# FCC 47 CFR PART 15 SUBPART C &
# INDUSTRY CANADA RSS-247 ISSUE 2 February 2017

## CERTIFICATION TEST REPORT

*For*

Product Name: 5" Video Baby Monitor

Model No.: COMFORT75BU

Trademark: motorola

FCC ID: VLJ-CF75BU

IC: 4522A-CF75BU

HVIN: COMFORT75BU

Report No.: ES181024005W

Issue Date: November 15, 2018

*Prepared for*

**Binatone Electronics International Ltd.**
Floor 23A, 9 Des Voeux Road West, Sheung Wan, Hong Kong

*Prepared by*

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# Table of Contents

# 1 TEST RESULT CERTIFICATION

| | |
|---|---|
| Applicant: | Binatone Electronics International Ltd.<br>Floor 23A, 9 Des Voeux Road West, Sheung Wan, Hong Kong |
| Manufacturer: | Foshan Shunde Alford Electronics Co., Ltd.<br>Xinjiao Industrial Park, DaLiang, ShunDe, Foshan, China |
| Product Description: | 5" Video Baby Monitor |
| Model Number: | COMFORT75BU |

Measurement Procedure Used:

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULT** |
| FCC 47 CFR Part 2, Subpart J<br>FCC 47 CFR Part 15, Subpart C<br>RSS-247 Issue2, February 2017<br>RSS-Gen, Issue5, April 2018 | **PASS** |

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2, Part 15.247, IC RSS-247 IC RSS-GEN.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : September 26, 2018 to October 28, 2017

Prepared by : Yaping Shen

Yaping Shen /Editor

Reviewer : Joe Xia

Joe Xia /Supervisor

EMTEK (SHENZHEN) CO., LTD. TESTING

Approve & Authorized Signer :

Lisa Wang/Manager

## 2 EUT TECHNICAL DESCRIPTION

The EUT is a Baby Unit (Camera) which supports 2.4GHz FHSS wireless technology.

| Characteristics | Description |
|---|---|
| **Device Type:** | FHSS |
| **Modulation:** | GFSK |
| **Operating Frequency Range(s):** | 2415.375 - 2471.625 MHz |
| **Number of Channels:** | 21 channels |
| **Channel Spacing:** | 2.25 / 3.375 / 4.5 MHz |
| **Transmit Power Max:** | 18.14 dBm |
| **Antenna Type:** | Integral antenna |
| **Antenna Gain:** | 0 dBi |
| **Operating Voltage:** | DC 5.0V 1000mA input via AC/DC adapter |
| **Adapter 1#:** | Model: S005BNU0500100 (Tenpao)<br>Input: AC 100-240V~50/60Hz, 150mA<br>Output: DC 5.0V@1000mA |
| **Adapter 2#:** | Model: TPA-468050100UU (TianYin)<br>Input: AC 100-240V~50/60Hz, 0.2mA<br>Output: DC 5.0V@1000mA |

***Note:*** *for more details, please refer to the User's manual of the EUT.*

# 3 SUMMARY OF TEST RESULT

| FCC&IC Part Clause | Test Parameter | Verdict |
|---|---|---|
| FCC Part 15.247(a)(1)<br>RSS-247 Clause 5.1(a) | 20 dB Bandwidth | PASS |
| FCC Part 15.247(a)(1)<br>RSS-247 Clause 5.1(b) | Carrier Frequency Separation | PASS |
| FCC Part 15.247(a)(1)(iii)<br>RSS-247 Clause 5.1(d) | Number of Hopping Frequencies | PASS |
| FCC Part 15.247(a)(1)<br>RSS-247 Clause 5.4(b) | Average Time of Occupancy (Dwell Time) | PASS |
| FCC Part 15.247(b)1<br>RSS-247 Clause 5.4(b) | Maximum Peak Conducted Output Power and EIRP Power | PASS |
| FCC Part 15.247(d)<br>RSS-247 Clause 5.5 | Unwanted emissions | PASS |
| FCC Part 15.247(d) & FCC Part 15.209 & FCC Part 15.205<br>RSS-247 Clause 3.3 | Radiated Spurious Emissions | PASS |
| FCC Part 15.207<br>RSS-Gen Clause 8.8 | Conducted Emission | PASS |
| FCC Part 15.203<br>RSS-Gen Clause 6.8 | Antenna Application | PASS |
| RSS-Gen Clause 6.7 | 99% Occupied Bandwidth | PASS |
| NOTE1: N/A (Not Applicable) | | |

# 4 TEST METHODOLOGY

## 4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart C
ANSI C63.10: 2013
DA 00-705
RSS-Gen, Issue 5 April 2018
RSS-247, Issue 2 February 2017.

## 4.2 MEASUREMENT EQUIPMENT USED

### 4.2.1 Conducted Emission Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | DUE CAL. |
|---|---|---|---|---|---|
| Test Receiver | Rohde & Schwarz | ESCS30 | 828985/018 | 05/19/2018 | 05/20/2019 |
| L.I.S.N. | Schwarzbeck | NNLK8129 | 8129203 | 05/19/2018 | 05/20/2019 |
| 50Ω Coaxial Switch | Anritsu | MP59B | M20531 | N/A | N/A |
| Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 100006 | 05/19/2018 | 05/20/2019 |

### *4.2.2* Radiated Emission Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | DUE CAL. |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESU | 1302.6005.26 | 05/19/2018 | 05/20/2019 |
| Pre-Amplifier | HP | 8447D | 2944A07999 | 05/19/2018 | 05/20/2019 |
| Bilog Antenna | Schwarzbeck | VULB9163 | 142 | 05/19/2018 | 05/20/2019 |
| Loop Antenna | ARA | PLA-1030/B | 1029 | 05/19/2018 | 05/20/2019 |
| Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA9170399 | 05/19/2018 | 05/20/2019 |
| Horn Antenna | Schwarzbeck | BBHA 9120 | D143 | 05/19/2018 | 05/20/2019 |
| Cable | Schwarzbeck | AK9513 | ACRX1 | 05/19/2018 | 05/20/2019 |
| Cable | Rosenberger | N/A | FP2RX2 | 05/19/2018 | 05/20/2019 |
| Cable | Schwarzbeck | AK9513 | CRPX1 | 05/19/2018 | 05/20/2019 |
| Cable | Schwarzbeck | AK9513 | CRRX2 | 05/19/2018 | 05/20/2019 |

### 4.2.3 Radio Frequency Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | DUE CAL. |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4407B | 88156318 | 05/19/2018 | 05/20/2019 |
| Power meter | Anritsu | ML2495A | 0824006 | 05/19/2018 | 05/20/2019 |
| Power sensor | Anritsu | MA2411B | 0738172 | 05/19/2018 | 05/20/2019 |
| Spectrum Analyzer | Agilent | N9010A | My53470879 | 05/19/2018 | 05/20/2019 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

### 4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.
The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Frequency and Channel list:

| RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| **01** | **2415.375** | 08 | 2435.625 | 15 | 2454.750 |
| 02 | 2418.750 | 09 | 2437.875 | 16 | 2458.125 |
| 03 | 2423.250 | 10 | 2440.125 | 17 | 2460.375 |
| 04 | 2426.625 | **11** | **2443.500** | 18 | 2462.625 |
| 05 | 2428.875 | 12 | 2445.750 | 19 | 2466.000 |
| 06 | 2431.125 | 13 | 2449.125 | 20 | 2468.250 |
| 07 | 2433.375 | 14 | 2451.375 | **21** | **2471.625** |

# 5 FACILITIES AND ACCREDITATIONS

## 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

## 5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab. **:** Accredited by CNAS, 2016.10.24
The certificate is valid until 2022.10.28
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006(identical to ISO/IEC17025: 2005)
The Certificate Registration Number is L2291

**:** Accredited by TUV Rheinland Shenzhen, 2010.5.25
The Laboratory has been assessed according to the requirements ISO/IEC 17025.

**:** Accredited by FCC, August 06, 2018
The certificate is valid until August 07, 2020
Designation Number: CN1204
Test Firm Registration Number: 882943

**:** Accredited by Industry Canada, November 24, 2015
The Certificate Registration Number is 4480A-2

# 6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

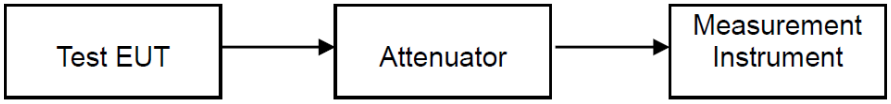
| Parameter | Uncertainty |
|---|---|
| Radio Frequency | ±1x10^-5 |
| Maximum Peak Output Power Test | ±1.0dB |
| Conducted Emissions Test | ±2.0dB |
| Radiated Emission Test | ±2.0dB |
| Occupied Bandwidth Test | ±1.0dB |
| Band Edge Test | ±3dB |
| All emission, radiated | ±3dB |
| Antenna Port Emission | ±3dB |
| Temperature | ±0.5℃ |
| Humidity | ±3% |

Measurement Uncertainty for a level of Confidence of 95%

# 7 SETUP OF EQUIPMENT UNDER TEST

## 7.1 RADIO FREQUENCY TEST SETUP 1

The EUT component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.




## 7.2 RADIO FREQUENCY TEST SETUP 2

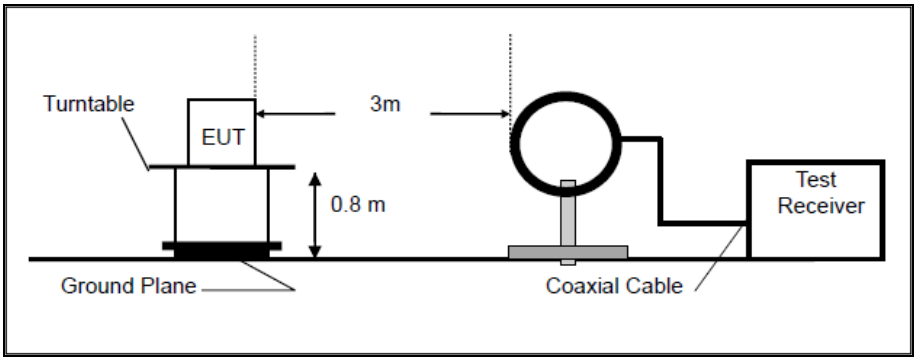
The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz：
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

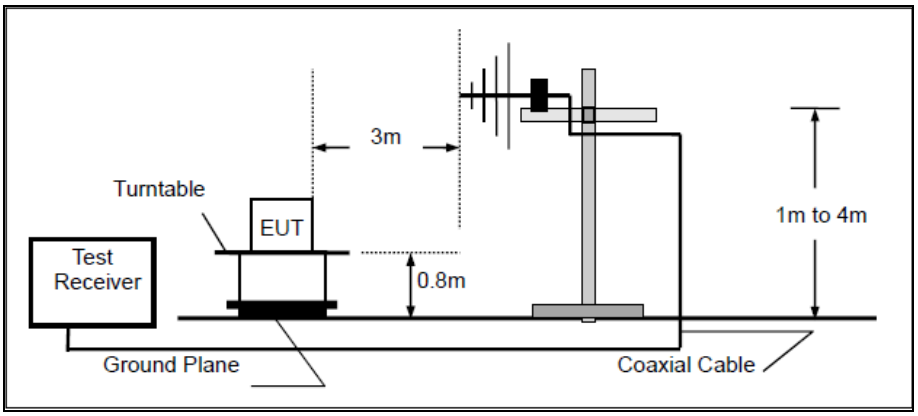
Above 30MHz：
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:
(Note: the FCC's permission to use 1.5 m as an alternative per TCBC Conf call of Dec. 2, 2014.)
The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

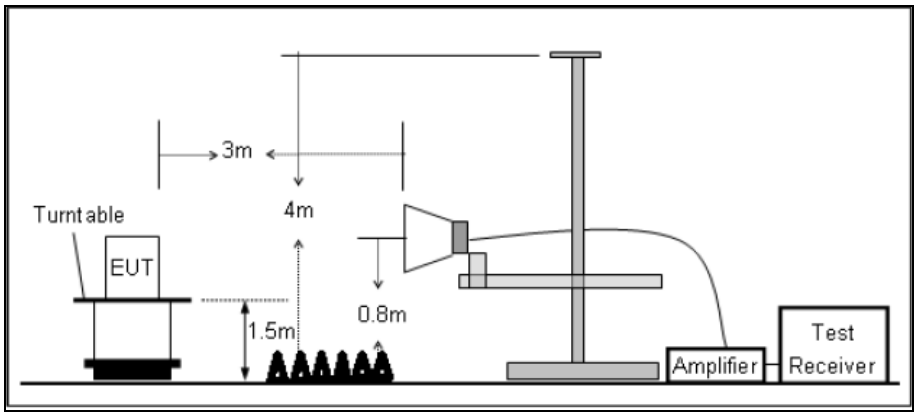
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz




(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

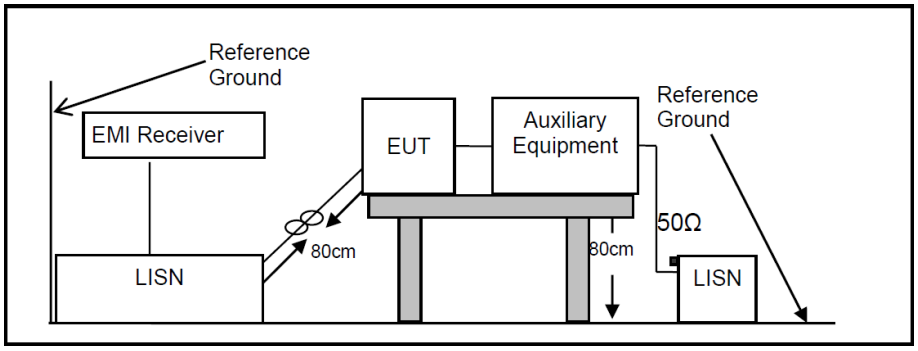


### 7.3 CONDUCTED EMISSION TEST SETUP

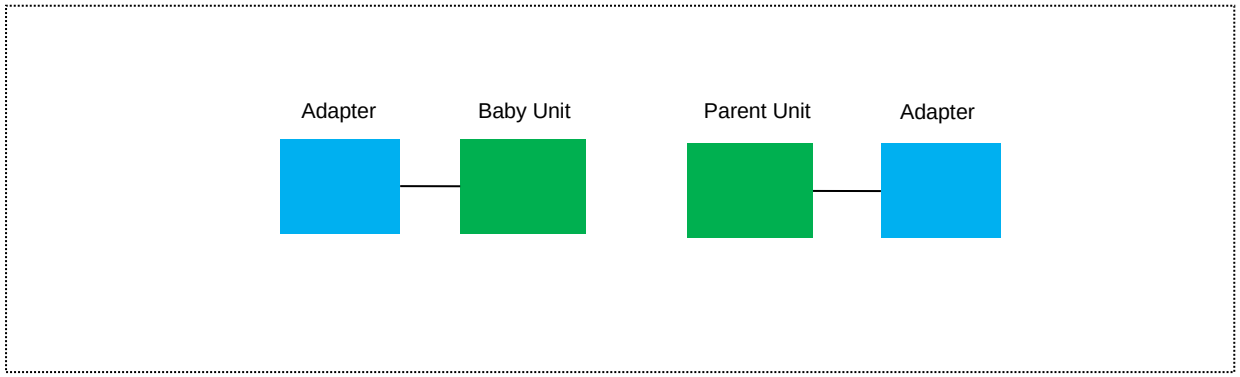
The mains cable of the EUT (Perfect Share Mini) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.8 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



## 7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM




## 7.5 SUPPORT EQUIPMENT

| Item | Equipment | Mfr/Brand | Model/Type No. | S/N | Note |
|---|---|---|---|---|---|
| 1. | 5" Video Baby Monitor | motorola | COMFORT75PU | N/A | N/A |

***Notes:***

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

# 8 TEST REQUIREMENTS

## 8.1 20DB BANDWIDTH

### 8.1.1 Applicable Standard

According to FCC Part 15.247(a)(1) and RSS-247 Clause 5.1(a)

### 8.1.2 Conformance Limit

No limit requirement.

### 8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.1.4 Test Procedure

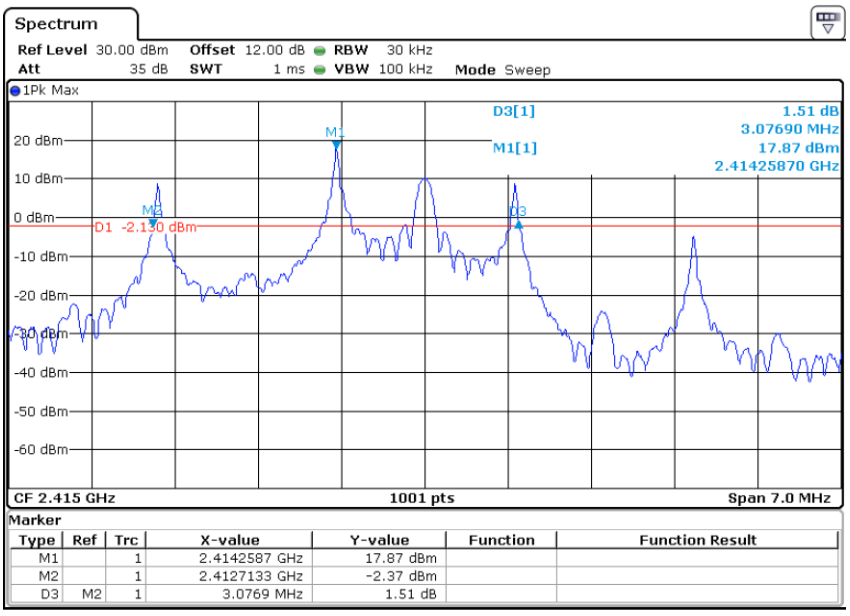
The EUT was operating in mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.
The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
Set to the maximum power setting and enable the EUT transmit continuously
Set RBW = 1%-5% OBW
Set the video bandwidth (VBW) = 3 * RBW
Set Span= approximately 2 to 3 times the 20 dB bandwidth
Set Detector = Peak.
Set Trace mode = max hold.
Set Sweep = auto couple.
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the markerdelta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.
If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.
Measure and record the results in the test report.

**Test Results**

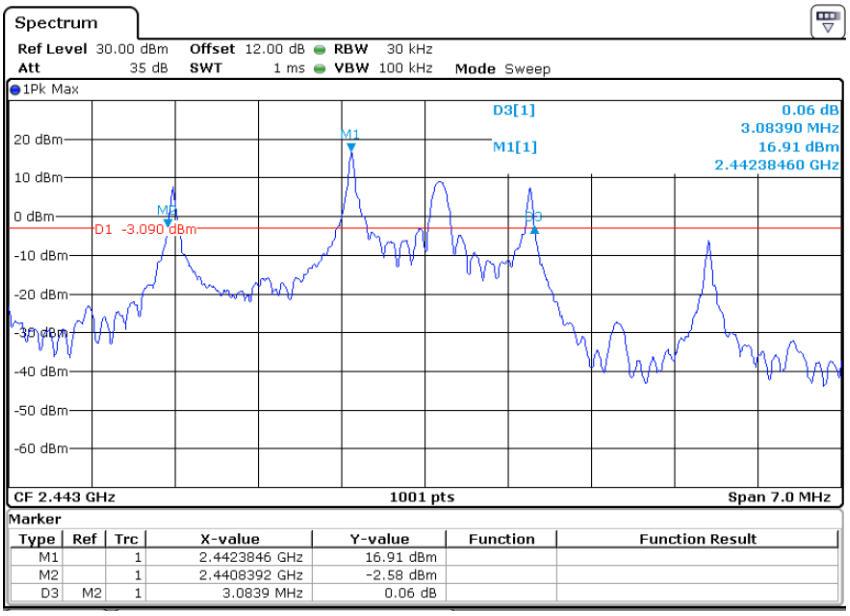
| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 24, 2018 |
| Humidity: | 53 % | Test By: | King Kong |

| Modulation Mode | Channel Number | Channel Frequency (MHz) | 20dB Bandwidth (MHz) | Limit (kHz) | Verdict |
|---|---|---|---|---|---|
| GFSK | 01 | 2415.375 | 3.07 | N/A | PASS |
| | 11 | 2443.500 | 3.08 | N/A | PASS |
| | 21 | 2471.625 | 3.08 | N/A | PASS |
| Note: N/A (Not Applicable) | | | | | |

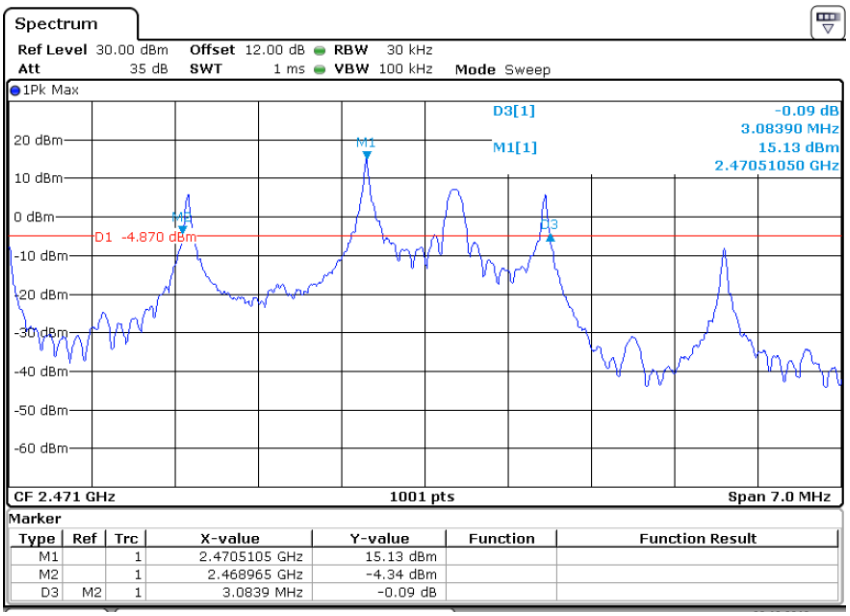
| Test Model | 20dB Bandwidth<br>Channel 01: 2415.375MHz GFSK Modulation |
|---|---|




| Test Model | 20dB Bandwidth<br>Channel 11: 2443.500MHz GFSK Modulation |
|---|---|



| Test Model | 20dB Bandwidth<br>Channel 21: 2471.625MHz | GFSK Modulation |
|---|---|---|



## 8.2 99%BANDWIDTH

### 8.2.1 Applicable Standard

According to RSS-Gen Clause 6.7

### 8.2.2 Conformance Limit

No limit requirement.

