

APPLICATION CERTIFICATION  
On Behalf of  
Shenzhen Minde Electronics Technology LTD.

Barcode Scanner

Model No.: MS3390,CS3260,CS3290,CS3261,CS3291,MS3590,  
MS3391,MS3591,CS3262,CS3292,CS3263,CS3293,MS3392,MS3393,  
MS3592,MS3593,MS3396,MS3596,MS3395,MS3595,CS3266,CS3296,  
CS3265,CS3295,MS3390A,MS3390B,MS3390C,CS3260A,CS3260B,  
MS3590A,MS3590B,MS3590C,CS3260C,CS3290A,CS3290B,CS3290C

FCC ID: 2AASG-MS3390

Prepared for : Shenzhen Minde Electronics Technology LTD.  
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Report Number : ATE20151107  
Date of Test : May 25-30,2015  
Date of Report : Jun 01,2015

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## Test Report Certification

Applicant : Shenzhen Minde Electronics Technology LTD.

Manufacturer : Shenzhen Minde Electronics Technology LTD.

EUT Description : Barcode Scanner

(A) MODEL NO.: MS3390,CS3260,CS3290,CS3261,CS3291,MS3590,MS3391,MS3591,CS3262,CS3292,CS3263,CS3293,MS3392,MS3393,MS3592,MS3593,MS3396,MS3596,MS3395,MS3595,CS3266,CS3296,CS3265,CS3295,MS3390A,MS3390B,MS3390C,CS3260A,CS3260B,MS3590A,MS3590B,MS3590C,CS3260C,CS3290A,CS3290B,CS3290C

(B) POWER SUPPLY: DC 3.7V (Battery) or DC 5V(USB)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247

ANSI C63.10- 2013

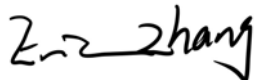
The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : May 25-30,2015

Date of Report : Jun 01,2015

Prepared by :

  
(Eric Zhang, Engineer)

Approved & Authorized Signer :

  
(Sean Liu, Manager)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                         |   |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT                     | : | Barcode Scanner                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Model Number            | : | MS3390,CS3260,CS3290,CS3261,CS3291,MS3590,MS3391,MS3591,CS3262.CS3292,CS3263,CS3293,MS3392,MS3393, MS3592,MS3593,MS3396,MS3596,MS3395,MS3595,CS3266,CS3296, CS3265,CS3295,MS3390A,MS3390B,MS3390C,CS3260A,CS3260B,MS3590A,MS3590B,MS3590C,CS3260C,CS3290A,CS3290B,CS3290C (Note: These samples are same except for the model number and colors are different for the marketing requirement. So we prepare the MS3390 for test.) |
| Frequency Band          | : | 2402MHz-2480MHz                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Number of Channels      | : | 79                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Bluetooth Version       | : | 2.1+EDR                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Modulation type         | : | GFSK, $\Pi/4$ -DQPSK, 8DPSK                                                                                                                                                                                                                                                                                                                                                                                                     |
| Antenna Gain            | : | 0dBi                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Power Supply            | : | DC 3.7V (Battery) or DC 5V(USB)                                                                                                                                                                                                                                                                                                                                                                                                 |
| Applicant               | : | Shenzhen Minde Electronics Technology LTD.                                                                                                                                                                                                                                                                                                                                                                                      |
| Address                 | : | 5th Floor, Section 1,25th Block,No.5,Keji Xi Road, Keji Yuan, Nanshan District, Shenzhen, P.R. China                                                                                                                                                                                                                                                                                                                            |
| Manufacturer            | : | Shenzhen Minde Electronics Technology LTD.                                                                                                                                                                                                                                                                                                                                                                                      |
| Address                 | : | 5th Floor, Section 1,25th Block,No.5,Keji Xi Road, Keji Yuan, Nanshan District, Shenzhen, P.R. China                                                                                                                                                                                                                                                                                                                            |
| Date of sample received | : | May 25, 2015                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Date of Test            | : | May 25-30,2015                                                                                                                                                                                                                                                                                                                                                                                                                  |

## 1.2. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC  
The Registration Number is 752051

Listed by Industry Canada  
The Registration Number is 5077A-2

Accredited by China National Accreditation Committee  
for Laboratories  
The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD

Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.  
Science & Industry Park, Nanshan, Shenzhen, Guangdong  
P.R. China

## 1.3. Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2  
(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2  
(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2  
(Above 1GHz)

## 2. MEASURING DEVICE AND TEST EQUIPMENT

**Table 1: List of Test and Measurement Equipment**

| Kind of equipment  | Manufacturer              | Type                                    | S/N        | Calibrated dates | Cal. Interval |
|--------------------|---------------------------|-----------------------------------------|------------|------------------|---------------|
| EMI Test Receiver  | Rohde&Schwarz             | ESCS30                                  | 100307     | Jan. 11, 2015    | One Year      |
| EMI Test Receiver  | Rohde&Schwarz             | ESPI3                                   | 101526/003 | Jan. 11, 2015    | One Year      |
| Spectrum Analyzer  | Agilent                   | E7405A                                  | MY45115511 | Jan. 11, 2015    | One Year      |
| Pre-Amplifier      | Rohde&Schwarz             | CBLU118354<br>0-01                      | 3791       | Jan. 11, 2015    | One Year      |
| Loop Antenna       | Schwarzbeck               | FMZB1516                                | 1516131    | Jan. 15, 2015    | One Year      |
| Bilog Antenna      | Schwarzbeck               | VULB9163                                | 9163-323   | Jan. 15, 2015    | One Year      |
| Horn Antenna       | Schwarzbeck               | BBHA9120D                               | 9120D-655  | Jan. 15, 2015    | One Year      |
| Horn Antenna       | Schwarzbeck               | BBHA9120D                               | 9120D-1067 | Jan. 15, 2015    | One Year      |
| LISN               | Rohde&Schwarz             | ESH3-Z5                                 | 100305     | Jan. 11, 2015    | One Year      |
| LISN               | Schwarzbeck               | NSLK8126                                | 8126431    | Jan. 11, 2015    | One Year      |
| Highpass Filter    | Wainwright<br>Instruments | WHKX3.6/18<br>G-10SS                    | N/A        | Jan. 11, 2015    | One Year      |
| Band Reject Filter | Wainwright<br>Instruments | WRCG2400/2<br>485-2375/2510<br>-60/11SS | N/A        | Jan. 11, 2015    | One Year      |

### 3. OPERATION OF EUT DURING TESTING

#### 3.1.Operating Mode

The mode is used: Transmitting mode

Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

#### 3.2.Configuration and peripherals

EUT

(EUT: Barcode Scanner)

#### 4. TEST PROCEDURES AND RESULTS

| FCC Rules                           | Description of Test               | Result    |
|-------------------------------------|-----------------------------------|-----------|
| Section 15.207                      | Conducted Emission Test           | Compliant |
| Section 15.247(a)(1)                | 20dB Bandwidth Test               | Compliant |
| Section 15.247(a)(1)                | Carrier Frequency Separation Test | Compliant |
| Section 15.247(a)(1)(iii)           | Number Of Hopping Frequency Test  | Compliant |
| Section 15.247(a)(1)(iii)           | Dwell Time Test                   | Compliant |
| Section 15.247(b)(1)                | Maximum Peak Output Power Test    | Compliant |
| Section 15.247(d)<br>Section 15.209 | Radiated Emission Test            | Compliant |
| Section 15.247(d)                   | Band Edge Compliance Test         | Compliant |
| Section 15.203                      | Antenna Requirement               | Compliant |

## 5. 20DB BANDWIDTH TEST

### 5.1. Block Diagram of Test Setup



(EUT: Barcode Scanner)

### 5.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

### 5.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 5.4. Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

## 5.5. Test Procedure

5.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.5.2. Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz.

5.5.3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

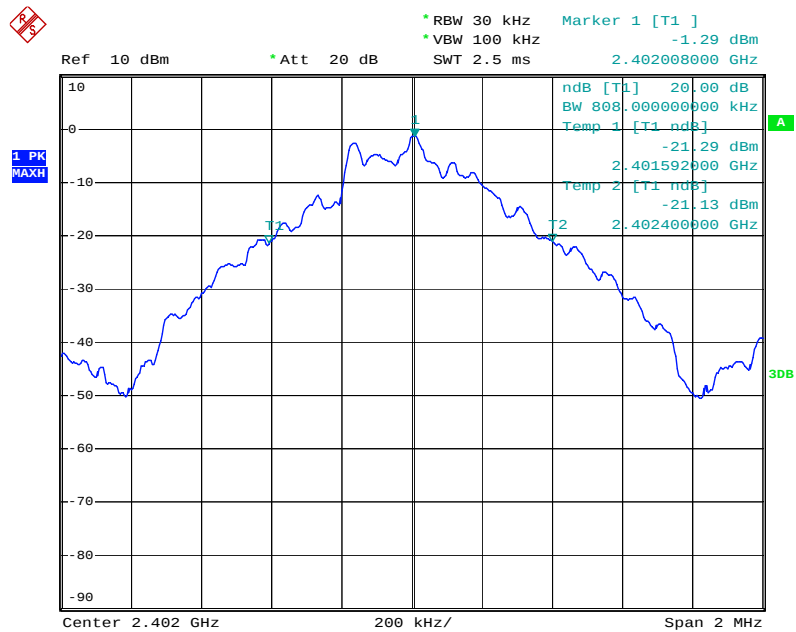
## 5.6. Test Result

| Channel | Frequency (MHz) | GFSK<br>20dB Bandwidth (MHz) | $\Pi/4$ -DQPSK<br>20dB Bandwidth (MHz) | 8DPSK<br>20dB Bandwidth (MHz) | Result |
|---------|-----------------|------------------------------|----------------------------------------|-------------------------------|--------|
| Low     | 2402            | 0.808                        | 1.228                                  | 1.152                         | Pass   |
| Middle  | 2441            | 0.808                        | 1.224                                  | 1.152                         | Pass   |
| High    | 2480            | 0.844                        | 1.224                                  | 1.148                         | Pass   |

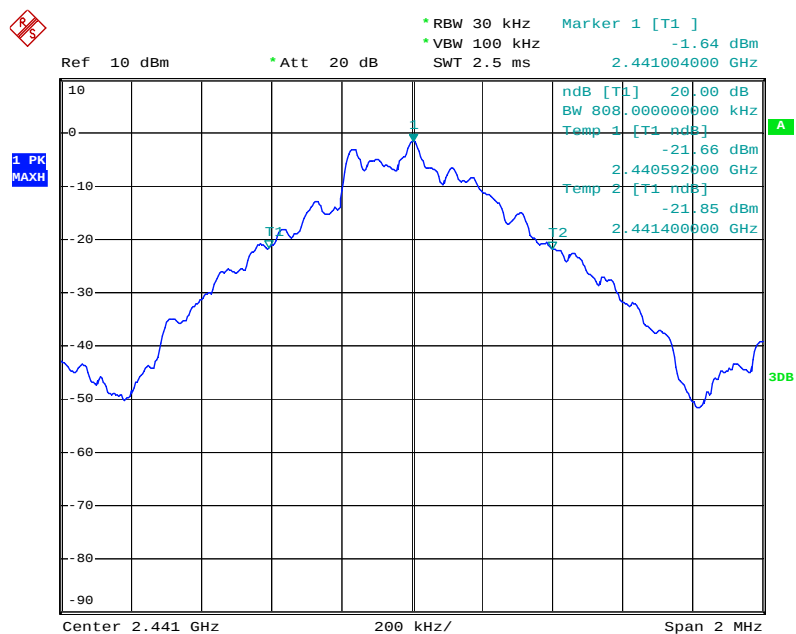
The spectrum analyzer plots are attached as below.

## GFSK Mode

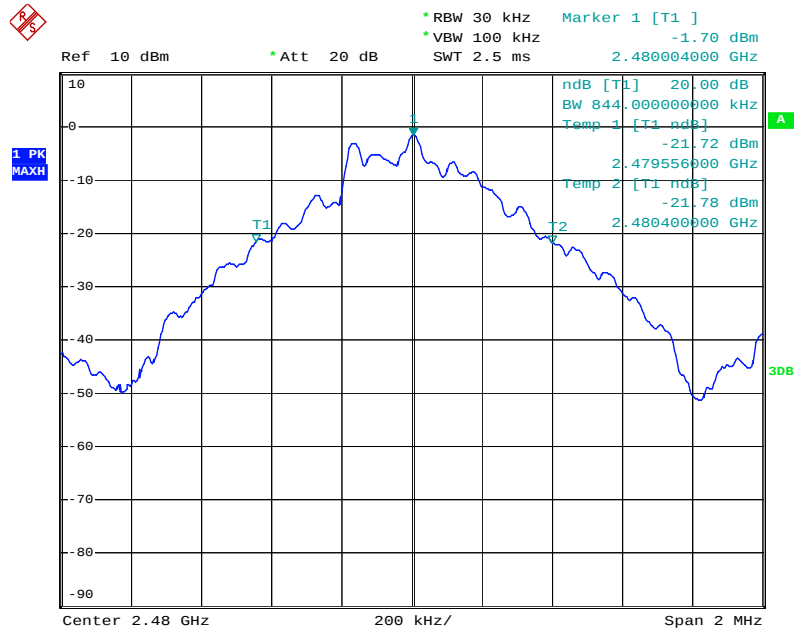
### Low channel



### Middle channel

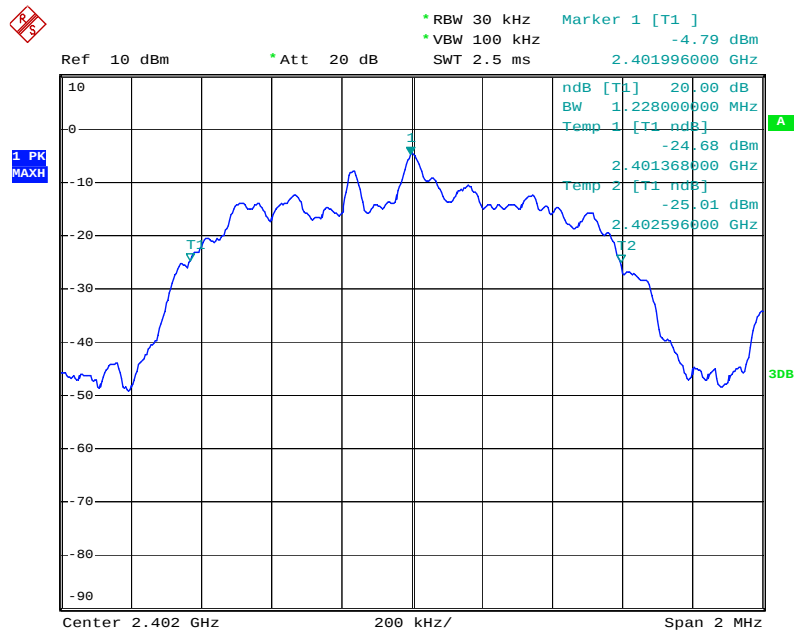


## High channel

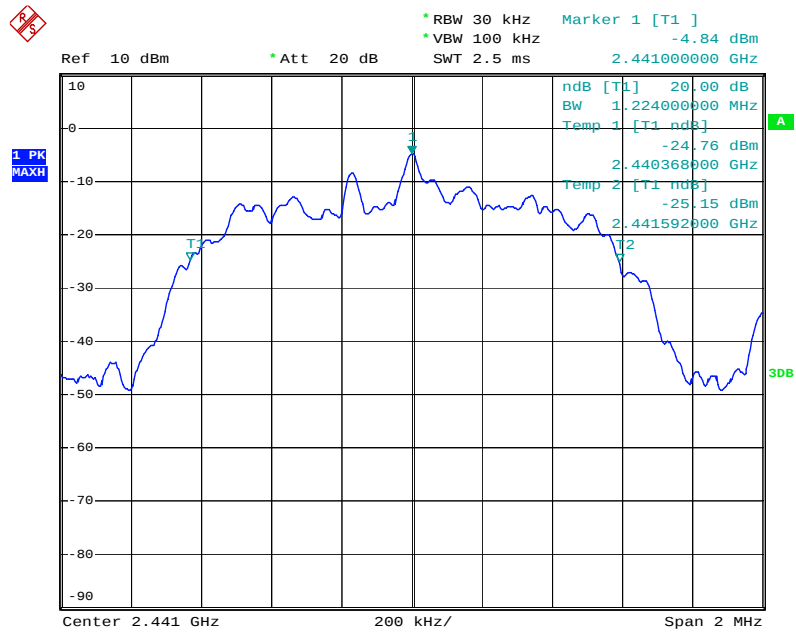


## Π/4-DQPSK Mode

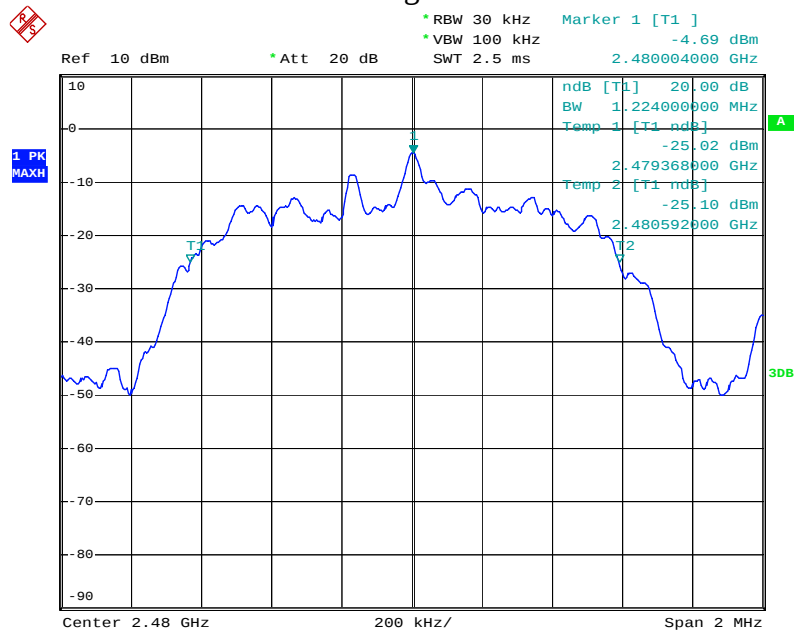
## Low channel



## Middle channel

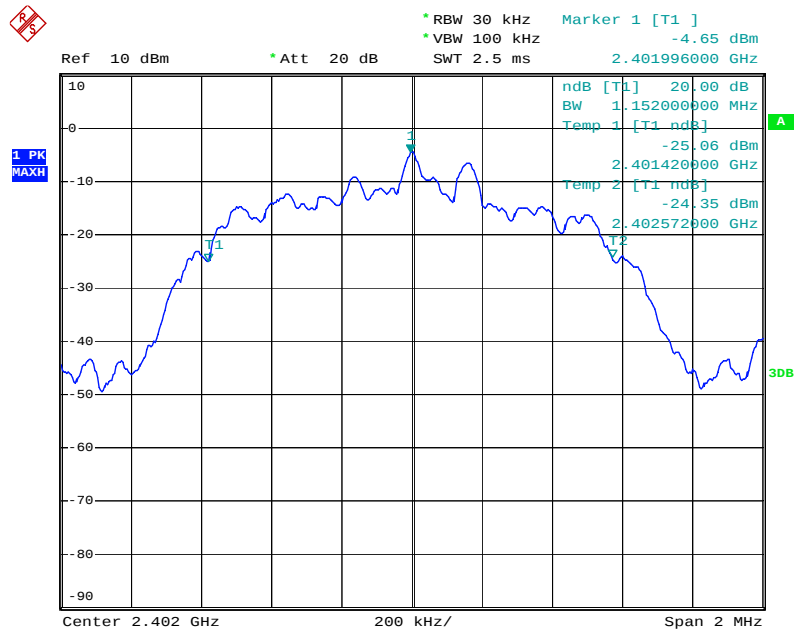


## High channel

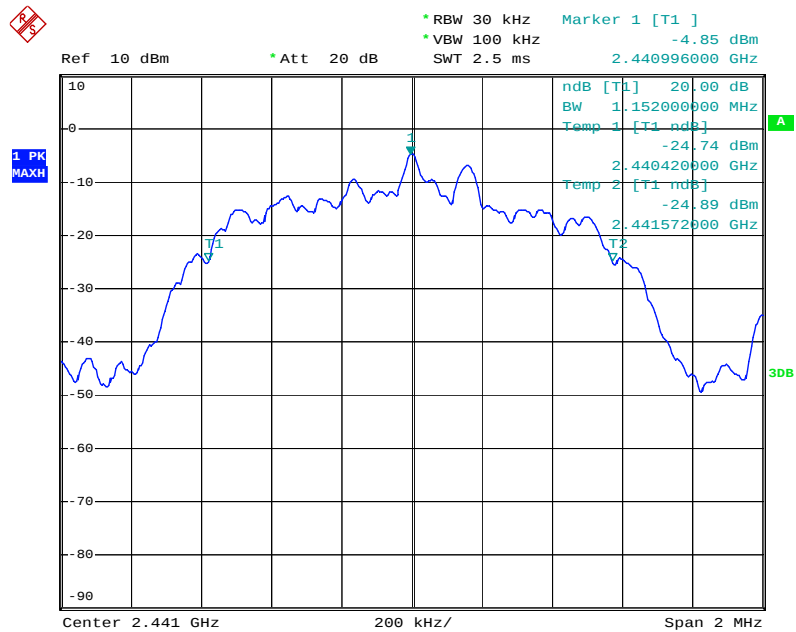


## 8DPSK Mode

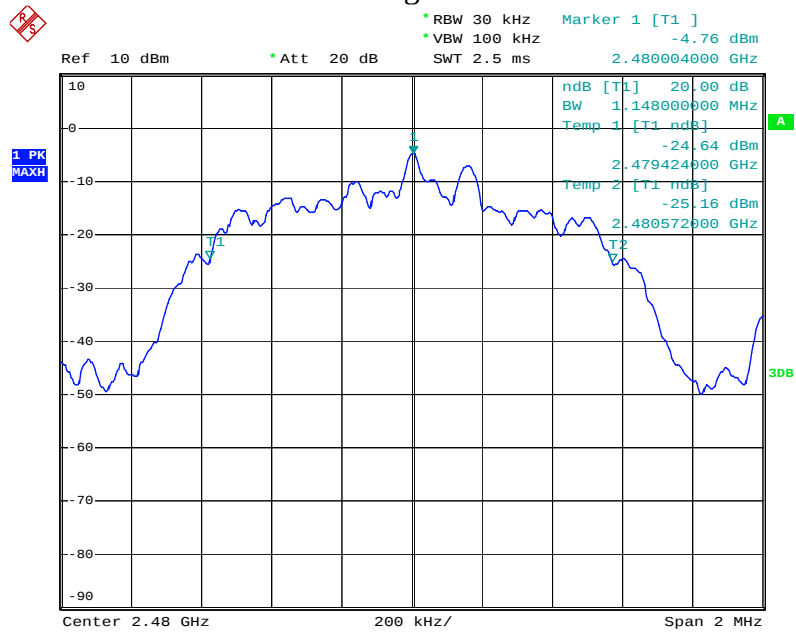
### Low channel



### Middle channel



## High channel



## 6. CARRIER FREQUENCY SEPARATION TEST

### 6.1. Block Diagram of Test Setup



(EUT: Barcode Scanner)

### 6.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

### 6.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

## 6.5. Test Procedure

6.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

6.5.2. Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz. Adjust Span to 3 MHz.

6.5.3. Set the adjacent channel of the EUT maxhold another trace.

6.5.4. Measurement the channel separation

## 6.6. Test Result

### GFSK

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)             | Result |
|---------|-----------------|-------------------------|-------------------------|--------|
| Low     | 2402            | 1.000                   | 25KHz or 20dB bandwidth | PASS   |
|         | 2403            |                         |                         |        |
| Middle  | 2440            | 1.000                   | 25KHz or 20dB bandwidth | PASS   |
|         | 2441            |                         |                         |        |
| High    | 2479            | 1.000                   | 25KHz or 20dB bandwidth | PASS   |
|         | 2480            |                         |                         |        |

### Π/4-DQPSK

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)                 | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low     | 2402            | 1.002                   | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2403            |                         |                             |        |
| Middle  | 2440            | 1.002                   | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2441            |                         |                             |        |
| High    | 2479            | 1.002                   | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2480            |                         |                             |        |

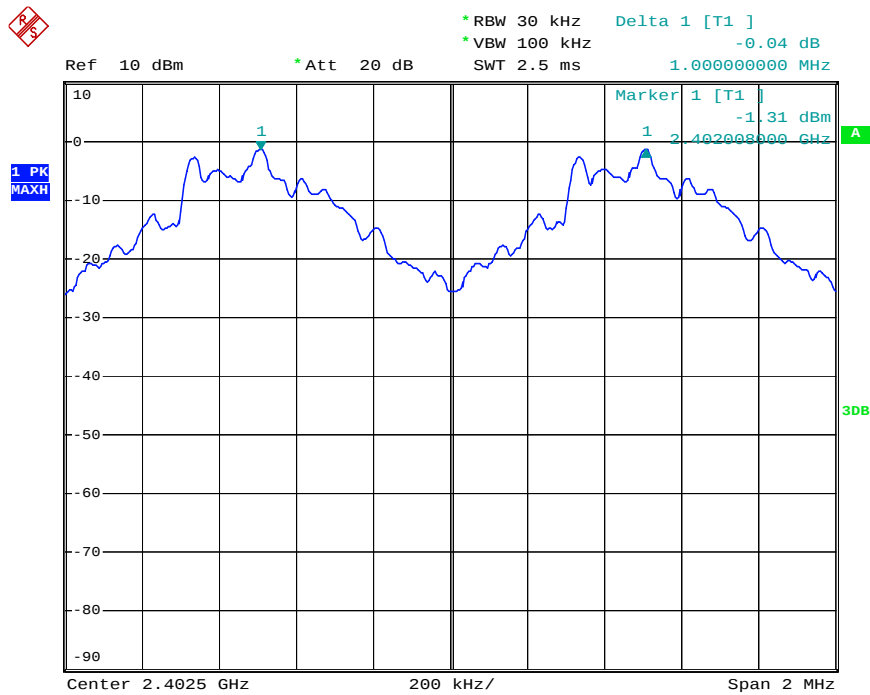
### 8DPSK

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)                 | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low     | 2402            | 1.000                   | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2403            |                         |                             |        |
| Middle  | 2440            | 1.002                   | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2441            |                         |                             |        |
| High    | 2479            | 1.002                   | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2480            |                         |                             |        |

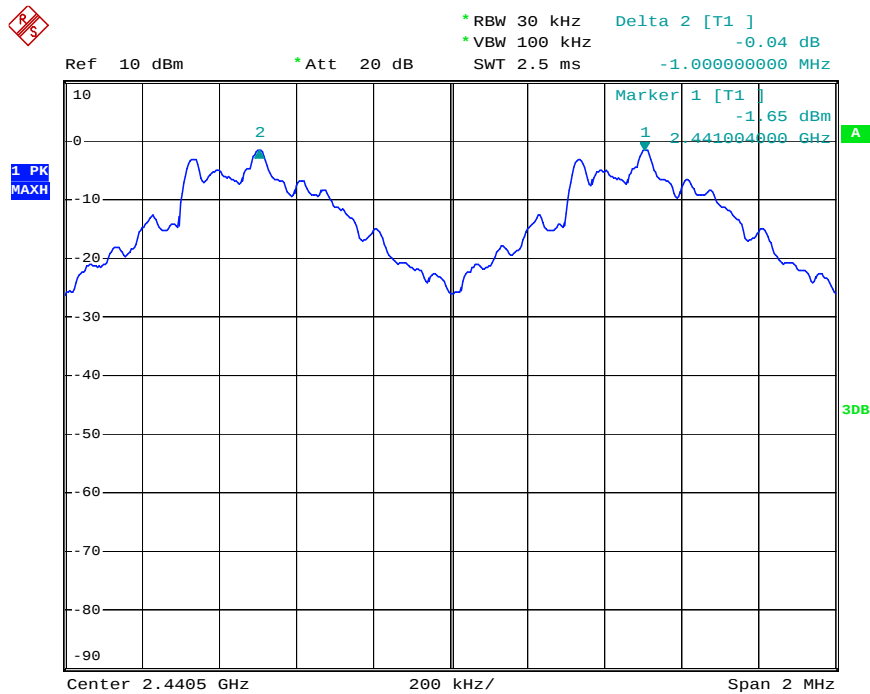
The spectrum analyzer plots are attached as below.

