

## APPLICATION CERTIFICATION FCC Part 15C

On Behalf of  
Modern Marketing Concepts, Inc.

## DISCOVERY

Model No.: CR8009A-DU,  
CR8009X-XX("X" can be replaced by letter from "A" to "Z" or blank)

FCC ID: AUSCR8009A

Prepared for : Modern Marketing Concepts, Inc.  
Address : 1220 E Oak, St. Louisville, Kentucky, United States  
40204

Prepared by : Shenzhen Accurate Technology Co., Ltd.  
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Report No. : ATE20190551  
Date of Test : Apr. 21, 2019--May 06, 2019  
Date of Report : May 07, 2019

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## Test Report Certification

Applicant : Modern Marketing Concepts, Inc.  
Address : 1220 E Oak, St. Louisville, Kentucky, United States 40204  
Manufacturer : TIMSEN DEVELOPMENT LIMITED  
Address : 5F, 447# Tianhebei Road, Guangzhou, China  
Product : DISCOVERY  
Model No. : CR8009A-DU  
Trade name : CROSLEY

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 SHENZHEN 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 SHENZHEN 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 SHENZHEN ACCURATE TECHNOLOGY CO. LTD.

Date of Test : Apr. 21, 2019--May 06, 2019  
Date of Report: May 07, 2019

Prepared by :

(Tim Zhang, Engineer)

Approved &  
Authorized Signer :

(Sean Liu, Manager)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                         |   |                                                                                                                                                                                                                                                                                                          |
|-------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT                     | : | DISCOVERY                                                                                                                                                                                                                                                                                                |
| Model Number            | : | CR8009A-DU,<br>CR8009X-XX("X" can be replaced by letter from "A" to<br>"Z" or blank)<br>(Note: We hereby state that these models are identical in interior structure,<br>electrical circuits and components, Just model name is different, Therefore,<br>only model CR8009A-DU is tested for EMC tests.) |
| Rating                  | : | DC 12V (Powered by adapter)                                                                                                                                                                                                                                                                              |
| Adapter information     | : | Model:SW1200500-F04<br>Input: 100-240V~50/60Hz Max. 200mA<br>Output: DC 12V/500mA                                                                                                                                                                                                                        |
| Bluetooth version       | : | BT V5.0<br>This report is for BT classic mode                                                                                                                                                                                                                                                            |
| Frequency Range         | : | 2402MHz-2480MHz                                                                                                                                                                                                                                                                                          |
| Number of Channels      | : | 79                                                                                                                                                                                                                                                                                                       |
| Antenna Gain(Max)       | : | 1.2dBi                                                                                                                                                                                                                                                                                                   |
| Antenna type            | : | PCB Antenna                                                                                                                                                                                                                                                                                              |
| Trade Name              | : | CROSLEY                                                                                                                                                                                                                                                                                                  |
| Modulation mode         | : | GFSK, $\pi/4$ DQPSK, 8DPSK                                                                                                                                                                                                                                                                               |
| Applicant               | : | Modern Marketing Concepts, Inc.                                                                                                                                                                                                                                                                          |
| Address                 | : | 1220 E Oak, St. Louisville, Kentucky, United States<br>40204                                                                                                                                                                                                                                             |
| Manufacturer            | : | TIMSEN DEVELOPMENT LIMITED                                                                                                                                                                                                                                                                               |
| Address                 | : | 5F, 447# Tianhebei Road, Guangzhou, China                                                                                                                                                                                                                                                                |
| Date of sample received | : | Apr. 20, 2019                                                                                                                                                                                                                                                                                            |
| Date of Test            | : | Apr. 21, 2019--May 06, 2019                                                                                                                                                                                                                                                                              |

## 1.2. Accessory and Auxiliary Equipment

|                                |   |                      |
|--------------------------------|---|----------------------|
| PC<br>(provided by laboratory) | : | Manufacturer: LENOVO |
|                                |   | M/N: 4290-RT8        |
|                                |   | S/N: R9-FW93G 11/08  |

## 1.3. Model difference declaration

CR8009X-XX("X" can be replaced by letter from "A" to "Z" or blank)

They are identical in PCB motherboard, driver IC, RF module and Enclosure except the model number is different.

## 1.4. Description of Test Facility

EMC Lab : Recognition of accreditation by Federal Communications Commission (FCC)  
The Designation Number is CN1189  
The Registration Number is 708358

Listed by Innovation, Science and Economic Development Canada (ISED)  
The Registration Number is 5077A-2

Accredited by China National Accreditation Service for Conformity Assessment (CNAS)  
The Registration Number is CNAS L3193

Accredited by American Association for Laboratory Accreditation (A2LA)  
The Certificate Number is 4297.01

Name of Firm : Shenzhen Accurate Technology Co., Ltd.  
Site Location : 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

### 1.5.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 | Calibrated until |
|---------------------------------|---------------------------|-----------------------------------------|--------------------|------------------|------------------|
| EMI Test Receiver               | Rohde&Schwarz             | ESCS30                                  | 100307             | Jan. 05, 2019    | Jan. 04, 2020    |
| EMI Test Receiver               | Rohde&Schwarz             | ESPI3                                   | 101526/003         | Jan. 05, 2019    | Jan. 04, 2020    |
| Spectrum Analyzer               | Rohde&Schwarz             | FSV-40                                  | 101495             | Jan. 05, 2019    | Jan. 04, 2020    |
| Spectrum Analyzer               | Agilent                   | E7405A                                  | MY45115511         | Jan. 05, 2019    | Jan. 04, 2020    |
| Pre-Amplifier                   | Rohde&Schwarz             | CBLU118354<br>0-01                      | 3791               | Jan. 05, 2019    | Jan. 04, 2020    |
| Loop Antenna                    | Schwarzbeck               | FMZB1516                                | 1516131            | Jan. 05, 2019    | Jan. 04, 2020    |
| Bilog Antenna                   | Schwarzbeck               | VULB9163                                | 9163-323           | Jan. 05, 2019    | Jan. 04, 2020    |
| Horn Antenna                    | Schwarzbeck               | BBHA9120D                               | 9120D-655          | Jan. 05, 2019    | Jan. 04, 2020    |
| Horn Antenna                    | Schwarzbeck               | BBHA9170                                | 9170-359           | Jan. 05, 2019    | Jan. 04, 2020    |
| Open Switch and<br>Control Unit | Rohde&Schwarz             | OSP120 +<br>OSP-B157                    | 101244 +<br>100866 | Jan. 05, 2019    | Jan. 04, 2020    |
| LISN                            | Rohde&Schwarz             | ESH3-Z5                                 | 100305             | Jan. 05, 2019    | Jan. 04, 2020    |
| LISN                            | Schwarzbeck               | NSLK8126                                | 8126431            | Jan. 05, 2019    | Jan. 04, 2020    |
| Highpass Filter                 | Wainwright<br>Instruments | WHKX3.6/18<br>G-10SS                    | N/A                | Jan. 05, 2019    | Jan. 04, 2020    |
| Band Reject Filter              | Wainwright<br>Instruments | WRCG2400/2<br>485-2375/2510<br>-60/11SS | N/A                | Jan. 05, 2019    | Jan. 04, 2020    |

### 3. OPERATION OF EUT DURING TESTING

#### 3.1.Operating Mode

The mode is used: Transmitting mode

Low Channel: 2402MHz

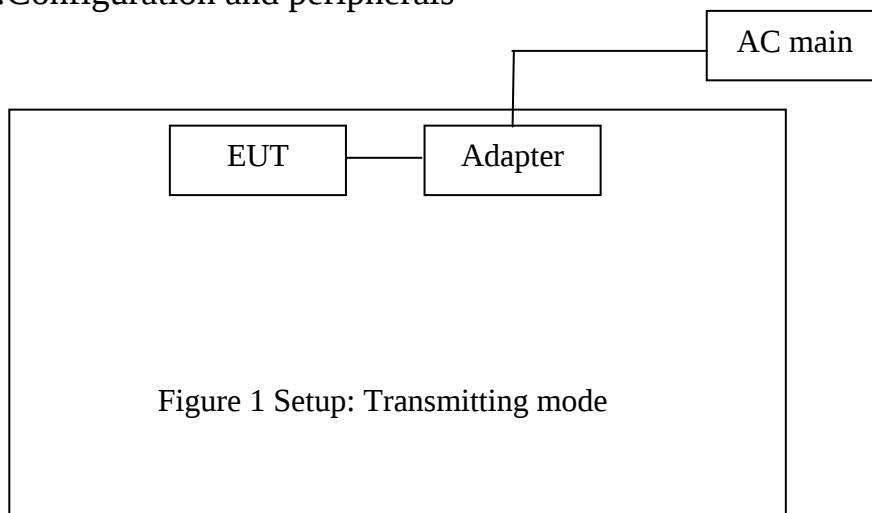
Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

Note: The Bluetooth has been tested under continuous transmission mode.

#### 3.2.Configuration and peripherals

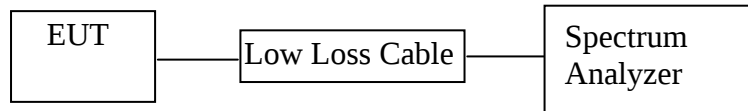


## 4. TEST PROCEDURES AND RESULTS

| FCC&IC Rules                        | Description of Test                   | Result    |
|-------------------------------------|---------------------------------------|-----------|
| Section 15.207                      | AC Power Line 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: DISCOVERY)

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

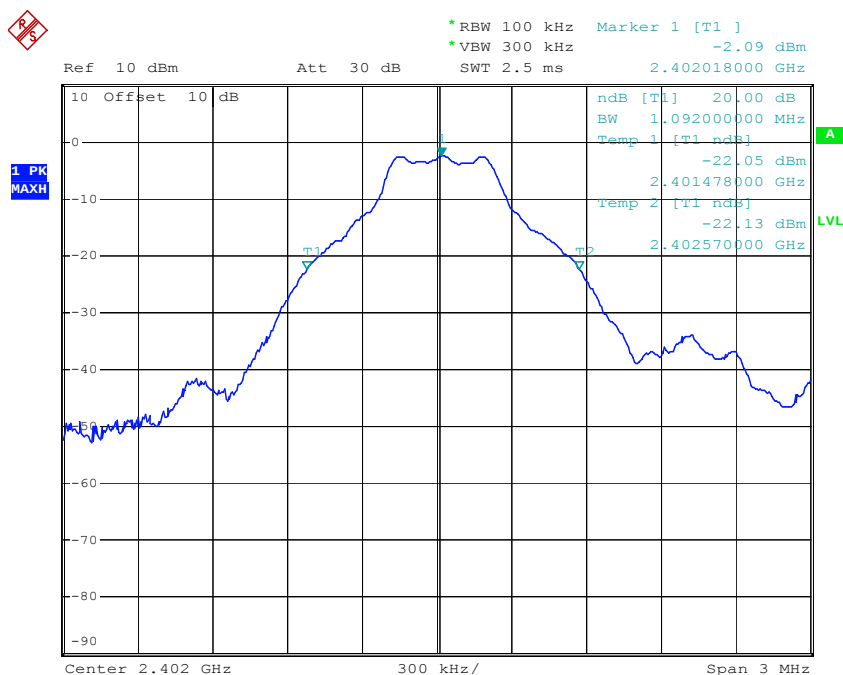
## 5.6.Test Result

| Channel | Frequency (MHz) | GFSK mode<br>20dB Bandwidth (MHz) | $\pi/4$ DQPSK mode<br>20dB Bandwidth (MHz) | 8DPSK mode<br>20dB Bandwidth (MHz) | Result |
|---------|-----------------|-----------------------------------|--------------------------------------------|------------------------------------|--------|
| Low     | 2402            | 1.092                             | 1.350                                      | 1.332                              | Pass   |
| Middle  | 2441            | 1.098                             | 1.356                                      | 1.344                              | Pass   |
| High    | 2480            | 1.092                             | 1.356                                      | 1.344                              | Pass   |

The spectrum analyzer plots are attached as below.

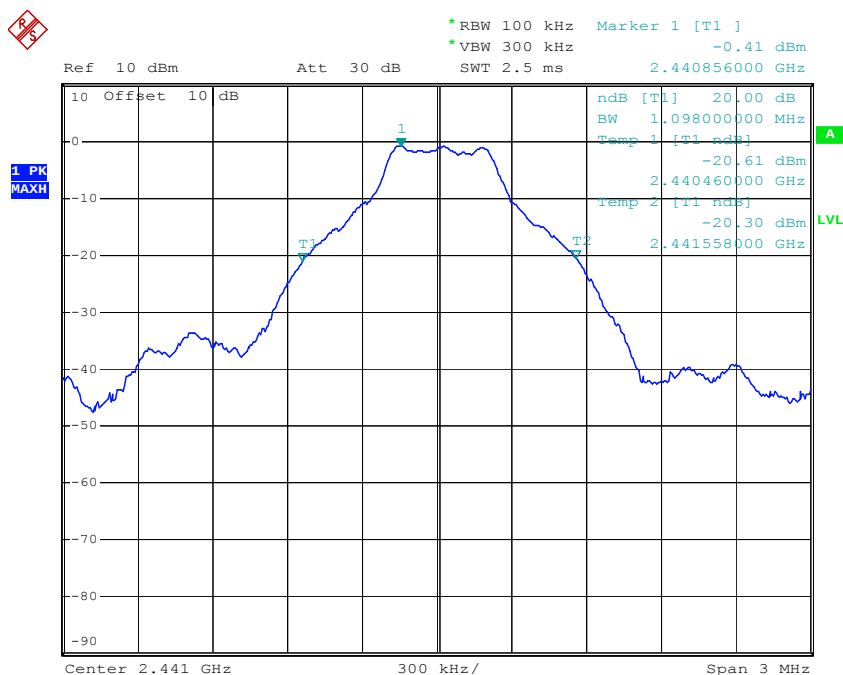
### GFSK Mode

#### Low channel



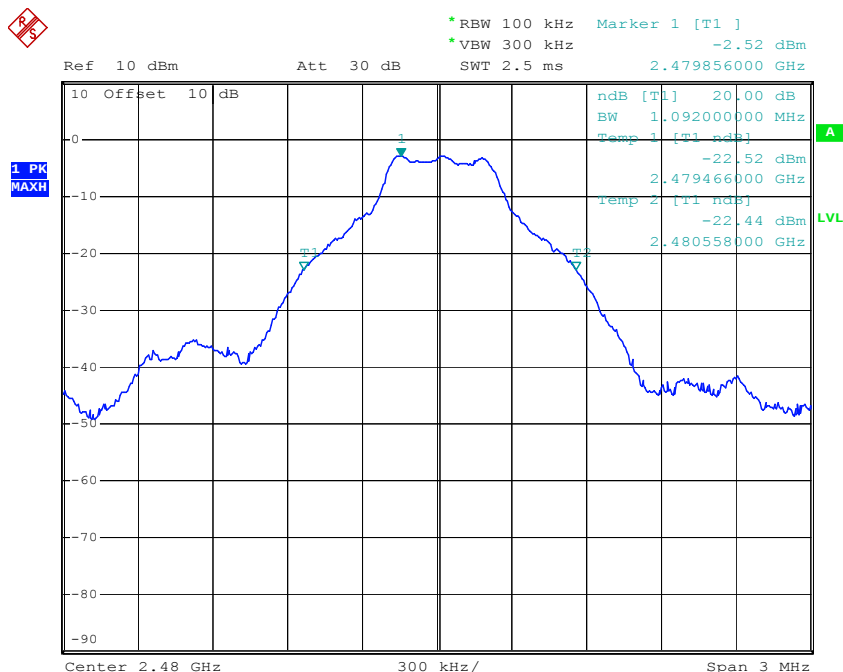
Comment A:  
Date: 27.APR.2019 10:18:21

## Middle channel



Comment A:  
Date: 27.APR.2019 10:19:13

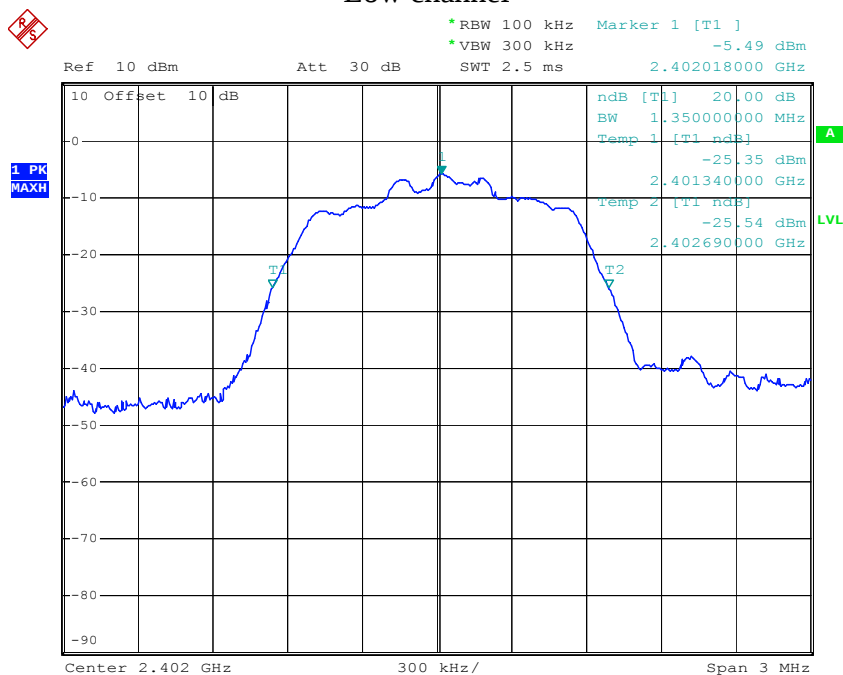
## High channel



Comment A:  
Date: 27.APR.2019 10:20:11

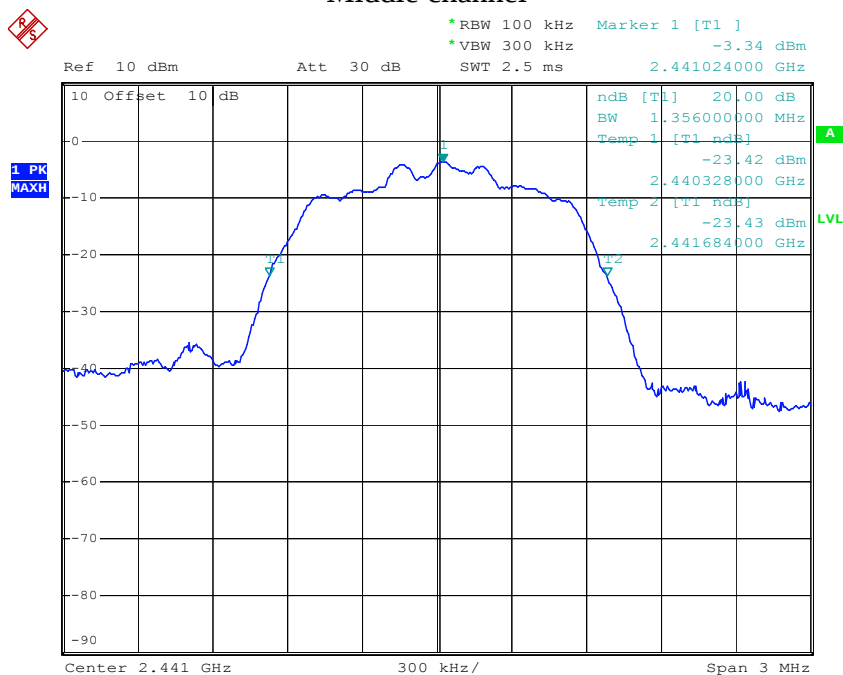
## $\pi/4$ DQPSK Mode

### Low channel



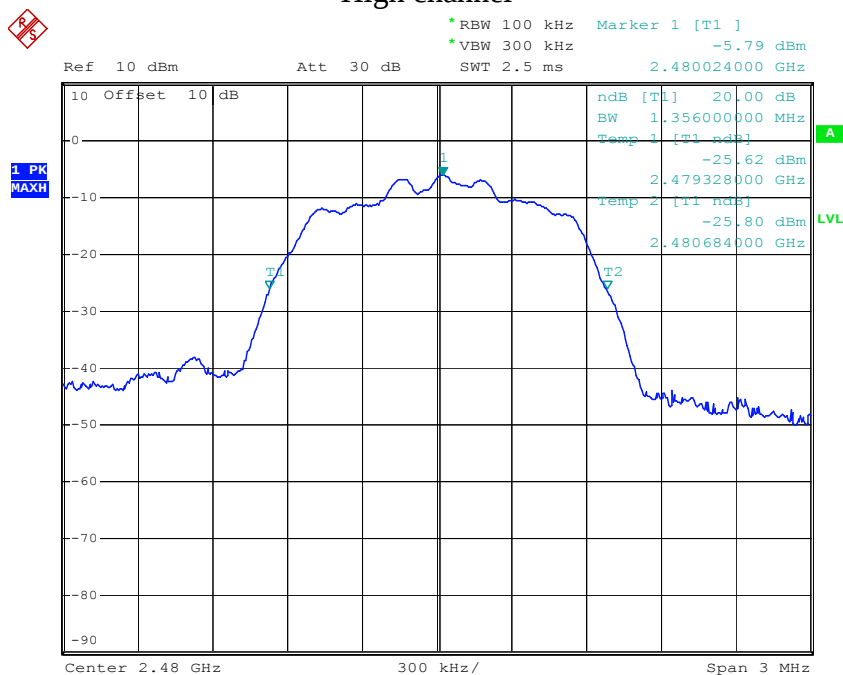
Comment A:  
Date: 27.APR.2019 10:24:28

### Middle channel



Comment A:  
Date: 27.APR.2019 10:23:22

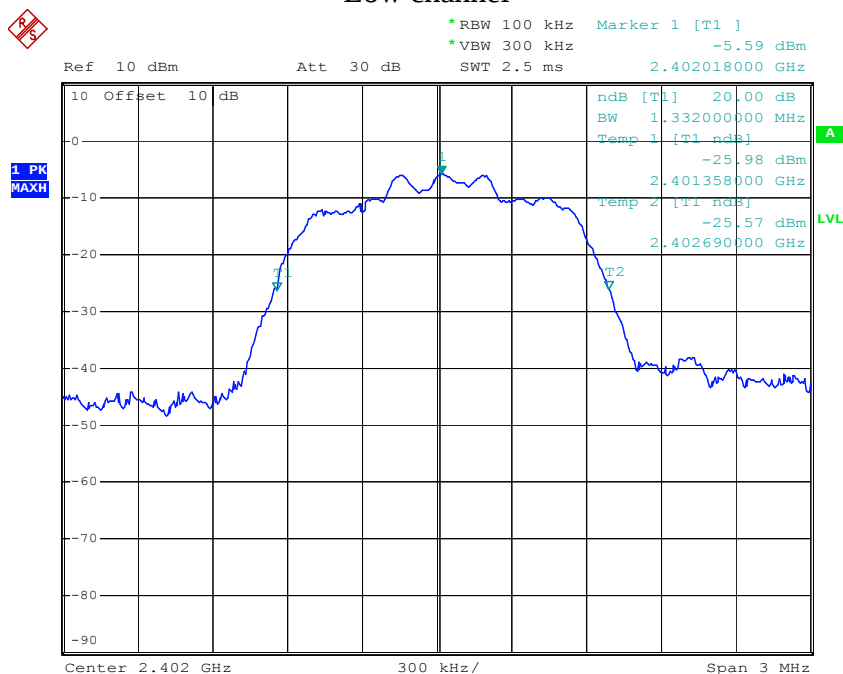
## High channel



Comment A:  
Date: 27.APR.2019 10:22:14

## 8DPSK Mode

## Low channel



Comment A:  
Date: 27.APR.2019 10:26:03

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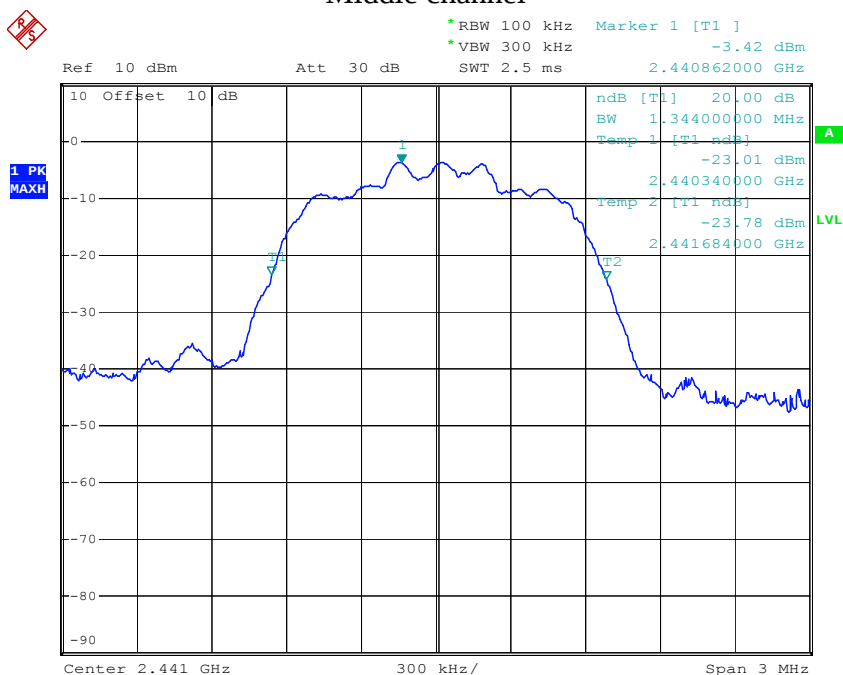
Tel: +86-755-26503290

Fax: +86-755-26503396

E-mail: webmaster@atc-lab.com

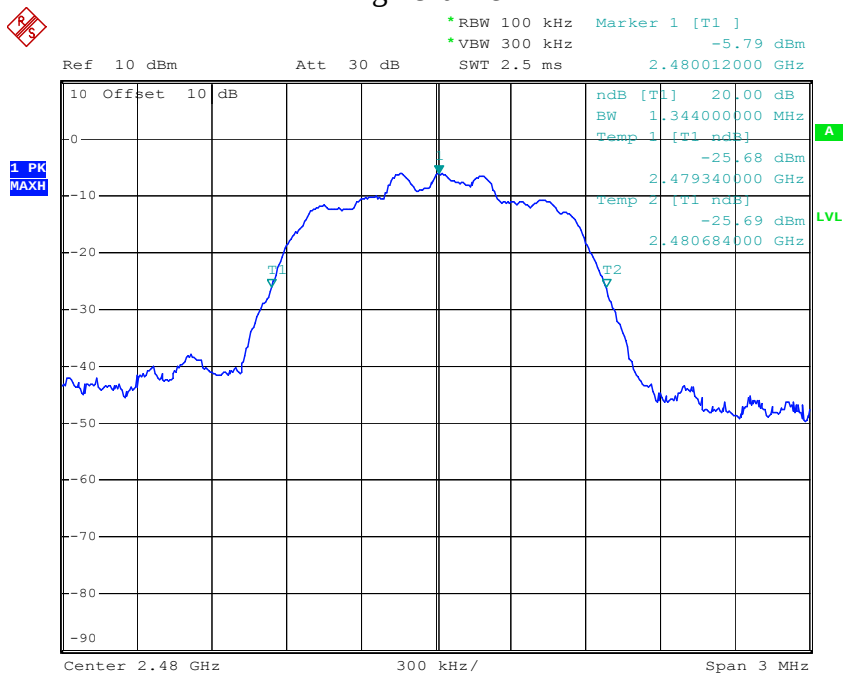
[Http://www.atc-lab.com](http://www.atc-lab.com)

## Middle channel



Comment A:  
Date: 27.APR.2019 10:27:02

## High channel



Comment A:  
Date: 27.APR.2019 10:28:11

## 6. CARRIER FREQUENCY SEPARATION TEST

### 6.1. Block Diagram of Test Setup



(EUT: DISCOVERY)

### 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 100 kHz and VBW to 300 kHz. Adjust Span to 3MHz.

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 mode

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit              | Result |
|---------|-----------------|-------------------------|--------------------|--------|
| Low     | 2402            | 1.002                   | 25KHz or 0.784 MHz | PASS   |
|         | 2403            |                         |                    |        |
| Middle  | 2440            | 0.996                   | 25KHz or 0.772 MHz | PASS   |
|         | 2441            |                         |                    |        |
| High    | 2479            | 1.002                   | 25KHz or 0.788 MHz | PASS   |
|         | 2480            |                         |                    |        |

### $\pi/4$ DQPSK mode

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit              | Result |
|---------|-----------------|-------------------------|--------------------|--------|
| Low     | 2402            | 1.008                   | 25KHz or 0.892 MHz | PASS   |
|         | 2403            |                         |                    |        |
| Middle  | 2440            | 1.002                   | 25KHz or 0.904 MHz | PASS   |
|         | 2441            |                         |                    |        |
| High    | 2479            | 1.002                   | 25KHz or 0.884 MHz | PASS   |
|         | 2480            |                         |                    |        |

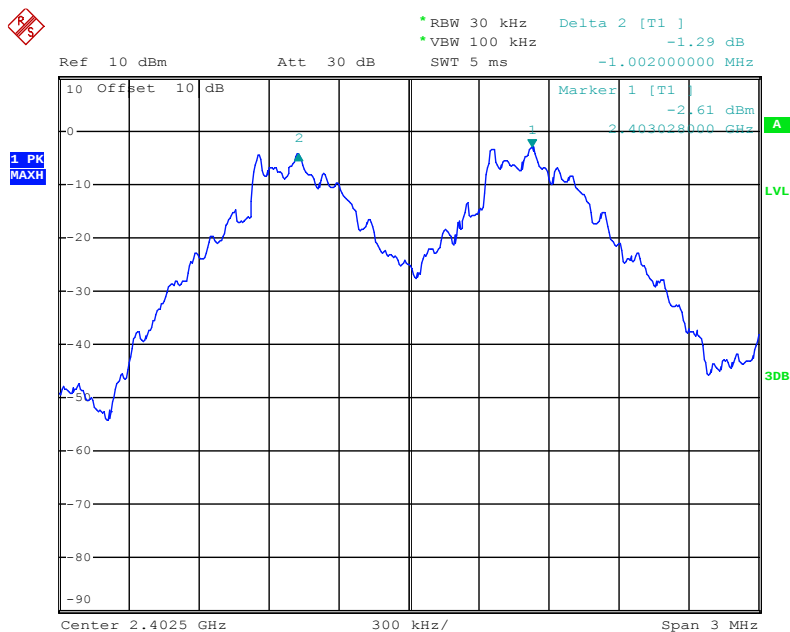
### 8DPSK mode

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit              | Result |
|---------|-----------------|-------------------------|--------------------|--------|
| Low     | 2402            | 1.008                   | 25KHz or 0.928 MHz | PASS   |
|         | 2403            |                         |                    |        |
| Middle  | 2440            | 1.002                   | 25KHz or 0.920 MHz | PASS   |
|         | 2441            |                         |                    |        |
| High    | 2479            | 0.996                   | 25KHz or 0.936 MHz | PASS   |
|         | 2480            |                         |                    |        |

The spectrum analyzer plots are attached as below.

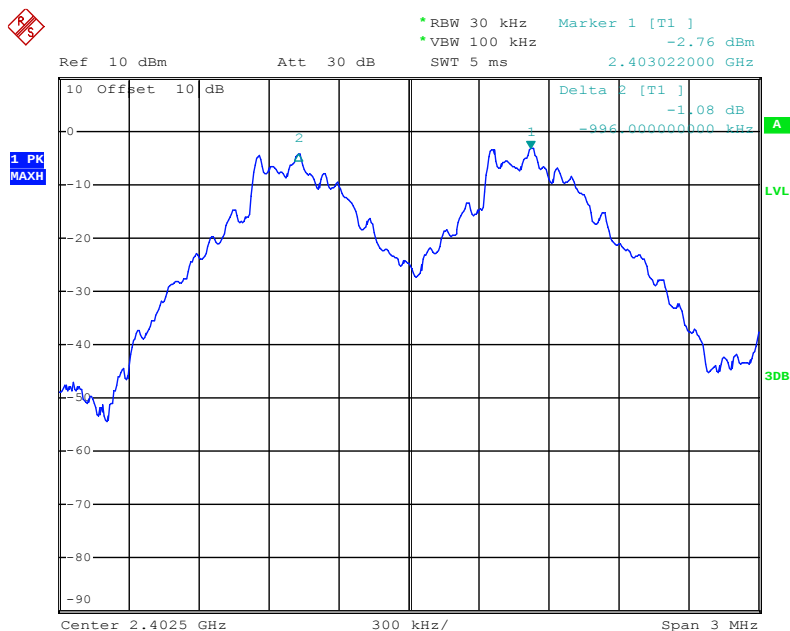
## GFSK Mode

### Low channel



Date: 28.APR.2019 09:13:56

### Middle channel



Date: 28.APR.2019 09:13:18

shenzhen Accurate Technology Co., Ltd.