### 8.2.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.2.4 Test Procedure

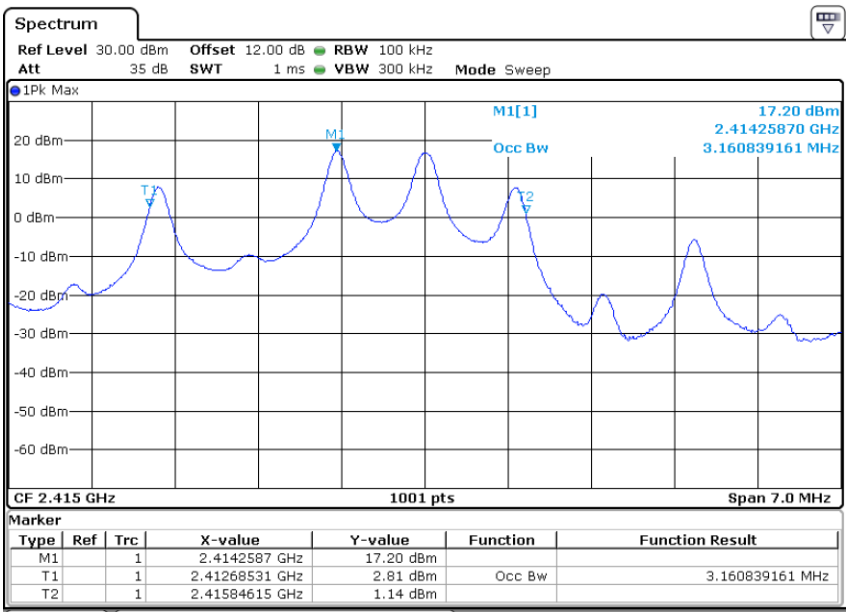
The EUT was operating in fixed frequency mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.
The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
Set to the maximum power setting and enable the EUT transmit continuously
Set RBW = 1%-5% OBW
Set the video bandwidth (VBW) ≥100kHz.
Set Span= approximately 2 to 3 times the 20 dB bandwidth
Set Detector = Peak.
Set Trace mode = max hold.
Set Sweep = auto couple.
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize.Use the marker-to-peak function to set the marker to the peak of the emission. Use themarker-delta function to measure 20 dB down one side of the emission. Reset the markerdeltafunction, and move the marker to the other side of the emission, until it is (asclose as possible to) even with the reference marker level. The marker-delta reading atthis point is the 20 dB bandwidth of the emission.
If this value varies with differentmodes of operation (e.g., data rate, modulation format, etc.), repeat this test for eachvariation.
Measure and record the results in the test report.

**Test Results**

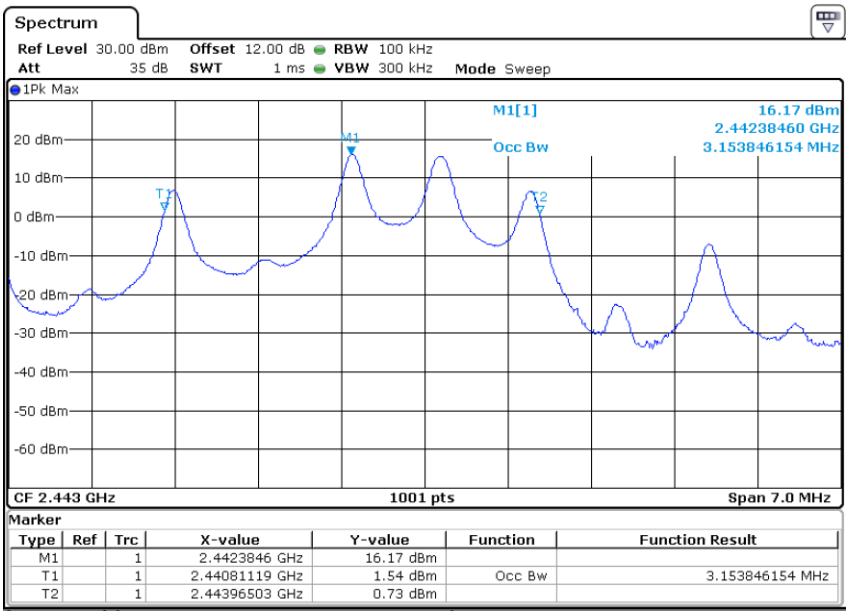
| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 24, 2018 |
| Humidity: | 53 % | Test By: | KK |

| Modulation Mode | Channel Number | Channel Frequency (MHz) | 99% Measurement Bandwidth(MHz) | Verdict |
|---|---|---|---|---|
| GFSK | 01 | 2415.375 | 3.16 | PASS |
| | 11 | 2443.500 | 3.15 | PASS |
| | 21 | 2471.625 | 3.17 | PASS |
| | | | | |

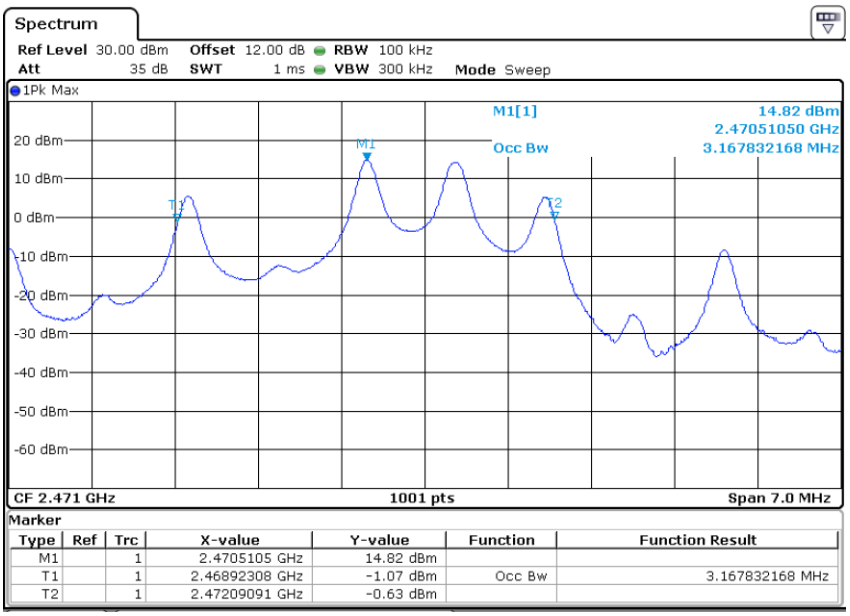
| Test Model | 99% Bandwidth<br>Channel 01: 2415.375MHz GFSK Modulation |
|---|---|




| Test Model | 99% Bandwidth<br>Channel 11: 2443.500MHz GFSK Modulation |
|---|---|



| Test Model | 99% Bandwidth<br>Channel 21: 2471.625MHz | GFSK Modulation |
|---|---|---|



## 8.3 CARRIER FREQUENCY SEPARATION

### 8.3.1 Applicable Standard

According to FCC Part 15.247(a)(1) and RSS-247 Clause 5.1(b)

### 8.3.2 Conformance Limit

Frequency hopping systems operating in the 2400-2483.5MHz band shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.
In case of an output power less than 125mW, the frequency hopping system may have channels separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

### 8.3.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.3.4 Test Procedure

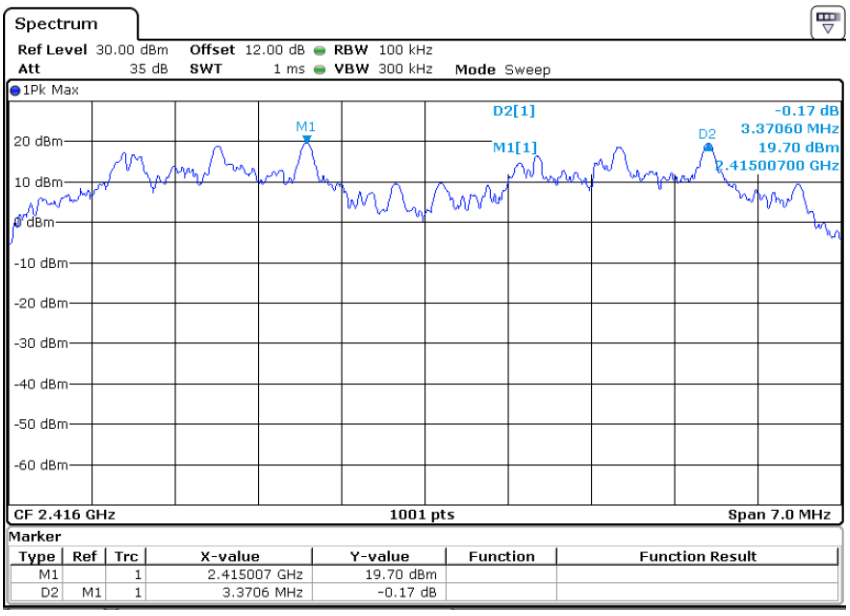
■ According to FCC Part15.247(a)(1)& According to RSS-247 Clause 5.1(b)
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Set the RBW =100kHz.
Set VBW =300kHz.
Set the span = wide enough to capture the peaks of two adjacent channels
Set Sweep time = auto couple.
Set Detector = peak.
Set Trace mode = max hold.
Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

**Test Results**

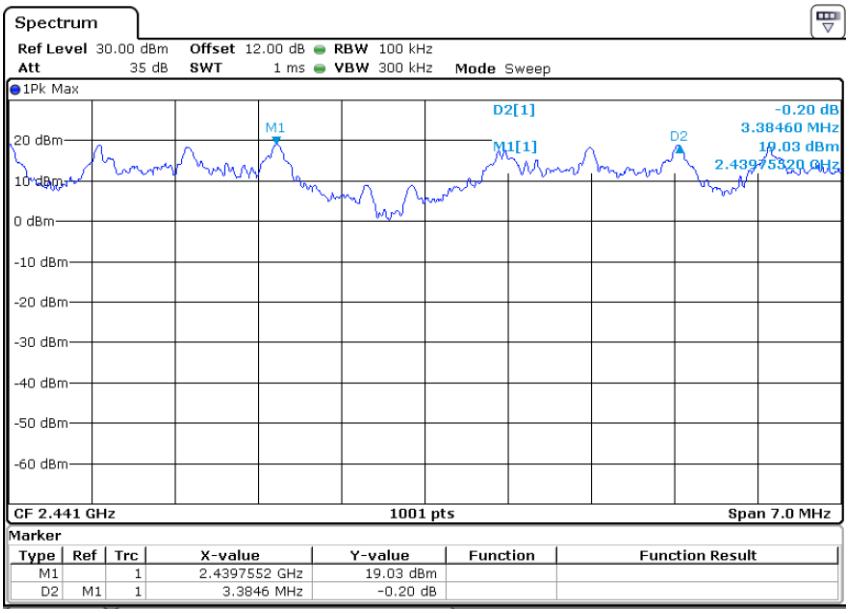
| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 24, 2018 |
| Humidity: | 53 % | Test By: | King Kong |

| Modulation Mode | Channel Number | Channel Frequency (MHz) | Channel Seperation (MHz) | Limit (MHz) | Verdict |
|---|---|---|---|---|---|
| GFSK | 01 | 2415.375 | 3.37 | >2.0 | PASS |
| | 11 | 2443.500 | 3.38 | >2.1 | PASS |
| | 21 | 2471.625 | 3.38 | >2.1 | PASS |
| Note: Limit = 20dB bandwidth * 2/3, if it is greater than 25kHz and the output power is less than 125mW (21dBm). | | | | | |

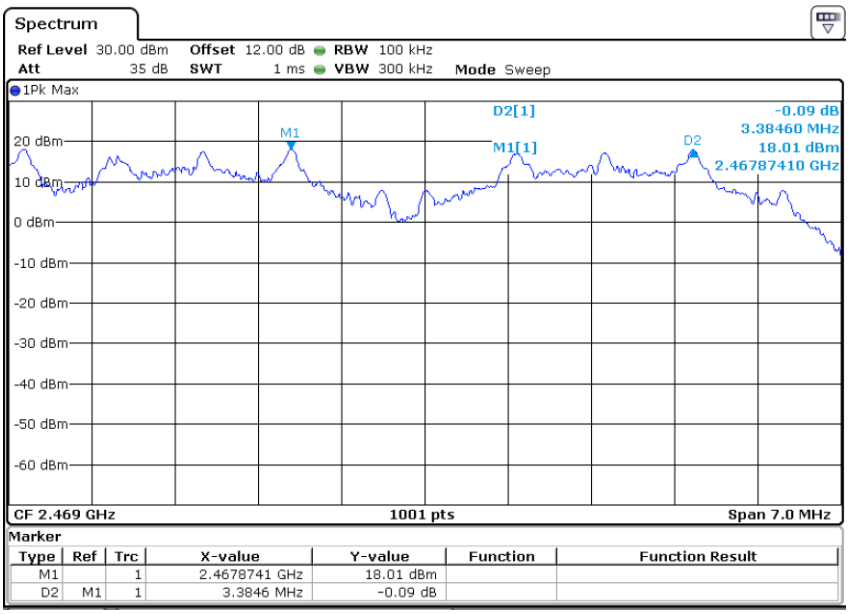
| Test Model | Carrier Frequency Separation<br>Channel 01: 2415.375MHz GFSK Modulation |
|---|---|




| Test Model | Carrier Frequency Separation<br>Channel 11: 2443.500MHz GFSK Modulation |
|---|---|



| Test Model | Carrier Frequency Separation<br>Channel 21: 2471.625MHz | GFSK Modulation |
|---|---|---|



## 8.4 NUMBER OF HOPPING FREQUENCIES

### 8.4.1 Applicable Standard

According to FCC Part 15.247(a)(1)(iii) and RSS-247 Clause 5.1(d)

### 8.4.2 Conformance Limit

Frequency hopping systems operating in the 2400-2483.5MHz band shall use at least 15 channels.

### 8.4.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.4.4 Test Procedure

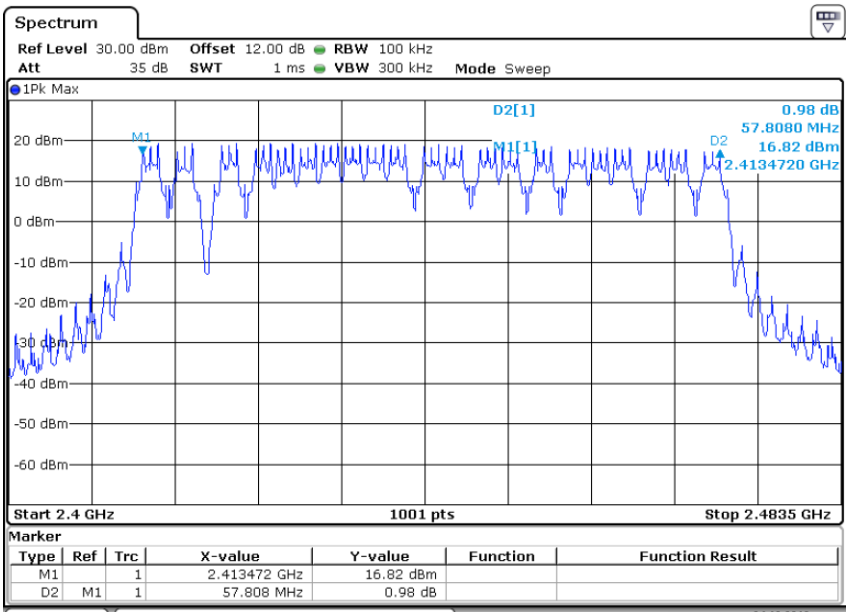
According to FCC Part15.247(a)(1)(iii) and RSS-247 Clause 5.1(d)
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = the frequency band of operation (2400-2483.5MHz)
RBW ≥ 100KHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies.

**Test Results**

| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 24, 2018 |
| Humidity: | 53 % | Test By: | King Kong |

| Hopping Channel Frequency Range | Quantity of Hopping Channel | Quantity of Hopping Channel limit |
|---|---|---|
| 2415.375MHz-2471.625MHz | 21 | ＞15 |

| Test Model | Number Of Hopping Frequencies<br>Span: 2400-2483.5MHz |
|---|---|



## 8.5 AVERAGE TIME OF OCCUPANCY (DWELL TIME)

### 8.5.1 Applicable Standard

According to FCC Part 15.247(a)(1)(iii) and RSS-247 Clause 5.4(d)

### 8.5.2 Conformance Limit

For frequency hopping systems operating in the 2400-2483.5MHz band, the average time of occupancy on any channel shall not be greater than 0.4s within a period of 0.4s multiplied by the number of hopping channels employed.

### 8.5.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.5.4 Test Procedure

■ According to FCC Part15.247(a)(1)(iii) and RSS-247 Clause 5.4(d)

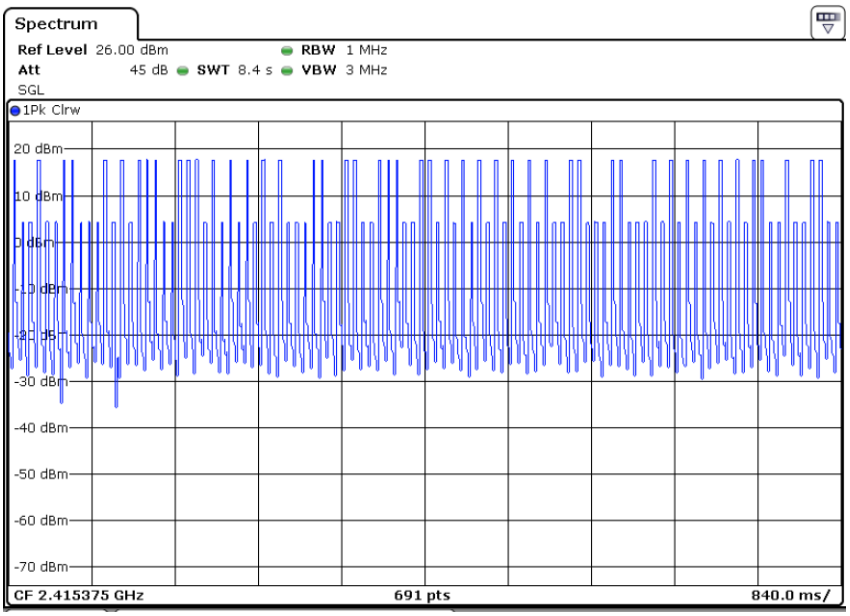
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = zero span, centered on a hopping channel
RBW = 1 MHz
VBW ≥ RBW
Sweep = as necessary to capture the entire dwell time per hopping channel
Detector function = peak
Trace = max hold
If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section.

