



| TE   | EST REPORT  |
|--|---|
| Report Reference No:                             | <b>TRE1803002805</b> R/C: 12417   |
| FCC ID:  | HD5-EDA703  |
| Applicant's name:                                | Honeywell International Inc   |
| Address  | 9680 Old Bailes Rd, Fort Mill, South Carolina, United States                                    |
| Manufacturer                                     | Honeywell International Inc   |
| Address  | 9680 Old Bailes Rd, Fort Mill, South Carolina, United States                                    |
| Test item description                            | Tablet  |
| Trade Mark                                       | Honeywell   |
| Model/Type reference:                            | EDA70-3   |
| Listed Model(s)                                  |   |
| Standard:  | FCC CFR Title 47 Part 15 Subpart C Section 15.247   |
| Date of receipt of test sample:                  | Mar.07,2018   |
| Date of testing                                  | Mar.07,2018- Mar.15,2018  |
| Date of issue                                    | Mar.15,2018   |
| Result:  | PASS  |
| Compiled by<br>(position+printedname+signature): | File administrators Candy Liu   |
| Supervised by (position+printedname+signature):  | Project Engineer Edward Pan<br><i>Edward Pan</i><br><i>Hawk</i> Hu                              |
| Approved by (Position+Printed name+Signature):   | RF Manager Hans Hu  |
| Testing Laboratory Name:                         | Shenzhen Huatongwei International Inspection Co., Ltd.  |
| Address  | 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road,<br>Tianliao, Gongming, Shenzhen, China |

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The test report merely correspond to the test sample.

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# 1. TEST STANDARDS AND REPORT VERSION

# 1.1. Test Standards

The tests were performed according to following standards:

<u>FCC Rules Part 15.247:</u> Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ANSI C63.10-2013: American National Standard forTesting Unlicensed Wireless Devicese

# 1.2. Report version

| Version No. | Date of issue | Description |
|-------------|---------------|-------------|
| 00          | Mar.15,2018   | Original    |
|             |               |             |
|             |               |             |
|             |               |             |
|             |               |             |

# 2. TEST DESCRIPTION

| Test Item                                  | Section in CFR 47 | Result | Test Engineer  |
|--|-------------------|--------|----------------|
| Antenna Requirement                        | 15.203/15.247 (c) | PASS   | Zhaohui ouyang |
| AC Power Line Conducted Emissions          | 15.207            | PASS   | Zhaohui ouyang |
| Conducted Peak Output Power                | 15.247 (b)(1)     | PASS   | Zhaohui ouyang |
| 20 dB Bandwidth                            | 15.247 (a)(1)     | PASS   | Zhaohui ouyang |
| Carrier Frequencies Separation             | 15.247 (a)(1)     | PASS   | Zhaohui ouyang |
| Hopping Channel Number                     | 15.247 (a)(1)     | PASS   | Zhaohui ouyang |
| Dwell Time                                 | 15.247 (a)(1)     | PASS   | Zhaohui ouyang |
| Pseudorandom Frequency Hopping<br>Sequence | 15.247(b)(4)      | PASS   | Zhaohui ouyang |
| Restricted band                            | 15.247(d)/15.205  | PASS   | Jiuru Pan      |
| Radiated Emissions                         | 15.247(d)/15.209  | PASS   | Jiuru Pan      |

Note: The measurement uncertainty is not included in the test result.

# 3. <u>SUMMARY</u>

# 3.1. Client Information

| Applicant: 9680 Old Bailes Rd, Fort Mill, South Carolina, United States    |  |
|--|--|
| Address: Honeywell International Inc                                       |  |
| Manufacturer: 9680 Old Bailes Rd, Fort Mill, South Carolina, United States |  |
| Address:   | 9680 Old Bailes Rd, Fort Mill, South Carolina, United States |

# 3.2. Product Description

| Name of EUT:         | Tablet  |  |  |
|----------------------|---|--|--|
| Trade Mark:          | Honeywell   |  |  |
| Model No.:           | EDA70-3   |  |  |
| Listed Model(s):     | -   |  |  |
| IMEI:                | Conducted: 35893608074936<br>Radiated: 358936080077343  |  |  |
| Power supply:        | DC 3.8V   |  |  |
| Adapter information: | Input:100-240Va.c.,50/60Hz,0.30A<br>Output: 5Vd.c.,2.0A |  |  |
| Hardware version:    | IDH53_MB_V2.0.1   |  |  |
| Software version:    | 209.01.00.0002  |  |  |
| Bluetooth            |   |  |  |
| Version:             | Supported BT4.0+EDR                                     |  |  |
| Modulation:          | GFSK, π/4DQPSK, 8DPSK                                   |  |  |
| Operation frequency: | 2402MHz~2480MHz   |  |  |
| Channel number:      | 79  |  |  |
| Channel separation:  | 1MHz  |  |  |
| Antenna type:        | PIFA Antenna  |  |  |
| Antenna gain:        | 3.20dBi   |  |  |

# 3.3. Operation state

# Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

| Channel | Frequency (MHz) |
|---------|-----------------|
| 00      | 2402            |
| 01      | 2403            |
| :       | :               |
| 39      | 2441            |
| :       | :               |
| 77      | 2479            |
| 78      | 2480            |

# > <u>TEST MODE</u>

For RF test items:

The engineering test program was provided and enabled to make EUT continuous transmit

For AC power line conducted emissions:

The EUT was set to connect with the Bluetooth instrument under large package sizes transmission.

For Radiated suprious emissions test item:

The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data recorded in the report.

# 3.4. EUT configuration

# The following peripheral devices and interface cables were connected during the measurement:

supplied by the manufacturer
 supplied by the lab

| Γ |   | Manufacturer: | 1 |
|---|---|---------------|---|
|   | / | Manufacturer. | 1 |
|   | · | Model No.:    | / |
|   | 1 | Manufacturer: | / |
|   | 1 | Model No.:    | / |

# 3.5. Modifications

No modifications were implemented to meet testing criteria.

# 4. TEST ENVIRONMENT

# 4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd. Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

# 4.2. Test Facility

#### CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

### FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files.

#### IC-Registration No.:5377B-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377B-1.

## ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

# 4.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

| Temperature:       | 15~35°C     |
|--------------------|-------------|
| Relative Humidity: | 30~60 %     |
| Air Pressure:      | 950~1050mba |

# 4.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd. quality system according to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei International Inspection Co., Ltd. is reported:

| Test Items                              | Measurement Uncertainty | Notes |
|---|-------------------------|-------|
| Transmitter power conducted             | 0.57 dB                 | (1)   |
| Transmitter power Radiated              | 2.20 dB                 | (1)   |
| Conducted spurious emissions 9kHz~40GHz | 1.60 dB                 | (1)   |
| Radiated spurious emissions 9kHz~40GHz  | 2.20 dB                 | (1)   |
| Conducted Emissions 9kHz~30MHz          | 3.39 dB                 | (1)   |
| Radiated Emissions 30~1000MHz           | 4.24 dB                 | (1)   |
| Radiated Emissions 1~18GHz              | 5.16 dB                 | (1)   |
| Radiated Emissions 18~40GHz             | 5.54 dB                 | (1)   |
| Occupied Bandwidth                      |                         | (1)   |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

# 4.5. Equipments Used during the Test

| Conduc | Conducted Emissions       |              |           |            |                         |                         |  |
|--------|---------------------------|--------------|-----------|------------|-------------------------|-------------------------|--|
| Item   | Test<br>Equipment         | Manufacturer | Model No. | Serial No. | Last Cal.<br>(mm-dd-yy) | Next Cal.<br>(mm-dd-yy) |  |
| 1      | EMI Test<br>Receiver      | R&S          | ESCI      | 101247     | 11/11/2017              | 11/10/2018              |  |
| 2      | Artificial Mains          | SCHWARZBECK  | NNLK 8121 | 573        | 11/11/2017              | 11/10/2018              |  |
| 3      | 2-Line V-<br>Network      | R&S          | ESH3-Z5   | 100049     | 11/11/2017              | 11/10/2018              |  |
| 4      | Pulse Limiter             | R&S          | ESH3-Z2   | 101488     | 11/11/2017              | 11/10/2018              |  |
| 5      | RF<br>Connection<br>Cable | HUBER+SUHNER | EF400     | N/A        | 11/21/2017              | 11/20/2018              |  |
| 6      | Test Software             | R&S          | ES-K1     | N/A        | N/A                     | N/A                     |  |

| Radiat | Radiated Emissions             |                                 |           |            |                         |                         |  |
|--------|--------------------------------|---------------------------------|-----------|------------|-------------------------|-------------------------|--|
| Item   | Test<br>Equipment              | Manufacturer                    | Model No. | Serial No. | Last Cal.<br>(mm-dd-yy) | Next Cal.<br>(mm-dd-yy) |  |
| 1      | EMI Test<br>Receiver           | R&S                             | ESCI      | 101247     | 11/11/2017              | 11/10/2018              |  |
| 2      | Loop Antenna                   | R&S                             | HFH2-Z2   | 100020     | 11/20/2017              | 11/19/2018              |  |
| 3      | Ultra-<br>Broadband<br>Antenna | SCHWARZBECK                     | VULB9163  | 538        | 4/5/2017                | 4/4/2020                |  |
| 4      | Preamplifier                   | SCHWARZBECK                     | BBV 9743  | 9743-0022  | 10/18/2017              | 10/17/2018              |  |
| 5      | RF<br>Connection<br>Cable      | HUBER+SUHNE<br>R                | RE-7-FL   | N/A        | 11/21/2017              | 11/20/2018              |  |
| 6      | EMI Test<br>Software           | R&S                             | ESK1      | N/A        | N/A                     | N/A                     |  |
| 7      | Spectrum<br>Analyzer           | R&S                             | FSP40     | 100597     | 11/11/2017              | 11/10/2018              |  |
| 8      | Horn Antenna                   | SCHWARZBECK                     | 9120D     | 1011       | 3/27/2017               | 3/26/2020               |  |
| 9      | Horn Antenna                   | SCHWARZBECK                     | BBHA9170  | 25841      | 3/27/2017               | 3/26/2018               |  |
| 10     | Broadband<br>Preamplifier      | SCHWARZBECK                     | BBV 9718  | 9718-248   | 10/18/2017              | 10/17/2018              |  |
| 11     | High pass<br>filter            | Compliance<br>Direction systems | BSU-6     | 34202      | 11/11/2017              | 11/10/2018              |  |
| 12     | RF<br>Connection<br>Cable      | HUBER+SUHNE<br>R                | RE-7-FH   | N/A        | 11/21/2017              | 11/20/2018              |  |
| 13     | EMI Test<br>Software           | Audix                           | E3        | N/A        | N/A                     | N/A                     |  |
| 14     | Turntable                      | MATURO                          | TT2.0     | /          | N/A                     | N/A                     |  |
| 15     | Antenna Mast                   | MATURO                          | TAM-4.0-P | /          | N/A                     | N/A                     |  |

| RF Con | RF Conducted Test      |              |           |            |                         |                         |
|--------|------------------------|--------------|-----------|------------|-------------------------|-------------------------|
| Item   | Test<br>Equipment      | Manufacturer | Model No. | Serial No. | Last Cal.<br>(mm-dd-yy) | Next Cal.<br>(mm-dd-yy) |
| 1      | Spectrum<br>Analyzer   | R&S          | FSV40     | 100048     | 11/11/2017              | 11/10/2018              |
| 2      | EXA Signal<br>Analyzer | Agilent      | N9020A    | 184247     | 9/22/2017               | 9/21/2018               |
| 3      | Power Meter            | Agilent      | U2021XA   | 178231     | 9/22/2017               | 9/21/2018               |
| 4      | OSP                    | R&S          | OSP120    | 101317     | N/A                     | N/A                     |

# 5. TEST CONDITIONS AND RESULTS

# 5.1. Antenna requirement

# **Requirement**

### FCC CFR Title 47 Part 15 Subpart C 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. The use of a permanently attached antenna or of anantenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

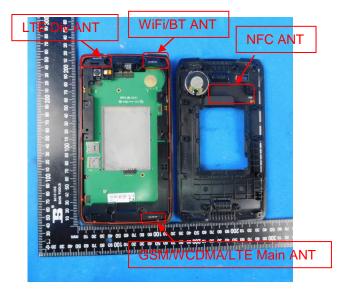
## FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

# Test Result:

# ☑ Passed □ Not Applicable

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



# 5.2. Conducted Emissions (AC Main)

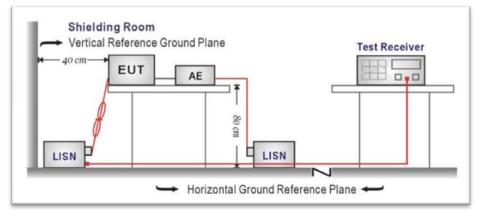
# <u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.207

| Frequency range (MHz) | Limit (d   | BuV)      |
|-----------------------|------------|-----------|
|                       | Quasi-peak | Average   |
| 0.15-0.5              | 66 to 56*  | 56 to 46* |
| 0.5-5                 | 56         | 46        |
| 5-30                  | 60         | 50        |

\* Decreases with the logarithm of the frequency.

# TEST CONFIGURATION



# TEST PROCEDURE

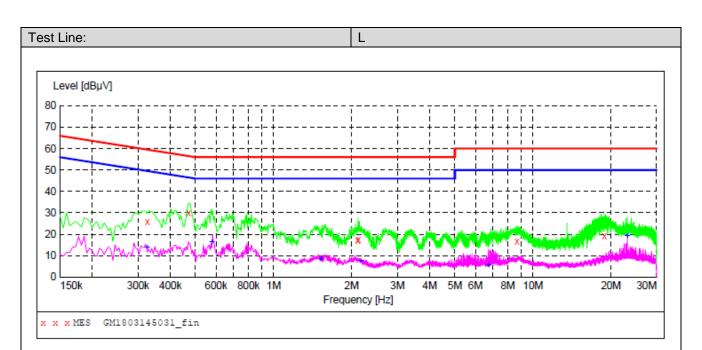
- 1. The EUT was setup according to ANSI C63.10:2013 requirements.
- 2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
- 3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
- 4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
- 5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
- 6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- 7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
- 8. During the above scans, the emissions were maximized by cable manipulation.

