          | 50.00     | CISPR    |

|           |  |  |           |           |        |
|-----------|--|--|-----------|-----------|--------|
| 0.15 -0.5 |  |  | 66 - 56 * | 56 - 46 * | LP002. |
| 0.50 -5.0 |  |  | 56.00     | 46.00     | LP002. |
| 5.0 -30.0 |  |  | 60.00     | 50.00     | LP002. |

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |

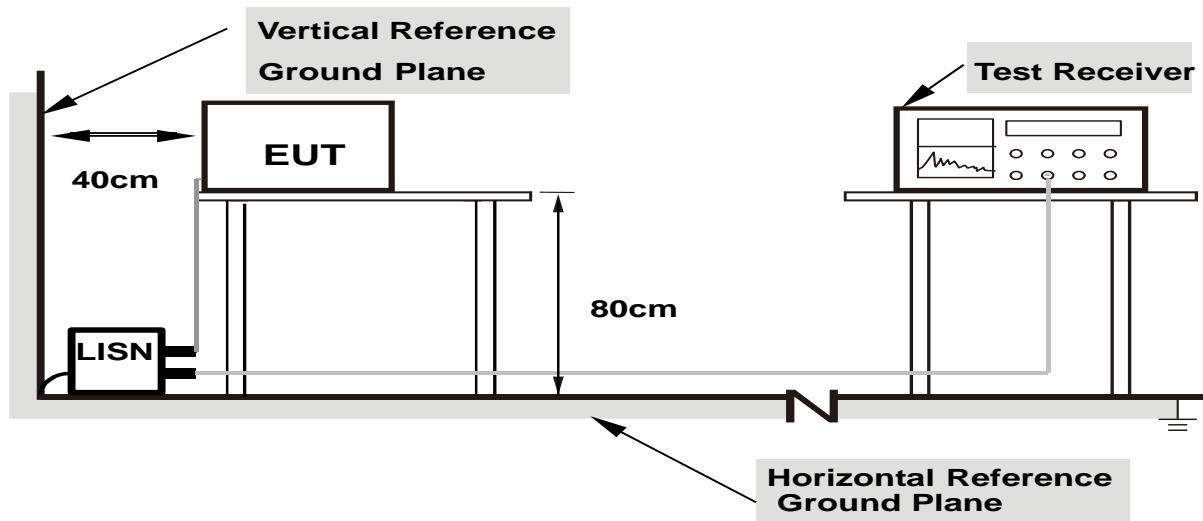
### 3.3.2 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.3.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.3.4 TEST SETUP



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

**3.2.5 TEST RESULT****3.3.5 TEST RESULTS**

|                |             |                     |      |
|----------------|-------------|---------------------|------|
| EUT :          | Transmitter | Model Name. :       | T410 |
| Temperature :  | 26 °C       | Relative Humidity : | 54%  |
| Pressure :     | 1010hPa     | Phase :             | L    |
| Test Voltage : | N/A         | Test Mode :         | N/A  |

### 3.4 RADIATED EMISSION MEASUREMENT

#### 3.4.1 Radiated Emission Limits ( FCC 15.209 )

| Frequencies (MHz) | Field Strength (micorvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009~0.490       | 2400/F(KHz)                       | 300                           |
| 0.490~1.705       | 24000/F(KHz)                      | 30                            |
| 1.705~30.0        | 30                                | 30                            |
| 30~88             | 100                               | 3                             |
| 88~216            | 150                               | 3                             |
| 216~960           | 200                               | 3                             |
| Above 960         | 500                               | 3                             |

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

#### LIMITS OF RADIATED EMISSION MEASUREMENT ( FCC 15.231 )

| Fundamental Frequency (MHz) | Field Strength of fundamental (microvolts/meter) | Field Strength of Unwanted Emissions (microvolts/meter) |
|-----------------------------|--|---|
| 40.66 - 40.70               | 2250.00  | 225.00  |
| 70 - 130                    | 1250.00  | 125.00  |
| 130 - 174                   | 1,250 to 3,750 **                                | 125 to 375 **   |
| 174 - 260                   | 3750.00  | 375.00  |
| 260 - 470                   | 3,750 to 12,500 **                               | 375 to 1,250 **   |
| Above 470                   | 12500.00   | 1250.00   |

Notes:

- (1) \*\* 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,  $\mu\text{V/m}$  at 3 meters =  $56.81818(F) - 6136.3636$ ; for the band 260-470 MHz,  $\mu\text{V/m}$  at 3 meters =  $41.6667(F) - 7083.3333$ . The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in 93 Section 15.209, whichever limit permits a higher field strength.