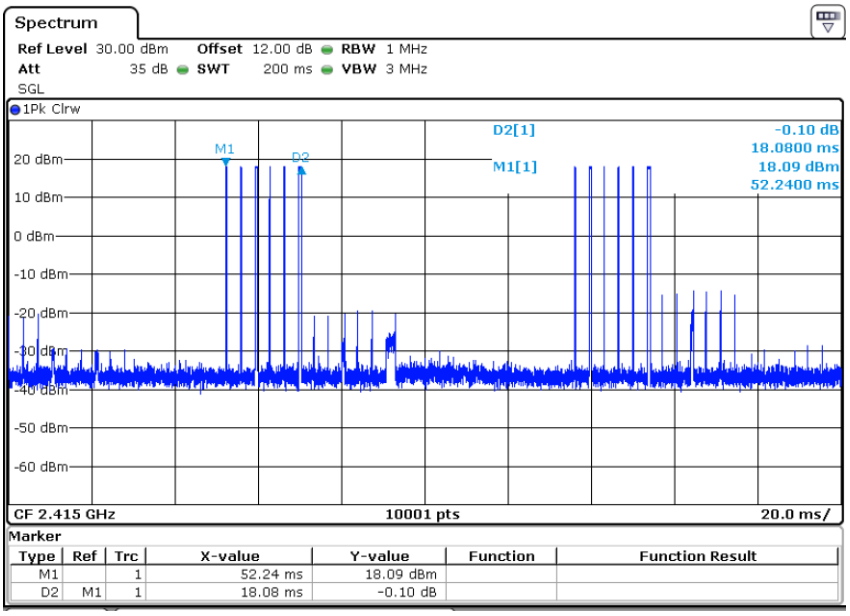
### 8.5.5 Test Results

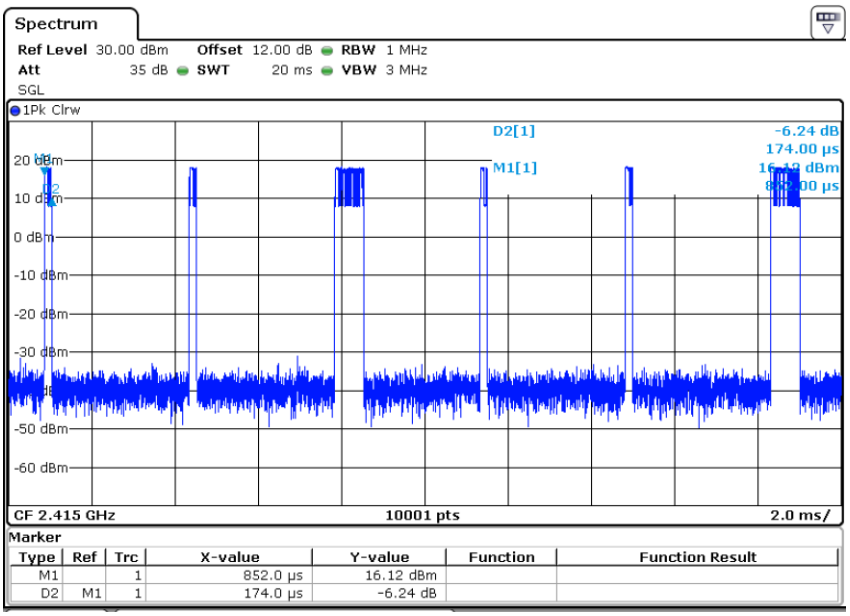
| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 24, 2018 |
| Humidity: | 53 % | Test By: | King Kong |

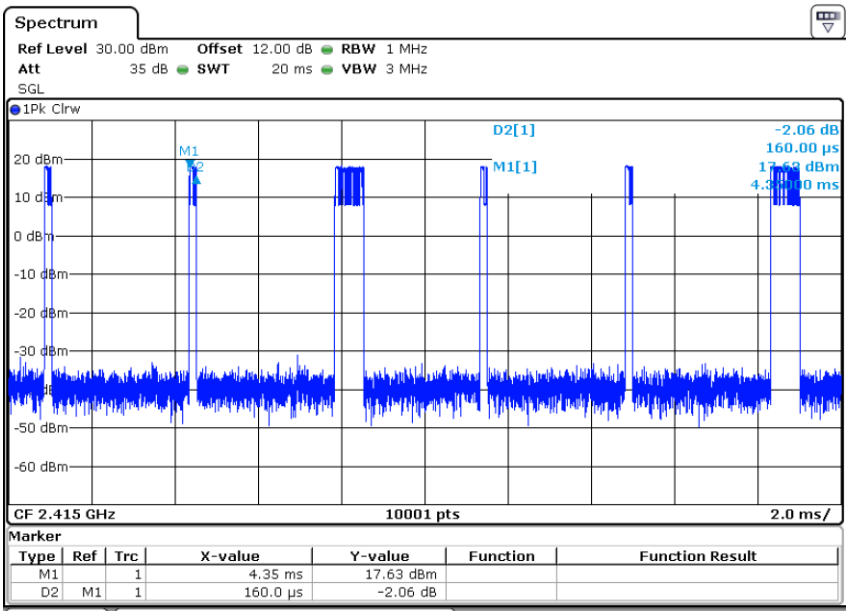
| Modulation Mode | Channel Number | Channel Frequency (MHz) | Pulse widths(ms) | Dwell Time (ms) | Limit (ms) | Verdict |
|---|---|---|---|---|---|---|
| GFSK | 01 | 2415.375 | 2.048 | 98.304 | <400 | PASS |
| | 11 | 2443.500 | 1.608 | 41.808 | <400 | PASS |
| | 21 | 2471.625 | 2.106 | 111.618 | <400 | PASS |
| Note:<br>Dwell Time(ms)= pulse widths* Sum of pulse widths<br>Period(s)=0.4* number of hopping channels | | | | | | |

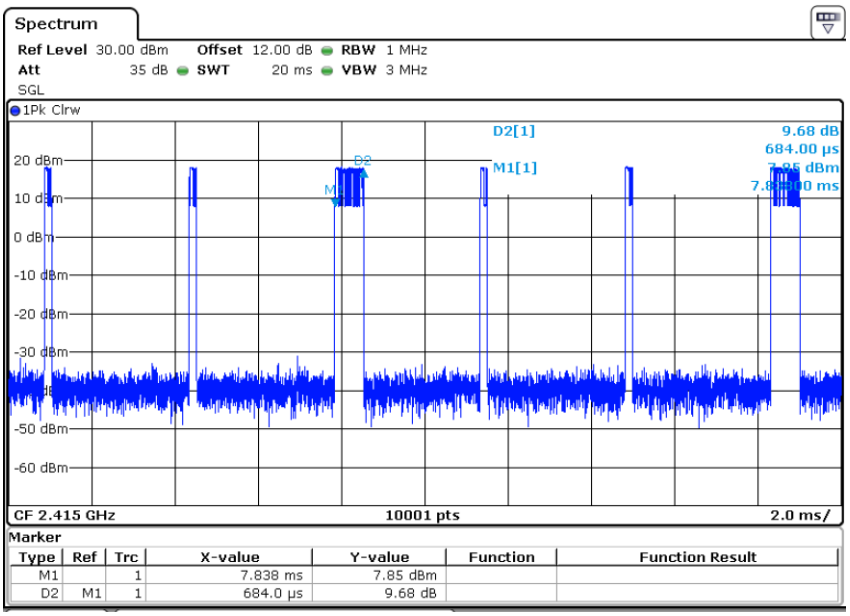
| Test Model | AVERAGE TIME OF OCCUPANCY<br>Channel 01: 2415.375MHz GFSK Modulation |
|---|---|

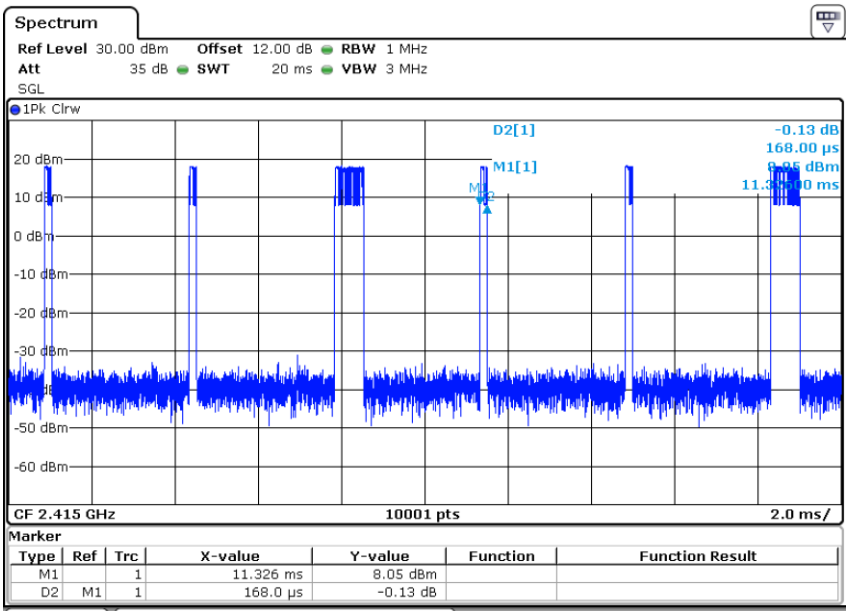


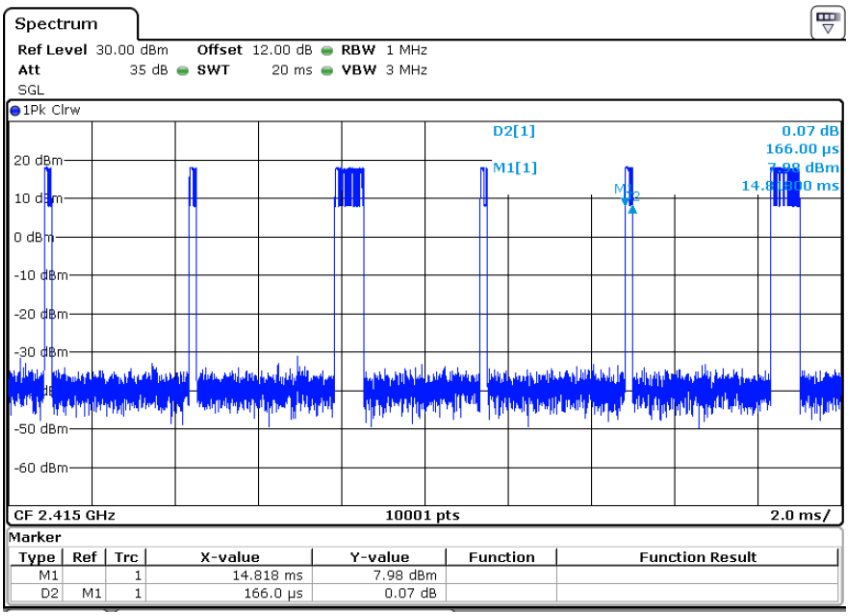



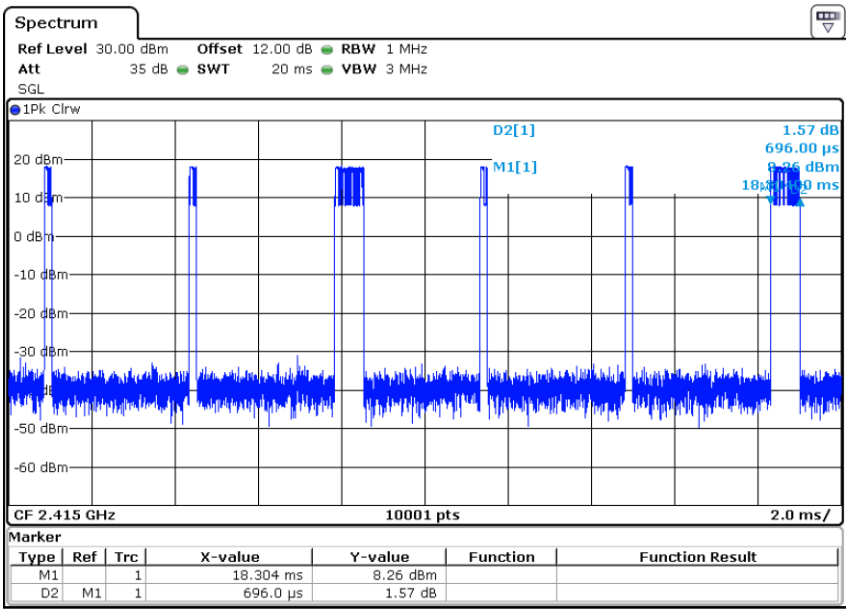

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 20 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] -6.24 dB
174.00 µs
M1[1]
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.415 GHz
10001 pts
2.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 852.0 µs 16.12 dBm
D2 M1 1 174.0 µs -6.24 dB


Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 20 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] -2.06 dB
160.00 µs
M1[1]
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.415 GHz
10001 pts
2.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 4.35 ms 17.63 dBm
D2 M1 1 160.0 µs -2.06 dB

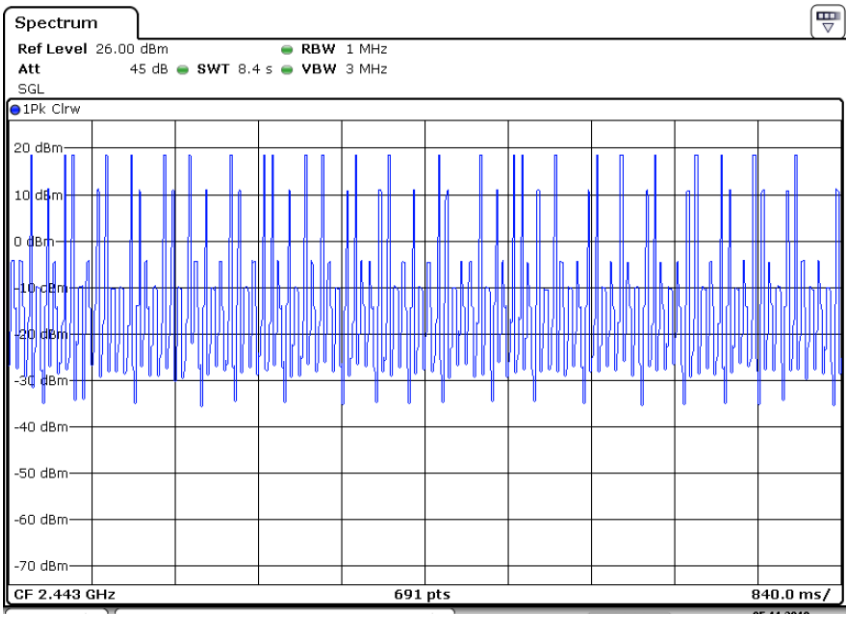

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 20 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] 9.68 dB
684.00 µs
M1[1]
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.415 GHz
10001 pts
2.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 7.838 ms 7.85 dBm
D2 M1 1 684.0 µs 9.68 dB

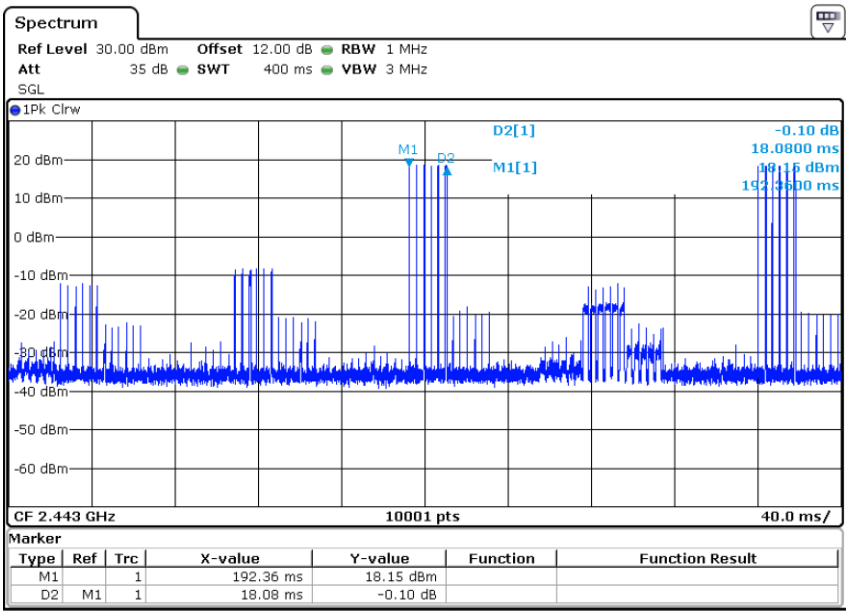

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 20 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] -0.13 dB
168.00 µs
M1[1]
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.415 GHz
10001 pts
2.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 11.326 ms 8.05 dBm
D2 M1 1 168.0 µs -0.13 dB

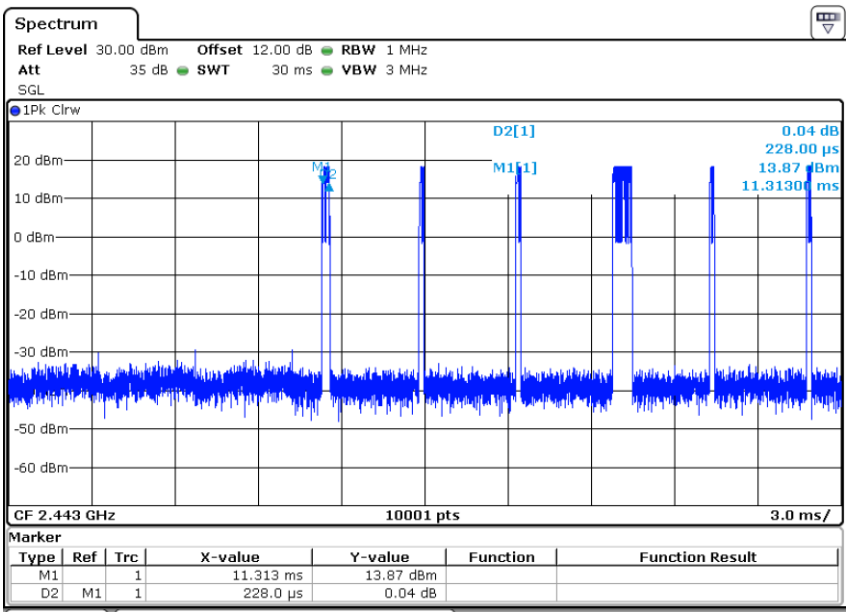

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 20 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1]
0.07 dB
166.00 µs
M1[1]
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.415 GHz
10001 pts
2.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 14.818 ms 7.98 dBm
D2 M1 1 166.0 µs 0.07 dB

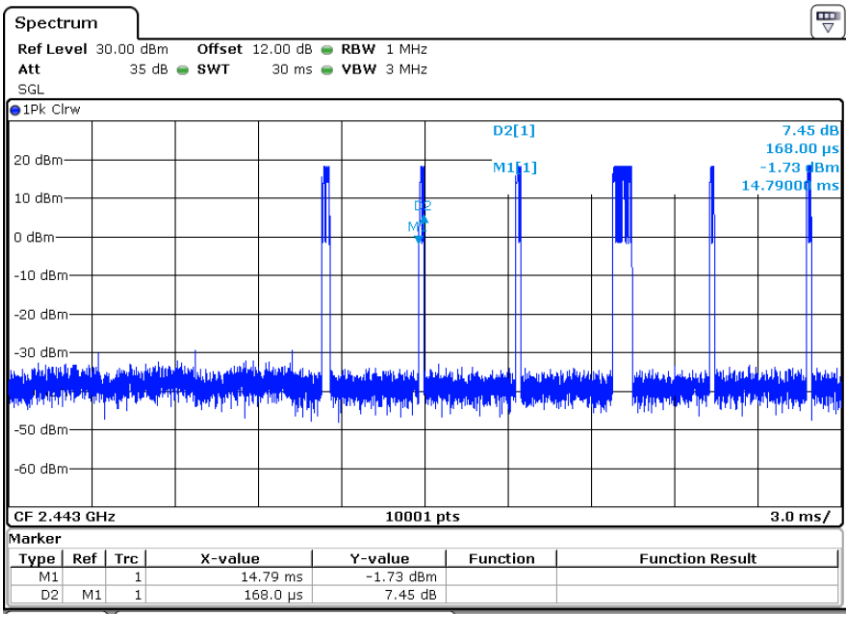

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 20 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1]
1.57 dB
696.00 µs
M1[1]
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.415 GHz
10001 pts
2.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 18.304 ms 8.26 dBm
D2 M1 1 696.0 µs 1.57 dB

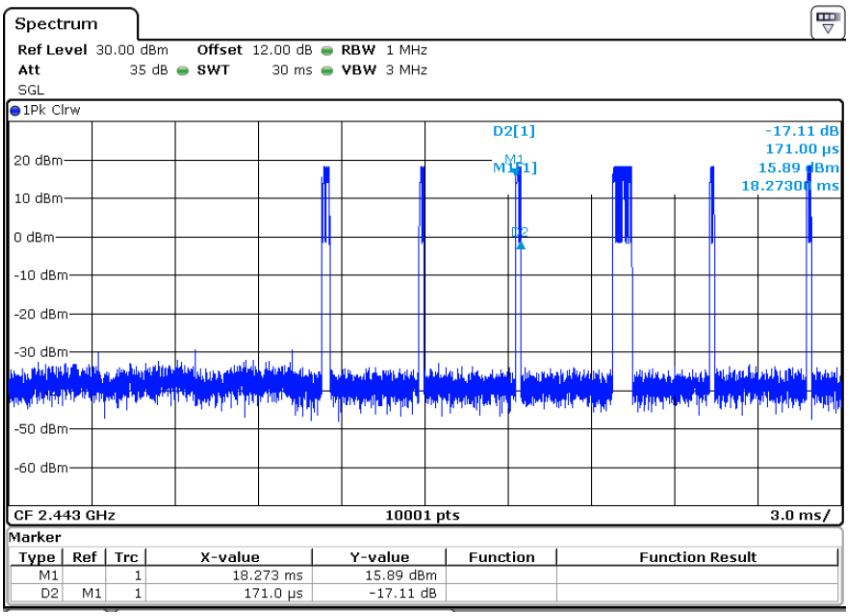
| Test Model | AVERAGE TIME OF OCCUPANCY<br>Channel 11: 2443.500MHz GFSK Modulation |
|---|---|