# TEST RESULTS

## ☑ Passed □ Not Applicable

Note:

- 1) Transd= Cable lose + Pulse Limiter Factor + Artificial Mains Factor
- 2) Margin= Limit Level

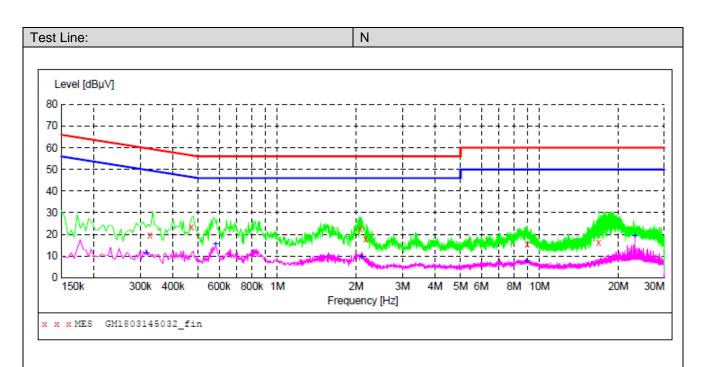


#### MEASUREMENT RESULT: "GM1803145031\_fin"

3/14/2018 2:27PM Frequency Level Transd Limit Margin Detector Line PE dB dBµV MHz dBµV dB 9.9 9.9 0.325500 25.90 60 33.7 QP GND ь1 0.469500 30.10 57 26.4 QP ь1 GND 10.1 2.107500 17.20 56 38.8 QP ь1 GND 10.1 38.5 QP 2.121000 17.50 56 ь1 GND 8.677500 16.50 10.4 60 43.5 QP ь1 GND 18.856500 40.6 QP 19.40 10.6 60 ь1 GND

#### MEASUREMENT RESULT: "GM1803145031\_fin2"

| 3/14/2018 2:2<br>Frequency<br>MHz |       | Transd<br>dB | Limit<br>dBµV | Margin<br>dB | Detector | Line | PE  |
|-----------------------------------|-------|--------------|---------------|--------------|----------|------|-----|
| 0.325500                          | 13.70 | 9.9          | 50            | 35.9         | AV       | L1   | GND |
| 0.577500                          | 16.20 | 10.0         | 46            | 29.8         | AV       | ь1   | GND |
| 1.522500                          | 8.60  | 10.1         | 46            | 37.4         | AV       | ь1   | GND |
| 2.161500                          | 7.40  | 10.1         | 46            | 38.6         | AV       | ь1   | GND |
| 6.751500                          | 5.60  | 10.2         | 50            | 44.4         | AV       | ь1   | GND |
| 23.127000                         | 19.30 | 10.7         | 50            | 30.7         | AV       | L1   | GND |



#### MEASUREMENT RESULT: "GM1803145032\_fin"

3/14/2018 2:30PM Level Transd Limit Margin Detector Line Frequency

| Frequency<br>MHz | Level<br>dBµV | Transd<br>dB | Limit<br>dBµV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.325500         | 19.70         | 9.9          | 60            | 39.9         | QP       | N    | GND |
| 0.469500         | 23.20         | 9.9          | 57            | 33.3         | QP       | N    | GND |
| 2.071500         | 22.50         | 10.1         | 56            | 33.5         | QP       | N    | GND |
| 2.170500         | 18.00         | 10.1         | 56            | 38.0         | QP       | N    | GND |
| 8.974500         | 15.30         | 10.4         | 60            | 44.7         | QP       | N    | GND |
| 16.804500        | 16.20         | 10.5         | 60            | 43.8         | QP       | N    | GND |

#### MEASUREMENT RESULT: "GM1803145032 fin2"

| Frequency<br>MHz | Level<br>dBµV | Transd<br>dB | Limit<br>dBµV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.316500         | 11.50         | 9.9          | 50            | 38.3         | AV       | N    | GND |
| 0.582000         | 15.30         | 10.0         | 46            | 30.7         | AV       | N    | GND |
| 2.089500         | 9.70          | 10.1         | 46            | 36.3         | AV       | N    | GND |
| 2.094000         | 9.50          | 10.1         | 46            | 36.5         | AV       | N    | GND |
| 8.947500         | 7.40          | 10.4         | 50            | 42.6         | AV       | N    | GND |
| 23.127000        | 19.10         | 10.7         | 50            | 30.9         | AV       | N    | GND |

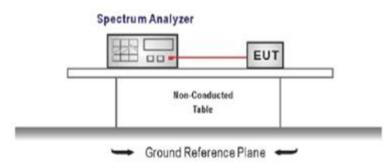
# 5.3. Conducted Peak Output Power

### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(1):

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 nonoverlapping 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.

### **TEST CONFIGURATION**



### TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the pathloss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW≥ the 20 dB bandwidth of the emission being measured, VBW≥RBW Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

#### TEST MODE:

Please refer to the clause 3.3

#### TEST RESULTS

#### ☑ Passed □ Not Applicable

| Modulation type | Channel | Output power (dBm) | Limit (dBm) | Result |
|-----------------|---------|--------------------|-------------|--------|
|                 | 00      | 7.80               |             |        |
| GFSK            | 39      | 8.17               | ≤ 30.00     | Pass   |
|                 | 78      | 7.54               |             |        |
|                 | 00      | 7.81               |             |        |
| π/4DQPSK        | 39      | 8.18               | ≤ 21.00     | Pass   |
|                 | 78      | 7.57               |             |        |
|                 | 00      | 8.07               |             |        |
| 8DPSK           | 39      | 8.48               | ≤ 21.00     | Pass   |
|                 | 78      | 7.86               |             |        |

| odulation Type: | GFSK  |
|-----------------|---|
|                 | Spectrum 🕎  |
|                 | RefLevel 20.00 dBm Offset 1.00 dB RBW 1 MHz<br>Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep |
|                 | ●1Pk View M1[1] 7.80 dBm  |
|                 | 10 dBm 2.40181910 GHz   |
|                 | 0 dBm   |
|                 | -10 dBm   |
|                 |   |
| CH00            | -20 dBm   |
| Chico           | 30d\$h  |
|                 | -40 d8m   |
|                 | -50 dBm   |
|                 | -60 dBm   |
|                 | -70 dBm-  |
|                 | CF 2.402 GHz         691 pts         Span 5.0 MHz   |
|                 | Measuring.  |
|                 | Spectrum 🕎  |
|                 | RefLevel 20.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep    |
|                 | PPK View     M1[1] 8.17 dBm   |
|                 | 10 dBm  |
|                 | D dBm   |
|                 | -10 dBm   |
|                 | -20 dBm   |
| CH39            | I ABOOK   |
|                 |   |
|                 | 40 d8m  |
|                 | -50 dBm-  |
|                 | -60 dBm   |
|                 | -70 dBm-  |
|                 | CF 2.441 GHz 691 pts Span 5.0 MHz   |
|                 | Measuring (Internet) (40 Header   |
|                 | Spectrum 🕎  |
|                 | Reflevel 20.00 dBm Offset 1.00 dB  RBW 1 MHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep   |
|                 | ●JPK View M1[1] 7.54 dBm<br>2.48011580 GHz  |
|                 | 10 dBm  |
|                 | 0 dBm   |
|                 | -10 dBm   |
|                 | -20 dBm   |
| CH78            | 38/d5m  |
|                 | 440 dem   |
|                 | -50 dBm   |
|                 |   |
|                 | -60 dBm-  |
|                 | -70 dBm   |
|                 | CF 2.48 GHz 691 pts Span 5.0 MHz  |
|                 | Messuring (1111111 10) 🚧 (1202211)  |

| Modulation Type: | π/4DQPSK  |
|------------------|---|
|                  |   |
|                  | Spectrum (<br>Ref Level 20.00 dBm Offset 1.00 dB ● RBW 2 MHz  |
|                  | Att 30 dB SWT 1 ms VBW 5 MHz Mode Auto Sweep  |
|                  | 1Pk View     M1[1]     7.81 dBm   |
|                  | 10 dBm  |
|                  |   |
|                  | 0 dBm   |
|                  | -10 dBm   |
|                  | -20 dBm   |
| CH00             |   |
| 01100            | -30 dBm   |
|                  | -40 dBm   |
|                  | -50 dBm   |
|                  |   |
|                  | -60 dBm   |
|                  | -70 dBm   |
|                  |   |
|                  | CF 2.402 GHz 691 pts Span 5.0 MHz   |
|                  |   |
|                  | Spectrum     □  |
|                  | Ref Level         20.00 dBm         Offset         1.00 dB         RBW         2 MHz           Att         30 dB         SWT         1 ms         VBW         5 MHz         Mode         Auto Sweep |
|                  | ●1Pk View M1[1] 8.18 dBm  |
|                  | 2.44084800 GHz  |
|                  |   |
|                  | 0 dBm   |
|                  | -10 dBm   |
|                  | -20 dBm   |
| CH39             |   |
| 01185            | -30 dBm   |
|                  | -40 dBm   |
|                  | -50 dBm   |
|                  |   |
|                  | -60 dBm   |
|                  | -70 dBm   |
|                  |   |
|                  | CF 2.441 GHz 691 pts Span 5.0 MHz   |
|                  |   |
|                  | Spectrum (<br>Ref Level 20.00 dBm Offset 1.00 dB ● RBW 2 MHz  |
|                  | Att 30 db SWT 1 ms VBW 5 MHz Mode Auto Sweep  |
|                  | M1[1] 7.57 dBm  |
|                  | 10 dBm  |
|                  |   |
|                  | 0 dBm   |
|                  | -10 dBm   |
|                  | -20 dBm   |
| CH78             | -30 dBm   |
|                  |   |
|                  | -40 dBm   |
|                  | -50 dBm   |
|                  |   |
|                  | -60 dBm   |
|                  | -70 dBm   |
|                  |   |
|                  | CF 2.48 GHz 691 pts Span 5.0 MHz  |
|                  |   |

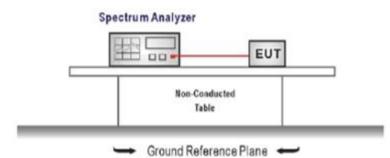
| odulation Type: | 8DPSK  |
|-----------------|--|
| odulation Type. |  |
|                 | Spectrum (<br>Ref Level 20.00 dBm Offset 1.00 dB ● RBW 2 MHz   |
|                 | ● Att 30 dB SWT 1 ms ● VBW 5 MHz Mode Auto Sweep<br>● 1Pk View   |
|                 | M1[1] 8.07 dBm<br>2.40197110 GHz   |
|                 |  |
|                 | 0 dBm  |
|                 |  |
|                 | -10 dBm-   |
|                 | -20 dBm  |
| CH00            | -30 dBm  |
|                 | -40 dBm-   |
|                 |  |
|                 | -50 dBm  |
|                 | -60 dBm  |
|                 | -70 dBm-   |
|                 |  |
|                 | CF 2.402 GHz 691 pts Span 5.0 MHz  |
|                 |  |
|                 | Spectrum 🕎   |
|                 | Ref Level         20.00 dBm         Offset         1.00 dB         RBW         2 MHz           Att         30 dB         SWT         1 ms         WW         5 MHz |
|                 | 1Pk View     M1[1] 8.48 dBm  |
|                 | 10 dBm   |
|                 |  |
|                 | 0 dBm  |
|                 | -10 dBm-   |
|                 | -20 dBm-   |
| CH39            | -30 dBm-   |
|                 |  |
|                 | -40 dBm-   |
|                 | -50 dBm-   |
|                 | -60 dBm-   |
|                 | -70 dBm-   |
|                 | -70 ubii   |
|                 | CF 2.441 GHz 691 pts Span 5.0 MHz  |
|                 | He a surfing   |
|                 | Spectrum 🕎   |
|                 | RefLevel         20.00 dBm         Offset         1.00 dB         RBW         2 MHz           Att         30 dB         SWT         1 ms         WBW         5 MHz |
|                 | 1Pk View     M1[1]     7.86 dBm  |
|                 | 10 dBm   |
|                 |  |
|                 | 0 dBm  |
|                 | -10 dBm  |
|                 | -20 dBm-   |
| CH78            |  |
| 00              | -30 dBm-   |
|                 | -40 dBm-   |
|                 | -50 dBm-   |
|                 | -60 dBm  |
|                 |  |
|                 |  |
|                 | -70 dBm-   |
|                 | -70 dBm  |

# 5.4. 20 dB Bandwidth

<u>LIMIT</u>

N/A

# **TEST CONFIGURATION**



## TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- 3. Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel RBW  $\ge$  1% of the 20 dB bandwidth, VBW  $\ge$  RBW

Sweep = auto, Detector function = peak, Trace = max hold

4. Measure and record the results in the test report.

## TEST MODE:

Please refer to the clause 3.3

## TEST RESULTS

#### 

| Modulation type | Channel | 20 dB Bandwidth (MHz) | Limit (MHz) | Result |
|-----------------|---------|-----------------------|-------------|--------|
|                 | 00      | 0.93                  |             |        |
| GFSK            | 39      | 0.93                  | -           | Pass   |
|                 | 78      | 0.93                  |             |        |
|                 | 00      | 1.28                  |             |        |
| π/4DQPSK        | 39      | 1.28                  | -           | Pass   |
|                 | 78      | 1.29                  |             |        |
|                 | 00      | 1.28                  |             |        |
| 8DPSK           | 39      | 1.29                  | -           | Pass   |
|                 | 78      | 1.28                  |             |        |

| Modulation Type: | GFSK   |
|------------------|--|
|                  | Spectrum   Ref Level 20.00 dBm Offset 1.00 dB ● RBW 10 kHz   |
|                  | Att         30 dB         SWT         189.6 µs         VBW 30 kHz         Mode         Auto FFT                • IPk View               • · · · · · · · · · · · · ·  |
| CH00             | -20 dBm - 01 -17.812 dBm - 10 - 17.812 dBm - 10 - 17.812 dBm - 10 - 17.812 dBm - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1  |
|                  | Type         Ref         Trc         X-value         Y-value         Function           Marker         100 pts         50 dts         50 dts         50 dts           Marker         100 pts         50 dts         50 dts         50 dts           Marker         1 2.40152 dts         190 dts         50 dts         50 dts           M2         1 2.402 dts         2.19 dts         50 dts         50 dts           D3         M1 1 927.5 kts         -0.22 dts         50 dts         50 dts   |
|                  | Spectrum   |
| CH39             | Ref Level 20:00 dBm       Offset       100 dB       RBW 10 kHz         M1       189.6 µS       YBW 30 kHz       Mode Auto FFT         IPk View       M1[1]       -18.39 dBm         10 dBm       M2[1]       2.44052000 GHz         0 dBm       M2[1]       2.44052000 GHz         0 dBm       M2[1]       2.4410000 GHz         10 dBm       M2[1]       2.4410000 GHz         -10 dBm       M1[1]       2.4410000 GHz         -20 dBm       M1       M1         -30 dBm       M1       M1         -70 dBm       M1       M1         -11       2.4410Hz       0.57 dB         M1       1       2.4410Hz         -23 dBm       M1       0.67 dB  |
| CH78             | Spectrum         W           Ref Level 20:00 dbm         Offset 1:00 db         RBW 10 kHz           Att         30 db         SWT         189.6 µS         VBW 30 kHz         Mode Auto FFT           I dbm         -19.00 dbm         -19.00 dbm         -19.00 dbm         2.47952000 GHz         2.01 dbm           0 dbm         -12.47952000 GHz         2.01 dbm         -2.00 dbm         -12.00 dbm         -2.48000000 GHz           -10 dbm         -17.991 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm           -20 dbm         -11.7.991 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm           -30 dbm         -11.7.991 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm           -40 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm           -50 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm           -60 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm         -12.00 dbm           -70 dbm         -70 dbm         -70.00 dbm         -70.00 dbm         -70.00 dbm         -70.00 dbm           -71 dbm< |

| Iodulation Type: | π/4DQPSK   |
|------------------|--|
|                  | Spectrum 🕎   |
|                  | RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz<br>● Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT  |
|                  | ● 1Pk View M1[1] -16.02 dBm  |
|                  | 10 dBm 2.40134250 GHz<br>M2 M2[1] 4.11 dBm   |
|                  | 0 dBm 2.40199000 GHz   |
|                  | -10 dBm  |
|                  | -10 dBm M17 D1 -15.891 dBm   |
| CH00             | -30 dBm  |
|                  |  |
|                  | -50 dBm  |
|                  | -60 dBm  |
|                  | -70 dBm-   |
|                  | CF 2.402 GHz         1001 pts         Span 2.5 MHz   |
|                  | Marker Type   Ref   Trc   X-value   Y-value   Function   Function Result   |
|                  | M1         1         2.4013425 GHz         -16.02 dBm           M2         1         2.40199 GHz         4.11 dBm  |
|                  | D3 M1 1 1.2825 MHz -0.15 dB  |
|                  | Mersuring and the suring and the sur |
|                  | Spectrum     □   |
|                  | RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz<br>● Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT  |
|                  | ●1Pk View M1[1] -16.02 dBm 2,44034000 GHz  |
|                  | 10 dBm M2[1] 4.37 dBm 2.44098750 GHz   |
|                  |  |
|                  | -10 d8m01 -15.627 d8m02302301 -15.627 d8m02301 -15.627 d8m01 -15.627 d8m00 -15.677 d8m00 -15.677 d8m00 -15.677 d8m00 -15.67  |
|                  | -20 dBm  |
|                  | -30 dBm  |
| CH39             | -40 dBm  |
|                  | -50 dBm-   |
|                  | -60 dBm-   |
|                  | -70 dBm  |
|                  | CF 2.441 GHz 1001 pts Span 2.5 MHz   |
|                  | Marker           Type         Ref         Trc         X-value         Function         Function Result   |
|                  | M1         1         2.44034 GHz         -16.02 dBm           M2         1         2.4409875 GHz         4.37 dBm           D3         M1         1         1.8285 MHz         0.38 dB   |
|                  |  |
|                  | Spectrum 🕎   |
|                  | RefLevel 20.00 dBm Offset 1.00 dB  RBW 30 kHz  |
|                  | ● Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT<br>●1Pk View   |
|                  | 10 dBm MI[1] -16.58 dBm<br>2.47934000 GHz<br>0.06 dPm  |
|                  | 0 dBm 2.47998750 GHz   |
|                  |  |
|                  | -10 dBm M1/7 03 01 -16.137 dBm 4   |
|                  | -30 dBm  |
| CH78             | -10 0800   |
|                  | -50 d8m  |
|                  | -60 d8m-   |
|                  | -70 dBm  |
|                  | CF 2.48 GHz 1001 pts Span 2.5 MHz  |
|                  | Marker   |
|                  | Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.47934 GHz         -16.50 dBm         -10.50 dBm         -10.50 dBm  |
|                  | D3 M1 1 1.285 MHz 0.06 dB  |
|                  | Measuring 🔐 111111 (0.012013   |