## GFSK Mode

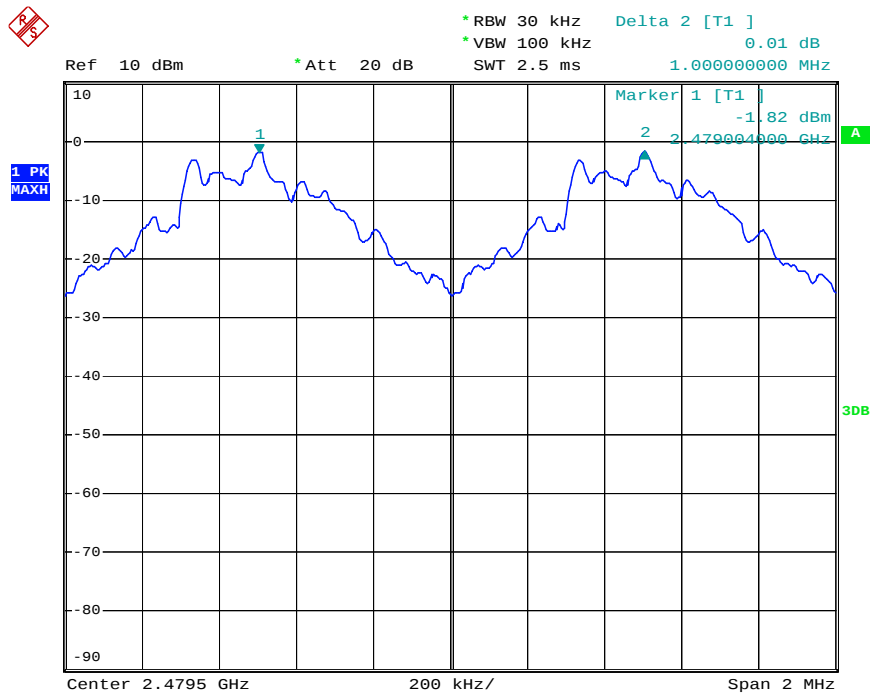
### Low channel



### Middle channel

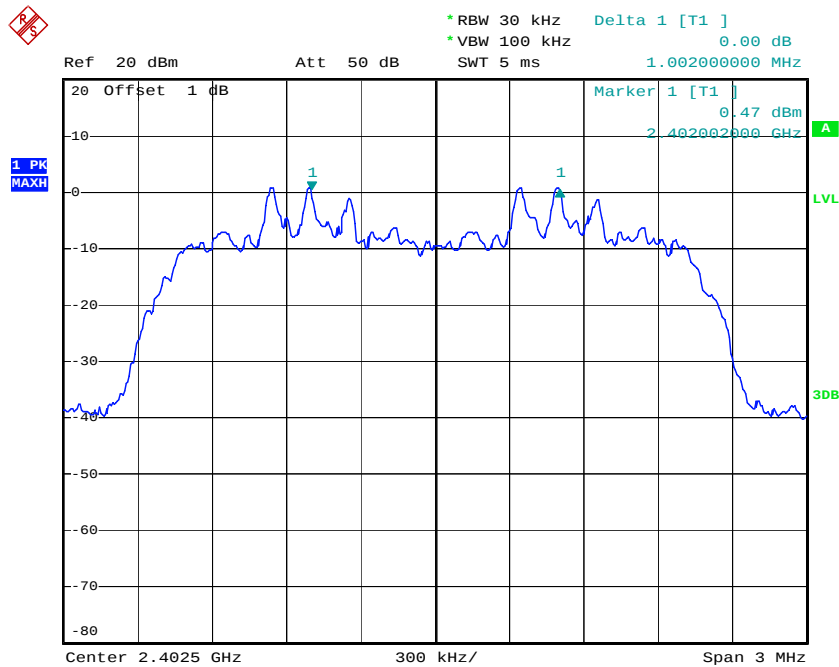


## High channel

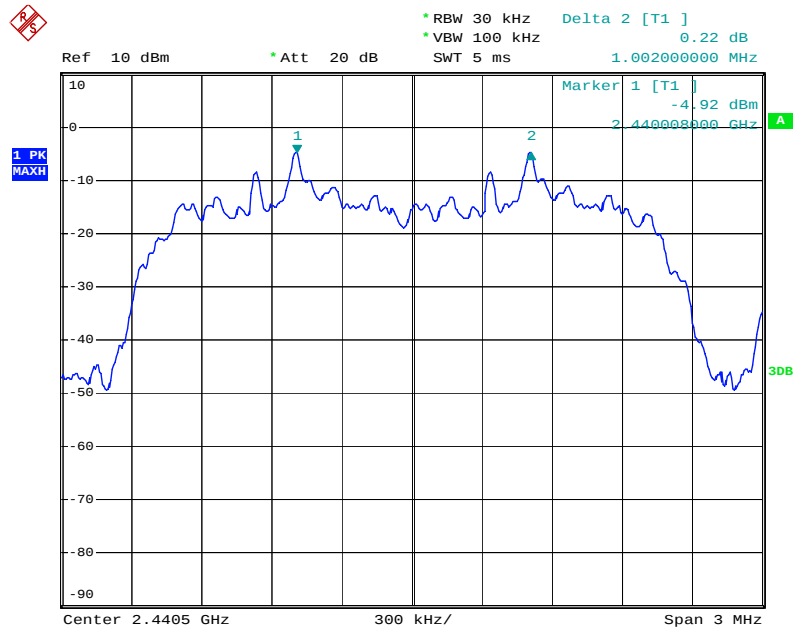


## Π/4-DQPSK Mode

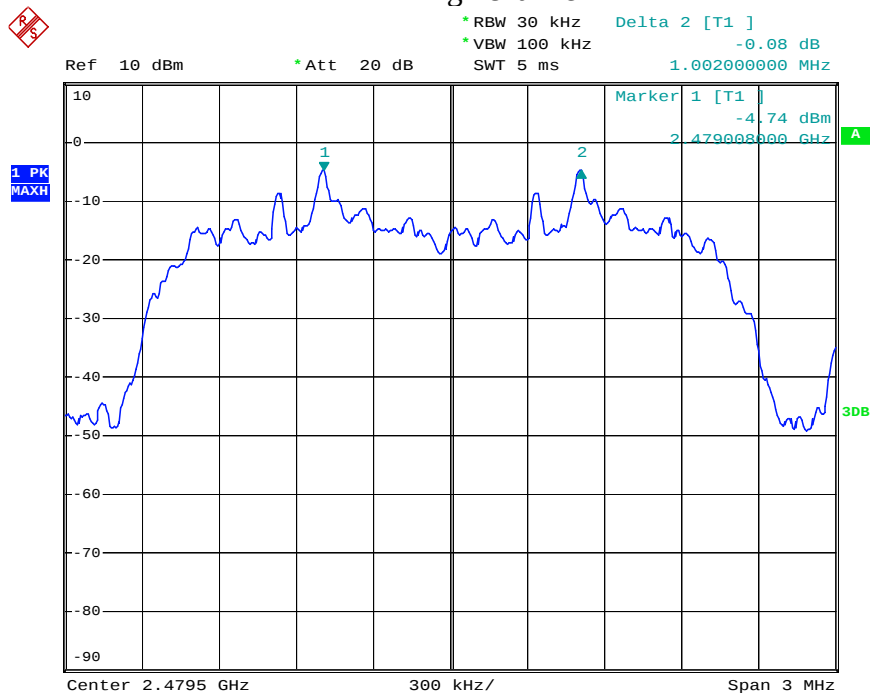
## Low channel



## Middle channel

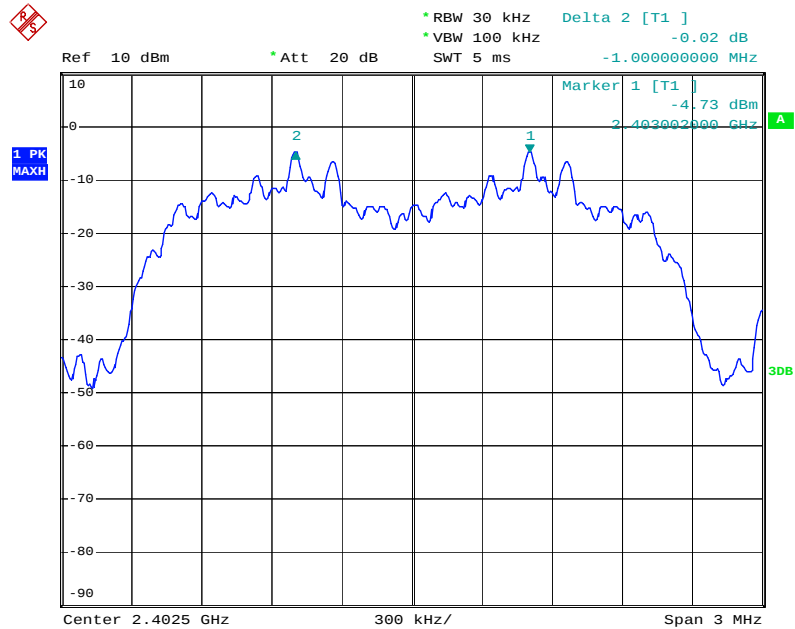


## High channel

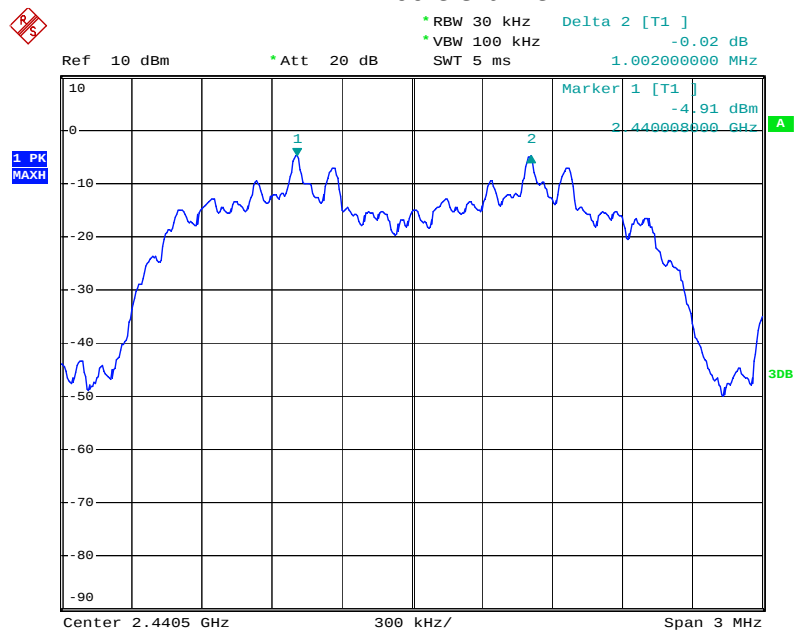


## 8DPSK Mode

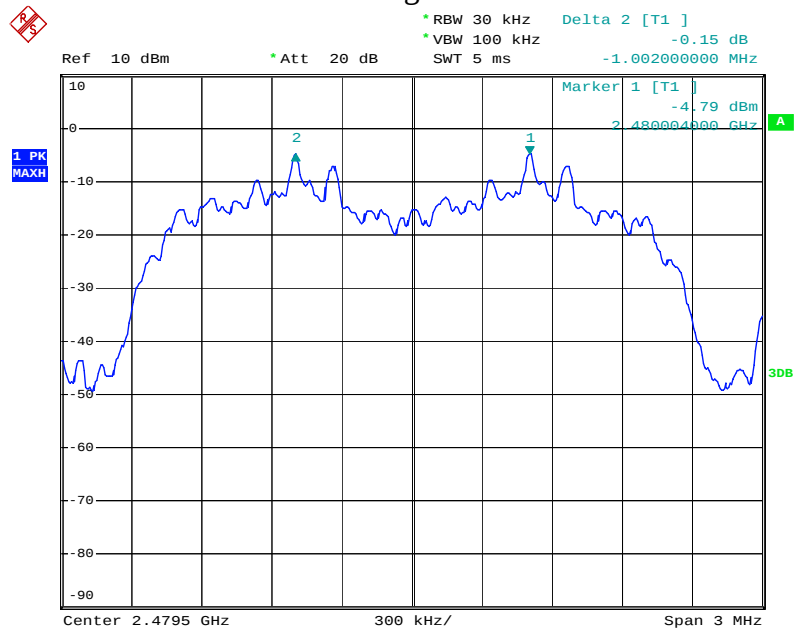
### Low channel



### Middle channel



## High channel



## 7. NUMBER OF HOPPING FREQUENCY TEST

### 7.1. Block Diagram of Test Setup



(EUT: Barcode Scanner)

### 7.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

### 7.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX (Hopping on) modes measure it.

## 7.5. Test Procedure

7.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.2. Set the spectrum analyzer as Span=83.5MHz, RBW=100 kHz, VBW=300 kHz.

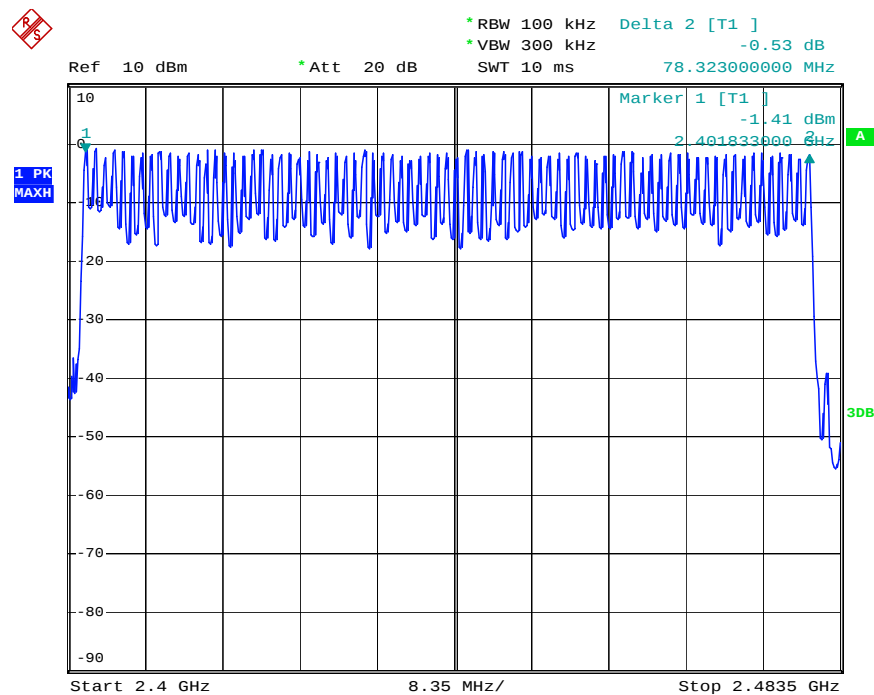
7.5.3. Max hold, view and count how many channel in the band.

## 7.6. Test Result

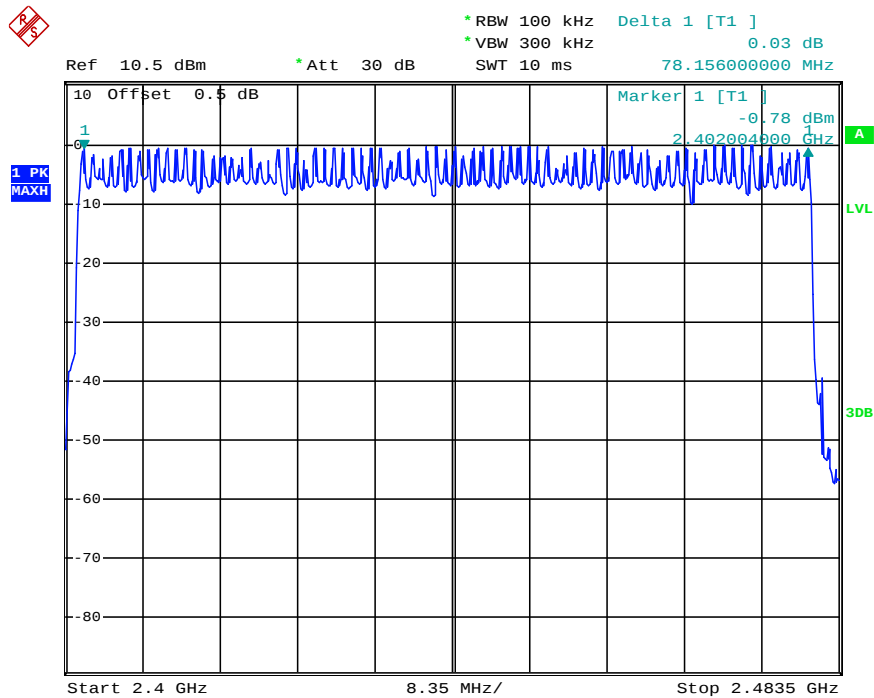
| Total number of hopping channel | Measurement result(CH) | Limit(CH) |
|---------------------------------|------------------------|-----------|
|                                 | 79                     | $\geq 15$ |

The spectrum analyzer plots are attached as below.

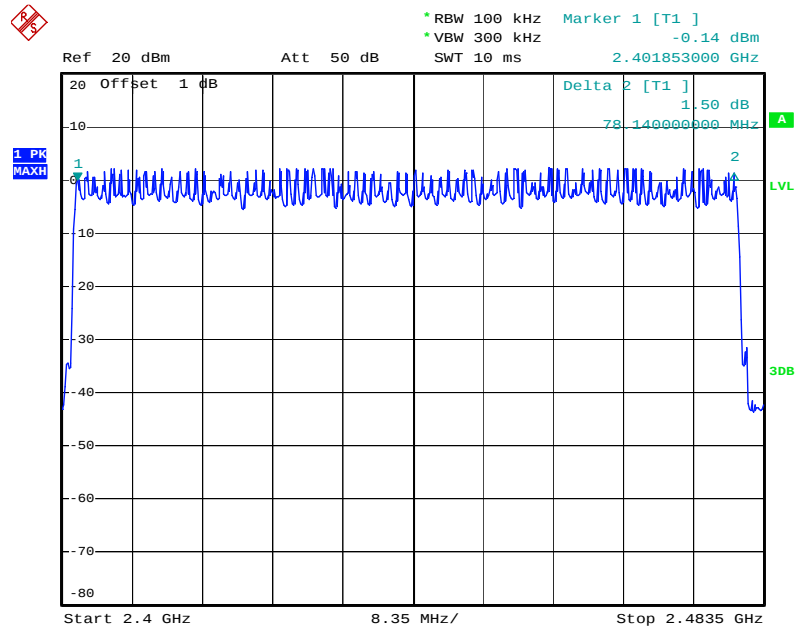
Number of hopping channels(GFSK)



## Number of hopping channels( $\pi/4$ -DQPSK)



## Number of hopping channels(8DPSK)



## 8. DWELL TIME TEST

### 8.1. Block Diagram of Test Setup



(EUT: Barcode Scanner)

### 8.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 8.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 8.4. Operating Condition of EUT

8.4.1. Setup the EUT and simulator as shown as Section 8.1.

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

## 8.5. Test Procedure

8.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.2. Set center frequency of spectrum analyzer = operating frequency.

8.5.3. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz.

8.5.4. Repeat above procedures until all frequency measured were complete.

## 8.6. Test Result

### GFSK Mode

| Mode                                                                                                              | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|-------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| DH1                                                                                                               | 2402                    | 0.530           | 169.60          | 400        |
|                                                                                                                   | 2441                    | 0.530           | 169.60          | 400        |
|                                                                                                                   | 2480                    | 0.530           | 169.60          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                               | 2402                    | 1.790           | 286.40          | 400        |
|                                                                                                                   | 2441                    | 1.800           | 288.00          | 400        |
|                                                                                                                   | 2480                    | 1.790           | 286.40          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH5                                                                                                               | 2402                    | 3.070           | 327.47          | 400        |
|                                                                                                                   | 2441                    | 3.070           | 327.47          | 400        |
|                                                                                                                   | 2480                    | 3.070           | 327.47          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$ |                         |                 |                 |            |

## Π/4-DQPSK

| Mode                                                                                                              | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|-------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| DH1                                                                                                               | 2402                    | 0.545           | 174.40          | 400        |
|                                                                                                                   | 2441                    | 0.545           | 174.40          | 400        |
|                                                                                                                   | 2480                    | 0.545           | 174.40          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                               | 2402                    | 1.315           | 210.40          | 400        |
|                                                                                                                   | 2441                    | 1.325           | 212.00          | 400        |
|                                                                                                                   | 2480                    | 1.325           | 212.00          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH5                                                                                                               | 2402                    | 3.495           | 372.80          | 400        |
|                                                                                                                   | 2441                    | 3.075           | 328.00          | 400        |
|                                                                                                                   | 2480                    | 3.075           | 328.00          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$ |                         |                 |                 |            |

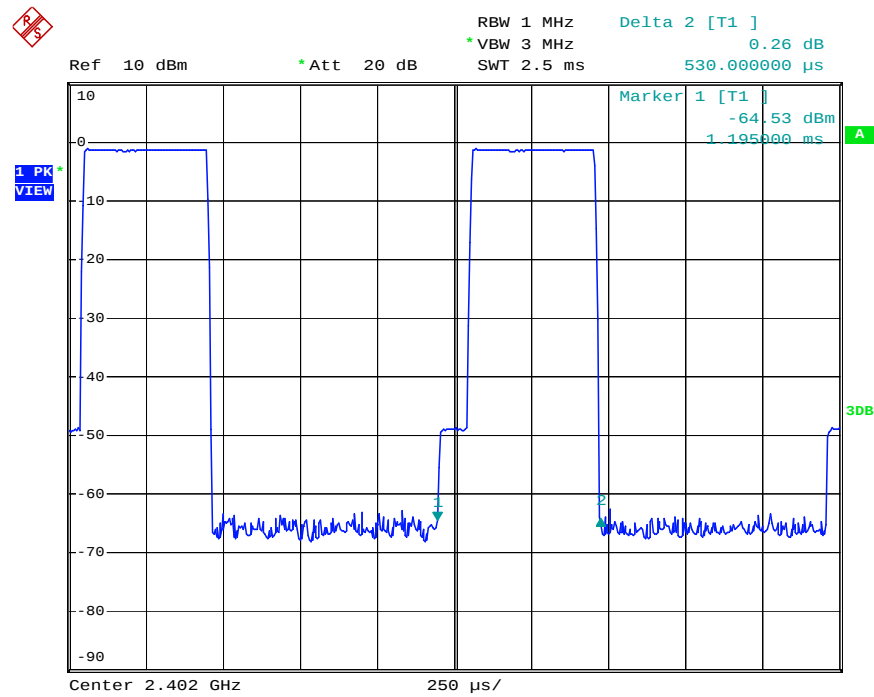
## 8DPSK Mode

| Mode                                                                                                              | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|-------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| DH1                                                                                                               | 2402                    | 0.540           | 172.80          | 400        |
|                                                                                                                   | 2441                    | 0.540           | 172.80          | 400        |
|                                                                                                                   | 2480                    | 0.545           | 174.40          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                               | 2402                    | 1.890           | 302.40          | 400        |
|                                                                                                                   | 2441                    | 1.815           | 290.40          | 400        |
|                                                                                                                   | 2480                    | 1.805           | 288.80          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH5                                                                                                               | 2402                    | 3.075           | 328.00          | 400        |
|                                                                                                                   | 2441                    | 3.095           | 330.13          | 400        |
|                                                                                                                   | 2480                    | 3.080           | 328.53          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$ |                         |                 |                 |            |

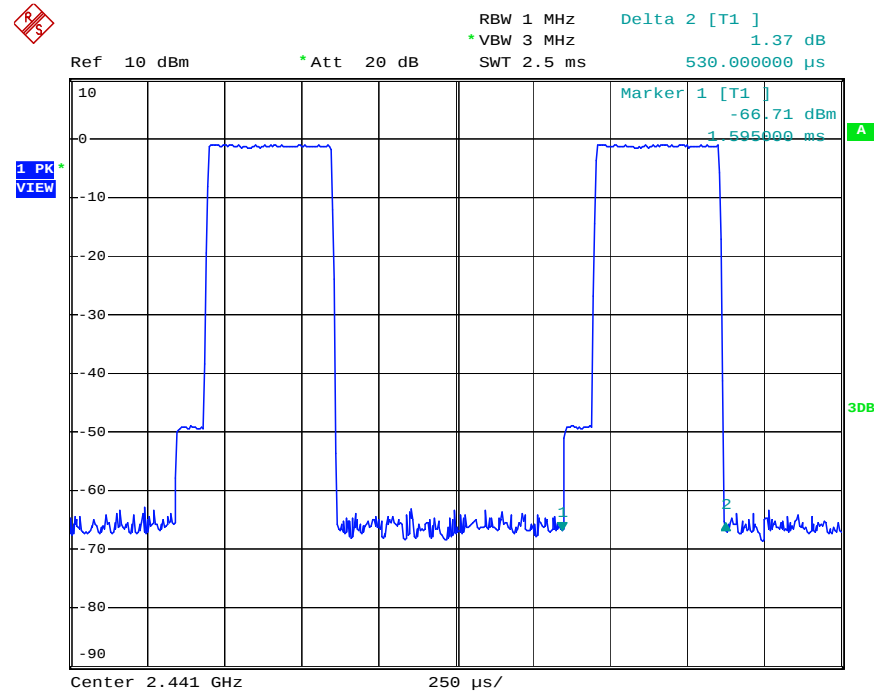
The spectrum analyzer plots are attached as below.