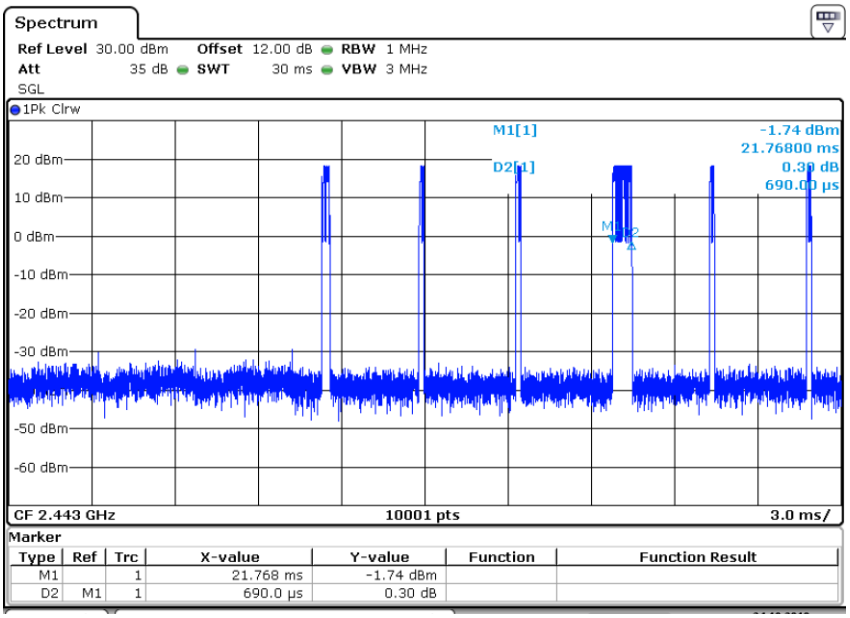


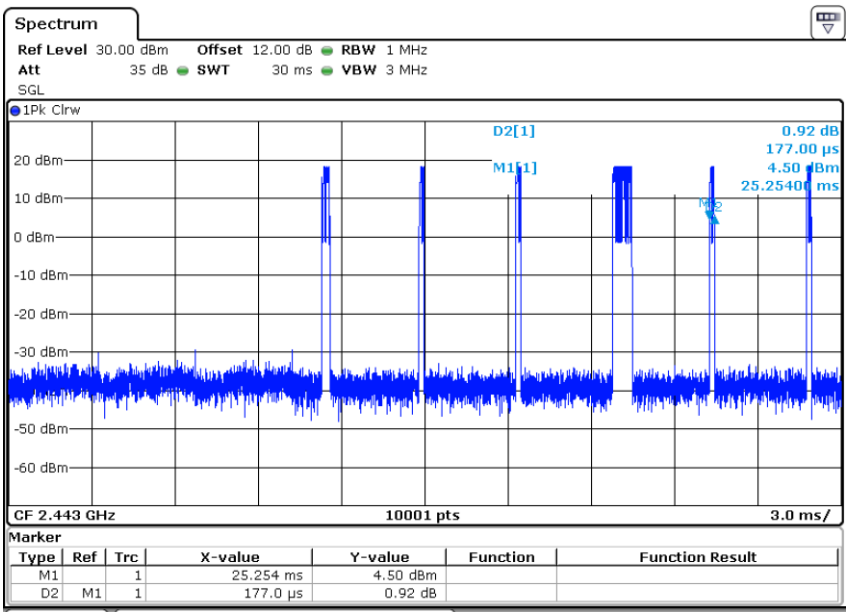



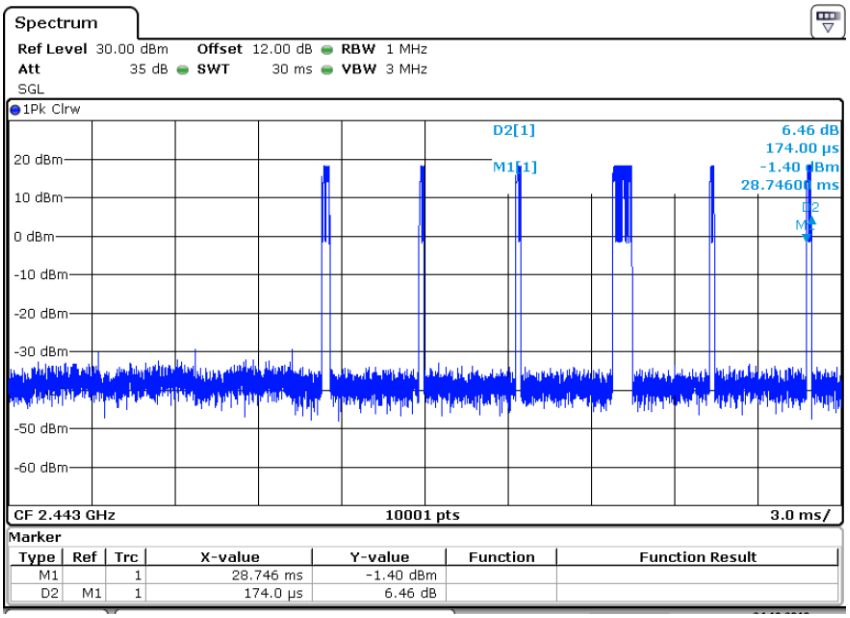

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] 0.04 dB
228.00 µs
M1[1] 13.87 dBm
11.31300 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.443 GHz
10001 pts
3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 11.313 ms 13.87 dBm
D2 M1 1 228.0 µs 0.04 dB


Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] 7.45 dB
168.00 µs
M1[1] -1.73 dBm
14.79000 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.443 GHz
10001 pts
3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 14.79 ms -1.73 dBm
D2 M1 1 168.0 µs 7.45 dB

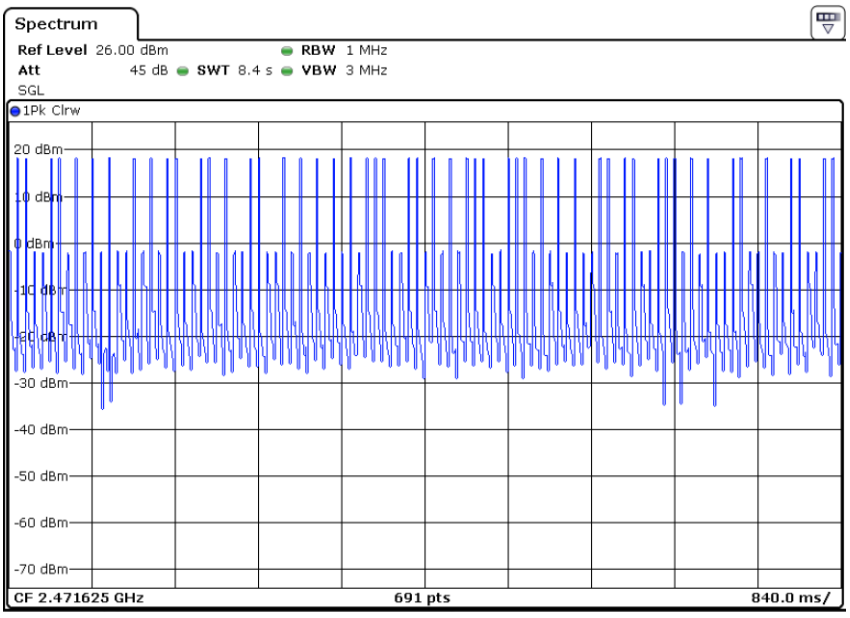

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] -17.11 dB
171.00 µs
M1[1] 15.89 dBm
18.27300 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.443 GHz
10001 pts
3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 18.273 ms 15.89 dBm
D2 M1 1 171.0 µs -17.11 dB

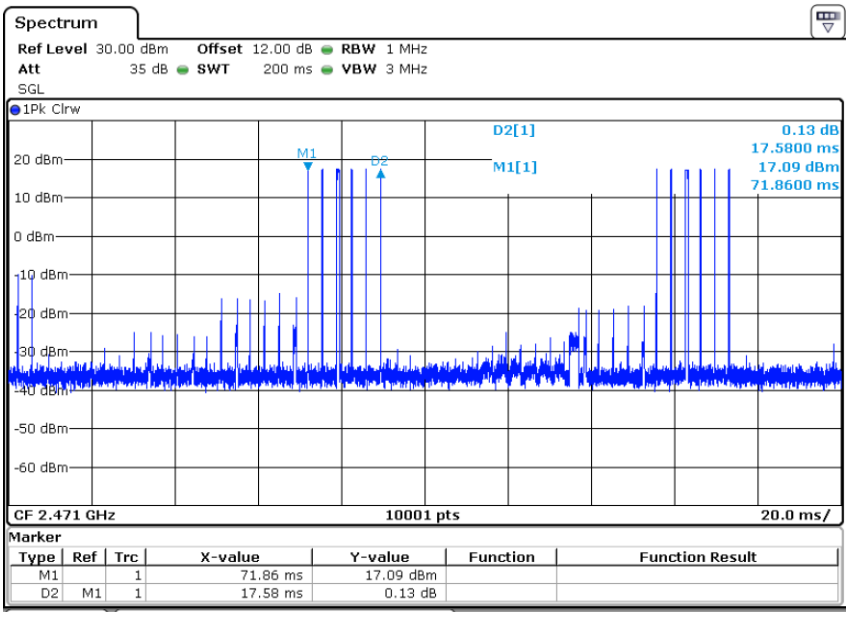

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
M1[1] -1.74 dBm
21.76800 ms
D2[1] 0.30 dB
690.00 µs
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.443 GHz
10001 pts
3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 21.768 ms -1.74 dBm
D2 M1 1 690.0 µs 0.30 dB

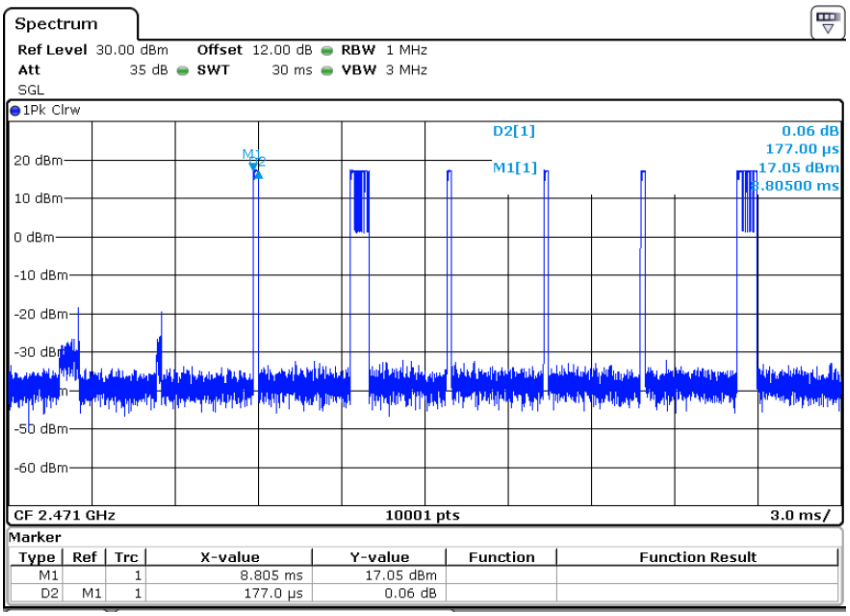

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] 0.92 dB
177.00 µs
M1[1] 4.50 dBm
25.25400 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.443 GHz
10001 pts
3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 25.254 ms 4.50 dBm
D2 M1 1 177.0 µs 0.92 dB

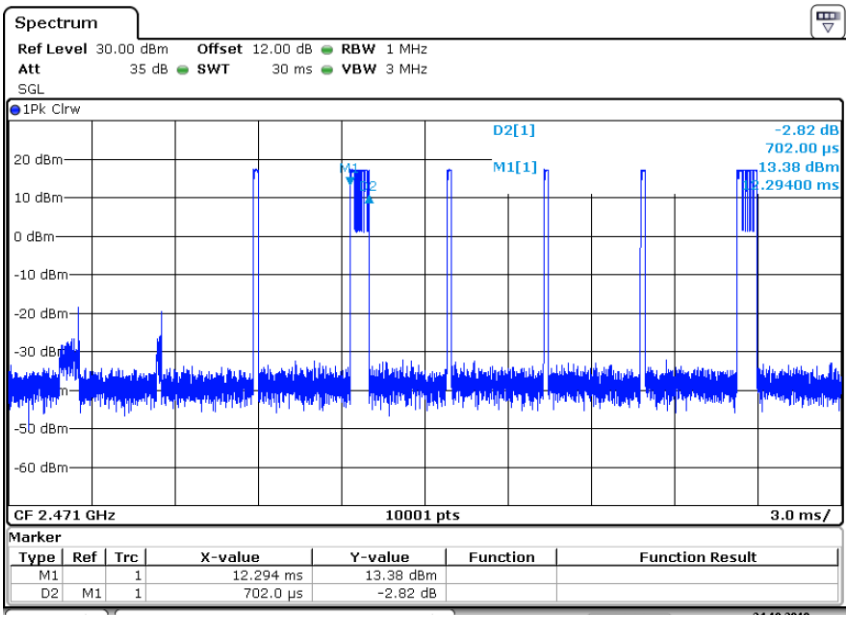

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] 6.46 dB
174.00 µs
M1[1] -1.40 dBm
28.74600 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.443 GHz
10001 pts
3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 28.746 ms -1.40 dBm
D2 M1 1 174.0 µs 6.46 dB

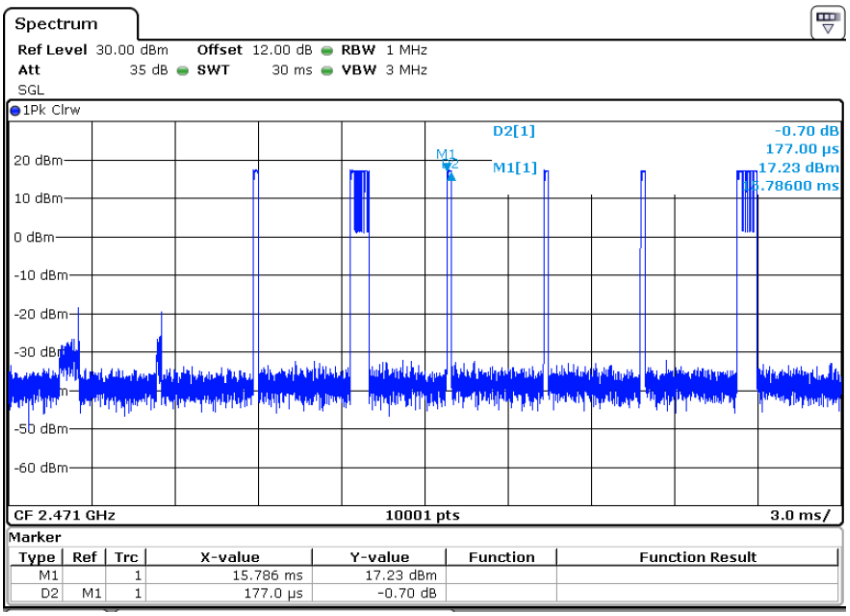
| Test Model | AVERAGE TIME OF OCCUPANCY<br>Channel 21: 2471.625MHz GFSK Modulation |
|---|---|

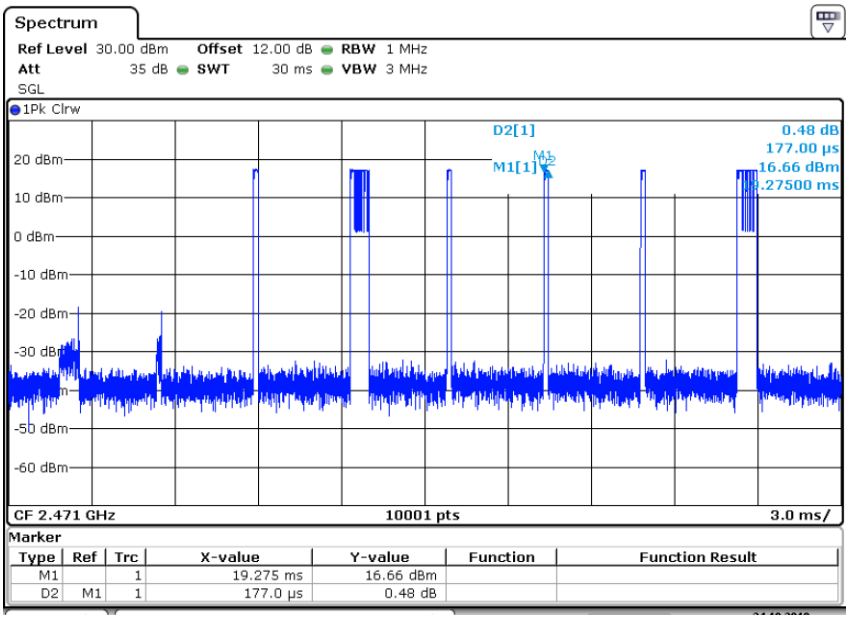


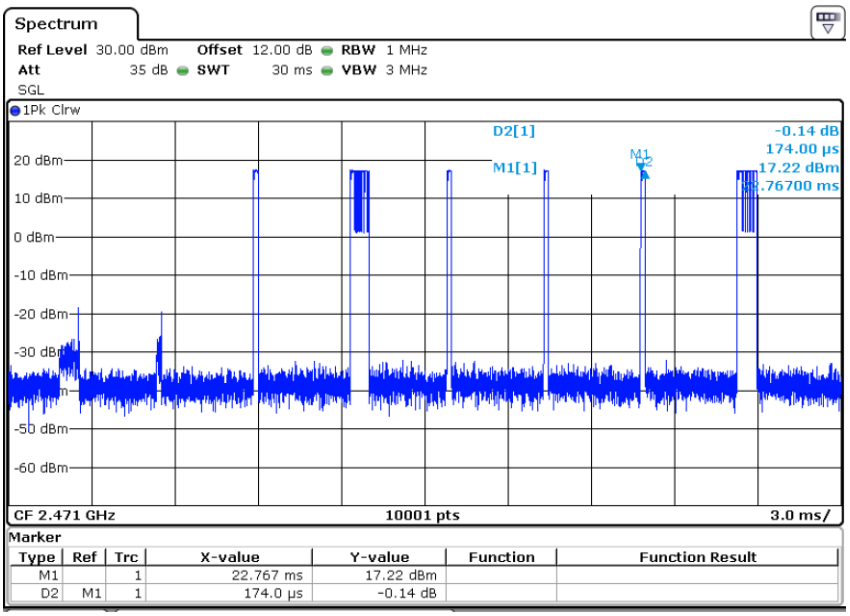



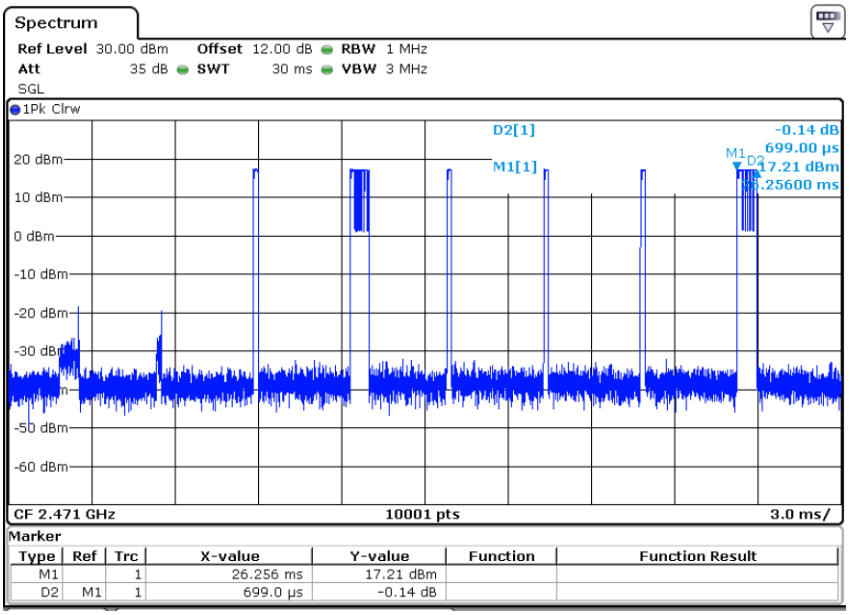

Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] 0.06 dB 177.00 µs
M1[1] 17.05 dBm 8.80500 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.471 GHz 10001 pts 3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 8.805 ms 17.05 dBm
D2 M1 1 177.0 µs 0.06 dB


Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] -2.82 dB 702.00 µs
M1[1] 13.38 dBm 12.29400 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.471 GHz 10001 pts 3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 12.294 ms 13.38 dBm
D2 M1 1 702.0 µs -2.82 dB


Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] -0.70 dB
177.00 µs
M1[1] 17.23 dBm
15.78600 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.471 GHz 10001 pts 3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 15.786 ms 17.23 dBm
D2 M1 1 177.0 µs -0.70 dB


Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] 0.48 dB
177.00 µs
M1[1] 16.66 dBm
19.27500 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.471 GHz 10001 pts 3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 19.275 ms 16.66 dBm
D2 M1 1 177.0 µs 0.48 dB


Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] -0.14 dB
174.00 µs
M1[1] 17.22 dBm
22.76700 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.471 GHz
10001 pts
3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 22.767 ms 17.22 dBm
D2 M1 1 174.0 µs -0.14 dB


Spectrum
Ref Level 30.00 dBm Offset 12.00 dB RBW 1 MHz
Att 35 dB SWT 30 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] -0.14 dB
699.00 µs
M1[1] 17.21 dBm
26.25600 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
CF 2.471 GHz
10001 pts
3.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 26.256 ms 17.21 dBm
D2 M1 1 699.0 µs -0.14 dB

## 8.6 MAXIMUM PEAK CONDUCTED OUTPUT POWER AND EIRP POWER

### 8.6.1 Applicable Standard

According to FCC Part 15.247(b)(1) and RSS-247 Clause 5.4(b)

### 8.6.2 Conformance Limit

The max For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

### 8.6.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.6.4 Test Procedure

■ According to FCC Part15.247(b)(1) and RSS-247 Clause 5.4(b)
As an alternative to a peak power measurement, compliance with the limit can be based on a measurement of the maximum conducted output power.
Use the following spectrum analyzer settings:
Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel (about 10MHz)
Set RBW > the 20 dB bandwidth of the emission being measured (about 3MHz)
Set VBW ≥ RBW
Set Sweep = auto
Set Detector function = peak
Set Trace = max hold
Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission to determine the peak amplitude level.