Address: 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

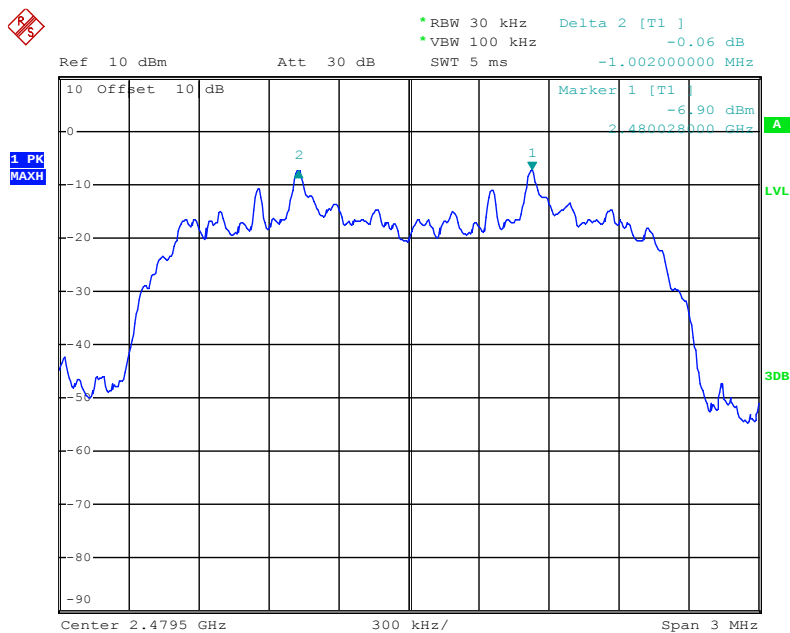
Tel: +86-755-26503290

Fax: +86-755-26503396

E-mail: webmaster@atc-lab.com

[Http://www.atc-lab.com](http://www.atc-lab.com)

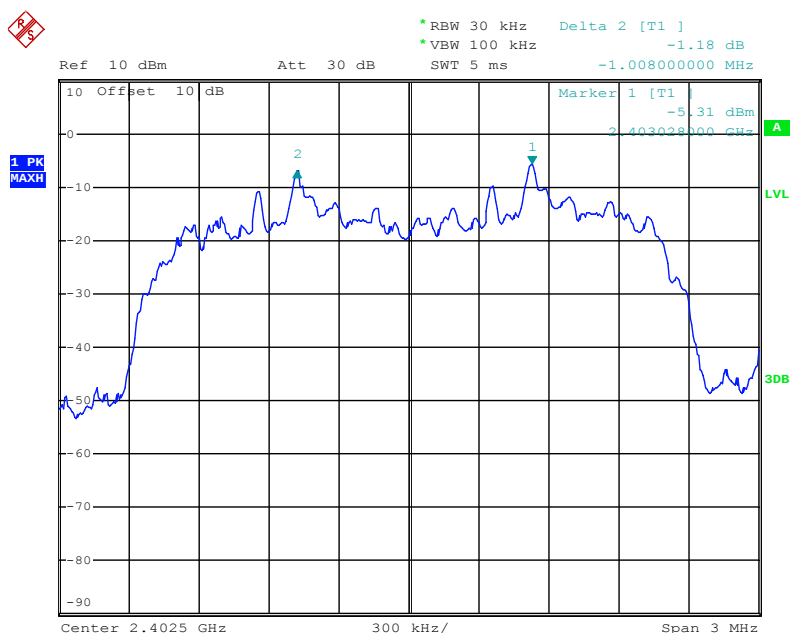
## High channel



Date: 28.APR.2019 09:16:38

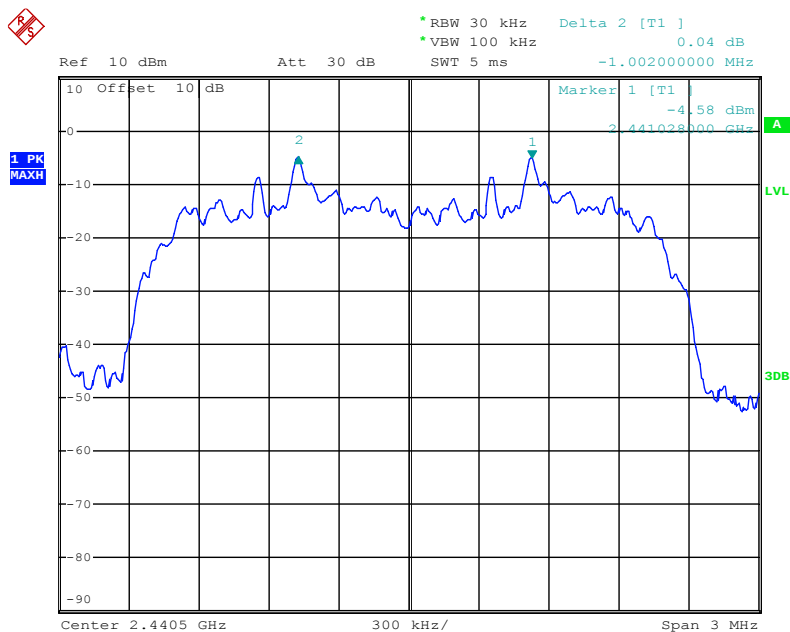
## $\pi/4$ DQPSK Mode

## Low channel



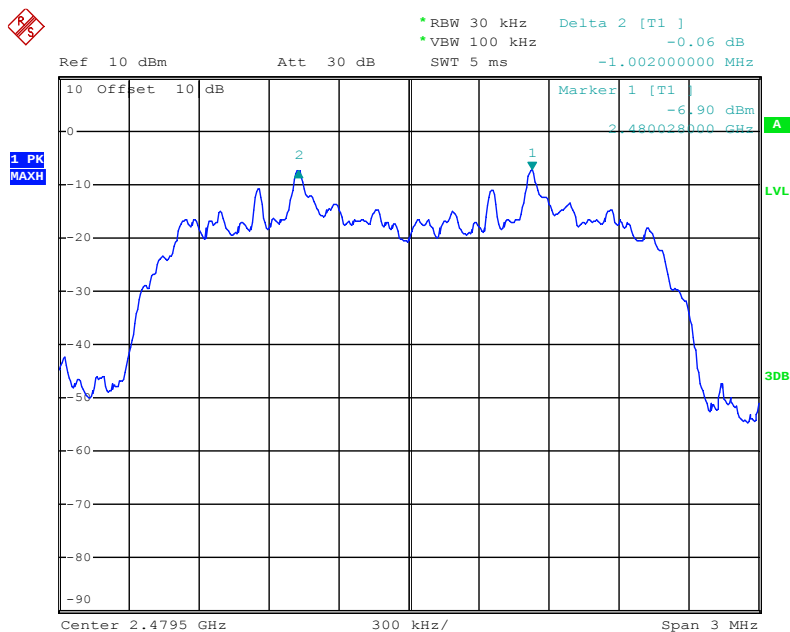
Date: 28.APR.2019 09:18:34

## Middle channel



Date: 28.APR.2019 09:17:42

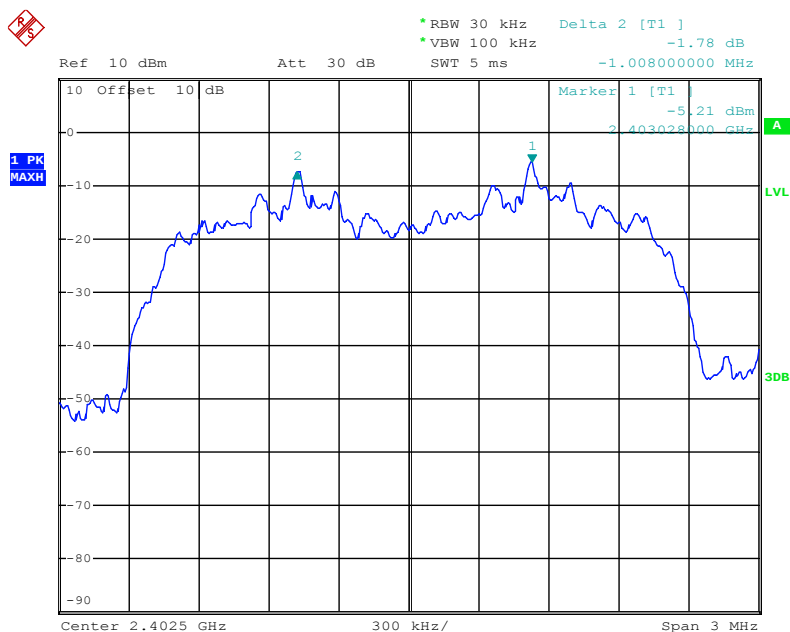
## High channel



Date: 28.APR.2019 09:16:38

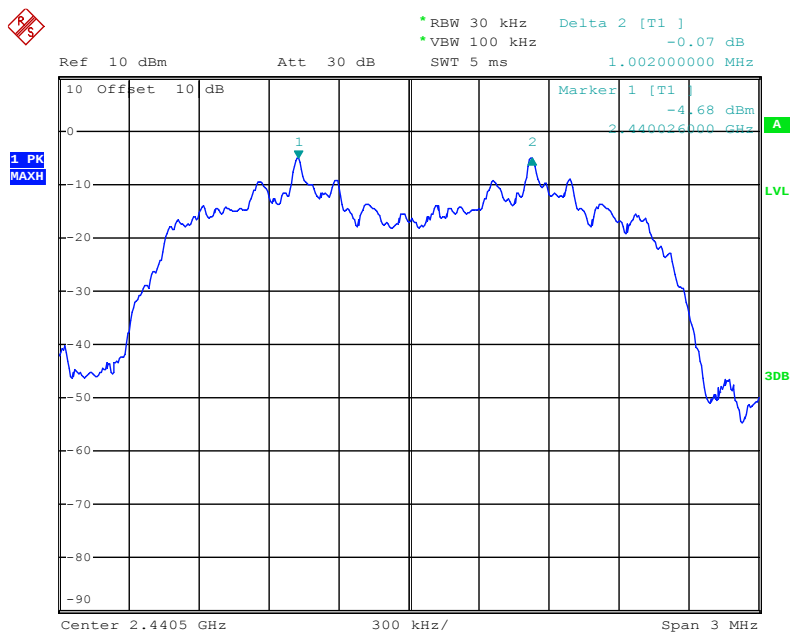
## 8DPSK Mode

### Low channel



Date: 28.APR.2019 09:20:19

### Middle channel



Date: 28.APR.2019 09:21:17

shenzhen Accurate Technology Co., Ltd.

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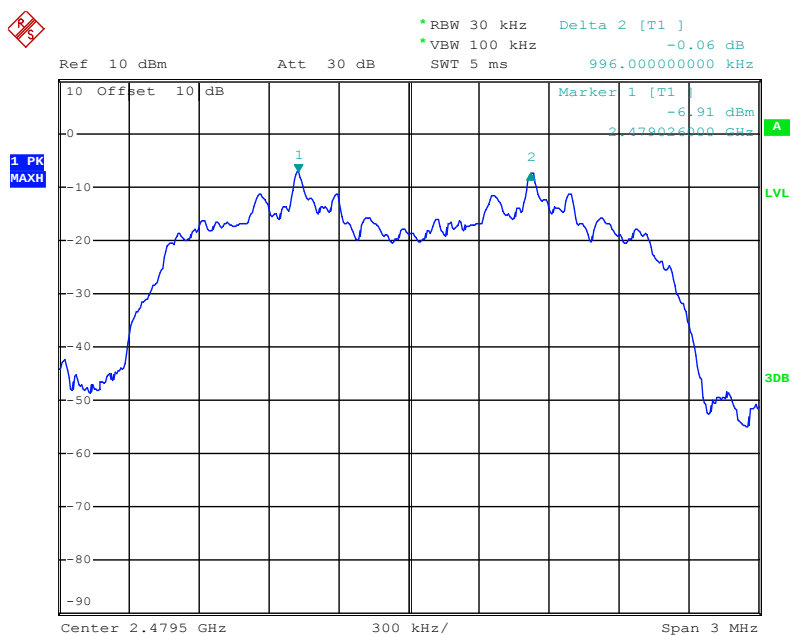
Tel: +86-755-26503290

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## High channel



Date: 28.APR.2019 09:22:24

## 7. NUMBER OF HOPPING FREQUENCY TEST

### 7.1. Block Diagram of Test Setup



(EUT: DISCOVERY)

### 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=85MHz, RBW=100 kHz, VBW=300 kHz.

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

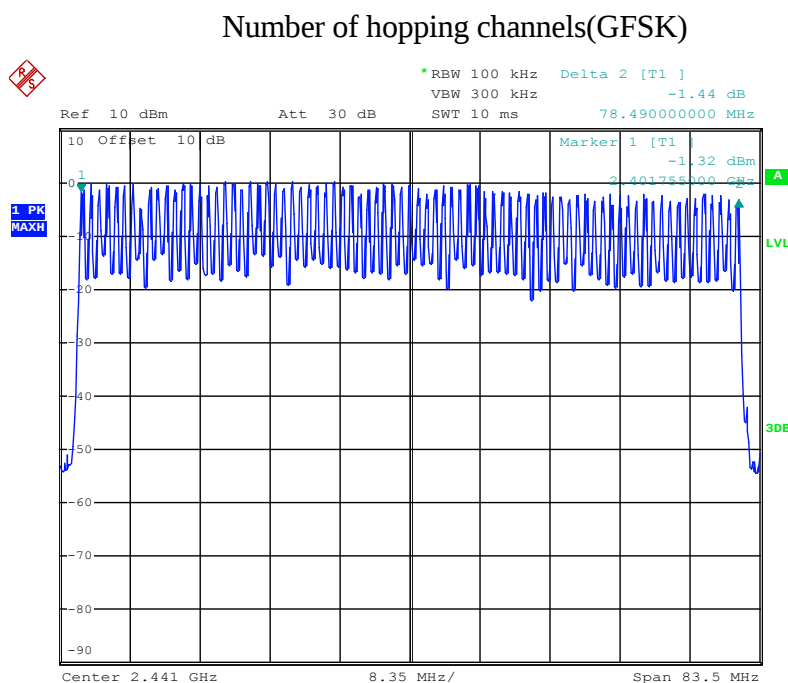
## 7.6.Test Result

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

| Total number of hopping channel ( $\pi/4$ DQPSK mode) | Measurement result(CH) | Limit(CH) |
|-------------------------------------------------------|------------------------|-----------|
|                                                       | 79                     | $\geq 15$ |

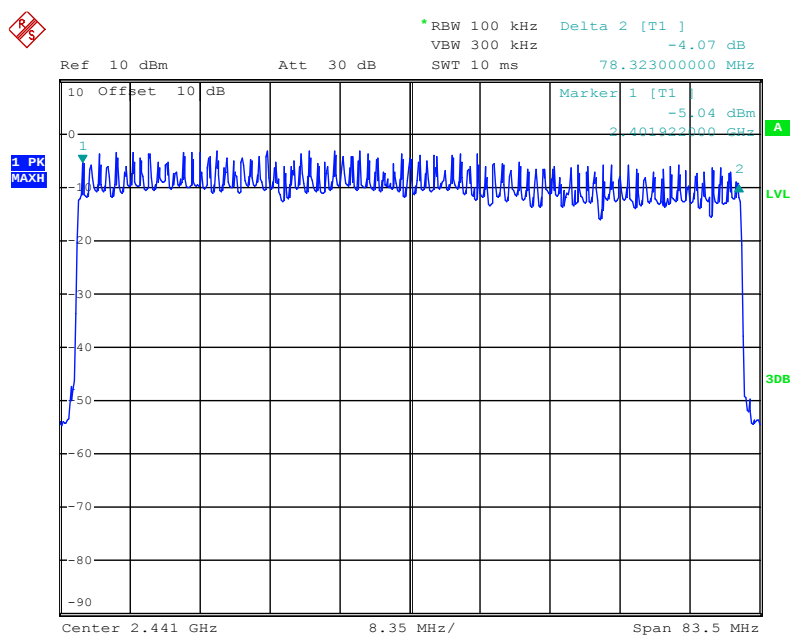
| Total number of hopping channel (8DPSK mode) | Measurement result(CH) | Limit(CH) |
|----------------------------------------------|------------------------|-----------|
|                                              | 79                     | $\geq 15$ |

The spectrum analyzer plots are attached as below.



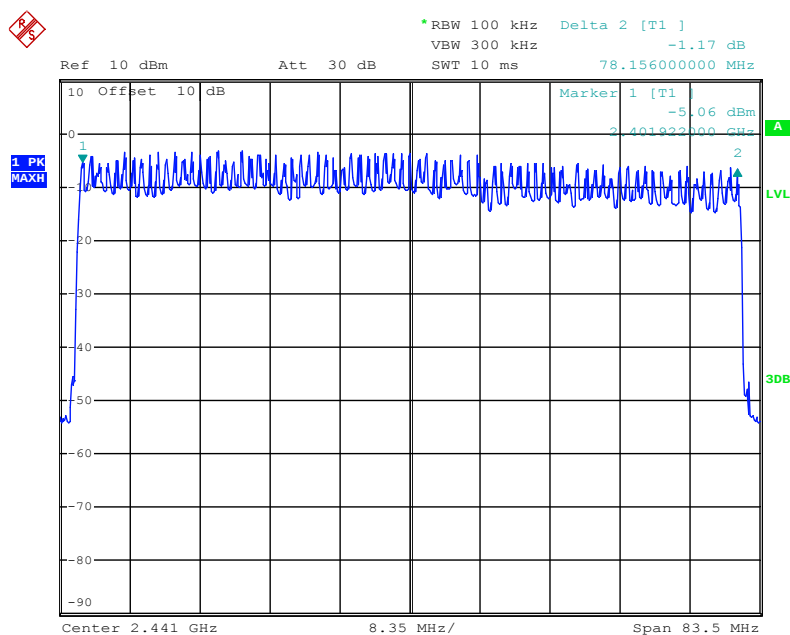
Date: 27.APR.2019 13:48:38

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



Date: 27.APR.2019 13:53:09

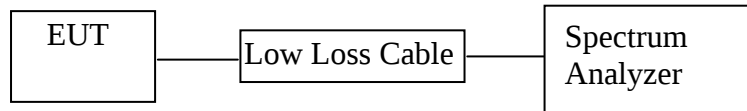
## Number of hopping channels(8DPSK)



Date: 27.APR.2019 13:55:04

## 8. DWELL TIME TEST

### 8.1. Block Diagram of Test Setup



(EUT: DISCOVERY)

### 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, Adjust

Sweep=5ms, 10ms, 15ms. Get the pulse time.

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                    | 0.430           | 137.60          | 400        |
|                                                                                                            | 2441                    | 0.430           | 137.60          | 400        |
|                                                                                                            | 2480                    | 0.430           | 137.60          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2*79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                        | 2402                    | 1.710           | 273.60          | 400        |
|                                                                                                            | 2441                    | 1.690           | 270.40          | 400        |
|                                                                                                            | 2480                    | 1.710           | 273.60          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4*79)) \times 31.6$ |                         |                 |                 |            |
| DH5                                                                                                        | 2402                    | 2.980           | 317.87          | 400        |
|                                                                                                            | 2441                    | 2.980           | 317.87          | 400        |
|                                                                                                            | 2480                    | 2.960           | 315.73          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$ |                         |                 |                 |            |

### $\pi/4$ DQPSK Mode

| Mode                                                                                                              | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|-------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| 2DH1                                                                                                              | 2402                    | 0.440           | 140.80          | 400        |
|                                                                                                                   | 2441                    | 0.450           | 144.00          | 400        |
|                                                                                                                   | 2480                    | 0.450           | 144.00          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$ |                         |                 |                 |            |
| 2DH3                                                                                                              | 2402                    | 1.730           | 276.80          | 400        |
|                                                                                                                   | 2441                    | 1.730           | 276.80          | 400        |
|                                                                                                                   | 2480                    | 1.730           | 276.80          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$ |                         |                 |                 |            |
| 2DH5                                                                                                              | 2402                    | 3.020           | 322.13          | 400        |
|                                                                                                                   | 2441                    | 2.990           | 318.93          | 400        |
|                                                                                                                   | 2480                    | 3.000           | 320.00          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$ |                         |                 |                 |            |

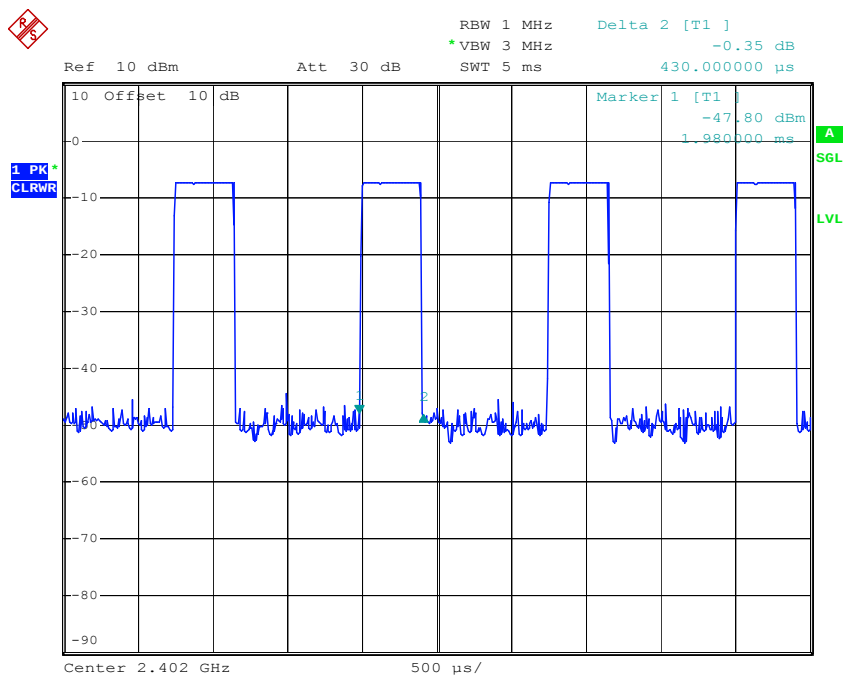
### 8DPSK Mode

| Mode                                                                                                              | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|-------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| 3DH1                                                                                                              | 2402                    | 0.440           | 140.80          | 400        |
|                                                                                                                   | 2441                    | 0.450           | 144.00          | 400        |
|                                                                                                                   | 2480                    | 0.450           | 144.00          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$ |                         |                 |                 |            |
| 3DH3                                                                                                              | 2402                    | 1.710           | 273.60          | 400        |
|                                                                                                                   | 2441                    | 1.670           | 267.20          | 400        |
|                                                                                                                   | 2480                    | 1.720           | 275.20          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$ |                         |                 |                 |            |
| 3DH5                                                                                                              | 2402                    | 3.000           | 320.00          | 400        |
|                                                                                                                   | 2441                    | 2.950           | 314.67          | 400        |
|                                                                                                                   | 2480                    | 2.990           | 318.93          | 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.

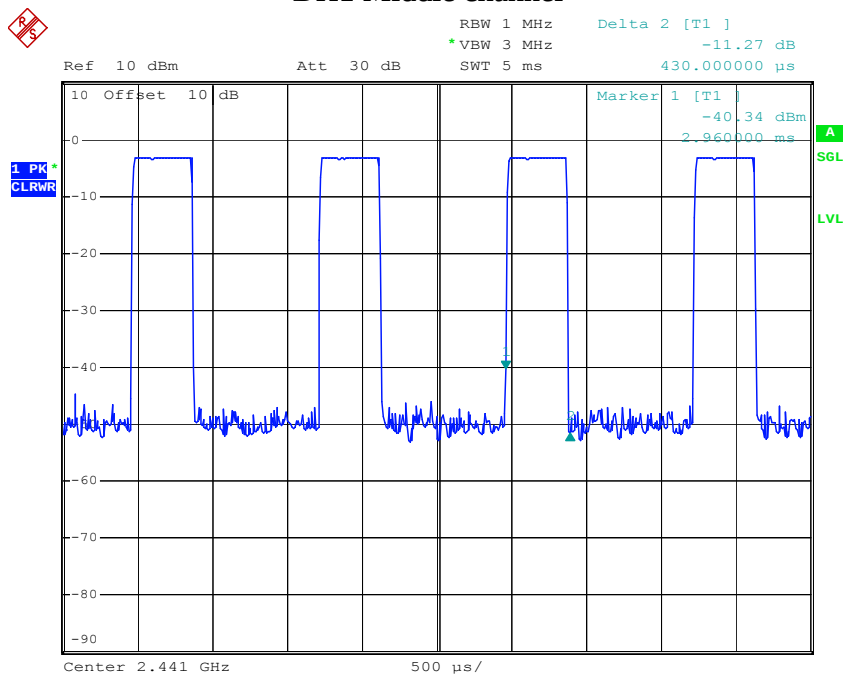
## GFSK Mode

### DH1 Low channel



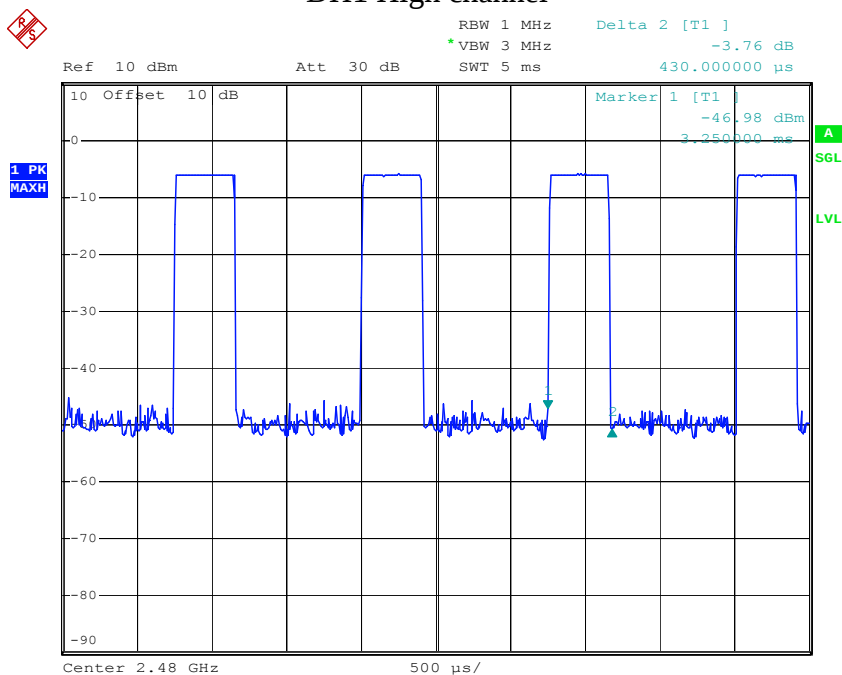
Comment A:  
 Date: 27.APR.2019 16:36:56

### DH1 Middle channel



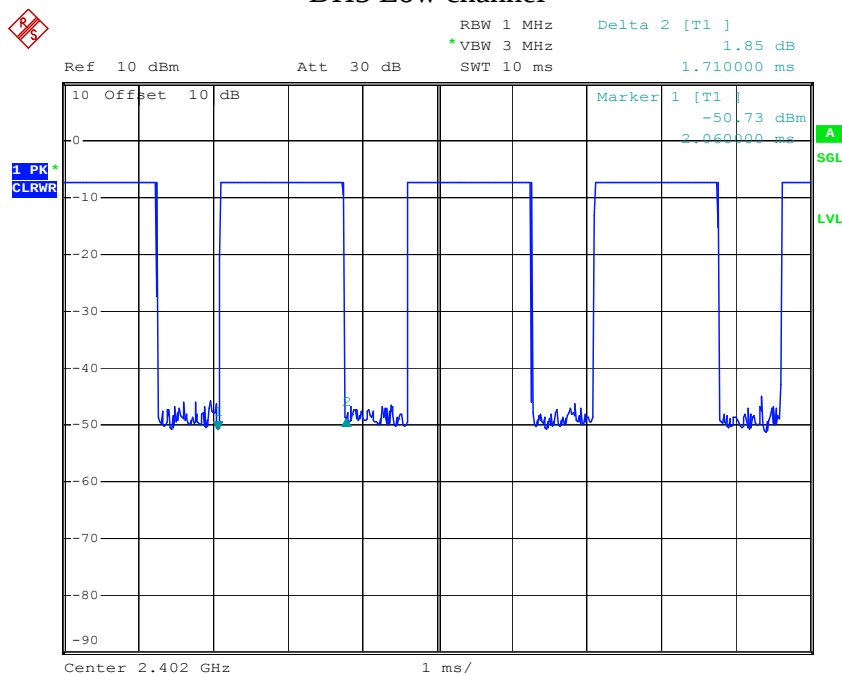
Comment A:  
 Date: 27.APR.2019 16:48:33

## DH1 High channel



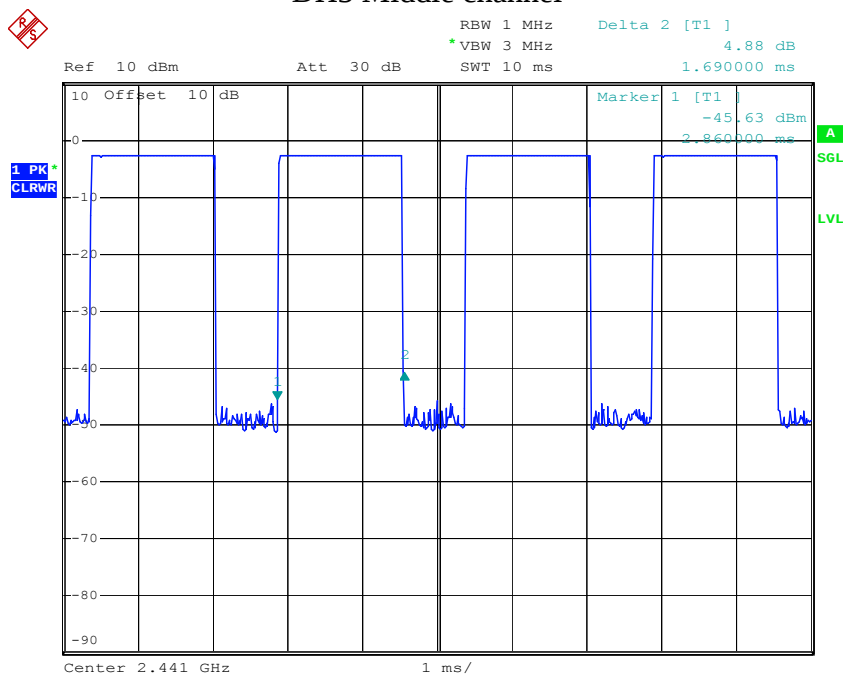
Comment A:  
Date: 27.APR.2019 17:17:22

## DH3 Low channel



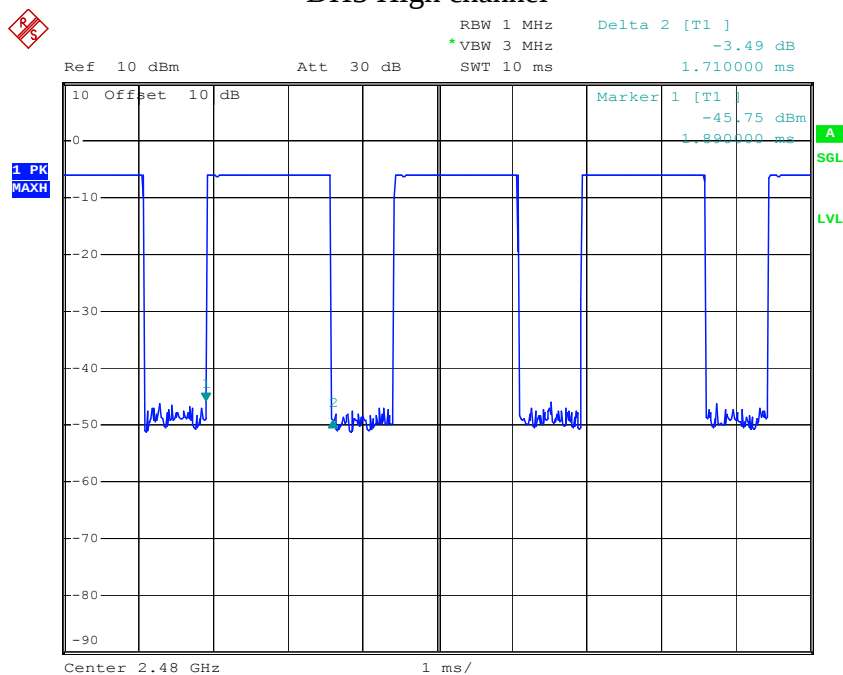
Comment A:  
Date: 27.APR.2019 16:38:05

## DH3 Middle channel



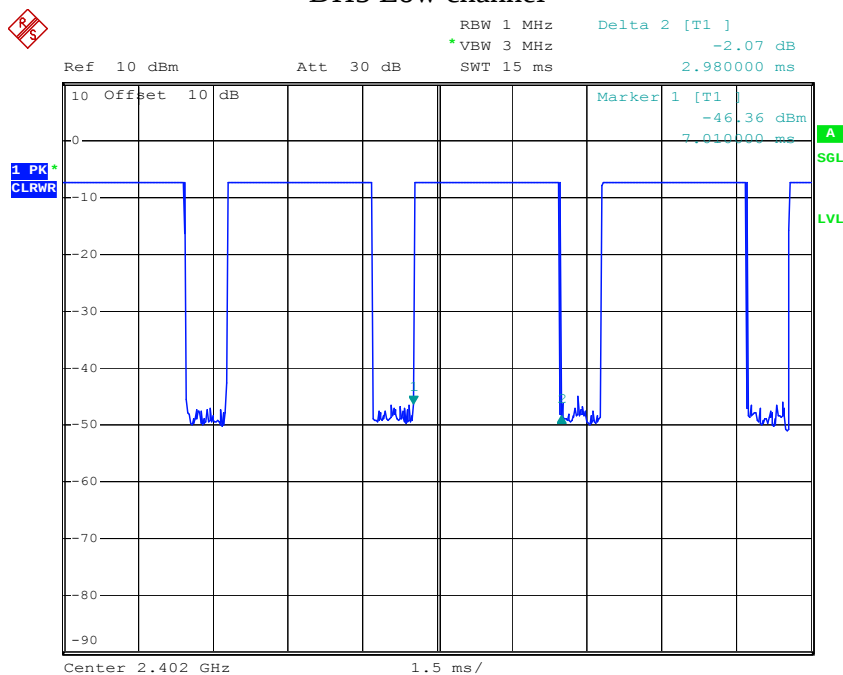
Comment A:  
 Date: 27.APR.2019 16:50:10