| Modulation Type: | 8DPSK  |
|------------------|--|
|                  | Spectrum 🕎   |
|                  | RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz<br>● Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT  |
|                  | ●1Pk View M1[1] -15.89 dBm   |
|                  | 10 dBm MP M2[1] 4.11 dBm   |
|                  | 0 dBm 2.40199000 GHz   |
|                  |  |
|                  | -10 dBm M1 D1 -15.888 dBm 20 D |
|                  | -30 dBm  |
| CH00             | 40 dBm   |
|                  | -50 dBm  |
|                  | -60 dBm  |
|                  | -70 dBm  |
|                  |  |
|                  | CF 2.402 GHz 1001 pts Span 2.5 MHz<br>Marker   |
|                  | Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.40133 GHz         -15.89 dBm         -  |
|                  | M2         1         2.40199 GHz         4.11 dBm           D3         M1         1         1.2825 MHz         -0.02 dB  |
|                  | Measuring  |
|                  | Spectrum 🕎   |
|                  | Ref Level 20:00 dBm Offset 1:00 dB   |
|                  | ● Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT<br>● 1Pk View  |
|                  | M1[1] -15.74 dBm<br>2.44032750 GHz   |
|                  | 10 dBm M2 M2[1] 4.31 dBm X 2 44098750 GHz  |
|                  | U dBm  |
|                  | -10 dBm 01 -15.693 dBM 03 03 01  |
|                  | -20 dBm  |
|                  | -30 dBm  |
| CH39             | veo dem  |
|                  | -50 dBm  |
|                  | -60 dBm  |
|                  | -70 dBm  |
|                  | CF 2.441 GHz         1001 pts         Span 2.5 MHz   |
|                  | Marker Type   Ref   Trc   X-value   Y-value   Function   Function Result   |
|                  | MI         1         2.4403275 GHz         -15.74 dBm           M2         1         2.4409875 GHz         4.31 dBm  |
|                  | D3 M1 1 1.285 MHz -0.17 dB   |
|                  | Measuring 🚺 Harden 🕽 🚧 et al. 2010   |
|                  | Spectrum 🕎   |
|                  | RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz<br>● Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT  |
|                  | PIPK View     M1[1] -16.20 dBm   |
|                  | 10 dBm M2[1] -10.20 dBm<br>2.47932750 GHz<br>3.82 dBm  |
|                  | 0 dBm  |
|                  |  |
|                  | -10 dBm M1 03  |
|                  | -30 dBm  |
| CH78             |  |
|                  | -50 dBm  |
|                  |  |
|                  | -60 dam-   |
|                  | -70 dBm-   |
|                  | CF 2.48 GHz 1001 pts Span 2.5 MHz  |
|                  | Marker Type Ref Trc X-value Y-value Function Function Result   |
|                  | M1         1         2.4793275         GHz         -16.20         dBm           M2         1         2.4793975         GHz         3.82         dBm  |
|                  | D3 M1 1 1.2825 MHz -0.14 dB  |
|                  |  |

# 5.5. Carrier Frequencies Separation

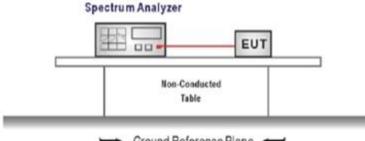
# <u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C 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.

## **TEST CONFIGURATION**



➡ Ground Reference Plane 

# TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels RBW ≥ 1% of the span, VBW ≥ RBW Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

## TEST MODE:

Please refer to the clause 3.3

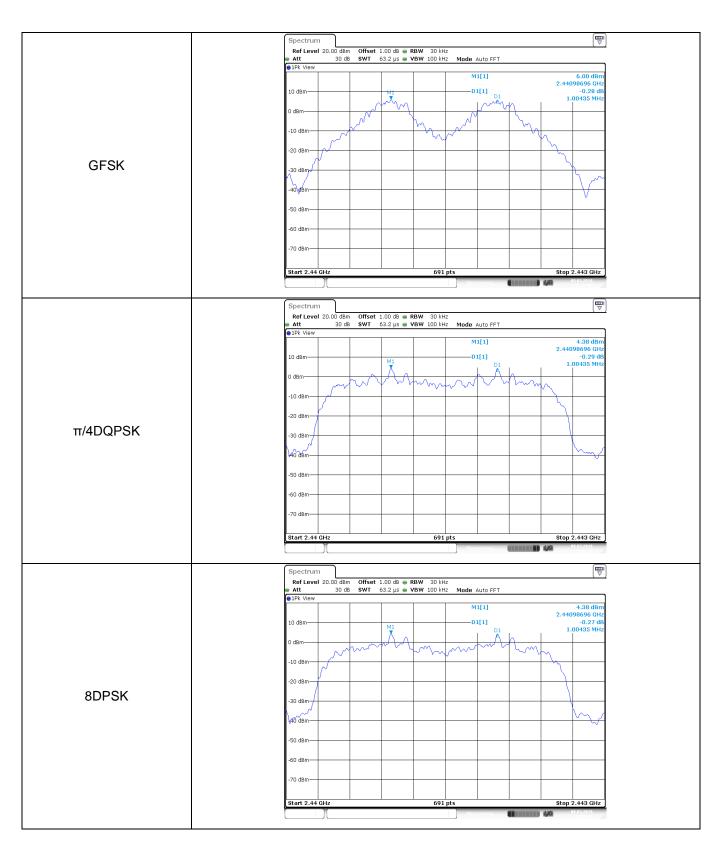
#### TEST RESULTS

## ☑ Passed □ Not Applicable

| Modulation type | Channel | Carrier Frequencies<br>Separation (MHz) | Limit (MHz) * | Result |
|-----------------|---------|---|---------------|--------|
| GFSK            | 39      | 1.00                                    | ≥0.93         | Pass   |
| π/4DQPSK        | 39      | 1.00                                    | ≥0.85         | Pass   |
| 8DPSK           | 39      | 1.00                                    | ≥0.85         | Pass   |

Note:

\*: GFSK limit = The maximum 20 dB Bandwidth for GFSK modulation on the section 5.4.  $\pi/4DQPSK$  limit = 2/3 \* The maximum 20 dB Bandwidth for  $\pi/4DQPSK$  modulation on the section 5.4. 8DPSK limit = 2/3 \* The maximum 20 dB Bandwidth for 8DPSK modulation on the section 5.4

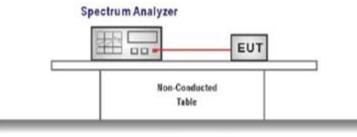


# 5.6. Hopping Channel Number

# <u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):Frequency hopping systems in the 2400–2483.5 MHz band shall use at least **15** channels.

# **TEST CONFIGURATION**



Ground Reference Plane

## TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: Span = the frequency band of operation RBW ≥ 1% of the span, VBW ≥ RBW Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

## TEST MODE:

Please refer to the clause 3.3

## TEST RESULTS

☑ Passed □ Not Applicable

| Modulation type | Channel number | Limit  | Result |
|-----------------|----------------|--------|--------|
| GFSK            | 79             |        |        |
| π/4DQPSK        | 79             | ≥15.00 | Pass   |
| 8DPSK           | 79             |        |        |

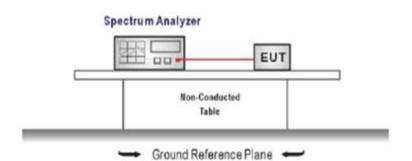
|          | Spectrum   |
|----------|--|
|          | Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep   |
|          |  |
|          | 10 dem.  |
|          |  |
|          |  |
|          |  |
| GFSK     | -20 dBm  |
| GFSK     | -80 dBm  |
|          | -40 dBm  |
|          | -50 dBm-   |
|          | -60 dBm  |
|          |  |
|          | -70 dBm  |
|          | Start 2.4 GHz         691 pts         Stop 2.4835 GHz  |
|          | Measuring  |
|          | Spectrum 🕎   |
|          | RefLevel 20.00 dBm Offset 1.00 dB RBW 100 kHz<br>Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep  |
|          | PIK View   |
|          | 10 dBm   |
|          | " Manual and a second secon |
|          | -10 dBm  |
|          |  |
|          | -20 dBm  |
| π/4DQPSK | -30 dBm  |
|          | -40 dBm-   |
|          | -50 dBm  |
|          | -60 dBm  |
|          |  |
|          | -70 dBm  |
|          | Start 2.4 GHz         691 pts         Stop 2.4835 GHz  |
|          | Measuring  |
|          | Spectrum 🕎   |
|          | RefLevel 20.00 dBm Offset 1.00 dB RBW 100 kHz<br>Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep  |
|          | PIK View   |
|          | 10 dBm   |
|          | a municipality and a second  |
|          |  |
|          | -10 dBm  |
|          | -20 dBm-   |
| 8DPSK    | -30 dBm  |
|          | -40 d8m  |
|          | -50 d8m  |
|          |  |
|          | -60 dBm  |
|          | -70 dBm-   |
|          | Start 2.4 GHz         691 pts         Stop 2.4835 GHz  |
|          |  |

# 5.7. Dwell Time

# <u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):The average time of occupancy on any channel shall not be greater than 0.4 seconds within a pe-riod of 0.4 seconds multiplied by the number of hopping channels employed.

# **TEST CONFIGURATION**



# TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel, RBW= 1 MHz, VBW ≥ RBW Sweep = as necessary to capture the entire dwell time per hopping channel, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

## TEST MODE:

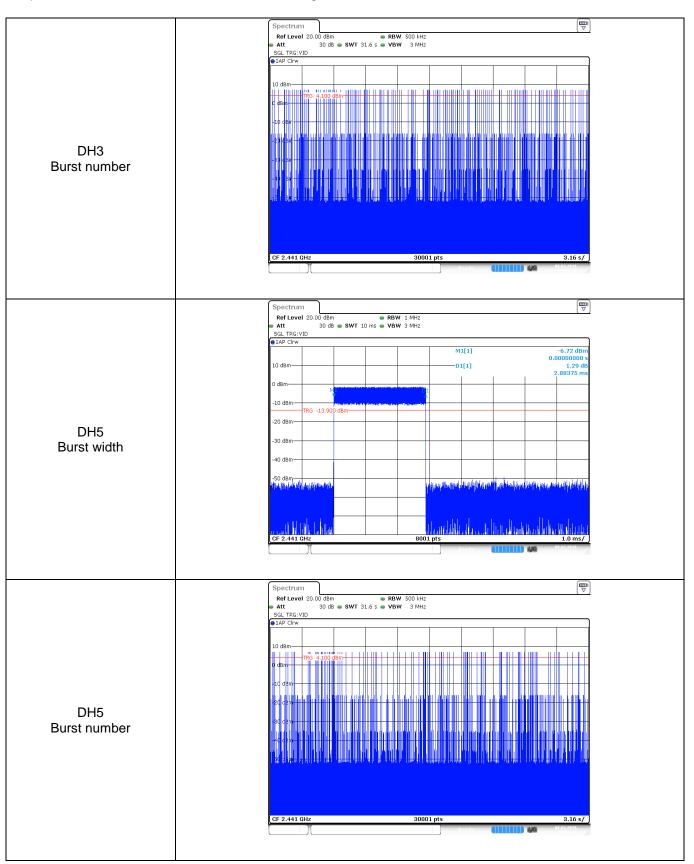
Please refer to the clause 3.3

## TEST RESULTS

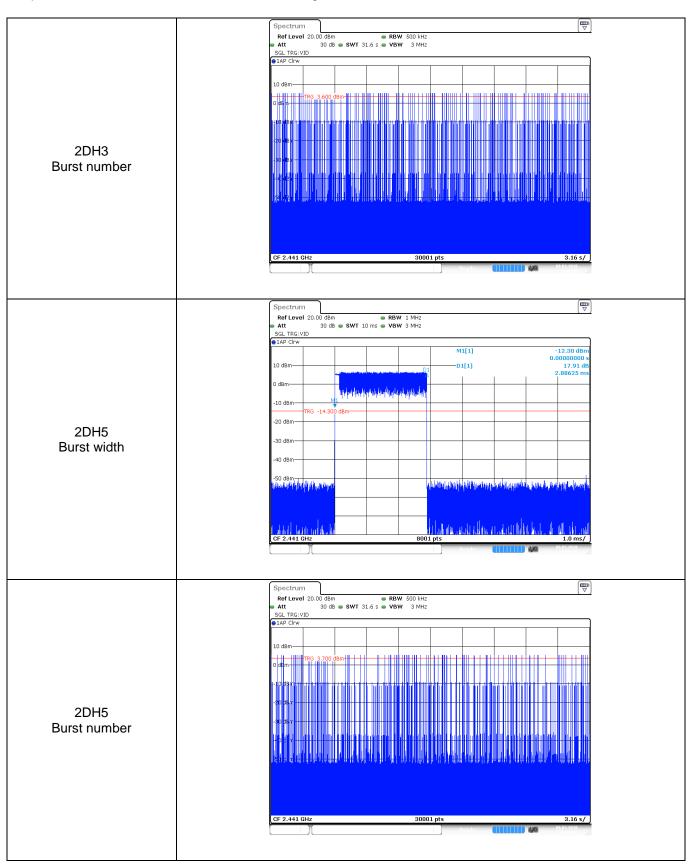
## ☑ Passed □ Not Applicable

| Modulation<br>type | Channel                                       | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell time<br>(Second) | Limit<br>(Second) | Result |
|--------------------|---|----------------------------|-----------------------|------------------------|-------------------|--------|
|                    | DH1   | 0.38                       | 313.00                | 0.12                   |                   |        |
| GFSK               | DH3   | 1.64                       | 157.00                | 0.26                   | ≤ 0.40            | Pass   |
|                    | DH5   | 2.88                       | 104.00                | 0.30                   |                   |        |
|                    | 2DH1         0.39           2DH3         1.64 |                            | 312.00                | 0.12                   |                   |        |
| π/4DQPSK           |   |                            | 147.00                | 0.24                   | ≤ 0.40            | Pass   |
|                    | 2DH5  | 2.89                       | 116.00                | 0.34                   |                   |        |
|                    | 3DH1  | 0.39                       | 313.00                | 0.12                   |                   |        |
| 8DPSK              | 3DH3  | 1.64                       | 159.00                | 0.26                   | ≤ 0.40            | Pass   |
|                    | 3DH5  | 2.89                       | 103.00                | 0.30                   |                   |        |