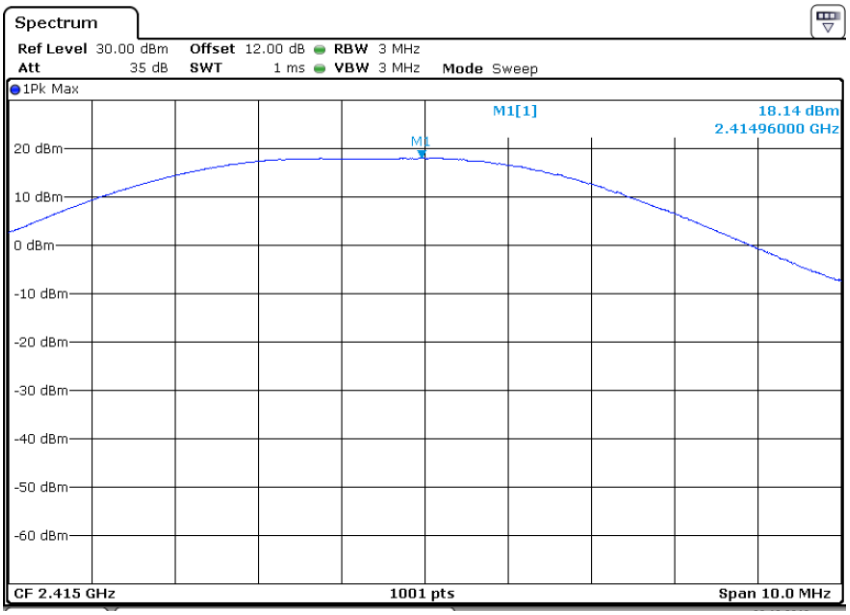
**Test Results**

| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 24, 2018 |
| Humidity: | 53 % | Test By: | King Kong |

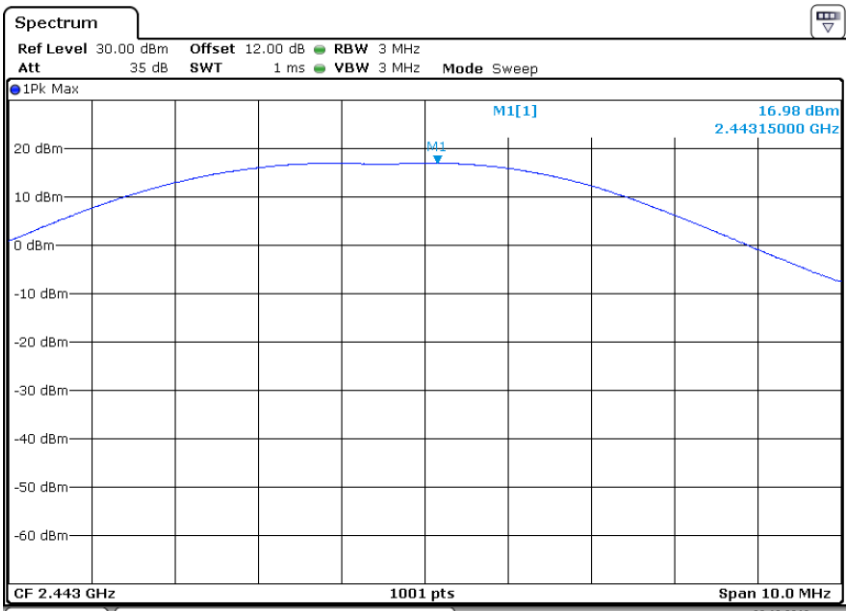
| Operation Mode | Channel Number | Channel Frequency (MHz) | Max Peak Power (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|
| GFSK | 01 | 2415.375 | 18.14 | 21 | PASS |
| | 11 | 2443.500 | 16.98 | 21 | PASS |
| | 21 | 2471.625 | 15.47 | 21 | PASS |
| Note: N/A | | | | | |

| Operation Mode | Channel Number | Channel Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|
| GFSK | 01 | 2415.375 | 18.14 | 36 | PASS |
| | 11 | 2443.500 | 16.98 | 36 | PASS |
| | 21 | 2471.625 | 15.47 | 36 | PASS |
| Note: EIRP= Max Peak Power+Antenna Gain (0dBi) | | | | | |

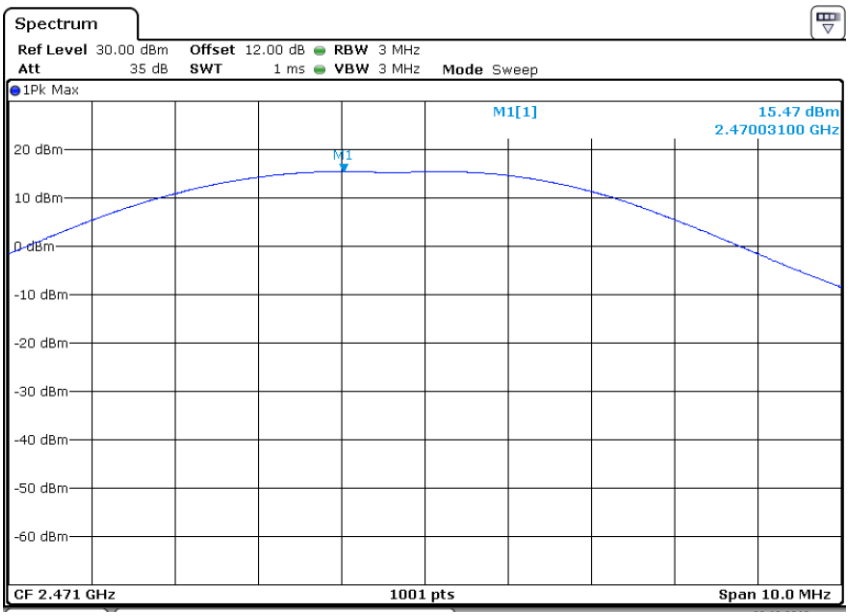
| Test Model | Max Peak Power<br>Channel 01: 2415.375MHz GFSK Modulation |
|---|---|




| Test Model | Max Peak Power<br>Channel 11: 2443.500MHz GFSK Modulation |
|---|---|



| Test Model | Max Peak Power<br>Channel 21: 2471.625MHz GFSK Modulation |
|---|---|



## 8.7 CONDUCTED SUPRIOUS EMISSION

### 8.7.1 Applicable Standard

According to FCC Part 15.247(d) and RSS-Gen Clause 5.5

### 8.7.2 Conformance Limit

According to FCC Part 15.247(d) and RSS-Gen Clause 5.5
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, provided the transmitter demonstrates compliance with the peak conducted power limits.

### 8.7.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.7.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

- **Reference level measurement**

Establish a reference level by using the following procedure:
Set instrument center frequency to DSS channel center frequency.
Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel.
Set the RBW = 100 kHz. Set the VBW ≥ 3 x RBW.
Set Detector = peak. Set Sweep time = auto couple.
Set Trace mode = max hold. Allow trace to fully stabilize.
Use the peak marker function to determine the maximum Maximum conduceted level.
Note that the channel found to contain the maximum conduceted level can be used to establish the reference level.

- **Band-edge Compliance of RF Conducted Emissions**

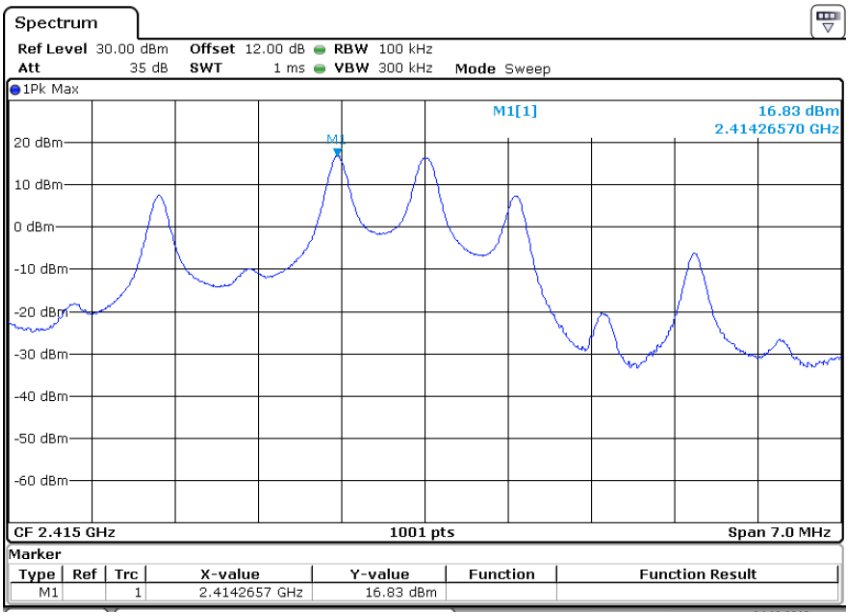
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation
Set RBW ≥ 1% of the span=100kHz Set VBW ≥ RBW
Set Sweep = auto Set Detector function = peak Set Trace = max hold
Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.
Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

- **Conduceted Spurious RF Conducted Emission**

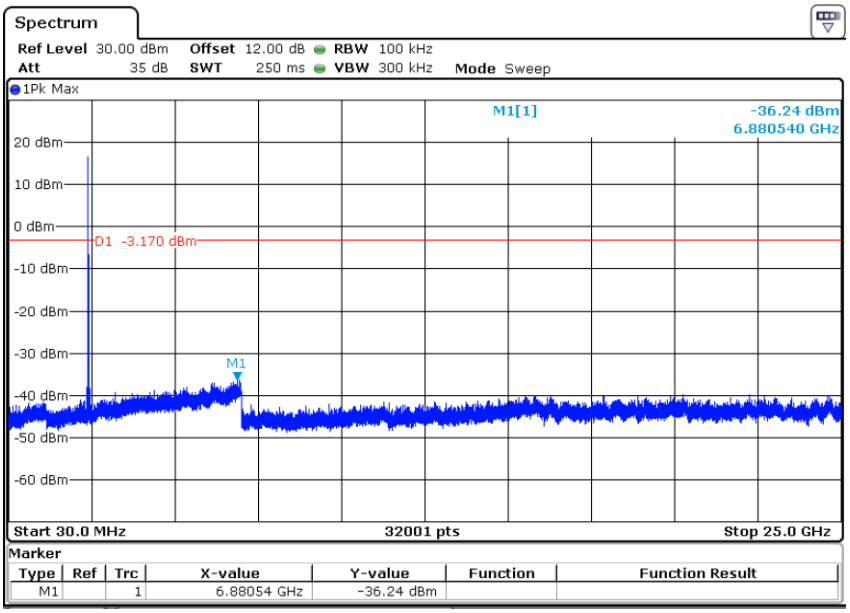
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.(30MHz to 25GHz). Set RBW = 100 kHz Set VBW ≥ RBW
Set Sweep = auto Set Detector function = peak Set Trace = max hold
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section.

### 8.7.5 Test Results

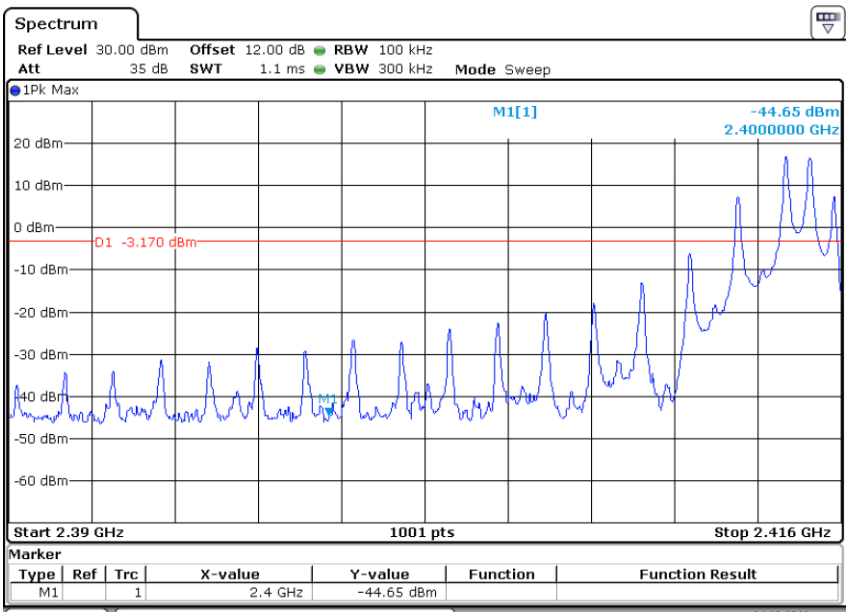
| Test Model | Maximum Conduceted Level RBW=100kHz<br>Channel 01: 2415.375MHz GFSK Modulation |
|---|---|



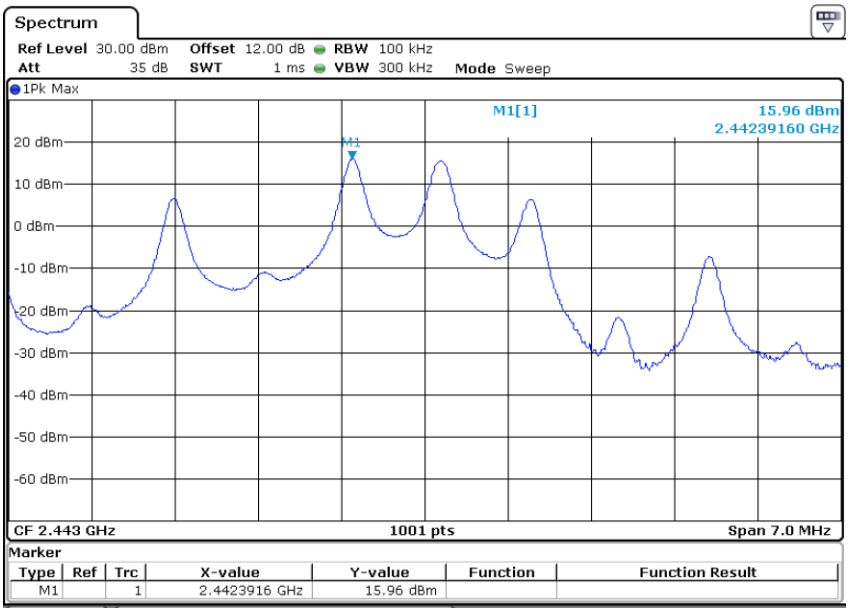

| Test Model | Conduceted Spurious RF Conducted Emission<br>Channel 01: 2415.375MHz GFSK Modulation |
|---|---|



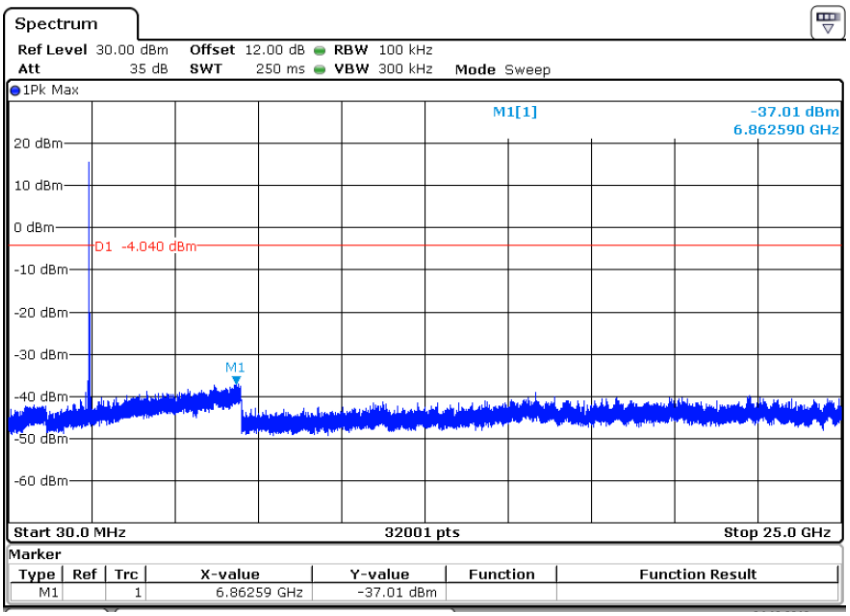
| Test Model | Band-edge Conducted Emissions<br>Channel 01: 2415.375MHz GFSK Modulation |
|---|---|



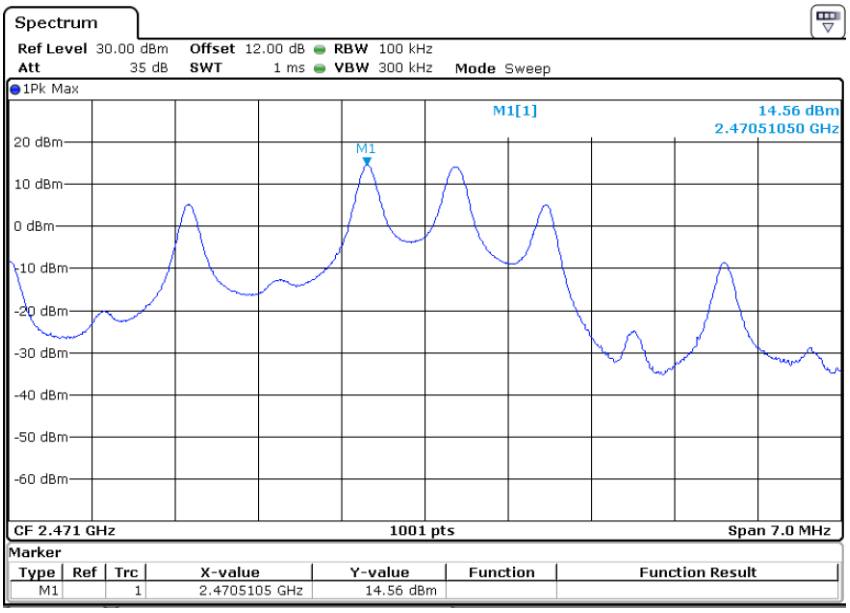

| Test Model | Maximum Conduceted Level RBW=100kHz<br>Channel 11: 2443.500MHz GFSK Modulation |
|---|---|



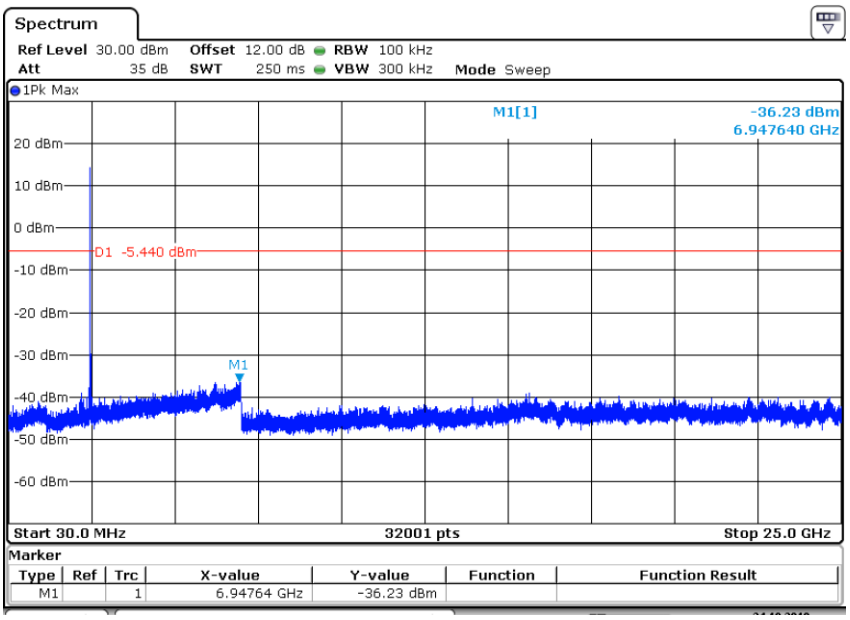
| Test Model | Conducted Spurious RF Conducted Emission<br>Channel 11: 2443.500MHz GFSK Modulation |
|---|---|



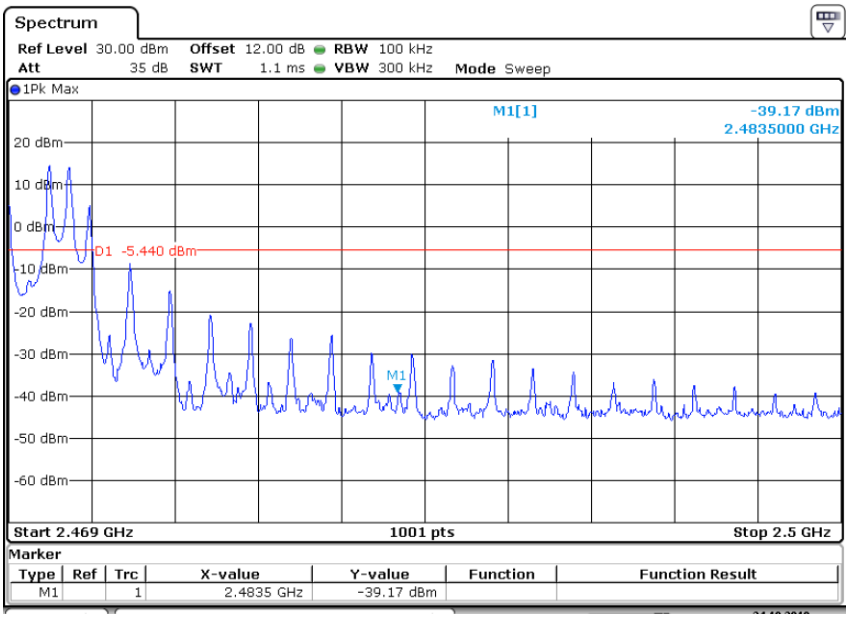

| Test Model | Maximum Conducted Level RBW=100kHz<br>Channel 21: 2471.625MHz GFSK Modulation |
|---|---|