## DH3 High channel



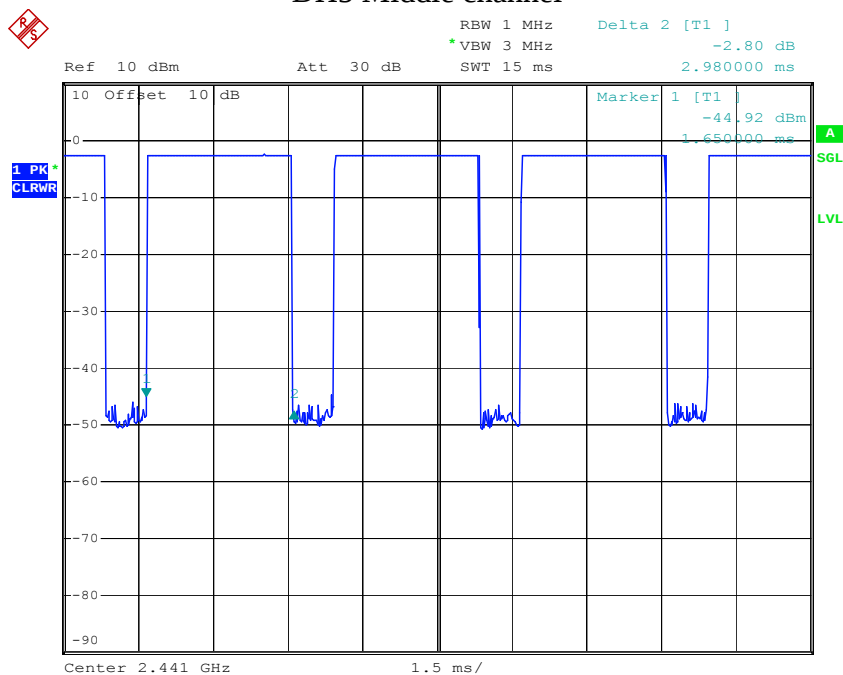
Comment A:  
 Date: 27.APR.2019 17:18:20

## DH5 Low channel



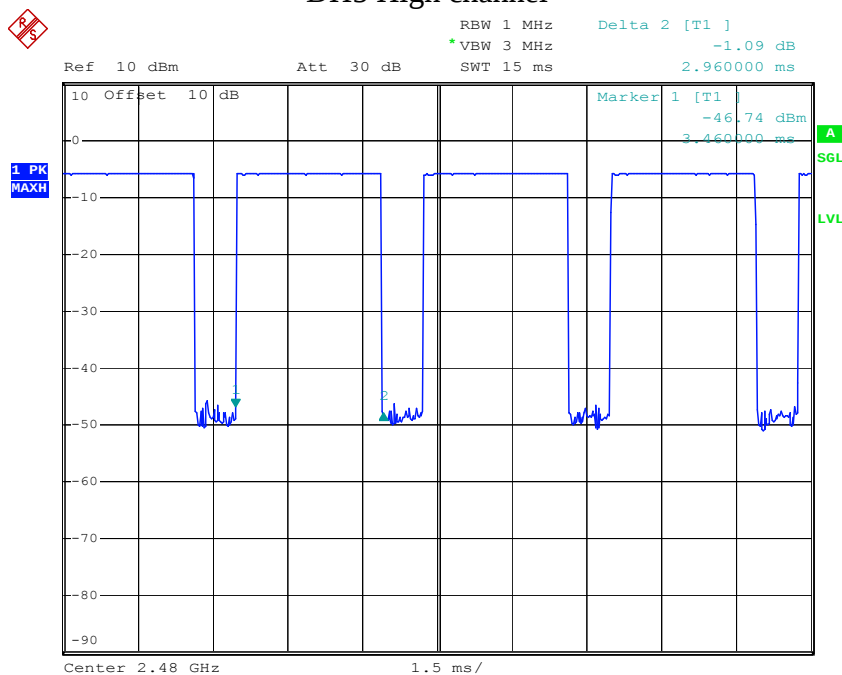
Comment A:  
 Date: 27.APR.2019 16:39:08

## DH5 Middle channel



Comment A:  
 Date: 27.APR.2019 16:51:07

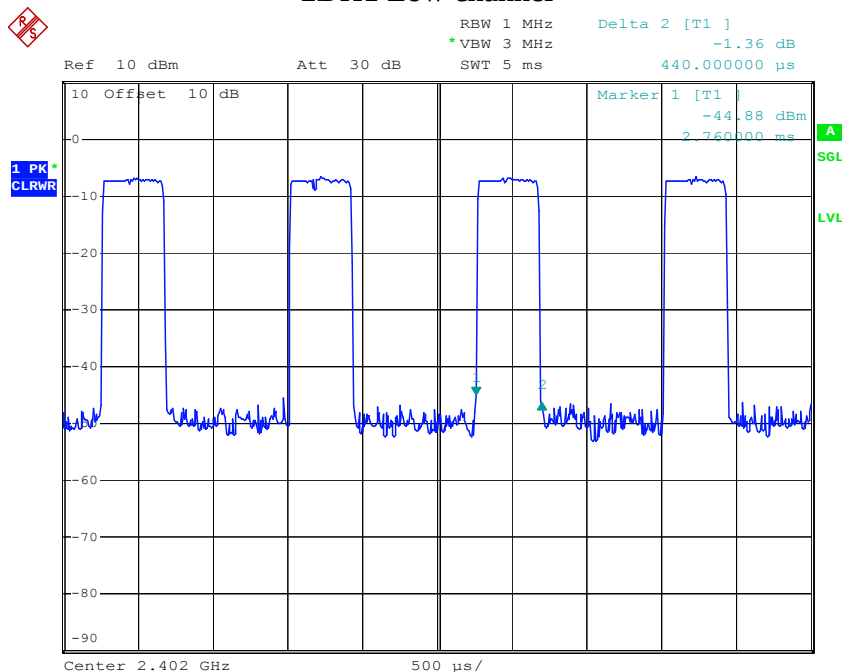
## DH5 High channel



Comment A:  
Date: 27.APR.2019 17:19:17

## $\pi/4$ DQPSK Mode

## 2DH1 Low channel



Comment A:  
Date: 27.APR.2019 16:40:40

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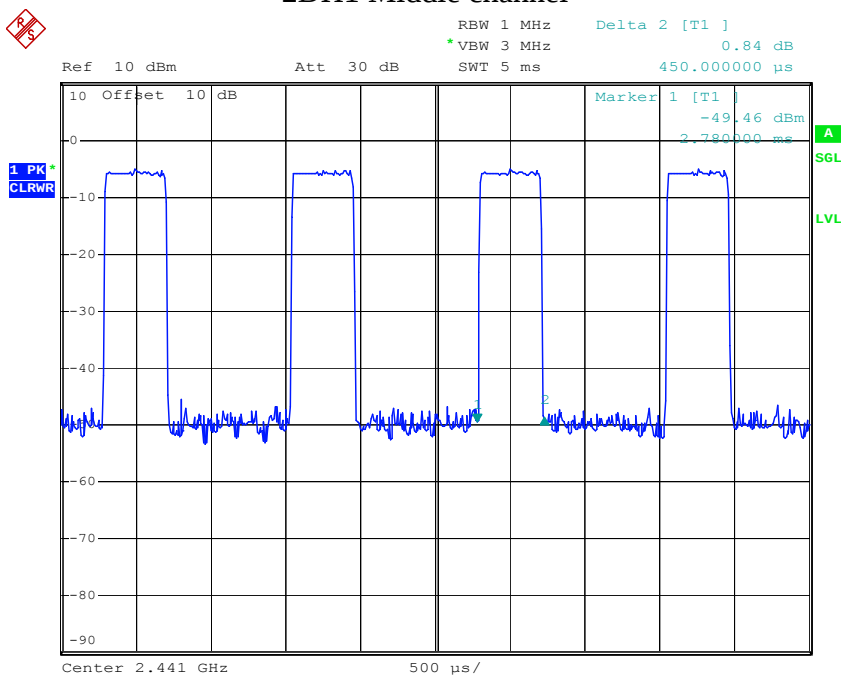
Tel: +86-755-26503290

Fax: +86-755-26503396

E-mail: webmaster@atc-lab.com

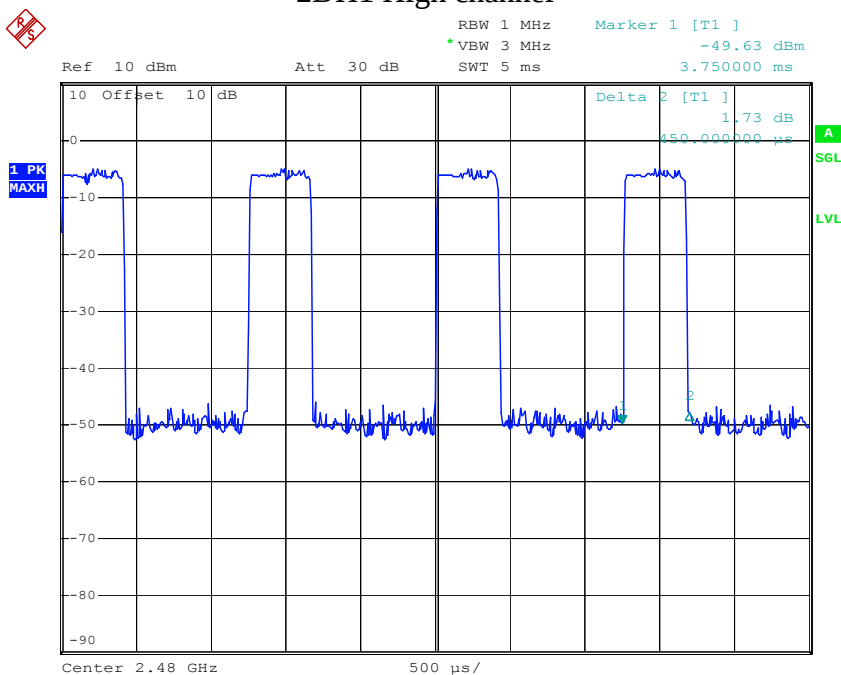
[Http://www.atc-lab.com](http://www.atc-lab.com)

## 2DH1 Middle channel



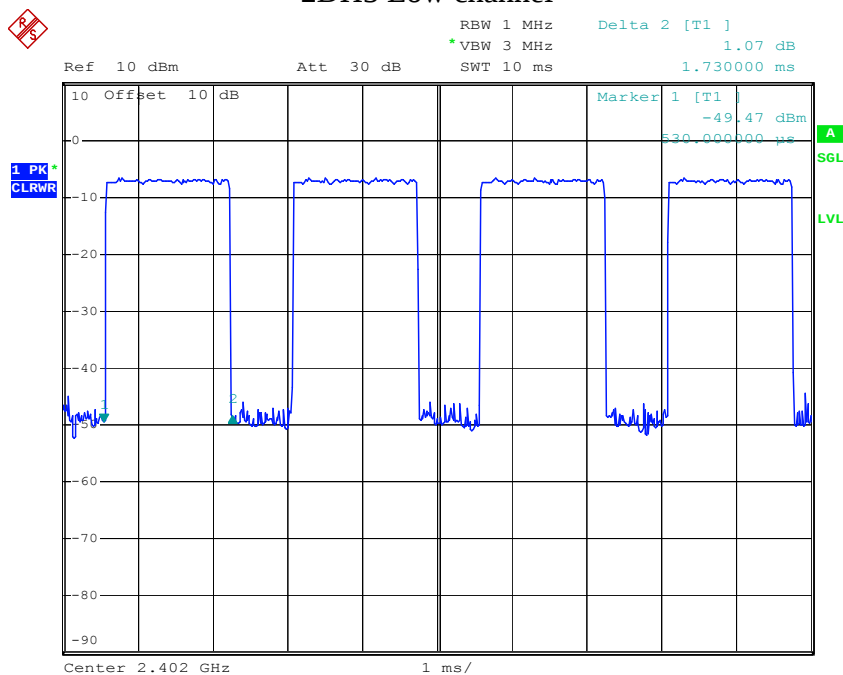
Comment A:  
 Date: 27.APR.2019 16:52:06

## 2DH1 High channel



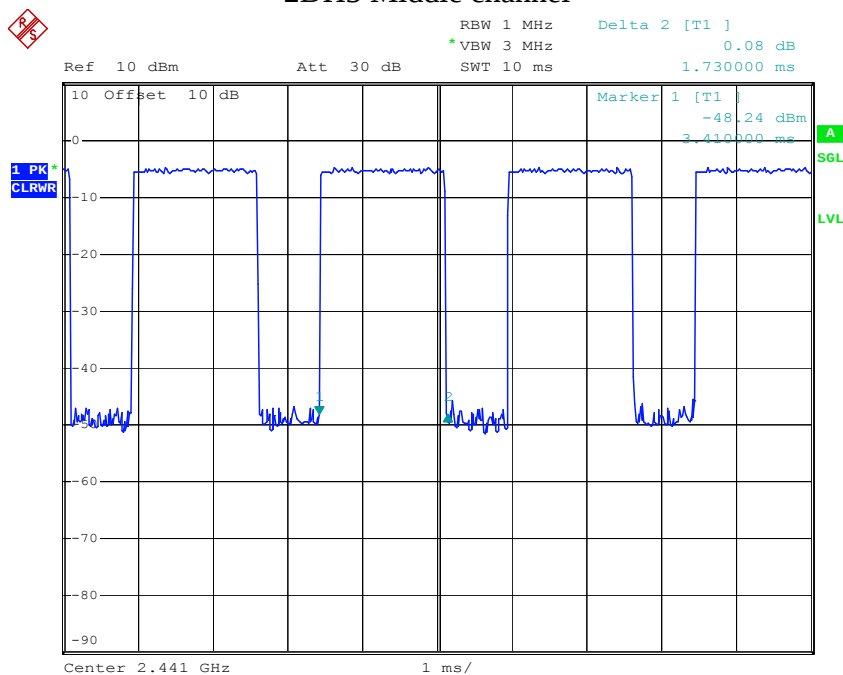
Comment A:  
 Date: 27.APR.2019 17:15:09

## 2DH3 Low channel



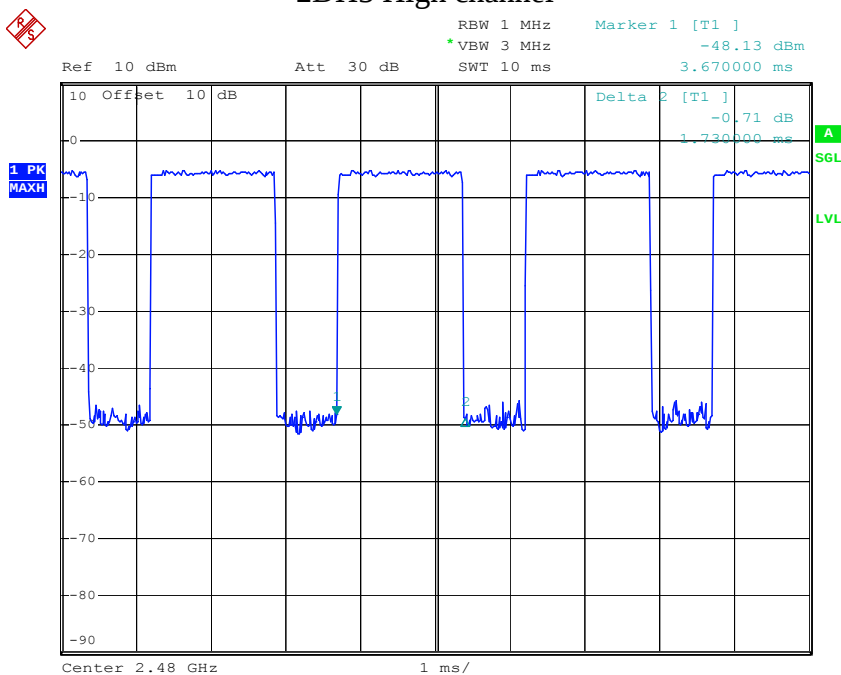
Comment A:  
Date: 27.APR.2019 16:41:38

## 2DH3 Middle channel



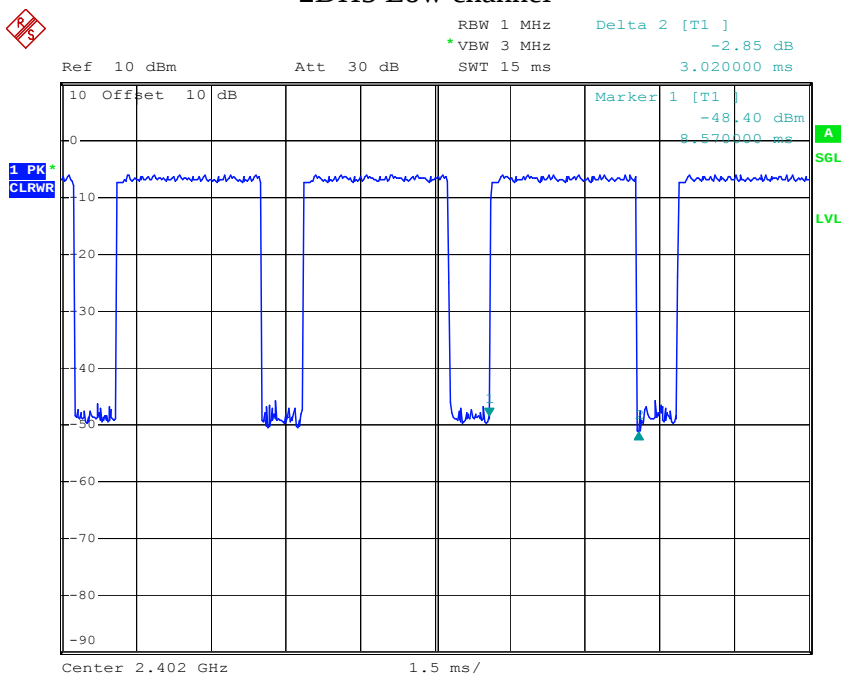
Comment A:  
Date: 27.APR.2019 16:52:59

## 2DH3 High channel



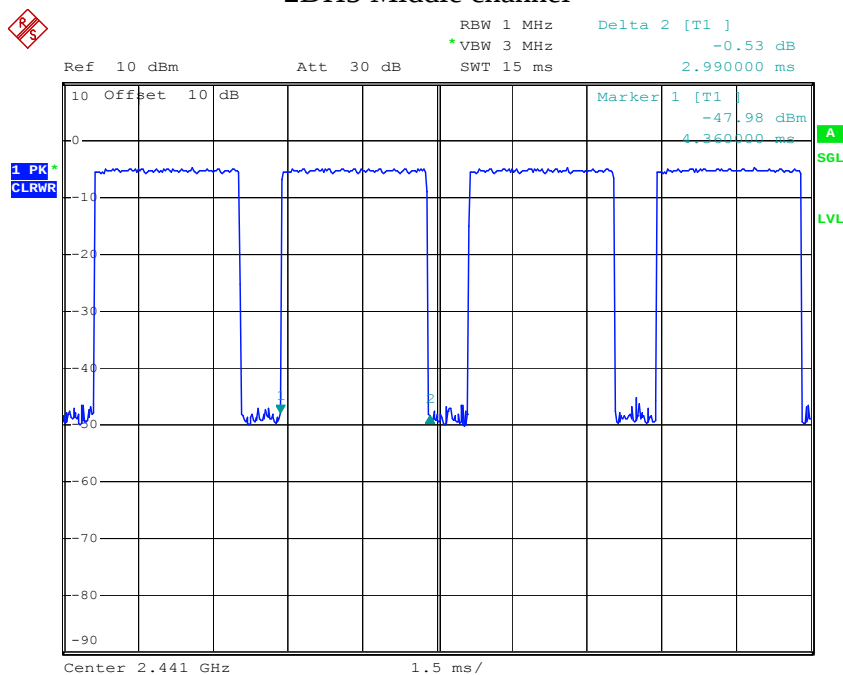
Comment A:  
Date: 27.APR.2019 17:14:15

## 2DH5 Low channel



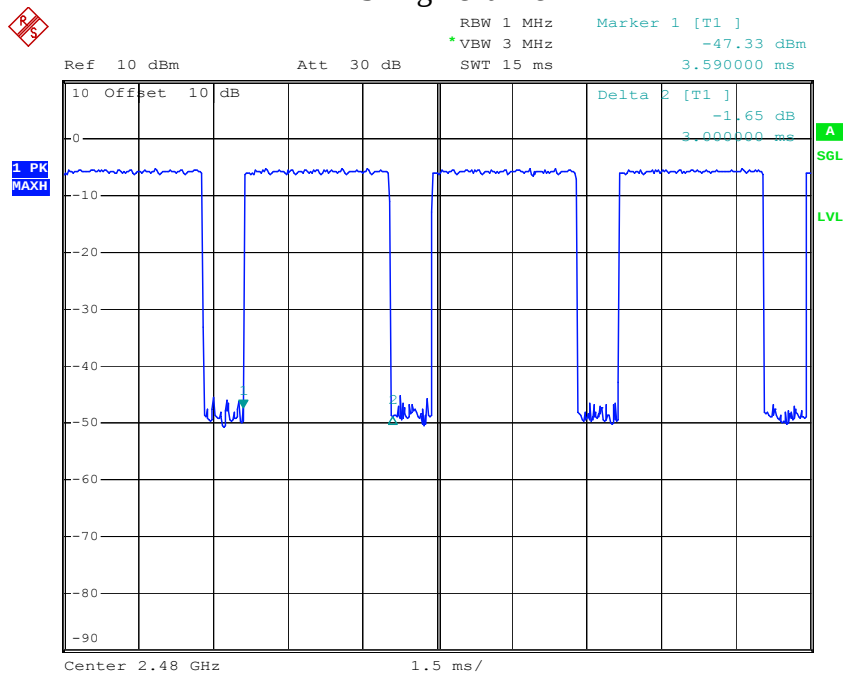
Comment A:  
Date: 27.APR.2019 16:42:59

## 2DH5 Middle channel



Comment A:  
Date: 27.APR.2019 16:54:03

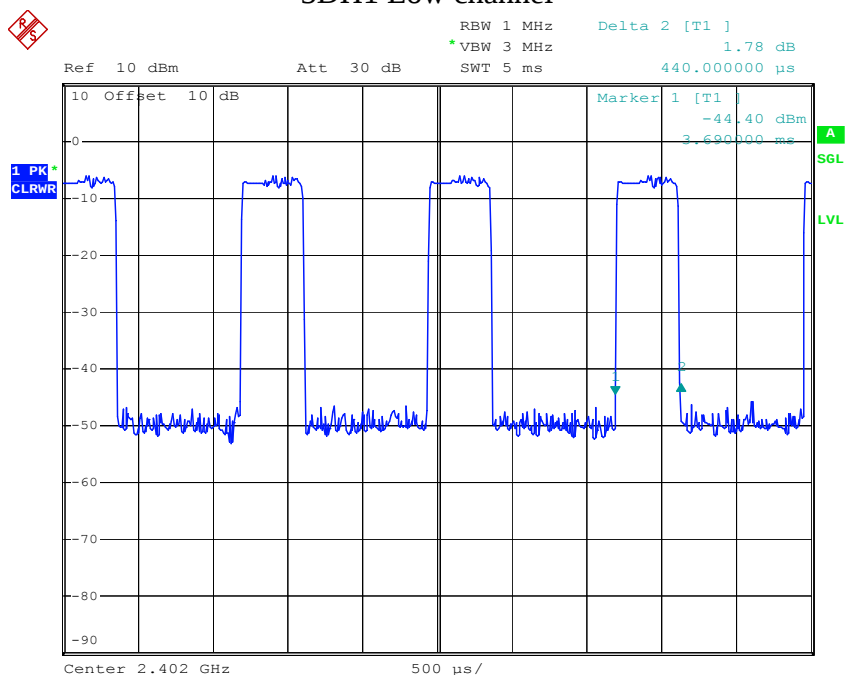
## 2DH5 High channel



Comment A:  
Date: 27.APR.2019 17:13:18

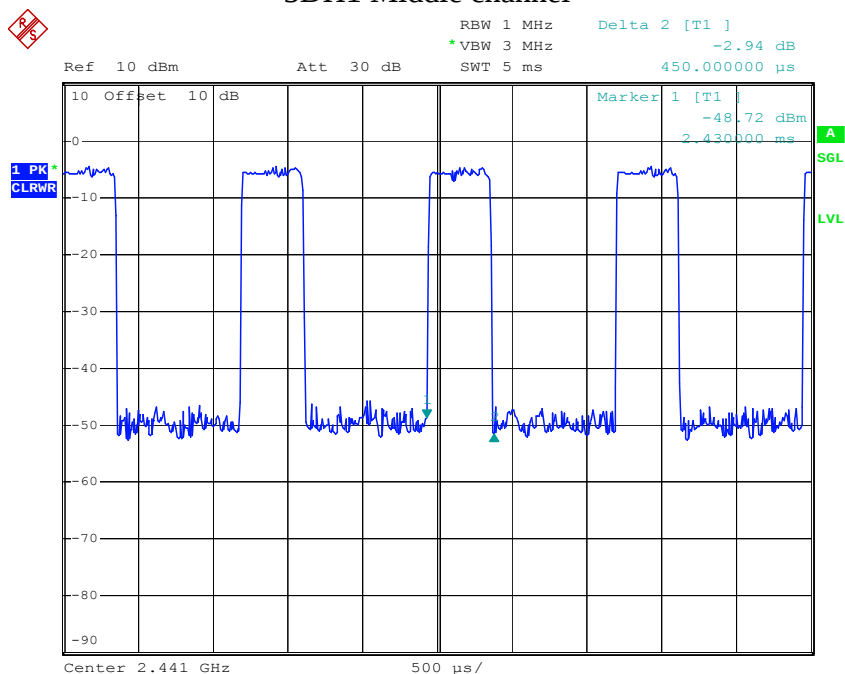
## 8DPSK Mode

### 3DH1 Low channel



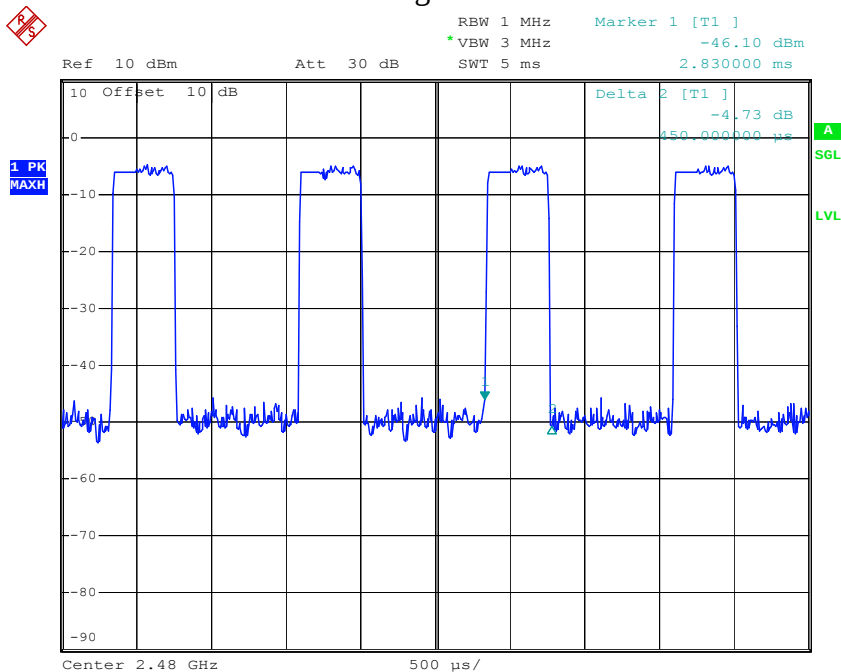
Comment A:  
 Date: 27.APR.2019 16:43:54

### 3DH1 Middle channel



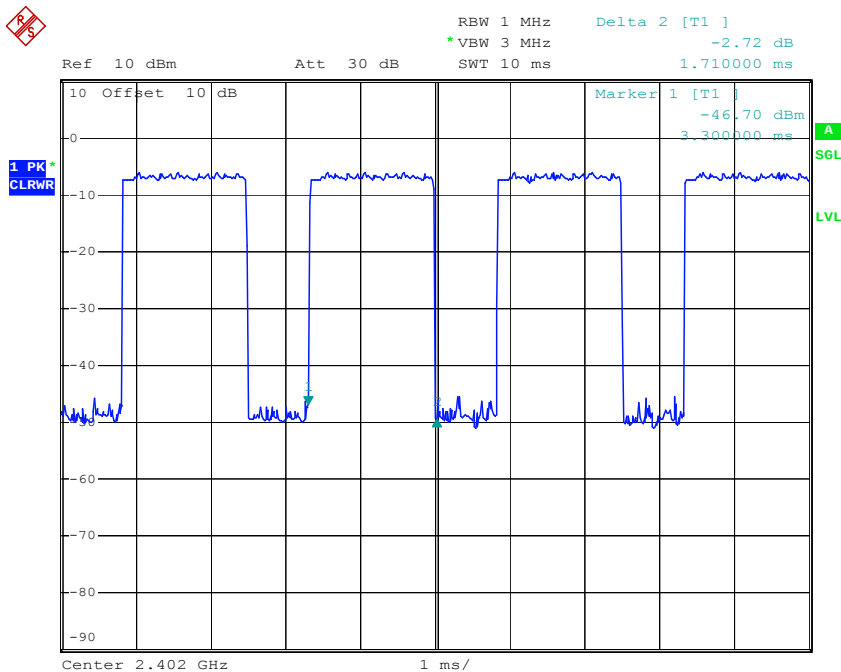
Comment A:  
 Date: 27.APR.2019 16:55:04

## 3DH1 High channel



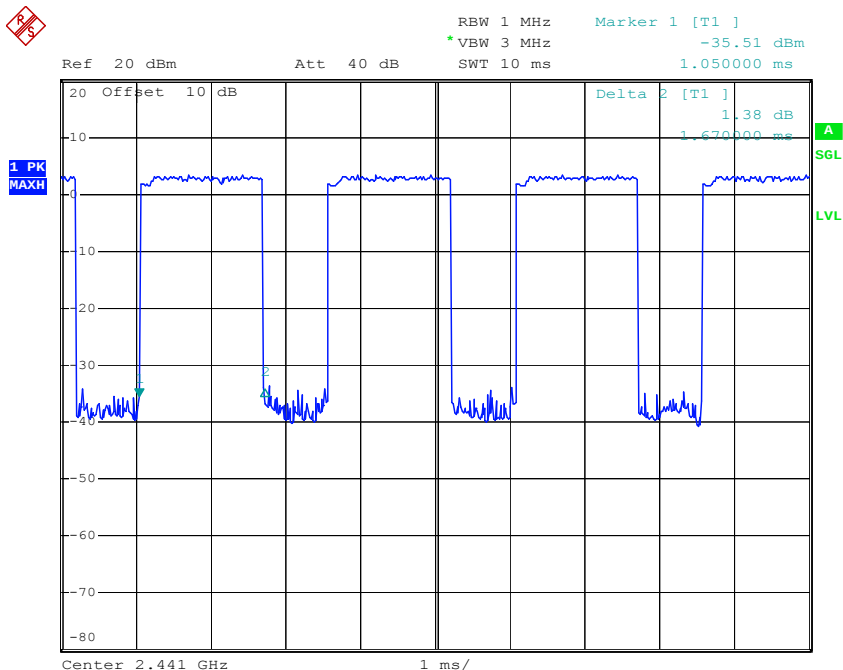
Comment A:  
Date: 27.APR.2019 17:12:02

## 3DH3 Low channel



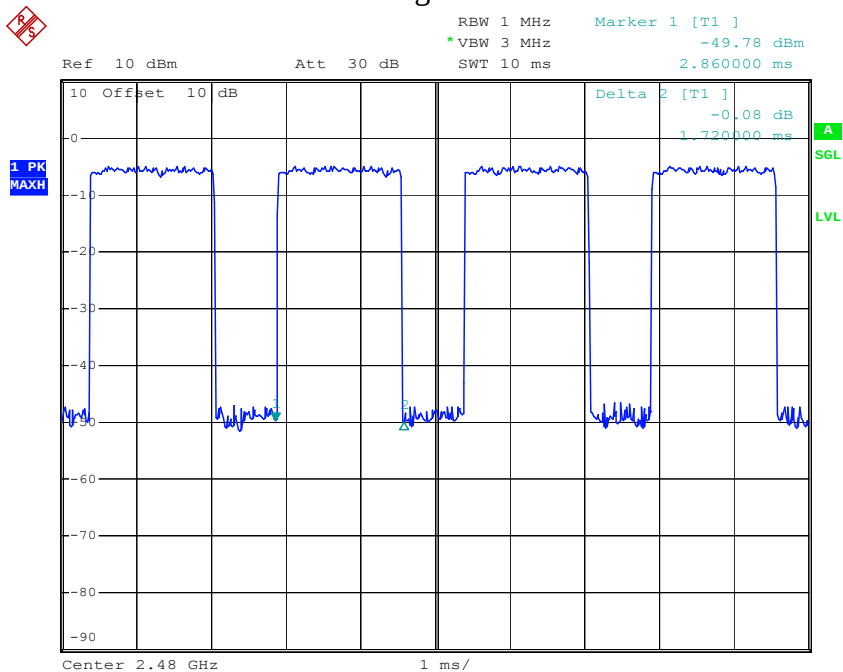
Comment A:  
Date: 27.APR.2019 16:44:45

## 3DH3 Middle channel



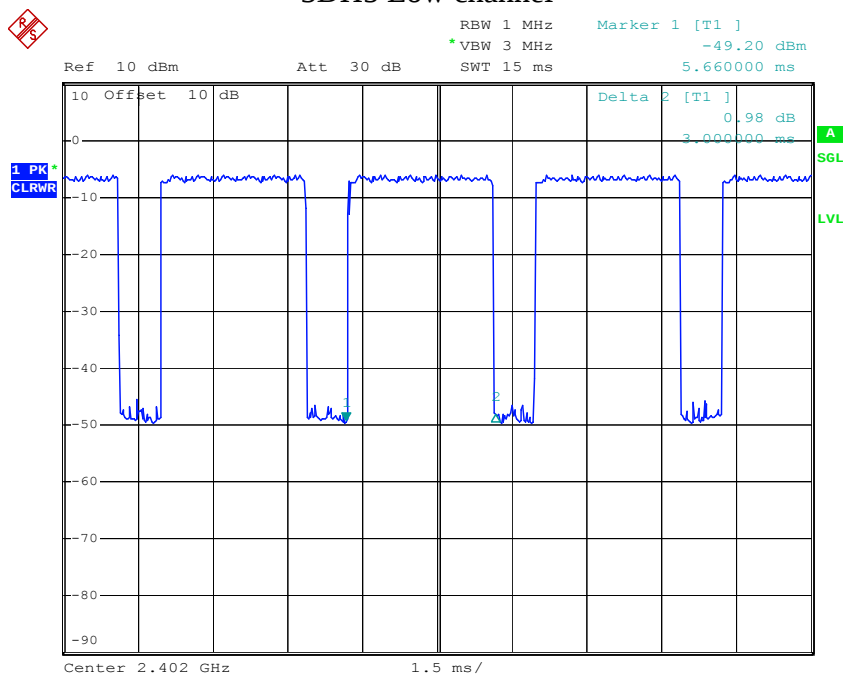
Comment A:  
Date: 27.APR.2019 20:14:46

## 3DH3 High channel



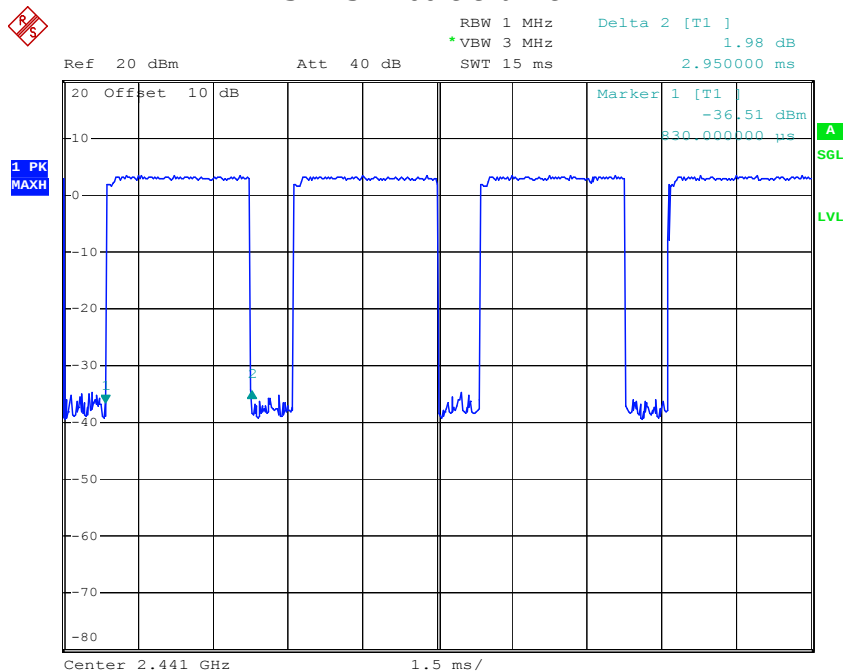
Comment A:  
Date: 27.APR.2019 17:11:09

## 3DH5 Low channel



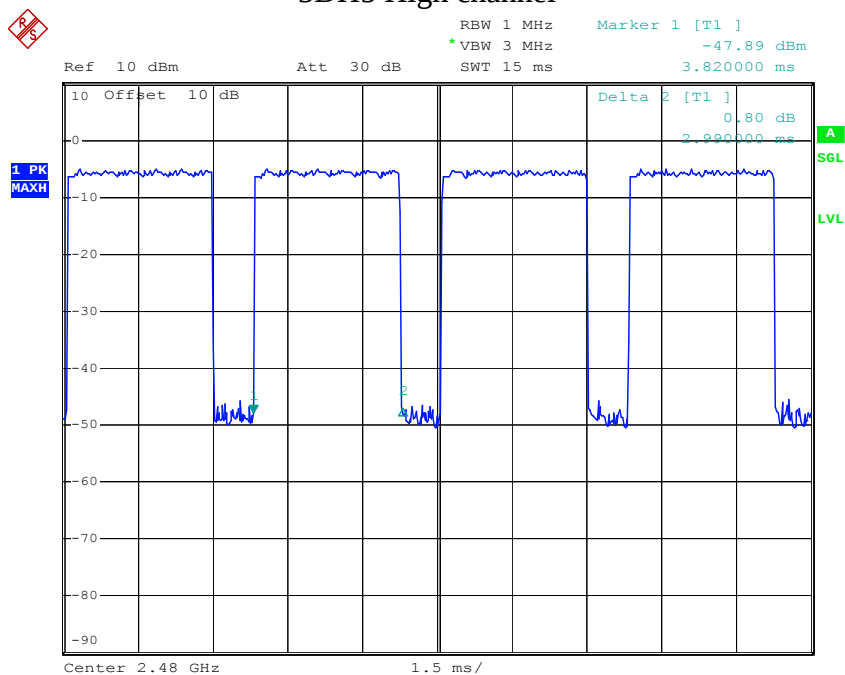
Comment A:  
Date: 27.APR.2019 16:46:00

## 3DH5 Middle channel



Comment A:  
Date: 27.APR.2019 20:14:17

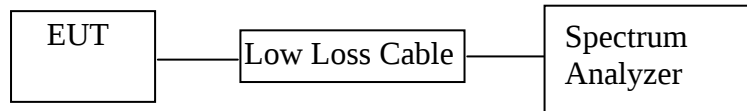
## 3DH5 High channel



Comment A:  
Date: 27.APR.2019 17:09:36

## 9. MAXIMUM PEAK OUTPUT POWER TEST

### 9.1. Block Diagram of Test Setup



(EUT: DISCOVERY)

### 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 3MHz and VBW to 10MHz for BDR mode

9.5.3. Set RBW of spectrum analyzer to 3MHz and VBW to 10MHz for EDR mode

9.5.4. Measurement the maximum peak output power.

## 9.6.Test Result

### GFSK Mode

| Frequency (MHz) | Maximum peak conducted output power (dBm) | Maximum peak conducted output power (W) | Limits dBm / W |
|-----------------|-------------------------------------------|-----------------------------------------|----------------|
| 2402            | -2.18                                     | 0.000605                                | 21 / 0.125     |
| 2441            | -0.53                                     | 0.000885                                | 21 / 0.125     |
| 2480            | -2.73                                     | 0.000533                                | 21 / 0.125     |

### $\pi/4$ DQPSK Mode

| Frequency (MHz) | Maximum peak conducted output power (dBm) | Maximum peak conducted output power (W) | Limits dBm / W |
|-----------------|-------------------------------------------|-----------------------------------------|----------------|
| 2402            | -4.56                                     | 0.000350                                | 21 / 0.125     |
| 2441            | -2.73                                     | 0.000533                                | 21 / 0.125     |
| 2480            | -5.05                                     | 0.000313                                | 21 / 0.125     |

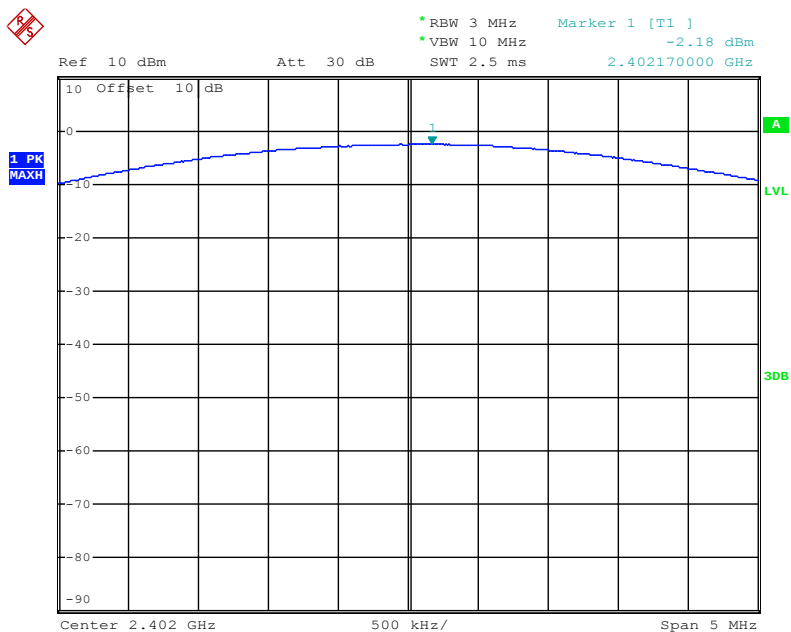
### 8DPSK Mode

| Frequency (MHz) | Maximum peak conducted output power (dBm) | Maximum peak conducted output power (W) | Limits dBm / W |
|-----------------|-------------------------------------------|-----------------------------------------|----------------|
| 2402            | -3.86                                     | 0.000411                                | 21 / 0.125     |
| 2441            | -2.18                                     | 0.000605                                | 21 / 0.125     |
| 2480            | -4.74                                     | 0.000336                                | 21 / 0.125     |

The spectrum analyzer plots are attached as below.

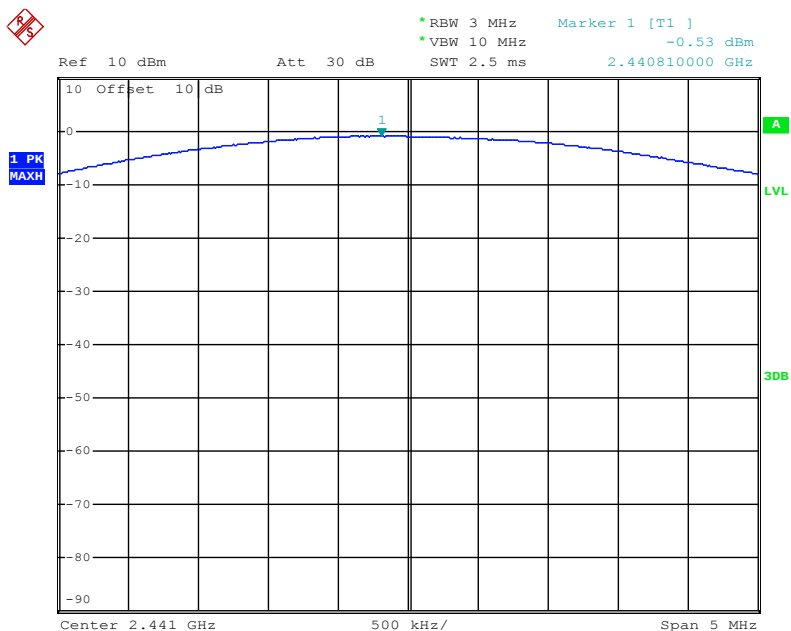
## GFSK Mode

### Low channel



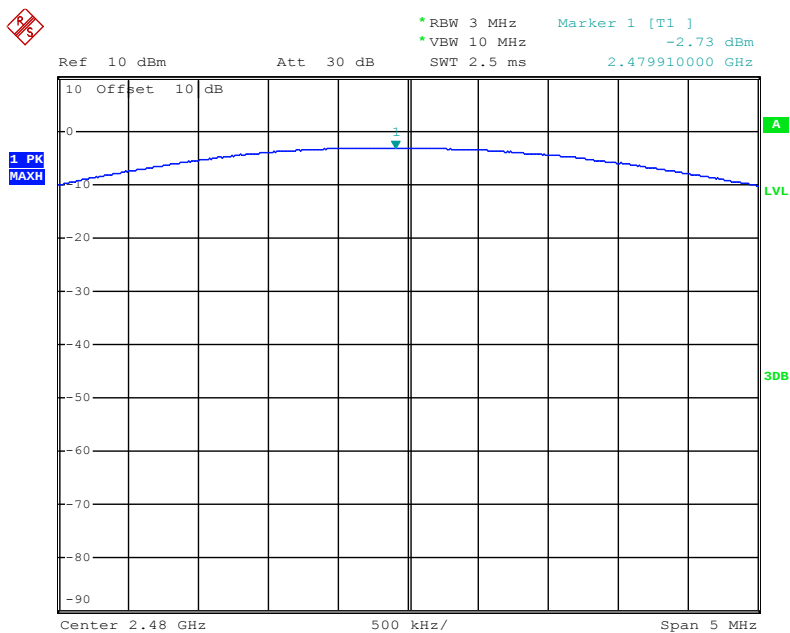
Date: 28.APR.2019 08:57:15

### Middle channel



Date: 28.APR.2019 08:58:01

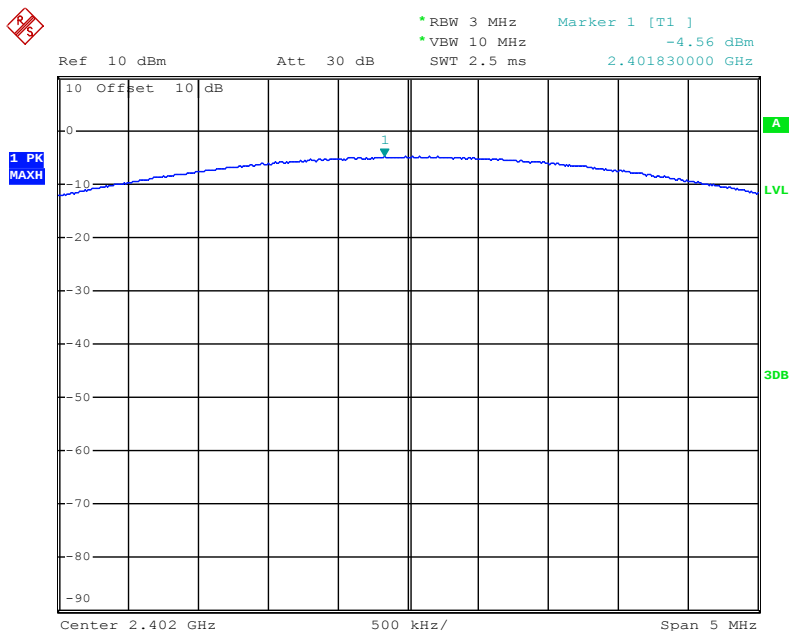
## High channel



Date: 28.APR.2019 08:58:40

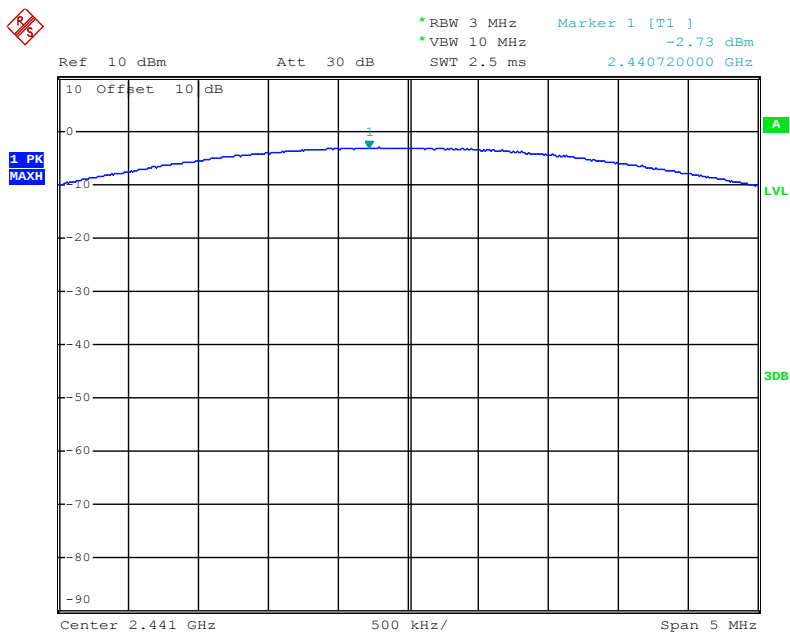
## $\pi/4$ DQPSK Mode

## Low channel



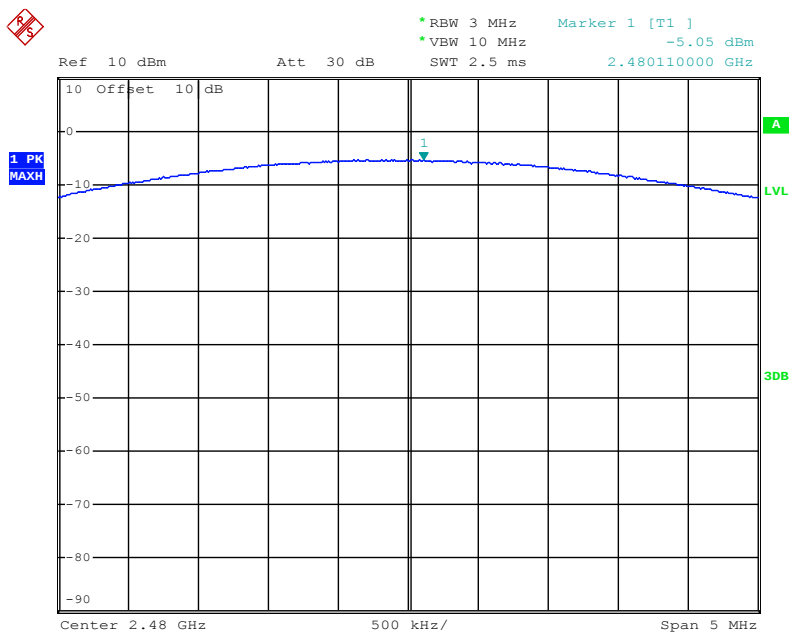
Date: 28.APR.2019 09:00:38

## Middle channel



Date: 28.APR.2019 09:00:09

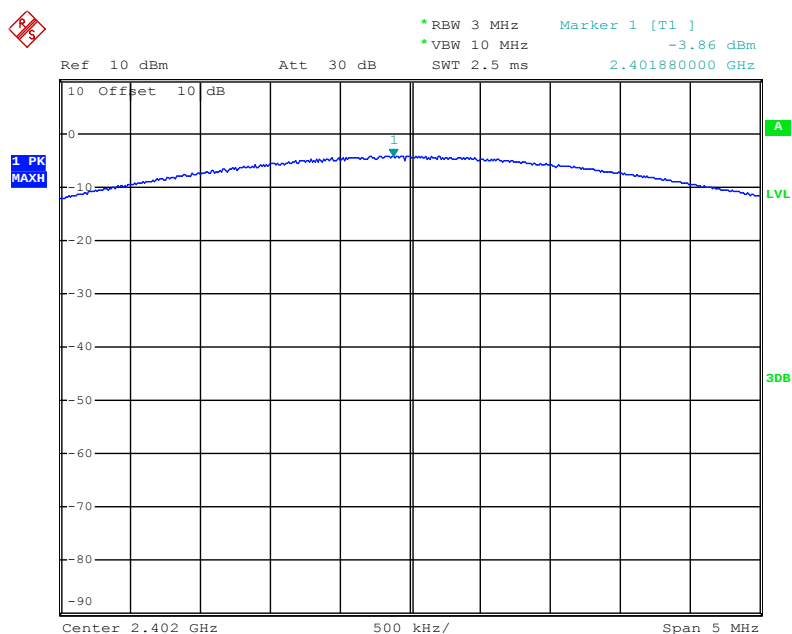
## High channel



Date: 28.APR.2019 08:59:33

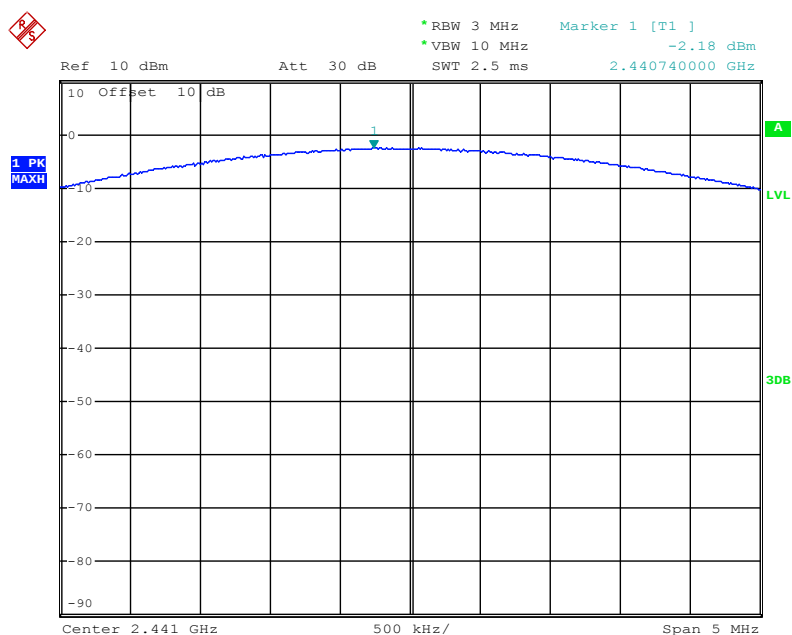
## 8DPSK Mode

### Low channel



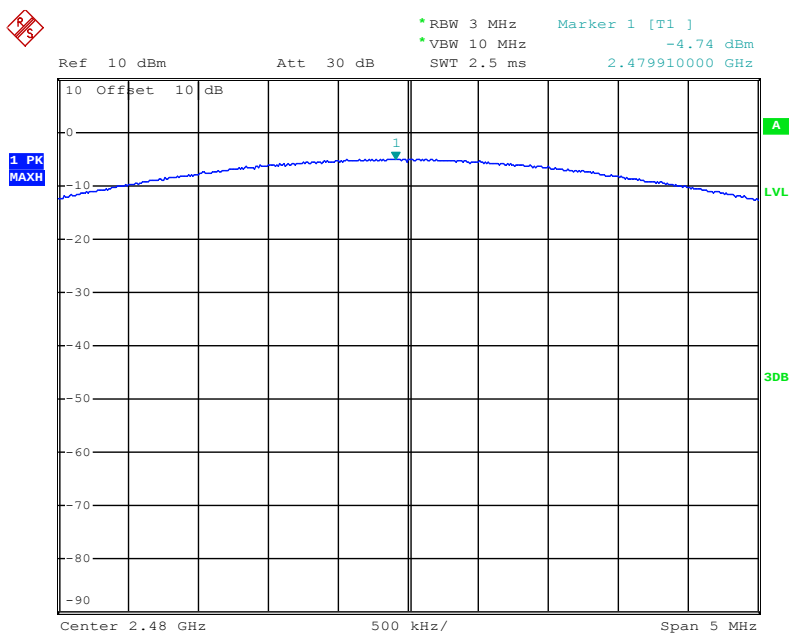
Date: 28.APR.2019 09:01:38

### Middle channel



Date: 28.APR.2019 09:02:12

## High channel

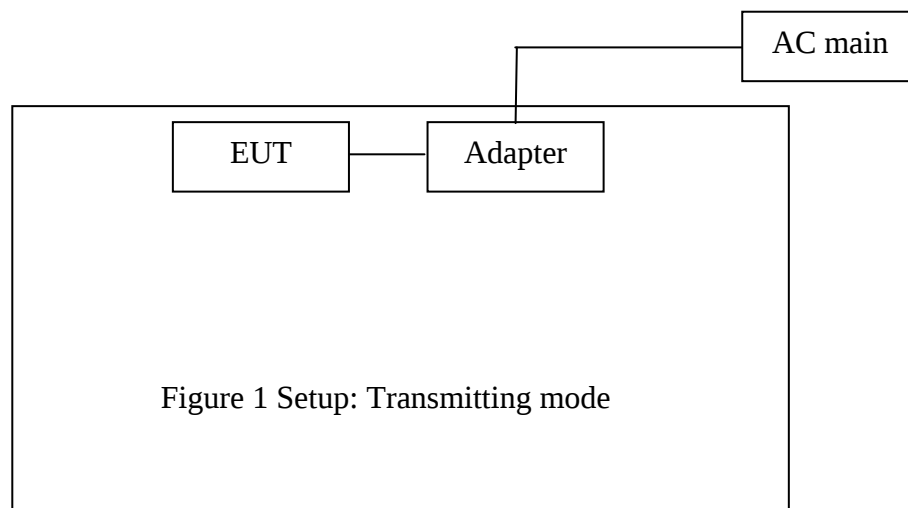


Date: 28.APR.2019 09:03:42

## 10.RADIATED EMISSION TEST

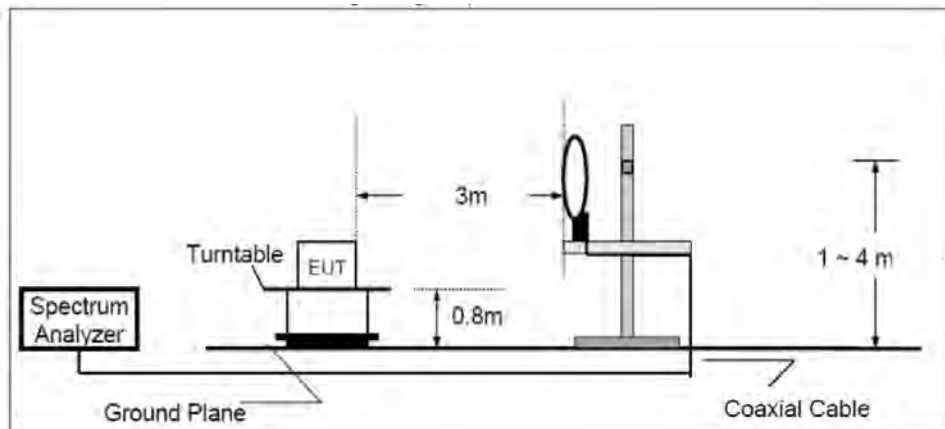
### 10.1.Block Diagram of Test Setup

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

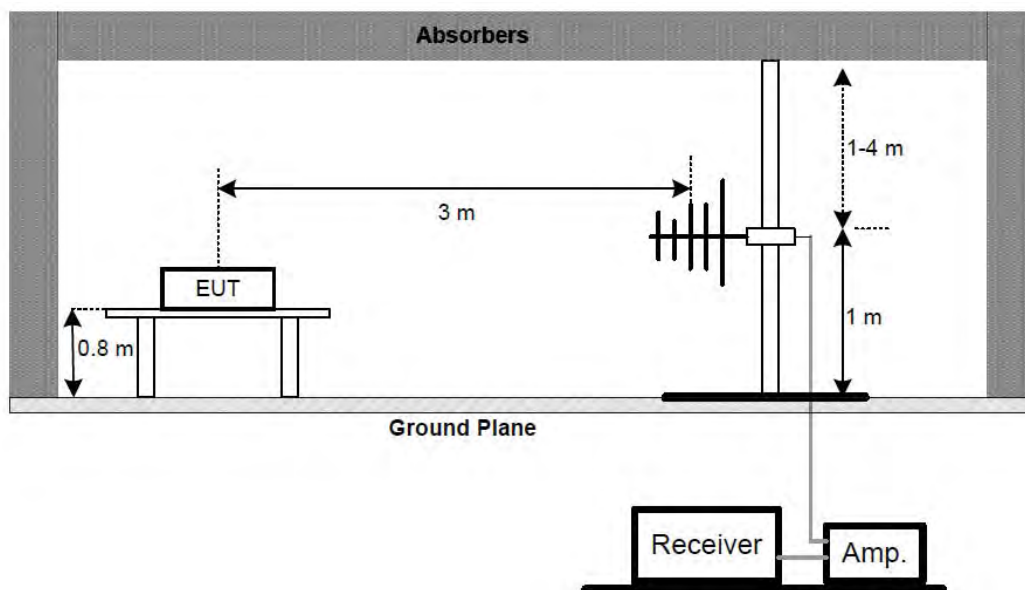


#### 10.1.2.Semi-Anechoic Chamber Test Setup Diagram

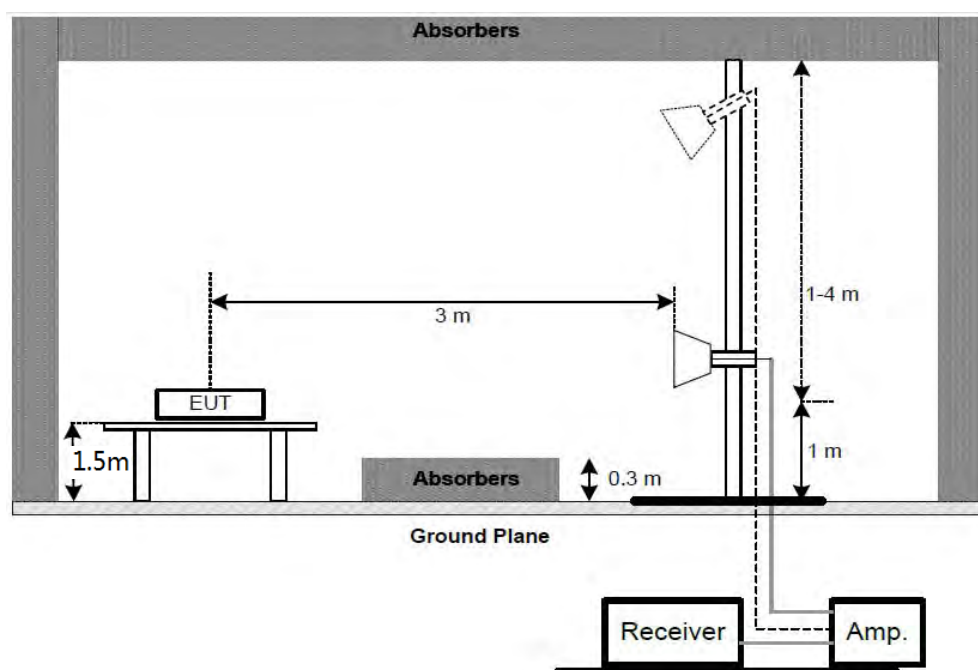
##### (A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1GHz



Above 1GHz:



## 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 is 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 high above ground(Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). 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 bi-log 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 EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

### 10.6.Data Sample

| Frequency<br>(MHz) | Reading<br>(dB $\mu$ v) | Factor<br>(dB/m) | Result<br>(dB $\mu$ v/m) | Limit<br>(dB $\mu$ v/m) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|------------------|--------------------------|-------------------------|----------------|--------|
| X.XX               | 48.69                   | -13.35           | 35.34                    | 46                      | -10.66         | QP     |

Frequency(MHz) = Emission frequency in MHz

Reading(dB $\mu$ v) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB $\mu$ v/m) = Reading(dB $\mu$ v) + Factor(dB/m)

Limit (dB $\mu$ v/m) = Limit stated in standard

Margin (dB) = Result(dB $\mu$ v/m) - Limit (dB $\mu$ v/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB $\mu$ V/m)–Limit(dB $\mu$ V/m)

Result(dB $\mu$ V/m)= Reading(dB $\mu$ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

### 10.7.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 (GFSK mode) for all test mode.**

**2.The radiation emissions from 9kHz-30MHz and 18-25GHz are not reported, because the test values lower than the limits of 20dB.**

## 30MHz-1000MHz test data



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Job No.: FRANK2019 #958

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

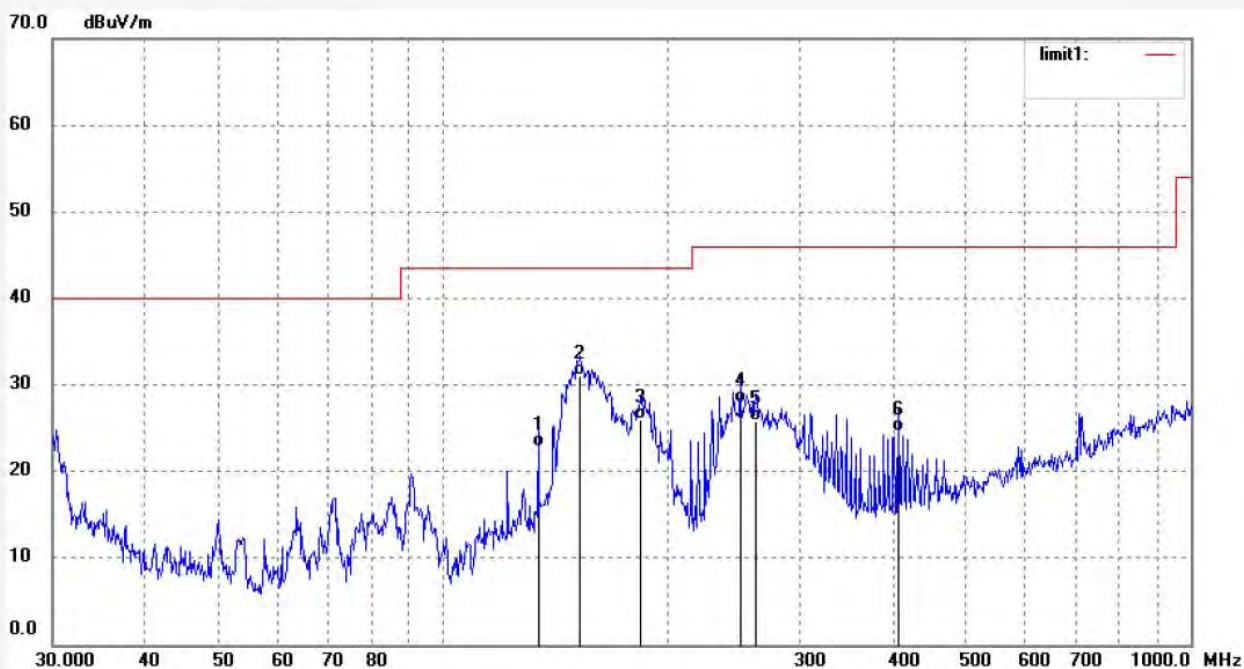
Date: 19/05/06/

Time: 9/22/48

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 134.0193    | 50.67            | -27.83      | 22.84           | 43.50          | -20.66      | QP       | 100         | 195           |        |
| 2   | 152.6254    | 58.97            | -27.83      | 31.14           | 43.50          | -12.36      | QP       | 100         | 66            |        |
| 3   | 183.8660    | 51.64            | -25.65      | 25.99           | 43.50          | -17.51      | QP       | 100         | 115           |        |
| 4   | 249.6074    | 51.63            | -23.63      | 28.00           | 46.00          | -18.00      | QP       | 100         | 214           |        |
| 5   | 262.1926    | 48.67            | -22.91      | 25.76           | 46.00          | -20.24      | QP       | 100         | 95            |        |
| 6   | 406.7819    | 42.78            | -18.19      | 24.59           | 46.00          | -21.41      | QP       | 100         | 44            |        |