| Spectrum Parameter                    | Setting               |
|---------------------------------------|-----------------------|
| Attenuation                           | Auto                  |
| Start Frequency                       | 1000 MHz              |
| Stop Frequency                        | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1MHz / 1MHz for Peak  |

| Receiver Parameter     | Setting                          |
|------------------------|----------------------------------|
| Attenuation            | Auto                             |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP    |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP    |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

### 3.4.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m.
- 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 re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

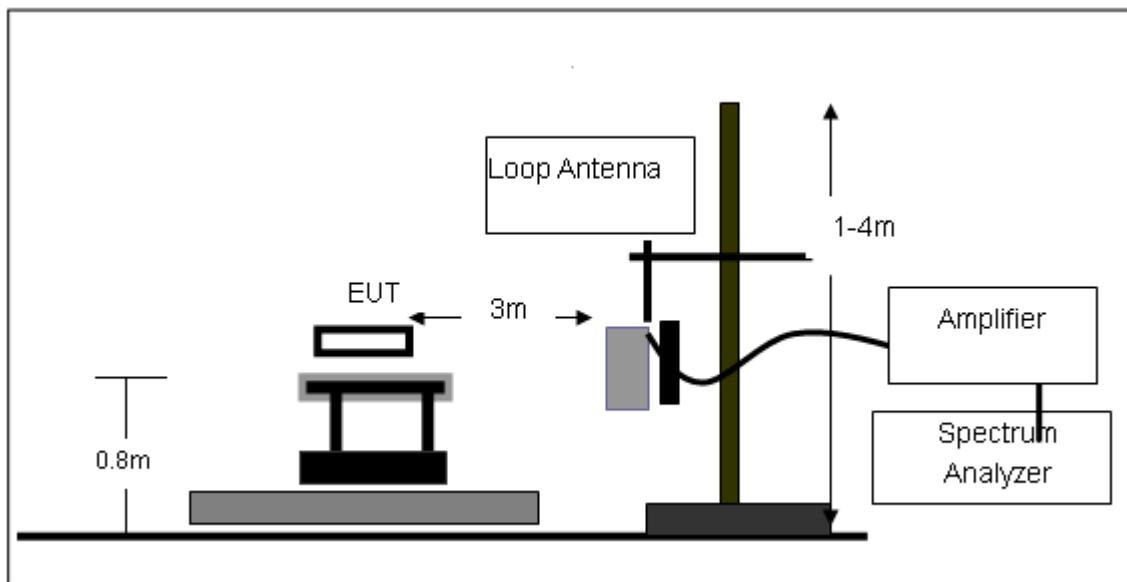
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