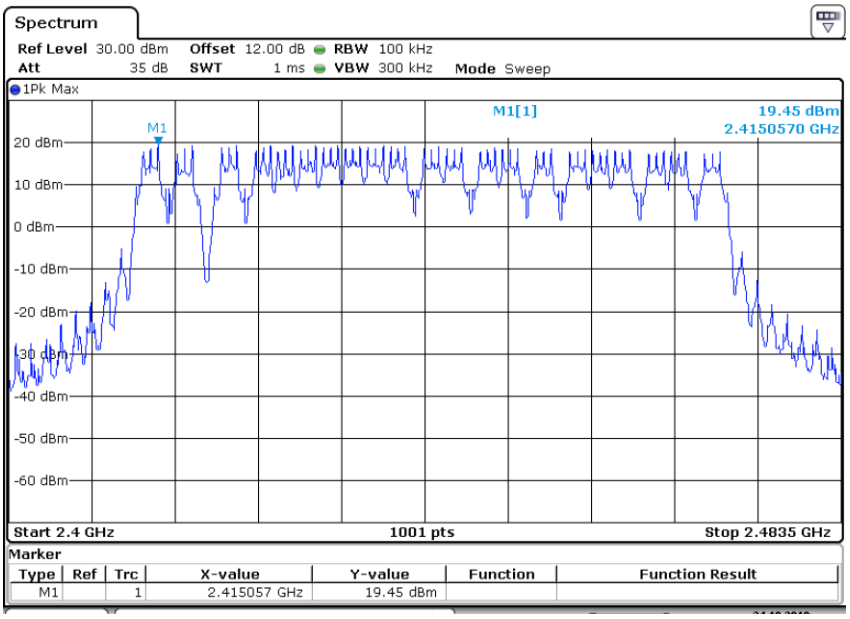
| Test Model | Conduceted Spurious RF Conducted Emission<br>Channel 21: 2471.625MHz GFSK Modulation |
|---|---|



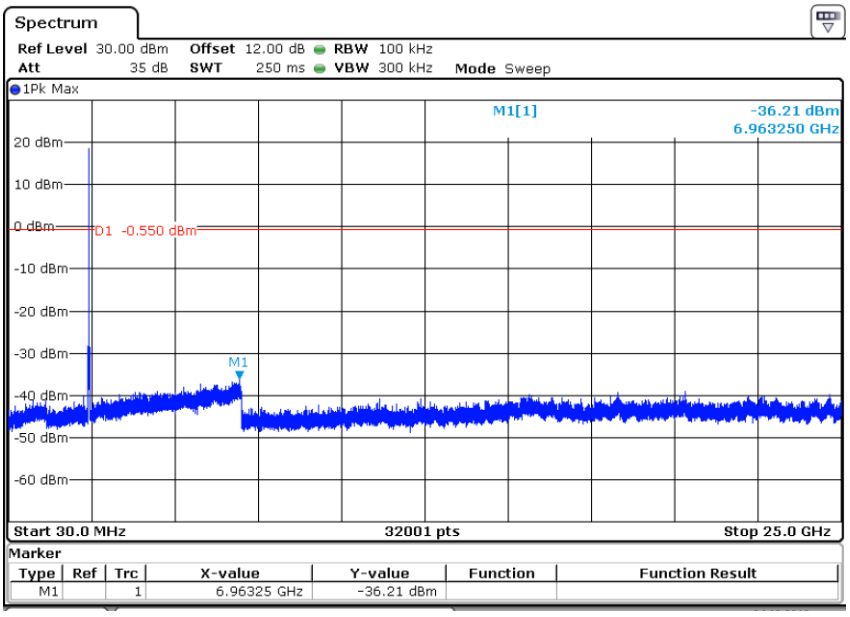

| Test Model | Band-edge Conducted Emissions<br>Channel 21: 2471.625MHz GFSK Modulation |
|---|---|



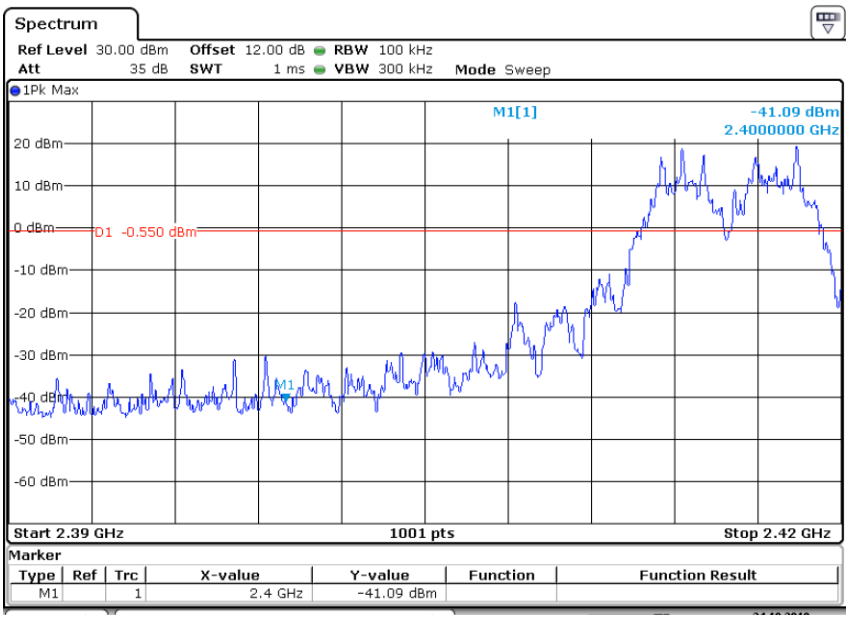
| Test Model | Maximum Conduceted Level RBW=100kHz<br>Hopping GFSK Modulation |
|---|---|



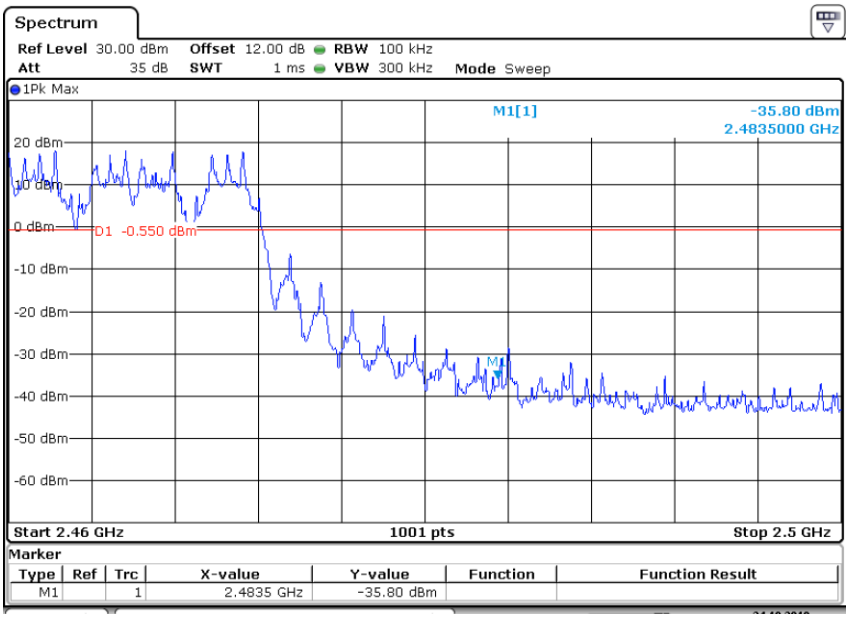

| Test Model | Conduceted Spurious RF Conducted Emission<br>Hopping GFSK Modulation |
|---|---|



| Test Model | Band-edge Conducted Emissions<br>Hopping | GFSK Modulation |
|---|---|---|




| Test Model | Band-edge Conducted Emissions<br>Hopping | GFSK Modulation |
|---|---|---|



## 8.8 RADIATED SPURIOUS EMISSION

### 8.8.1 Applicable Standard

According to FCC Part 15.247(d), 15.209 and RSS-247 Clause 3.3

### 8.8.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part15.205, Restricted bands

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| 10.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | (2) |
| 13.36-13.41 | | | |

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

| Restricted Frequency(MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance |
|---|---|---|---|
| 0.009-0.490 | 2400/F(KHz) | 20 log (uV/m) | 300 |
| 0.490-1.705 | 24000/F(KHz) | 20 log (uV/m) | 30 |
| 1.705-30 | 30 | 29.5 | 30 |
| 30-88 | 100 | 40 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

### 8.8.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

### 8.8.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:
For Above 1GHz:
The EUT was placed on a turn table which is 0.1m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz
VBW ≥ RBW
Sweep = auto

Detector function = peak
Trace = max hold
For Below 1GHz:
The EUT was placed on a turn table which is 0.1m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 100 kHz for
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 30MHz:
The EUT was placed on a turn table which is 0.1m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 9kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 150KHz:
The EUT was placed on a turn table which is 0.1m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 200Hz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.
Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.
Repeat above procedures until all frequency measured was complete.

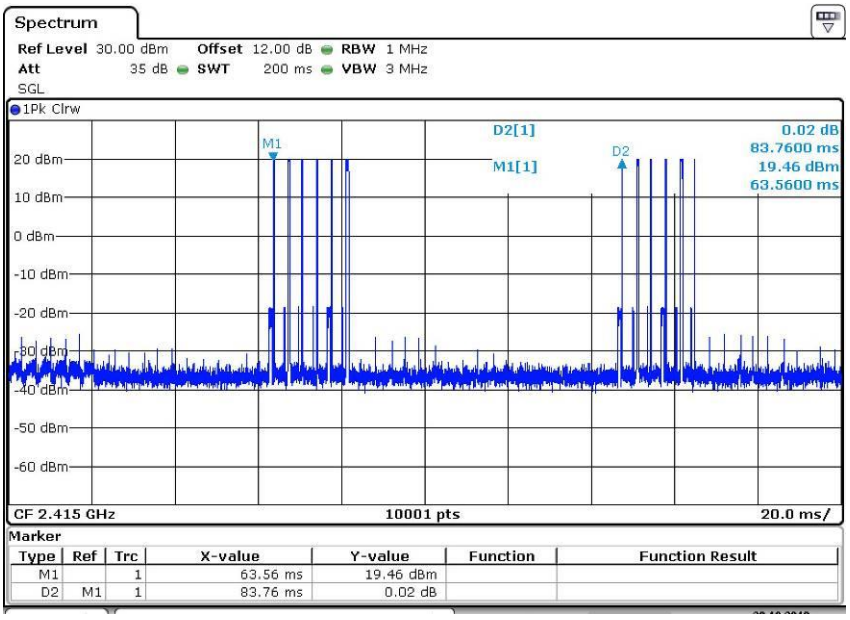
- Calculation of Average factor

The output field strengths of specification in accordance with the FCC rules specify measurements with an average detector. During the test, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.
The duty cycle is measured in 20ms or the repetition cycle period, whichever is a shorter time frame, the duty cycle is measured by placing the spectrum analyzer to set zero span at 1MHz resolution bandwidth.

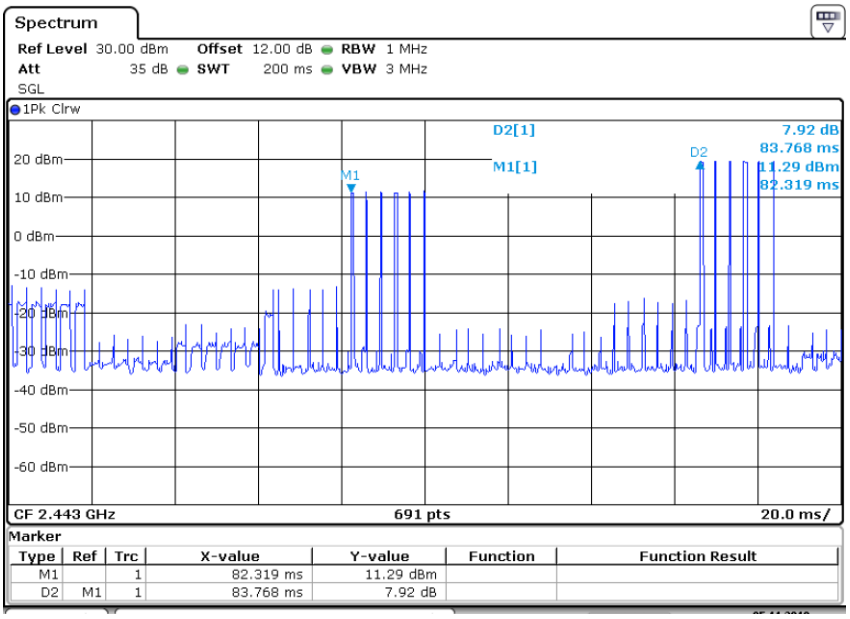
| Modulation Mode | Channel Number | Channel Frequency (MHz) | Period (ms) | AV Factor (dB) | Limit (ms) | Verdict |
|---|---|---|---|---|---|---|
| GFSK | 01 | 2415.375 | 83.760 | -32.23 | <400 | PASS |
| | 11 | 2443.500 | 83.768 | -34.33 | <400 | PASS |
| | 21 | 2471.625 | 83.768 | -31.99 | <400 | PASS |
| Note1: The pulse widths is from the page 25.<br>Note2: Duty cycle= Pulse widths/Period<br>Note3: Averaging factor in dB=20log(duty cycle) | | | | | | |

■ Transmit Period measure

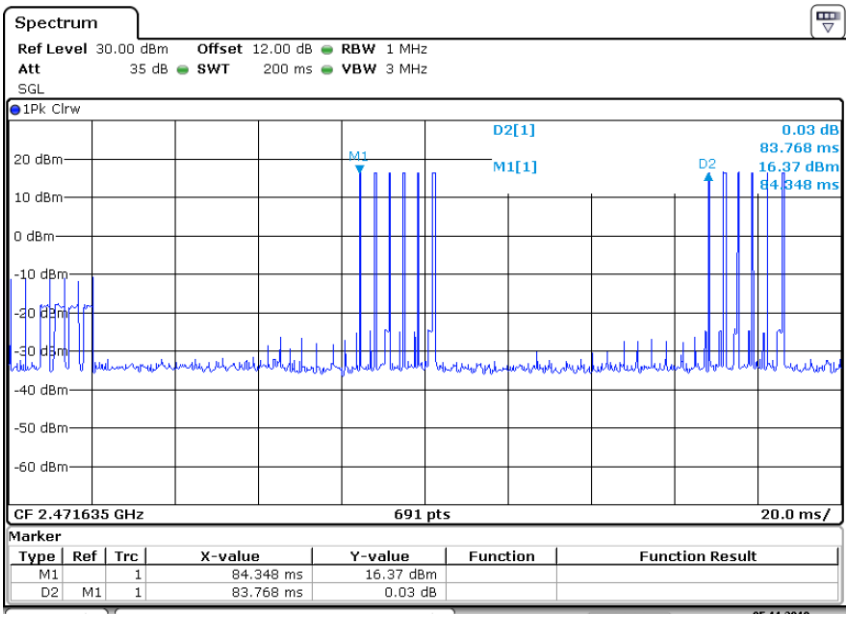
| Test Model | Period |
|---|---|
| | Channel 01: 2415.325MHz |




| Test Model | Period |
|---|---|
| | Channel 11: 2443.500MHz |



| Test Model | Period |
|---|---|
| | Channel 21: 2471.625MHz |



### 8.8.5 Test Results

■ Spurious Emission below 30MHz (9KHz to 30MHz)

| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 28, 2018 |
| Humidity: | 53 % | Test By: | KK |
| Test mode: | TX Mode | | |

| Freq. (MHz) | Ant.Pol. | Emission Level(dBuV/m) | | Limit 3m(dBuV/m) | | Over(dB) | |
|---|---|---|---|---|---|---|---|
| | H/V | PK | AV | PK | AV | PK | AV |
| -- | -- | -- | -- | -- | -- | -- | -- |

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
Distance extrapolation factor =40log(Specific distance/ test distance)( dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor

■ Spurious Emission Above 1GHz (1GHz to 25GHz)

| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 28, 2018 |
| Humidity: | 53 % | Test By: | King Kong |
| Test mode: | GFSK Modulation | Frequency: | Channel 01: 2415.375MHz |

| Freq. (MHz) | Ant.Pol. | Emission Level(dBuV/m) | | | Limit 3m(dBuV/m) | | Over(dB) | |
|---|---|---|---|---|---|---|---|---|
| | H/V | PK | AV factor | AV | PK | AV | PK | AV |
| 4825.00 | V | 53.02 | -32.23 | 20.79 | 74.00 | 54.00 | -20.98 | -33.21 |
| 7766.00 | V | 52.10 | -32.23 | 19.87 | 74.00 | 54.00 | -21.90 | -16.77 |
| 25998.50 | V | 51.08 | -32.23 | 18.85 | 74.00 | 54.00 | -22.92 | -15.60 |
| 4825.00 | H | 60.88 | -32.23 | 28.65 | 74.00 | 54.00 | -13.12 | -25.35 |
| 7239.00 | H | 60.20 | -32.23 | 27.97 | 74.00 | 54.00 | -13.80 | -26.03 |
| 25420.50 | H | 52.40 | -32.23 | 20.17 | 74.00 | 54.00 | -21.60 | -16.80 |

| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 28, 2018 |
| Humidity: | 53 % | Test By: | King Kong |
| Test mode: | GFSK Modulation | Frequency: | Channel 11: 2443MHz |

| Freq. (MHz) | Ant.Pol. | Emission Level(dBuV/m) | | | Limit 3m(dBuV/m) | | Over(dB) | |
|---|---|---|---|---|---|---|---|---|
| | H/V | PK | AV factor | AV | PK | AV | PK | AV |
| 4876.00 | V | 54.70 | -34.33 | 20.37 | 74.00 | 54.00 | -19.30 | -14.5 |
| 8531.00 | V | 50.88 | -34.33 | 16.55 | 74.00 | 54.00 | -23.12 | -18.7 |
| 25633.00 | V | 51.05 | -34.33 | 16.72 | 74.00 | 54.00 | -22.95 | -20.2 |
| 4876.00 | H | 59.86 | -34.33 | 25.53 | 74.00 | 54.00 | -14.14 | -16.1 |
| 7324.00 | H | 59.30 | -34.33 | 24.97 | 74.00 | 54.00 | -14.70 | -13.5 |
| 25803.00 | H | 51.33 | -34.33 | 17.00 | 74.00 | 54.00 | -22.67 | -16.3 |

| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 28, 2018 |
| Humidity: | 53 % | Test By: | King Kong |
| Test mode: | GFSK Modulation | Frequency: | Channel 21: 2471.625MHz |

| Freq. (MHz) | Ant.Pol. H/V | Emission Level(dBuV/m) | | | Limit 3m(dBuV/m) | | Over(dB) | |
|---|---|---|---|---|---|---|---|---|
| | | PK | AV Factor | AV | PK | AV | PK | AV |
| 4944.00 | V | 54.92 | -31.99 | 22.93 | 74.00 | 54.00 | -19.08 | -31.07 |
| 9704.00 | V | 52.55 | -31.99 | 20.56 | 74.00 | 54.00 | -21.45 | -13.40 |
| 23610.00 | V | 49.56 | -31.99 | 17.57 | 74.00 | 54.00 | -24.44 | -18.80 |
| 4944.00 | H | 62.52 | -31.99 | 30.53 | 74.00 | 54.00 | -11.48 | -23.47 |
| 7409.00 | H | 54.16 | -31.99 | 22.17 | 74.00 | 54.00 | -19.84 | -31.83 |
| 26007.00 | H | 52.00 | -31.99 | 20.01 | 74.00 | 54.00 | -22.00 | -17.10 |

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) AV value of harmonics = PK+AV Factor

■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 28, 2018 |
| Humidity: | 53 % | Test By: | King Kong |
| Test mode: | GFSK Modulation | Frequency: | Channel 01: 2415.375MHz |

| Frequency (MHz) | Polarity H/V | PK(dBuV/m) (VBW=3M Hz) | Limit 3m (dBuV/m) | Over(dB) | AV(dBuV/m) (VBW=3M Hz) | Limit 3m (dBuV/m) | Over(dB) |
|---|---|---|---|---|---|---|---|
| 2386.12 | H | 47.89 | 74.00 | -26.11 | 33.33 | 54.00 | -20.67 |
| 2354.55 | V | 47.92 | 74.00 | -26.08 | 34.01 | 54.00 | -19.99 |

| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 28, 2018 |
| Humidity: | 53 % | Test By: | King Kong |
| Test mode: | GFSK Modulation | Frequency: | Channel 21: 2471.625MHz |