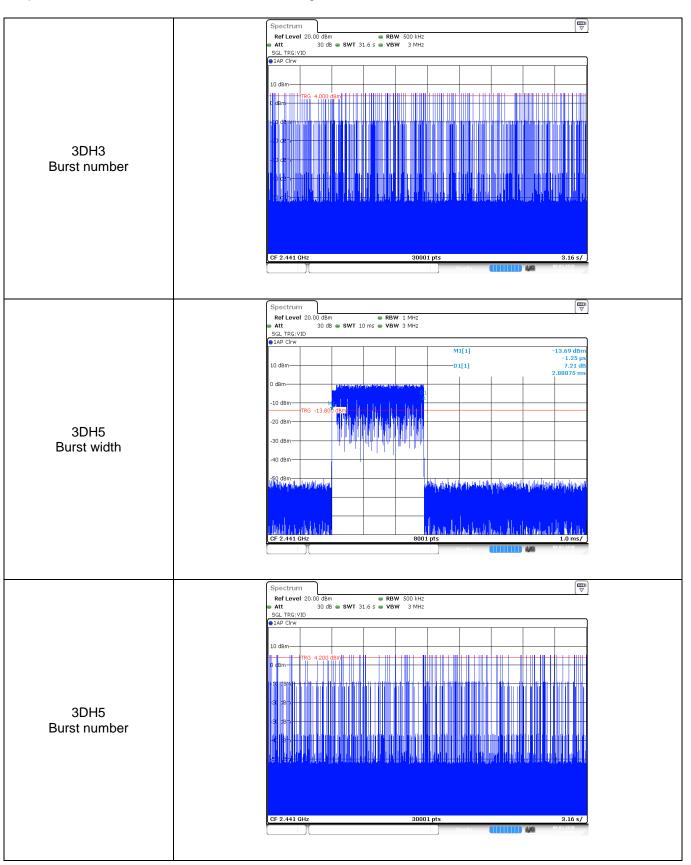
| Modulation Type:    | GFSK  |
|---------------------|---|
|                     | Spectrum         Image: Construction of the sector of   |
| DH1                 | SGL TRG: VID<br>SGL TRG: VID<br>S |
| Burst width         |   |
|                     | Spectrum         []           Ref Level 20.00 dBm         ● RBW 500 kHz           Att         30 dB         SWT 31.6 s         VBW         3 MHz  |
| DH1<br>Burst number | SGL TRG:VID         I AP Clow         10 dBm         I Market in the second of the second   |
|                     | Spectrum<br>Ref Level 20.00 dBm • RBW 1 MHz   |
| DH3<br>Burst width  | Ref Level       200 dBm       • KBW 3 MHz         SGL TAG: VID       • SWT 10 ms       • VBW 3 MHz         SGL TAG: VID       • III 1       • 1.00000000 s         10 dBm       M1       01(1)       • 2.06 dB         0 dBm       01       01(1)       • 2.06 dB         -10 dBm       M1       01       01(1)       • 63625 ms         0 dBm       01       01       01       • 01         -20 dBm       01       01       01       01         -30 dBm       01       01       01       01       01         -40 dBm       01       01       01       01       01       01         -20 dBm       01   |



| Modulation Type:     | π/4DQPSK  |
|----------------------|---|
| 2DH1<br>Burst width  | Spectrum       Implementation         Ref Level 20.00 dBm       • RBW 1 MHz         At       30 dB • SWT 10 ms • VBW 3 MHz         Sct. Trac:vio       • All of the second s |
| 2DH1<br>Burst number | Spectrum         Image: Spectrum           Ref Level 20.00 d8m         • RBW 500 kHz           • At         30 d8 • SWT 31.6 s • VBW 3 MHz           ScL TRG:VD         • IAP Clw           • IAP Clw   |
| 2DH3<br>Burst width  | Spectrum       TD         Ref Level 20.00 dBm       RBW 1 MHz         Att       30 dB       SWT 10 ms       VBW 3 MHz         SGL TRG:VID       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I D dBm       Image: SGL TRG:VID       Image: SGL TRG:VID         I   |



| Modulation Type:     | π/4DQPSK   |
|----------------------|--|
| 3DH1<br>Burst width  | Spectrum         W           Ref Level 20.00 dBm         • RBW 1 MHz           Att         30 dB • SWT 10 ms • VBW 3 MHz           SLI TBG/VD         • 14P Clw           • 14P Clw         • 0.0000000 s           • 0 dBm         • 0.113           • 0 dBm         • 0.113           • 0 dBm         • 0.0000000 s           • 0 dBm         • 0.113           • 0 dBm         • 0.0000000 s           • 0 dBm         • 0.000000 dm           • 0 dBm         • 0.00000 dm           • 0 dBm         • 0.00000 dm           • 0 dBm         • 0.0000 dm           • 0 dBm         • 0.00000 dm           • 0 dBm   |
| 3DH1<br>Burst number | Spectrum       Image: Spectrum         Ref Level 20.00 dbm       • RBW 500 kHz         • At       30 db       • WT 31.6 s       • VBW 3 MHz         Scl. TBG:YD       • IAP Chw       • Iap Chw       • Iap Chw         • Iap Chw       • Iap Chw       • Iap Chw       • Iap Chw         10 dbm       • TRG 4.120 dBm       • Iap Chw       • Iap Chw         10 dbm       • TRG 4.120 dBm       • Iap Chw       • Iap Chw         10 dbm       • TRG 4.120 dBm       • Iap Chw       • Iap Chw         10 dbm       • TRG 4.120 dBm       • Iap Chw       • Iap Chw         10 dbm       • TRG 4.120 dBm       • Iap Chw       • Iap Chw         10 dbm       • TRG 4.120 dBm       • Iap Chw       • Iap Chw         110 dbm       • TRG 4.120 dBm       • Iap Chw       • Iap Chw         123 dBm       • Iap Chw       • Iap Chw       • Iap Chw         133 dBm       • Iap Chw       • Iap Chw       • Iap Chw         134 dBm       • Iap Chw       • Iap Chw       • Iap Chw         135 dBm       • Iap Chw       • Iap Chw       • Iap Chw         136 dBm       • Iap Chw       • Iap Chw       • Iap Chw         137 dBm       • Iap Chw       • Iap Chw  |
| 3DH3<br>Burst width  | Spectrum       Image: Constraint of the second state of the second |



# 5.8. Pseudorandom Frequency Hopping Sequence

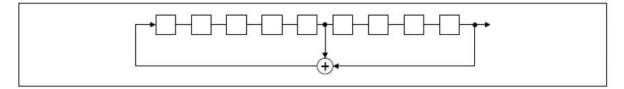
## LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):Frequency hopping systems shall have hopping channel carrier fre-quencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hop-ping channel, whichever is greater. Al-ternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier fre-quencies 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 chan-nel frequencies that are selected at the system hopping rate from a pseudo ran-domly ordered list of hopping fre-quencies. Each frequency must be used equally on the average by each trans-mitter. The system receivers shall have input bandwidths that match the hop-ping channel bandwidths of their cor-responding transmitters and shall shift frequencies in synchronization with the transmitted signals.

### TEST RESULTS

The pseudorandom frequency hopping sequence may be generated in a nice-stage shift register whose 5<sup>th</sup> and 9<sup>th</sup> stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the friststage. The sequence begins with the frist one of 9 consecutive ones, for example: the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence:29-1=511 bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An explame of pseudorandom frequency hopping sequence as follows:

| 0 3 | 2 | 4 | 6 |      | 62 | 64       | 78       | 1 | 73    | 75 7 |
|-----|---|---|---|------|----|----------|----------|---|-------|------|
|     |   |   |   | <br> |    |          | 1        |   | <br>  |      |
|     |   |   |   |      |    |          | 1        |   | 1     |      |
|     |   |   |   |      | 1  |          |          |   |       |      |
|     |   |   |   | <br> |    | <u> </u> | <u>L</u> |   | <br>L |      |

Each frequency used equally one the average by each transmitter.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitter and shift frequencies in synchronization with the transmitted signals.

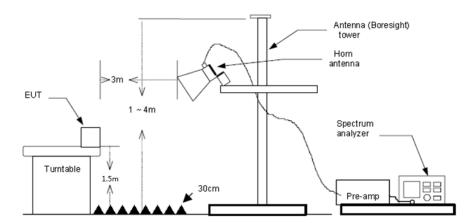
# 5.9. Restricted band (radiated)

### LIMIT

#### FCC CFR Title 47 Part 15 Subpart C 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, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

#### **TEST CONFIGURATION**



### TEST PROCEDURE

- 1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
- 4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- The receiver set as follow: RBW=1 MHz, VBW=3 MHz Peak detector for Peak value RBW=1 MHz, VBW=10 Hz Peak detector for Average value.

#### TEST MODE:

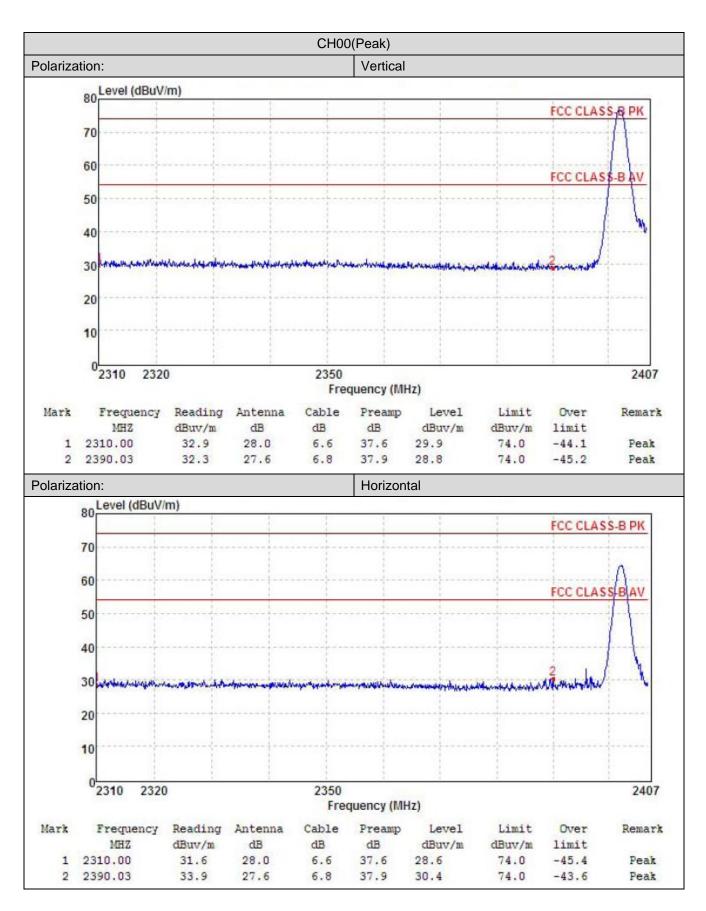
Please refer to the clause 3.3

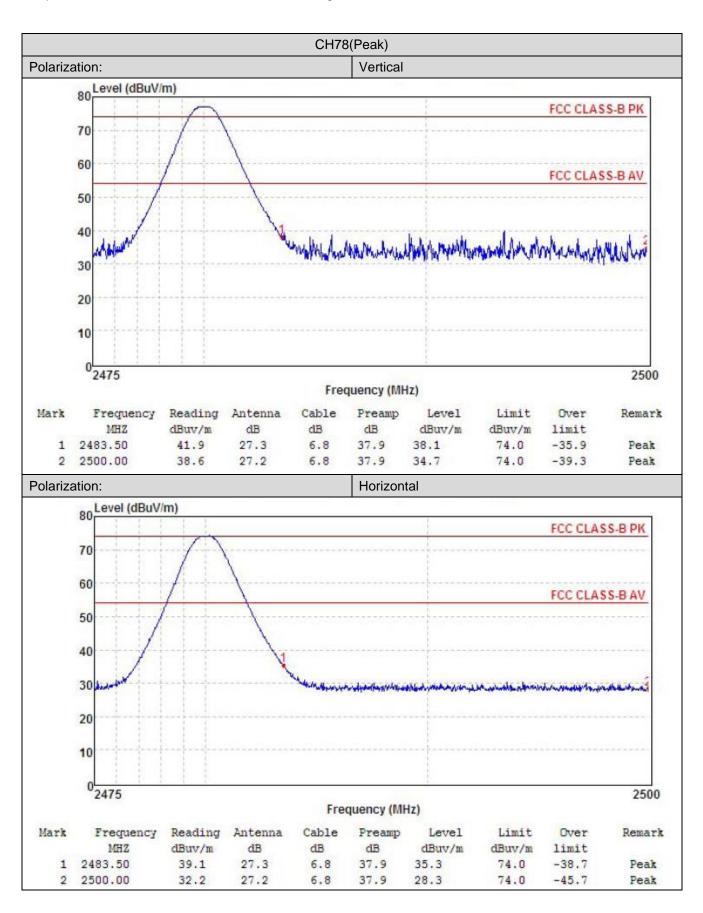
#### TEST RESULTS

| 🛛 Passed | Not Applicable |
|----------|----------------|
|----------|----------------|

Note:

- 1) Final level= Read level + Antenna Factor+ Cable Loss- Preamp Factor
- 2) Have pre-scan all modulation mode, found the GFSK modulation which it was worst case, so only the worst case's data on the test report.
- 3) The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.



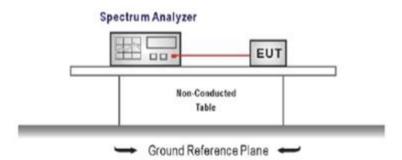


# 5.10. Band edge and Spurious Emissions (conducted)

## <u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

## **TEST CONFIGURATION**



## TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: RBW = 100 kHz, VBW ≥ RBW, scan up through 10<sup>th</sup> harmonic. Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

## TEST MODE:

Please refer to the clause 3.3

#### TEST RESULTS

☑ Passed □ Not Applicable

| Fest Item:      | Band edge |                                 | Modul                                | ation type:   | GFSK                                      |  |
|-----------------|-----------|---------------------------------|--------------------------------------|---|---|--|
|                 |           | Spectrum                        |                                      |   |   |  |
|                 |           | e Att 30 dB                     | Offset 1.00 dB  SWT 1.1 ms           | RBW 100 kHz<br>VBW 300 kHz Mode Auto 9  | weep                                      |  |
|                 |           | ●1Pk Max                        |                                      | M1[1]   | 7.27 dBm                                  |  |
|                 |           | 10 dBm                          |                                      |   | 2.402040\&Hz<br>-49.09 a <mark>B</mark> m |  |
|                 |           | 0 dBm                           |                                      |   | 2.400000 GHz                              |  |
|                 |           | -10 dBm D1 -12.730 dB           | m                                    |   |   |  |
|                 |           | -20 dBm                         |                                      |   |   |  |
| CH00            |           | -40 dBm                         |                                      |   |   |  |
| No hopping mode |           | -50 dBm                         |                                      |   | N#  |  |
| No hopping mode |           | 4<br>©60-dBht-wheet-steam       |                                      | and an an and the set of the set | M3  |  |
|                 |           | -70 dBm                         |                                      |   |   |  |
|                 |           | Start 2.31 GHz                  |                                      | 691 pts   | Stop 2.405 GHz                            |  |
|                 |           | Marker<br>Type Ref Trc          | X-value                              | Y-value Function  | Function Result                           |  |
|                 |           | M1 1<br>M2 1                    | 2.40204 GHz<br>2.4 GHz               | 7.27 dBm<br>-49.09 dBm  |   |  |
|                 |           | M3 1<br>M4 1<br>M5 1            | 2.39 GHz<br>2.31 GHz<br>2.399906 GHz | -58.44 dBm<br>-58.08 dBm<br>-51.07 dBm  |   |  |
|                 |           |                                 | 2.333300 0112                        | Measurini   |   |  |
|                 |           | Spectrum                        |                                      |   |   |  |
|                 |           | Ref Level 20.00 dBm             | Offset 1.00 dB                       |   | <u>.</u>                                  |  |
|                 |           | Att 30 dB     IPk Max           | SWT 1.1 ms -                         | VBW 300 kHz Mode Auto 9   |   |  |
|                 |           | 10 dBm                          |                                      | M1[1]   | 7.03 dBm<br>2.401910NGHz                  |  |
|                 |           | 0 dBm                           |                                      | M2[1]   | -57.48 dam<br>2.400000 GHz                |  |
|                 |           | -10 dBm D1 -12.970 dB           | m                                    |   |   |  |
|                 |           | -20 dBm                         |                                      |   |   |  |
|                 |           | -30 dBm                         |                                      |   |   |  |
| CH00            |           | -40 dBm                         |                                      |   |   |  |
| Hopping mode    |           | -50 dBm<br>4<br>-50 dbm         | and the American                     | wather at with the more   | M3 M2                                     |  |
|                 |           | -70 dBm                         |                                      |   | · · · · · · · · · · · · · · · · · · ·     |  |
|                 |           | Start 2.31 GHz                  |                                      | 691 pts   | Stop 2.405 GHz                            |  |
|                 |           | Marker<br>Type   Ref   Trc      | X-value                              | Y-value Function  | Function Result                           |  |
|                 |           | M1 1<br>M2 1                    | 2.40191 GHz<br>2.4 GHz               | 7.03 dBm<br>-57.48 dBm  |   |  |
|                 |           | M3 1<br>M4 1                    | 2.39 GHz<br>2.31 GHz                 | -58.88 dBm<br>-59.08 dBm  |   |  |
|                 |           | M5 1                            | 2.399906 GHz                         | -56.79 dBm  | 03.03.2018                                |  |
|                 |           |                                 |                                      |   |   |  |
|                 |           | Spectrum<br>Ref Level 20.00 dBm | Offset 1.00 dB                       | RBW 100 kHz   |   |  |
|                 |           |                                 |                                      | VBW 300 kHz Mode Auto F   | FT )                                      |  |
|                 |           |                                 |                                      | M1[1]   | 7.30 dBm<br>2.4801170 GHz                 |  |
|                 |           | 10 dBm                          |                                      | M2[1]   | -58.32 dBm<br>2.4835000 GHz               |  |
|                 |           | 10 dbm                          |                                      |   |   |  |
|                 |           | -20 dBm                         | m                                    |   |   |  |
|                 |           | -30 dgm                         |                                      |   |   |  |
| CH78            |           | -40/dBm                         |                                      |   |   |  |
| No hopping mode |           | ~50 dBm                         | M2 M4                                |   |   |  |
|                 |           | -60 dBm                         | M2 M4                                | -   | - marine - marine                         |  |
|                 |           | -70 dBm                         |                                      | + + +   |   |  |
|                 |           | Start 2.478 GHz                 |                                      | 691 pts   | Stop 2.5 GHz                              |  |
|                 |           | Marker<br>Type Ref Trc          | X-value                              | Y-value Function  | Function Result                           |  |
|                 |           | M1 1<br>M2 1                    | 2.480117 GHz<br>2.4835 GHz           | 7.30 dBm<br>-58.32 dBm  |   |  |
|                 |           | M3 1<br>M4 1                    | 2.5 GHz<br>2.4844725 GHz             | -60.55 dBm<br>-57.23 dBm  |   |  |
|                 |           |                                 |                                      | Measurin  | (111111) (A) 08.03/2018                   |  |