### 3.4.3 DEVIATION FROM TEST STANDARD

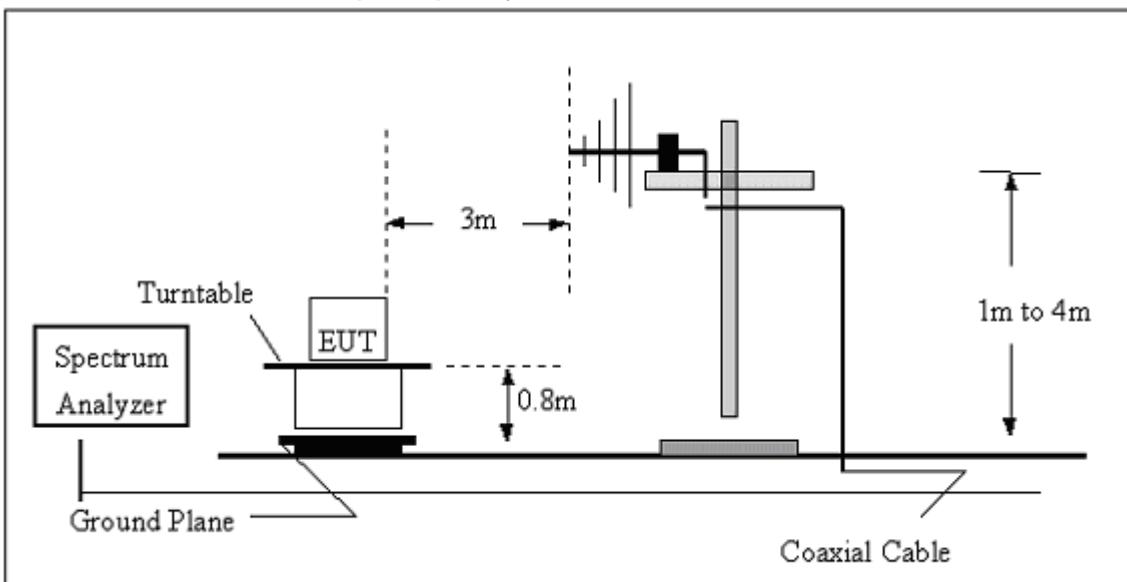
No deviation

### 3.4.4 TEST SETUP

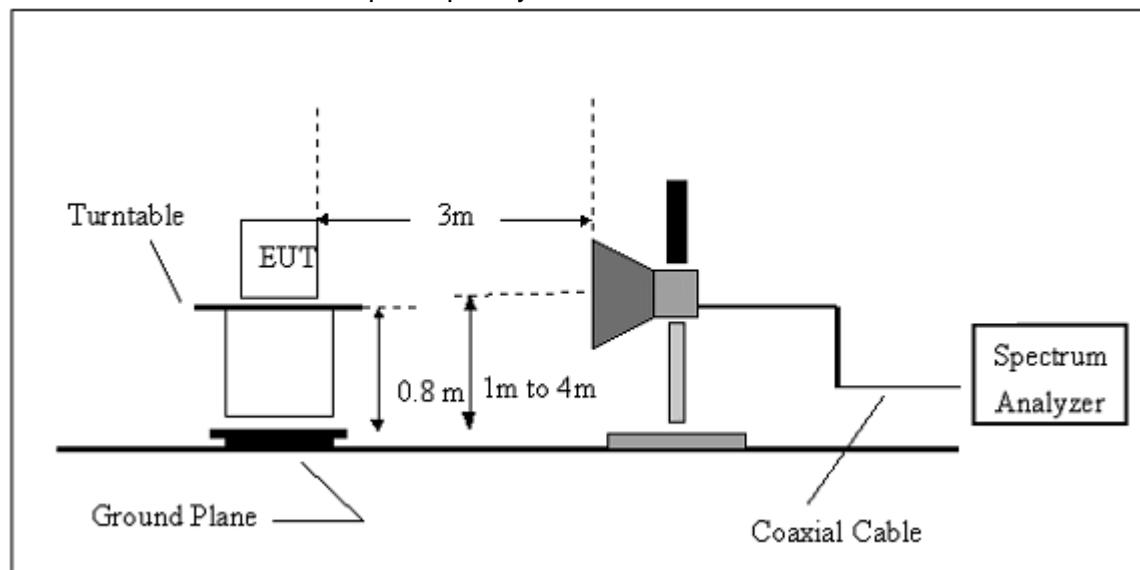
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



## (C) Radiated Emission Test-Up Frequency Above 1GHz



**3.4.5 TEST RESULTS (BELOW 30MHz)**

|               |             |                     |                     |
|---------------|-------------|---------------------|---------------------|
| EUT :         | Transmitter | Model Name. :       | T410                |
| Temperature : | 20 °C       | Relative Humidity : | 48%                 |
| Pressure :    | 1010 hPa    | Test Voltage :      | DC 12V from battery |
| Test Mode :   | TX          | Polarization :      | --                  |

| Freq.<br>(MHz) | Reading<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | State |
|----------------|---------------------|-------------------|----------------|-------|
| --             | --                  | --                | --             | P/F   |
| --             | --                  | --                | --             | PASS  |
| --             | --                  | --                | --             | PASS  |

**NOTE:**

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

Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

### 3.4.6 TEST RESULTS (BETWEEN 30 – 1000 MHZ)

The duty cycle is simply the on time divided by the period:

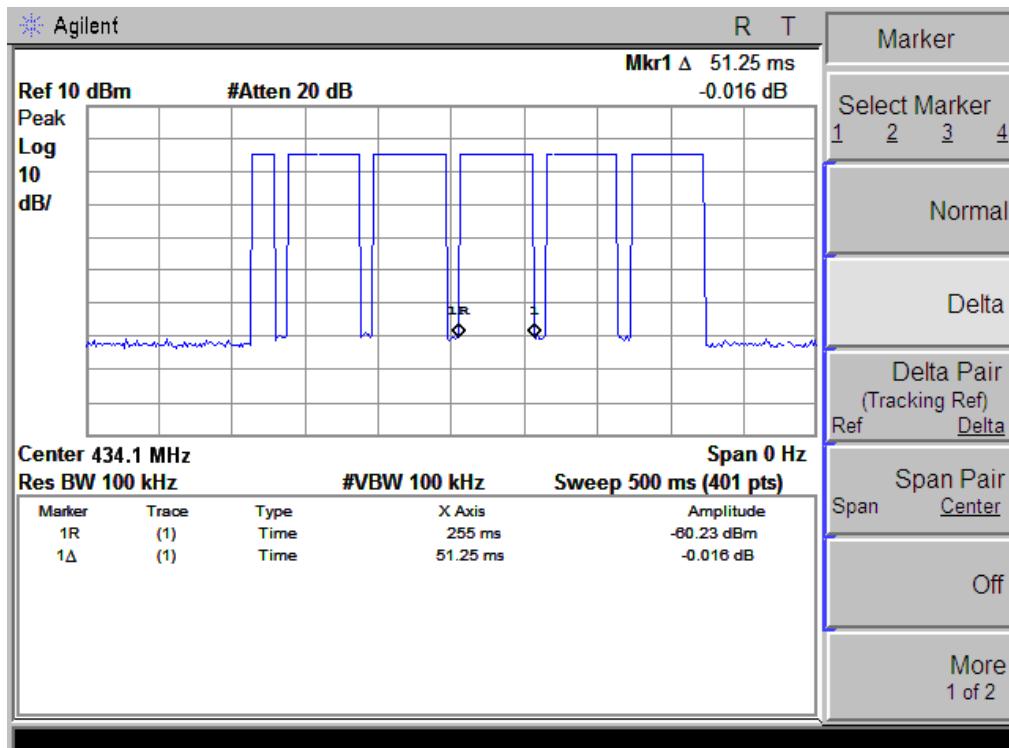
The duration of one cycle = 76.25 ms

Effective period of the cycle =  $(29 \times 0.95) + (8 \times 0.3)$  ms = 29.95ms