Mode 1: GFSK Link Mode

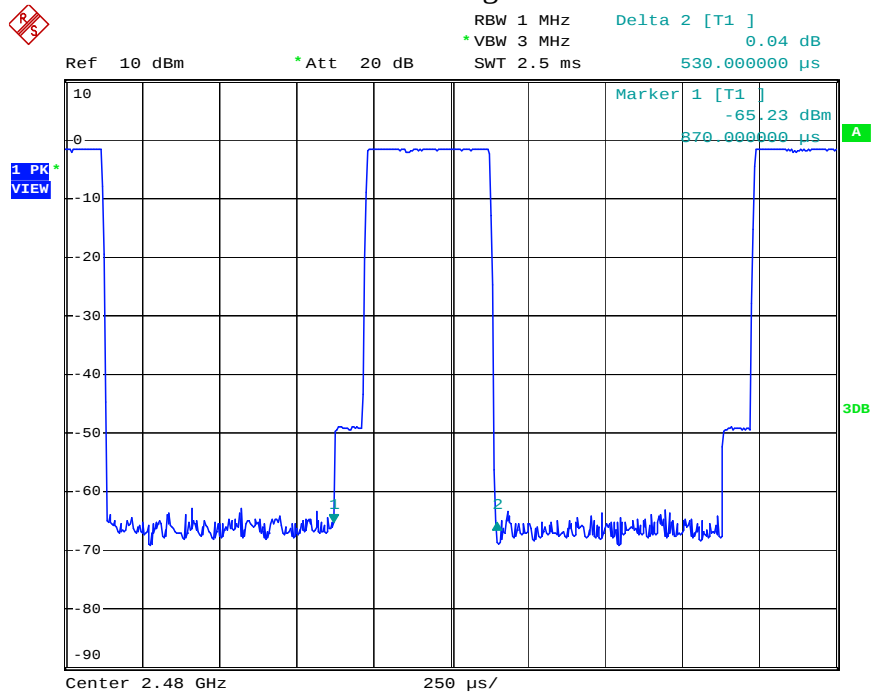
## DH1 Low channel



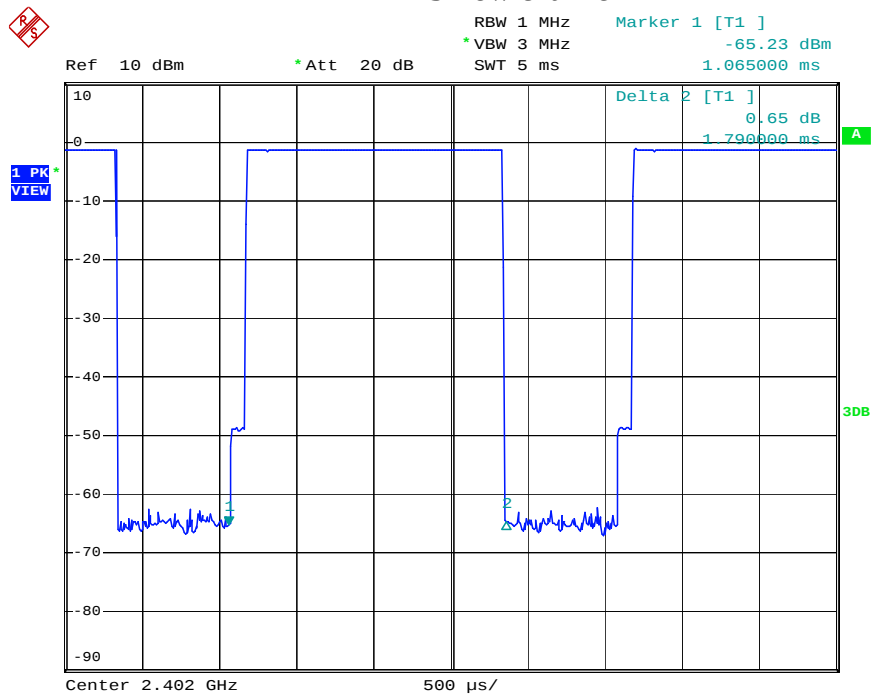
## DH1 Middle channel



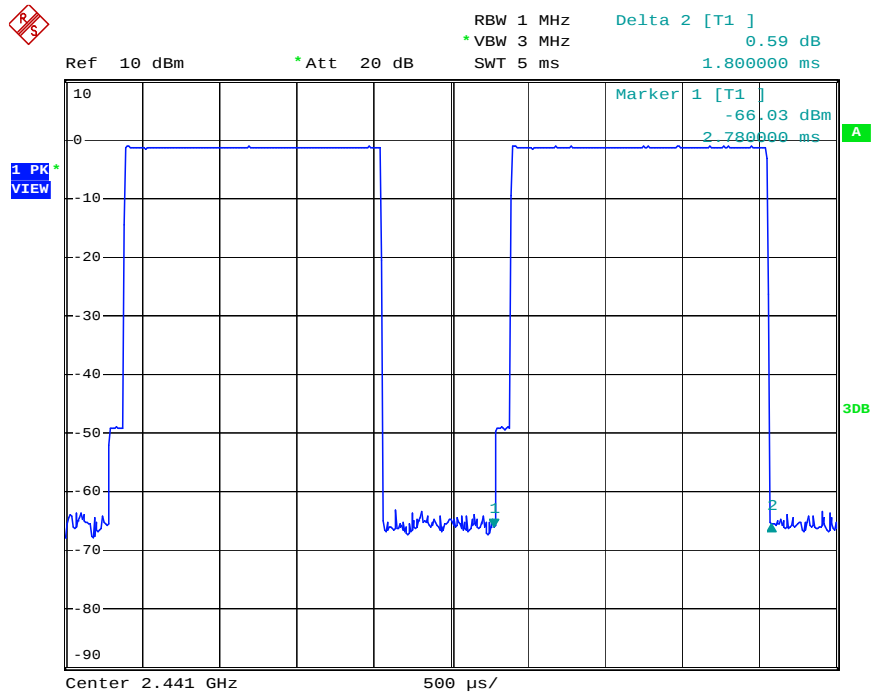
## DH1 High channel



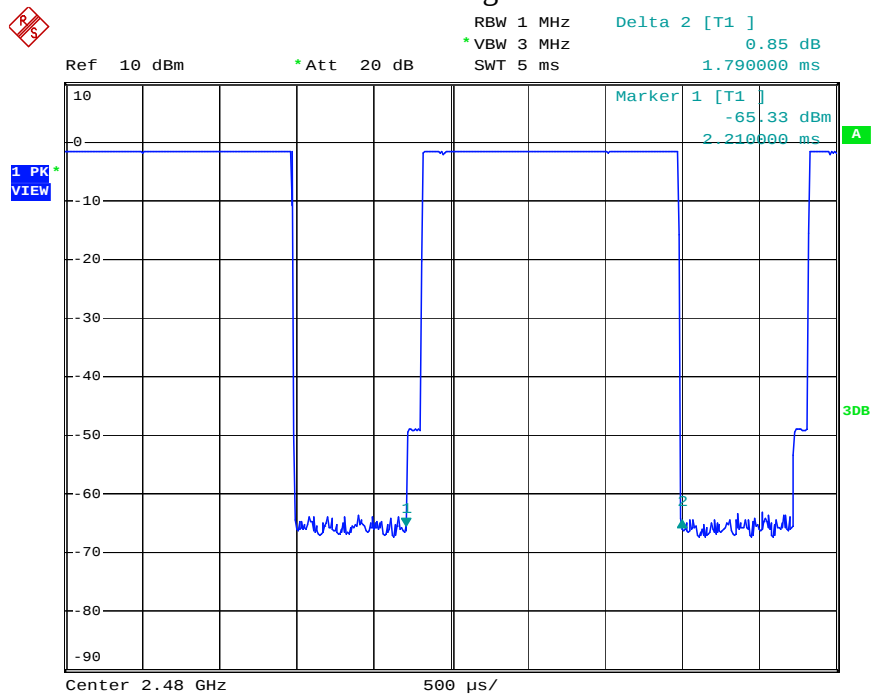
## DH3 Low channel



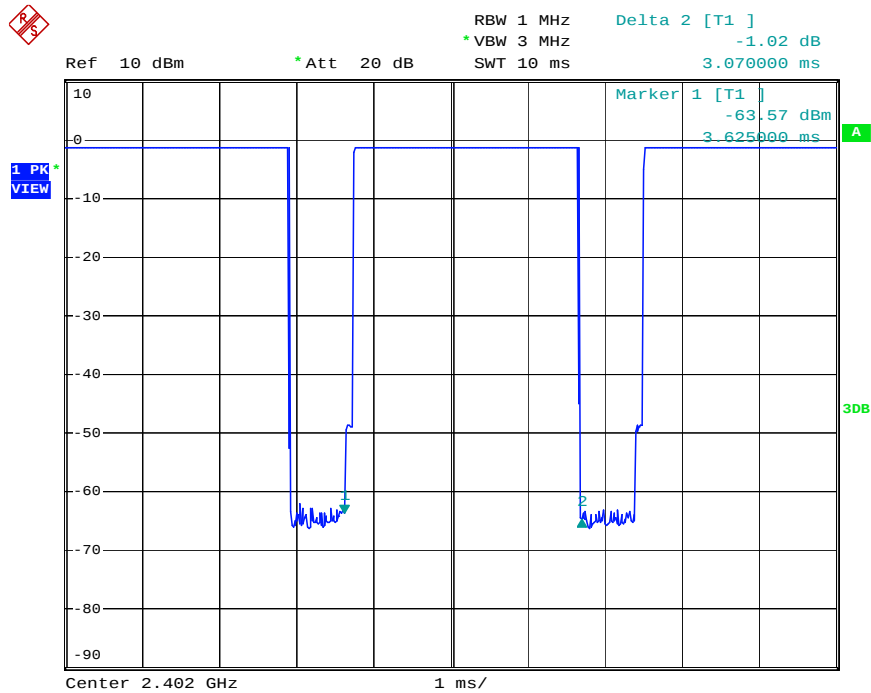
## DH3 Middle channel



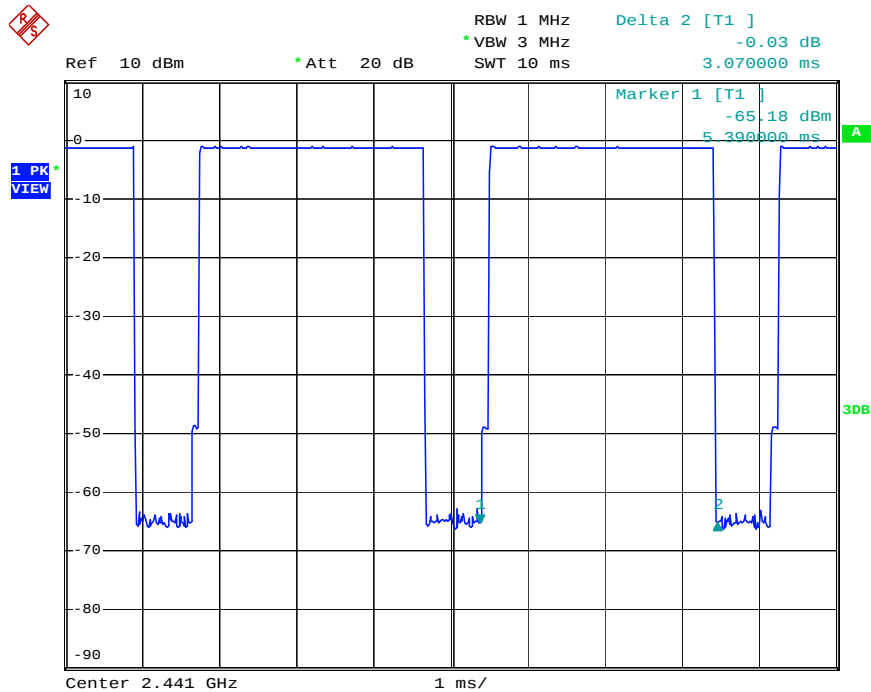
## DH3 High channel



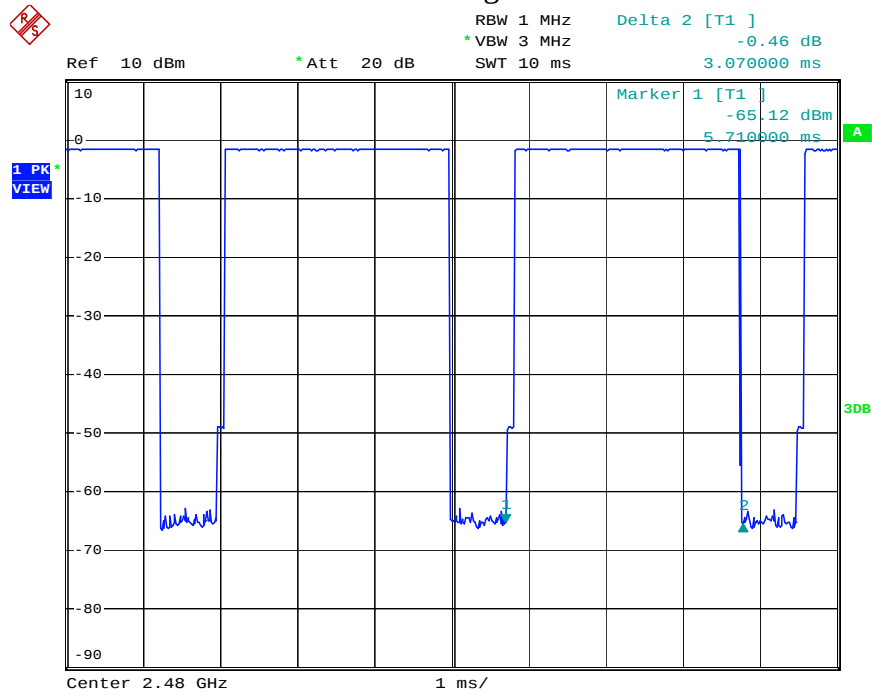
## DH5 Low channel



## DH5 Middle channel

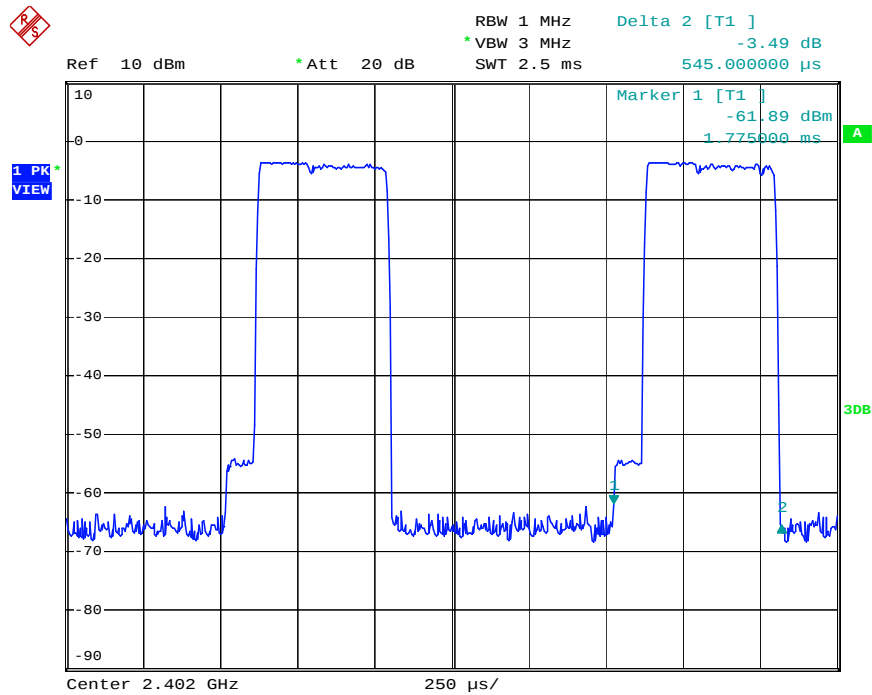


## DH5 High channel

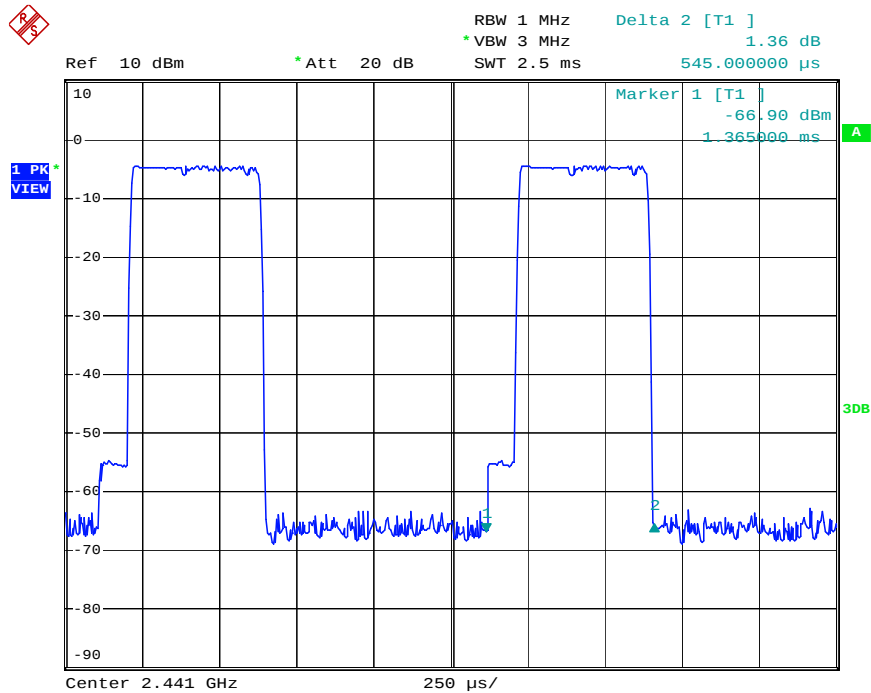


Mode 2:  $\pi/4$  DQPSK Link Mode

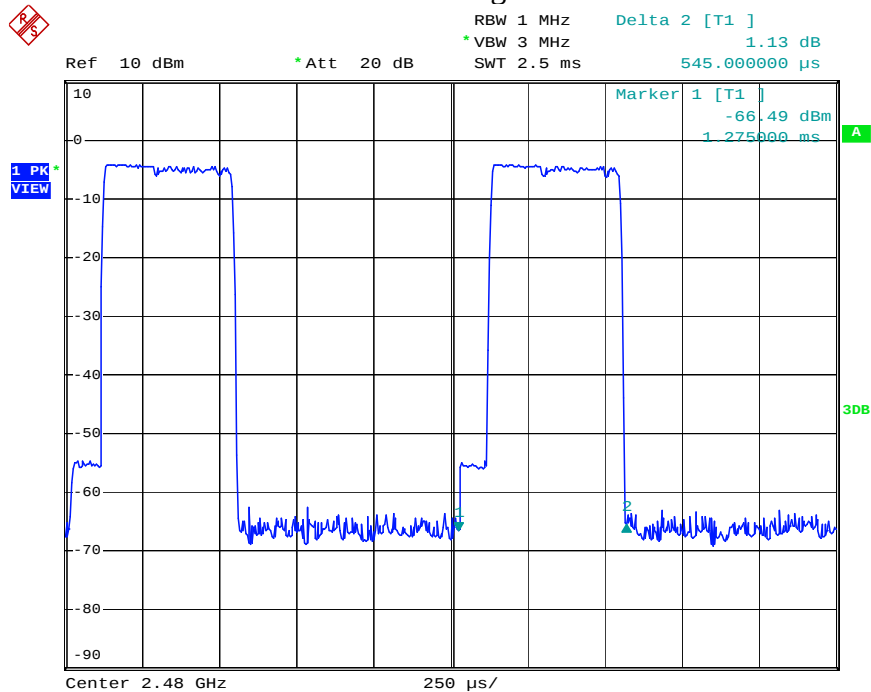
## 2DH1 Low channel



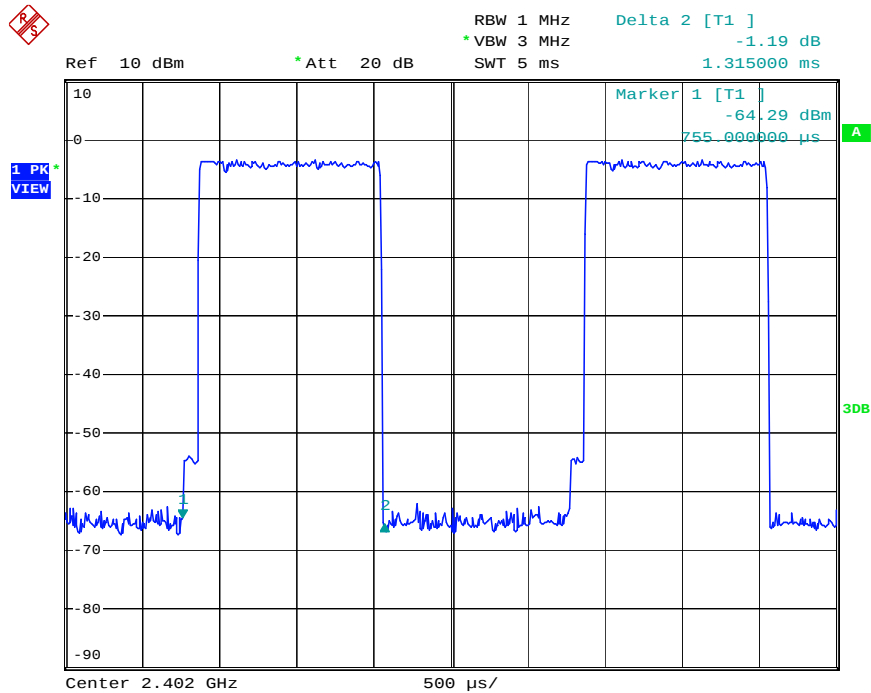
## 2DH1 Middle channel



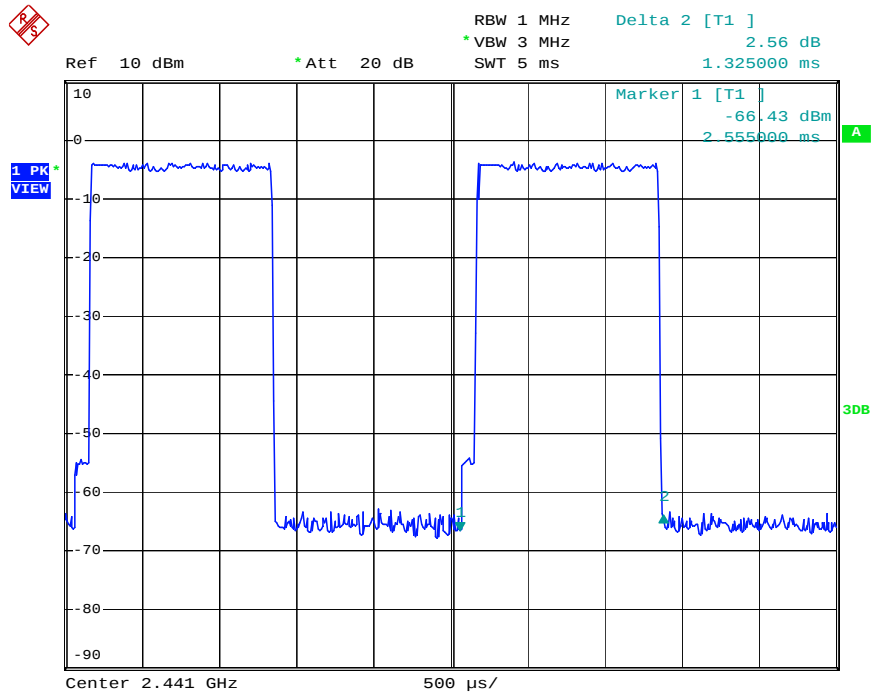
## 2DH1 High channel



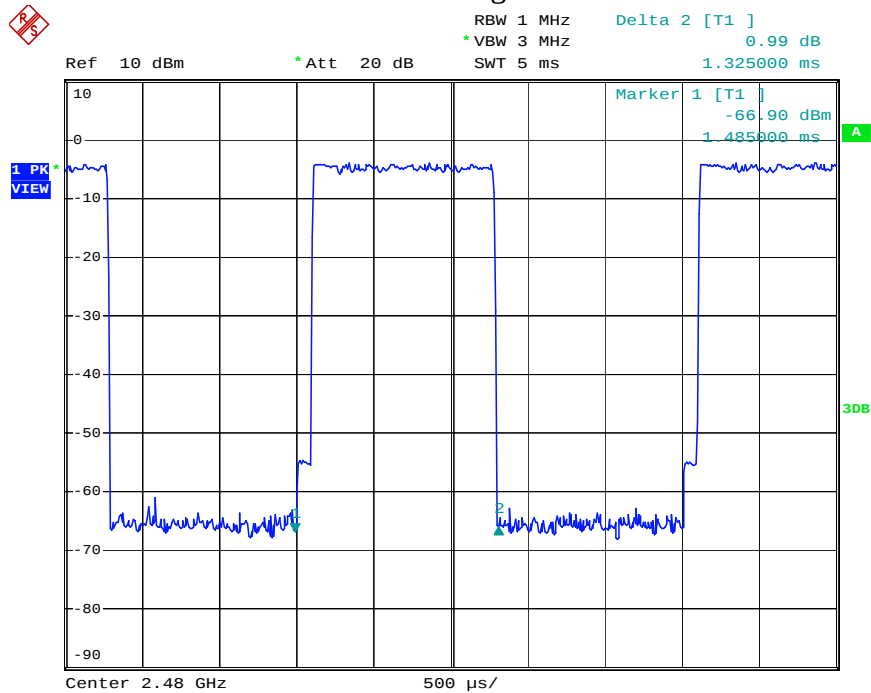
## 2DH3 Low channel



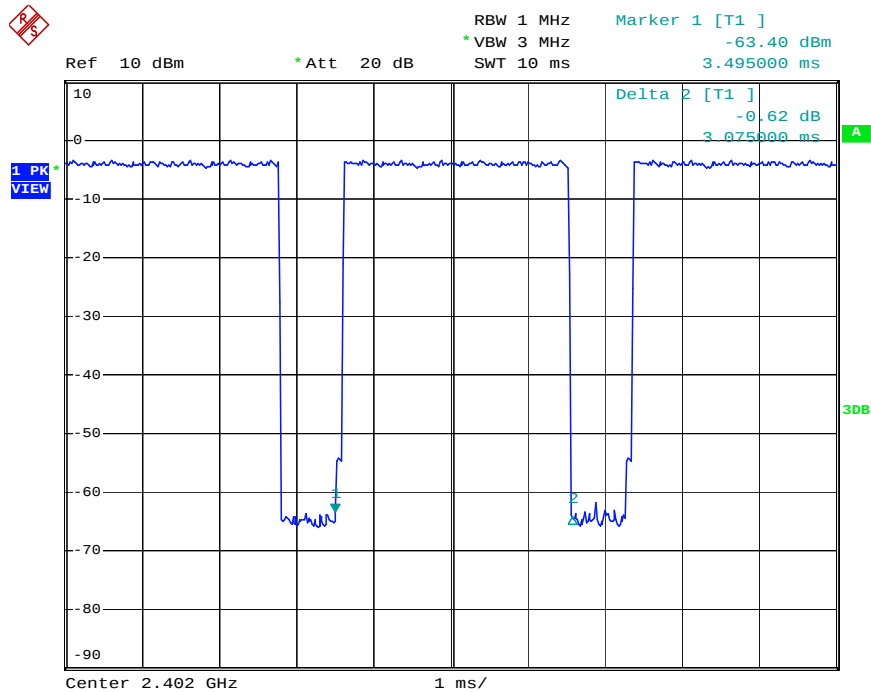
## 2DH3 Middle channel



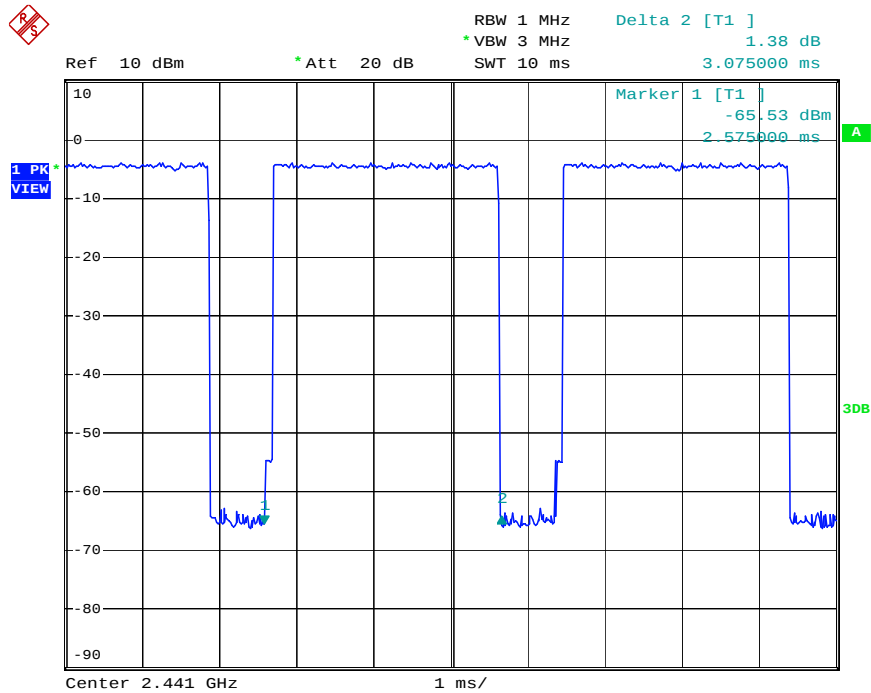
## 2DH3 High channel



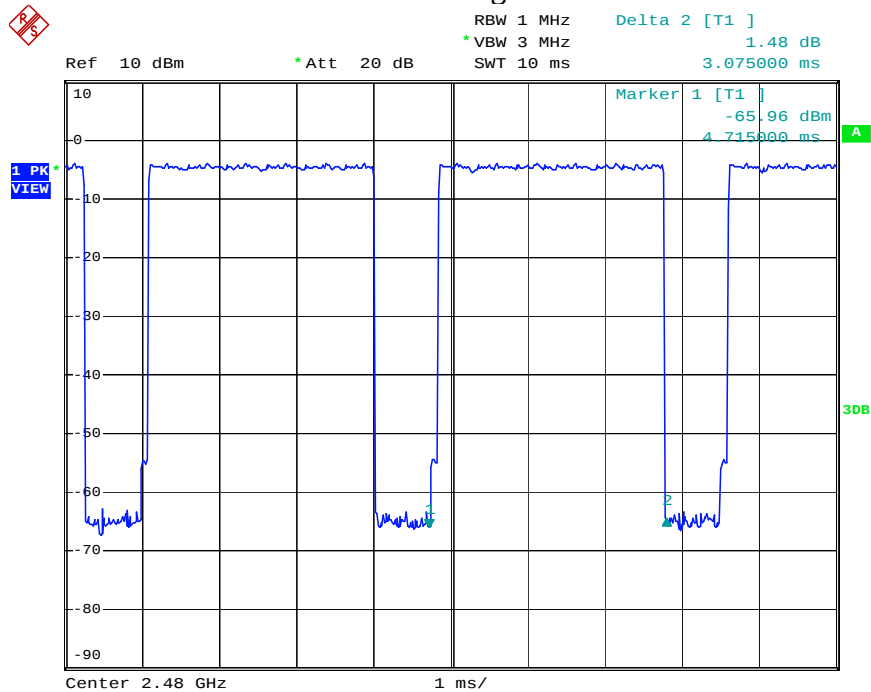
## 2DH5 Low channel



## 2DH5 Middle channel

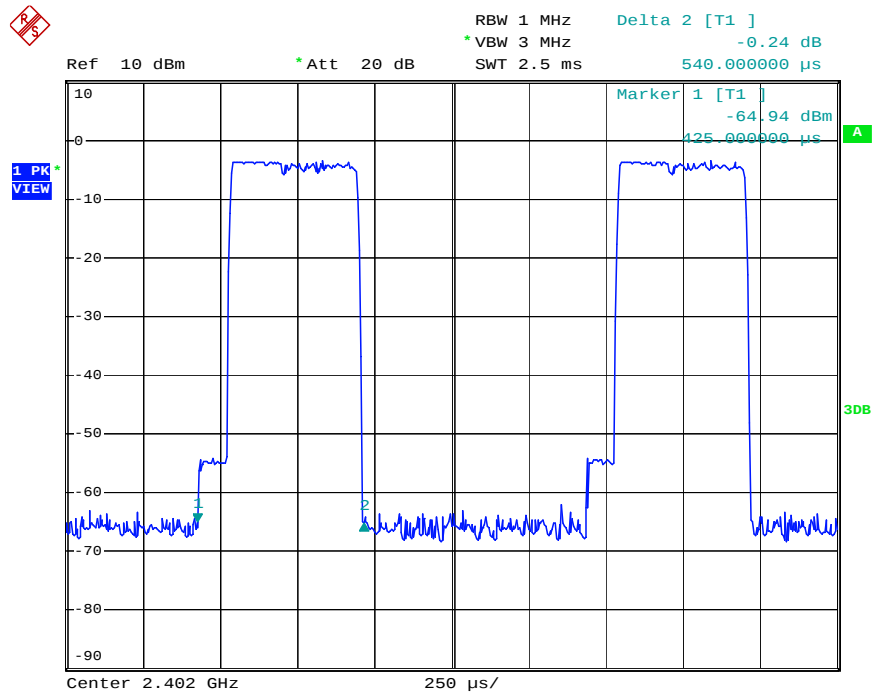


## 2DH5 High channel

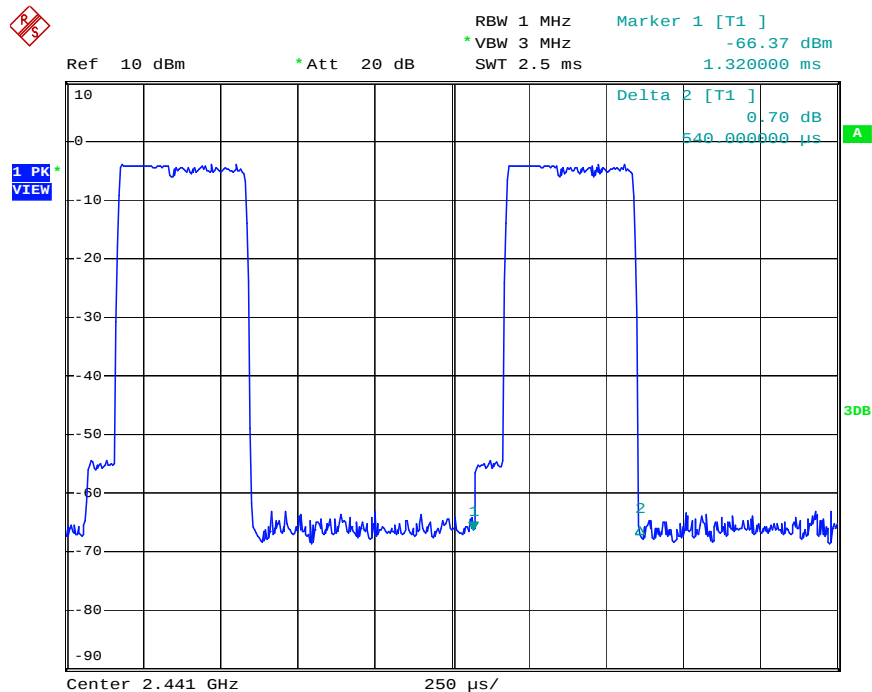


## Mode 3: 8DPSK Link Mode

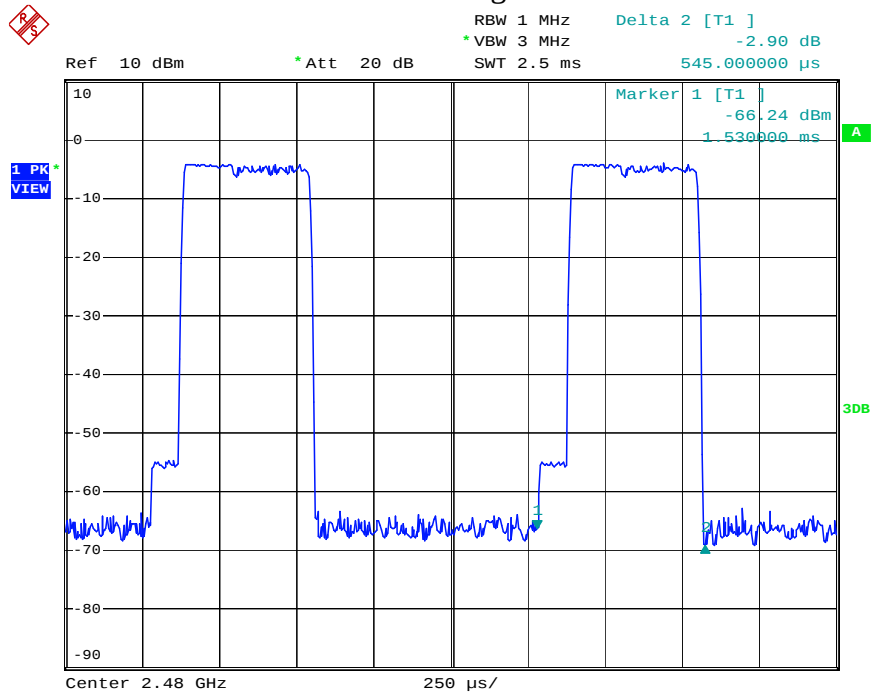
### 3DH1 Low channel



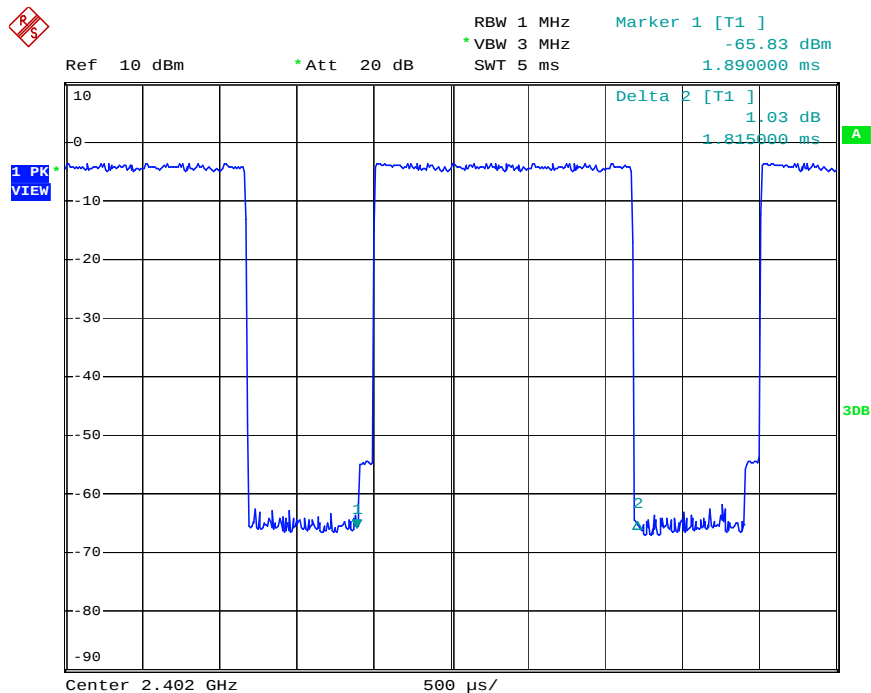
### 3DH1 Middle channel



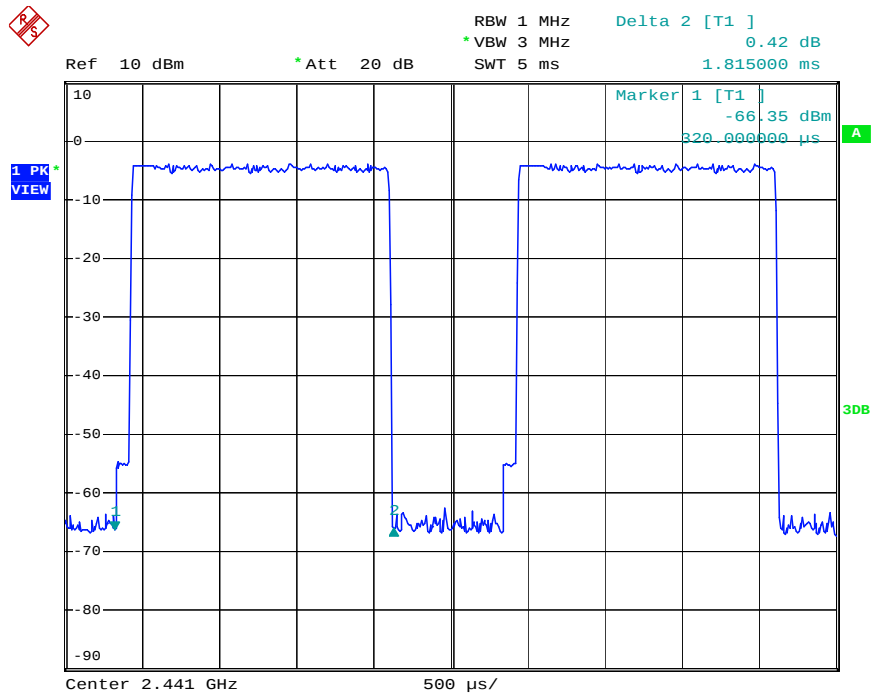
## 3DH1 High channel



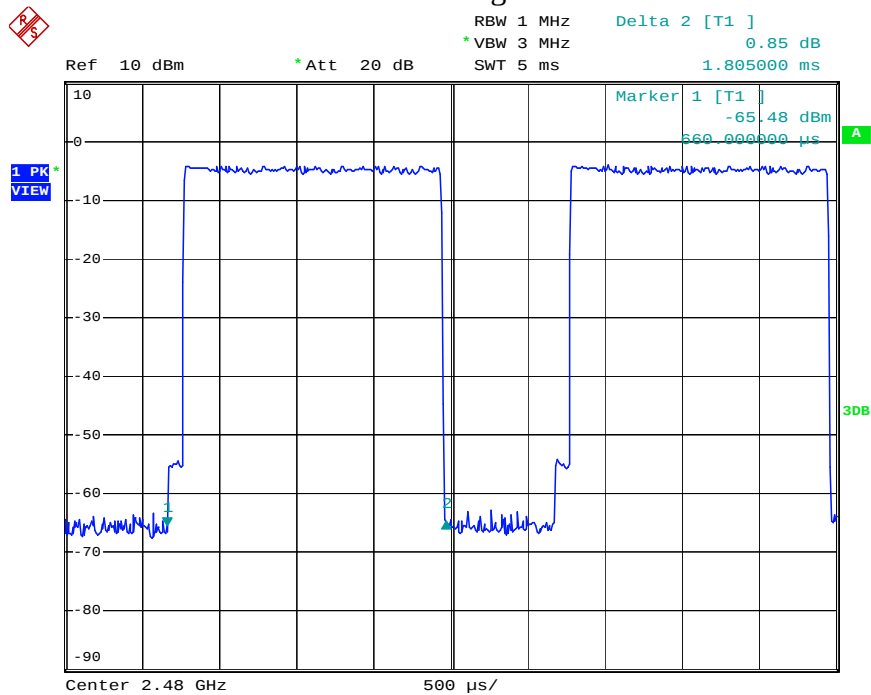
## 3DH3 Low channel



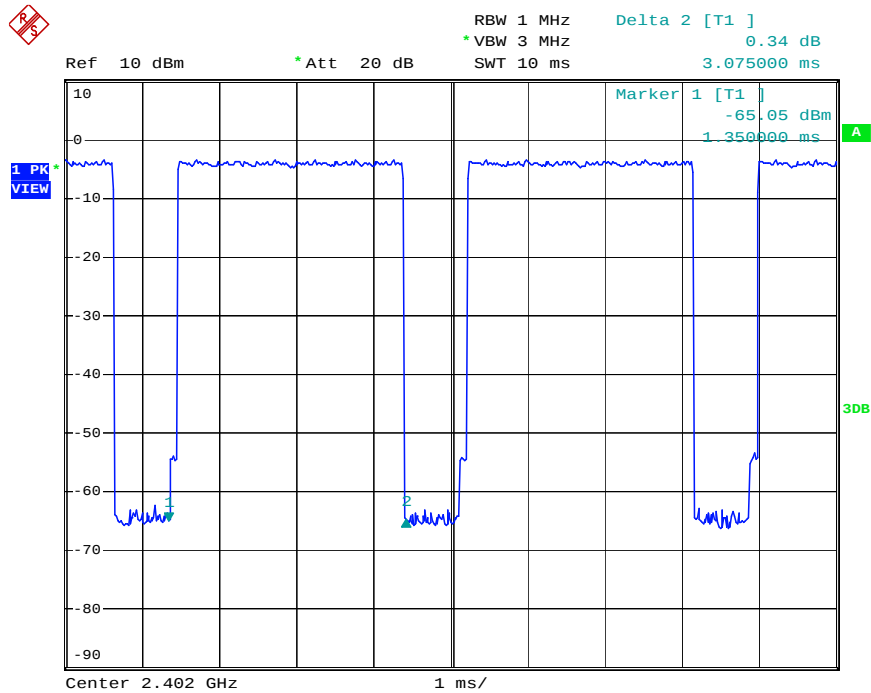
## 3DH3 Middle channel



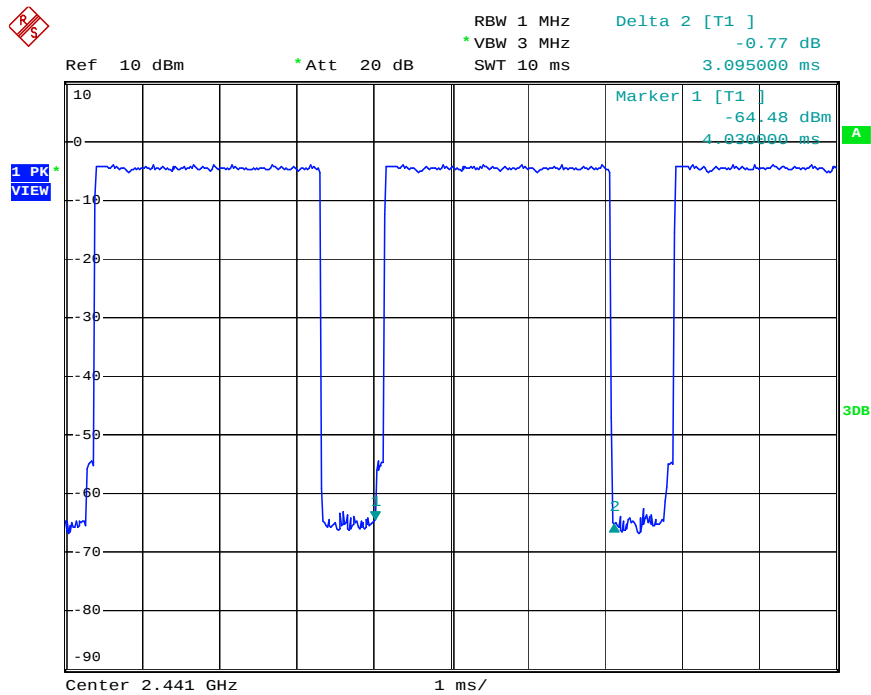
## 3DH3 High channel



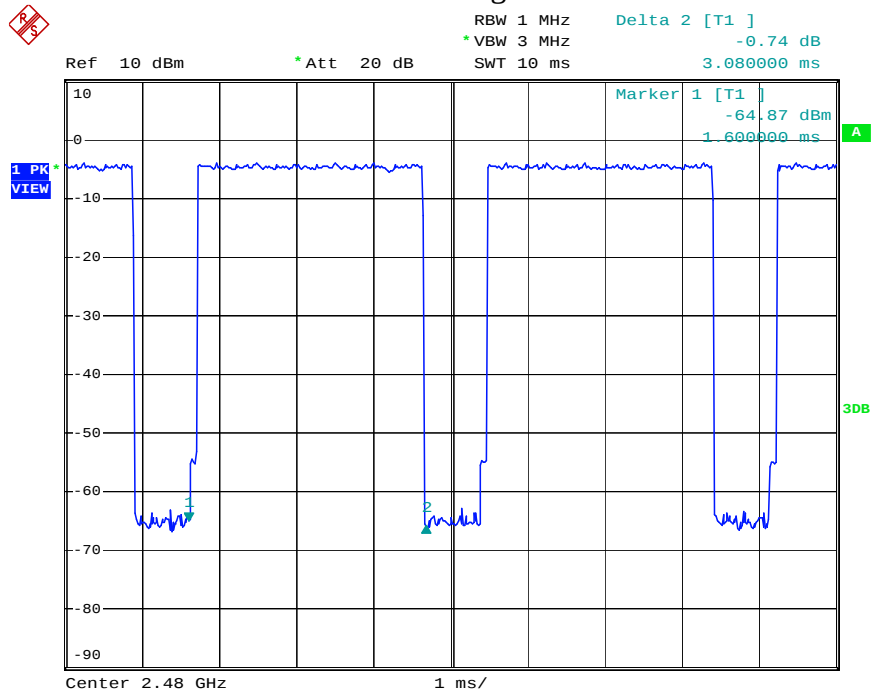
## 3DH5 Low channel



## 3DH5 Middle channel



## 3DH5 High channel



## 9. MAXIMUM PEAK OUTPUT POWER TEST

### 9.1. Block Diagram of Test Setup



(EUT: Barcode Scanner)

### 9.2. The Requirement For Section 15.247(b)(1)

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

### 9.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 9.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

## 9.5. Test Procedure

9.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2. Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz for GFSK mode

9.5.3. Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz for other mode

9.5.4. Measurement the maximum peak output power.

## 9.6. Test Result

### GFSK Mode

| Channel | Frequency (MHz) | Peak Output Power(dBm) | Peak Output Power(mW) | Limits dBm / W |
|---------|-----------------|------------------------|-----------------------|----------------|
| Low     | 2402            | -0.66                  | 0.86                  | 30/1.0         |
| Middle  | 2441            | -0.19                  | 0.96                  | 30/1.0         |
| High    | 2480            | 0.03                   | 1.01                  | 30/1.0         |

### II/4-DQPSK Mode

| Channel | Frequency (MHz) | Peak Output Power(dBm) | Peak Output Power(mW) | Limits dBm / W |
|---------|-----------------|------------------------|-----------------------|----------------|
| Low     | 2402            | -2.24                  | 0.60                  | 21 / 0.125     |
| Middle  | 2441            | -1.59                  | 0.69                  | 21 / 0.125     |