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|                 | 1Pk Max<br>0 dBm<br>1 dBm<br>10 dBm<br>20 dBm<br>30 dBm | 1 -13.29( | dBm               |             |                     | M1[<br>              |               |     |            | 6.71 dBm<br>800220 GHz<br>-59.70 dBm<br>835000 GHz |
|-----------------|---|-----------|-------------------|-------------|---------------------|----------------------|---------------|-----|------------|--|
|                 | to dam  | 1 -13.29( | dBm               |             |                     |                      |               |     |            | 800220 GHz<br>-59.70 dBm                           |
|                 | to dBm  | 1 -13.290 | dBm               |             |                     |                      |               |     |            |  |
|                 |   |           |                   |             |                     |                      |               |     |            |  |
| CH78 pping mode | 40 dBm  | 4         |                   |             |                     |                      |               |     |            |  |
|                 | 50 dBm  | hu        | M2                | ۔ ۵۵ معرب م |                     | ر.<br>مەرىمەر مەرىمە | لى<br>ئىرچىمە | 4   | -          |  |
|                 | 70 dBm  |           |                   |             |                     |                      |               |     |            |  |
| s               | tart 2.478  | GHz       |                   |             | 691 p               | ots                  |               |     | St         | op 2.5 GHz   |
|                 | arker   |           |                   |             |                     |                      |               |     |            |  |
|                 | Type Ref  | Trc 1     | X-value<br>2.4800 |             | Y-value<br>6.71 dBn | Functio              | on            | Fun | ction Resu | lt   |
| -               | M2  | 1         |                   | 35 GHz      | -59.70 dBn          |                      |               |     |            |  |
|                 | M3  | 1         |                   | .5 GHz      | -59.01 dBn          |                      |               |     |            |  |
|                 | M4  | 1         | 2.49336           | B1 GHz      | -57.85 dBn          | n                    |               |     |            |  |

| Test Item:              | Band edge |   | Modul   | ation type:  |                                   | π/4DQPSK  | { |
|-------------------------|-----------|---|---|--|-----------------------------------|---|---|
|                         |           | Spectrum  |   |  |                                   |   |   |
|                         |           |   |   | WBW 300 kHz Mode a   | Auto Sweep                        | 5.70 dBn<br>2.401770,QH<br>-51.21 dBn<br>2.40000 GH   |   |
| CH00<br>No hopping mode |           | -30 dBm   |   | 691 pts  | , term from , the is good spatial | M3<br>Stop 2.405 GHz  |   |
|                         |           |   | X-value<br>2.40177 GHz<br>2.4 GHz<br>2.39 GHz<br>2.31 GHz<br>2.399906 GHz | Y-value         Func           5.70 dBm         -51.21 dBm           -59.01 dBm         -59.01 dBm           -58.71 dBm         -53.43 dBm |                                   | Cunction Result   |   |
|                         |           |   | Offset 1.00 dB 👄<br>SWT 1.1 ms 👄  |  | auto Sween                        |   |   |
| CH00<br>Hopping mode    |           | 10 dBm     1-15.310 dBr     -20 dBm     -30 dBm     -40 dBm     -50 |   |  | 1[1] 2[1]                         | 4.69 dbm<br>2.404110 dbm<br>- 58.36 dbm<br>2.400000 dbm<br>- 2.400000 dbm<br>- 2.400000 dbm<br>- 2.405 dbm<br>- 2.405 GHz<br> |   |
| CH78<br>No hopping mode |           | Ref Level         20.00 dBm           Att         30 dB           9 IPk Max         10 dBm           10 dBm         10 dBm           -10 dBm         01 -14.330 dBm           -20 dBm         -14.330 dBm           -50 dBm         -70 dBm   | SWT 56.9 µs ●   | VBW 300 kHz Mode a   | Luto FFT  1[1]  2[1]              | 5.67 dBn<br>2.4798310 GHz<br>-58.88 dBn<br>2.4835000 GHz  |   |
|                         |           | M1 1<br>M2 1<br>M3 1  | X-value<br>2.479831 GHz<br>2.4835 GHz<br>2.5 GHz<br>2.4837391 GHz         | 691 pts<br>Y-value Func<br>5.67 dBm<br>-58.88 dBm<br>-59.33 dBm<br>-57.35 dBm  |                                   | Stop 2.5 GHz  |   |

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|                      | Att 30 dB SWT  | et 1.00 dB 👄 RBW 100 kHz<br>56.9 µs 👄 VBW 300 kHz  | Mode Auto FFT  |  |
|----------------------|--|--|----------------|--|
| CH78<br>Hopping mode | 1Pk Max     10 dBm +++     10 dBm +++     10 dBm +++     10 dBm -++     10 dBm     10 dBm     20 dBm     20 dBm     40 dBm     40 dBm     50 dBm     50 dBm     70 dBm |  | M1[1]<br>M2[1] | 4.80 dBm<br>2,4799590 GHz<br>-60.08 dBm<br>2,4835000 GHz |
|                      | Start 2.478 GHz<br>Marker  | 691 pts  |                | Stop 2.5 GHz   |
|                      | M1 1 2.4<br>M2 1 3<br>M3 1   | alue         Y-value           179958 GHz         4.80 dBm           2.4835 GHz         -60.08 dBm           2.5 GHz         -59.17 dBm           30812 GHz         -57.65 dBm |                | eunction Result  |

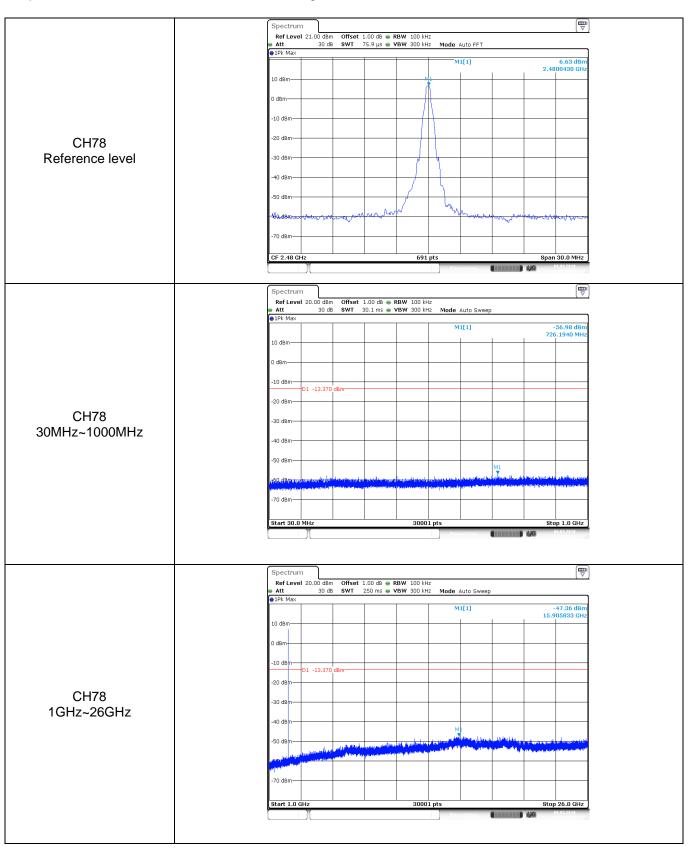
| est Item:       | Band edge |                                       | Modula                              | ation type:  |   | 8DPS   | Κ  |
|-----------------|-----------|---------------------------------------|-------------------------------------|--|---|--|--|
|                 |           | Spectrum                              |                                     |  |   |  | (The second seco |
|                 |           | Ref Level 20.00 dBm<br>Att 30 dB      | Offset 1.00 dB<br>SWT 1.1 ms        | RBW 100 kHz<br>VBW 300 kHz Mode  | Auto Sweep                                    |  |  |
|                 |           | ●1Pk Max                              |                                     |  | M1[1]   |  | 5.44 dBm   |
|                 |           | 10 dBm                                |                                     |  | M2[1]   | 2.40   | 2180 GHz<br>0.59 dpm   |
|                 |           | 0 dBm                                 |                                     |  | 1   | 2.40   | 10000 GHz  |
|                 |           | -10 dBm-D1 -14.560                    | Bm                                  |  |   |  |  |
|                 |           | -20 dBm                               | 2011                                |  |   |  |  |
|                 |           | -30 dBm                               |                                     |  |   |  |  |
| CH00            |           | -40 dBm                               |                                     |  |   |  | MR   |
| No hopping mode |           | -50 dBm                               |                                     |  |   | M3   | 1  |
|                 |           | 9-90-6BW                              | acetter, Bern da den alemporter, el | and the second | اميد عرائب به علما عربي الارتما المتلك مع وال | in discourse the first state of the state of | ener -   |
|                 |           | -70 dBm                               |                                     |  |   |  |  |
|                 |           | Start 2.31 GHz<br>Marker              |                                     | 691 pts  |   | Stop 2   | .405 GHz   |
|                 |           | Type Ref Trc                          | X-value<br>2.40218 GHz              | Y-value Fur<br>5.44 dBm  | ction   | Function Result  |  |
|                 |           | M2 1<br>M3 1                          | 2.4 GHz<br>2.39 GHz                 | -50.59 dBm<br>-60.40 dBm   |   |  |  |
|                 |           | M4 1<br>M5 1                          | 2.31 GHz<br>2.399906 GHz            | -59.30 dBm<br>-53.41 dBm   |   |  |  |
|                 |           |                                       |                                     | M  | asuring                                       | 4/4  | .03.2018   |
|                 |           | Spectrum                              |                                     |  |   |  |  |
|                 |           | Ref Level 20.00 dBm                   |                                     | RBW 100 kHz  |   |  | [ 🛛  |
|                 |           | Att 30 dB     IPk Max                 | SWT 1.1 ms                          | VBW 300 kHz Mode   |   |  |  |
|                 |           | 10 dBm                                |                                     |  | M1[1]   | 2.40   | 5.23 dBm<br>13970 GHz  |
|                 |           | 0 dBm                                 |                                     |  | M2[1]   | -5   | 7.76 dB  |
|                 |           | -10 dBm                               |                                     |  |   |  |  |
|                 |           | -20 dBm                               | dBm                                 |  |   |  |  |
|                 |           | -30 dBm                               |                                     |  |   |  |  |
| CH00            |           | -40 dBm                               |                                     |  |   |  |  |
| Hopping mode    |           | -50 dBm                               |                                     | MS   |   | МЗ   | MP   |
| 11 0            |           | 4<br>Fordem <del>aisesson/Autor</del> | amarka have                         | March Laborer John Contract States   | 1 hours and the second second                 | Saladdin and the Shared State  | inun 🗡   |
|                 |           | -70 dBm                               |                                     |  |   |  |  |
|                 |           | Start 2.31 GHz                        |                                     | 691 pts  |   | Stop 2   | .405 GHz   |
|                 |           | Marker<br>Type Ref Trc                | X-value                             |  | ction   | Function Result  |  |
|                 |           | M1 1<br>M2 1                          | 2.40397 GHz<br>2.4 GHz              | 5.23 dBm<br>-57.76 dBm   |   |  |  |
|                 |           | M3 1<br>M4 1                          | 2.39 GHz<br>2.31 GHz                | -59.84 dBm<br>-59.15 dBm   |   |  |  |
|                 |           | M5 1                                  | 2.356261 GHz                        | -56.66 dBm   | asuring                                       |  | .03.2018   |
|                 |           |                                       |                                     |  |   |  | (  |
|                 |           | Spectrum<br>Ref Level 20.00 dBm       | Offset 1.00 dB 👄                    | RBW 100 kHz  |   |  |  |
|                 |           |                                       |                                     | VBW 300 kHz Mode   | Auto FFT                                      |  |  |
|                 |           |                                       |                                     |  | M1[1]   | 9.4Rf  | 5.67 dBm<br>11170 GHz  |
|                 |           | 10 dBm                                |                                     |  | M2[1]   | -8   | i8.60 dBm<br>15000 GHz   |
|                 |           | 0 dBm                                 |                                     |  |   | 2.100  |  |
|                 |           | -10 dBm D1 -14.330                    | dBm                                 |  |   |  |  |
|                 |           | -20 dBm                               |                                     |  |   |  |  |
| CH78            |           | -30 dßm                               |                                     |  |   |  |  |
| lo hopping mode |           | -40 dBm                               |                                     |  |   |  |  |
|                 |           | ~50 dBm                               | M2                                  |  | M4  |  |  |
|                 |           | -60 dBm                               |                                     | 14-and the set of the second   | - PIDS  | and an area when   | anna anna anna anna anna anna anna ann   |
|                 |           | -70 dBm                               |                                     |  |   |  |  |
|                 |           | Start 2.478 GHz<br>Marker             | I                                   | 691 pts  | - I   | Sto  | 2.5 GHz  |
|                 |           | Type Ref Trc                          | X-value<br>2.480117 GHz             | Y-value Fur<br>5.67 dBm  | ction   | Function Result  |  |
|                 |           | M1 1<br>M2 1<br>M3 1                  | 2.4835 GHz                          | -58.60 dBm   |   |  |  |
|                 |           | M3 1<br>M4 1                          | 2.5 GHz<br>2.4935275 GHz            | -59.86 dBm<br>-56.80 dBm   |   |  |  |
|                 |           |                                       |                                     | M  | asuring                                       | <b>III 4</b> /4  | .03.2018   |