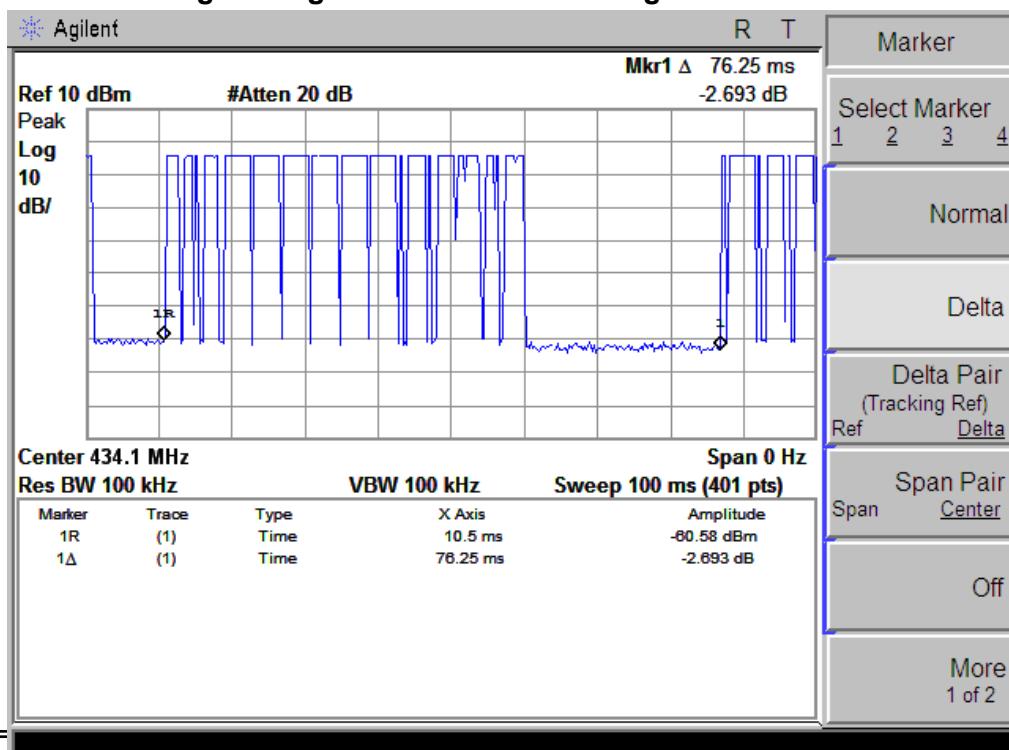
DC = 29.95ms/76.25ms = 0.3928

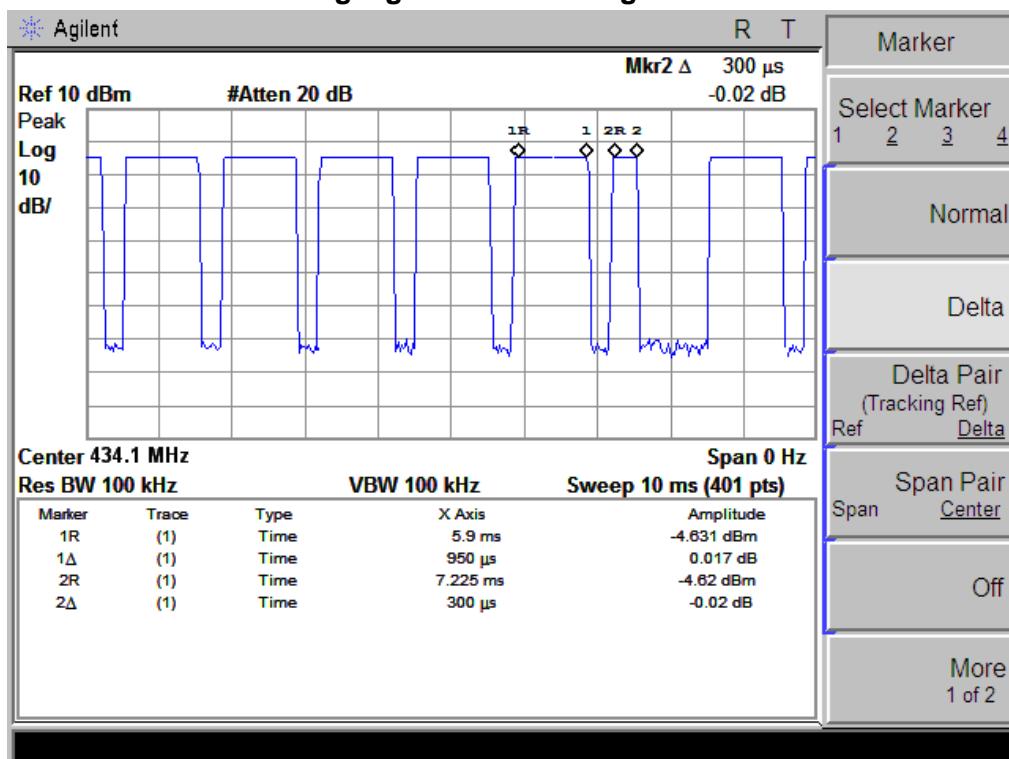
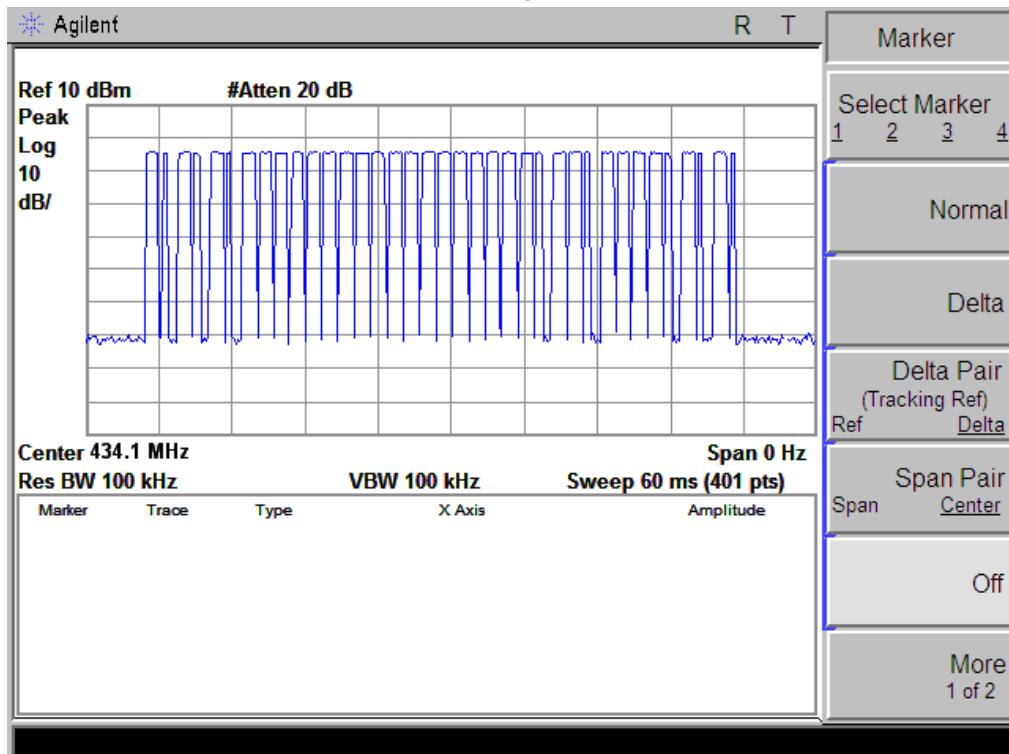
Therefore, the average factor is found by  $20\log 0.3928 = -8.12$