| High    | 2480            | -1.66                  | 0.68                  | 21 / 0.125     |

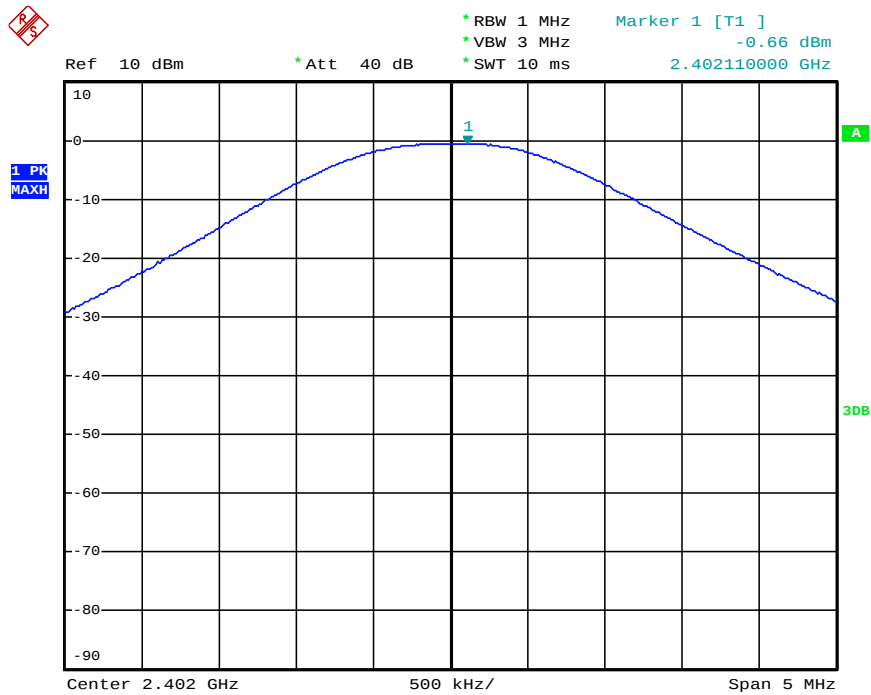
### 8DPSK Mode

| Channel | Frequency (MHz) | Peak Output Power(dBm) | Peak Output Power(mW) | Limits dBm / W |
|---------|-----------------|------------------------|-----------------------|----------------|
| Low     | 2402            | -1.93                  | 0.64                  | 21 / 0.125     |
| Middle  | 2441            | -1.75                  | 0.67                  | 21 / 0.125     |
| High    | 2480            | -1.44                  | 0.72                  | 21 / 0.125     |

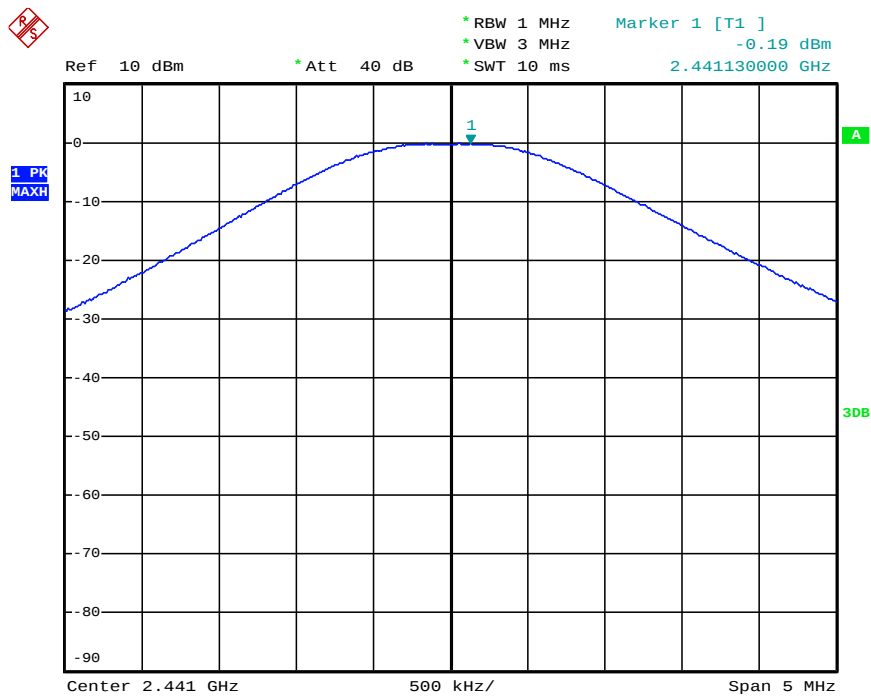
The spectrum analyzer plots are attached as below.

## GFSK Mode

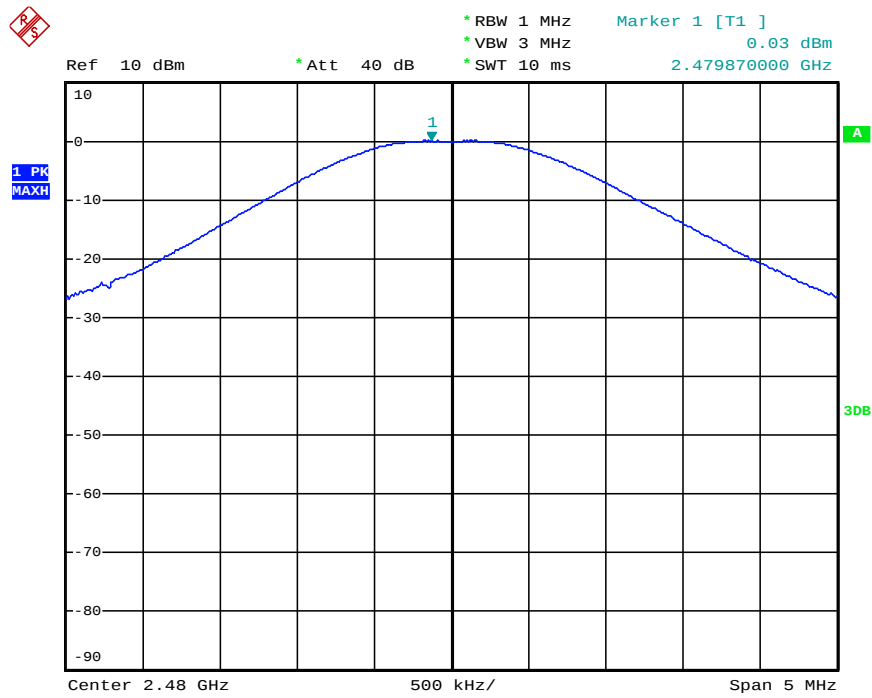
### Low channel



### Middle channel

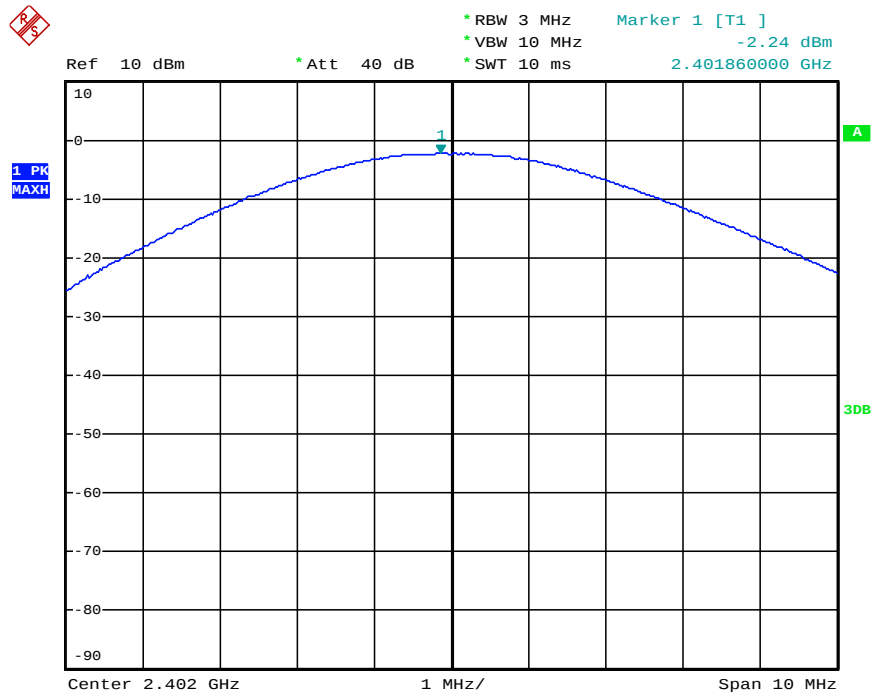


## High channel

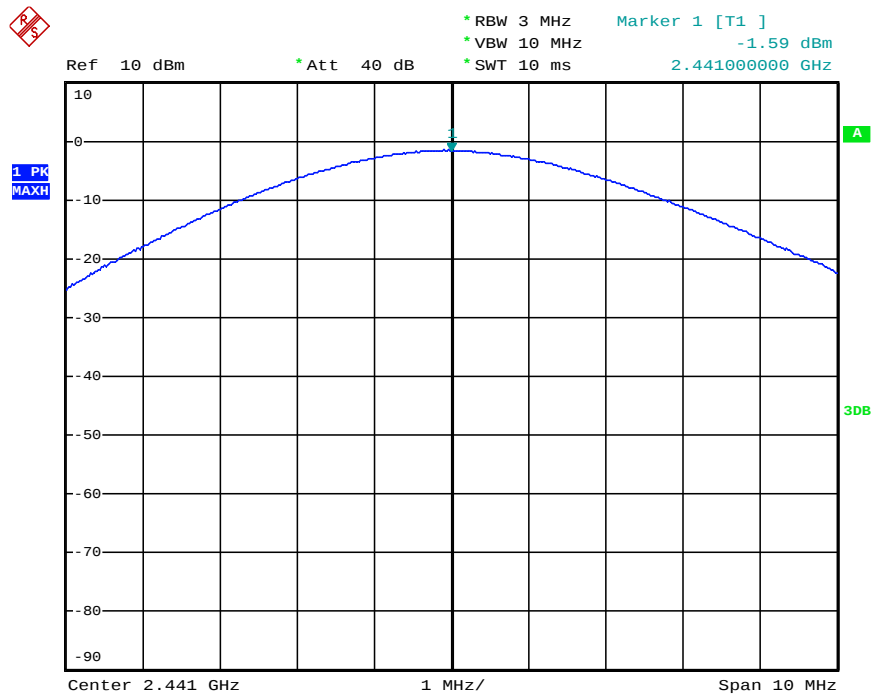


## II/4-DQPSK Mode

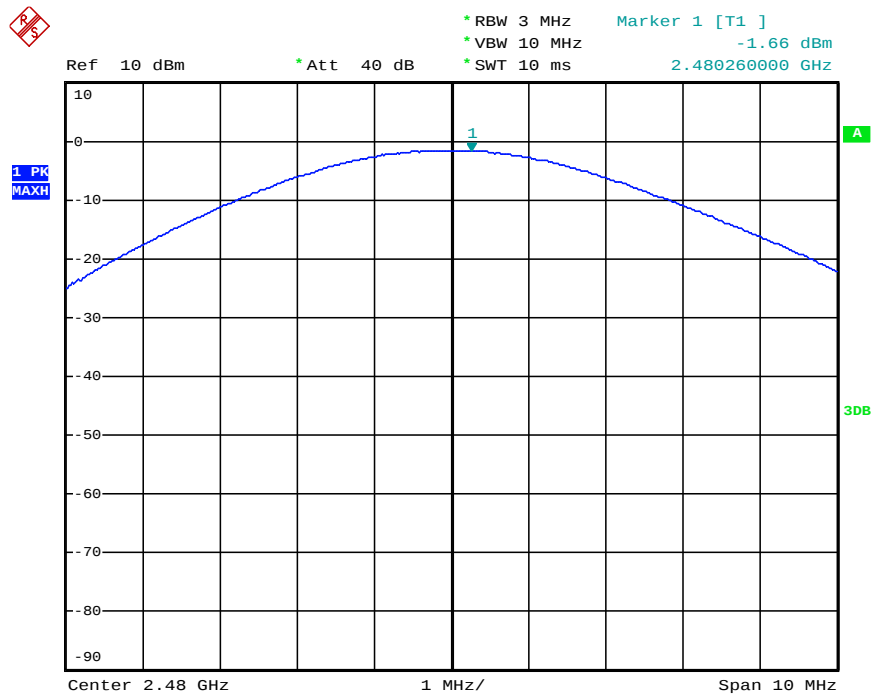
## Low channel



## Middle channel

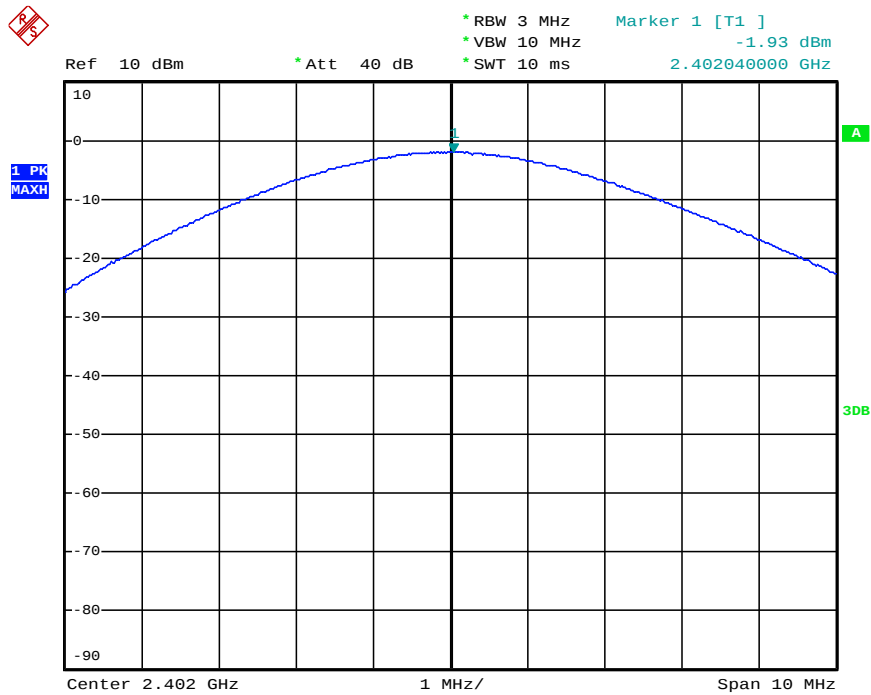


## High channel

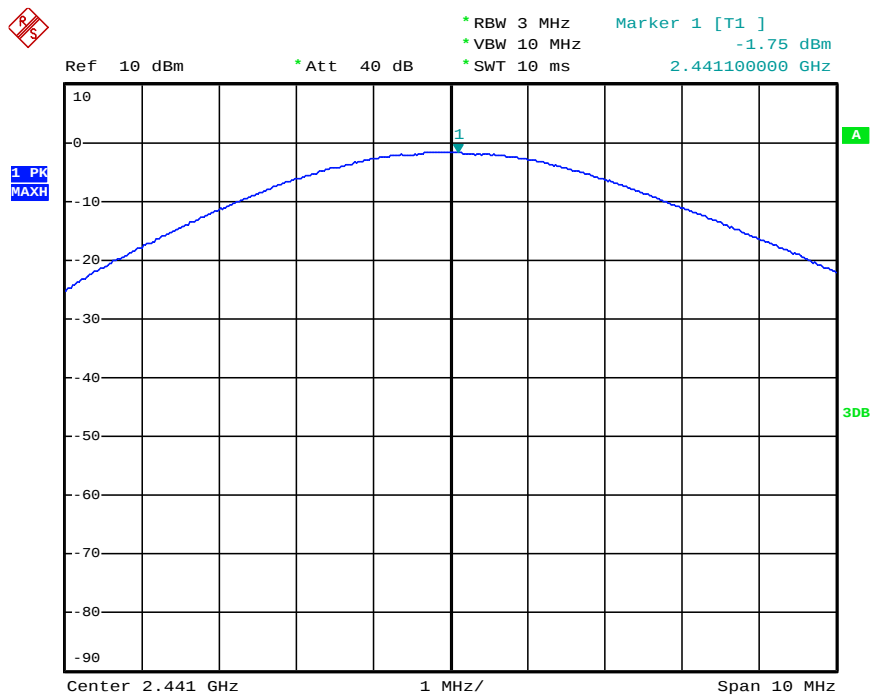


## 8DPSK Mode

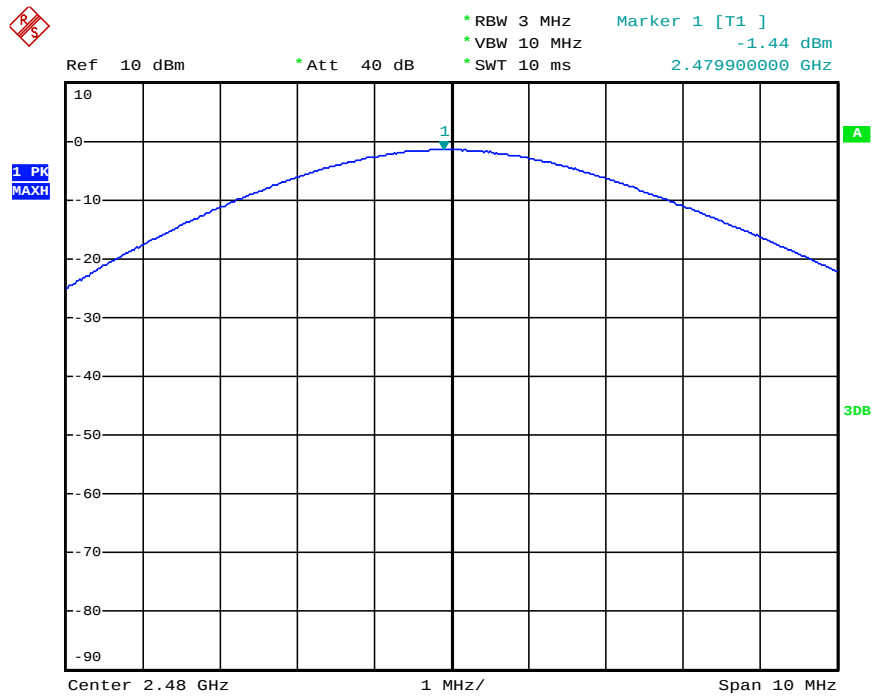
### Low channel



### Middle channel



## High channel



## 10.RADIATED EMISSION TEST

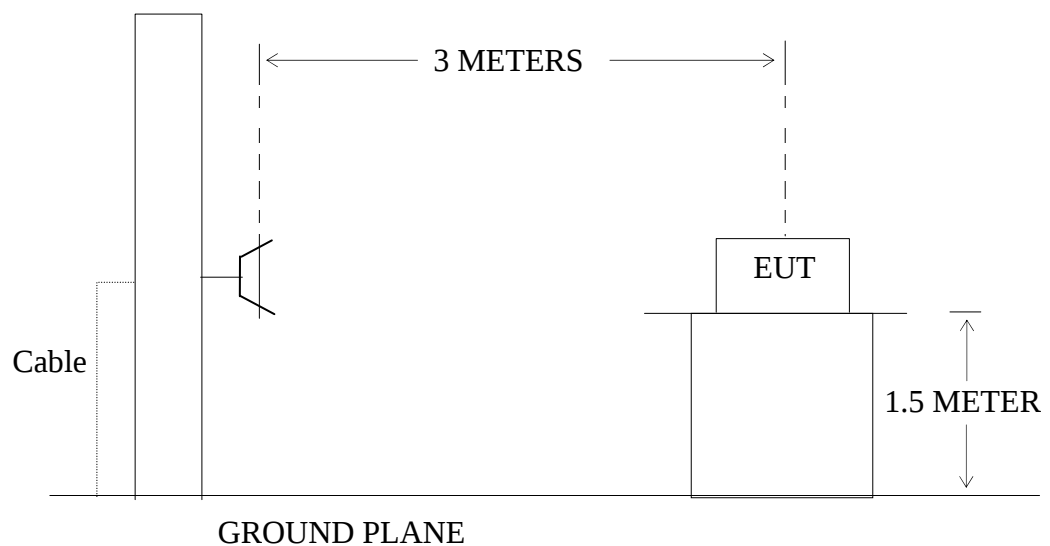
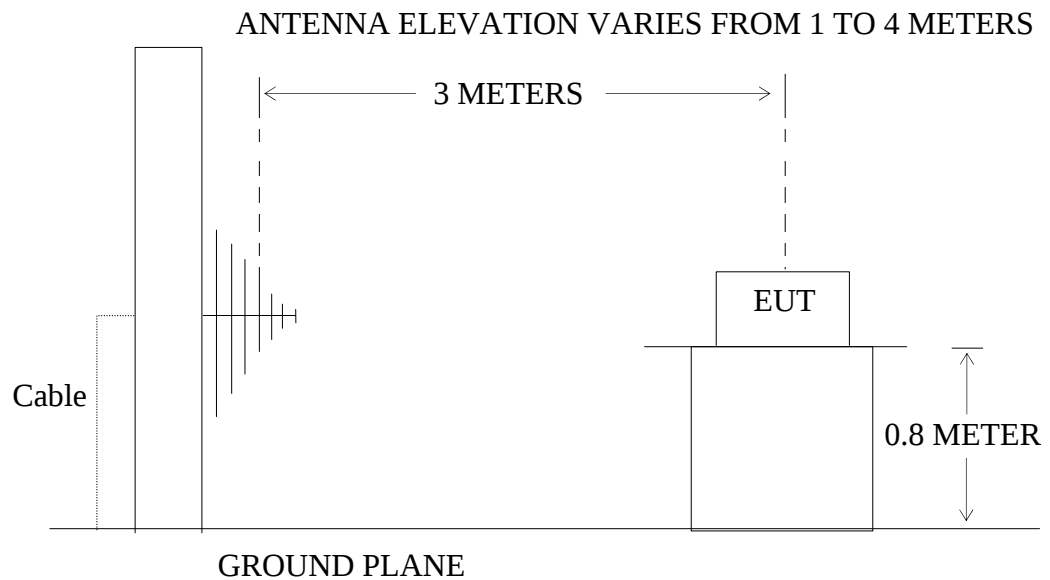
### 10.1.Block Diagram of Test Setup

#### 10.1.1.Block diagram of connection between the EUT and simulators



(EUT: Barcode Scanner)

#### 10.1.2.Anechoic Chamber Test Setup Diagram



## 10.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

## 10.3.Restricted bands of operation

### 10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                      | MHz                 | MHz           | GHz              |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| <sup>1</sup> 0.495-0.505 | 16.69475-16.69525   | 608-614       | 5.35-5.46        |
| 2.1735-2.1905            | 16.80425-16.80475   | 960-1240      | 7.25-7.75        |
| 4.125-4.128              | 25.5-25.67          | 1300-1427     | 8.025-8.5        |
| 4.17725-4.17775          | 37.5-38.25          | 1435-1626.5   | 9.0-9.2          |
| 4.20725-4.20775          | 73-74.6             | 1645.5-1646.5 | 9.3-9.5          |
| 6.215-6.218              | 74.8-75.2           | 1660-1710     | 10.6-12.7        |
| 6.26775-6.26825          | 108-121.94          | 1718.8-1722.2 | 13.25-13.4       |
| 6.31175-6.31225          | 123-138             | 2200-2300     | 14.47-14.5       |
| 8.291-8.294              | 149.9-150.05        | 2310-2390     | 15.35-16.2       |
| 8.362-8.366              | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4        |
| 8.37625-8.38675          | 156.7-156.9         | 2690-2900     | 22.01-23.12      |
| 8.41425-8.41475          | 162.0125-167.17     | 3260-3267     | 23.6-24.0        |
| 12.29-12.293             | 167.72-173.2        | 3332-3339     | 31.2-31.8        |
| 12.51975-12.52025        | 240-285             | 3345.8-3358   | 36.43-36.5       |
| 12.57675-12.57725        | 322-335.4           | 3600-4400     | ( <sup>2</sup> ) |
| 13.36-13.41              |                     |               |                  |

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510

<sup>2</sup>Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section

15.35 apply to these measurements.