## Report No.: TRE1803002805

|                     | Spectrum<br>Ref Level 20.0<br>Att  |                         |                                       | <b>RBW</b> 100 kHz<br><b>VBW</b> 300 kHz                      | Mode Auto FF   | т  |              |   |
|---------------------|--|-------------------------|---------------------------------------|---|----------------|--|--------------|---|
| CH78<br>Hoppig mode | 1Pk Max     10 dBm +++     10 dBm +++     10 dBm     10 dBm | 15.180 d8m              |                                       |   | M1[1]<br>M2[1] | and a second sec | -            | 4.82 dBm<br>98310 GHz<br>58.95 dBm<br>35000 GHz |
|                     | Start 2.478 GHz  | z                       | 1                                     | 691 pts   | 5              |  | Sto          | pp 2.5 GHz                                      |
|                     | M2<br>M3   | 1 2.4798<br>1 2.48<br>1 | 31 GHz<br>35 GHz<br>2.5 GHz<br>13 GHz | Y-value<br>4.82 dBm<br>-58.95 dBm<br>-60.80 dBm<br>-57.41 dBm | Function       | Fund   | ction Result | 08.03.2018                                      |

| Test Item:              | SE |  | Modul  | ation ty  | vpe:  |                       | GFSK               | Ι  |  |
|-------------------------|----|--|--|---|---|-----------------------|--------------------|--|--|
|                         |    | Spectrum   |  |   |   |                       |                    |  |  |
|                         |    | Ref Level 21.00 dBm<br>Att 30 dE<br>1Pk Max  | n Offset 1.00 dB 🖷<br>3 SWT 75.9 µs 🖷  | RBW 100 kHz<br>VBW 300 kHz  | Mode Auto FF  | т                     |                    | 1  |  |
|                         |    |  |  |   | M1[1]   |                       | 2.40               | 7.01 dBm<br>20000 GHz                    |  |
|                         |    | 10 dBm   |  | *   |   |                       |                    |  |  |
|                         |    | 0 dBm  |  | + #   |   |                       |                    |  |  |
|                         |    | -10 dBm  |  | + /1  |   |                       |                    |  |  |
|                         |    | -20 dBm  |  |   |   |                       |                    |  |  |
| CH00<br>Reference level |    | -30 dBm  |  |   | h   |                       |                    |  |  |
| Reference level         |    | -40 dBm  |  | +/+   |   |                       |                    |  |  |
|                         |    | -50 dBm  |  | -   | - <u>_</u>  |                       |                    |  |  |
|                         |    | -c69.d800 turburburburburburburburburburburburburbu  | and and a start of the start of | ~   | Maren   | montologicartor       | www                | tome the                                 |  |
|                         |    | -70 dBm  |  |   |   |                       |                    |  |  |
|                         |    | CF 2.402 GHz   |  | 691 pt  | s   |                       | Spar               | 30.0 MHz                                 |  |
|                         |    |  |  |   | Measuring.  |                       |                    | 08.03.2018                               |  |
|                         |    |  |  |   |   |                       |                    |  |  |
|                         |    | Spectrum   |  |   |   |                       |                    |  |  |
| CH00<br>30MHz~1000MHz   |    | Ref Level 20.00 dBn<br>Att 30 dB<br>1Pk Max  |  |   | Mode Auto Sv  | /еер                  |                    |  |  |
|                         |    | AFK MdX  |  |   | M1[1]   |                       | 86                 | -56.54 dBm<br>+.5760 MHz                 |  |
|                         |    | 10 dBm   |  |   |   |                       | +                  |  |  |
|                         |    | 0 dBm  |  |   |   |                       | -                  | <u> </u>                                 |  |
|                         |    | -10 dBm-D1 -12.990   | dBm  |   |   | _                     |                    |  |  |
|                         |    | -20 dBm  |  |   |   |                       |                    |  |  |
|                         |    | -30 dBm  |  | + +   |   |                       |                    |  |  |
|                         |    | -40 dBm  |  |   |   |                       |                    |  |  |
|                         |    | -50 dBm  |  |   |   |                       | M1                 |  |  |
|                         |    | 1,60, <b>4</b> 8m,   |  |   | مرابع بند و دو برو برو برو برو المرابع<br>مرابع برو | ale dana and          | M1                 | uli na mini lani d                       |  |
|                         |    | -70 dBm  |  |   |   |                       |                    |  |  |
|                         |    | Start 30.0 MHz   | <u> </u>   | 30001 p   | its   |                       | Sto                | pp 1.0 GHz                               |  |
|                         |    |  |  |   | Measuring   |                       |                    | 08.03.2018<br>15-23:30                   |  |
|                         |    |  |  |   |   |                       |                    |  |  |
|                         |    | Spectrum<br>Ref Level 20.00 dBm  | n Offset 1.00 dB 🖷   | RBW 100 kHz   |   |                       |                    |  |  |
|                         |    | <ul> <li>Att 30 dE</li> <li>1Pk Max</li> </ul>   |  |   |   | reep                  |                    |  |  |
|                         |    |  |  |   | M1[1]   |                       | 15.6               | 47.18 dBm<br>26667 GHz                   |  |
|                         |    | 10 dBm   |  |   |   |                       |                    |  |  |
|                         |    | 0 dBm  |  |   |   |                       |                    |  |  |
|                         |    | -10 dBm-D1 -12.990   | dBm  |   |   |                       |                    |  |  |
| CHOO                    |    | -20 dBm  |  |   |   |                       |                    |  |  |
| CH00<br>1GHz~26GHz      |    | -30 dBm  |  |   |   |                       |                    |  |  |
|                         |    | -40 dBm  |  |   | M1  |                       |                    | <u> </u>                                 |  |
|                         |    | -50 dBm  | والاسترادين أستناه والمستلك  |   |   | territe and the block | Address of the sta | an a |  |
|                         |    | A starting of the second s | and the state of the second second   | the second statement of the second | (m. 1   |                       | - I house and the  |  |  |
|                         |    | -70 dBm  |  |   |   |                       |                    | <b> </b>                                 |  |
|                         |    | Start 1.0 GHz  |  | 30001 p   | ts  |                       | Stor               | 26.0 GHz                                 |  |
|                         |    |  |  |   |   |                       |                    |  |  |

|                    | Spectrum<br>Ref Level 21.00 dBm Offset 1.00 dB ⊕ RBW 100 kHz  |  |
|--------------------|---|--|
|                    | Att 30 dB SWT 75.9 μs WBW 300 kHz Mode Auto FFT Φ 1Pk Max   |  |
|                    | M1[1] 7.59 dBm<br>2.4409570 GHz   |  |
|                    | 10 dBm  |  |
|                    | D dBm   |  |
|                    | 10.00   |  |
|                    | -10 dBm   |  |
| CH39               | -20 dBm   |  |
| Reference level    | -30 dBm   |  |
|                    | -40 d8m-  |  |
|                    |   |  |
|                    | -50 dBm   |  |
|                    | tegen month and a start a start and a start a start and a start   |  |
|                    | -70 dBm-  |  |
|                    | CF 2.441 GHz         691 pts         Span 30.0 MHz  |  |
|                    | OF 2.447 GHz         OS 2 (F3)         Open 00.0 mFz  |  |
|                    | Spectrum 🕎  |  |
|                    | Ref Level 20.00 dBm Offset 1.00 dB  RBW 100 kHz   |  |
|                    | Att 30 dB SWT 30.1 ms VBW 300 kHz Mode Auto Sweep<br>1Pk Max  |  |
|                    | M1[1] -57.22 dBm<br>742.2310 MHz  |  |
|                    | 10 dBm  |  |
|                    | 0 dBm   |  |
|                    | -10 d8m   |  |
|                    | D1 -12.410 dBm  |  |
| CH39               |   |  |
| 30MHz~1000MHz      | -30 dBm-  |  |
|                    | -40 d8m   |  |
|                    | -50 d8m-  |  |
|                    |   |  |
|                    |   |  |
|                    | -70 dBm-  |  |
|                    | Start 30.0 MHz         30001 pts         Stop 1.0 GHz   |  |
|                    | Messuring. 11111 Mar 40412413   |  |
|                    |   |  |
|                    | Spectrum 🕎  |  |
|                    | RefLevel 20.00 dBm Offset 1.00 dB RBW 100 kHz<br>Att 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep   |  |
|                    |   |  |
|                    | IPk Max   |  |
|                    | ●1Pk Max<br>M1[1] -46.79 dBm<br>16.827500 GHz   |  |
|                    |   |  |
|                    | ●1Pk Max<br>M1[1] -46.79 dBm<br>16.827500 GHz   |  |
|                    |   |  |
|                    | P1Pk Max      M1[1]     -46.79 dBm      16.827500 GHz      0 dBm      0 dBm   |  |
| СН39               | P1Pk Max      M1[1]     -46.79 dBm      16.827500 GHz      0 dBm      -10 dBm      D1 -12.410 dBm      -20 dBm      - |  |
| CH39<br>1GHz~26GHz |   |  |
|                    | PIPk Max      M1[1]     -46.79 dBm      16.827500 GHz      0 dBm      -10 dBm      D1 -12.410 dBm      -20 dBm      -30 dBm      -40.79 dBm      -10 dBm     |  |
|                    | PIPk Max      M1[1]     -46.79 dBm      16.827500 GH2      0 dBm      0 dBm      -10 dBm      -10 dBm      -20 dBm      -30 dBm      -30 dBm      -30 dBm      -40 dBm    |  |
|                    | P1Pk Max      M1[1]     -46.79 dBm      16.827500 GHz      0 dBm      -10 dBm      D1 -12.410 dBm      -20 dBm      -30 dBm      -40 dBm      - |  |
|                    | 1Pk Max      10 dBm       |  |
|                    |   |  |
|                    | 1Pk Max      10 dBm       |  |



| est Item:               | SE |   | Modu  | lation                                     | type:                 |                       | Т           | т/4D0  | QPSK                               |
|-------------------------|----|---|---|--|-----------------------|-----------------------|-------------|--|------------------------------------|
|                         |    | Spectrum                                    |   |  |                       |                       |             |  |                                    |
|                         |    | Ref Level 21.00 dBm<br>Att 30 dB<br>1Pk Max | Offset 1.00 dB<br>SWT 75.9 μs   |  |                       | Auto FFT              |             |  | 1                                  |
|                         |    | THK MIGX                                    |   |  | м                     | 1[1]                  |             | 2.40   | 4.51 dBm<br>021300 GHz             |
|                         |    | 10 dBm                                      |   | N  | 11                    |                       |             |  |                                    |
|                         |    | 0 dBm                                       |   |  | h                     |                       |             |  |                                    |
|                         |    | -10 dBm                                     |   |  |                       |                       |             |  |                                    |
| 01100                   |    | -20 dBm                                     |   |  |                       |                       |             |  |                                    |
| CH00<br>Reference level |    | -30 dBm                                     |   |  | H                     |                       |             |  |                                    |
|                         |    | -40 dBm                                     |   | - (*                                       | M                     |                       |             |  |                                    |
|                         |    | -50 dBm                                     |   |  | $\square$             |                       |             |  |                                    |
|                         |    | All demonstration                           | Mayound   | man  | hy                    | mary                  | myne        | man  | mangahan                           |
|                         |    | -70 dBm                                     |   |  |                       |                       |             |  |                                    |
|                         |    | CF 2.402 GHz                                |   | 691  | pts                   |                       |             | Spar   | 30.0 MHz                           |
|                         |    |   |   |  | ·<br>Mea              | suring                |             |  | 08.03.2018<br>15:30:03             |
|                         |    |   |   |  |                       |                       |             |  |                                    |
|                         |    | Spectrum<br>Ref Level 20.00 dBm             | Offset 1.00 dB  | <b>RBW</b> 100 kH                          | 47                    |                       |             |  |                                    |
| CH00<br>30MHz~1000MHz   |    | Att 30 dB     IPk Max                       | SWT 30.1 ms   | • VBW 300 kH                               | Hz Mode               |                       |             |  | ]                                  |
|                         |    | 10 - 20                                     |   |  | м                     | 1[1]                  |             |  | -57.05 dBm<br>7.1920 MHz           |
|                         |    | 10 dBm                                      |   |  |                       |                       |             |  |                                    |
|                         |    | 0 dBm                                       |   |  |                       |                       |             |  |                                    |
|                         |    | -10 dBm<br>D1 -15.490                       | dBm   |  |                       |                       |             |  |                                    |
|                         |    | -20 dBm                                     |   |  |                       |                       |             |  |                                    |
|                         |    | -30 dBm                                     |   |  |                       |                       |             |  |                                    |
|                         |    | -40 dBm                                     |   | -  |                       |                       |             |  |                                    |
|                         |    | -50 dBm                                     |   |  |                       |                       | M1          |  |                                    |
|                         |    | n 60. dBtb da na star brite faile           | alahan baya ya kata ana bayan baya<br>Taari aya ataa harra ƙarawalingan | روماندو وروایی الوار<br>روماندو وروایی مرو |                       | and an estimate       |             | nan Kalantak<br>Kasiya mangina   | and the floor of the floor         |
|                         |    | -70 dBm                                     |   |  |                       |                       |             |  |                                    |
|                         |    | Start 30.0 MHz                              |   | 3000                                       | 1 pts                 |                       |             |  | op 1.0 GHz                         |
|                         |    |   |   |  | Mea                   | suring                |             | 4,70   | 0670372018                         |
|                         |    |   |   |  |                       |                       |             |  | (me)                               |
|                         |    | Ref Level 20.00 dBm                         |   |  |                       |                       |             |  |                                    |
|                         |    | Att 30 dB<br>1Pk Max                        | <b>SWT</b> 250 ms €   | • • • • • 300 KH                           |                       | Auto Sweep            |             |  | -46.23 dBm                         |
|                         |    | 10 dBm                                      |   | _  |                       |                       |             | 15.6   | 987500 GHz                         |
|                         |    | 0 dBm                                       |   | _  |                       |                       |             |  |                                    |
|                         |    | -10 dBm                                     |   |  |                       |                       |             |  |                                    |
|                         |    | -20 dBm                                     | dBm   |  |                       |                       |             |  |                                    |
| CH00                    |    | -30 dem                                     |   |  |                       |                       |             |  |                                    |
| 1GHz~26GHz              |    |   |   |  |                       |                       |             |  |                                    |
|                         |    | -40 dBm                                     |   |  | M                     | and the second second | . السنان ال |  |                                    |
|                         |    | -50 dBm                                     |   | allandi dina andira<br>Na ang anatan       | and the second second | a Marine and Articles |             | periorente constructions<br>periorente de la construction de la<br>periorente de la construction de la | and an a start of the start of the |
|                         |    |   |   |  |                       |                       |             |  |                                    |
|                         |    | -70 dBm                                     |   | -  |                       |                       |             |  |                                    |
|                         |    | Start 1.0 GHz                               |   | 3000                                       | 1 pts                 |                       |             |  | 26.0 GHz                           |
|                         |    |   |   |  |                       |                       |             |  | 00.02.2010                         |

| eport No 1 RE 1803002803 | Fage. 49 01 59 Issued. 2016-03-15   |
|--------------------------|---|
|                          | Spectrum 🕎  |
|                          | Ref Level         21.00         dBm         Offset         1.00         dB         RBW         100         kHz           Att         30         30         SWT         75.9 µs         VBW         300 kHz         Mode         Auto         FFT           FIR Max         30         30         30         300         kHz         Mode         Auto         FFT   |
|                          | M1[1] 4.87 dBm<br>2.4407830 GHz   |
|                          | 10 dBm  |
|                          | 0 dBm   |
|                          | -10 dBm-  |
| CH39                     | -20 dBm-  |
| Reference level          | -30 dBm   |
|                          | -40 dBm   |
|                          | -50 dBm   |
|                          | 18adstown water and a second and  |
|                          | -70 dBm-  |
|                          | CF 2.441 GHz 691 pts Span 30.0 MHz  |
|                          | Nextrano (Interest ID 4/0 42432010  |
|                          | Spectrum V  |
|                          | Ref Level         20.00 d/sm         Offset         1.00 d/s         RBW         100 kHz           Att         30 d/s         SWT         30.1 ms         VBW         300 kHz         Mode         Auto Sweep           FIR Max         30 d/s         SWT         30.1 ms         VBW         300 kHz         Mode         Auto Sweep  |
|                          | M1[1] -57.38 dBm<br>913.7860 MHz  |
|                          | 10 dBm  |
|                          | 0 dBm   |
|                          | -10 dBm D1 -15.130 dBm D2 D2D2 D2  |
|                          | -20 dBm-  |
| CH39<br>30MHz~1000MHz    | -30 dBm-  |
| 3000112~100000112        | -40 dBm-  |
|                          | -50 dam   |
|                          |   |
|                          | -70 dBm-  |
|                          | Start 30.0 MHz 30001 pts Stop 1.0 GHz   |
|                          |   |
|                          |   |
|                          | Spectrum         Image: Constraint of the sector of t |
|                          | Att 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep  PPK Max   |
|                          | 10 dBm 47.35 dBm 16.792500 GHz  |
|                          | 0 dBm   |
|                          | -10 db/n  |
|                          | -20 dBm   |
| CH39                     | -20 dB/n  |
| 1GHz~26GHz               |   |
|                          |   |
|                          |   |
|                          |   |
|                          | -70 dBm-  |
|                          | Start 1.0 GHz 30001 pts Stop 26.0 GHz   |
|                          |   |