The duration of 500ms



29 long 'on' signals and 8 short 'on' signals within 100ms



**long signal and short signal time****One cycle**

|               |             |                     |                     |
|---------------|-------------|---------------------|---------------------|
| EUT :         | Transmitter | Model Name :        | T410                |
| Temperature : | 20 °C       | Relative Humidity : | 48%                 |
| Pressure :    | 1010 hPa    | Test Voltage :      | DC 12V from battery |
| Test Mode :   | TX          | Polarization :      | Horizontal          |

| Frequency | Average Factor | Field Strength | Field Strength | Limit(PK) | Limit(AV) | State |
|-----------|----------------|----------------|----------------|-----------|-----------|-------|
| MHz       | dB             | dBuV/m (PK)    | dBuV/m (AV)    | dBuV/m    | dBuV/m    |       |
| 434.116   | -8.12          | 79.23          | 71.23          | 100.8     | 80.8      | pass  |
| 868.232   | -8.12          | 52.34          | 44.33          | 80.8      | 60.8      | pass  |
| 1302.348  | -8.12          | 42.24          | 34.22          | 80.8      | 60.8      | pass  |
| --        | --             | --             | --             | 74.00     | 54.00     | pass  |
| --        | --             | --             | --             | 74.00     | 54.00     | pass  |
| --        | --             | --             | --             | 74.00     | 54.00     | pass  |

|               |             |                     |                     |
|---------------|-------------|---------------------|---------------------|
| EUT :         | Transmitter | Model Name :        | T410                |
| Temperature : | 20 °C       | Relative Humidity : | 48%                 |
| Pressure :    | 1010 hPa    | Test Voltage :      | DC 12V from battery |
| Test Mode :   | TX          | Polarization :      | Vertical            |

| Frequency | Average Factor | Field Strength | Field Strength | Limit(PK) | Limit(AV) | State |
|-----------|----------------|----------------|----------------|-----------|-----------|-------|
| MHz       | dB             | dBuV/m (PK)    | dBuV/m (AV)    | dBuV/m    | dBuV/m    |       |
| 434.116   | -8.12          | 75.23          | 66.21          | 100.8     | 80.8      | pass  |
| 868.232   | -8.12          | 45.62          | 41.52          | 80.8      | 60.8      | pass  |
| 1302.348  | -8.12          | 41.29          | 35.42          | 80.8      | 60.8      | pass  |
| --        | --             | --             | --             | 74.00     | 54.00     | pass  |
| --        | --             | --             | --             | 74.00     | 54.00     | pass  |
| --        | --             | --             | --             | 74.00     | 54.00     | pass  |

**Note:**

1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. \*: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission falling within the restricted bands of FCC Part 15 Section 15.205 were compliance with the emission limit of FCC Part 15 Section 15.209.

3. FCC Limit for Average Measurement =  $41.6667(434.116)-7083.3333 = 11004.8478372\text{uV/m}$   
 $= 80.8\text{dBuV/m}$

4.  $1/\text{PW} = 1/0.3\text{ms} = 3.3 < \text{RBW}(120\text{KHz})$ , PDCF is not needed

## 4. BANDWIDTH TEST

### 4.1 TEST PROCEDURE

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. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Limit:  $434.116\text{MHz} \times 0.25\% = 1.0853\text{MHz}$

### 4.2 DEVIATION FROM STANDARD

No deviation.