#### 10.4. Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 10.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter (below 1G) or 1.5 meter (above 1G) high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10-2013 on radiated emission measurement.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

RBW (120 kHz), VBW (300 kHz) for QP detector below 1GHz

Peak detector above 1GHz

RBW (1 MHz), VBW (3MHz) for Peak measurement

RBW (1 MHz), VBW (10Hz) for AV measurement

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

## 10.6.The Field Strength of Radiation Emission Measurement Results

**Note: 1.**We tested GFSK mode,  $\Pi/4$ -DQPSK Mode & 8DPSK mode and recorded the worst case data (8DPSK mode) for all test mode.

**2.** The fundamental radiated emissions were reduced by 2.4G Band Reject Filter in the attached plots.

**3.** The 18-25GHz emissions are not reported, because the levels are too low against the limit.

**4.** The EUT is tested radiation emission in three axes. The worst emissions are reported in all channels.



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Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star2015 #711

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2402MHz

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

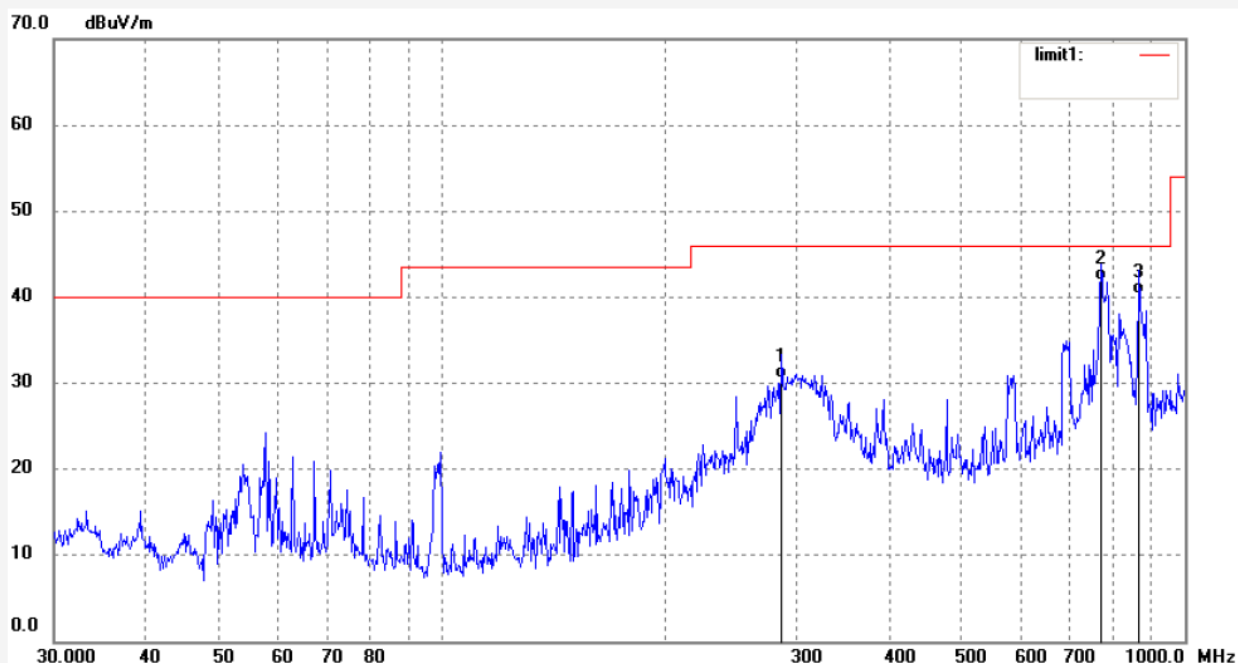
Date: 15/05/28/

Time: 8/39/08

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 286.2653    | 48.60            | -18.14      | 30.46           | 46.00          | -15.54      | QP       |             |               |        |
| 2   | 771.0475    | 50.10            | -8.26       | 41.84           | 46.00          | -4.16       | QP       |             |               |        |
| 3   | 868.8859    | 46.97            | -6.64       | 40.33           | 46.00          | -5.67       | QP       |             |               |        |



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Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star2015 #712

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Humidity(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2402MHz

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

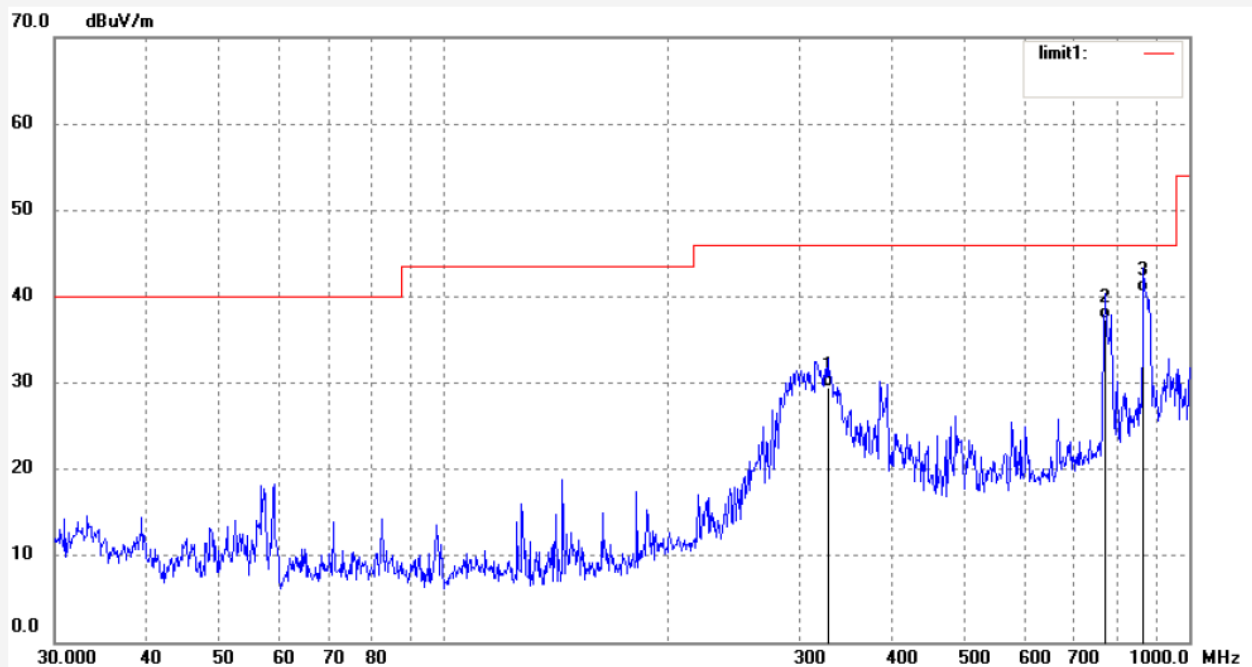
Date: 15/05/28/

Time: 8/39/55

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107

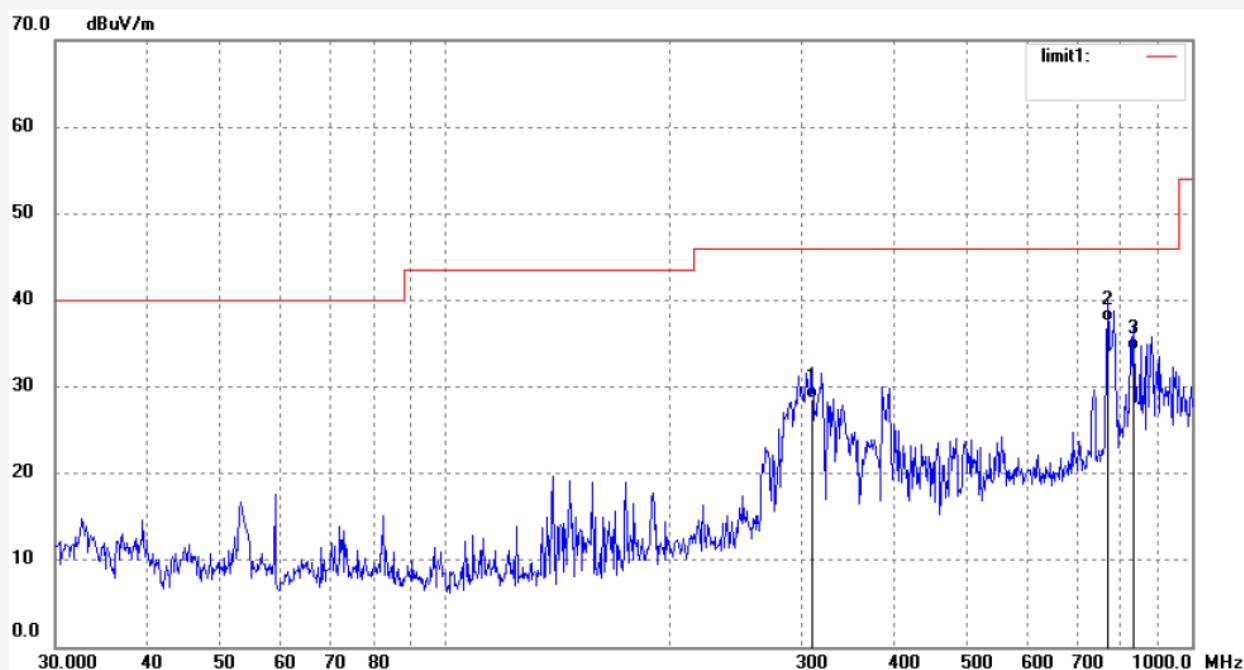


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 327.1553    | 46.55            | -17.11      | 29.44           | 46.00          | -16.56      | QP       |             |               |        |
| 2   | 771.0475    | 45.67            | -8.26       | 37.41           | 46.00          | -8.59       | QP       |             |               |        |
| 3   | 868.8859    | 47.10            | -6.64       | 40.46           | 46.00          | -5.54       | QP       |             |               |        |

Job No.: star2015 #713  
Standard: FCC Class B 3M Radiated  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 55 %  
EUT: Barcode Scanner  
Mode: TX 2441MHz  
Model: MS3390  
Manufacturer: MinDe

Polarization: Vertical  
Power Source: DC 5V  
Date: 15/05/28/  
Time: 8/41/10  
Engineer Signature:  
Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 310.3594    | 46.24            | -17.66      | 28.58           | 46.00          | -17.42      | QP       |             |               |        |
| 2   | 771.0475    | 45.72            | -8.26       | 37.46           | 46.00          | -8.54       | QP       |             |               |        |
| 3   | 835.9447    | 41.39            | -7.18       | 34.21           | 46.00          | -11.79      | QP       |             |               |        |

Job No.: star2015 #714

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2441MHz

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

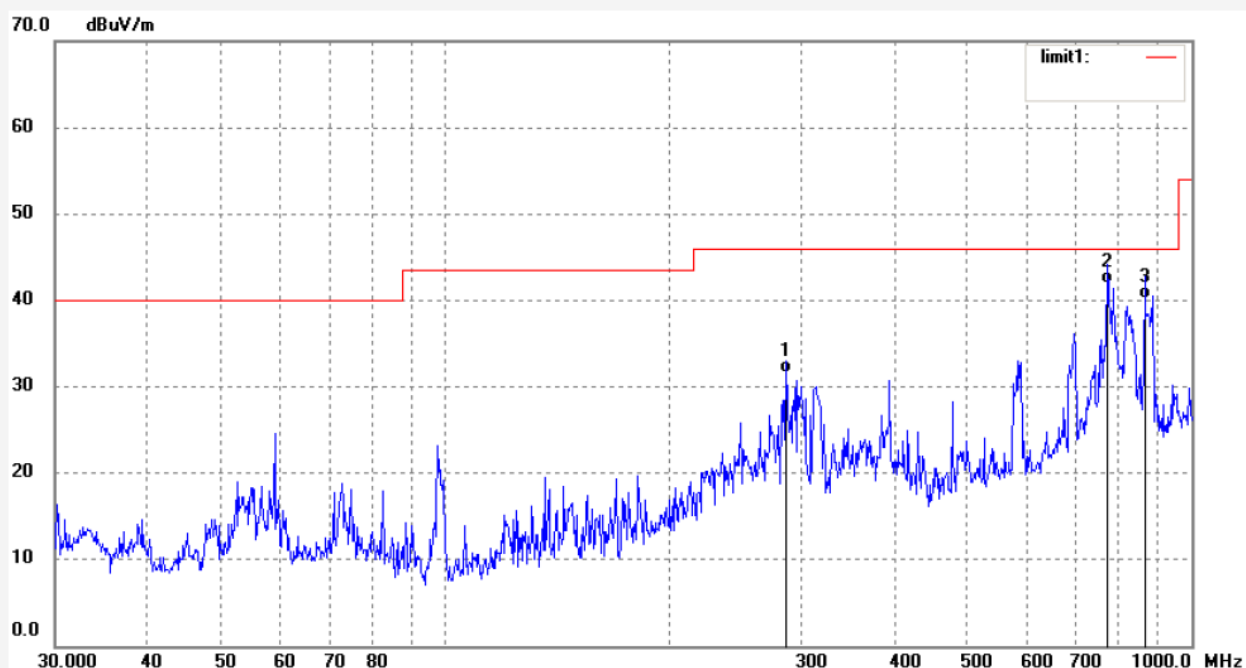
Date: 15/05/28/

Time: 8/42/46

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 286.2653       | 49.66               | -18.14         | 31.52              | 46.00             | -14.48         | QP       |                |                  |        |
| 2   | 771.0475       | 50.10               | -8.26          | 41.84              | 46.00             | -4.16          | QP       |                |                  |        |
| 3   | 865.8383       | 46.87               | -6.69          | 40.18              | 46.00             | -5.82          | QP       |                |                  |        |

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Job No.: star2015 #715

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2480MHz

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

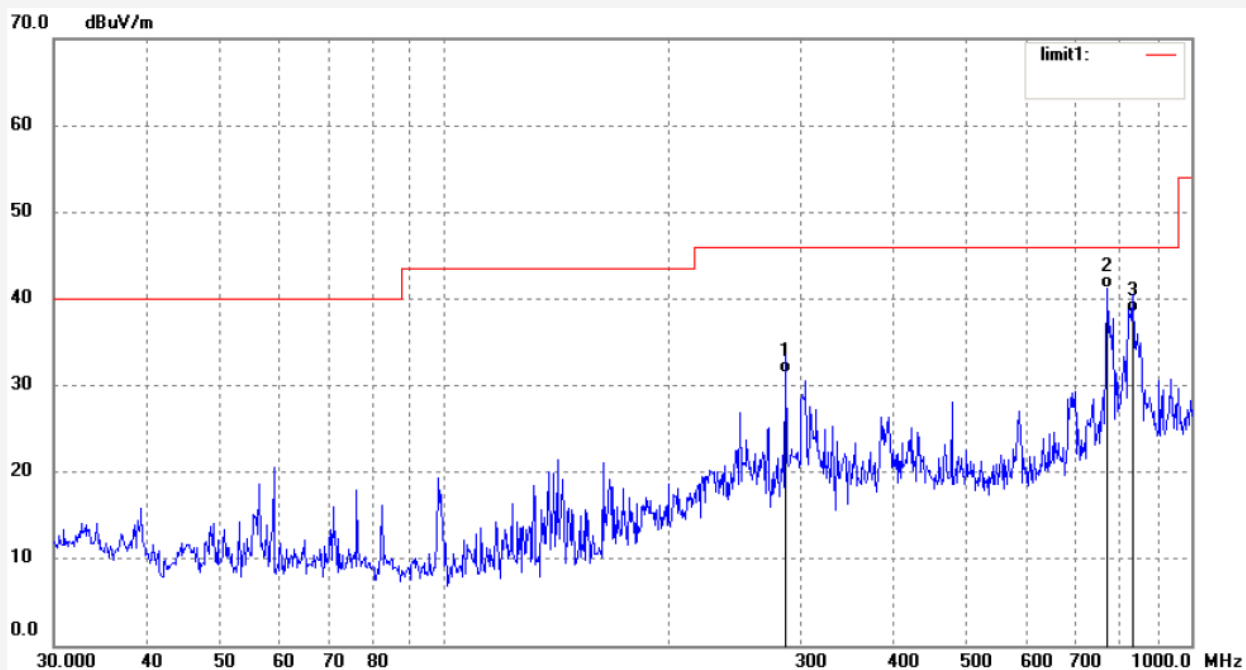
Date: 15/05/28/

Time: 8/44/43

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107

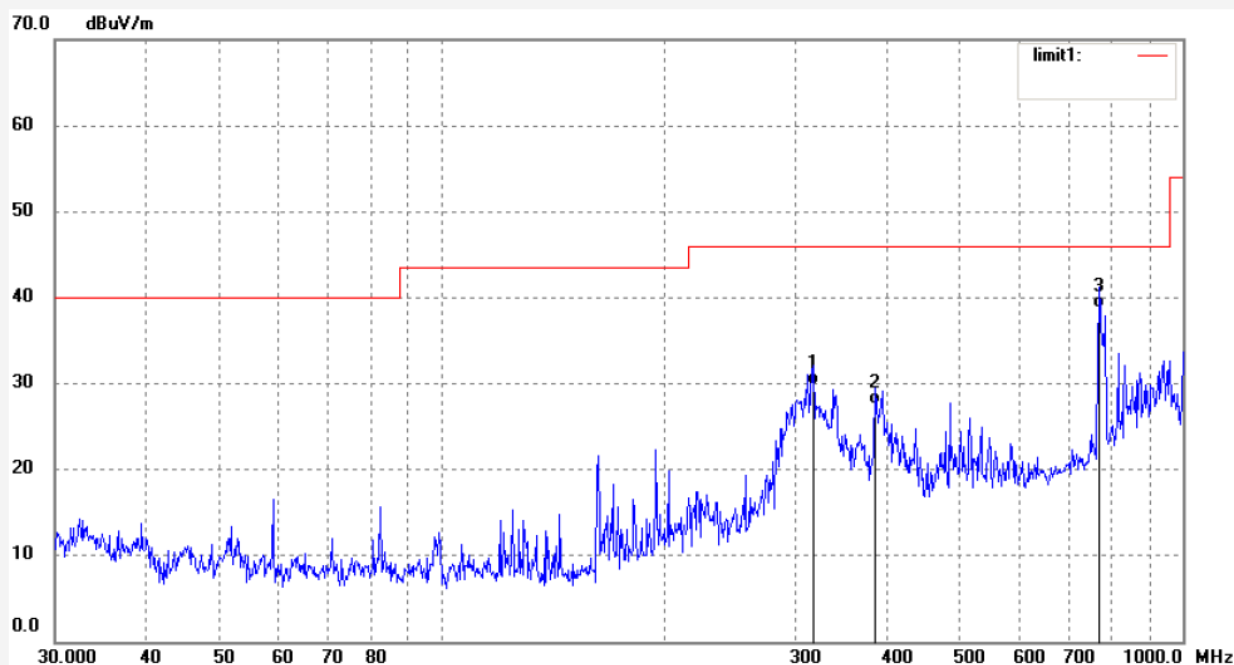


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 286.2653    | 49.55            | -18.14      | 31.41           | 46.00          | -14.59      | QP       |             |               |        |
| 2   | 771.0475    | 49.42            | -8.26       | 41.16           | 46.00          | -4.84       | QP       |             |               |        |
| 3   | 835.9447    | 45.63            | -7.18       | 38.45           | 46.00          | -7.55       | QP       |             |               |        |

Job No.: star2015 #716  
Standard: FCC Class B 3M Radiated  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 55 %  
EUT: Barcode Scanner  
Mode: TX 2480MHz  
Model: MS3390  
Manufacturer: MinDe

Polarization: Vertical  
Power Source: DC 5V  
Date: 15/05/28/  
Time: 8/46/27  
Engineer Signature:  
Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 316.9717       | 47.26               | -17.48         | 29.78              | 46.00             | -16.22         | QP       |                |                  |        |
| 2   | 384.5446       | 43.29               | -15.77         | 27.52              | 46.00             | -18.48         | QP       |                |                  |        |
| 3   | 771.0475       | 47.11               | -8.26          | 38.85              | 46.00             | -7.15          | QP       |                |                  |        |

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Site: 1# Chamber

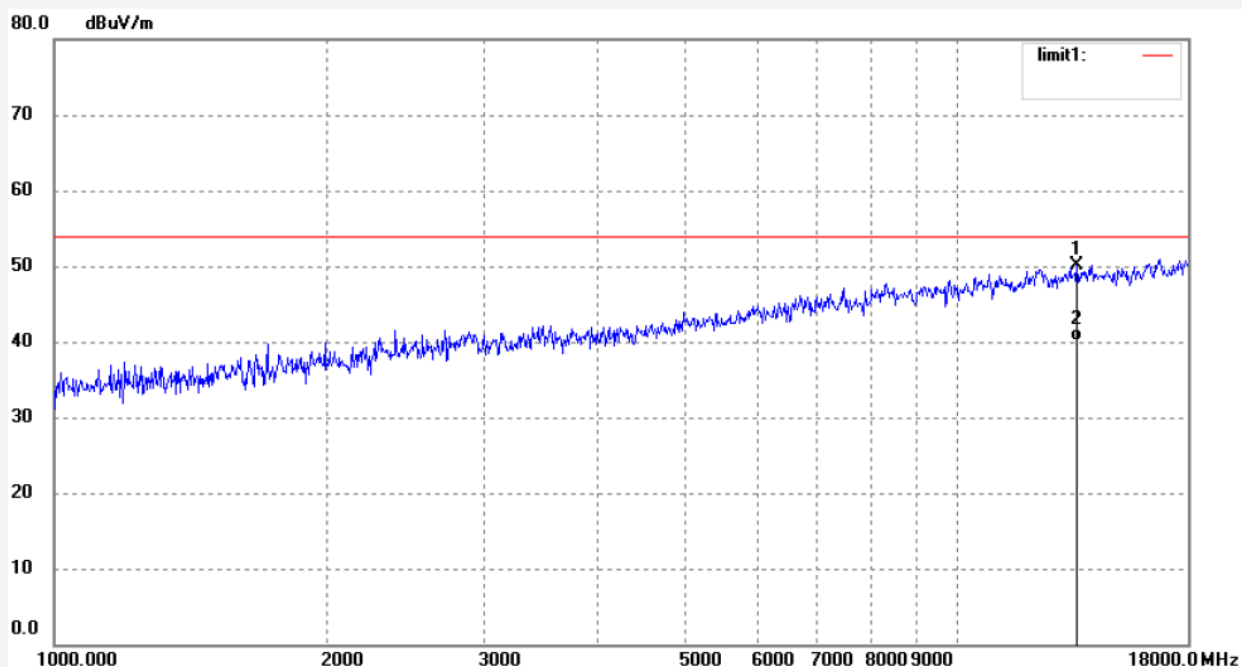
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star2015 #717  
Standard: FCC Class B 3M Radiated  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 55 %  
EUT: Barcode Scanner  
Mode: TX 2402MHz  
Model: MS3390  
Manufacturer: MinDe

Polarization: Vertical  
Power Source: DC 5V  
Date: 15/05/28/  
Time: 8/49/34  
Engineer Signature:  
Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 13572.278      | 39.38               | 10.75          | 50.13              | 54.00             | -3.87          | peak     |                |                  |        |
| 2   | 13572.278      | 29.34               | 10.75          | 40.09              | 54.00             | -13.91         | AVG      |                |                  |        |



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Job No.: star2015 #718

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2402MHz

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

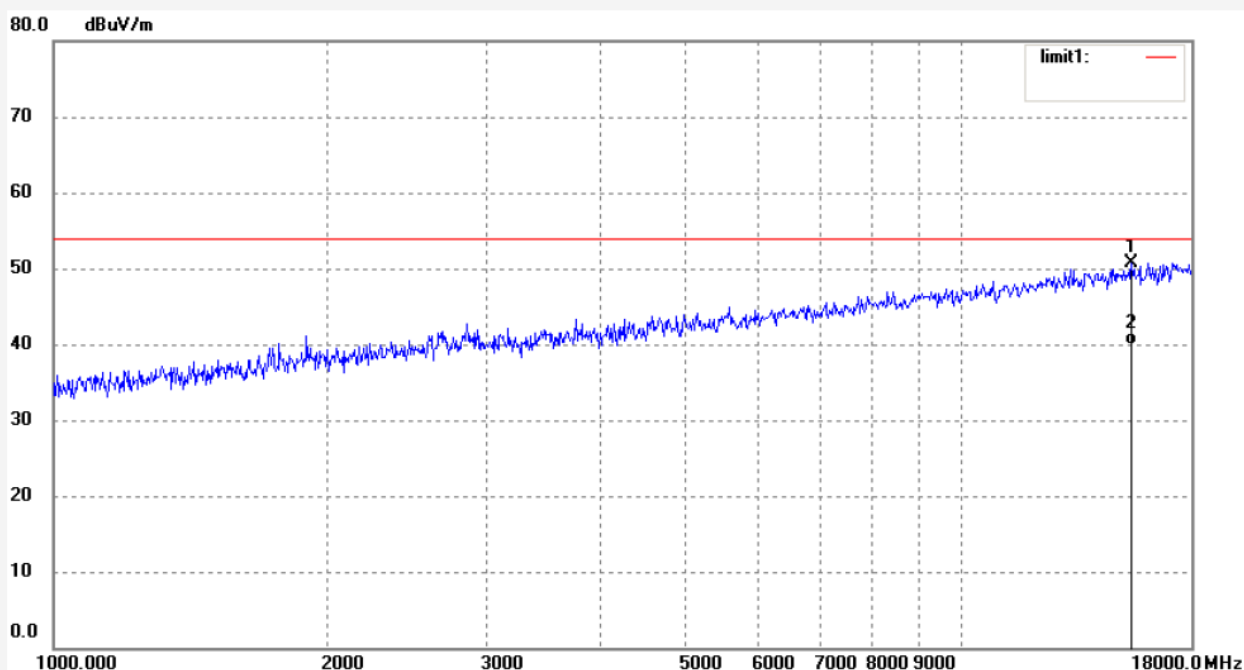
Date: 15/05/28/

Time: 8/50/31

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 15471.706   | 37.49            | 13.15       | 50.64           | 54.00          | -3.36       | peak     |             |               |        |
| 2   | 15471.706   | 26.76            | 13.15       | 39.91           | 54.00          | -14.09      | AVG      |             |               |        |



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Job No.: star2015 #719

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2441MHz

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

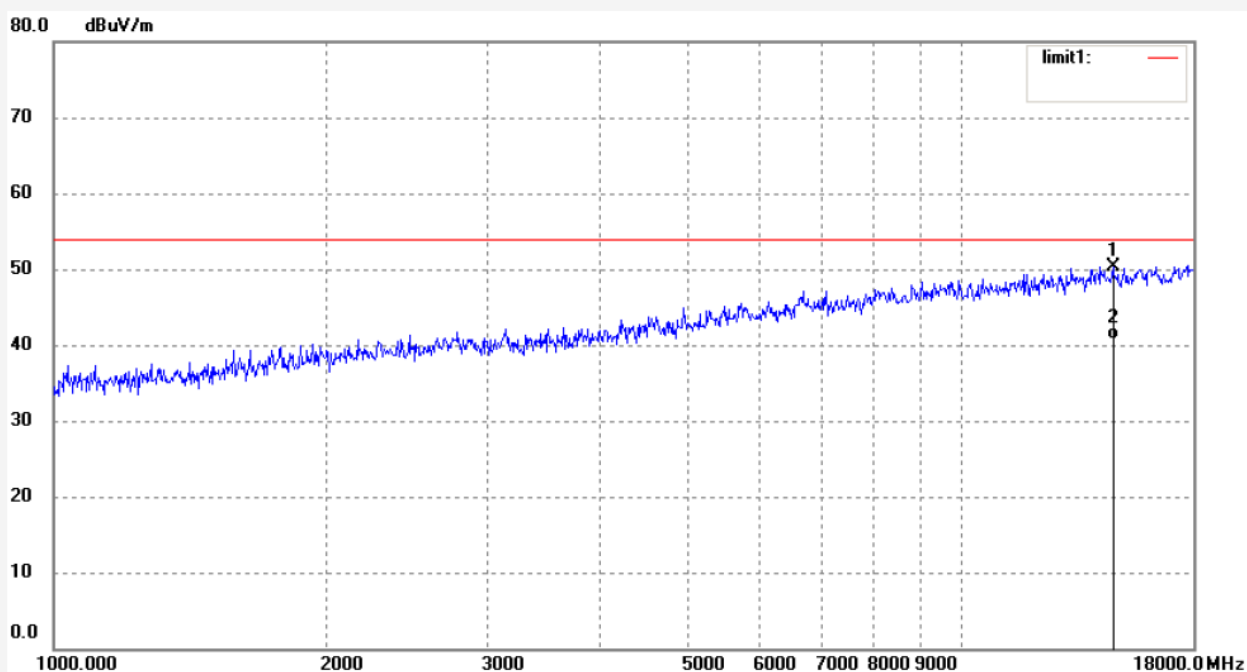
Date: 15/05/28/

Time: 8/51/41

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 14681.959      | 36.11               | 14.28          | 50.39              | 54.00             | -3.61          | peak     |                |                  |        |
| 2   | 14681.959      | 26.43               | 14.28          | 40.71              | 54.00             | -13.29         | AVG      |                |                  |        |



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Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star2015 #720