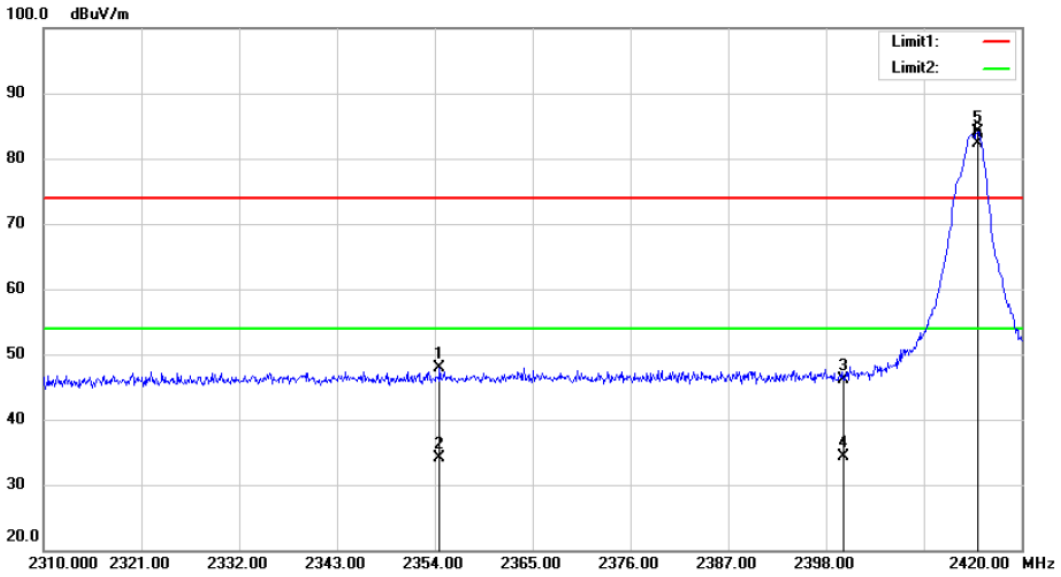
| Frequency (MHz) | Polarity H/V | PK(dBuV/m) (VBW=3M Hz) | Limit 3m (dBuV/m) | Over(dB) | AV(dBuV/m) (VBW=3M Hz) | Limit 3m (dBuV/m) | Over(dB) |
|---|---|---|---|---|---|---|---|
| 2483.5 | H | 46.99 | 74.00 | -27.01 | 35.16 | 54.00 | -18.84 |
| 2483.5 | V | 46.93 | 74.00 | -27.07 | 35.26 | 54.00 | -18.74 |

| | | | |
|---|---|---|---|
| Temperature: | 24℃ | Test Date: | October 28, 2018 |
| Humidity: | 53 % | Test By: | KK |
| Test mode: | GFSK Modulation | Frequency: | Hopping |

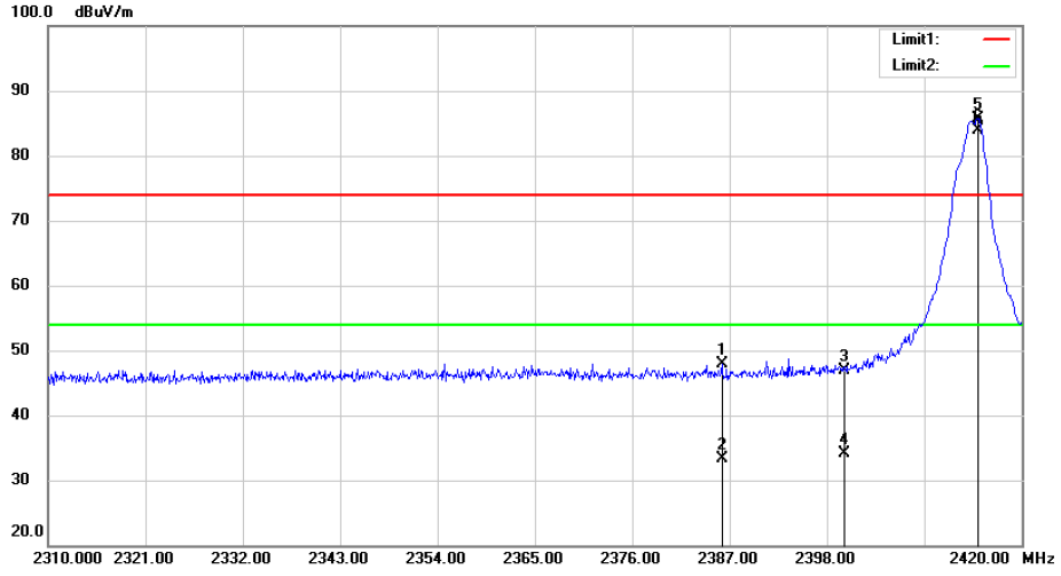
| Frequency (MHz) | Polarity H/V | PK(dBuV/m) (VBW=3M Hz) | Limit 3m (dBuV/m) | Over(dB) | AV(dBuV/m) (VBW=3M Hz) | Limit 3m (dBuV/m) | Over(dB) |
|---|---|---|---|---|---|---|---|
| 2386.38 | H | 64.90 | 74.00 | -9.10 | 44.94 | 54.00 | -9.06 |
| 2483.50 | V | 59.53 | 74.00 | -14.47 | 43.65 | 54.00 | -10.35 |
| 2388.09 | H | 62.96 | 74.00 | -11.04 | 44.94 | 54.00 | -9.06 |
| 2483.50 | V | 67.20 | 74.00 | -6.80 | 49.45 | 54.00 | -4.55 |

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

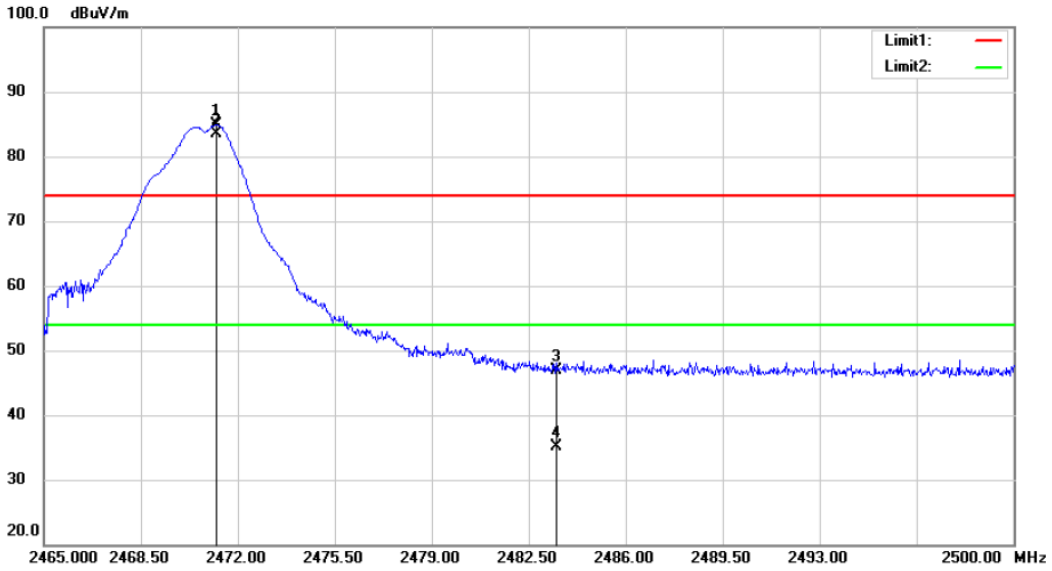
| Test Model | Spurious Emission in Restricted Band 2310-2390MHz | | |
|---|---|---|---|
| | Channel 01: 2415.375MHz | GFSK Modulation | H |
| | | Test By: King Kong | |



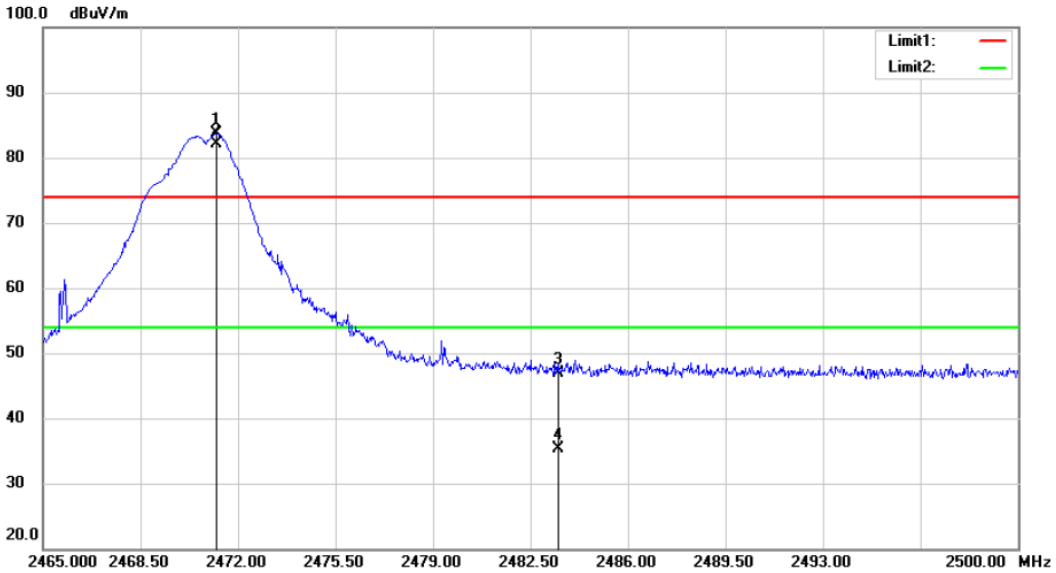

| Test Model | Spurious Emission in Restricted Band 2310-2390MHz | | |
|---|---|---|---|
| | Channel 01: 2415.375MHz | GFSK Modulation | V |
| | | Test By: King Kong | |



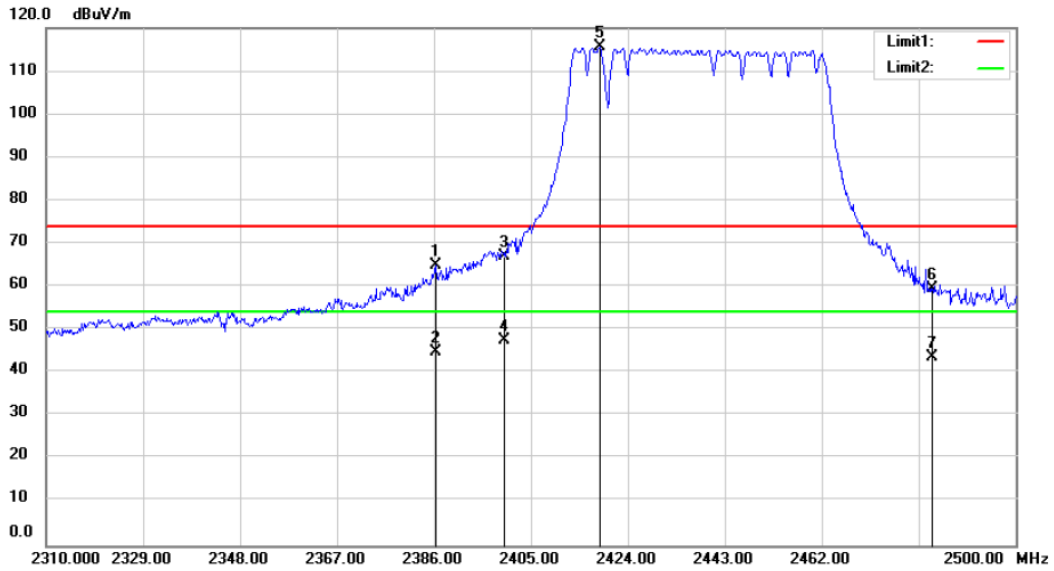
| Test Model | Spurious Emission in Restricted Band 2483.5-2500MHz | | |
|---|---|---|---|
| | Channel 21: 2471.625MHz | GFSK Modulation | H |
| | | Test By: King Kong | |



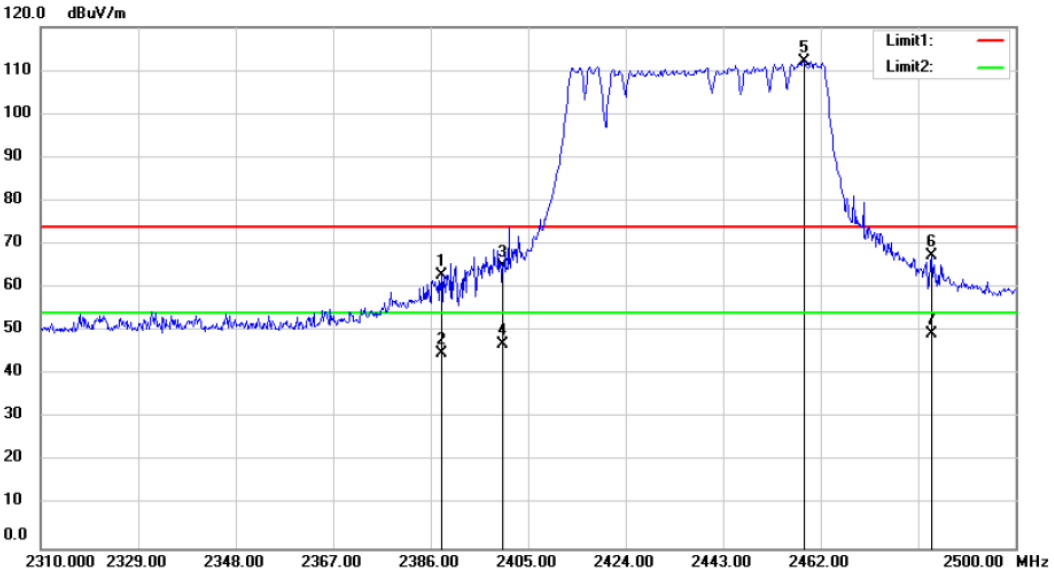

| Test Model | Spurious Emission in Restricted Band 2483.5-2500MHz | | |
|---|---|---|---|
| | Channel 21: 2471.625MHz | GFSK Modulation | V |
| | | Test By: King Kong | |



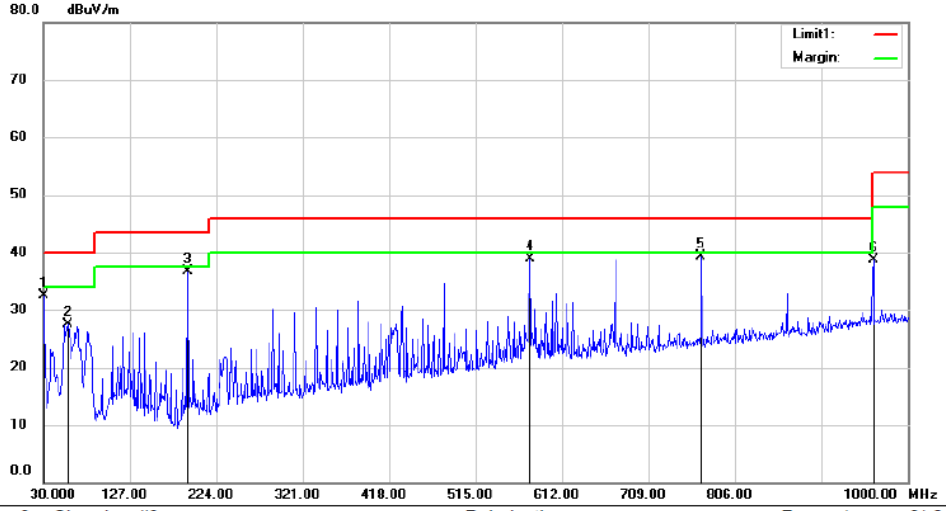
| Test Model | Spurious Emission in Restricted Band 2310-2390&2483.5-2500MHz | | |
|---|---|---|---|
| | Hopping | GFSK Modulation | H |
| | | Test By: King Kong | |




| Test Model | Spurious Emission in Restricted Band 2310-2390&2483.5-2500MHz | | |
|---|---|---|---|
| | Hopping | GFSK Modulation | V |
| | | Test By: King Kong | |



■ Spurious Emission below 1GHz (30MHz to 1GHz)



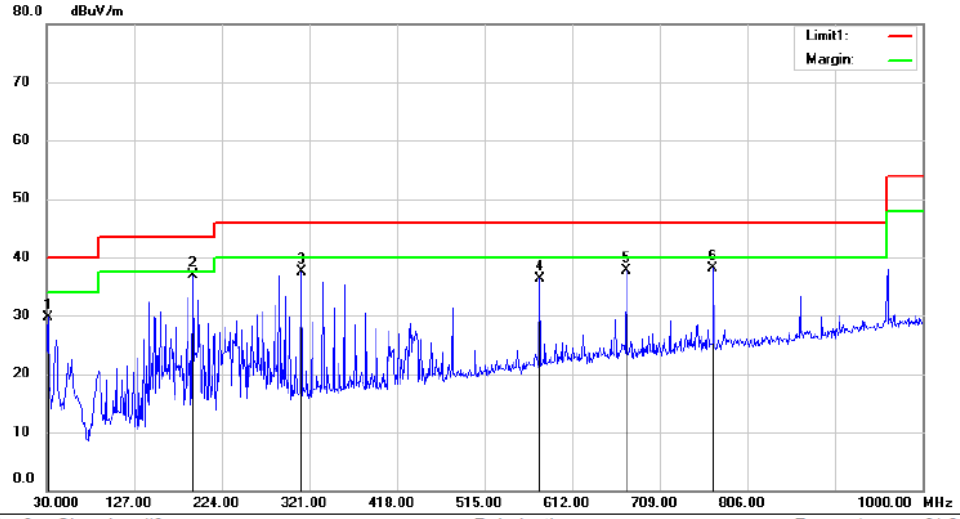

Site 3m Chamber #3 Polarization: *Vertical* Temperature: 21 C

Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 65 %

Mode: Low Channel

Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 30.0000 | 49.24 | -16.73 | 32.51 | 40.00 | -7.49 | QP | | | |
| 2 | | 58.1300 | 42.79 | -15.20 | 27.59 | 40.00 | -12.41 | QP | | | |
| 3 | | 191.9900 | 52.78 | -16.04 | 36.74 | 43.50 | -6.76 | QP | | | |
| 4 | | 576.1100 | 45.36 | -6.36 | 39.00 | 46.00 | -7.00 | QP | | | |
| 5 | * | 768.1700 | 42.50 | -3.17 | 39.33 | 46.00 | -6.67 | QP | | | |
| 6 | | 961.2000 | 38.49 | 0.12 | 38.61 | 54.00 | -15.39 | QP | | | |



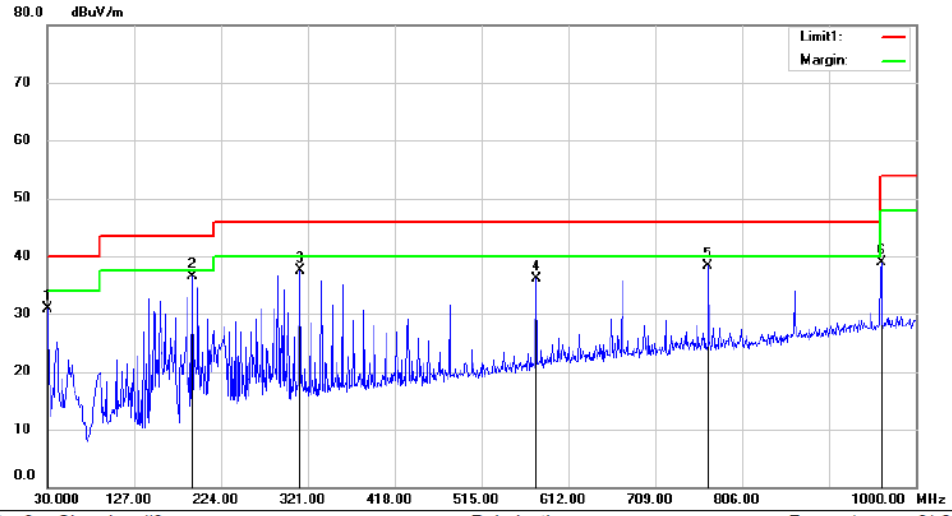

Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 21 C

Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 65 %

Mode:Low Channel

Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 31.9400 | 46.43 | -16.80 | 29.63 | 40.00 | -10.37 | QP | | | |
| 2 | * | 191.9900 | 52.86 | -16.04 | 36.82 | 43.50 | -6.68 | QP | | | |
| 3 | | 312.2700 | 50.01 | -12.44 | 37.57 | 46.00 | -8.43 | QP | | | |
| 4 | | 576.1100 | 42.74 | -6.36 | 36.38 | 46.00 | -9.62 | QP | | | |
| 5 | | 672.1400 | 42.47 | -4.77 | 37.70 | 46.00 | -8.30 | QP | | | |
| 6 | | 768.1700 | 41.25 | -3.17 | 38.08 | 46.00 | -7.92 | QP | | | |



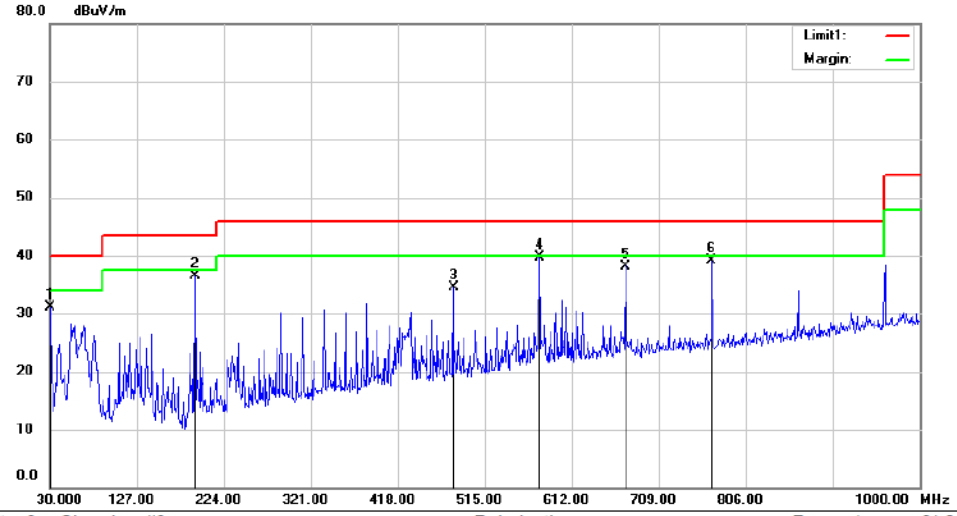

Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 21 C

Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 65 %

Mode: Middle Channel

Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 30.0000 | 47.57 | -16.73 | 30.84 | 40.00 | -9.16 | QP | | | |
| 2 | * | 191.9900 | 52.45 | -16.04 | 36.41 | 43.50 | -7.09 | QP | | | |
| 3 | | 312.2700 | 49.86 | -12.44 | 37.42 | 46.00 | -8.58 | QP | | | |
| 4 | | 576.1100 | 42.52 | -6.36 | 36.16 | 46.00 | -9.84 | QP | | | |
| 5 | | 768.1700 | 41.41 | -3.17 | 38.24 | 46.00 | -7.76 | QP | | | |
| 6 | | 961.2000 | 38.85 | 0.12 | 38.97 | 54.00 | -15.03 | QP | | | |



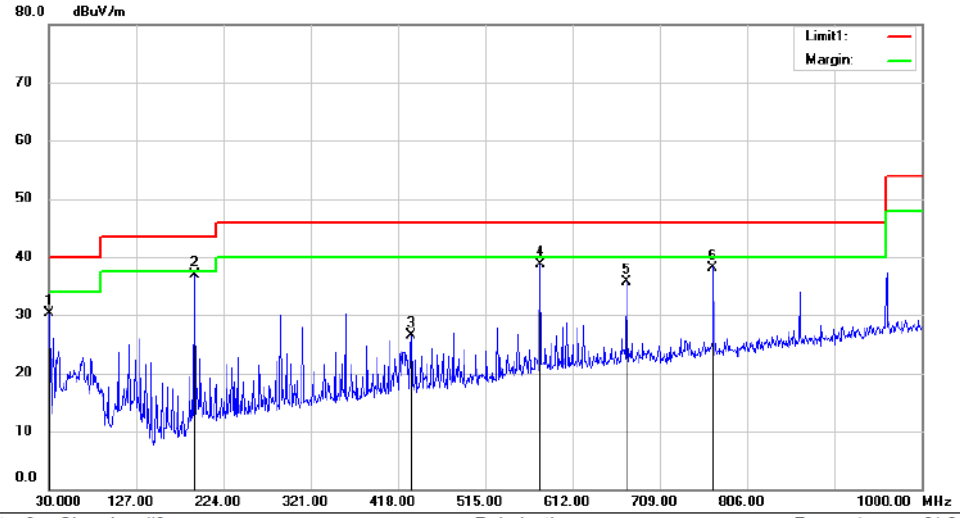

Site 3m Chamber #3 Polarization: *Vertical* Temperature: 21 C

Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 65 %

Mode: Middle Channel

Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 30.0000 | 47.82 | -16.73 | 31.09 | 40.00 | -8.91 | QP | | | |
| 2 | | 191.9900 | 52.61 | -16.04 | 36.57 | 43.50 | -6.93 | QP | | | |
| 3 | | 480.0800 | 43.07 | -8.58 | 34.49 | 46.00 | -11.51 | QP | | | |
| 4 | * | 576.1100 | 45.97 | -6.36 | 39.61 | 46.00 | -6.39 | QP | | | |
| 5 | | 672.1400 | 42.97 | -4.77 | 38.20 | 46.00 | -7.80 | QP | | | |
| 6 | | 768.1700 | 42.22 | -3.17 | 39.05 | 46.00 | -6.95 | QP | | | |



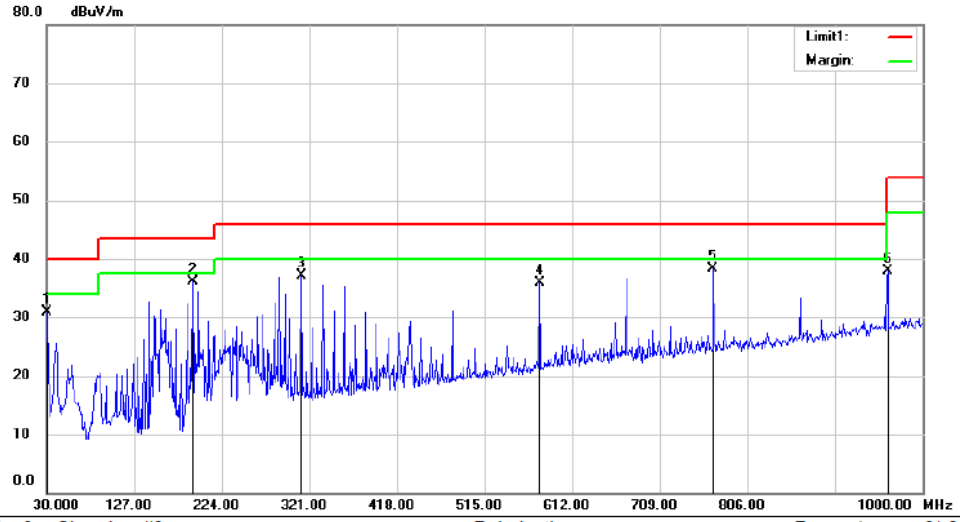

Site 3m Chamber #3 Polarization: *Vertical* Temperature: 21 C

Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 65 %

Mode: High Channel

Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 30.0000 | 46.98 | -16.73 | 30.25 | 40.00 | -9.75 | QP | | | |
| 2 | * | 191.9900 | 52.93 | -16.04 | 36.89 | 43.50 | -6.61 | QP | | | |
| 3 | | 432.5500 | 35.87 | -9.40 | 26.47 | 46.00 | -19.53 | QP | | | |
| 4 | | 576.1100 | 45.05 | -6.36 | 38.69 | 46.00 | -7.31 | QP | | | |
| 5 | | 672.1400 | 40.53 | -4.77 | 35.76 | 46.00 | -10.24 | QP | | | |
| 6 | | 768.1700 | 41.37 | -3.17 | 38.20 | 46.00 | -7.80 | QP | | | |




Site 3m Chamber #3 Polarization: ***Horizontal*** Temperature: 21 C

Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 65 %

Mode: High Channel

Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 30.0000 | 47.71 | -16.73 | 30.98 | 40.00 | -9.02 | QP | | | |
| 2 | * | 191.9900 | 52.22 | -16.04 | 36.18 | 43.50 | -7.32 | QP | | | |
| 3 | | 312.2700 | 49.56 | -12.44 | 37.12 | 46.00 | -8.88 | QP | | | |
| 4 | | 576.1100 | 42.30 | -6.36 | 35.94 | 46.00 | -10.06 | QP | | | |
| 5 | | 768.1700 | 41.42 | -3.17 | 38.25 | 46.00 | -7.75 | QP | | | |
| 6 | | 961.2000 | 37.69 | 0.12 | 37.81 | 54.00 | -16.19 | QP | | | |

## 8.9 CONDUCTED EMISSION TEST

### 8.9.1 Applicable Standard

According to FCC Part 15.207(a) and RSS-Gen Clause 8.8

### 8.9.2 Conformance Limit

| Conducted Emission Limit | | |
|---|---|---|
| Frequency(MHz) | Quasi-peak | Average |
| 0.15-0.5 | 66-56 | 56-46 |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |
| Note: 1. The lower limit shall apply at the transition frequencies<br>2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz. | | |

### 8.9.3 Test Configuration

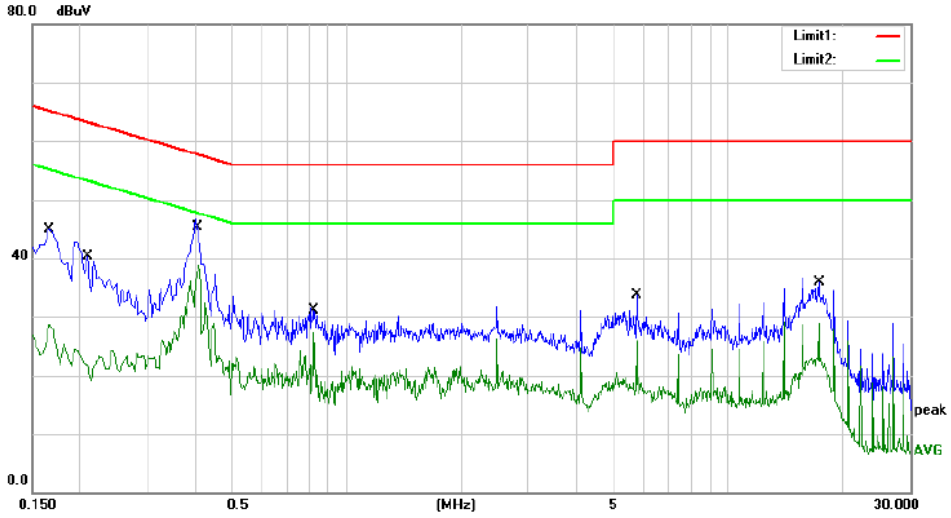
Test according to clause 7.3 conducted emission test setup

### 8.9.4 Test Procedure

The EUT was placed on a table which is 0.1m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

### 8.9.5 Test Results

Pass



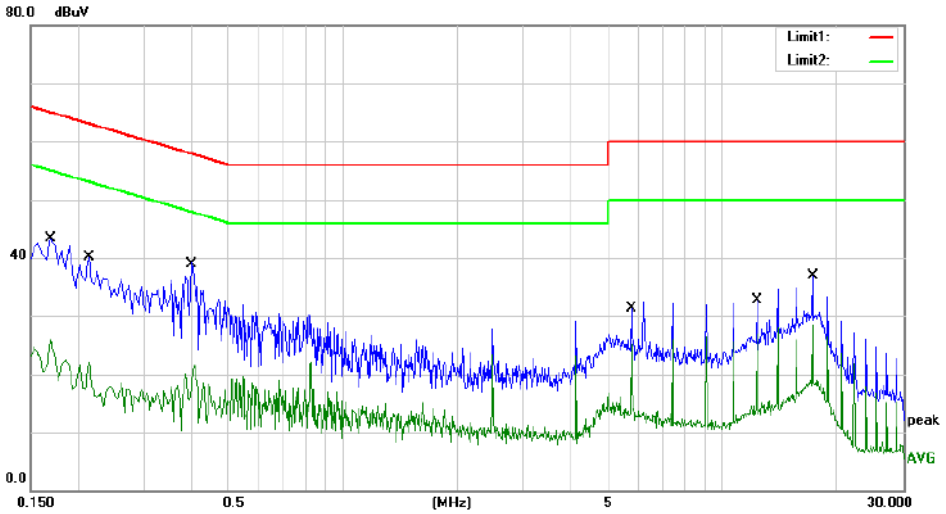

Site Conduction #1 Phase: L1 Temperature: 24.9

Limit: (CE)FCC PART 15 C_QP Power: AC 120V/60Hz Humidity: 54 %

Mode: 2.4G Wireless connecting

Note: Adapter: Tenpao

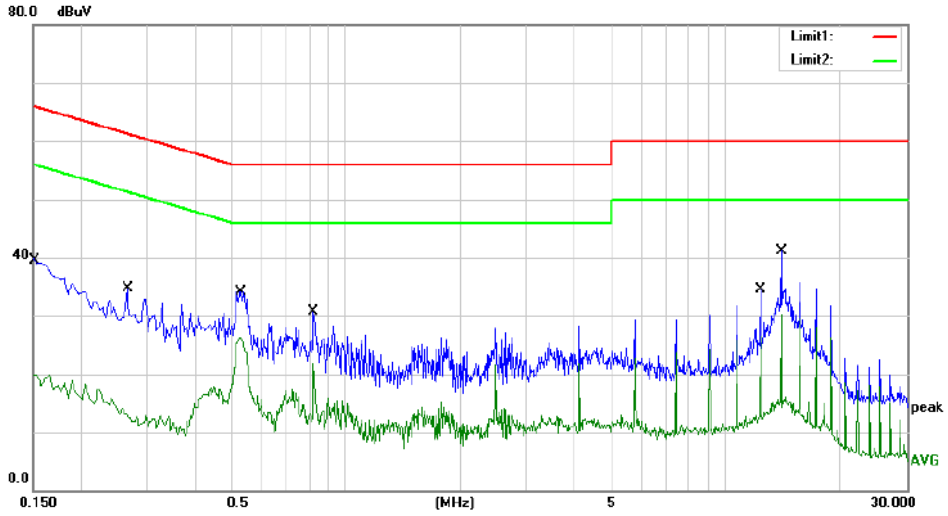
| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1660 | 35.39 | 9.56 | 44.95 | 65.16 | -20.21 | QP | |
| 2 | | 0.1660 | 19.14 | 9.56 | 28.70 | 55.16 | -26.46 | AVG | |
| 3 | | 0.2100 | 30.80 | 9.56 | 40.36 | 63.21 | -22.85 | QP | |
| 4 | | 0.2100 | 14.89 | 9.56 | 24.45 | 53.21 | -28.76 | AVG | |
| 5 | | 0.4100 | 37.06 | 9.57 | 46.63 | 57.65 | -11.02 | QP | |
| 6 | * | 0.4100 | 29.42 | 9.57 | 38.99 | 47.65 | -8.66 | AVG | |
| 7 | | 0.8260 | 22.00 | 9.58 | 31.58 | 56.00 | -24.42 | QP | |
| 8 | | 0.8260 | 17.78 | 9.58 | 27.36 | 46.00 | -18.64 | AVG | |
| 9 | | 5.7740 | 23.98 | 9.68 | 33.66 | 60.00 | -26.34 | QP | |
| 10 | | 5.7740 | 16.25 | 9.68 | 25.93 | 50.00 | -24.07 | AVG | |
| 11 | | 17.3140 | 26.05 | 9.93 | 35.98 | 60.00 | -24.02 | QP | |
| 12 | | 17.3140 | 19.02 | 9.93 | 28.95 | 50.00 | -21.05 | AVG | |




Site Conduction #1 Phase: N Temperature: 24.9
Limit: (CE)FCC PART 15 C_QP Power: AC 120V/60Hz Humidity: 54 %

Mode: 2.4G Wireless connecting
Note: Adapter: Tenpao

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1700 | 33.83 | 9.56 | 43.39 | 64.96 | -21.57 | QP | |
| 2 | | 0.1700 | 16.30 | 9.56 | 25.86 | 54.96 | -29.10 | AVG | |
| 3 | | 0.2140 | 30.47 | 9.56 | 40.03 | 63.05 | -23.02 | QP | |
| 4 | | 0.2140 | 12.55 | 9.56 | 22.11 | 53.05 | -30.94 | AVG | |
| 5 | * | 0.4060 | 29.79 | 9.57 | 39.36 | 57.73 | -18.37 | QP | |
| 6 | | 0.4060 | 12.02 | 9.57 | 21.59 | 47.73 | -26.14 | AVG | |
| 7 | | 5.7740 | 21.67 | 9.68 | 31.35 | 60.00 | -28.65 | QP | |
| 8 | | 5.7740 | 15.46 | 9.68 | 25.14 | 50.00 | -24.86 | AVG | |
| 9 | | 12.3700 | 22.79 | 9.84 | 32.63 | 60.00 | -27.37 | QP | |
| 10 | | 12.3700 | 17.14 | 9.84 | 26.98 | 50.00 | -23.02 | AVG | |
| 11 | | 17.3180 | 26.94 | 9.93 | 36.87 | 60.00 | -23.13 | QP | |
| 12 | | 17.3180 | 18.57 | 9.93 | 28.50 | 50.00 | -21.50 | AVG | |



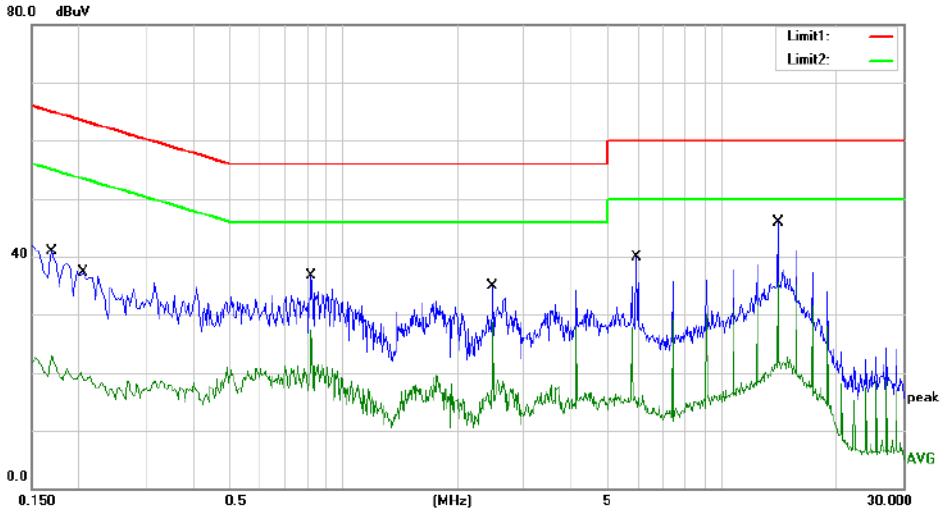

Site Conduction #1 Phase: N Temperature: 24.9

Limit: (CE)FCC PART 15 C_QP Power: AC 120V/60Hz Humidity: 54 %

Mode: 2.4G Wireless connecting

Note: Adapter: TianYin

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1540 | 30.57 | 9.56 | 40.13 | 65.78 | -25.65 | QP | |
| 2 | | 0.1540 | 10.37 | 9.56 | 19.93 | 55.78 | -35.85 | AVG | |
| 3 | | 0.2660 | 25.09 | 9.56 | 34.65 | 61.24 | -26.59 | QP | |
| 4 | | 0.2660 | 6.37 | 9.56 | 15.93 | 51.24 | -35.31 | AVG | |
| 5 | | 0.5260 | 24.57 | 9.57 | 34.14 | 56.00 | -21.86 | QP | |
| 6 | | 0.5260 | 16.75 | 9.57 | 26.32 | 46.00 | -19.68 | AVG | |
| 7 | | 0.8260 | 21.13 | 9.58 | 30.71 | 56.00 | -25.29 | QP | |
| 8 | | 0.8260 | 12.35 | 9.58 | 21.93 | 46.00 | -24.07 | AVG | |
| 9 | | 12.3700 | 24.73 | 9.84 | 34.57 | 60.00 | -25.43 | QP | |
| 10 | | 12.3700 | 16.75 | 9.84 | 26.59 | 50.00 | -23.41 | AVG | |
| 11 | * | 14.0180 | 31.32 | 9.88 | 41.20 | 60.00 | -18.80 | QP | |
| 12 | | 14.0180 | 20.35 | 9.88 | 30.23 | 50.00 | -19.77 | AVG | |




Site Conduction #1 Phase: L1 Temperature: 24.9

Limit: (CE)FCC PART 15 C_QP Power: AC 120V/60Hz Humidity: 54 %

Mode: 2.4G Wireless connecting

Note: Adapter: TianYin

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1700 | 32.52 | 9.56 | 42.08 | 64.96 | -22.88 | QP | |
| 2 | | 0.1700 | 13.28 | 9.56 | 22.84 | 54.96 | -32.12 | AVG | |
| 3 | | 0.2060 | 27.68 | 9.56 | 37.24 | 63.37 | -26.13 | QP | |
| 4 | | 0.2060 | 10.45 | 9.56 | 20.01 | 53.37 | -33.36 | AVG | |
| 5 | | 0.8260 | 27.08 | 9.58 | 36.66 | 56.00 | -19.34 | QP | |
| 6 | | 0.8260 | 17.70 | 9.58 | 27.28 | 46.00 | -18.72 | AVG | |
| 7 | | 2.4740 | 25.20 | 9.62 | 34.82 | 56.00 | -21.18 | QP | |
| 8 | | 2.4740 | 19.05 | 9.62 | 28.67 | 46.00 | -17.33 | AVG | |
| 9 | | 5.9540 | 30.20 | 9.68 | 39.88 | 60.00 | -20.12 | QP | |
| 10 | | 5.9540 | 18.12 | 9.68 | 27.80 | 50.00 | -22.20 | AVG | |
| 11 | * | 14.0180 | 36.07 | 9.88 | 45.95 | 60.00 | -14.05 | QP | |
| 12 | | 14.0180 | 25.52 | 9.88 | 35.40 | 50.00 | -14.60 | AVG | |

## 8.10 ANTENNA APPLICATION

### 8.10.1 Antenna Requirement

| Standard | Requirement |
|---|---|
| FCC CRF Part 15.203<br>RSS-Gen Clause 6.7 | An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded. |

For intentional device, according to FCC 47 CFR Section 15.203 and IC RSS-Gen 6.8, 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. And according to FCC 47 CFR Section 15.247 (b) and IC RSS-Gen 6.8, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 8.10.2 Result

PASS.

The EUT has a Integral Antenna for 2.4G, the gain is 0 dBi

Note: ☒ Antenna use a permanently attached antenna which is not replaceable.
☐ Not using a standard antenna jack or electrical connector for antenna replacement
☐ The antenna has to be professionally installed (please provide method of installation)

which in accordance to section 15.203, please refer to the internal photos.

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