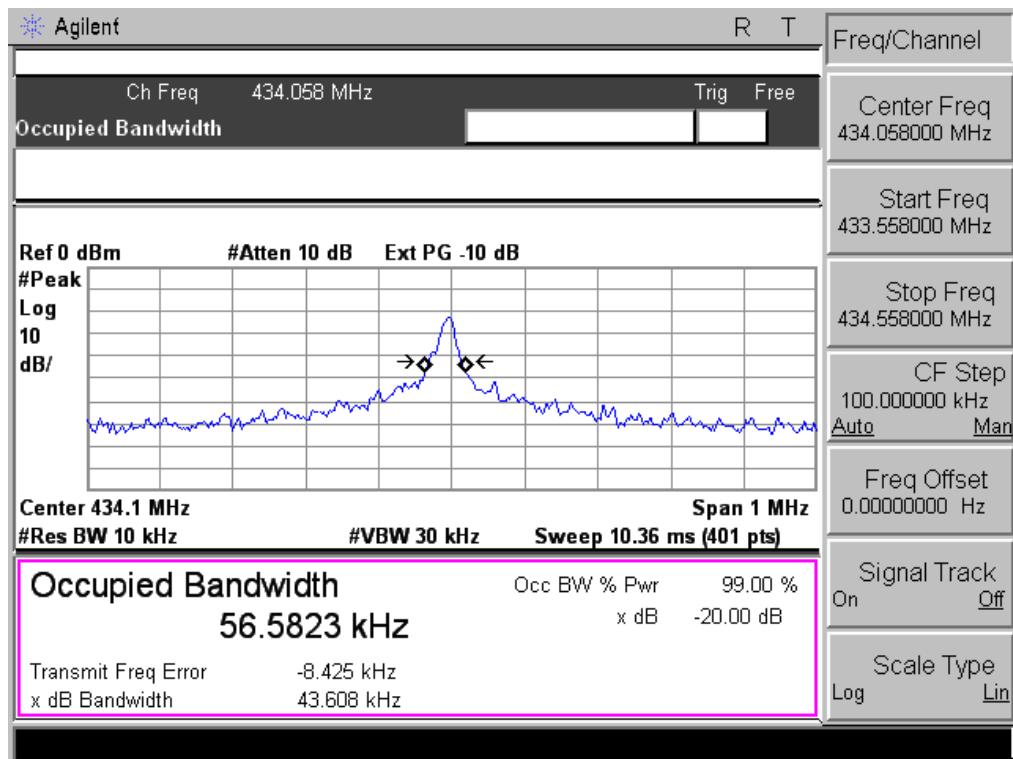
### 4.3 TEST SETUP



#### 4.4 TEST RESULTS

|               |             |                     |                     |
|---------------|-------------|---------------------|---------------------|
| EUT :         | Transmitter | Model Name :        | T410                |
| Temperature : | 26 °C       | Relative Humidity : | 53%                 |
| Pressure :    | 1020 hPa    | Test Power :        | DC 12V from battery |
| Test Mode :   | TX CH 1     |                     |                     |

| Test Channel | Frequency (MHz) | 20 dBc Bandwidth (kHz) | Limit (MHz) |
|--------------|-----------------|------------------------|-------------|
| CH01         | 434.116         | 43.608                 | 1.0853MHz   |



## 5. TRANSMITTER TIMEOUT

### 5.1 REQUIREMENTS

1 A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

**Result:** The EUT does not have a switch for activated transmitter

2 A transmitter activated automatically shall cease transmission within 5 seconds after activation.

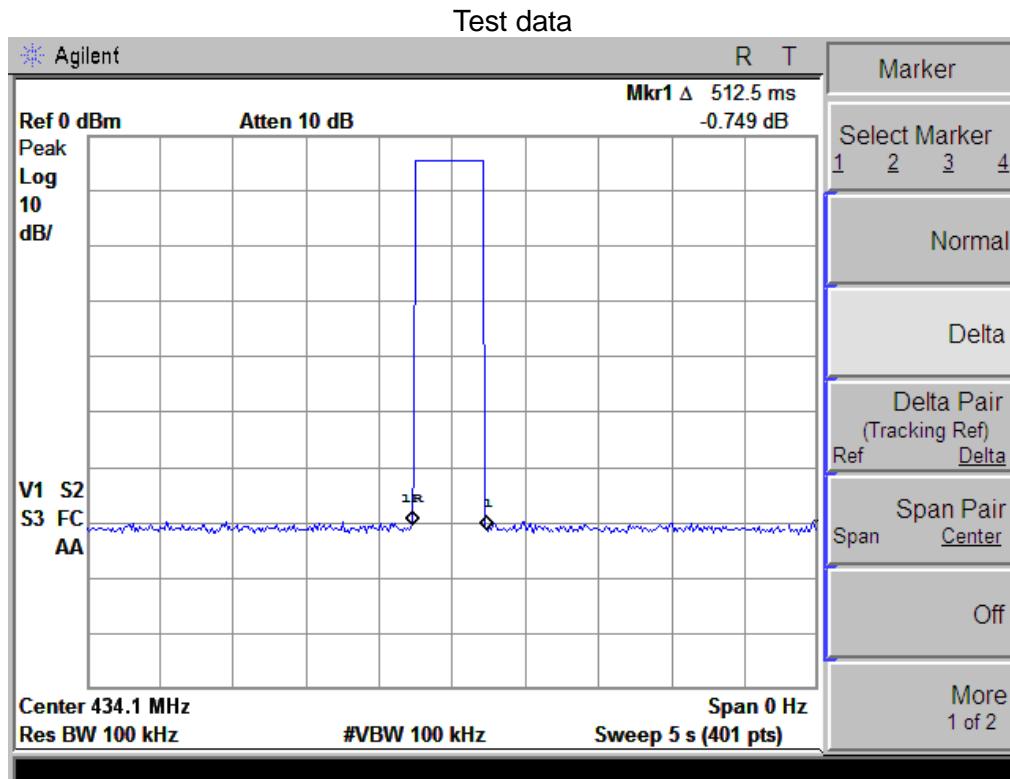
**Result:** The EUT has a automatically activated transmitter, please refer to below detail data

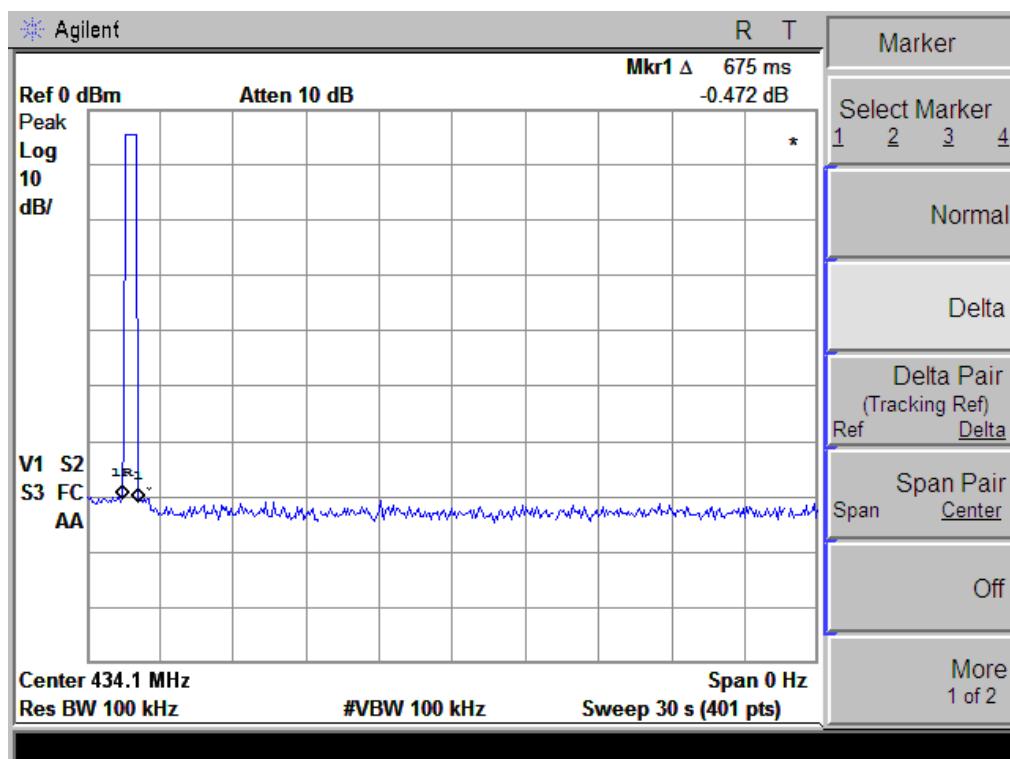
3 Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour

**Result:** The EUT does not employ periodic transmission.

4 Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

**Result:** The section is not applicable to EUT.





| THE DURATION OF EACH TRANSMISSION | LIMIT | RESULT |
|-----------------------------------|-------|--------|
| 0.5125s                           | <5s   | PASS   |

**6. EUT TEST PHOTO****Radiated Measurement Photos(worst case position)**