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2441MHz

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

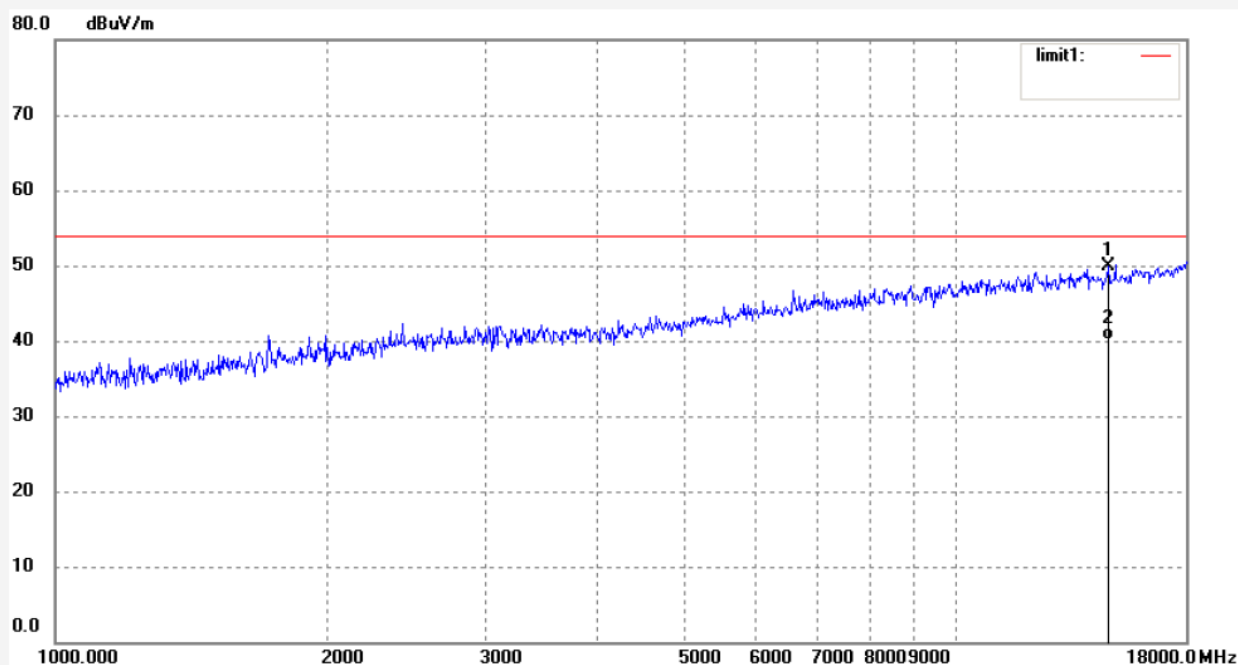
Date: 15/05/28/

Time: 8/53/08

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 14767.679      | 35.65               | 14.16          | 49.81              | 54.00             | -4.19          | peak     |                |                  |        |
| 2   | 14767.679      | 25.97               | 14.16          | 40.13              | 54.00             | -13.87         | AVG      |                |                  |        |

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Site: 1# Chamber

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Job No.: star2015 #721

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2480MHz

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

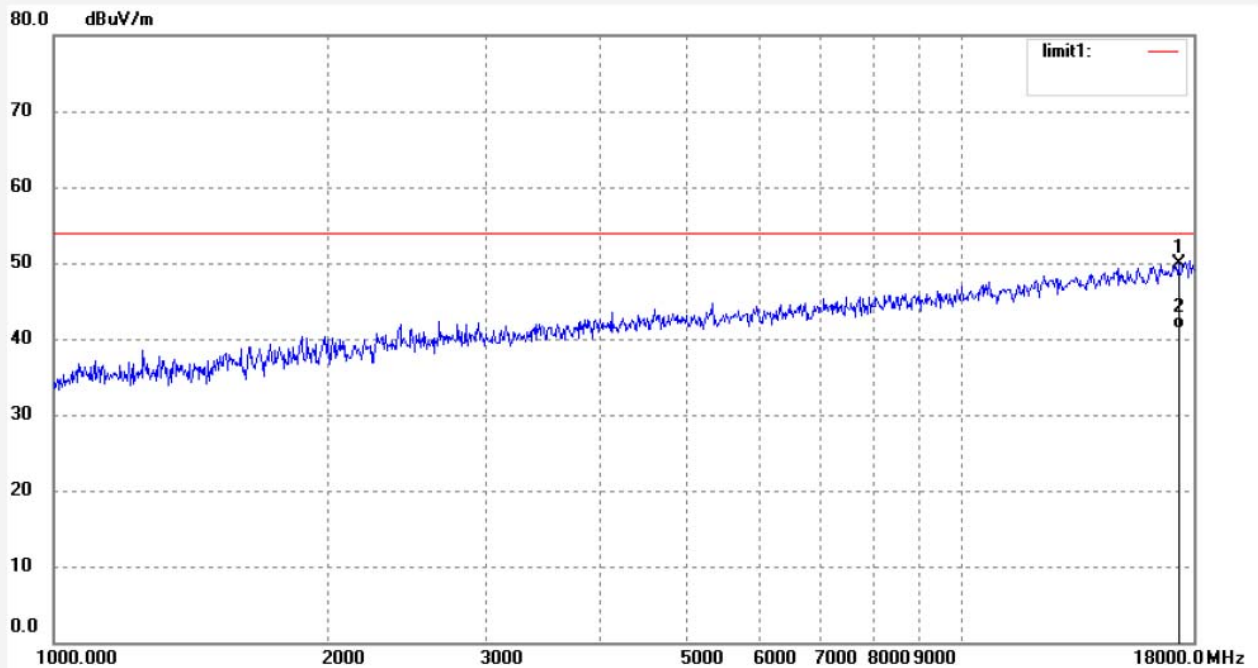
Date: 15/05/28/

Time: 8/54/24

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 17331.611      | 33.09               | 16.72          | 49.81              | 54.00             | -4.19          | peak     |                |                  |        |
| 2   | 17331.611      | 24.55               | 16.72          | 41.27              | 54.00             | -12.73         | AVG      |                |                  |        |



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Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star2015 #722

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2480MHz

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

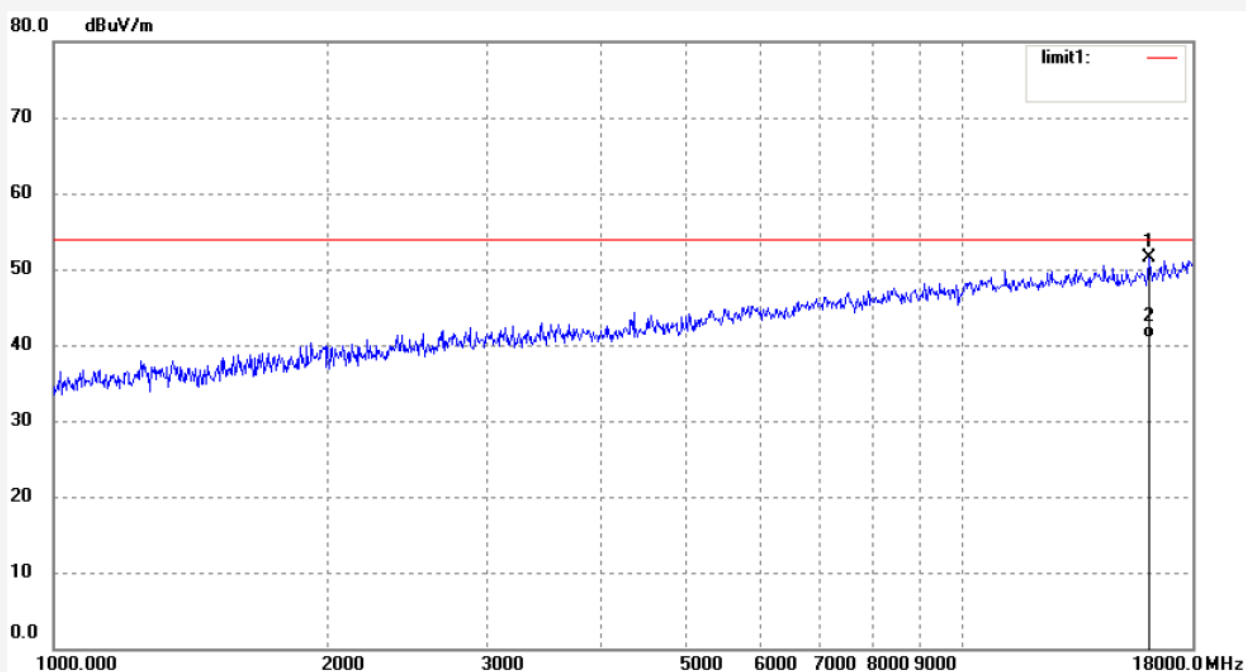
Date: 15/05/28/

Time: 8/56/02

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 16115.207      | 38.18               | 13.32          | 51.50              | 54.00             | -2.50          | peak     |                |                  |        |
| 2   | 16115.207      | 27.64               | 13.32          | 40.96              | 54.00             | -13.04         | AVG      |                |                  |        |

## 11.BAND EDGE COMPLIANCE TEST

### 11.1.Block Diagram of Test Setup



(EUT: Barcode Scanner)

### 11.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

### 11.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 11.4.Operating Condition of EUT

11.4.1.Setup the EUT and simulator as shown as Section 11.1.

11.4.2.Turn on the power of all equipment.

11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

## 11.5. Test Procedure

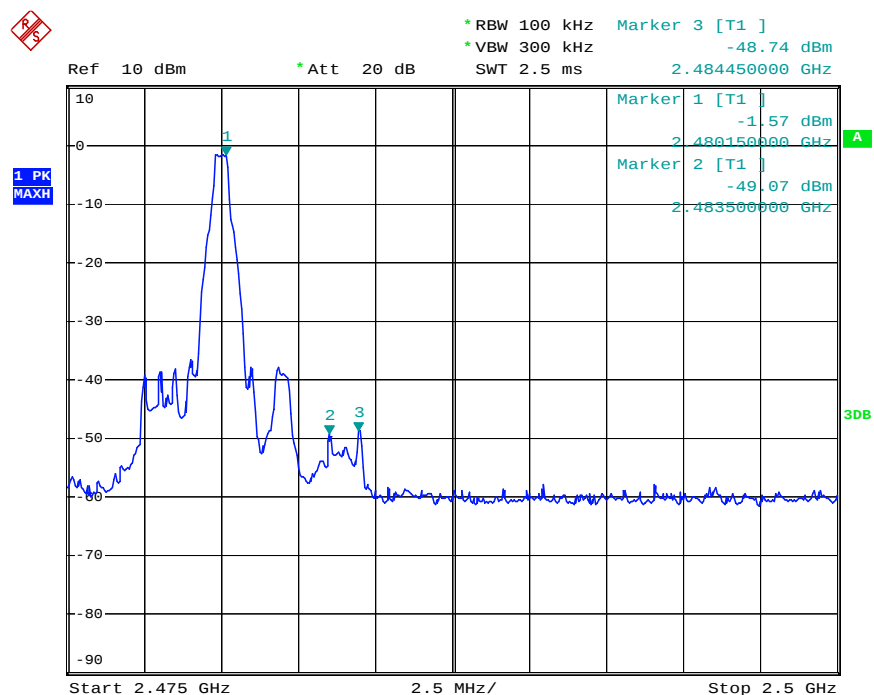
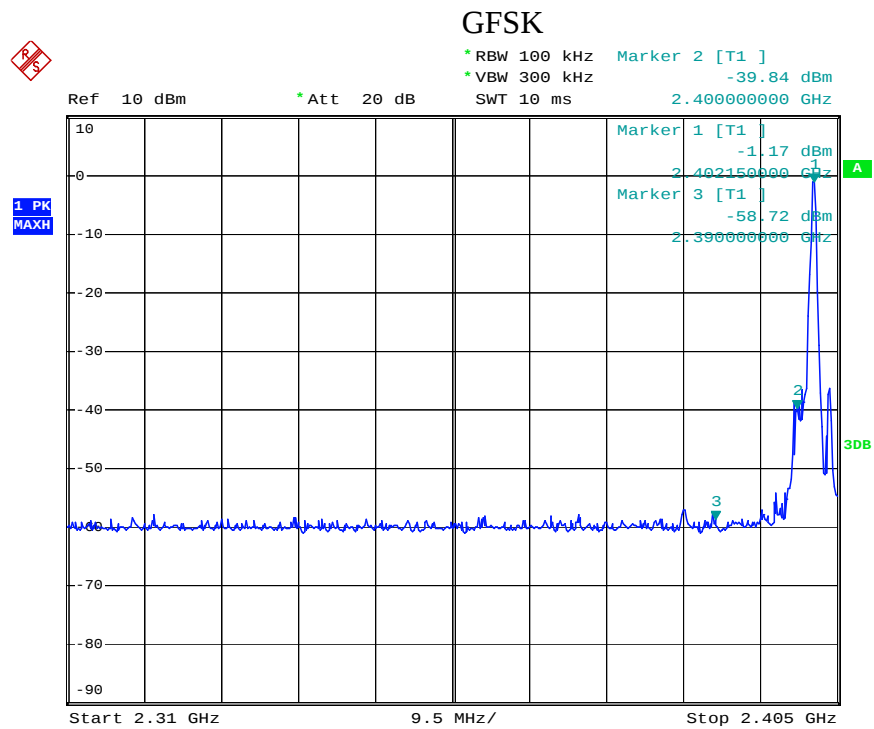
11.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.

11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

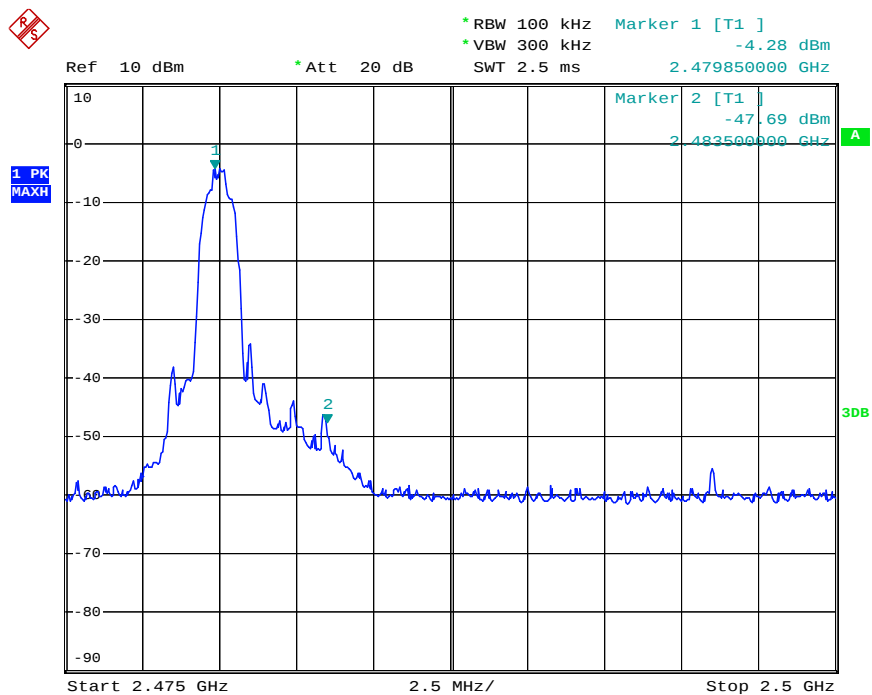
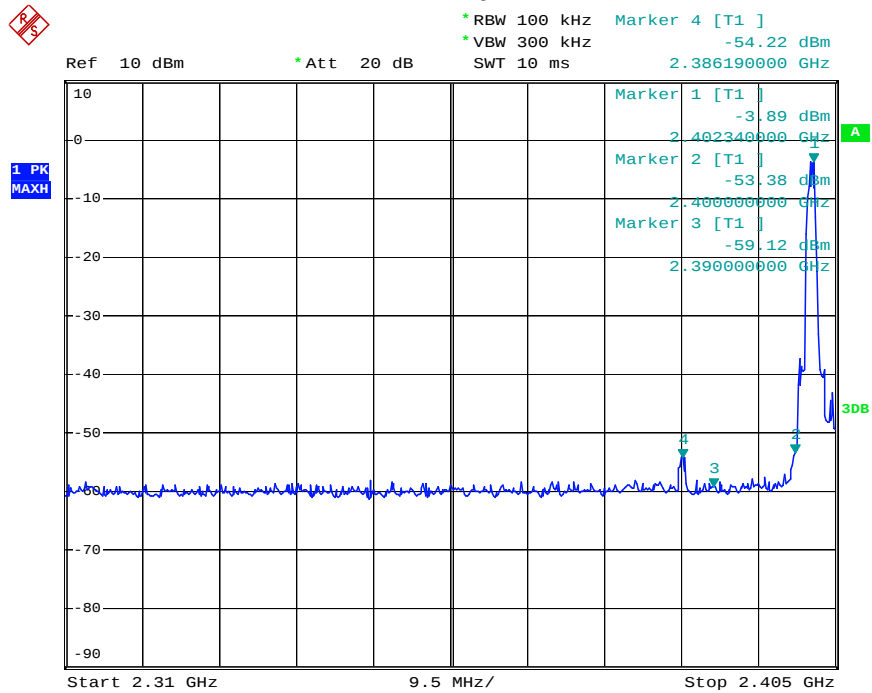
11.5.3. The band edges was measured and recorded.

## 11.6. Test Result

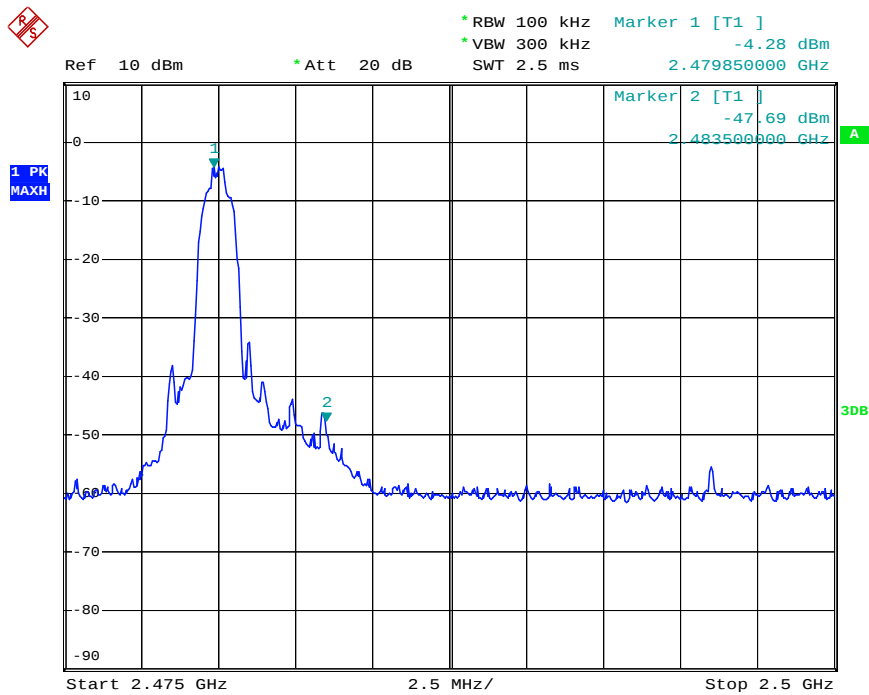
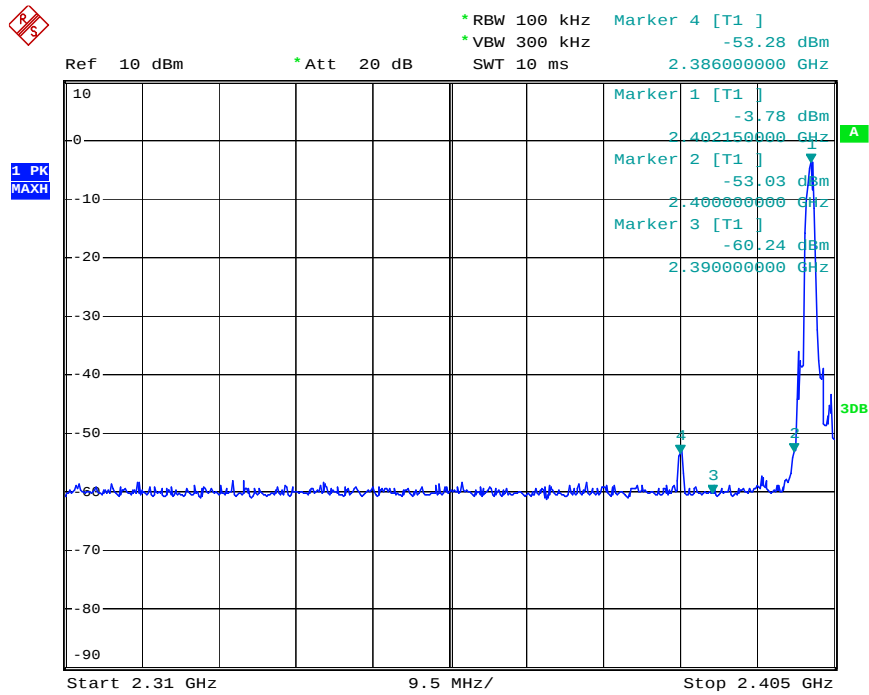
| Frequency<br>(MHz) | Result of Band Edge<br>(dBc) | Limit of Band Edge<br>(dBc) |
|--------------------|------------------------------|-----------------------------|
| GFSK               |                              |                             |
| 2400.00            | 38.67                        | > 20dBc                     |
| 2484.45            | 47.17                        | > 20dBc                     |
| Π/4-DQPSK Mode     |                              |                             |
| 2400.00            | 49.49                        | > 20dBc                     |
| 2483.50            | 43.41                        | > 20dBc                     |
| 8QPSK              |                              |                             |
| 2400.00            | 49.25                        | > 20dBc                     |
| 2483.50            | 43.41                        | > 20dBc                     |



## $\Pi/4$ -DQPSK Mode



## 8DPSK



## Radiated Band Edge Result

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

2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

3. Display the measurement of peak values.

### Non-hopping mode



## ACCURATE TECHNOLOGY CO., LTD.

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Site: 1# Chamber

Tel:+86-0755-26503290

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Job No.: STAR #3958

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2402MHz(GFSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

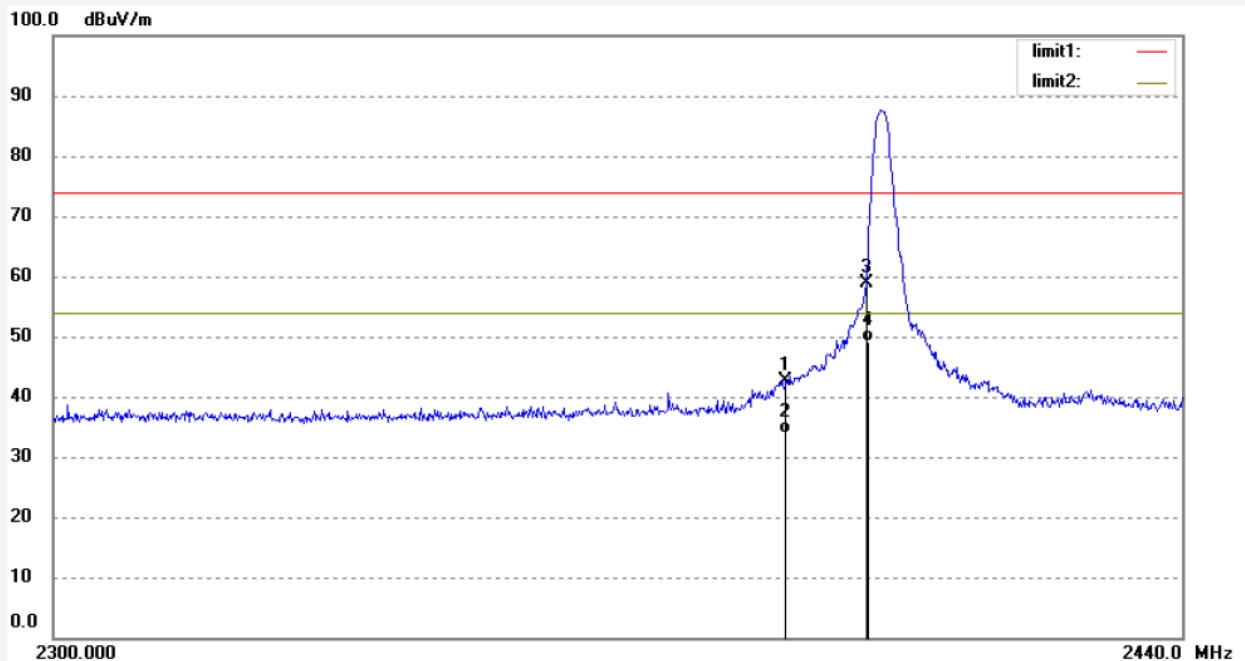
Date: 15/05/29/

Time: 8/44/05

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 49.39            | -6.78       | 42.61           | 74.00          | -31.39      | peak     |             |               |        |
| 2   | 2390.000    | 40.64            | -6.78       | 33.86           | 54.00          | -20.14      | AVG      |             |               |        |
| 3   | 2400.000    | 65.67            | -6.76       | 58.91           | 74.00          | -15.09      | peak     |             |               |        |
| 4   | 2400.000    | 55.97            | -6.76       | 49.21           | 54.00          | -4.79       | AVG      |             |               |        |

Job No.: STAR #3959

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2402MHz(GFSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

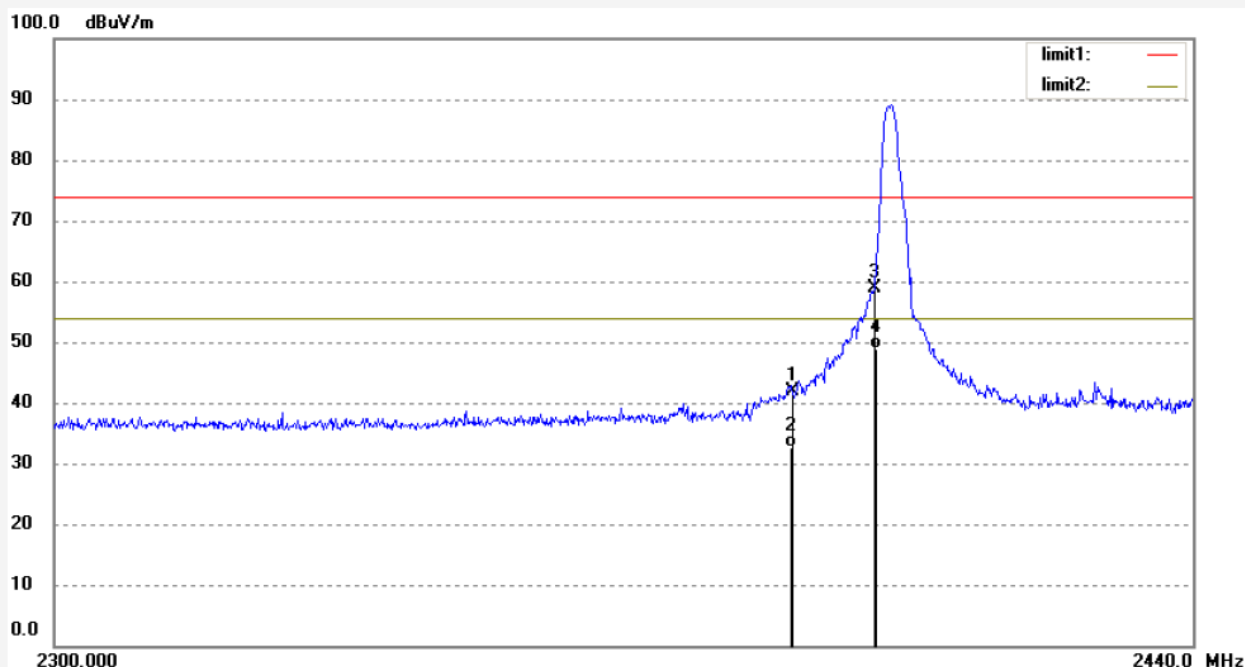
Date: 15/05/29/

Time: 8/48/19

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 48.75            | -6.78       | 41.97           | 74.00          | -32.03      | peak     |             |               |        |
| 2   | 2390.000    | 39.50            | -6.78       | 32.72           | 54.00          | -21.28      | AVG      |             |               |        |
| 3   | 2400.000    | 65.59            | -6.76       | 58.83           | 74.00          | -15.17      | peak     |             |               |        |
| 4   | 2400.000    | 55.64            | -6.76       | 48.88           | 54.00          | -5.12       | AVG      |             |               |        |

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Job No.: STAR #3964

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2480MHz(GFSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

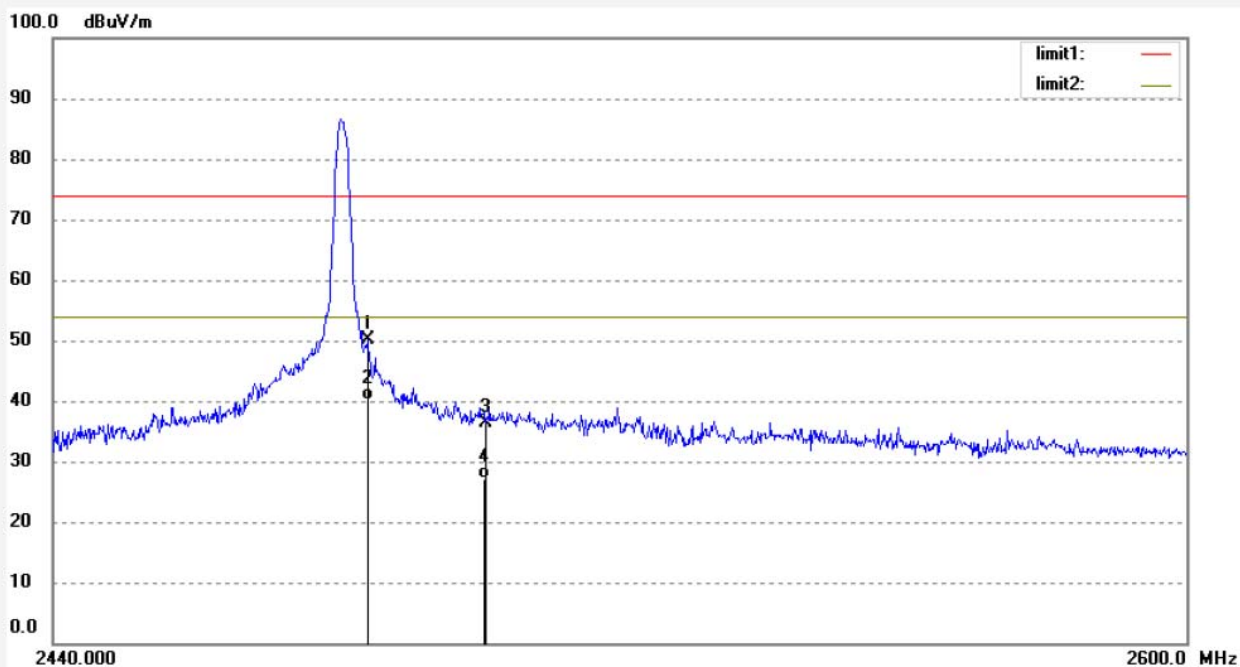
Date: 15/05/29/

Time: 9/07/04

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2483.500       | 56.79               | -6.54          | 50.25              | 74.00             | -23.75         | peak     |                |                  |        |
| 2   | 2483.500       | 46.79               | -6.54          | 40.25              | 54.00             | -13.75         | AVG      |                |                  |        |
| 3   | 2500.000       | 42.79               | -6.50          | 36.29              | 74.00             | -37.71         | peak     |                |                  |        |
| 4   | 2500.000       | 33.62               | -6.50          | 27.12              | 54.00             | -26.88         | AVG      |                |                  |        |

Job No.: STAR #3965

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2480MHz(GFSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