|                    | Spectrum 🕎   |
|--------------------|--|
|                    | Ref Level 21.00 dBm Offset 1.00 dB   |
|                    | ●1Pk Max   |
|                    | M1[1] 4.46 dBm<br>2.4797830 GHz  |
|                    | 10 d8m   |
|                    | 0 d8m  |
|                    | -10 dBm-   |
|                    | -20 dBm-   |
| CH78               | -20 UBIN-  |
| Reference level    | -30 dBm  |
|                    | -40 dBm  |
|                    | -50 dBm  |
|                    |  |
|                    | 160 dama hand way of the second of the secon |
|                    | -70 dBm-   |
|                    | CF 2.48 GHz         691 pts         Span 30.0 MHz  |
|                    | Mexcering. (111111) (A) 45.832318  |
|                    | Spectrum (♥  |
|                    | Ref Level 20.00 dBm         Offset 1.00 dB         RBW 100 kHz           Att         30 dB         SWT         30.1 ms         VBW 300 kHz   |
|                    | IPk Max  |
|                    | 10 dBm   |
|                    |  |
|                    | 0 dBm  |
|                    | -10 dBm-   |
|                    | D1 -15.540 dBm   |
| CH78               |  |
| 30MHz~1000MHz      | -30 dBm-   |
|                    | -40 dBm  |
|                    | -50 dBm  |
|                    |  |
|                    | we as the place of the standard back the standard place is a standard place is a standard place is a standard part of the sta  |
|                    | -70 dBm-   |
|                    | Start 30.0 MHz 30001 pts Stop 1.0 GHz  |
|                    | Measuring (1997) March 1987  |
|                    |  |
|                    |  |
|                    | Spectrum   |
|                    | Ref Level         20.00         dBm         Offset         1.00         dB         RBW         100         kHz           Att         30         dB         SWT         250 ms         SWH         300         kHz         Mode         Auto         Sweep  |
|                    | Ref Level         20.00         dtm         Offset         1.00         BW         100         Hz           Att         30         30 dB         SWT         250 ms         VBW         300 kHz         Mode         Auto Sweep           1Pk Max  |
|                    | RefLevel 20.00 dbm Offset 1.00 db ● RBW 100 kHz<br>● Att 30 dB SWT 250 ms ● VBW 300 kHz Mode Auto Sweep<br>● IPk Max   |
|                    | Ref Level 20.00 dbm         Offset 1.00 db         RBW         100 kHz           Att         30 dB         SWT         250 ms         VBW         300 kHz         Mode Auto Sweep           ● 1Pk Max  |
|                    | Ref Level 20.00 dem         Offset 1.00 de         RBW         100 kHz           Att         30 de         SWT         250 ms         VBW         300 kHz         Mode Auto Sweep           ● 1Pk Max           M1[1]         -46.85 dBm           10 dBm             16.835000 GHz           0 dBm  |
|                    | Ref Level         20.00 dbm         Offset         1.00 db         RBW         100 kHz           Att         30 db         SWT         250 ms         VBW         300 kHz         Mode         Auto Sweep           Image: SwT         250 ms         VBW         300 kHz         Mode         Auto Sweep           Image: SwT         250 ms         VBW         300 kHz         Mode         Auto Sweep           Image: SwT         30 db         SWT         250 ms         VBW         300 kHz           Image: SwT         30 db         SWT         250 ms         VBW         300 kHz           Image: SwT         10 dbm         16.835000 GHz         16.835000 GHz         10 dbm         10 dbm  |
|                    | Ref Level 20.00 dbm         Offset 1.00 db         RBW         100 kHz           Att         30 db         SWT         250 ms         VBW         300 kHz         Mode Auto Sweep           ● 1Pk Max         M1[1]         -46.85 dBm         16.835000 GHz           10 dBm         0 dBm         16.835000 GHz         16.835000 GHz  |
| CH78               | Ref Level 20.00 dem         Offset 1.00 de         RBW 100 kHz           Att         30 de         SWT         250 ms         VBW 300 kHz         Mode Auto Sweep           Image: SWT         250 ms         VBW 300 kHz         Mode Auto Sweep         -46.85 dBm           Image: SWT         Image: SWT         16.835000 GHz         -46.85 dBm         -46.85 dBm           Image: SWT         Image: SWT         Image: SWT         -46.95 dBm         -46.95 dBm           Image: SWT         Image: SWT         Image: SWT         -46.95 dBm         -46.95 dBm           Image: SWT         Image: SWT         Image: SWT         -46.95 dBm         -46.95 dBm           Image: SWT         Image: SWT         Image: SWT         Image: SWT         -46.95 dBm         -46.95 dBm           Image: SWT         Image: SWT         Image: SWT         Image: SWT         -46.95 dBm   |
| CH78<br>1GHz~26GHz | Ref Level 20.00 dem Offset 1.00 de e RBW 100 kHz         Att       30 de       SWT       250 ms       VBW 300 kHz       Mode Auto Sweep         ● 1Pk Max       M1[1]       -46.85 dBm         10 dBm       16.835000 GHz         0 dBm       0       0         -10 dBm       0       0         -20 dBm       01 -15.540 dBm       0         -30 dBm       0       0   |
|                    | Ref Level 20.00 dem Offset 1.00 de e RBW 100 kHz         Att       30 de       SWT       250 ms       VBW 300 kHz       Mode Auto Sweep         ●1Pk Max       MI[1]       -46.85 dBm       16.835000 GHz         10 dBm       0       0       0       0         0 dBm       0       0       0       0         -10 dBm       0       0       0       0       0         -20 dBm       0       0       0       0       0       0         -40 dBm       0       0       0       0       0       0   |
|                    | Ref Level 20.00 dbm         Offset 1.00 db         RBW         100 kHz           30 db         SWT         250 ms         VBW         300 kHz         Mode Auto Sweep           1Pk Max  |
|                    | Ref Level 20.00 dem Offset 1.00 de e RBW 100 kHz         Att       30 de       SWT       250 ms       VBW 300 kHz       Mode Auto Sweep         I Pk Max       M1[1]       -46.85 dBm         10 dBm       16.835000 GHz         0 dBm       0       0         -10 dBm       0       0         -20 dBm       0       0         -30 dBm       0       0         -40 dBm       0       0         -50 dBm       0       0   |
|                    | Ref Level 20.00 dem         Offset 1.00 de         RBW 100 kHz           30 dB         SWT         250 ms         VBW 300 kHz         Mode Auto Sweep           1Pk Max         10 dBm         16.635000 GHz         16.635000 GHz           0 dBm         0 dBm         0         0         0           -10 dBm         0         0         0         0         0           -30 dB         0         0         0         0         0         0           -30 dB         0         0         0         0         0         0         0           -30 dB         0         0         0         0         0         0         0         0         0           -30 dB         0         <   |
|                    | Ref Level 20.00 dm Offset 1.00 db • RBW 100 kHz         At       30 db       SWT       250 ms       VBW 300 kHz       Mode Auto Sweep         • 1Pk Max       -46.85 dBm       -46.85 dBm       -46.85 dBm         10 dBm       -40 dBm       -40.45 dBm       -46.85 dBm         -30 dBm       -40 dBm       -40.45 dBm       -46.85 dBm         -70 dBm       -40 dBm       -40 dBm       -40 dBm       -40 dBm  |
|                    | Ref Level 20.00 dem Offset 1.00 de RBW 100 kHz         Att       30 de       SWT       250 ms       VBW 300 kHz       Mode Auto Sweep         ●1Pk Max       MI[1]       -46.85 dBm       16.835000 GHz         10 dBm       0       0       0       0       0         0 dBm       0       0       0       0       0       0         -10 dBm       0       0       0       0       0       0       0         -20 dBm       0       0       0       0       0       0       0       0         -30 dBm       0   |

| Test Item:         | SE | Modulation type: 8DPSK   |
|--------------------|----|--|
|                    |    | Spectrum $\boxed{\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$   |
|                    |    | RefLevel 21.00 dBm Offset 1.00 dB ● RBW 100 KHz<br>Att 30 dB SWT 75.9 μs ● VBW 300 kHz Mode Auto FFT<br>● IPk Max  |
|                    |    | M1[1] 3.03 dBm<br>2.4017630 GHz  |
|                    |    |  |
|                    |    |  |
|                    |    | -10 dBm  |
| CH00               |    | -20 dBm  |
| Reference level    |    | -30 d8m  |
|                    |    | -40 dBm  |
|                    |    | -50 dBm  |
|                    |    | 152.080 and when the provide the second of t |
|                    |    | -70 dBm  |
|                    |    | CF 2.402 GHz 691 pts Span 30.0 MHz   |
|                    |    | Measuring- Thirten Mar 1993201   |
|                    |    |  |
| CH00               |    | Spectrum         Imm           Ref Level 20.00 dBm         Offset 1.00 dB ⊕ RBW 100 kHz  |
|                    |    | Att 30 dB SWT 30.1 ms VBW 300 kHz Mode Auto Sweep     OPPk Max     Max     M1[1] -57.54 dBm  |
|                    |    | 10 dBm   |
|                    |    | O dBm  |
|                    |    | -10 dBm  |
|                    |    | -20 dBm  |
|                    |    | -30 d8m  |
| 30MHz~1000MHz      |    |  |
|                    |    | -50 dBm  |
|                    |    | 50 dom. Mil  |
|                    |    | N22424/1/Working multiple and a second processing of second provide second   |
|                    |    |  |
|                    |    | Start 30.0 MHz         30001 pts         Stop 1.0 GHz           Measuring         Measuring         Measuring         Measuring  |
|                    |    |  |
|                    |    | Spectrum (₩  |
|                    |    | RefLevel 20.00 dBm Offset 1.00 dB @ RBW 100 kHz<br>Att 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep<br>Pirk Max  |
|                    |    | M1[1] -46.03 dBm<br>15.895000 GHz  |
|                    |    | 10 dBm   |
|                    |    | O dBm  |
|                    |    | -10 dgm  |
| 01100              |    | -20 dgm D1 -16.970 dBm   |
| CH00<br>1GHz~26GHz |    | -30 dgm  |
|                    |    | -40 d8m  |
|                    |    | -50 dem  |
|                    |    |  |
|                    |    | -70 dBm  |
|                    |    | Start 1.0 GHz         30001 pts         Stap 26.0 GHz  |
|                    |    | Measuring  |

| CH39<br>Reference level   |                 |   |
|---|-----------------|---|
| CH39<br>Reference level   |                 | Spectrum  |
| CH39<br>Reference level   |                 | RefLevel 21.00 dBm Offset 1.00 dB ● RBW 100 kHz<br>● Att 30 dB SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT  |
| CH39<br>Reference level   |                 | IPk Max   |
| CH39<br>Reference level   |                 | 2.4410870 GHz   |
| CH39         Reference level         13 80-<br>19 80-<br>10 10 10 100000-<br>10 10 10 100000-<br>10 10 10 100000-<br>10 10 1000000-<br>10 10 100000-<br>10 10 1000000-<br>10 10 10000  |                 |   |
| CH39<br>Reference level   |                 |   |
| Reference level<br>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  |                 | -10 dBm   |
| Reference level<br>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  | 01120           | -20 dBm   |
| CH39<br>OMHz-1000MHz<br>CH39<br>1GHz-26GHz  |                 |   |
| CH39<br>OMHz-1000MHz  | Reierence ievei | -su uem   |
| CH39<br>OMHZ~1000MHZ  |                 | -40 d8m   |
| CH39<br>OMHz~1000MHz  |                 | -50 dBm   |
| CH39<br>OMHz~1000MHz  |                 | saden   |
| CH39<br>OMHz~1000MHz  |                 |   |
| CH39<br>OMHz~1000MHz CH39 CH39 IGHz~26GHz CH39 IGHz - 26GHz   |                 | -/uusm  |
| CH39<br>OMHz~1000MHz  |                 |   |
| CH39<br>OMHz~1000MHz  |                 | Measuring   |
| CH39<br>OMHz~1000MHz  |                 | Spectrum 🕎  |
| CH39<br>0MHz~1000MHz<br>CH39<br>10 dbm + + + + + + + + + + + + + + + + + + +  |                 | Ref Level         20.00 dBm         Offset         1.00 dB         RBW         100 kHz           Att         30 dB         SWT         30.1 ms         VBW         300 kHz         Mode         Auto Sweep  |
| CH39<br>OMHz~1000MHz<br>CH39<br>OMHz~1000MHz<br>CH39<br>IGHz~26GHz<br>CH39<br>IGHz~26GHz  |                 | ● 1Pk Max   |
| CH39<br>0MHz-1000MHz<br>CH39<br>1GHz~26GHz<br>CH39<br>1GHz~26GHz  |                 | 10 dBm 765.1550 MHz   |
| CH39<br>0MHz-1000MHz $ \begin{bmatrix} 10 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 &$  |                 |   |
| CH39<br>0MHz-1000MHz $ \begin{bmatrix} 1 & 1 & 1 & 3 & 30 & 80 & 1 & 1 & 3 & 30 & 80 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & $  |                 |   |
| CH39<br>0MHz~1000MHz  |                 |   |
| OMHz~1000MHz         40 dbm         40 dbm         40 dbm         41 db  |                 |   |
| OMHz~1000MHz         40 dbm   | CH39            | -30 dBm   |
| Spectrum         Spectrum         Start 30.0 MHz         30001 pts         8tep 1.0 dHz           Spectrum         Spectrum         Start 30.0 MHz         30001 pts         30001 pts         Start 30.0 MHz         30001 pts         Start 30.0 MHz         30001 pts         30   | 30MHz~1000MHz   |   |
| CH39<br>1GHz-26GHz  |                 | -4U 08M   |
| CH39<br>1GHz~26GHz  |                 | -50 dBm M1  |
| Spectrum         Total         Step 1.0 dHz           Ref Level 20.00 dm         Offset 1.00 db         RBW 100 kHz         Att offset 1.00 db         Step 1.0 dHz           10 dbm         0 dbm         M1[1]         -47.19 dbm         -47.19 dbm           10 dbm         0 dbm         M1[1]         -47.19 dbm         -47.19 dbm           10 dbm         0 dbm         M1[1]         -47.19 dbm         -47.19 dbm           10 dbm         0 dbm         0 dbm         -47.19 dbm         -47.19 dbm           10 dbm         0 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm           10 dbm         0 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm           -0 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm           -0 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm           -0 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm           -0 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm         -47.19 dbm           -0 dbm         -40 dbm         -40 dbm         -40 dbm         -40 dbm         -40 dbm           -0 dbm         -40 dbm         -40 dbm         -   |                 | 160 demand and a start barren and the start of the |
| Spectrum         Total         Step 1.0 cHz           Ref Level 20.00 dlm         Offset 1.00 dlle         BBW 100 kHz         Made Auto Sweep           Itel:         Max         -47.19 dlm         -47.19 dlm           10 dlm         M1[1]         -47.19 dlm         -47.19 dlm           10 dlm         M1[1]         -47.19 dlm         -47.19 dlm           -0 dlm         M1[1]         -47.19 dlm         -47.19 dlm           -0 dlm  |                 |   |
| CH39<br>1GHz~26GHz  |                 |   |
| Spectrum         Image: Charge of the standard stand  |                 |   |
| Ref Level 20.00 dm         Offset 1.10 dk         Ref W 100 kkz           30 db         SWT         250 ms         VBW 300 kkz         Mode Auto Sweep           10 dbm         -47.19 dbm         -15.79167 CHz         -47.19 dbm           10 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -10 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -30 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -30 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -70 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -70 dbm         -10 dbm  |                 |   |
| Ref Level 20.00 dm         Offset 1.10 dk         Ref W 100 kkz           30 db         SWT         250 ms         VBW 300 kkz         Mode Auto Sweep           10 dbm         -47.19 dbm         -15.79167 CHz         -47.19 dbm           10 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -10 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -20 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -30 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -30 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -70 dbm         -10 dbm         -10 dbm         -10 dbm         -10 dbm           -70 dbm         -10 dbm  |                 |   |
| CH39<br>1GHz~26GHz  |                 | Spectrum  |
| CH39<br>1GHz~26GHz  |                 | Att 30 dB SWT 250 ms OVBW 300 kHz Mode Auto Sweep   |
| CH39<br>1GHz~26GHz  |                 | M1[1] -47.19 dBm  |
| CH39<br>1GHz~26GHz<br>-00 dBm<br>-30 dBm<br>-50 dB |                 |   |
| CH39<br>1GHz~26GHz  |                 | 0 dBm   |
| CH39<br>1GHz~26GHz  |                 |   |
| CH39<br>1GHz~26GHz  |                 | D1 -15.350 dBm  |
| 1GHz~26GHz  |                 |   |
| -40 dBm50 dBm70 dBm70 dBm70 dBm50 dBm70 dBm50 dBm70 dBm50 dB  |                 | -30 dBm   |
| -50 dBm   | 1GHz~26GHz      | -40 dBm   |
| -30 dBm   |                 | M1  |
| -70 dBm   |                 | -SU GBM   |
| Start 1.0 GHz         30001 pts         Stop 26.0 GHz   |                 |   |
| Start 1.0 GHz         30001 pts         Stop 26.0 GHz   |                 | -70 dBm   |
|   |                 |   |
|   |                 |   |
|   |                 | Measuring   |
|   |                 |   |

|                 | 1 age. 33 01 33 133000. 2010 03 13   |
|-----------------|--|
|                 | Spectrum (₩  |
|                 | Ref Level 21.00 dBm Offset 1.00 dB ● RBW 100 kHz<br>● Att 30 dB SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT  |
|                 | ●1Pk Max M1[1] 3.32 dBm  |
|                 | 10 dBm   |
|                 |  |
|                 | 0 dBm  |
|                 | -10 dBm-   |
| CH78            | -20 dBm  |
| Reference level | -30 dBm  |
|                 | -40 d8m  |
|                 | -50 dBm  |
|                 |  |
|                 | 100 Berling the who have the providence the providence of the prov |
|                 | -70 dBm  |
|                 | CF 2.48 GHz 691 pts Span 30.0 MHz  |
|                 |  |
|                 | Spectrum 🕎   |
|                 | Ref Level         20.00         dBm         Offset         1.00         dB         RBW         100         kHz           Att         30         dB         SWT         30.1 ms         VBW         300 kHz         Mode         Auto Sweep   |
|                 |  |
|                 | 10 dBm   |
|                 | 0 dBm  |
|                 | -10 dBm  |
|                 | 01 -16.680 dBm   |
| CH78            | -20 dBm-   |
| 30MHz~1000MHz   | -30 dBm-   |
|                 | -40 d8m  |
|                 | -50 dBm  |
|                 |  |
|                 | -70 dBm  |
|                 |  |
|                 | Start 30.0 MHz 30001 pts Stop 1.0 GHz  |
|                 |  |
|                 |  |
|                 | Spectrum         Image: Constraint of the sector of t                                  |
|                 | Att 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep  P1Pk Max   |
|                 | 10 dBm   |
|                 |  |
|                 | 0 d8m  |
|                 | -10 dB m   |
|                 | -20 dB m   |
| CH78            | -30 dB m   |
| 1GHz~26GHz      | -40 dBm  |
|                 |  |
|                 |  |
|                 |  |
|                 | -70 dBm-   |
|                 | Start 1.0 GHz         30001 pts         Stop 26.0 GHz  |
|                 | Measuring  |

# 5.11. Spurious Emissions (radiated)

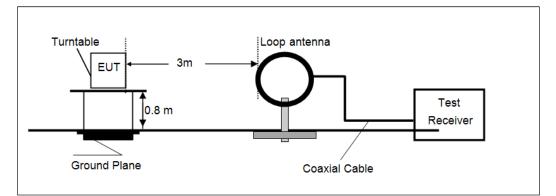
## <u>LIMIT</u>

## FCC CFR Title 47 Part 15 Subpart C Section 15.209

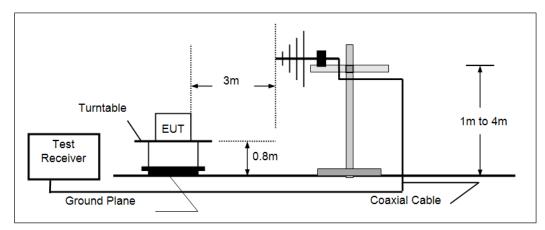
| Frequency         | Limit (dBuV/m @3m) | Value      |  |
|-------------------|--------------------|------------|--|
| 30 MHz ~ 88 MHz   | 40.00              | Quasi-peak |  |
| 88 MHz ~ 216 MHz  | 43.50              | Quasi-peak |  |
| 216 MHz ~ 960 MHz | 46.00              | Quasi-peak |  |
| 960 MHz ~ 1 GHz   | 54.00              | Quasi-peak |  |
| Above 1 GHz       | 54.00              | Average    |  |
|                   | 74.00              | Peak       |  |

# **TEST CONFIGURATION**

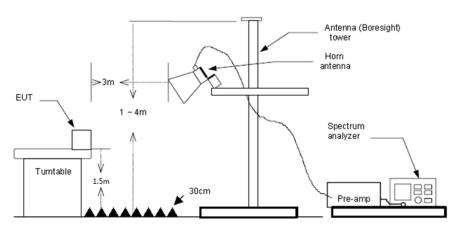
Below 30 MHz



## > 30 MHz ~1000 MHz



> Above 1 GHz



## TEST PROCEDURE

- 1. The EUT was tested according to ANSI C63.10:2013.
- 2. The EUT is placed on a turn table with 0.8 meter above ground for below 1GHz, 1.5 meter above ground for above 1GHz.
- 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
- 4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
- 5. Set to the maximum power setting and enable the EUT transmit continuously.
- 6. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
    - (2) Below 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detectoris 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

 (3) From 1 GHz to 10<sup>th</sup> harmonic: RBW=1 MHz, VBW=3 MHz Peak detector for Peak value RBW=1 MHz, VBW=10 Hz Peak detector for Average value.

#### TEST MODE:

Please refer to the clause 3.3

#### TEST RESULTS

#### Note:

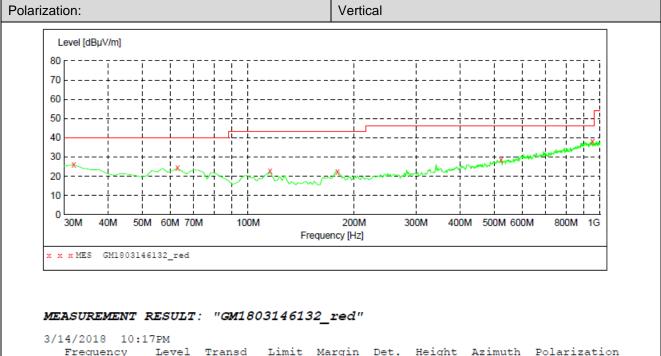
- 1) Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor
- 2) The emission levels of other frequencies are very lower than the limit and not show in test report.
- 3) Below 1 GHz, Have pre-scan all modulation mode, found the GFSK modulation High channel which it was worst case, so only the worst case's data on the test report.
- 4) Above 1 GHz, Have pre-scan all modulation mode, found the GFSK modulation which it was worst case, so only the worst case's data on the test report
- 5) The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

#### ➢ 9 kHz ~ 30 MHz

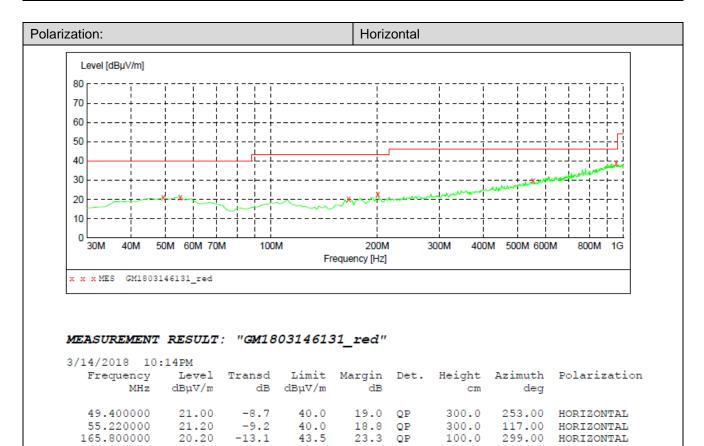
The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

<sup>☑</sup> Passed □ Not Applicable

#### ➢ 30 MHz ~ 1 GHz



| Frequency<br>MHz | Level<br>dBµV/m |       | Limit<br>dBµV/m | Margin<br>dB | Det. | Height<br>cm | Azimuth<br>deg | Polarization |
|------------------|-----------------|-------|-----------------|--------------|------|--------------|----------------|--------------|
| 31.940000        | 26.00           | -13.2 | 40.0            | 14.0         | QP   | 100.0        | 173.00         | VERTICAL     |
| 62.980000        | 24.20           | -10.8 | 40.0            | 15.8         | QP   | 100.0        | 360.00         | VERTICAL     |
| 115.360000       | 22.70           | -11.6 | 43.5            | 20.8         | QP   | 100.0        | 106.00         | VERTICAL     |
| 179.380000       | 22.50           | -12.3 | 43.5            | 21.0         | QP   | 100.0        | 22.00          | VERTICAL     |
| 522.760000       | 28.60           | -1.3  | 46.0            | 17.4         | QP   | 100.0        | 89.00          | VERTICAL     |
| 951.500000       | 38.10           | 7.3   | 46.0            | 7.9          | QP   | 100.0        | 190.00         | VERTICAL     |



Shenzhen Huatongwei International Inspection Co., Ltd.

22.90

29.90

39.00

-9.9

-0.7

7.3

43.5

46.0

46.0

20.6 QP

16.1 QP

7.0 QP

100.0

100.0

300.0

200.720000

553.800000

953.440000

253.00 HORIZONTAL

HORIZONTAL

HORIZONTAL

119.00

257.00

#### ➢ 1 GHz ~ 25 GHz

|                    | CH00                    |                             |                       |                          |                   |                        |                       |              |               |  |  |
|--------------------|-------------------------|-----------------------------|-----------------------|--------------------------|-------------------|------------------------|-----------------------|--------------|---------------|--|--|
| Frequency<br>(MHz) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Preamp<br>Factor<br>(dB) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) | Polarization | Test<br>value |  |  |
| 1395.80            | 39.50                   | 25.91                       | 4.99                  | 36.46                    | 33.94             | 74.00                  | -40.06                | Vertical     | Peak          |  |  |
| 3184.25            | 37.72                   | 28.80                       | 7.70                  | 38.20                    | 36.02             | 74.00                  | -37.98                | Vertical     | Peak          |  |  |
| 4797.27            | 35.83                   | 31.59                       | 9.54                  | 36.96                    | 40.00             | 74.00                  | -34.00                | Vertical     | Peak          |  |  |
| 7961.43            | 31.58                   | 36.95                       | 12.49                 | 34.63                    | 46.39             | 74.00                  | -27.61                | Vertical     | Peak          |  |  |
| 1392.25            | 35.34                   | 25.92                       | 4.99                  | 36.46                    | 29.79             | 74.00                  | -44.21                | Horizontal   | Peak          |  |  |
| 3507.65            | 34.36                   | 29.02                       | 8.13                  | 38.40                    | 33.11             | 74.00                  | -40.89                | Horizontal   | Peak          |  |  |
| 5518.20            | 31.60                   | 31.88                       | 10.21                 | 36.25                    | 37.44             | 74.00                  | -36.56                | Horizontal   | Peak          |  |  |
| 7432.62            | 30.75                   | 36.23                       | 12.18                 | 34.85                    | 44.31             | 74.00                  | -29.69                | Horizontal   | Peak          |  |  |

|                    | CH39                    |                             |                       |                          |                   |                        |                       |              |               |  |  |
|--------------------|-------------------------|-----------------------------|-----------------------|--------------------------|-------------------|------------------------|-----------------------|--------------|---------------|--|--|
| Frequency<br>(MHz) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Preamp<br>Factor<br>(dB) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) | Polarization | Test<br>value |  |  |
| 1198.10            | 46.23                   | 26.29                       | 4.66                  | 36.57                    | 40.61             | 74.00                  | -33.39                | Vertical     | Peak          |  |  |
| 1988.33            | 47.41                   | 26.19                       | 6.25                  | 37.29                    | 42.56             | 74.00                  | -31.44                | Vertical     | Peak          |  |  |
| 4785.08            | 36.93                   | 31.54                       | 9.53                  | 36.98                    | 41.02             | 74.00                  | -32.98                | Vertical     | Peak          |  |  |
| 7117.84            | 37.93                   | 35.71                       | 11.86                 | 34.96                    | 50.54             | 74.00                  | -23.46                | Vertical     | Peak          |  |  |
| 1195.05            | 38.07                   | 26.26                       | 4.65                  | 36.57                    | 32.41             | 74.00                  | -41.59                | Horizontal   | Peak          |  |  |
| 1993.40            | 36.37                   | 26.24                       | 6.26                  | 37.29                    | 31.58             | 74.00                  | -42.42                | Horizontal   | Peak          |  |  |
| 4582.42            | 33.71                   | 30.87                       | 9.43                  | 37.26                    | 36.75             | 74.00                  | -37.25                | Horizontal   | Peak          |  |  |
| 5732.97            | 33.63                   | 31.77                       | 10.48                 | 35.50                    | 40.38             | 74.00                  | -33.62                | Horizontal   | Peak          |  |  |

| CH78               |                         |                             |                       |                          |                   |                        |                       |              |               |  |
|--------------------|-------------------------|-----------------------------|-----------------------|--------------------------|-------------------|------------------------|-----------------------|--------------|---------------|--|
| Frequency<br>(MHz) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Preamp<br>Factor<br>(dB) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) | Polarization | Test<br>value |  |
| 1791.27            | 44.86                   | 25.38                       | 5.94                  | 37.12                    | 39.06             | 74.00                  | -34.94                | Vertical     | Peak          |  |
| 3192.37            | 36.81                   | 28.80                       | 7.71                  | 38.20                    | 35.12             | 74.00                  | -38.88                | Vertical     | Peak          |  |
| 5125.52            | 31.15                   | 31.80                       | 9.77                  | 36.27                    | 36.45             | 74.00                  | -37.55                | Vertical     | Peak          |  |
| 8571.38            | 32.08                   | 37.19                       | 12.88                 | 34.48                    | 47.67             | 74.00                  | -26.33                | Vertical     | Peak          |  |
| 1597.40            | 37.47                   | 24.92                       | 5.56                  | 36.72                    | 31.23             | 74.00                  | -42.77                | Horizontal   | Peak          |  |
| 4086.46            | 33.34                   | 29.87                       | 8.85                  | 37.91                    | 34.15             | 74.00                  | -39.85                | Horizontal   | Peak          |  |
| 6125.24            | 31.16                   | 32.60                       | 10.88                 | 35.35                    | 39.29             | 74.00                  | -34.71                | Horizontal   | Peak          |  |
| 8002.06            | 32.75                   | 37.10                       | 12.30                 | 34.53                    | 47.62             | 74.00                  | -26.38                | Horizontal   | Peak          |  |

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

3. The emission levels of other frequencies are very lower than the limit and not show in test report.

# 6. TEST SETUP PHOTOS

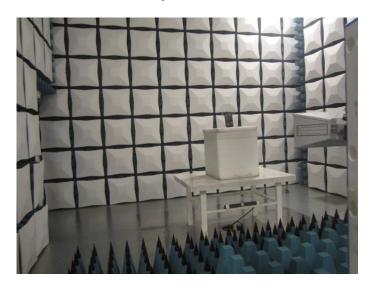
Conducted Emissions (AC Mains)



## Radiated Emissions







# 7. EXTERANAL AND INTERNAL PHOTOS

Reference to the test report No.: TRE1803002801.

-----End of Report------