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E-mail: webmaster@atc-lab.com

[Http://www.atc-lab.com](http://www.atc-lab.com)

Job No.: FRANK2019 #957

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

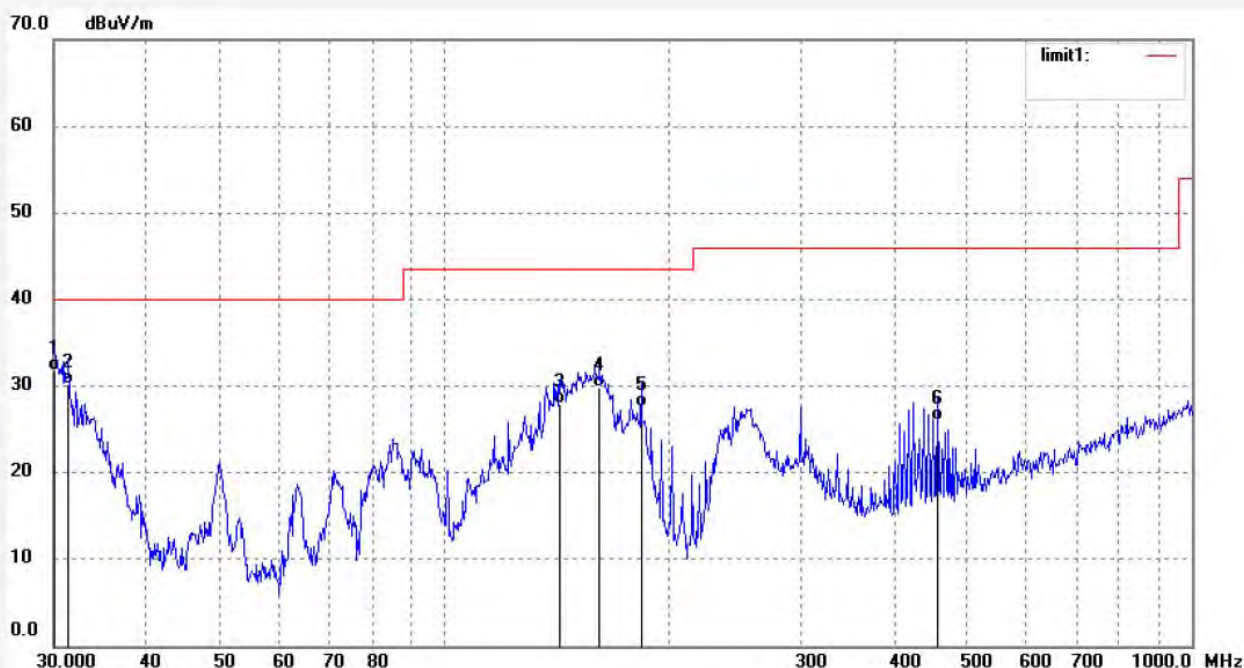
Date: 19/05/06/

Time: 9/21/59

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 30.0000     | 51.97            | -20.20      | 31.77           | 40.00          | -8.23       | QP       | 200         | 198           |        |
| 2   | 31.4021     | 50.67            | -20.55      | 30.12           | 40.00          | -9.88       | QP       | 200         | 85            |        |
| 3   | 142.7692    | 55.98            | -28.01      | 27.97           | 43.50          | -15.53      | QP       | 200         | 110           |        |
| 4   | 161.4515    | 56.67            | -26.91      | 29.76           | 43.50          | -13.74      | QP       | 200         | 33            |        |
| 5   | 183.2211    | 53.32            | -25.71      | 27.61           | 43.50          | -15.89      | QP       | 200         | 145           |        |
| 6   | 456.7909    | 42.99            | -17.06      | 25.93           | 46.00          | -20.07      | QP       | 200         | 56            |        |



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Job No.: FRANK2019 #960

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2441MHz

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

Date: 19/05/06/

Time: 9/34/13

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 151.0252    | 58.69            | -27.96      | 30.73           | 43.50          | -12.77      | QP       | 200         | 92            |        |
| 2   | 152.0902    | 57.62            | -27.87      | 29.75           | 43.50          | -13.75      | QP       | 200         | 119           |        |
| 3   | 159.7586    | 57.64            | -27.09      | 30.55           | 43.50          | -12.95      | QP       | 200         | 312           |        |
| 4   | 234.3098    | 49.78            | -23.81      | 25.97           | 46.00          | -20.03      | QP       | 200         | 41            |        |
| 5   | 254.0312    | 49.69            | -23.41      | 26.28           | 46.00          | -19.72      | QP       | 200         | 65            |        |
| 6   | 278.3308    | 48.67            | -22.21      | 26.46           | 46.00          | -19.54      | QP       | 200         | 196           |        |

Job No.: FRANK2019 #959

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2441MHz

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

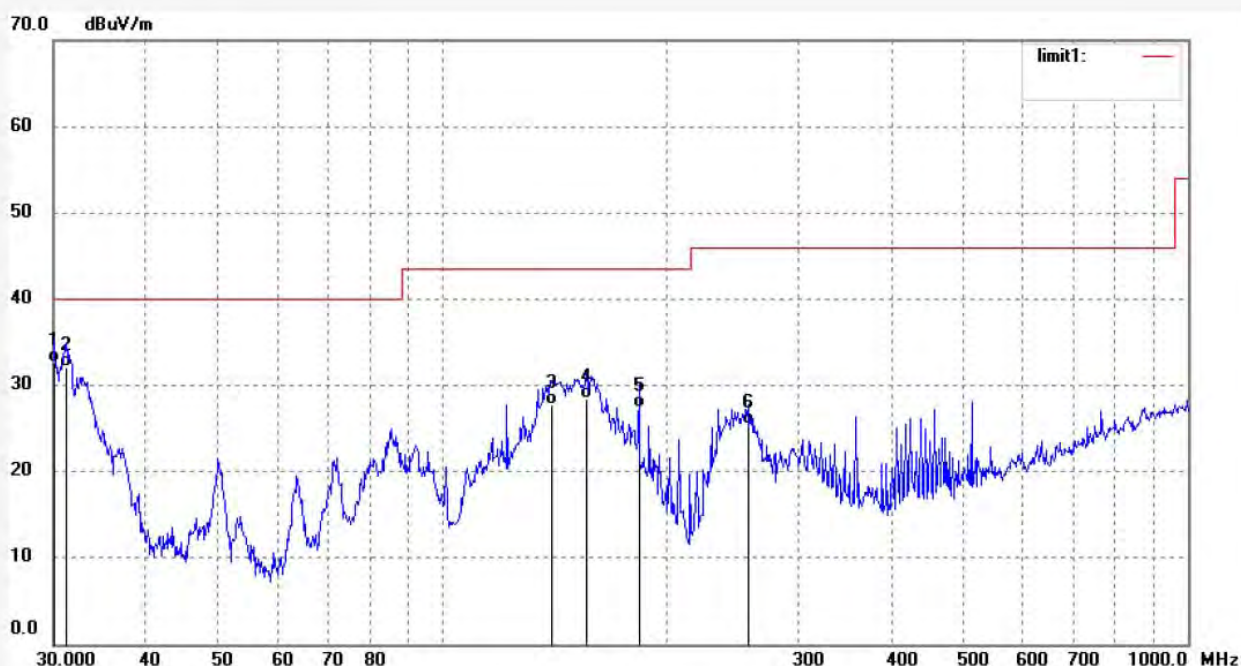
Date: 19/05/06/

Time: 9/33/11

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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   | 30.0000        | 52.78               | -20.20         | 32.58              | 40.00             | -7.42          | QP       | 100            | 210              |        |
| 2   | 31.1822        | 52.67               | -20.49         | 32.18              | 40.00             | -7.82          | QP       | 100            | 55               |        |
| 3   | 140.2829       | 55.68               | -27.95         | 27.73              | 43.50             | -15.77         | QP       | 100            | 114              |        |
| 4   | 155.8771       | 55.98               | -27.52         | 28.46              | 43.50             | -15.04         | QP       | 100            | 201              |        |
| 5   | 183.2211       | 53.02               | -25.71         | 27.31              | 43.50             | -16.19         | QP       | 100            | 331              |        |
| 6   | 256.7230       | 48.67               | -23.25         | 25.42              | 46.00             | -20.58         | QP       | 100            | 196              |        |

Job No.: FRANK2019 #961

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

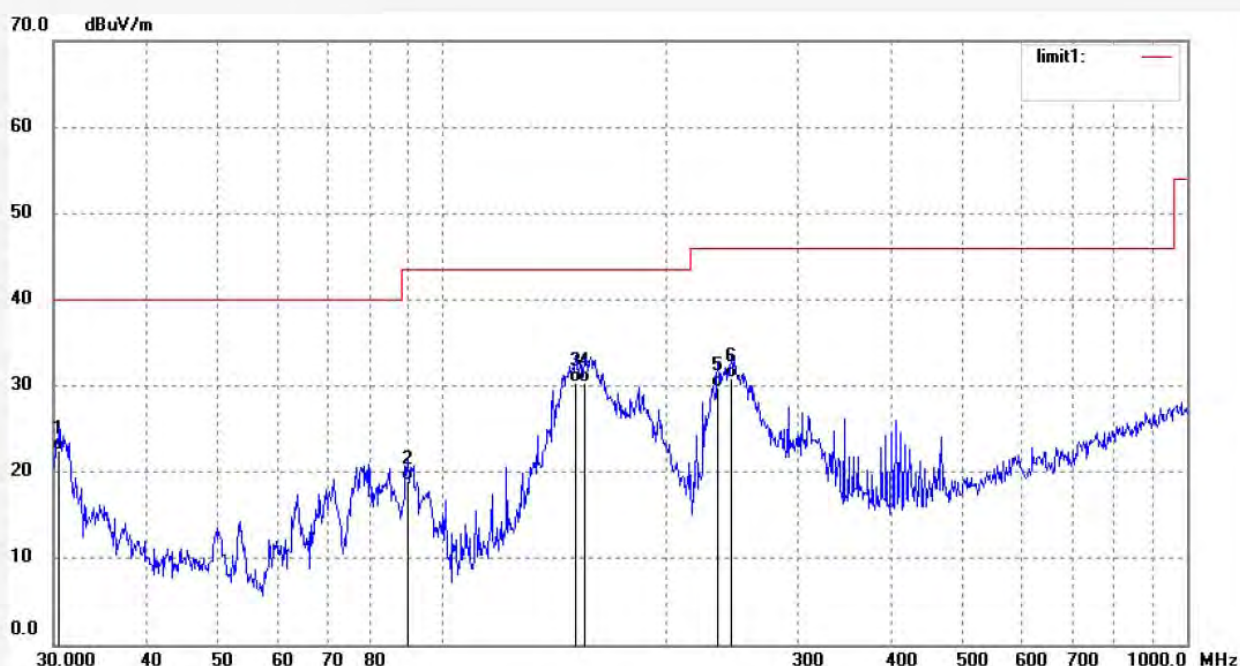
Date: 19/05/06/

Time: 9/38/16

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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   | 30.5317        | 42.79               | -20.33         | 22.46              | 40.00             | -17.54         | QP       | 200            | 221              |        |
| 2   | 89.7866        | 46.34               | -27.41         | 18.93              | 43.50             | -24.57         | QP       | 200            | 114              |        |
| 3   | 151.0252       | 58.35               | -27.96         | 30.39              | 43.50             | -13.11         | QP       | 200            | 56               |        |
| 4   | 155.3305       | 57.98               | -27.58         | 30.40              | 43.50             | -13.10         | QP       | 200            | 92               |        |
| 5   | 234.3098       | 53.68               | -23.81         | 29.87              | 46.00             | -16.13         | QP       | 200            | 129              |        |
| 6   | 244.4003       | 54.65               | -23.68         | 30.97              | 46.00             | -15.03         | QP       | 200            | 103              |        |

Job No.: FRANK2019 #962

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

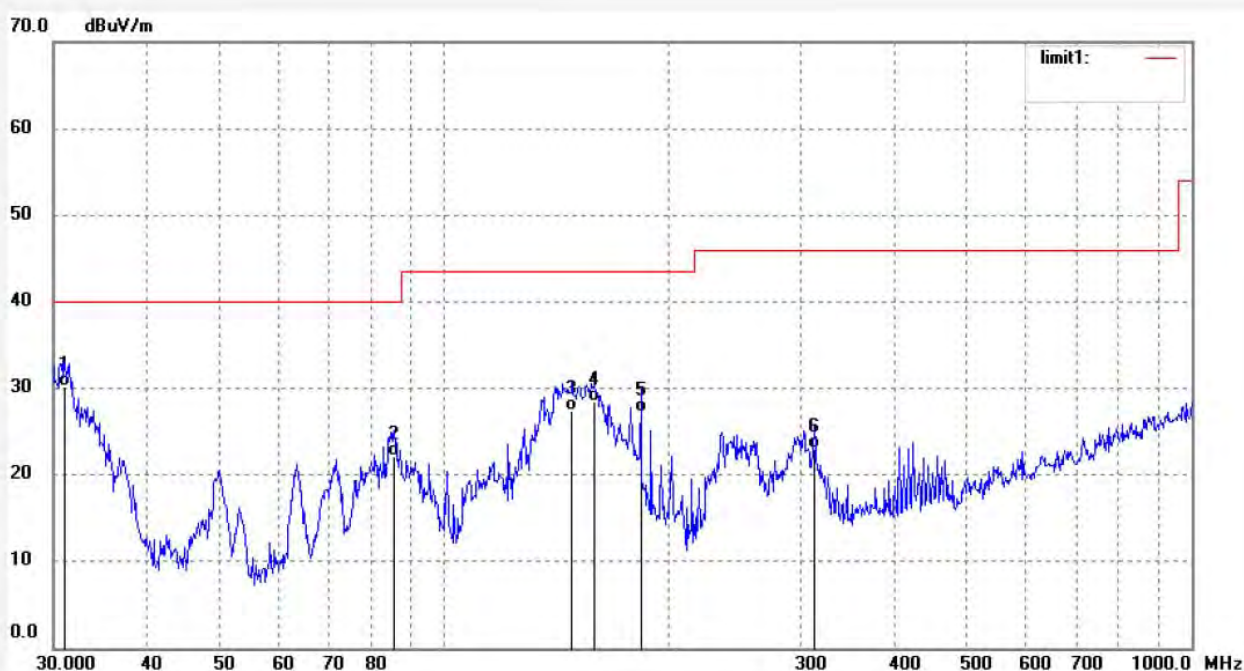
Date: 19/05/06/

Time: 9/39/12

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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   | 31.0728        | 50.67               | -20.47         | 30.20              | 40.00             | -9.80          | QP       | 100            | 21               |        |
| 2   | 85.7776        | 49.67               | -27.45         | 22.22              | 40.00             | -17.78         | QP       | 100            | 95               |        |
| 3   | 148.3951       | 55.45               | -28.05         | 27.40              | 43.50             | -16.10         | QP       | 100            | 221              |        |
| 4   | 159.1982       | 55.62               | -27.15         | 28.47              | 43.50             | -15.03         | QP       | 100            | 321              |        |
| 5   | 183.2211       | 52.99               | -25.71         | 27.28              | 43.50             | -16.22         | QP       | 100            | 216              |        |
| 6   | 312.5482       | 43.90               | -20.86         | 23.04              | 46.00             | -22.96         | QP       | 100            | 196              |        |

## 1GHz-18GHz test data



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Job No.: FRANK2019 #963

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz(GSFK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

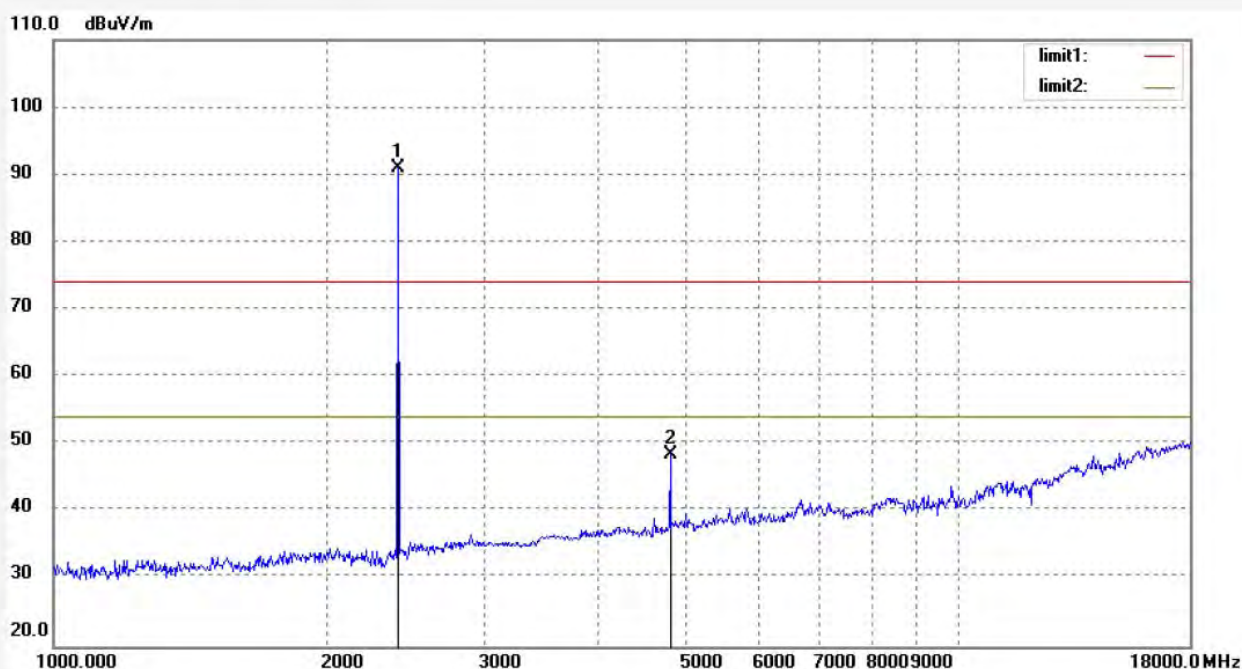
Date: 19/05/06/

Time: 9/53/00

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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   | 2402.199       | 97.20               | -6.27          | 90.93              |                   |                | peak     | 150            | 89               |        |
| 2   | 4804.328       | 47.42               | 1.00           | 48.42              | 74.00             | -25.58         | peak     | 150            | 144              |        |

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Job No.: FRANK2019 #964

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz(GSKF)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

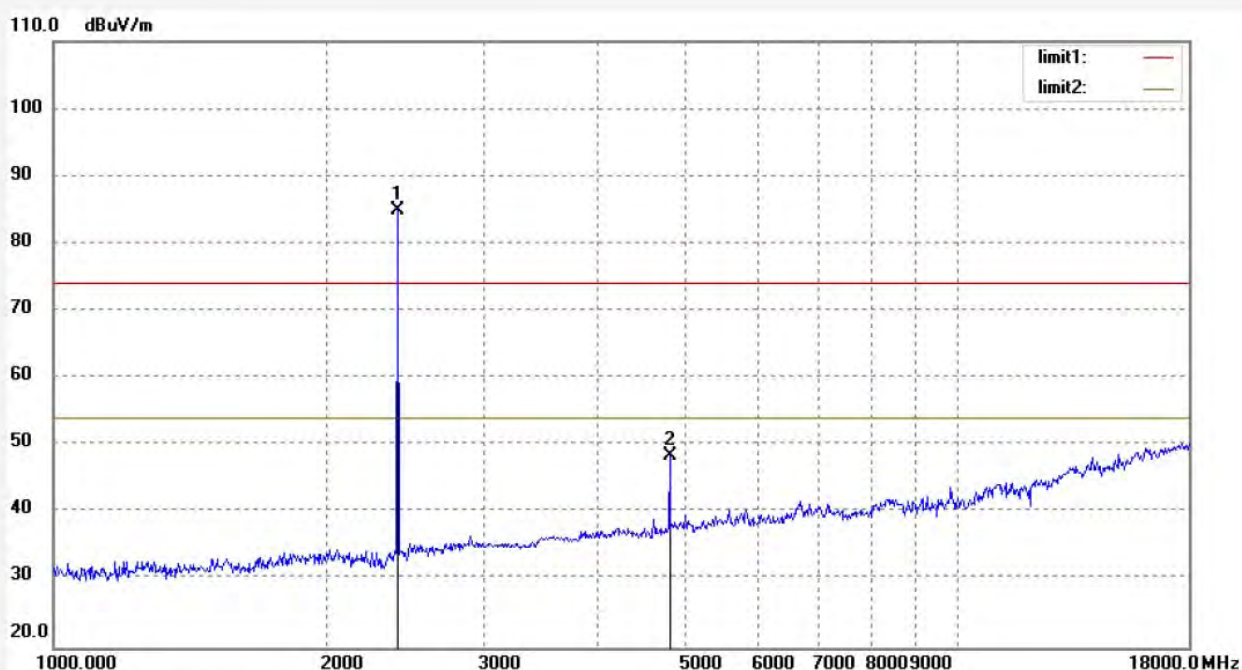
Date: 19/05/06/

Time: 9/56/12

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2402.199    | 91.20            | -6.27       | 84.93           |                |             | peak     | 150         | 255           |        |
| 2   | 4804.328    | 47.42            | 1.00        | 48.42           | 74.00          | -25.58      | peak     | 150         | 198           |        |

Job No.: FRANK2019 #966

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2441MHz(GSFK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

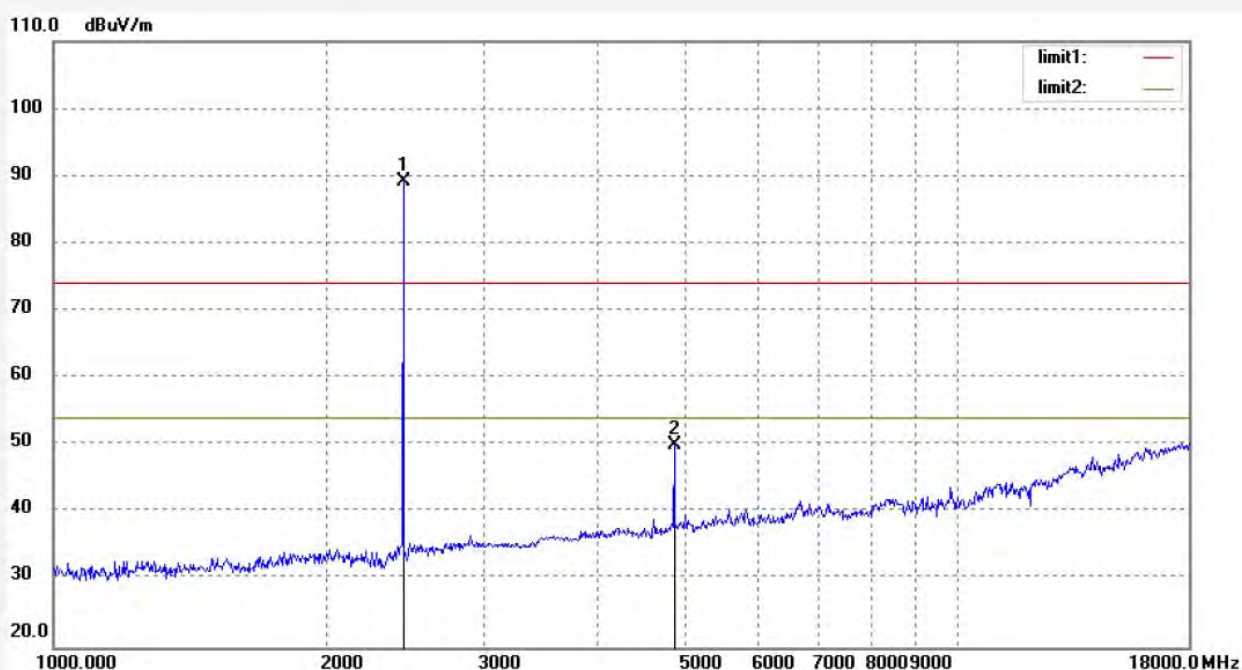
Date: 19/05/06/

Time: 10/05/34

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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   | 2440.407       | 95.30               | -6.10          | 89.20              |                   |                | peak     | 250            | 225              |        |
| 2   | 4880.917       | 48.76               | 1.25           | 50.01              | 74.00             | -23.99         | peak     | 250            | 136              |        |

Job No.: FRANK2019 #965

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2441MHz(GSFK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

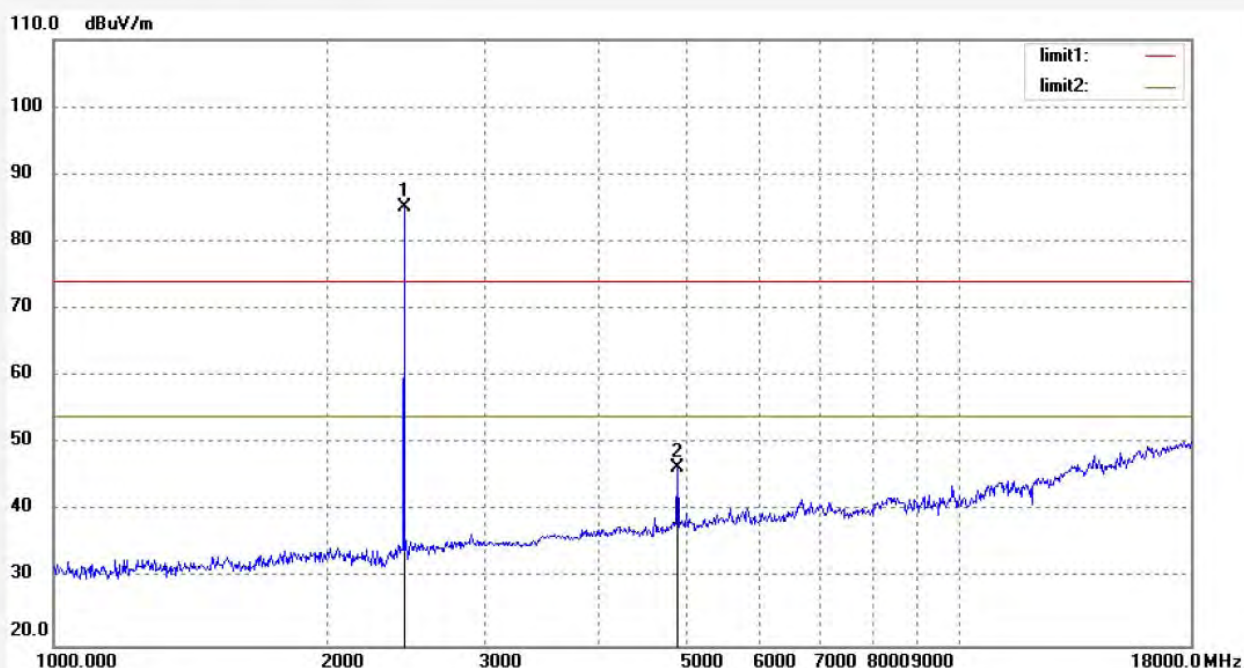
Date: 19/05/06/

Time: 10/01/21

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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   | 2440.407       | 91.30               | -6.10          | 85.20              |                   |                | peak     | 150            | 58               |        |
| 2   | 4880.917       | 45.15               | 1.36           | 46.51              | 74.00             | -27.49         | peak     | 150            | 196              |        |

Job No.: FRANK2019 #967

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz(GSKF)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

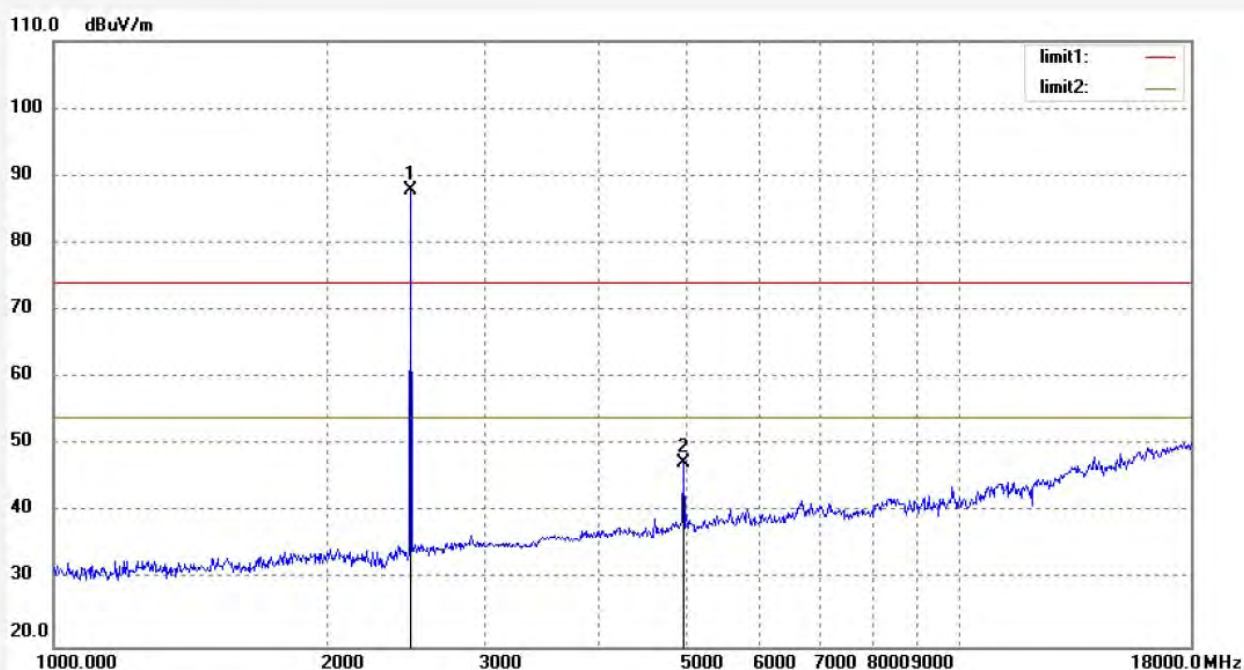
Date: 19/05/06/

Time: 10/09/14

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2480.238    | 94.78            | -5.90       | 88.88           |                |             | peak     | 250         | 116           |        |
| 2   | 4960.546    | 45.70            | 1.68        | 47.38           | 74.00          | -26.62      | peak     | 250         | 162           |        |

Job No.: FRANK2019 #969

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz(GSKF)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

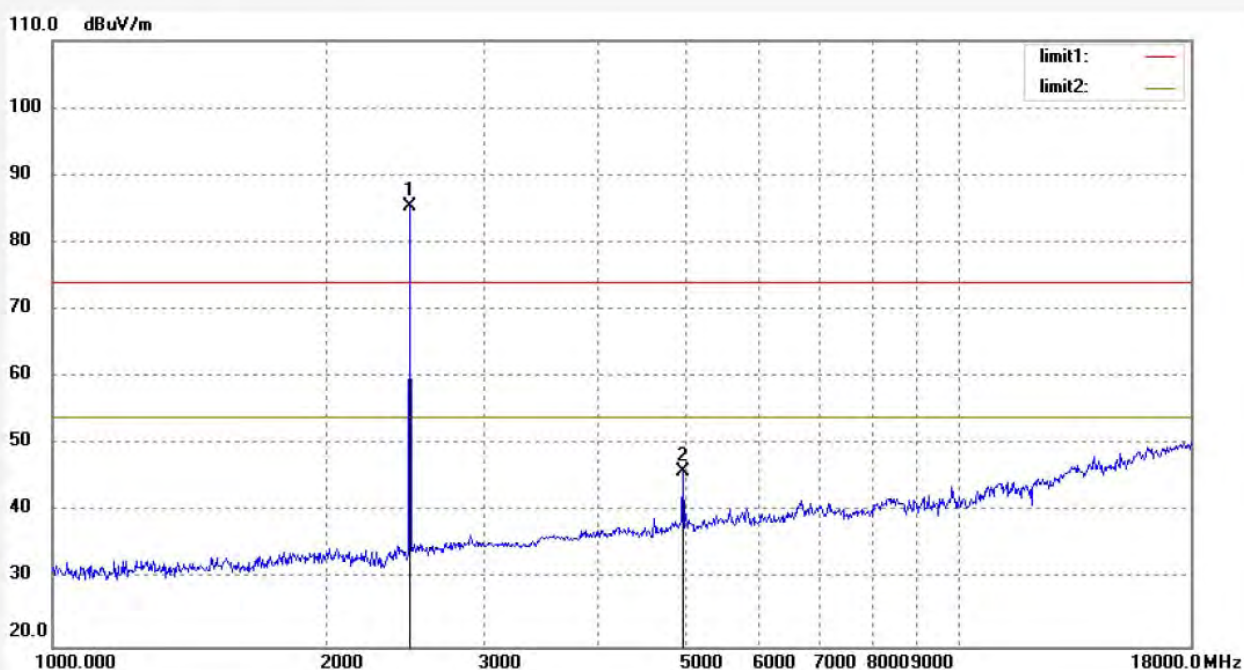
Date: 19/05/06/

Time: 10/14/32

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2480.238    | 91.28            | -5.90       | 85.38           |                |             | peak     | 150         | 22            |        |
| 2   | 4960.546    | 44.20            | 1.68        | 45.88           | 74.00          | -28.12      | peak     | 150         | 196           |        |

## 11.BAND EDGE COMPLIANCE TEST

### 11.1.Block Diagram of Test Setup



(EUT: DISCOVERY)

### 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

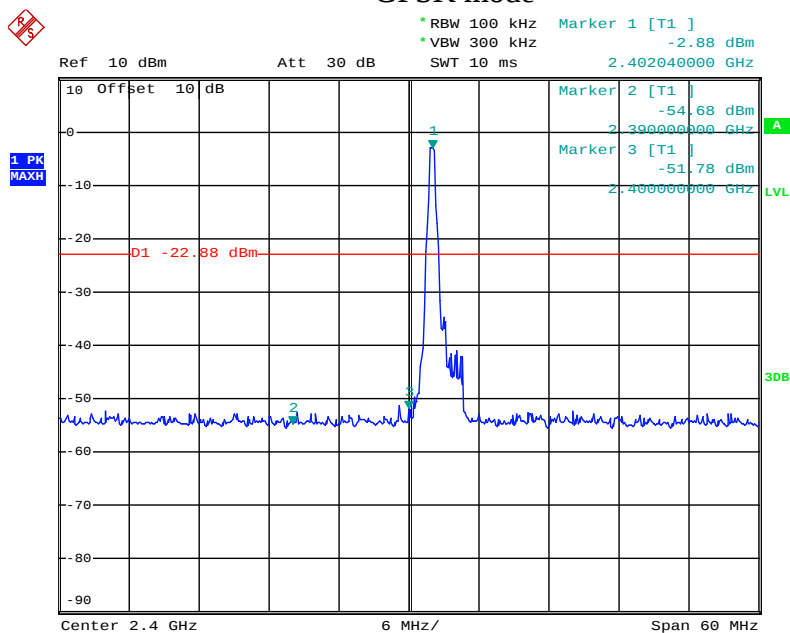
### Non-hopping mode

| Frequency<br>(MHz) | Result of Band Edge<br>(dBc) | Limit of Band Edge<br>(dBc) |
|--------------------|------------------------------|-----------------------------|
| GFSK mode          |                              |                             |
| 2400.00            | 48.90                        | > 20dBc                     |
| 2483.50            | 50.79                        | > 20dBc                     |
| $\pi/4$ DQPSK      |                              |                             |
| 2400.00            | 48.45                        | > 20dBc                     |
| 2483.5             | 48.00                        | > 20dBc                     |
| 8DPSK mode         |                              |                             |
| 2400.00            | 47.12                        | > 20dBc                     |
| 2483.5             | 47.15                        | > 20dBc                     |

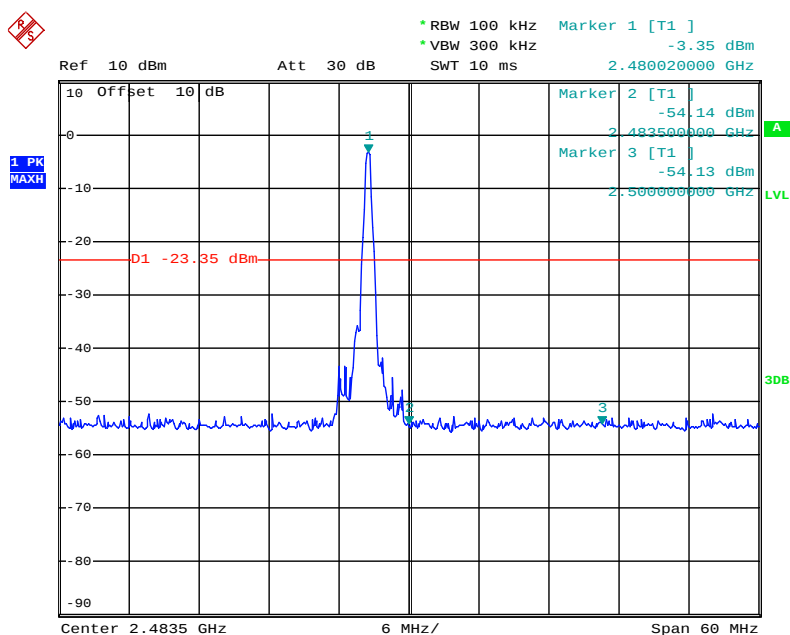
The spectrum analyzer plots are attached as below.

## Non-hopping mode

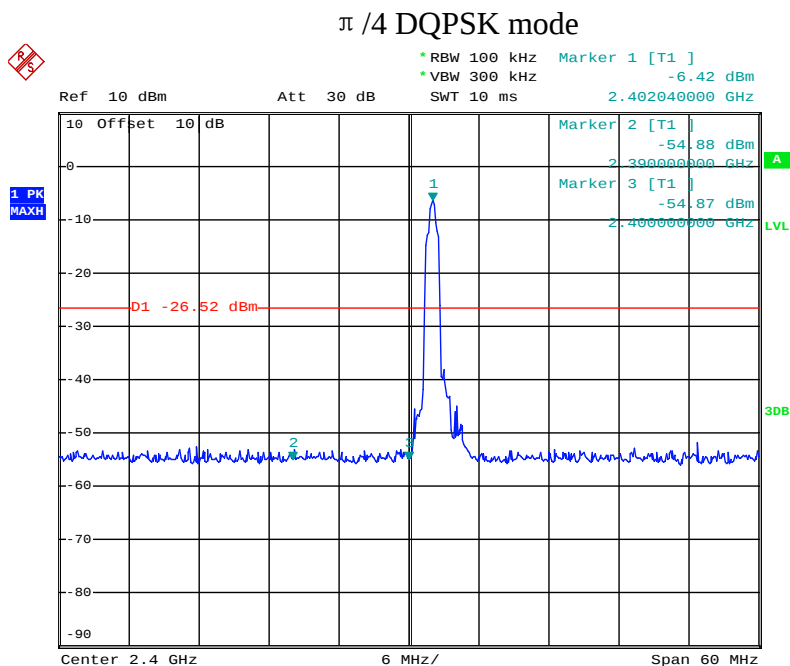
### GFSK mode



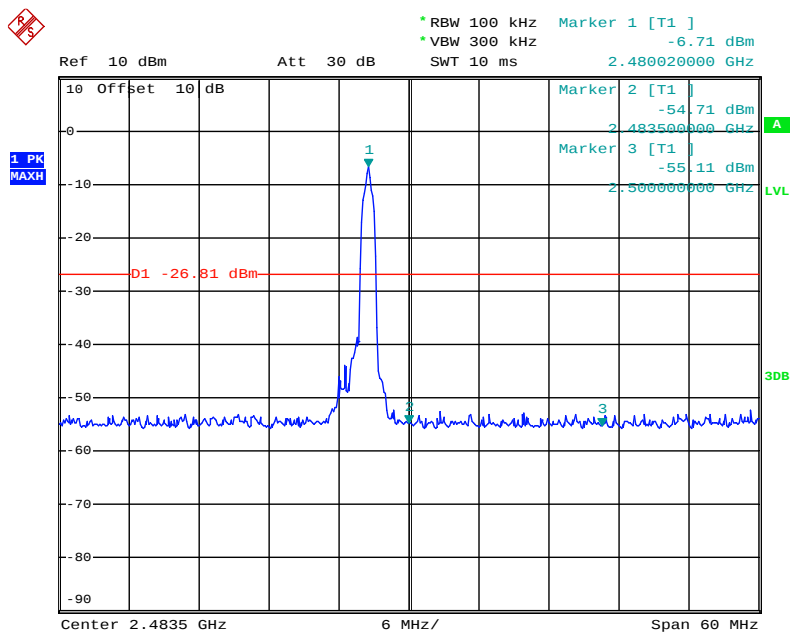
Date: 28.MAR.2019 09:11:32



Date: 28.MAR.2019 09:10:10

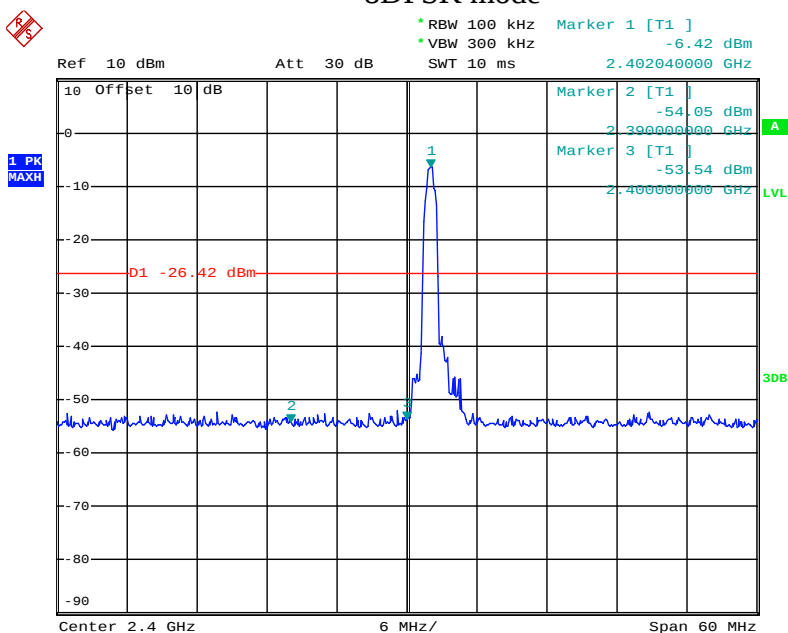


Date: 28.MAR.2019 09:08:16

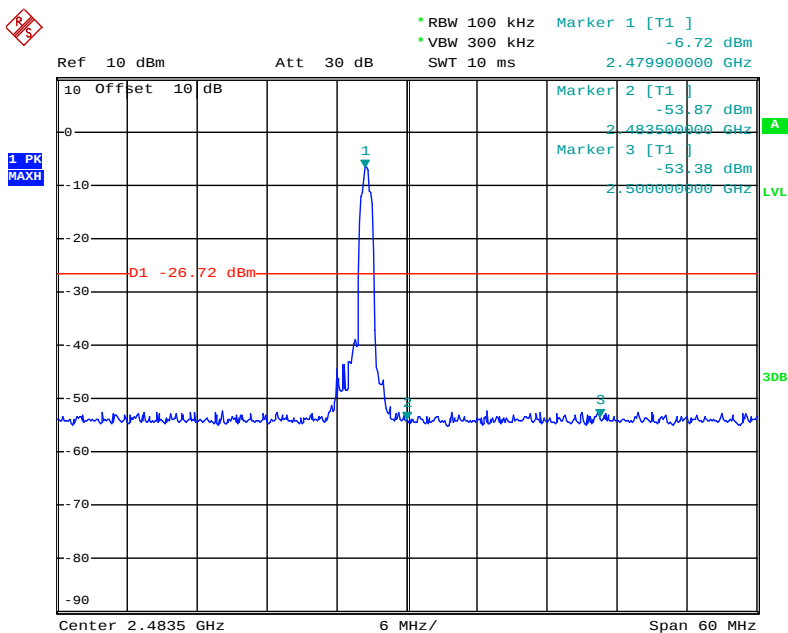


Date: 28.MAR.2019 09:09:16

## 8DPSK mode



Date: 28.MAR.2019 09:06:42



Date: 28.MAR.2019 09:05:32

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## 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.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). 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 bi-log 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 EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

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

We select 2402MHz, 2480MHz TX frequency to transmit(Hopping off mode).

We select 2402-2480MHz TX frequency to transmit(Hopping on mode).

During the radiated emission test, the spectrum analyzer was set with the following configurations:

- 1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
- 2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- 3.All modes of operation were investigated and the worst-case emissions are reported.

## Non-hopping mode(GFSK)



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Job No.: FRANK2019 #970

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz(GFSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

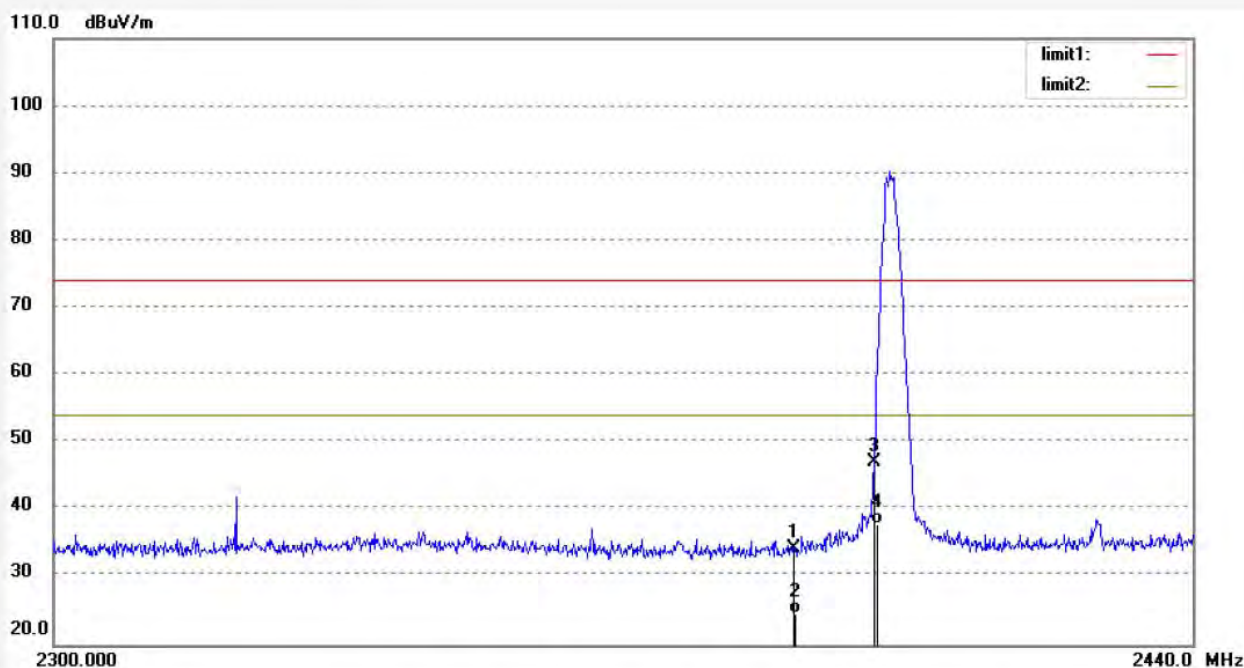
Date: 19/05/06/

Time: 10/18/24

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 40.57            | -6.32       | 34.25           | 74.00          | -39.75      | peak     | 200         | 146           |        |
| 2   | 2390.000    | 31.00            | -6.32       | 24.68           | 54.00          | -29.32      | AVG      | 200         | 69            |        |
| 3   | 2400.000    | 53.35            | -6.27       | 47.08           | 74.00          | -26.92      | peak     | 200         | 218           |        |
| 4   | 2400.000    | 44.11            | -6.27       | 37.84           | 54.00          | -16.16      | AVG      | 250         | 103           |        |

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Job No.: FRANK2019 #971

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz(GFSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

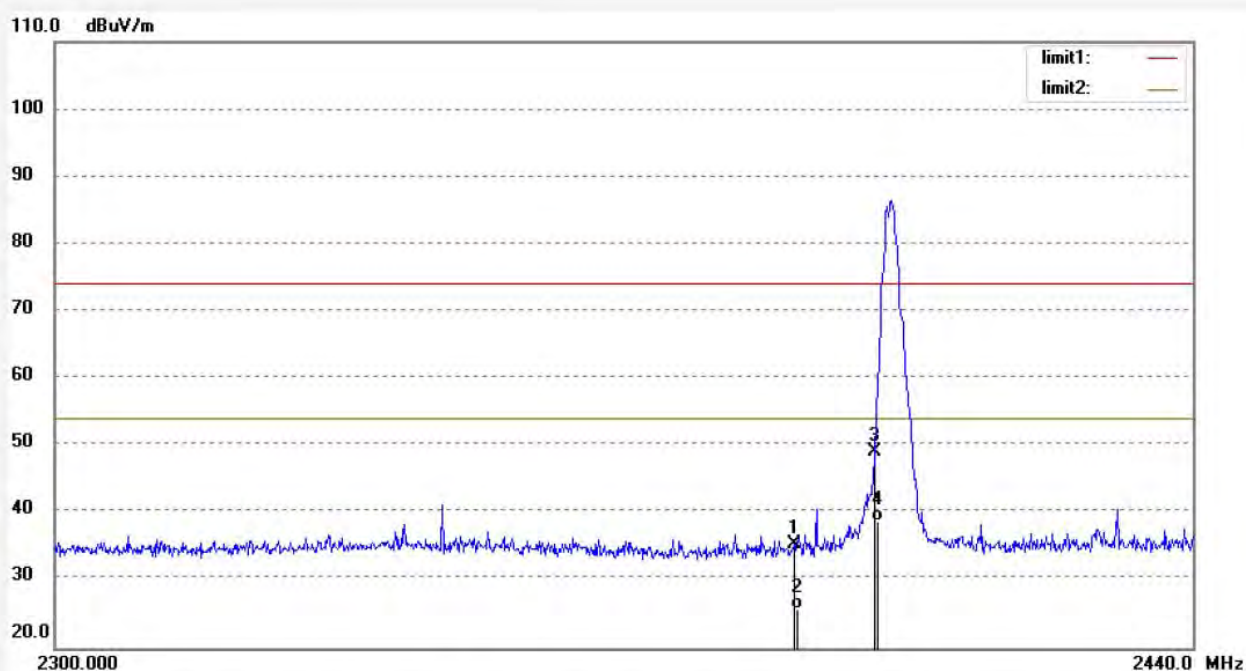
Date: 19/05/06/

Time: 10/22/15

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 41.77            | -6.32       | 35.45           | 74.00          | -38.55      | peak     | 150         | 69            |        |
| 2   | 2390.000    | 32.12            | -6.32       | 25.80           | 54.00          | -28.20      | AVG      | 150         | 116           |        |
| 3   | 2400.000    | 55.42            | -6.27       | 49.15           | 74.00          | -24.85      | peak     | 150         | 103           |        |
| 4   | 2400.000    | 45.14            | -6.27       | 38.87           | 54.00          | -15.13      | AVG      | 150         | 54            |        |

Job No.: FRANK2019 #981

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz(GFSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

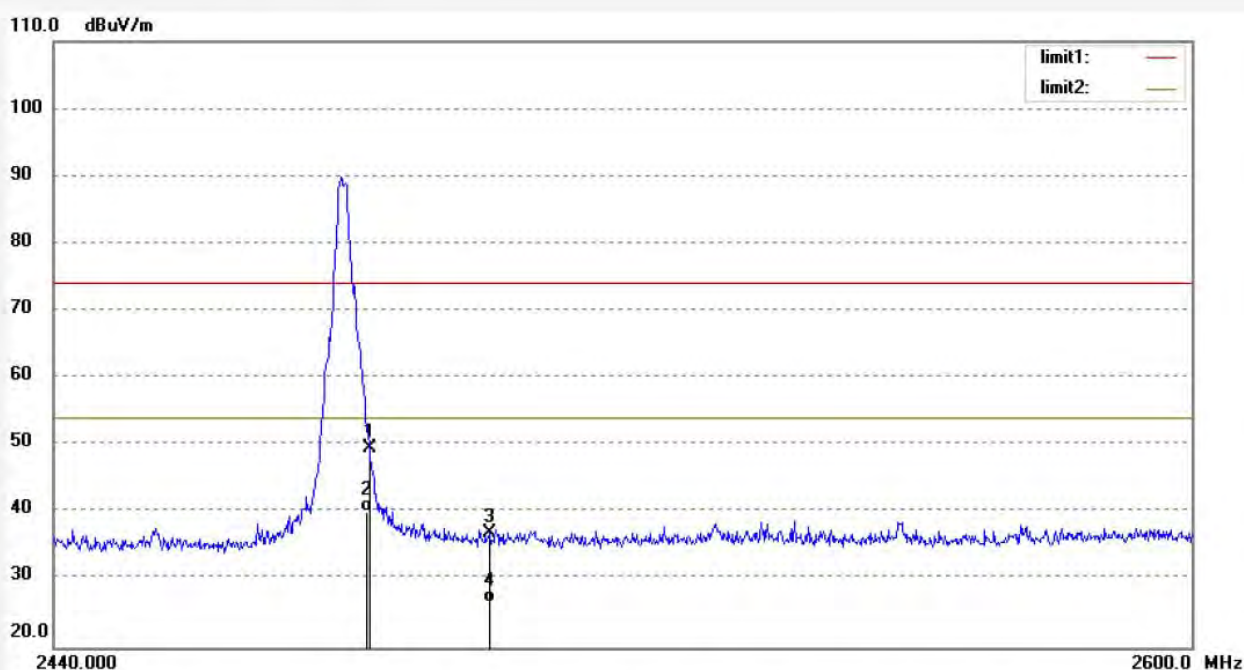
Date: 19/05/06/

Time: 11/06/02

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 55.44            | -5.89       | 49.55           | 74.00          | -24.45      | peak     | 200         | 102           |        |
| 2   | 2483.500    | 46.12            | -5.89       | 40.23           | 54.00          | -13.77      | AVG      | 200         | 311           |        |
| 3   | 2500.000    | 42.75            | -5.81       | 36.94           | 74.00          | -37.06      | peak     | 200         | 201           |        |
| 4   | 2500.000    | 32.48            | -5.81       | 26.67           | 54.00          | -27.33      | AVG      | 200         | 312           |        |

Job No.: FRANK2019 #980

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz(GFSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

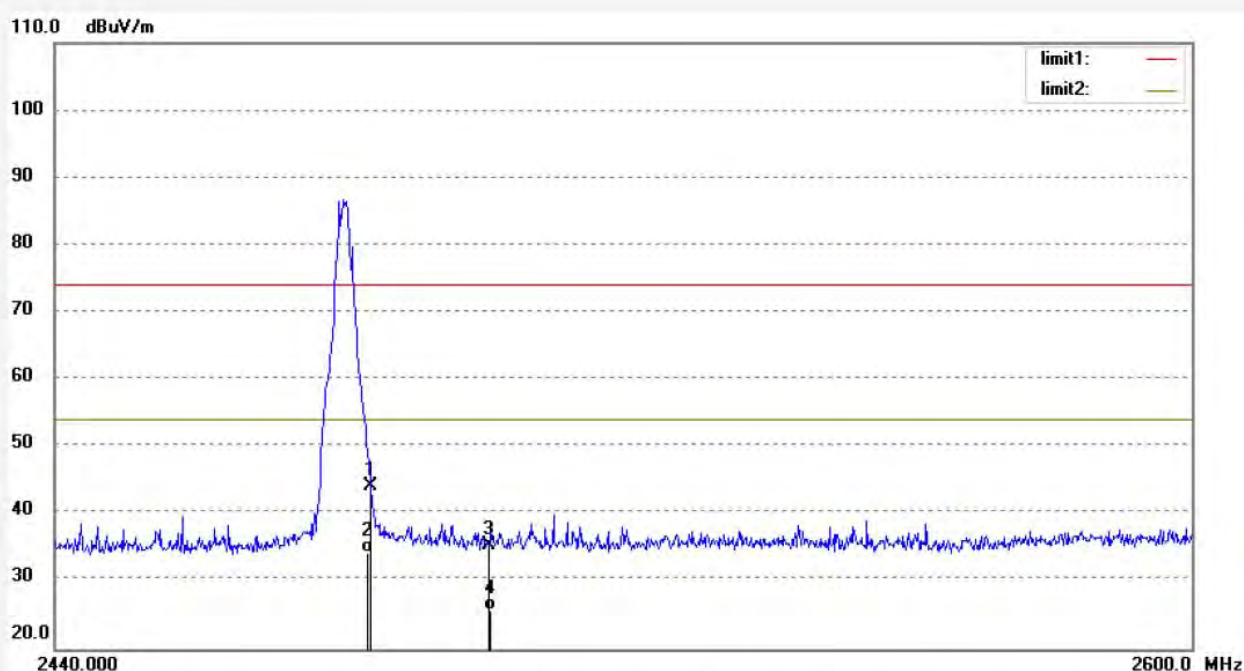
Date: 19/05/06/

Time: 11/03/16

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 50.02            | -5.89       | 44.13           | 74.00          | -29.87      | peak     | 150         | 302           |        |
| 2   | 2483.500    | 40.12            | -5.89       | 34.23           | 54.00          | -19.77      | AVG      | 150         | 66            |        |
| 3   | 2500.000    | 41.23            | -5.81       | 35.42           | 74.00          | -38.58      | peak     | 150         | 211           |        |
| 4   | 2500.000    | 31.45            | -5.81       | 25.64           | 54.00          | -28.36      | AVG      | 150         | 96            |        |

## Non-hopping mode( $\pi/4$ DQPSK)



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Job No.: FRANK2019 #973

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz( $\pi/4$  DQPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

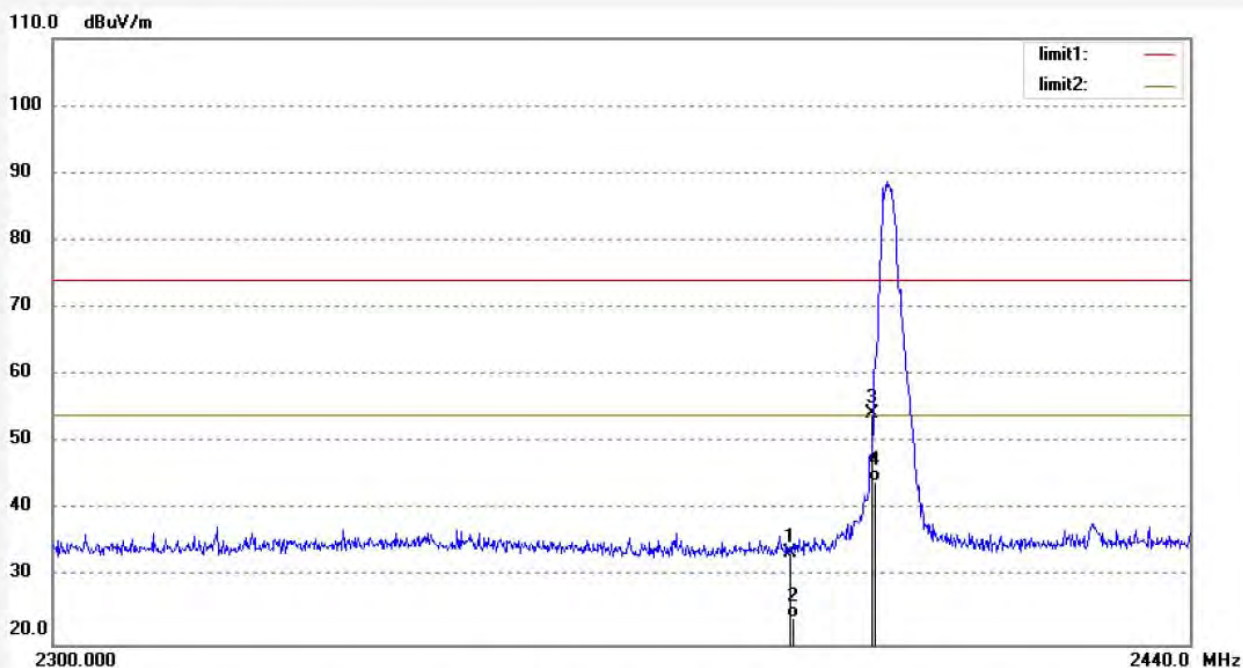
Date: 19/05/06/

Time: 10/30/45

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 39.98            | -6.32       | 33.66           | 74.00          | -40.34      | peak     | 200         | 302           |        |
| 2   | 2390.000    | 30.15            | -6.32       | 23.83           | 54.00          | -30.17      | AVG      | 200         | 106           |        |
| 3   | 2400.000    | 60.55            | -6.27       | 54.28           | 74.00          | -19.72      | peak     | 200         | 221           |        |
| 4   | 2400.000    | 50.48            | -6.27       | 44.21           | 54.00          | -9.79       | AVG      | 200         | 102           |        |

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Job No.: FRANK2019 #972

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz( $\pi/4$  DQPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

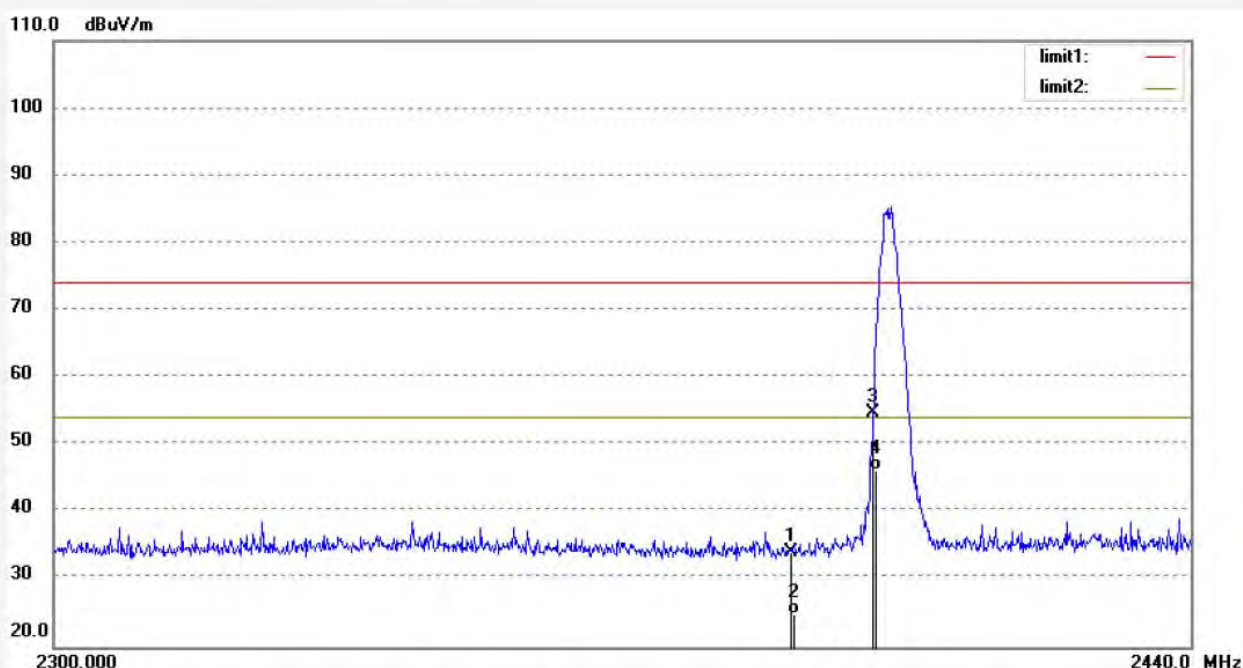
Date: 19/05/06/

Time: 10/26/26

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 40.48            | -6.32       | 34.16           | 74.00          | -39.84      | peak     | 150         | 301           |        |
| 2   | 2390.000    | 31.14            | -6.32       | 24.82           | 54.00          | -29.18      | AVG      | 150         | 126           |        |
| 3   | 2400.000    | 61.02            | -6.27       | 54.75           | 74.00          | -19.25      | peak     | 150         | 254           |        |
| 4   | 2400.000    | 52.48            | -6.27       | 46.21           | 54.00          | -7.79       | AVG      | 150         | 169           |        |

Job No.: FRANK2019 #978

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz( $\pi/4$  DQPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

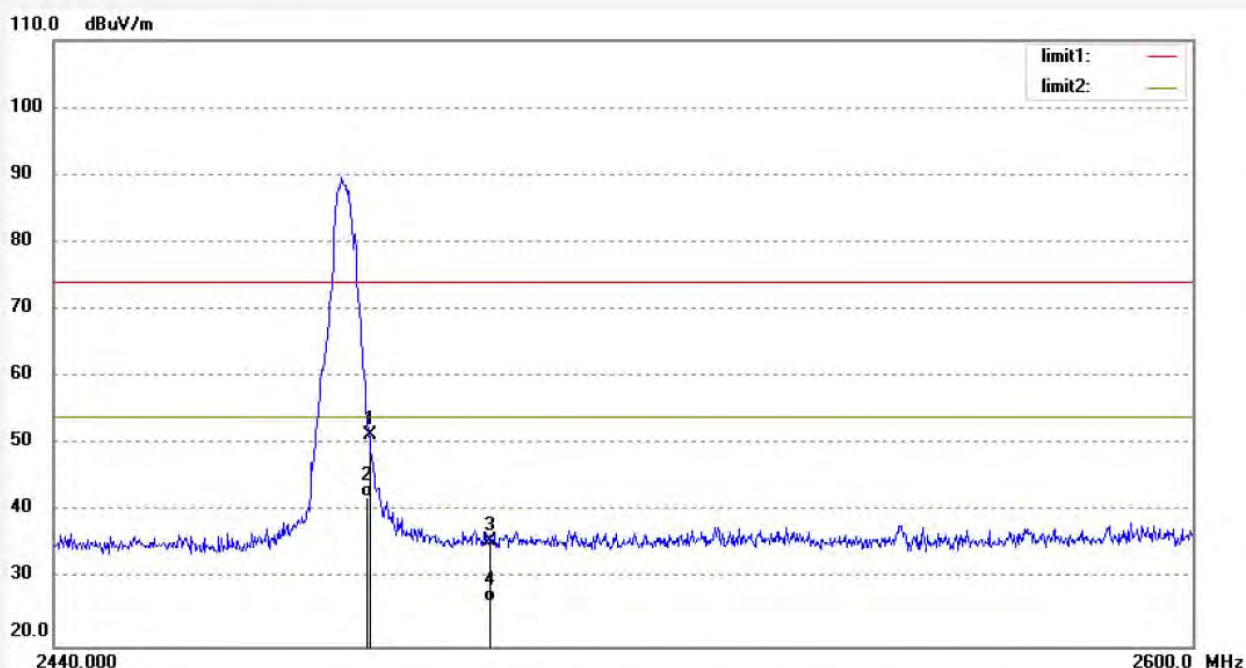
Date: 19/05/06/

Time: 10/51/53

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 57.19            | -5.89       | 51.30           | 74.00          | -22.70      | peak     | 200         | 302           |        |
| 2   | 2483.500    | 48.15            | -5.89       | 42.26           | 54.00          | -11.74      | AVG      | 200         | 201           |        |
| 3   | 2500.000    | 41.54            | -5.81       | 35.73           | 74.00          | -38.27      | peak     | 200         | 115           |        |
| 4   | 2500.000    | 32.45            | -5.81       | 26.64           | 54.00          | -27.36      | AVG      | 200         | 92            |        |

Job No.: FRANK2019 #979

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz( $\pi/4$  DQPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

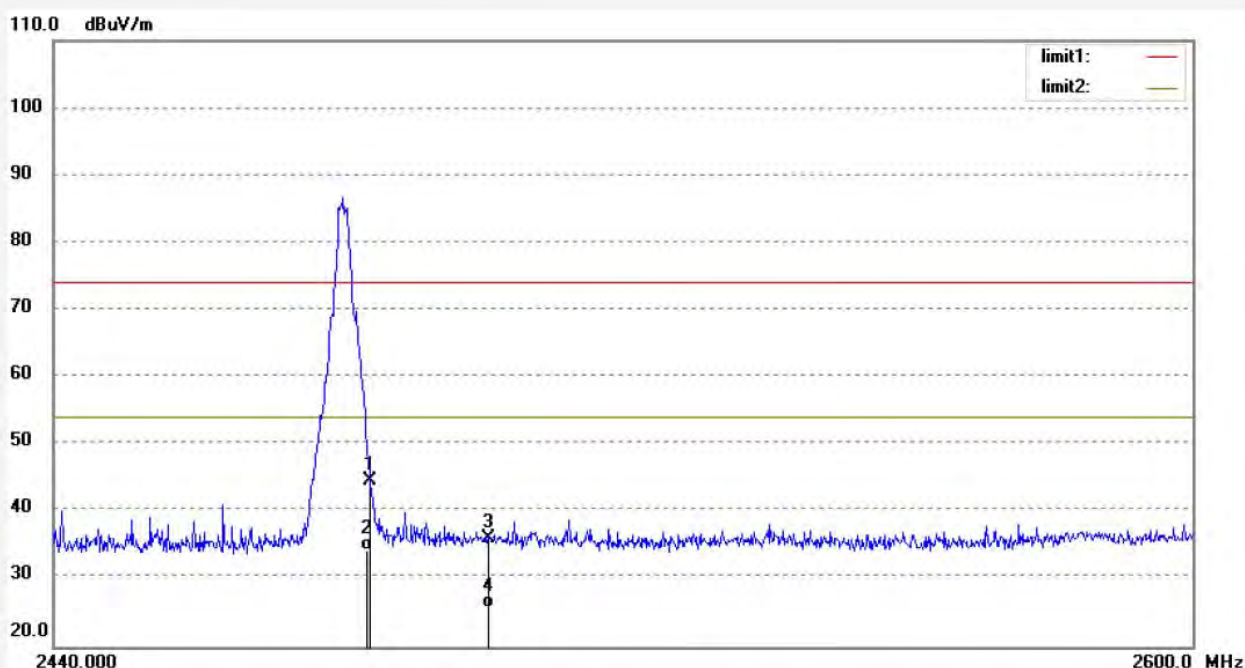
Date: 19/05/06/

Time: 10/57/13

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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       | 50.63               | -5.89          | 44.74              | 74.00             | -29.26         | peak     | 150            | 96               |        |
| 2   | 2483.500       | 40.12               | -5.89          | 34.23              | 54.00             | -19.77         | AVG      | 150            | 289              |        |
| 3   | 2500.000       | 41.84               | -5.81          | 36.03              | 74.00             | -37.97         | peak     | 150            | 115              |        |
| 4   | 2500.000       | 31.45               | -5.81          | 25.64              | 54.00             | -28.36         | AVG      | 150            | 302              |        |

## Non-hopping mode(8DPSK)



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Job No.: FRANK2019 #974

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz(8DPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

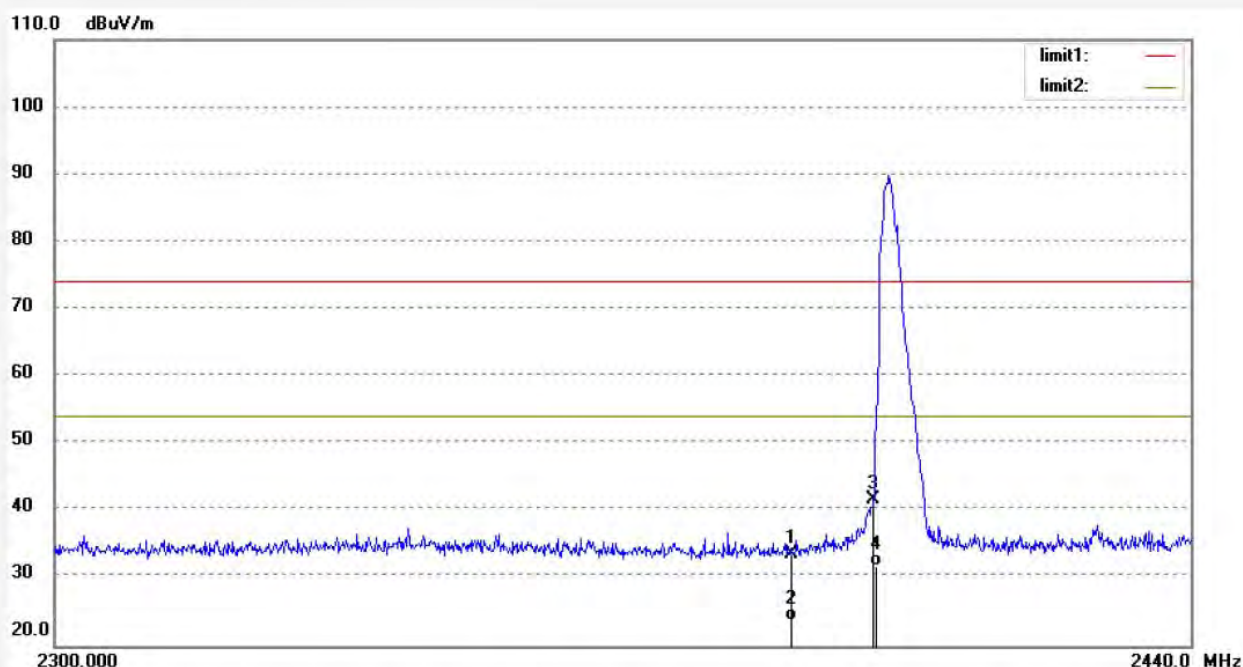
Date: 19/05/06/

Time: 10/34/29

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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       | 39.86               | -6.32          | 33.54              | 74.00             | -40.46         | peak     | 200            | 302              |        |
| 2   | 2390.000       | 30.12               | -6.32          | 23.80              | 54.00             | -30.20         | AVG      | 200            | 185              |        |
| 3   | 2400.000       | 47.99               | -6.27          | 41.72              | 74.00             | -32.28         | peak     | 200            | 62               |        |
| 4   | 2400.000       | 38.12               | -6.27          | 31.85              | 54.00             | -22.15         | AVG      | 200            | 52               |        |

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Job No.: FRANK2019 #975

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2402MHz(8DPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

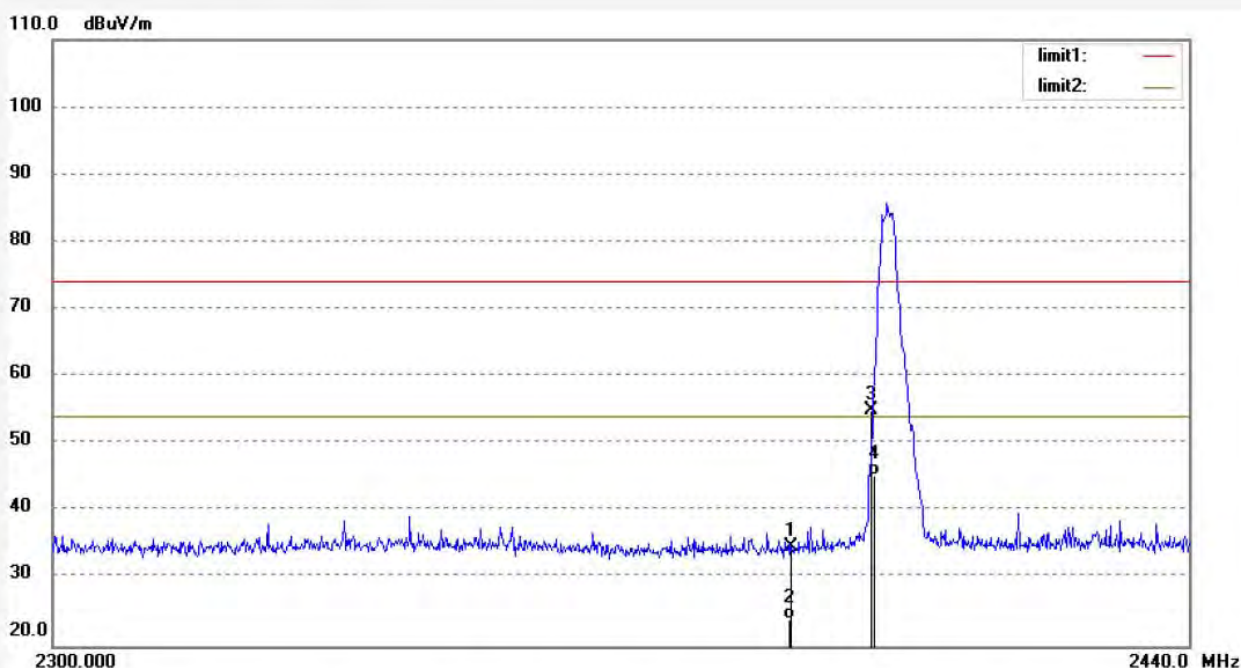
Date: 19/05/06/

Time: 10/38/00

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 40.97            | -6.32       | 34.65           | 74.00          | -39.35      | peak     | 150         | 163           |        |
| 2   | 2390.000    | 30.15            | -6.32       | 23.83           | 54.00          | -30.17      | AVG      | 150         | 48            |        |
| 3   | 2400.000    | 61.35            | -6.27       | 55.08           | 74.00          | -18.92      | peak     | 150         | 201           |        |
| 4   | 2400.000    | 51.49            | -6.27       | 45.22           | 54.00          | -8.78       | AVG      | 150         | 93            |        |

Job No.: FRANK2019 #977

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz(8DPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

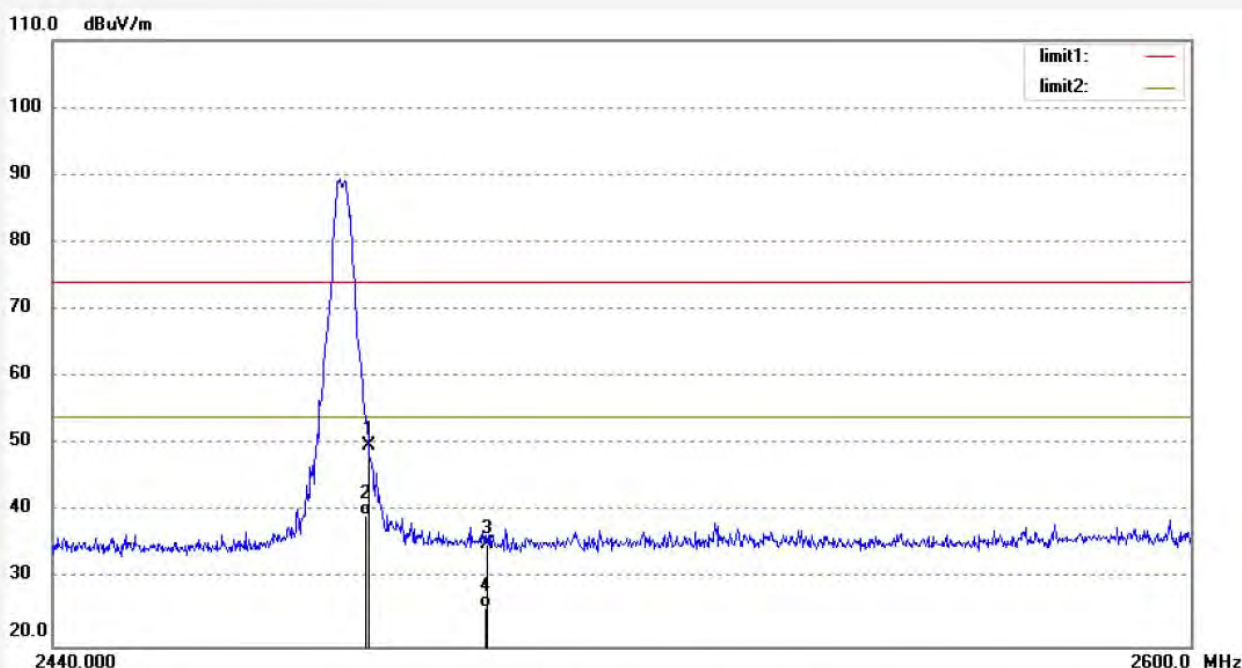
Date: 19/05/06/

Time: 10/48/00

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 55.75            | -5.89       | 49.86           | 74.00          | -24.14      | peak     | 200         | 302           |        |
| 2   | 2483.500    | 45.45            | -5.89       | 39.56           | 54.00          | -14.44      | AVG      | 200         | 62            |        |
| 3   | 2500.000    | 41.00            | -5.81       | 35.19           | 74.00          | -38.81      | peak     | 200         | 121           |        |
| 4   | 2500.000    | 31.45            | -5.81       | 25.64           | 54.00          | -28.36      | AVG      | 200         | 101           |        |

Job No.: FRANK2019 #976

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: TX 2480MHz(8DPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

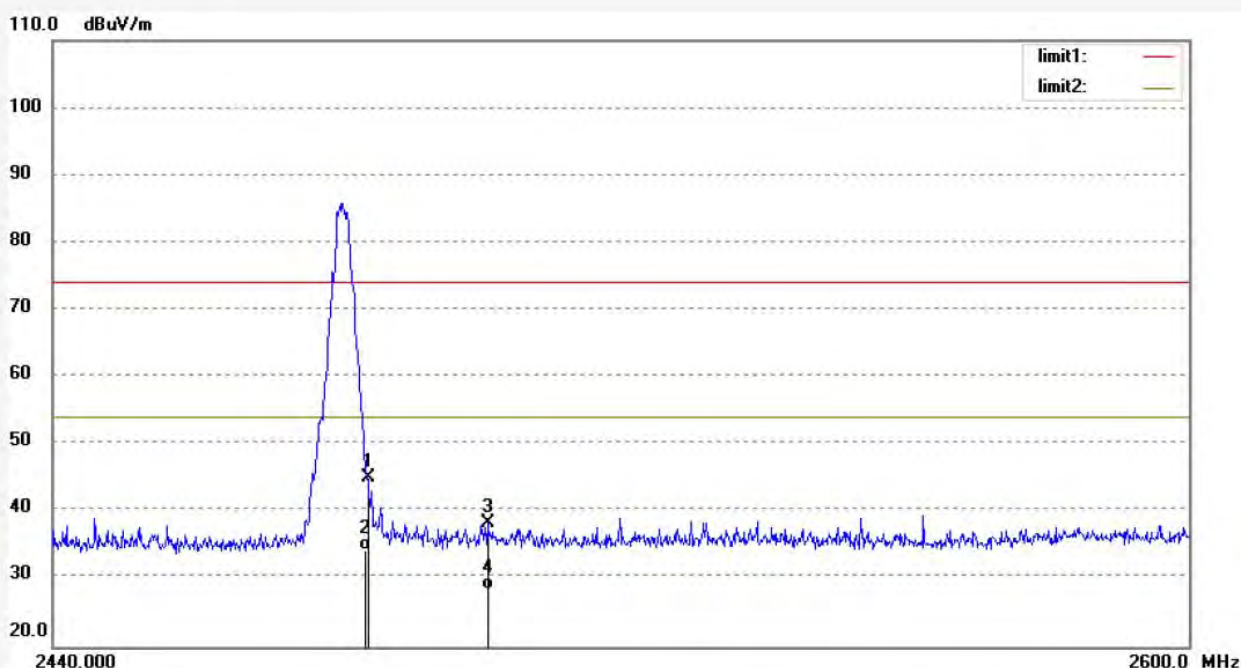
Date: 19/05/06/

Time: 10/42/52

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 50.87            | -5.89       | 44.98           | 74.00          | -29.02      | peak     | 150         | 99            |        |
| 2   | 2483.500    | 40.12            | -5.89       | 34.23           | 54.00          | -19.77      | AVG      | 150         | 204           |        |
| 3   | 2500.000    | 44.15            | -5.81       | 38.34           | 74.00          | -35.66      | peak     | 150         | 115           |        |
| 4   | 2500.000    | 34.15            | -5.81       | 28.34           | 54.00          | -25.66      | AVG      | 150         | 302           |        |

## Hopping mode(GFSK)



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Job No.: FRANK2019 #982

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: HOPPING(GFSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

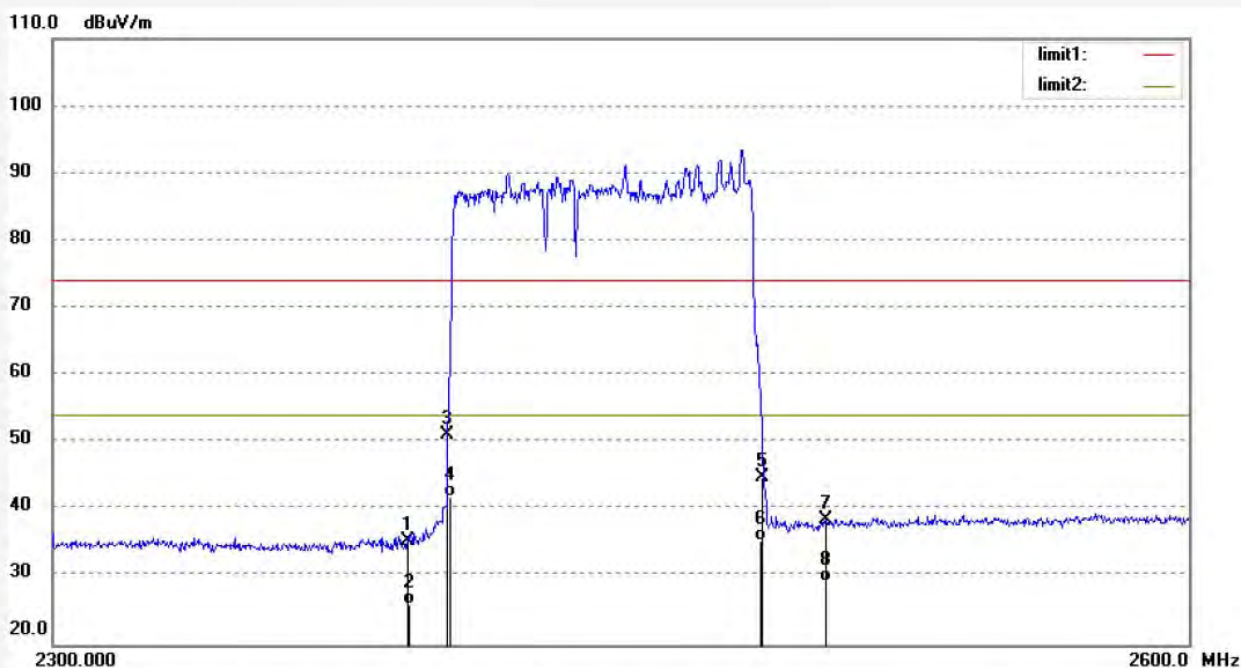
Date: 19/05/06/

Time: 11/10/57

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 41.64            | -6.32       | 35.32           | 74.00          | -38.68      | peak     | 200         | 302           |        |
| 2   | 2390.000    | 32.19            | -6.32       | 25.87           | 54.00          | -28.13      | AVG      | 200         | 92            |        |
| 3   | 2400.000    | 57.36            | -6.27       | 51.09           | 74.00          | -22.91      | peak     | 200         | 221           |        |
| 4   | 2400.000    | 48.31            | -6.27       | 42.04           | 54.00          | -11.96      | AVG      | 200         | 201           |        |
| 5   | 2483.500    | 50.72            | -5.89       | 44.83           | 74.00          | -29.17      | peak     | 200         | 332           |        |
| 6   | 2483.500    | 41.38            | -5.89       | 35.49           | 54.00          | -18.51      | AVG      | 200         | 201           |        |
| 7   | 2500.000    | 44.30            | -5.81       | 38.49           | 74.00          | -35.51      | peak     | 200         | 23            |        |
| 8   | 2500.000    | 35.21            | -5.81       | 29.40           | 54.00          | -24.60      | AVG      | 200         | 96            |        |

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Job No.: FRANK2019 #983

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: HOPPING(GFSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

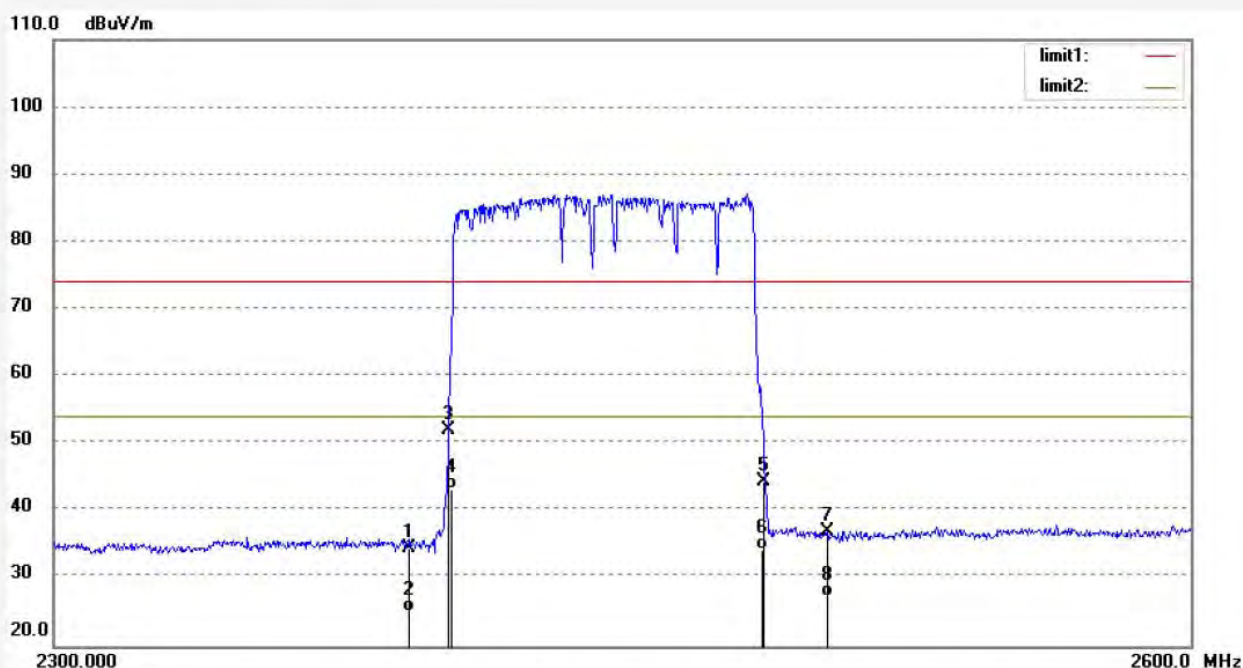
Date: 19/05/06/

Time: 11/16/18

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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       | 40.88               | -6.32          | 34.56              | 74.00             | -39.44         | peak     | 150            | 102              |        |
| 2   | 2390.000       | 31.45               | -6.32          | 25.13              | 54.00             | -28.87         | AVG      | 150            | 206              |        |
| 3   | 2400.000       | 58.30               | -6.27          | 52.03              | 74.00             | -21.97         | peak     | 150            | 112              |        |
| 4   | 2400.000       | 49.46               | -6.27          | 43.19              | 54.00             | -10.81         | AVG      | 150            | 95               |        |
| 5   | 2483.500       | 50.32               | -5.89          | 44.43              | 74.00             | -29.57         | peak     | 150            | 301              |        |
| 6   | 2483.500       | 40.16               | -5.89          | 34.27              | 54.00             | -19.73         | AVG      | 150            | 201              |        |
| 7   | 2500.000       | 42.72               | -5.81          | 36.91              | 74.00             | -37.09         | peak     | 150            | 332              |        |
| 8   | 2500.000       | 33.15               | -5.81          | 27.34              | 54.00             | -26.66         | AVG      | 150            | 209              |        |

## Hopping mode( $\pi/4$ DQPSK)



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Job No.: FRANK2019 #985

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: HOPPING( $\pi/4$  DQPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

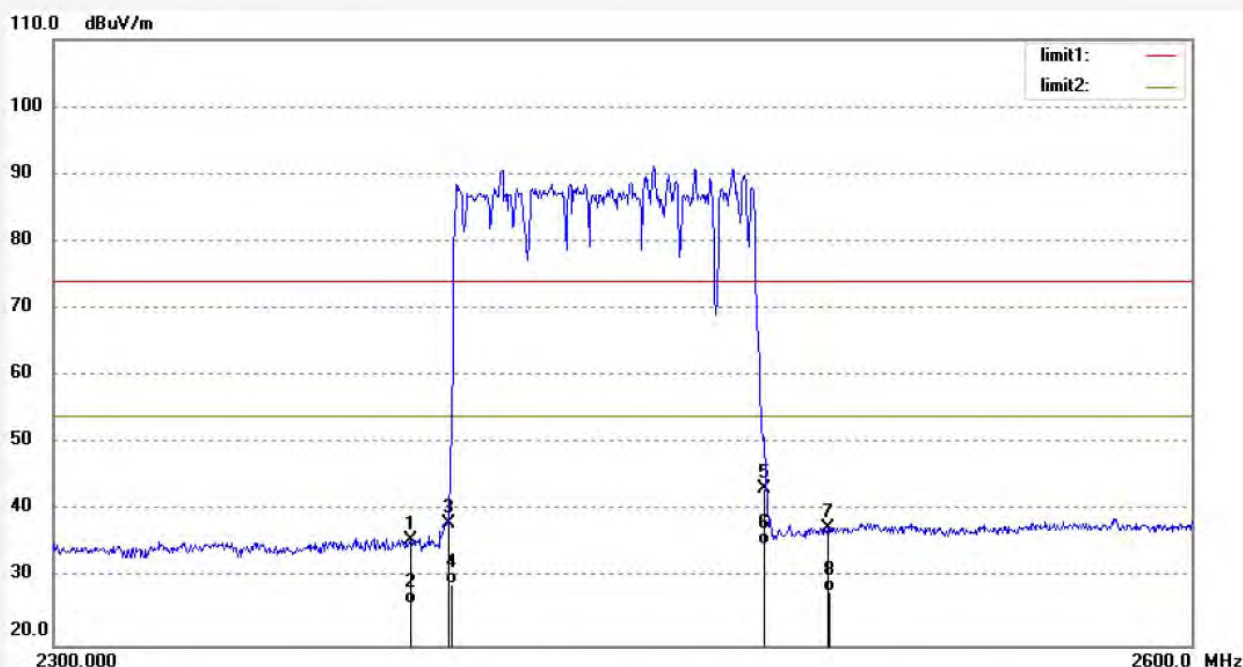
Date: 19/05/06/

Time: 11/26/41

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 41.89            | -6.32       | 35.57           | 74.00          | -38.43      | peak     | 200         | 233           |        |
| 2   | 2390.000    | 32.45            | -6.32       | 26.13           | 54.00          | -27.87      | AVG      | 200         | 201           |        |
| 3   | 2400.000    | 44.38            | -6.27       | 38.11           | 74.00          | -35.89      | peak     | 200         | 136           |        |
| 4   | 2400.000    | 35.48            | -6.27       | 29.21           | 54.00          | -24.79      | AVG      | 200         | 95            |        |
| 5   | 2483.500    | 49.08            | -5.89       | 43.19           | 74.00          | -30.81      | peak     | 200         | 141           |        |
| 6   | 2483.500    | 40.87            | -5.89       | 34.98           | 54.00          | -19.02      | AVG      | 200         | 210           |        |
| 7   | 2500.000    | 43.23            | -5.81       | 37.42           | 74.00          | -36.58      | peak     | 200         | 66            |        |
| 8   | 2500.000    | 33.78            | -5.81       | 27.97           | 54.00          | -26.03      | AVG      | 200         | 103           |        |

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Job No.: FRANK2019 #984

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: HOPPING( $\pi/4$  DQPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

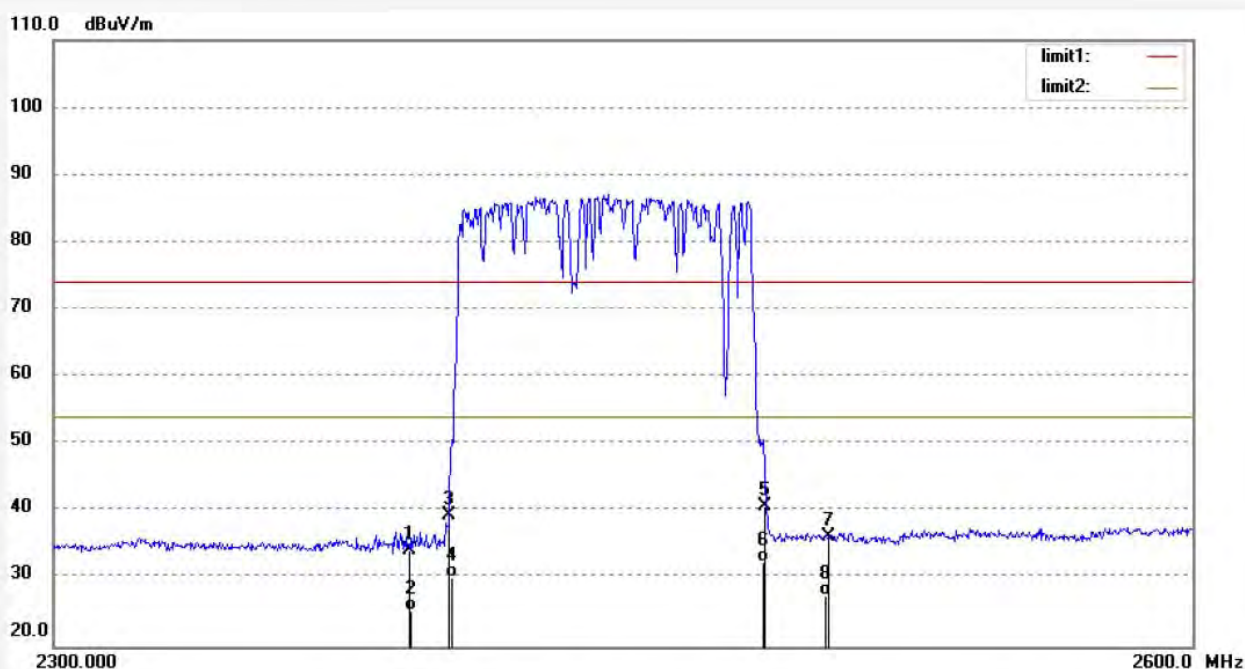
Date: 19/05/06/

Time: 11/20/45

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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       | 40.53               | -6.32          | 34.21              | 74.00             | -39.79         | peak     | 150            | 103              |        |
| 2   | 2390.000       | 31.54               | -6.32          | 25.22              | 54.00             | -28.78         | AVG      | 150            | 81               |        |
| 3   | 2400.000       | 45.65               | -6.27          | 39.38              | 74.00             | -34.62         | peak     | 150            | 69               |        |
| 4   | 2400.000       | 36.48               | -6.27          | 30.21              | 54.00             | -23.79         | AVG      | 150            | 116              |        |
| 5   | 2483.500       | 46.77               | -5.89          | 40.88              | 74.00             | -33.12         | peak     | 150            | 302              |        |
| 6   | 2483.500       | 38.48               | -5.89          | 32.59              | 54.00             | -21.41         | AVG      | 150            | 96               |        |
| 7   | 2500.000       | 42.21               | -5.81          | 36.40              | 74.00             | -37.60         | peak     | 150            | 165              |        |
| 8   | 2500.000       | 33.45               | -5.81          | 27.64              | 54.00             | -26.36         | AVG      | 150            | 321              |        |

## Hopping mode(8DPSK)



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Job No.: FRANK2019 #986

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: HOPPING(8DPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Horizontal

Power Source: AC 120V/60Hz

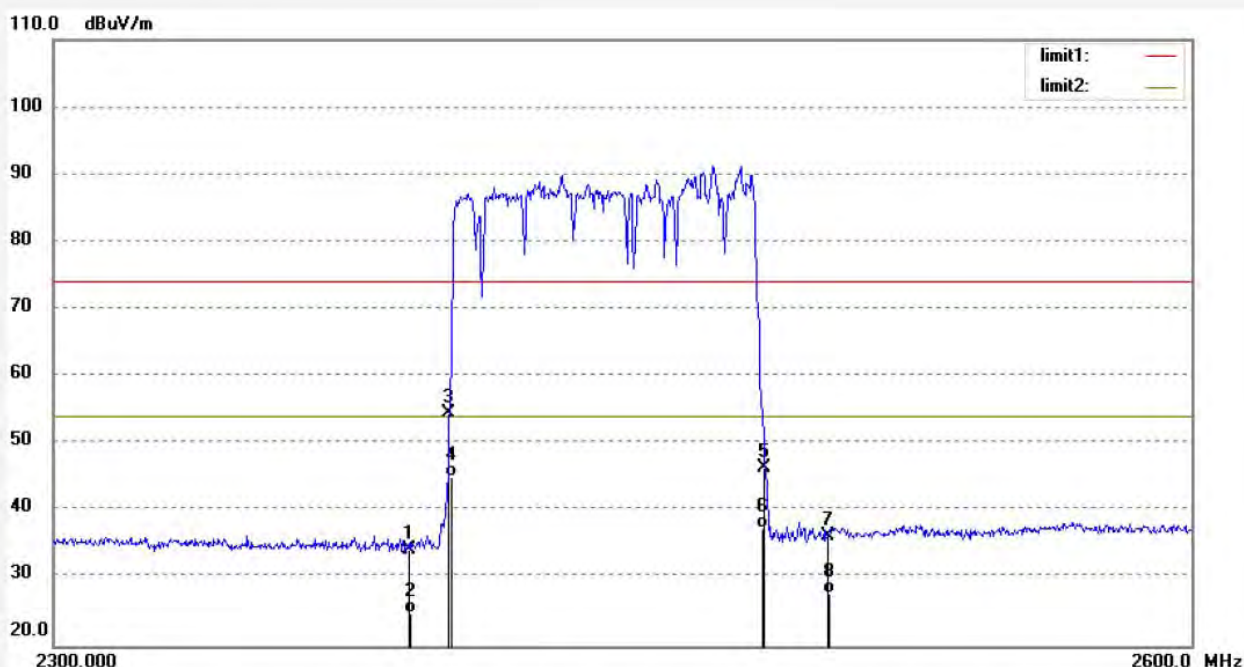
Date: 19/05/06/

Time: 11/31/25

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 40.71            | -6.32       | 34.39           | 74.00          | -39.61      | peak     | 200         | 194           |        |
| 2   | 2390.000    | 31.12            | -6.32       | 24.80           | 54.00          | -29.20      | AVG      | 200         | 85            |        |
| 3   | 2400.000    | 60.84            | -6.27       | 54.57           | 74.00          | -19.43      | peak     | 200         | 201           |        |
| 4   | 2400.000    | 51.37            | -6.27       | 45.10           | 54.00          | -8.90       | AVG      | 200         | 33            |        |
| 5   | 2483.500    | 52.25            | -5.89       | 46.36           | 74.00          | -27.64      | peak     | 200         | 200           |        |
| 6   | 2483.500    | 43.26            | -5.89       | 37.37           | 54.00          | -16.63      | AVG      | 200         | 102           |        |
| 7   | 2500.000    | 42.16            | -5.81       | 36.35           | 74.00          | -37.65      | peak     | 200         | 35            |        |
| 8   | 2500.000    | 33.67            | -5.81       | 27.86           | 54.00          | -26.14      | AVG      | 200         | 109           |        |

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Job No.: FRANK2019 #987

Standard: FCC PK

Test item: Radiation Test

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

EUT: DISCOVERY

Mode: HOPPING(8DPSK)

Model: CR8009A-DU

Manufacturer: TIMSEN DEVELOPMENT LIMITED

Polarization: Vertical

Power Source: AC 120V/60Hz

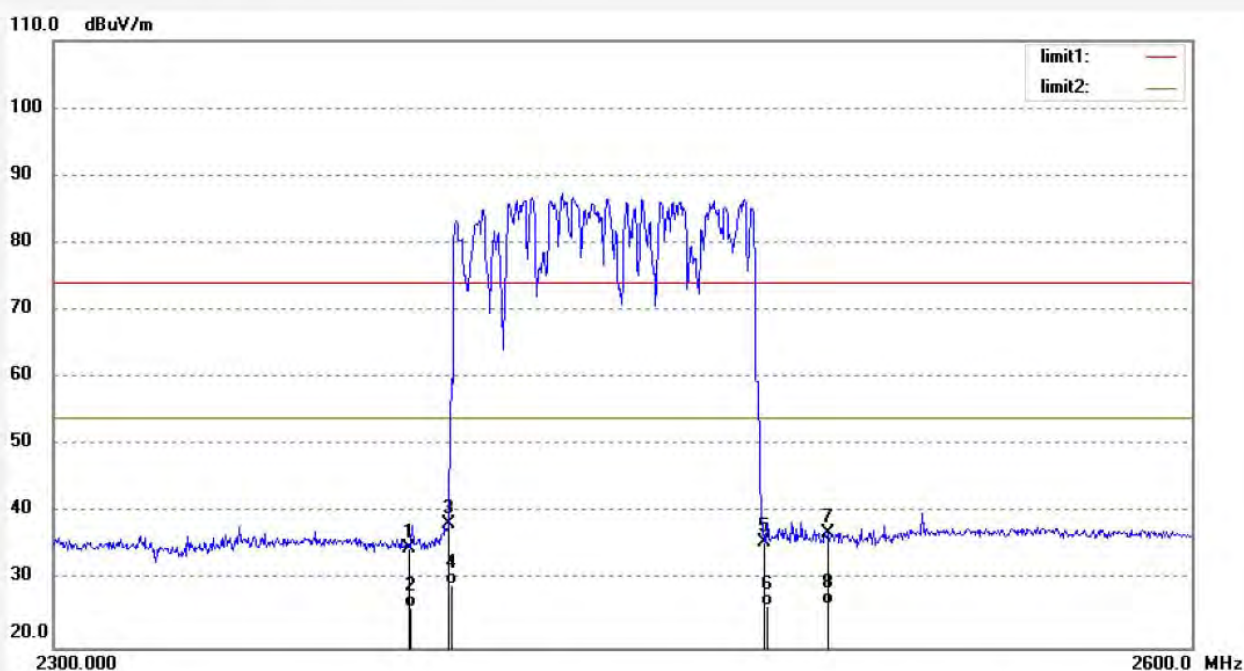
Date: 19/05/06/

Time: 11/38/01

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20190551



| 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    | 41.06            | -6.32       | 34.74           | 74.00          | -39.26      | peak     | 150         | 211           |        |
| 2   | 2390.000    | 32.32            | -6.32       | 26.00           | 54.00          | -28.00      | AVG      | 150         | 33            |        |
| 3   | 2400.000    | 44.70            | -6.27       | 38.43           | 74.00          | -35.57      | peak     | 150         | 202           |        |
| 4   | 2400.000    | 35.62            | -6.27       | 29.35           | 54.00          | -24.65      | AVG      | 150         | 94            |        |
| 5   | 2483.500    | 41.42            | -5.89       | 35.53           | 74.00          | -38.47      | peak     | 150         | 169           |        |
| 6   | 2483.500    | 32.15            | -5.89       | 26.26           | 54.00          | -27.74      | AVG      | 150         | 52            |        |
| 7   | 2500.000    | 42.80            | -5.81       | 36.99           | 74.00          | -37.01      | peak     | 150         | 215           |        |
| 8   | 2500.000    | 32.15            | -5.81       | 26.34           | 54.00          | -27.66      | AVG      | 150         | 103           |        |

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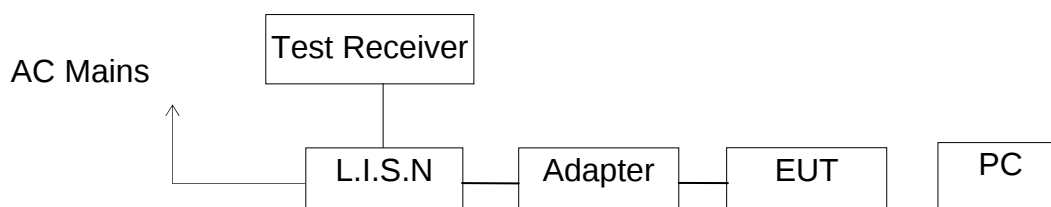
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## 12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART

### 15 SECTION 15.207(A)

#### 12.1.Block Diagram of Test Setup



(EUT: DISCOVERY)

#### 12.2.Power Line Conducted Emission Measurement Limits

| 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          |

NOTE1: The lower limit shall apply at the transition frequencies.  
NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

#### 12.3.Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

## 12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 12.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in test mode and 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 9kHz.

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

## 12.6.Data Sample

| Frequency (MHz) | Transducer value (dB) | QuasiPeak Level (dBμV) | Average Level (dBμV) | QuasiPeak Limit (dBμV) | Average Limit (dBμV) | QuasiPeak Margin (dB) | Average Margin (dB) | Remark (Pass/Fail) |
|-----------------|-----------------------|------------------------|----------------------|------------------------|----------------------|-----------------------|---------------------|--------------------|
| X.XX            | 10.6                  | 25.3                   | 17.0                 | 59.0                   | 49.0                 | 33.4                  | 31.7                | Pass               |

Frequency(MHz) = Emission frequency in MHz

Transducer value(dB) = Insertion loss of LISN + Cable Loss

Level(dBμV) = Quasi-peak Reading/Average Reading + Transducer value

Limit (dBμV) = Limit stated in standard

Margin = Limit (dBμV) - Level (dBμV)

Calculation Formula:

Margin = Limit (dBμV) - Level (dBμV)

## 12.7.Power Line Conducted Emission Measurement Results

### PASS.

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

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

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

We tested the conducted emission of high and low voltage mode and recorded the worst mode data. All data was recorded in the Quasi-peak and average detection mode.

#### Test mode : CHARGING&BT Operation(AC 120V/60Hz)

##### MEASUREMENT RESULT: "F-0551-7\_fin"

5/5/2019 4:29PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 42.50         | 10.6         | 59            | 16.2         | QP       | L1   | GND |
| 0.375000         | 43.70         | 10.7         | 58            | 14.7         | QP       | L1   | GND |
| 1.320000         | 35.00         | 10.9         | 56            | 21.0         | QP       | L1   | GND |
| 4.980000         | 43.60         | 11.2         | 56            | 12.4         | QP       | L1   | GND |
| 5.840000         | 44.40         | 11.2         | 60            | 15.6         | QP       | L1   | GND |
| 23.380000        | 41.20         | 11.5         | 60            | 18.8         | QP       | L1   | GND |

##### MEASUREMENT RESULT: "F-0551-7\_fin2"

5/5/2019 4:29PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.355000         | 36.30         | 10.6         | 49            | 12.5         | AV       | L1   | GND |
| 0.380000         | 38.80         | 10.7         | 48            | 9.5          | AV       | L1   | GND |
| 0.990000         | 24.30         | 10.8         | 46            | 21.7         | AV       | L1   | GND |
| 4.990000         | 35.80         | 11.2         | 46            | 10.2         | AV       | L1   | GND |
| 5.370000         | 37.10         | 11.2         | 50            | 12.9         | AV       | L1   | GND |
| 23.440000        | 31.20         | 11.5         | 50            | 18.8         | AV       | L1   | GND |

##### MEASUREMENT RESULT: "F-0551-8\_fin"

5/5/2019 4:36PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 42.80         | 10.6         | 59            | 15.9         | QP       | N    | GND |
| 0.375000         | 44.00         | 10.7         | 58            | 14.4         | QP       | N    | GND |
| 0.990000         | 30.00         | 10.8         | 56            | 26.0         | QP       | N    | GND |
| 4.960000         | 39.30         | 11.2         | 56            | 16.7         | QP       | N    | GND |
| 5.980000         | 39.30         | 11.2         | 60            | 20.7         | QP       | N    | GND |
| 24.085000        | 36.20         | 11.5         | 60            | 23.8         | QP       | N    | GND |

##### MEASUREMENT RESULT: "F-0551-8\_fin2"

5/5/2019 4:36PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.355000         | 37.60         | 10.6         | 49            | 11.2         | AV       | N    | GND |
| 0.375000         | 39.10         | 10.7         | 48            | 9.3          | AV       | N    | GND |
| 0.905000         | 22.50         | 10.8         | 46            | 23.5         | AV       | N    | GND |
| 4.990000         | 32.80         | 11.2         | 46            | 13.2         | AV       | N    | GND |
| 5.460000         | 33.20         | 11.2         | 50            | 16.8         | AV       | N    | GND |
| 24.265000        | 24.70         | 11.5         | 50            | 25.3         | AV       | N    | GND |

Test mode : BT Operation(AC 240V/60Hz)

**MEASUREMENT RESULT: "F-0551-10\_fin"**

5/5/2019 4:44PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 43.20         | 10.6         | 59            | 15.5         | QP       | L1   | GND |
| 0.825000         | 37.80         | 10.8         | 56            | 18.2         | QP       | L1   | GND |
| 1.625000         | 33.60         | 10.9         | 56            | 22.4         | QP       | L1   | GND |
| 4.980000         | 45.70         | 11.2         | 56            | 10.3         | QP       | L1   | GND |
| 7.160000         | 42.60         | 11.2         | 60            | 17.4         | QP       | L1   | GND |
| 23.545000        | 36.70         | 11.5         | 60            | 23.3         | QP       | L1   | GND |

**MEASUREMENT RESULT: "F-0551-10\_fin2"**

5/5/2019 4:44PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 37.80         | 10.6         | 49            | 10.9         | AV       | L1   | GND |
| 0.375000         | 39.20         | 10.7         | 48            | 9.2          | AV       | L1   | GND |
| 2.040000         | 28.10         | 11.0         | 46            | 17.9         | AV       | L1   | GND |
| 4.890000         | 38.20         | 11.1         | 46            | 7.8          | AV       | L1   | GND |
| 5.210000         | 38.60         | 11.2         | 50            | 11.4         | AV       | L1   | GND |
| 23.545000        | 26.00         | 11.5         | 50            | 24.0         | AV       | L1   | GND |

**MEASUREMENT RESULT: "F-0551-9\_fin"**

5/5/2019 4:40PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 42.70         | 10.6         | 59            | 16.0         | QP       | N    | GND |
| 0.365000         | 43.80         | 10.6         | 59            | 14.8         | QP       | N    | GND |
| 1.590000         | 33.20         | 10.9         | 56            | 22.8         | QP       | N    | GND |
| 4.920000         | 37.70         | 11.2         | 56            | 18.3         | QP       | N    | GND |
| 5.780000         | 37.20         | 11.2         | 60            | 22.8         | QP       | N    | GND |
| 22.210000        | 27.60         | 11.4         | 60            | 32.4         | QP       | N    | GND |

**MEASUREMENT RESULT: "F-0551-9\_fin2"**

5/5/2019 4:40PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 38.20         | 10.6         | 49            | 10.5         | AV       | N    | GND |
| 0.370000         | 39.70         | 10.7         | 49            | 8.8          | AV       | N    | GND |
| 1.845000         | 28.50         | 11.0         | 46            | 17.5         | AV       | N    | GND |
| 4.870000         | 34.30         | 11.1         | 46            | 11.7         | AV       | N    | GND |
| 5.540000         | 34.60         | 11.2         | 50            | 15.4         | AV       | N    | GND |
| 21.700000        | 24.00         | 11.4         | 50            | 26.0         | AV       | N    | GND |

The spectral diagrams are attached as below.

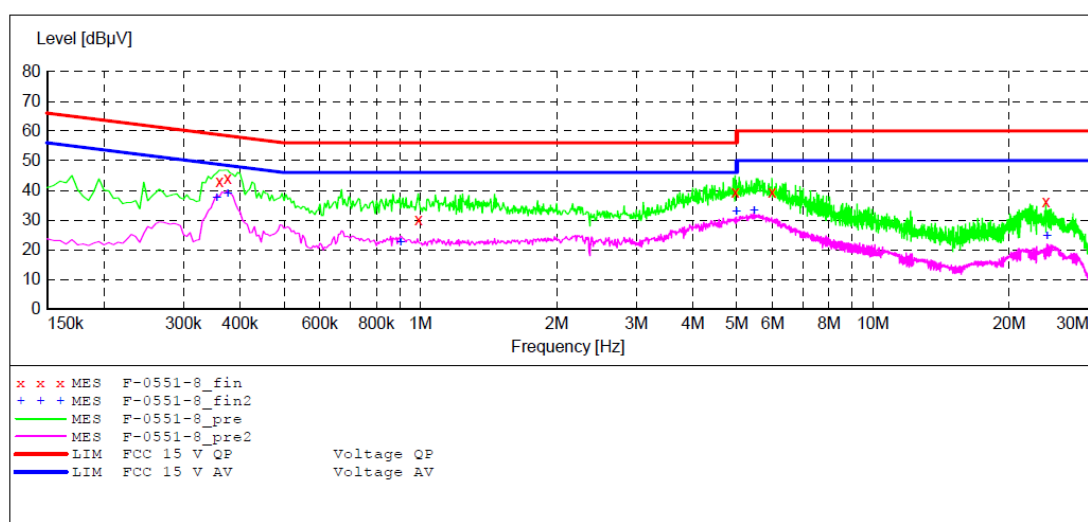
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15

EUT: DISCOVERY M/N:CR8009A-DU  
 Manufacturer: TIMSEN DEVELOPMENT LIMITED  
 Operating Condition: BT OPERATION  
 Test Site: 1#Shielding Room  
 Operator: Frank  
 Test Specification: N 120V/60Hz  
 Comment: Report NO.:ATE20190551  
 Start of Test: 5/5/2019 / 4:30:02PM

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

Short Description: SUB STD VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008  
 Average  
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008  
 Average



### MEASUREMENT RESULT: "F-0551-8\_fin"

5/5/2019 4:36PM

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 42.80         | 10.6         | 59            | 15.9         | QP       | N    | GND |
| 0.375000         | 44.00         | 10.7         | 58            | 14.4         | QP       | N    | GND |
| 0.990000         | 30.00         | 10.8         | 56            | 26.0         | QP       | N    | GND |
| 4.960000         | 39.30         | 11.2         | 56            | 16.7         | QP       | N    | GND |
| 5.980000         | 39.30         | 11.2         | 60            | 20.7         | QP       | N    | GND |
| 24.085000        | 36.20         | 11.5         | 60            | 23.8         | QP       | N    | GND |

### MEASUREMENT RESULT: "F-0551-8\_fin2"

5/5/2019 4:36PM

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.355000         | 37.60         | 10.6         | 49            | 11.2         | AV       | N    | GND |
| 0.375000         | 39.10         | 10.7         | 48            | 9.3          | AV       | N    | GND |
| 0.905000         | 22.50         | 10.8         | 46            | 23.5         | AV       | N    | GND |
| 4.990000         | 32.80         | 11.2         | 46            | 13.2         | AV       | N    | GND |
| 5.460000         | 33.20         | 11.2         | 50            | 16.8         | AV       | N    | GND |
| 24.265000        | 24.70         | 11.5         | 50            | 25.3         | AV       | N    | GND |

shenzhen Accurate Technology Co., Ltd.

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[Http://www.atc-lab.com](http://www.atc-lab.com)

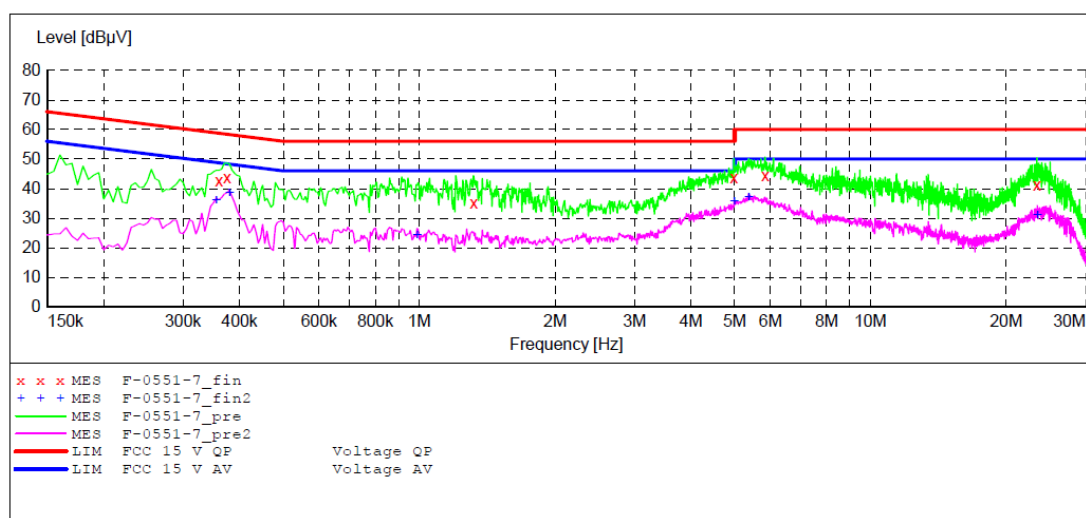
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15

EUT: DISCOVERY M/N:CR8009A-DU  
 Manufacturer: TIMSEN DEVELOPMENT LIMITED  
 Operating Condition: BT OPERATION  
 Test Site: 1#Shielding Room  
 Operator: Frank  
 Test Specification: L 120V/60Hz  
 Comment: Report NO.:ATE20190551  
 Start of Test: 5/5/2019 / 4:26:02PM

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

Short Description: SUB STD VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008  
 Average  
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008  
 Average



### MEASUREMENT RESULT: "F-0551-7\_fin"

5/5/2019 4:29PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 42.50         | 10.6         | 59            | 16.2         | QP       | L1   | GND |
| 0.375000         | 43.70         | 10.7         | 58            | 14.7         | QP       | L1   | GND |
| 1.320000         | 35.00         | 10.9         | 56            | 21.0         | QP       | L1   | GND |
| 4.980000         | 43.60         | 11.2         | 56            | 12.4         | QP       | L1   | GND |
| 5.840000         | 44.40         | 11.2         | 60            | 15.6         | QP       | L1   | GND |
| 23.380000        | 41.20         | 11.5         | 60            | 18.8         | QP       | L1   | GND |

### MEASUREMENT RESULT: "F-0551-7\_fin2"

5/5/2019 4:29PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.355000         | 36.30         | 10.6         | 49            | 12.5         | AV       | L1   | GND |
| 0.380000         | 38.80         | 10.7         | 48            | 9.5          | AV       | L1   | GND |
| 0.990000         | 24.30         | 10.8         | 46            | 21.7         | AV       | L1   | GND |
| 4.990000         | 35.80         | 11.2         | 46            | 10.2         | AV       | L1   | GND |
| 5.370000         | 37.10         | 11.2         | 50            | 12.9         | AV       | L1   | GND |
| 23.440000        | 31.20         | 11.5         | 50            | 18.8         | AV       | L1   | GND |

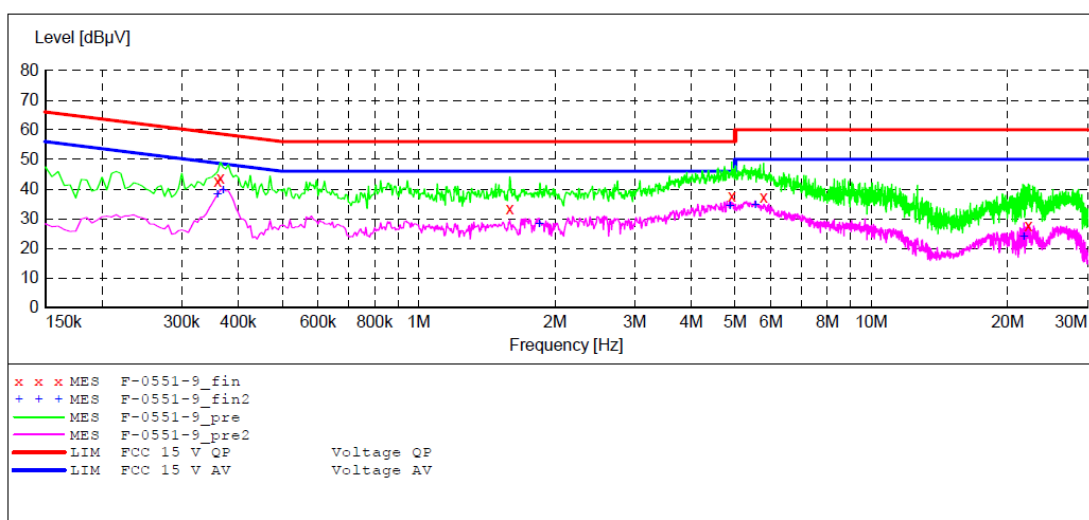
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15

EUT: DISCOVERY M/N:CR8009A-DU  
 Manufacturer: TIMSEN DEVELOPMENT LIMITED  
 Operating Condition: BT OPERATION  
 Test Site: 1#Shielding Room  
 Operator: Frank  
 Test Specification: N 240V/60Hz  
 Comment: Report NO.:ATE20190551  
 Start of Test: 5/5/2019 / 4:37:31PM

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

Short Description: SUB STD VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008  
 Average  
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008  
 Average



#### MEASUREMENT RESULT: "F-0551-9\_fin"

5/5/2019 4:40PM

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 42.70         | 10.6         | 59            | 16.0         | QP       | N    | GND |
| 0.365000         | 43.80         | 10.6         | 59            | 14.8         | QP       | N    | GND |
| 1.590000         | 33.20         | 10.9         | 56            | 22.8         | QP       | N    | GND |
| 4.920000         | 37.70         | 11.2         | 56            | 18.3         | QP       | N    | GND |
| 5.780000         | 37.20         | 11.2         | 60            | 22.8         | QP       | N    | GND |
| 22.210000        | 27.60         | 11.4         | 60            | 32.4         | QP       | N    | GND |

#### MEASUREMENT RESULT: "F-0551-9\_fin2"

5/5/2019 4:40PM

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.360000         | 38.20         | 10.6         | 49            | 10.5         | AV       | N    | GND |
| 0.370000         | 39.70         | 10.7         | 49            | 8.8          | AV       | N    | GND |
| 1.845000         | 28.50         | 11.0         | 46            | 17.5         | AV       | N    | GND |
| 4.870000         | 34.30         | 11.1         | 46            | 11.7         | AV       | N    | GND |
| 5.540000         | 34.60         | 11.2         | 50            | 15.4         | AV       | N    | GND |
| 21.700000        | 24.00         | 11.4         | 50            | 26.0         | AV       | N    | GND |

## ACCURATE TECHNOLOGY CO., LTD

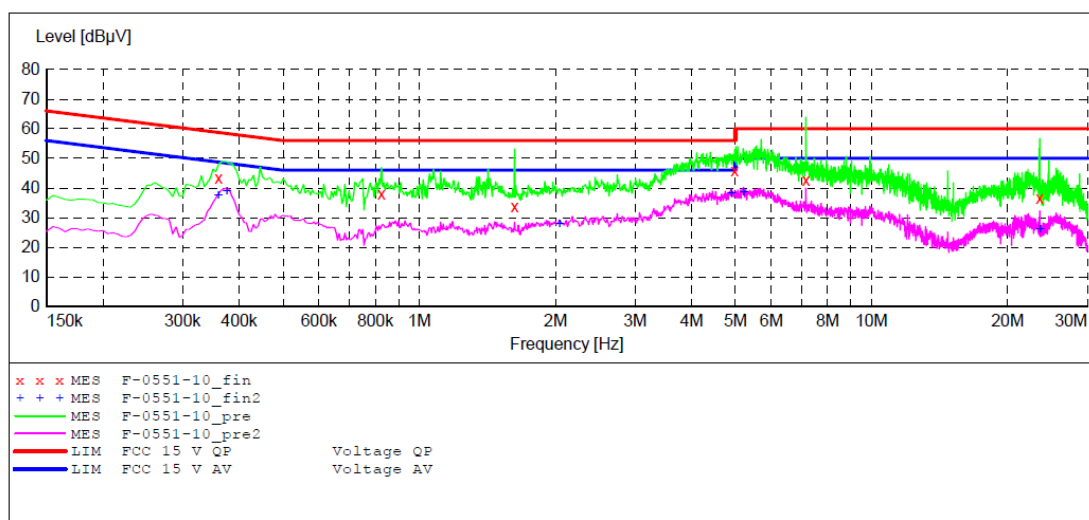
### CONDUCTED EMISSION STANDARD FCC PART 15

EUT: DISCOVERY M/N:CR8009A-DU  
 Manufacturer: TIMSEN DEVELOPMENT LIMITED  
 Operating Condition: BT OPERATION  
 Test Site: 1#Shielding Room  
 Operator: Frank  
 Test Specification: L 240V/60Hz  
 Comment: Report NO.:ATE20190551  
 Start of Test: 5/5/2019 / 4:41:21PM

#### 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       | 5.0 kHz    | QuasiPeak | 1.0 s      | 9 kHz     | NSLK8126 2008 |
| Average         |                |            |           |            |           |               |



#### MEASUREMENT RESULT: "F-0551-10\_fin"

5/5/2019 4:44PM

| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.360000      | 43.20      | 10.6      | 59         | 15.5      | QP       | L1   | GND |
| 0.825000      | 37.80      | 10.8      | 56         | 18.2      | QP       | L1   | GND |
| 1.625000      | 33.60      | 10.9      | 56         | 22.4      | QP       | L1   | GND |
| 4.980000      | 45.70      | 11.2      | 56         | 10.3      | QP       | L1   | GND |
| 7.160000      | 42.60      | 11.2      | 60         | 17.4      | QP       | L1   | GND |
| 23.545000     | 36.70      | 11.5      | 60         | 23.3      | QP       | L1   | GND |

#### MEASUREMENT RESULT: "F-0551-10\_fin2"

5/5/2019 4:44PM

| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.360000      | 37.80      | 10.6      | 49         | 10.9      | AV       | L1   | GND |
| 0.375000      | 39.20      | 10.7      | 48         | 9.2       | AV       | L1   | GND |
| 2.040000      | 28.10      | 11.0      | 46         | 17.9      | AV       | L1   | GND |
| 4.890000      | 38.20      | 11.1      | 46         | 7.8       | AV       | L1   | GND |
| 5.210000      | 38.60      | 11.2      | 50         | 11.4      | AV       | L1   | GND |
| 23.545000     | 26.00      | 11.5      | 50         | 24.0      | AV       | L1   | GND |

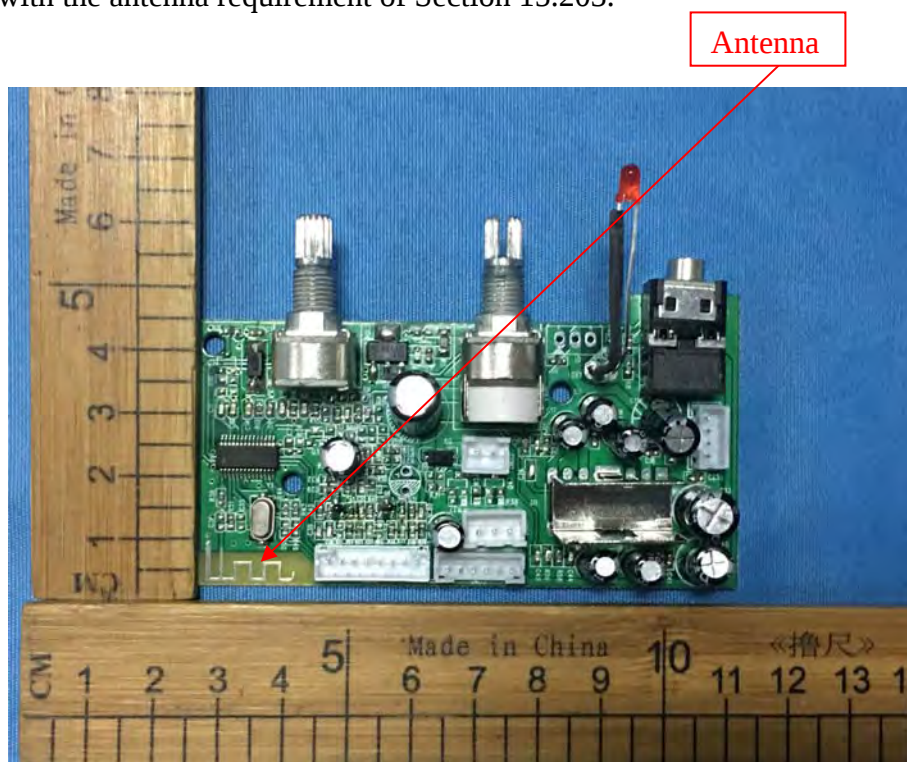
## 13.ANTENNA REQUIREMENT

### 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

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Max Antenna gain of EUT is 1.2dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



\*\*\*\*\* End of Test Report \*\*\*\*\*