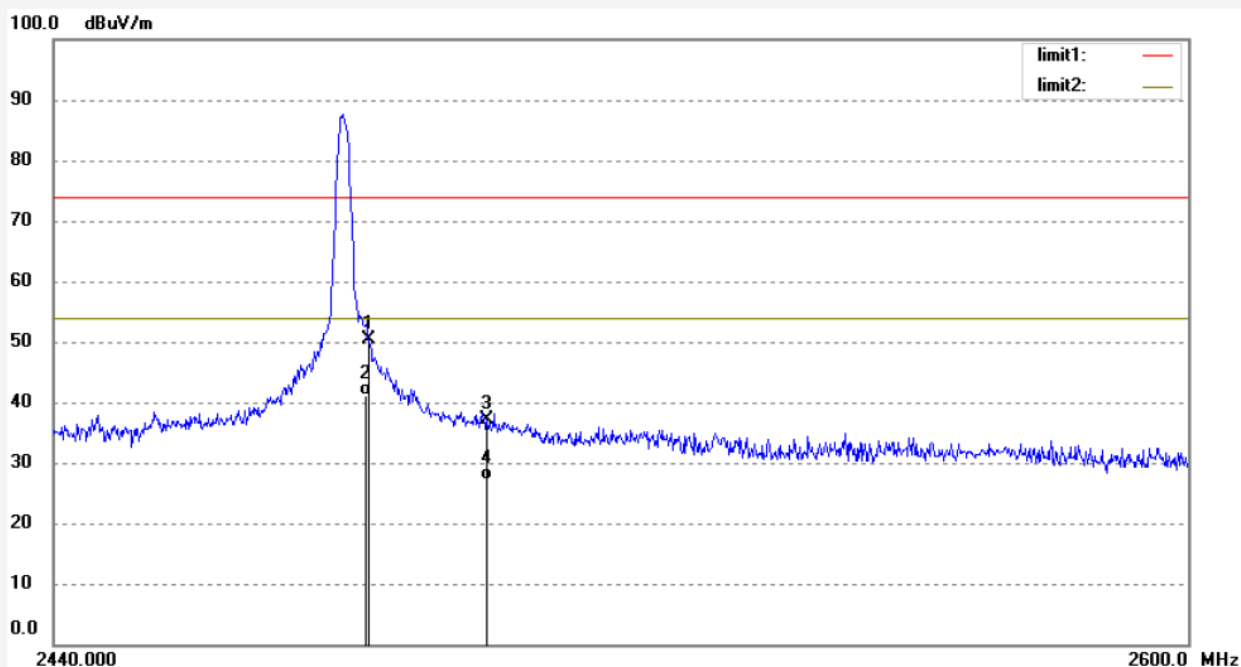
Date: 15/05/29/

Time: 9/11/34

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 57.02            | -6.54       | 50.48           | 74.00          | -23.52      | peak     |             |               |        |
| 2   | 2483.500    | 47.58            | -6.54       | 41.04           | 54.00          | -12.96      | AVG      |             |               |        |
| 3   | 2500.000    | 43.62            | -6.50       | 37.12           | 74.00          | -36.88      | peak     |             |               |        |
| 4   | 2500.000    | 33.67            | -6.50       | 27.17           | 54.00          | -26.83      | AVG      |             |               |        |

Job No.: STAR #3960

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2402MHz(PI/4DQPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

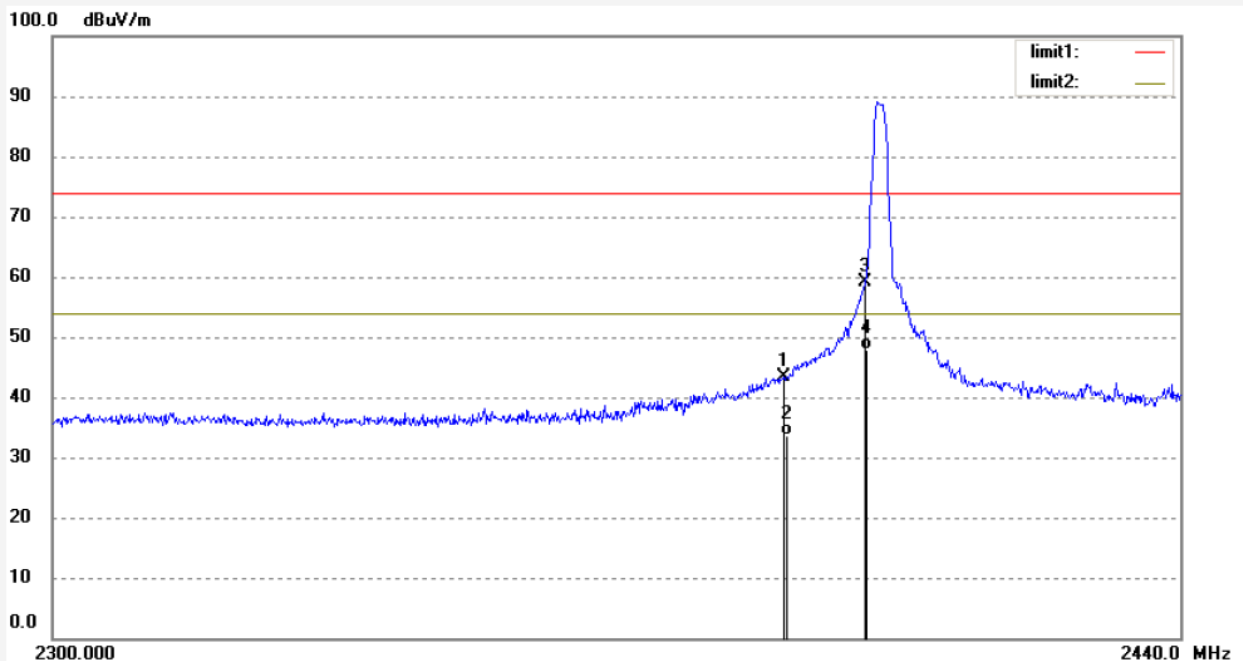
Date: 15/05/29/

Time: 8/52/46

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2390.000       | 50.04               | -6.78          | 43.26              | 74.00             | -30.74         | peak     |                |                  |        |
| 2   | 2390.000       | 40.31               | -6.78          | 33.53              | 54.00             | -20.47         | AVG      |                |                  |        |
| 3   | 2400.000       | 65.91               | -6.76          | 59.15              | 74.00             | -14.85         | peak     |                |                  |        |
| 4   | 2400.000       | 54.67               | -6.76          | 47.91              | 54.00             | -6.09          | AVG      |                |                  |        |

Job No.: STAR #3961

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2402MHz(PI/4DQPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

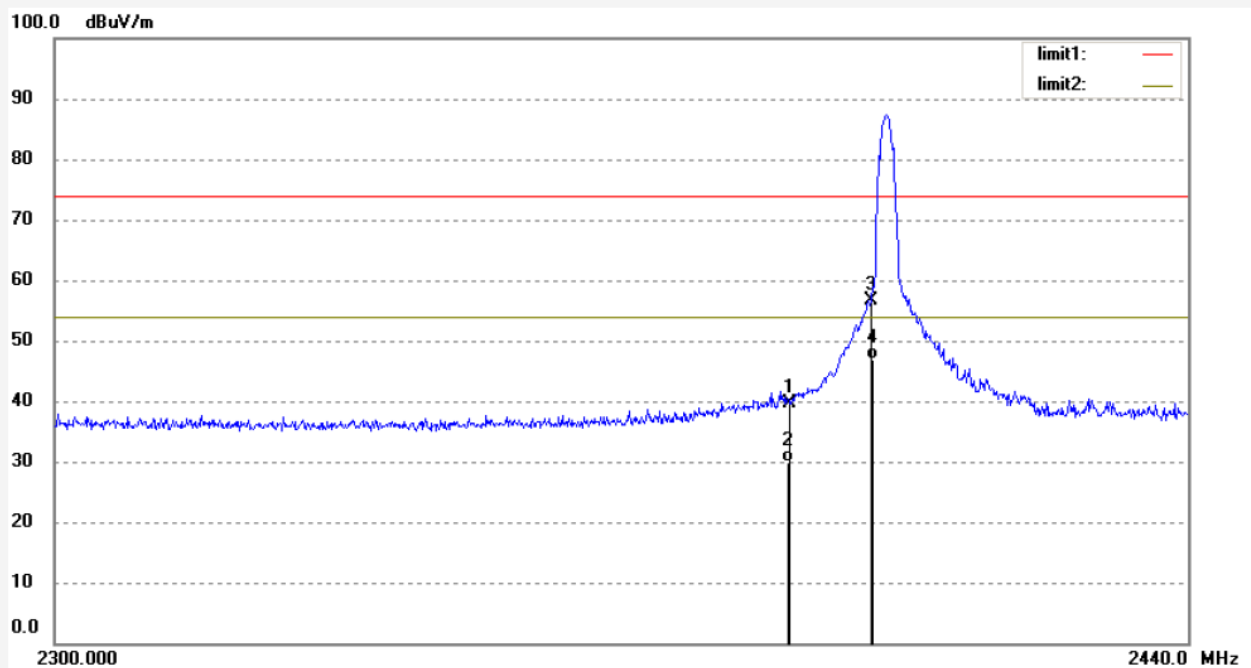
Date: 15/05/29/

Time: 8/55/45

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 46.51            | -6.78       | 39.73           | 74.00          | -34.27      | peak     |             |               |        |
| 2   | 2390.000    | 36.70            | -6.78       | 29.92           | 54.00          | -24.08      | AVG      |             |               |        |
| 3   | 2400.000    | 63.47            | -6.76       | 56.71           | 74.00          | -17.29      | peak     |             |               |        |
| 4   | 2400.000    | 53.67            | -6.76       | 46.91           | 54.00          | -7.09       | AVG      |             |               |        |

Job No.: STAR #3968

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2480MHz(PI/4DQPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

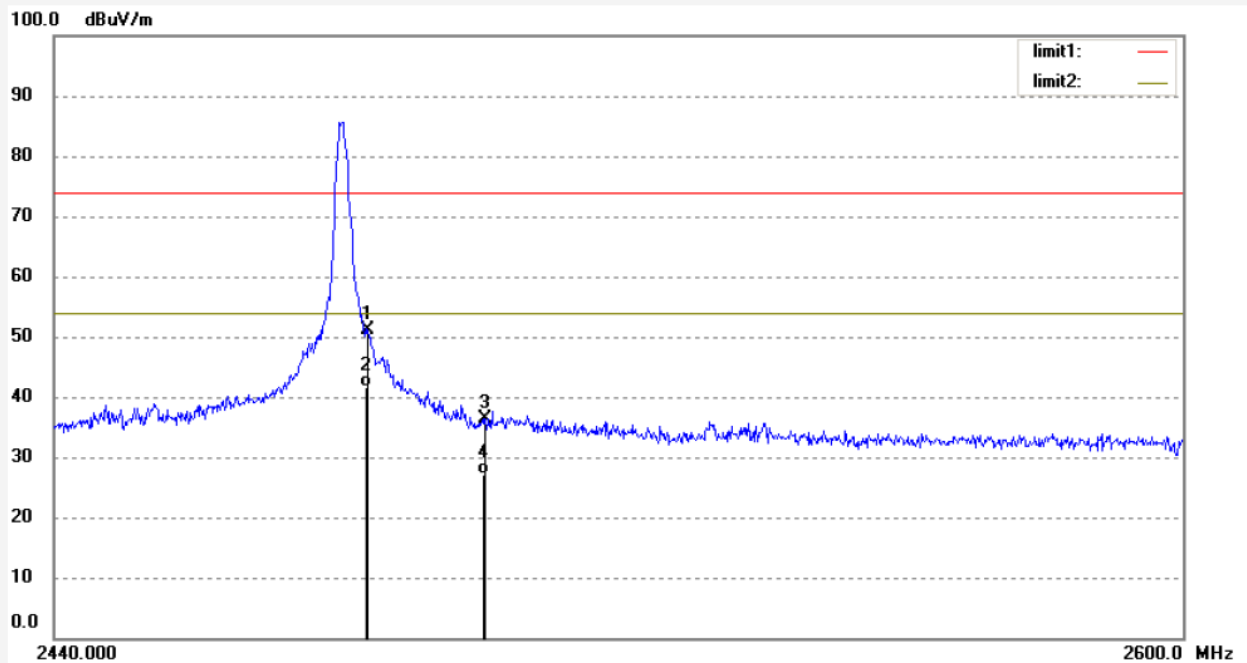
Date: 15/05/29/

Time: 9/23/20

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2483.500       | 57.77               | -6.54          | 51.23              | 74.00             | -22.77         | peak     |                |                  |        |
| 2   | 2483.500       | 48.16               | -6.54          | 41.62              | 54.00             | -12.38         | AVG      |                |                  |        |
| 3   | 2500.000       | 42.90               | -6.50          | 36.40              | 74.00             | -37.60         | peak     |                |                  |        |
| 4   | 2500.000       | 33.55               | -6.50          | 27.05              | 54.00             | -26.95         | AVG      |                |                  |        |



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Job No.: STAR #3969

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2480MHz(PI/4DQPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

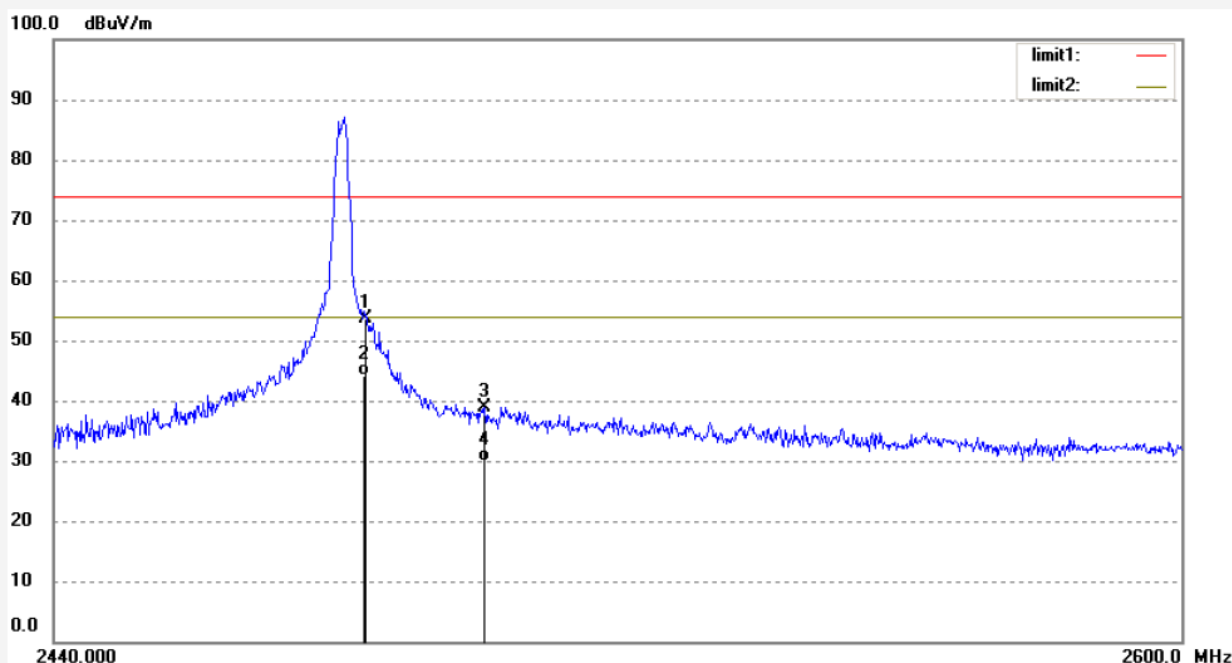
Date: 15/05/29/

Time: 9/28/07

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2483.500       | 60.16               | -6.54          | 53.62              | 74.00             | -20.38         | peak     |                |                  |        |
| 2   | 2483.500       | 50.67               | -6.54          | 44.13              | 54.00             | -9.87          | AVG      |                |                  |        |
| 3   | 2500.000       | 45.34               | -6.50          | 38.84              | 74.00             | -35.16         | peak     |                |                  |        |
| 4   | 2500.000       | 36.44               | -6.50          | 29.94              | 54.00             | -24.06         | AVG      |                |                  |        |

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Job No.: STAR #3962

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2402MHz(8DPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

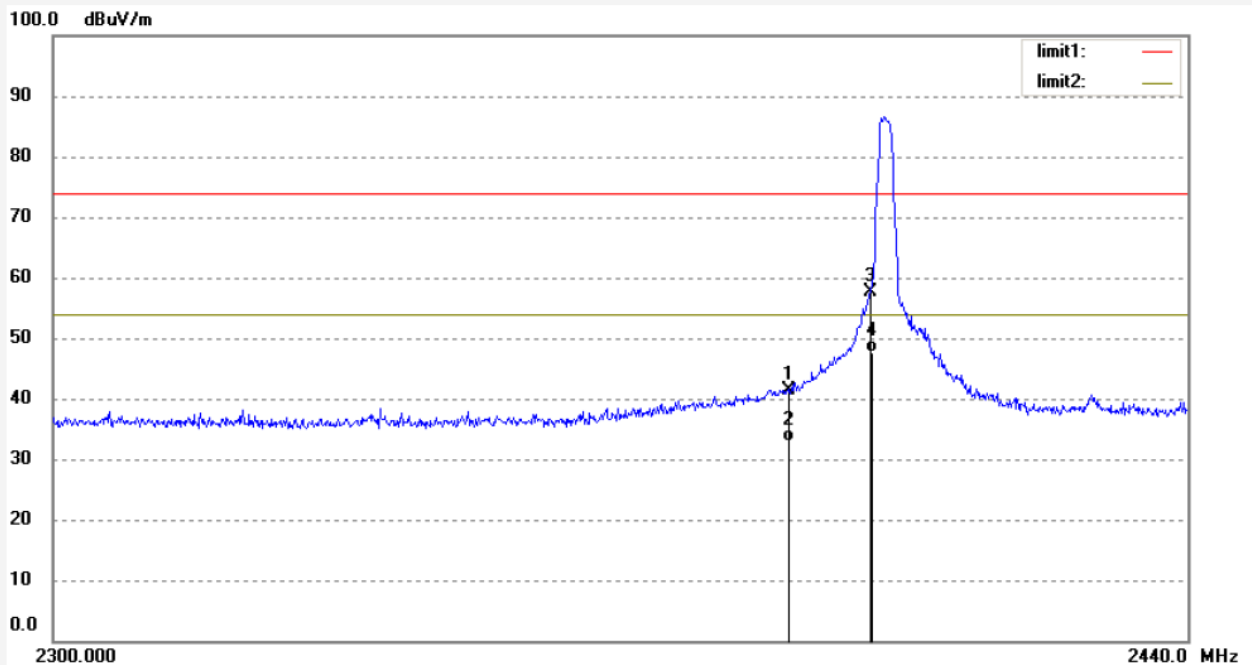
Date: 15/05/29/

Time: 8/58/50

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107

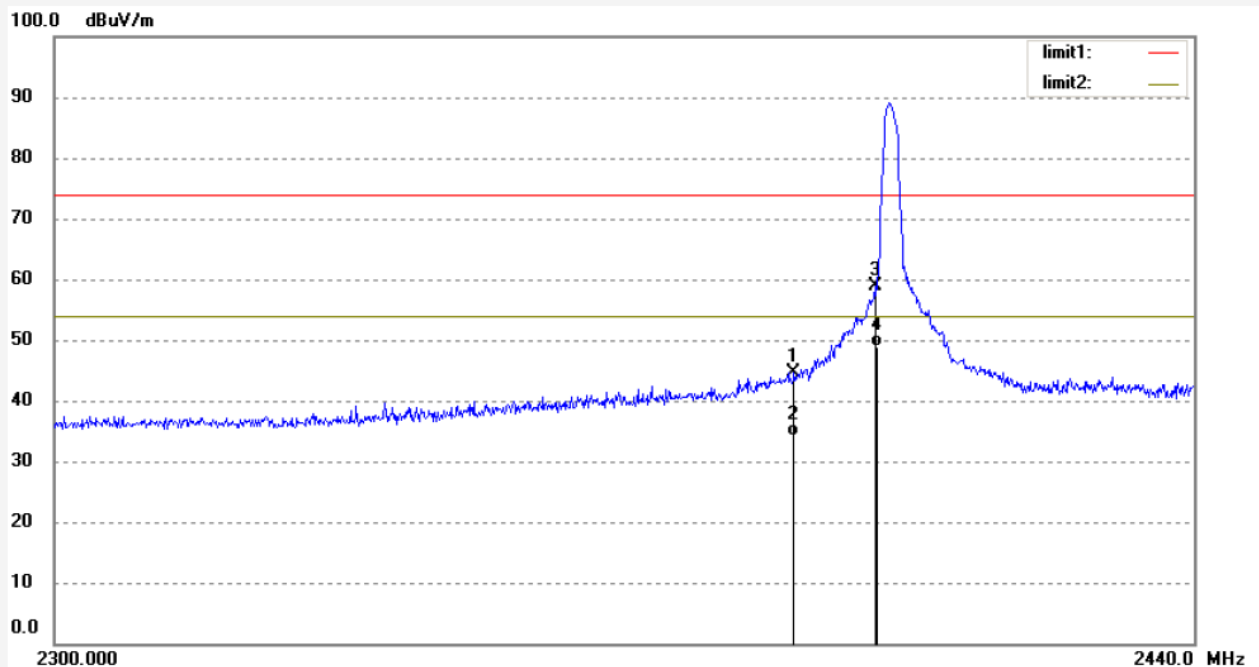


| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2390.000       | 48.27               | -6.78          | 41.49              | 74.00             | -32.51         | peak     |                |                  |        |
| 2   | 2390.000       | 39.62               | -6.78          | 32.84              | 54.00             | -21.16         | AVG      |                |                  |        |
| 3   | 2400.000       | 64.44               | -6.76          | 57.68              | 74.00             | -16.32         | peak     |                |                  |        |
| 4   | 2400.000       | 54.39               | -6.76          | 47.63              | 54.00             | -6.37          | AVG      |                |                  |        |

Job No.: STAR #3963  
Standard: FCC PK  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 55 %  
EUT: Barcode Scanner  
Mode: TX 2402MHz(8DPSK)  
Model: MS3390  
Manufacturer: MinDe

Polarization: Vertical  
Power Source: DC 5V  
Date: 15/05/29/  
Time: 9/03/58  
Engineer Signature:  
Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 51.36            | -6.78       | 44.58           | 74.00          | -29.42      | peak     |             |               |        |
| 2   | 2390.000    | 40.86            | -6.78       | 34.08           | 54.00          | -19.92      | AVG      |             |               |        |
| 3   | 2400.000    | 65.65            | -6.76       | 58.89           | 74.00          | -15.11      | peak     |             |               |        |
| 4   | 2400.000    | 55.67            | -6.76       | 48.91           | 54.00          | -5.09       | AVG      |             |               |        |

Job No.: STAR #3966

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2480MHz(8DPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

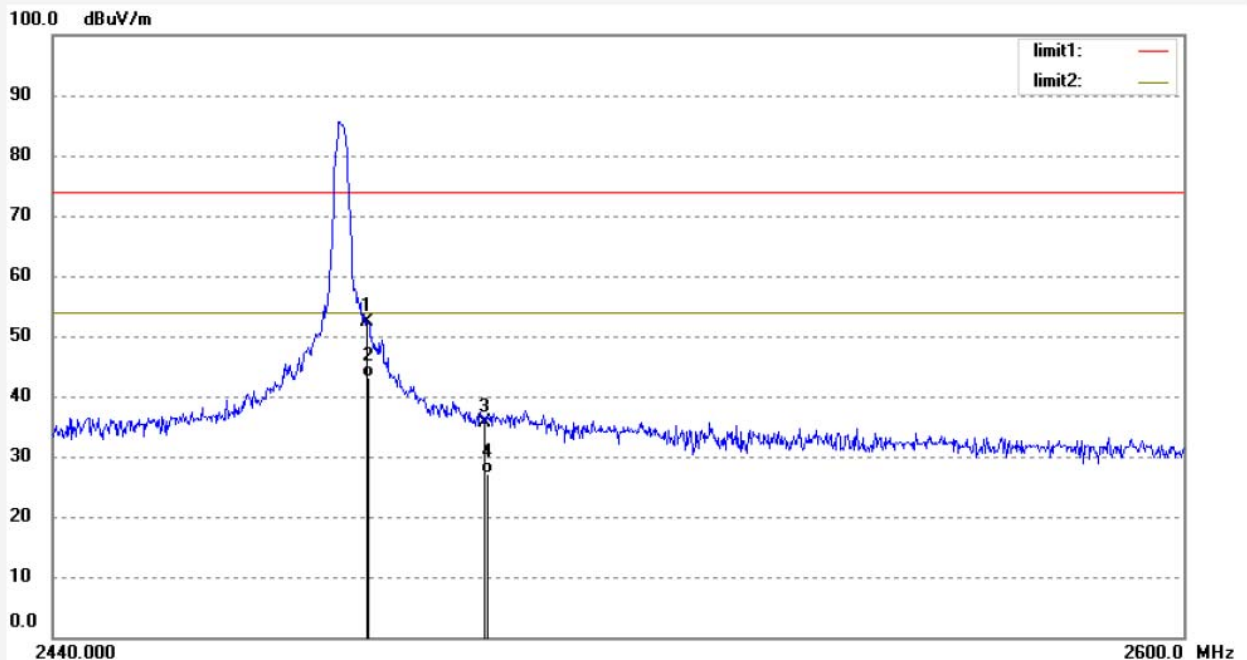
Date: 15/05/29/

Time: 9/15/59

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 58.81            | -6.54       | 52.27           | 74.00          | -21.73      | peak     |             |               |        |
| 2   | 2483.500    | 49.66            | -6.54       | 43.12           | 54.00          | -10.88      | AVG      |             |               |        |
| 3   | 2500.000    | 42.02            | -6.50       | 35.52           | 74.00          | -38.48      | peak     |             |               |        |
| 4   | 2500.000    | 33.51            | -6.50       | 27.01           | 54.00          | -26.99      | AVG      |             |               |        |

Job No.: STAR #3967

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: TX 2480MHz(8DPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

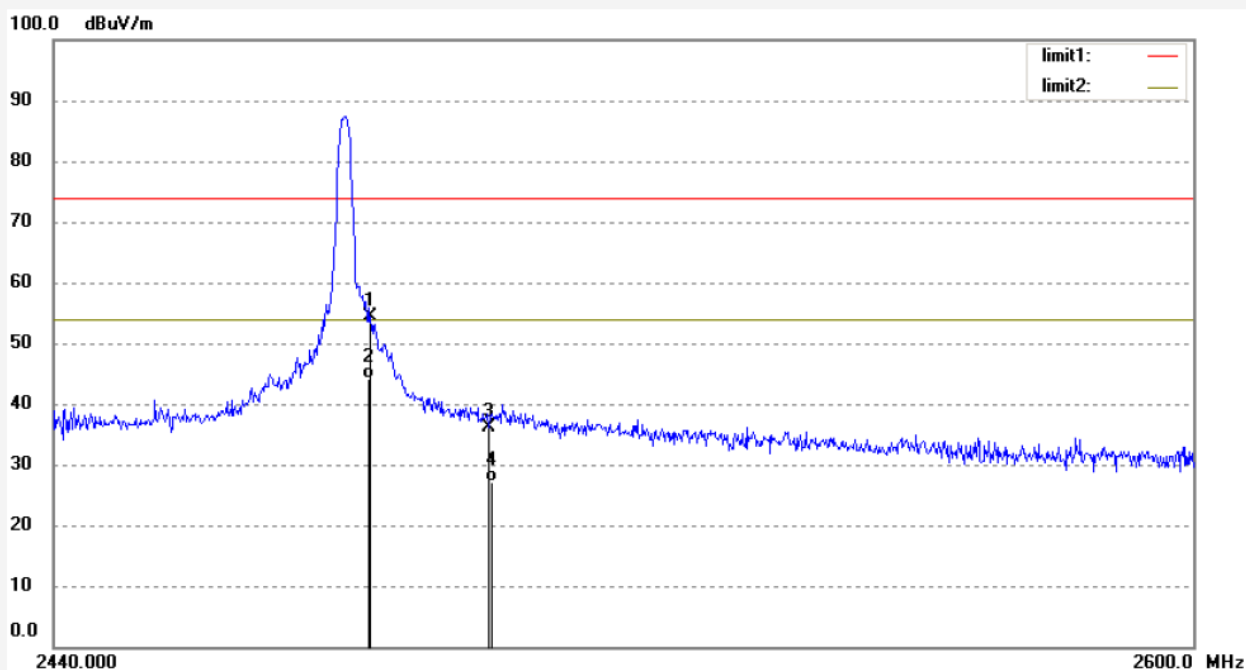
Date: 15/05/29/

Time: 9/19/53

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 60.87            | -6.54       | 54.33           | 74.00          | -19.67      | peak     |             |               |        |
| 2   | 2483.500    | 50.67            | -6.54       | 44.13           | 54.00          | -9.87       | AVG      |             |               |        |
| 3   | 2500.000    | 42.60            | -6.50       | 36.10           | 74.00          | -37.90      | peak     |             |               |        |
| 4   | 2500.000    | 33.67            | -6.50       | 27.17           | 54.00          | -26.83      | AVG      |             |               |        |

## Hopping mode



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Job No.: STAR #3996

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: HOPPING (GFSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

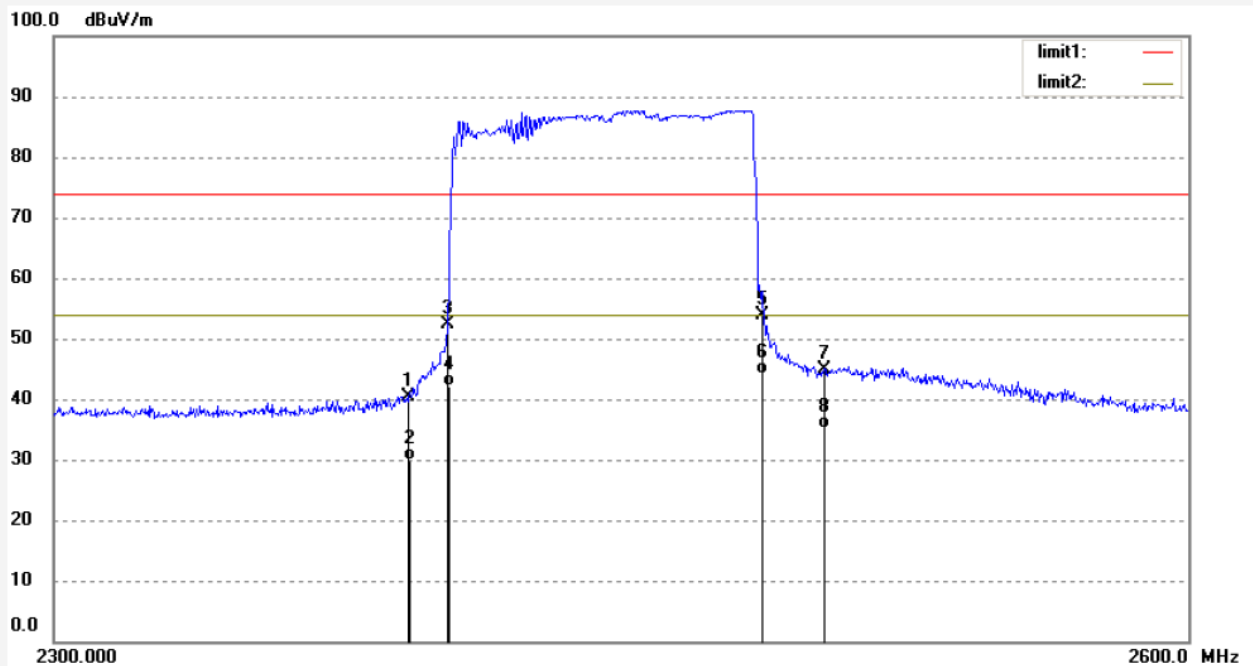
Date: 15/05/29/

Time: 9:35:18

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 47.19            | -6.78       | 40.41           | 74.00          | -33.59      | peak     |             |               |        |
| 2   | 2390.000    | 36.78            | -6.78       | 30.00           | 54.00          | -24.00      | AVG      |             |               |        |
| 3   | 2400.000    | 59.11            | -6.76       | 52.35           | 74.00          | -21.65      | peak     |             |               |        |
| 4   | 2400.000    | 49.00            | -6.76       | 42.24           | 54.00          | -11.76      | AVG      |             |               |        |
| 5   | 2483.500    | 60.54            | -6.54       | 54.00           | 74.00          | -20.00      | peak     |             |               |        |
| 6   | 2483.500    | 50.67            | -6.54       | 44.13           | 54.00          | -9.87       | AVG      |             |               |        |
| 7   | 2500.000    | 51.37            | -6.50       | 44.87           | 74.00          | -29.13      | peak     |             |               |        |
| 8   | 2500.000    | 41.69            | -6.50       | 35.19           | 54.00          | -18.81      | AVG      |             |               |        |

Job No.: STAR #3997

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: HOPPING (GFSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

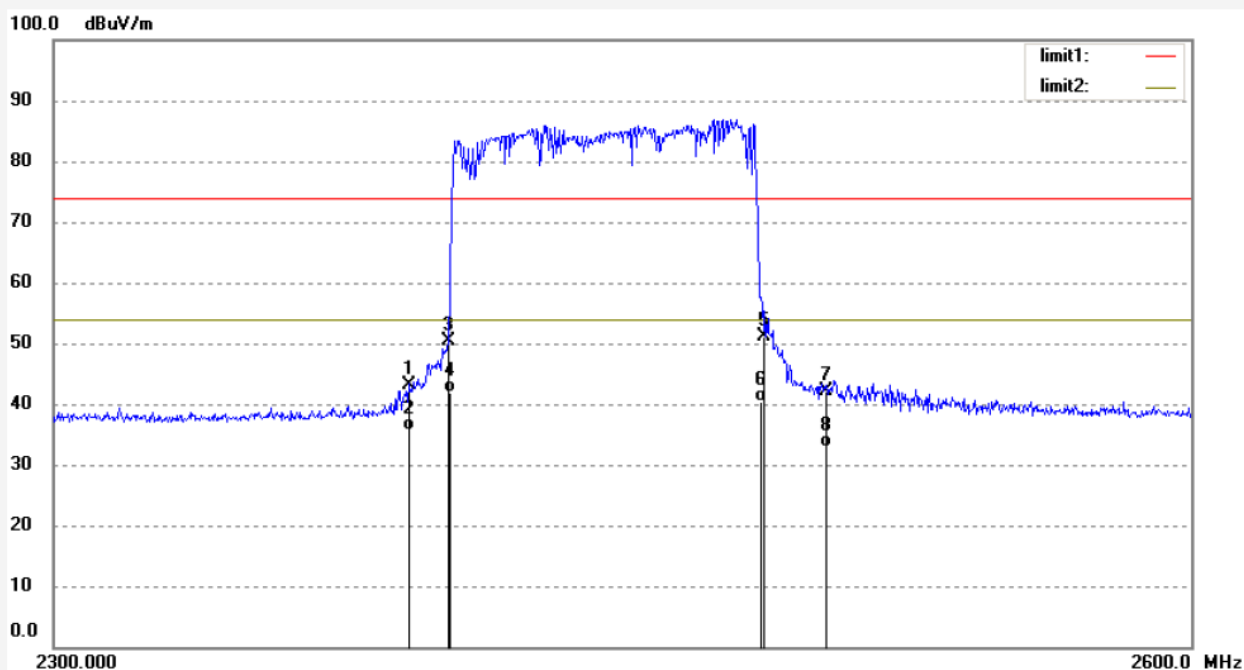
Date: 15/05/29/

Time: 9:39:45

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 49.92            | -6.78       | 43.14           | 74.00          | -30.86      | peak     |             |               |        |
| 2   | 2390.000    | 42.40            | -6.78       | 35.62           | 54.00          | -18.38      | AVG      |             |               |        |
| 3   | 2400.000    | 57.04            | -6.76       | 50.28           | 74.00          | -23.72      | peak     |             |               |        |
| 4   | 2400.000    | 48.67            | -6.76       | 41.91           | 54.00          | -12.09      | AVG      |             |               |        |
| 5   | 2483.500    | 57.74            | -6.54       | 51.20           | 74.00          | -22.80      | peak     |             |               |        |
| 6   | 2483.500    | 46.97            | -6.54       | 40.43           | 54.00          | -13.57      | AVG      |             |               |        |
| 7   | 2500.000    | 48.73            | -6.50       | 42.23           | 74.00          | -31.77      | peak     |             |               |        |
| 8   | 2500.000    | 39.46            | -6.50       | 32.96           | 54.00          | -21.04      | AVG      |             |               |        |

Job No.: STAR #3998

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: HOPPING (PI/4DQPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

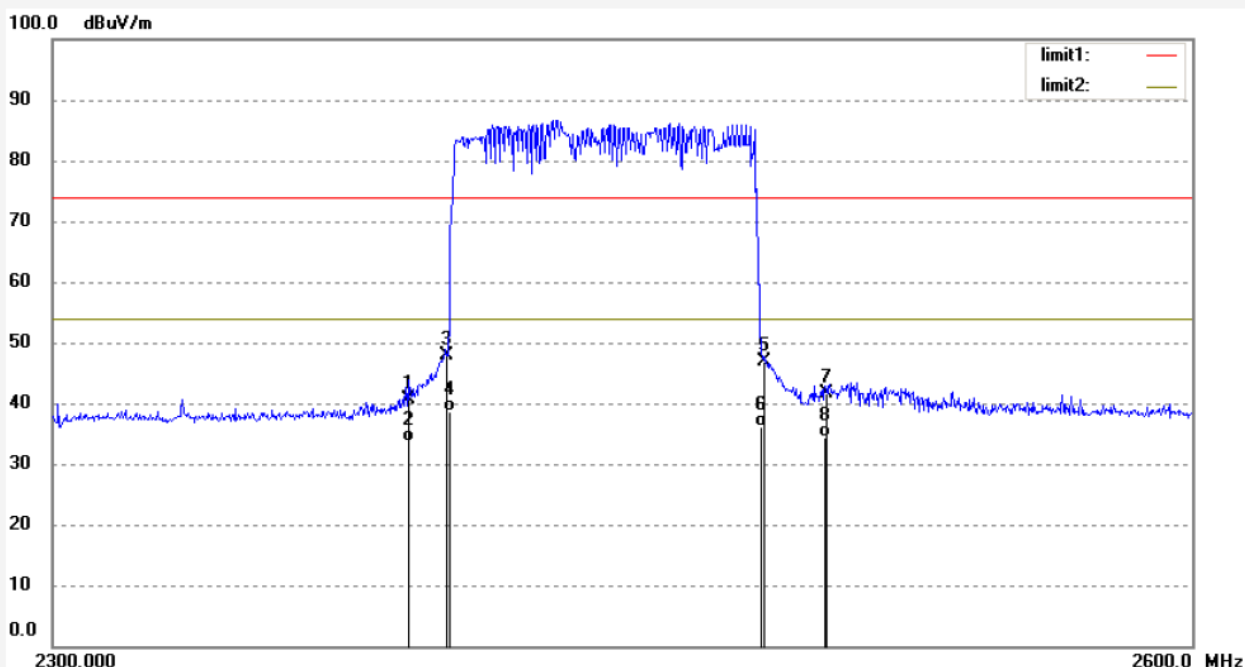
Date: 15/05/29/

Time: 9:46:41

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 47.44            | -6.78       | 40.66           | 74.00          | -33.34      | peak     |             |               |        |
| 2   | 2390.000    | 40.31            | -6.78       | 33.53           | 54.00          | -20.47      | AVG      |             |               |        |
| 3   | 2400.000    | 54.56            | -6.76       | 47.80           | 74.00          | -26.20      | peak     |             |               |        |
| 4   | 2400.000    | 45.31            | -6.76       | 38.55           | 54.00          | -15.45      | AVG      |             |               |        |
| 5   | 2483.500    | 53.47            | -6.54       | 46.93           | 74.00          | -27.07      | peak     |             |               |        |
| 6   | 2483.500    | 42.57            | -6.54       | 36.03           | 54.00          | -17.97      | AVG      |             |               |        |
| 7   | 2500.000    | 48.04            | -6.50       | 41.54           | 74.00          | -32.46      | peak     |             |               |        |
| 8   | 2500.000    | 40.82            | -6.50       | 34.32           | 54.00          | -19.68      | AVG      |             |               |        |

Job No.: STAR #3999

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: HOPPING (PI/4DQPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

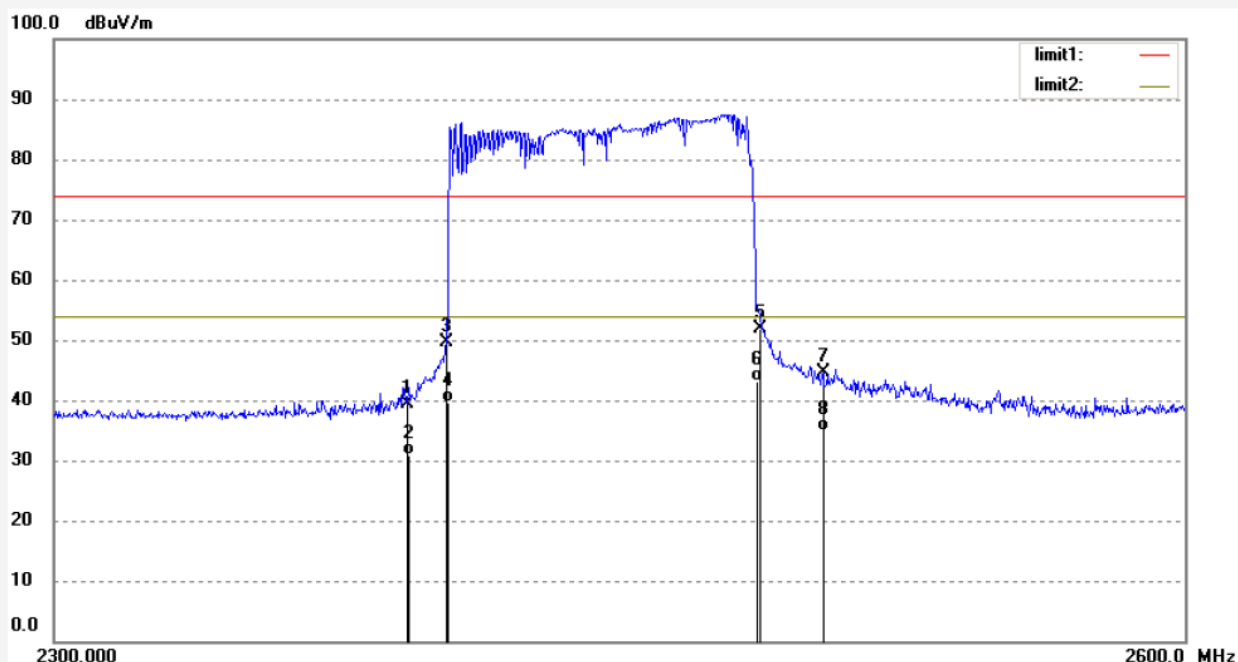
Date: 15/05/29/

Time: 9:51:16

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2390.000       | 46.09               | -6.78          | 39.31              | 74.00             | -34.69         | peak     |                |                  |        |
| 2   | 2390.000       | 37.62               | -6.78          | 30.84              | 54.00             | -23.16         | AVG      |                |                  |        |
| 3   | 2400.000       | 56.51               | -6.76          | 49.75              | 74.00             | -24.25         | peak     |                |                  |        |
| 4   | 2400.000       | 46.34               | -6.76          | 39.58              | 54.00             | -14.42         | AVG      |                |                  |        |
| 5   | 2483.500       | 58.34               | -6.54          | 51.80              | 74.00             | -22.20         | peak     |                |                  |        |
| 6   | 2483.500       | 49.77               | -6.54          | 43.23              | 54.00             | -10.77         | AVG      |                |                  |        |
| 7   | 2500.000       | 51.06               | -6.50          | 44.56              | 74.00             | -29.44         | peak     |                |                  |        |
| 8   | 2500.000       | 41.36               | -6.50          | 34.86              | 54.00             | -19.14         | AVG      |                |                  |        |

Job No.: STAR #4000

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: HOPPING (8DPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Vertical

Power Source: DC 5V

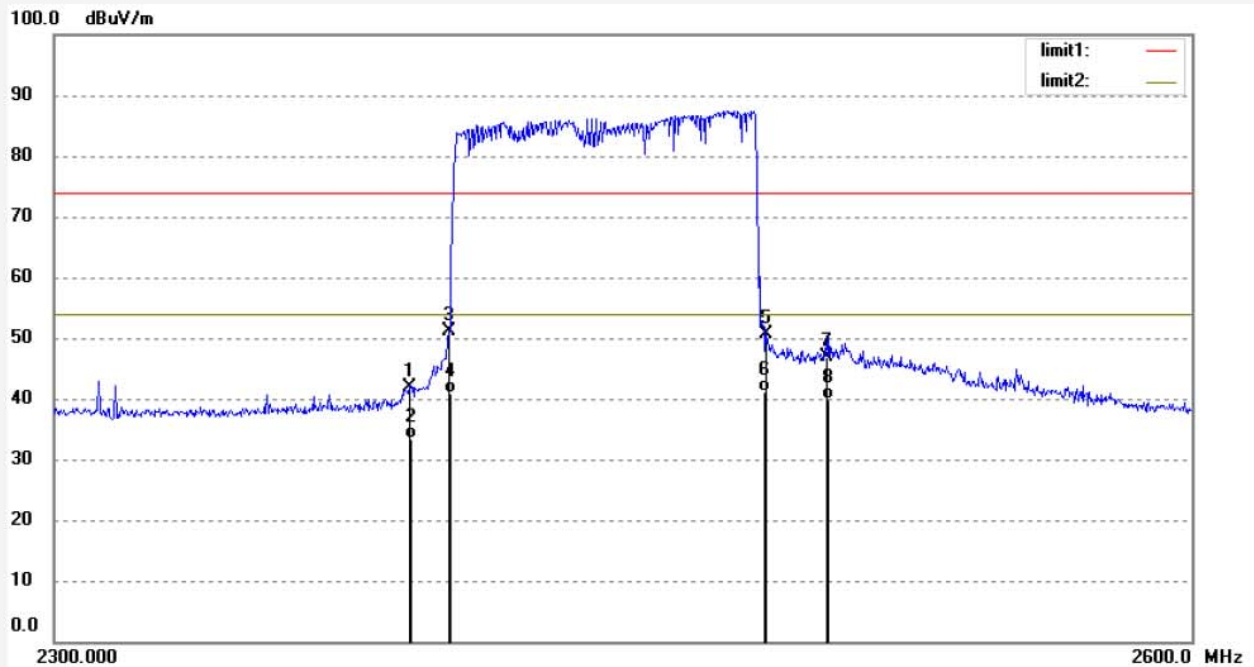
Date: 15/05/29/

Time: 9:56:29

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 48.77            | -6.78       | 41.99           | 74.00          | -32.01      | peak     |             |               |        |
| 2   | 2390.000    | 40.20            | -6.78       | 33.42           | 54.00          | -20.58      | AVG      |             |               |        |
| 3   | 2400.000    | 57.88            | -6.76       | 51.12           | 74.00          | -22.88      | peak     |             |               |        |
| 4   | 2400.000    | 47.67            | -6.76       | 40.91           | 54.00          | -13.09      | AVG      |             |               |        |
| 5   | 2483.500    | 57.21            | -6.54       | 50.67           | 74.00          | -23.33      | peak     |             |               |        |
| 6   | 2483.500    | 47.67            | -6.54       | 41.13           | 54.00          | -12.87      | AVG      |             |               |        |
| 7   | 2500.000    | 53.50            | -6.50       | 47.00           | 74.00          | -27.00      | peak     |             |               |        |
| 8   | 2500.000    | 46.30            | -6.50       | 39.80           | 54.00          | -14.20      | AVG      |             |               |        |

Job No.: STAR #4001

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Barcode Scanner

Mode: HOPPING (8DPSK)

Model: MS3390

Manufacturer: MinDe

Polarization: Horizontal

Power Source: DC 5V

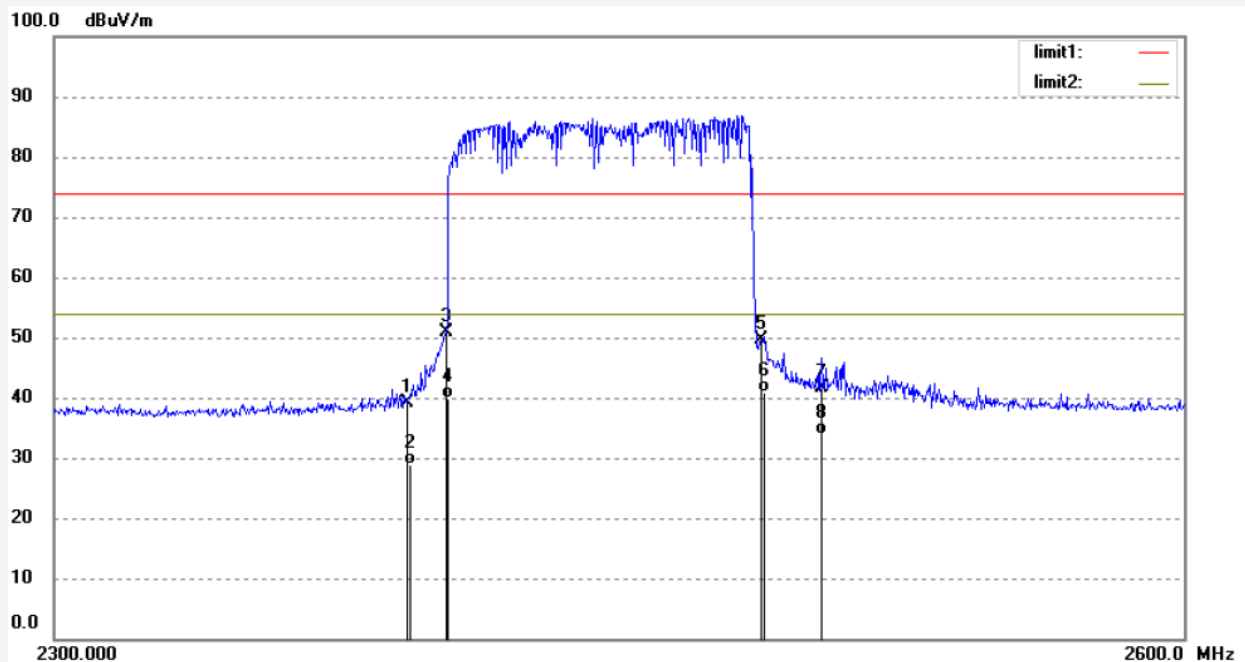
Date: 15/05/29/

Time: 10:02:30

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151107



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 45.95            | -6.78       | 39.17           | 74.00          | -34.83      | peak     |             |               |        |
| 2   | 2390.000    | 35.69            | -6.78       | 28.91           | 54.00          | -25.09      | AVG      |             |               |        |
| 3   | 2400.000    | 57.62            | -6.76       | 50.86           | 74.00          | -23.14      | peak     |             |               |        |
| 4   | 2400.000    | 46.67            | -6.76       | 39.91           | 54.00          | -14.09      | AVG      |             |               |        |
| 5   | 2483.500    | 56.20            | -6.54       | 49.66           | 74.00          | -24.34      | peak     |             |               |        |
| 6   | 2483.500    | 47.38            | -6.54       | 40.84           | 54.00          | -13.16      | AVG      |             |               |        |
| 7   | 2500.000    | 48.23            | -6.50       | 41.73           | 74.00          | -32.27      | peak     |             |               |        |
| 8   | 2500.000    | 40.36            | -6.50       | 33.86           | 54.00          | -20.14      | AVG      |             |               |        |

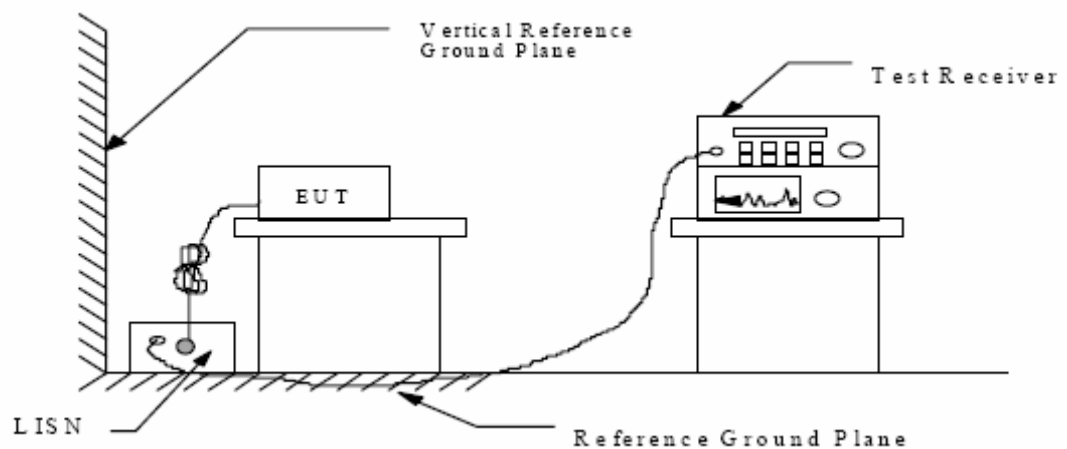
## 12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART

### 15 SECTION 15.207(A)

#### 12.1.Block Diagram of Test Setup

12.1.1.Block diagram of connection between the EUT and simulators

12.1.2.Shielding Room Test Setup Diagram



(EUT: Barcode Scanner)

#### 12.2.The Emission Limit

12.2.1.Conducted Emission Measurement Limits According to Section 15.207(a)

| Frequency<br>(MHz) | Limit dB( $\mu$ V) |               |
|--------------------|--------------------|---------------|
|                    | Quasi-peak Level   | Average Level |
| 0.15 - 0.50        | 66.0 – 56.0 *      | 56.0 – 46.0 * |
| 0.50 - 5.00        | 56.0               | 46.0          |
| 5.00 - 30.00       | 60.0               | 50.0          |

\* Decreases with the logarithm of the frequency.

### 12.3.Configuration of EUT on Measurement

The equipment are installed on the Conducted Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 11.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in TX (Operation) mode measure it.

### 12.5.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.

The frequency range from 150 kHz to 30MHz is checked.

### 12.6.Power Line Conducted Emission Measurement Results

ACCURATE TECHNOLOGY CO.,LTD

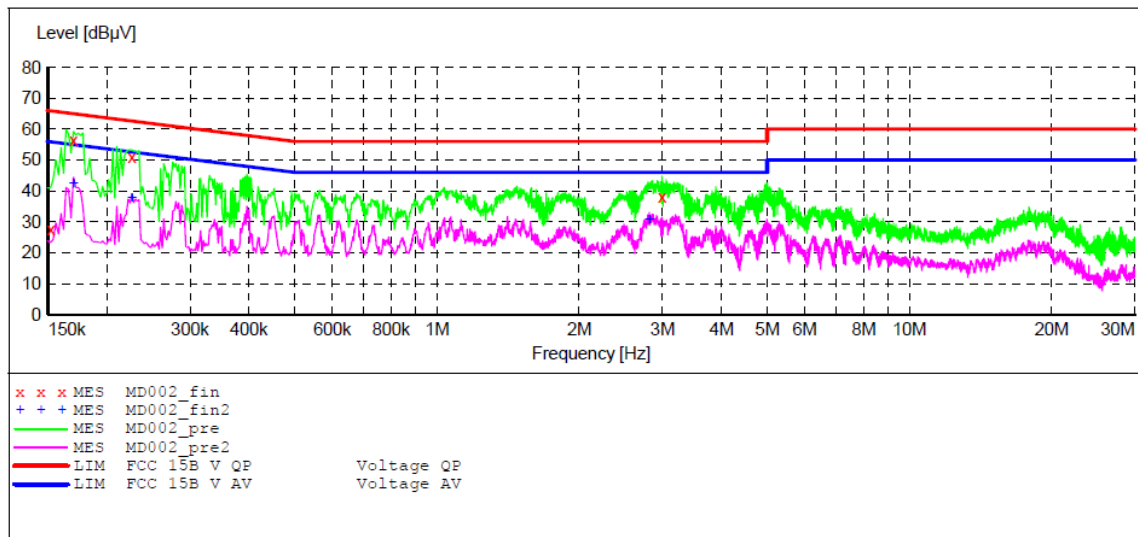
## CONDUCTED EMISSION STANDARD FCC PART15B

EUT: Barcode Scanner M/N:MS3390  
 Manufacturer: MinDe  
 Operating Condition: ON  
 Test Site: 1#Shielding Room  
 Operator: star  
 Test Specification: L 120V/60Hz  
 Comment: Report No.:ATE20151107  
 Start of Test: 5/28/2015 / 9:13:30AM

### SCAN TABLE: "V 9K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70

| Start             | Stop                | Step           | Detector          | Meas. Time | IF Bandw. | Transducer    |
|-------------------|---------------------|----------------|-------------------|------------|-----------|---------------|
| Frequency 9.0 kHz | Frequency 150.0 kHz | Width 100.0 Hz | QuasiPeak Average | 1.0 s      | 200 Hz    | NSLK8126 2008 |
| 150.0 kHz         | 30.0 MHz            | 4.5 kHz        | QuasiPeak Average | 1.0 s      | 9 kHz     | NSLK8126 2008 |



### MEASUREMENT RESULT: "MD002\_fin"

5/28/2015 9:14AM

| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.170000      | 56.50      | 10.5      | 65         | 8.5       | QP       | L1   | GND |
| 0.226000      | 50.80      | 10.6      | 63         | 11.8      | QP       | L1   | GND |
| 2.994000      | 37.90      | 11.1      | 56         | 18.1      | QP       | L1   | GND |

### MEASUREMENT RESULT: "MD002\_fin2"

5/28/2015 9:14AM

| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.170000      | 42.30      | 10.5      | 55         | 12.7      | AV       | L1   | GND |
| 0.226000      | 37.70      | 10.6      | 53         | 14.9      | AV       | L1   | GND |
| 2.814000      | 30.50      | 11.0      | 46         | 15.5      | AV       | L1   | GND |

## ACCURATE TECHNOLOGY CO.,LTD

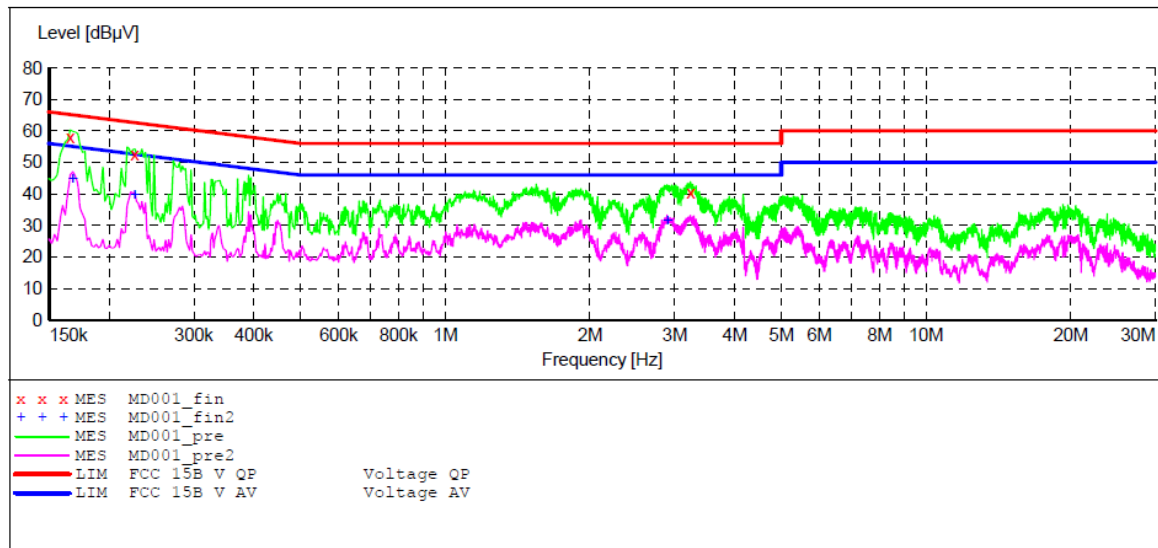
### CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Barcode Scanner M/N:MS3390  
 Manufacturer: MinDe  
 Operating Condition: ON  
 Test Site: 1#Shielding Room  
 Operator: star  
 Test Specification: N 120V/60Hz  
 Comment: Report No.:ATE20151107  
 Start of Test: 5/28/2015 / 9:06:08AM

### SCAN TABLE: "V 9K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70

| Start Frequency | Stop Frequency | Step Width | Detector  | Meas. Time | IF Bandw. | Transducer    |
|-----------------|----------------|------------|-----------|------------|-----------|---------------|
| 9.0 kHz         | 150.0 kHz      | 100.0 Hz   | QuasiPeak | 1.0 s      | 200 Hz    | NSLK8126 2008 |
|                 |                |            | Average   |            |           |               |
| 150.0 kHz       | 30.0 MHz       | 4.5 kHz    | QuasiPeak | 1.0 s      | 9 kHz     | NSLK8126 2008 |
|                 |                |            | Average   |            |           |               |



### MEASUREMENT RESULT: "MD001\_fin"

5/28/2015 9:08AM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.166000      | 58.10      | 10.5      | 65         | 7.1       | QP       | N    | GND |
| 0.226000      | 52.40      | 10.6      | 63         | 10.2      | QP       | N    | GND |
| 3.238000      | 40.30      | 11.1      | 56         | 15.7      | QP       | N    | GND |

### MEASUREMENT RESULT: "MD001\_fin2"

5/28/2015 9:08AM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.168000      | 44.50      | 10.5      | 55         | 10.6      | AV       | N    | GND |
| 0.226000      | 39.70      | 10.6      | 53         | 12.9      | AV       | N    | GND |
| 2.894000      | 31.60      | 11.0      | 46         | 14.4      | AV       | N    | GND |

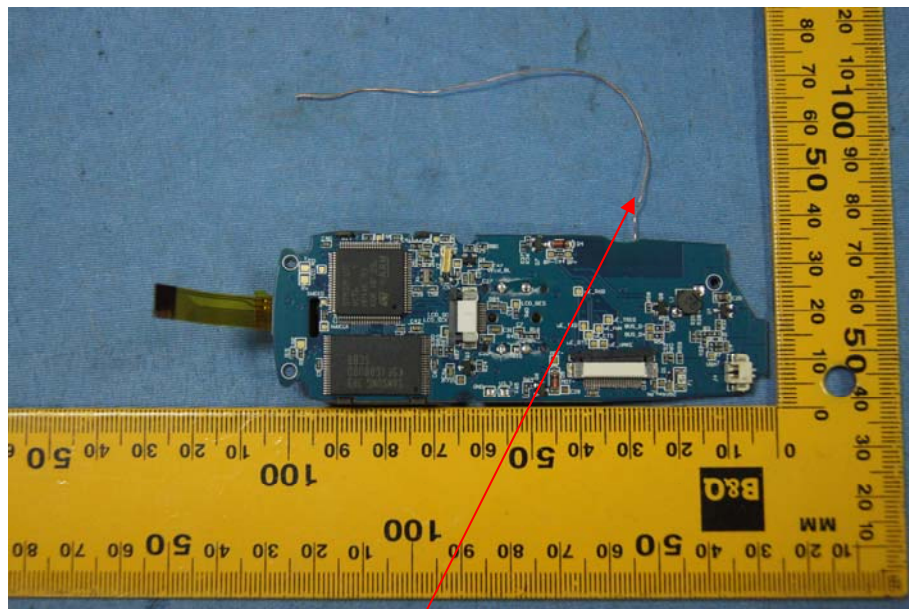
## 13.ANTENNA REQUIREMENT

### 13.1.The Requirement

According to Section 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.

### 13.2.Antenna Construction

The antenna is wire antenna, no consideration of replacement. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna