# EMC
# TEST REPORT

**Report No.** : **150600032TWN-001**
**Model No.** : **#7416, #7416-CN, #7416-LG, #7416-US, #7416-K, #7416-FE, #7416-BUKI, #7416ITA, #7416-IQ, #7416-EL, 1617389, 620375**
**Issued Date** : **Jul. 23, 2015**

**Applicant:** **GENIUS TOY TAIWAN CO., LTD.**
**7F-2, NO. 302, TAICHUNG KANG ROAD, SEC. 1, TAICHUNG, 403 R.O.C.**

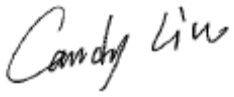
**Test Method/ Standard:** **47 CFR FCC Part 15.247 & ANSI C63.4 2009**
**KDB 558074 D01 v03r03**
**KDB 662911 D01 v02r01**

**Test Site:** **93910**

**Test By:** **Intertek Testing Services Taiwan Ltd.**
**No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li, Shiang-Shan District, Hsinchu City, Taiwan**

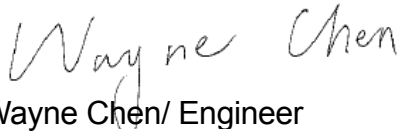


**The test report was prepared by:**



Candy Liu/ Assistant

**These measurements were taken by:**



Wayne Chen/ Engineer

**The test report was reviewed by:**

**Name** Jimmy Yang
**Title** Senior Engineer

# Revision History

| Report No. | Issue Date | Revision Summary |
|---|---|---|
| 150600032TWN-001 | Jul. 23, 2015 | Original report |

# Table of Contents

# 1. Summary of Test Data

| Test Requirement | Applicable Rule (Section 15.247) | Result |
|---|---|---|
| Minimum 6 dB Bandwidth | 15.247(a)(2)<br>KDB 558074 D01 v03r03 | Pass |
| Maximum Peak Conducted Output Power | 15.247(b)(3)<br>KDB 558074 D01 v03r03<br>KDB 662911 D01 v02r01 | Pass |
| Power Spectral Density | 15.247(e) | Pass |
| Emissions In Non-Restricted Frequency Bands | 15.247(d) | Pass |
| Emissions In Restricted Frequency Bands (Radiated emission measurements) | 15.247(d), 15.205, 15.209 | Pass |
| Emission On The Band Edge | 15.247(d), 15.205 | Pass |
| AC Power Line Conducted Emission | 15.207 | N/A |
| Antenna Requirement | 15.203 | Pass |

# 2. General Information

## 2.1 Identification of the EUT

| | |
|---|---|
| Product: | SMART MACHINES |
| Model No: | #7416-US |
| FCC ID: | 2AE3D-GC258006 |
| Operating Frequency: | 2402 MHz ~ 2480 MHz |
| Channel Number: | 40 channels |
| Frequency of Each Channel: | 2402+2 k MHz, k＝0~39 |
| Access scheme: | GFSK |
| Rated Power: | DC 4.5V |
| Power Cord: | N/A |
| Sample Received: | Jun. 02, 2015 |
| Sample condition: | Workable |
| Test Date(s): | Jul. 15, 2015 ~ Jul. 16, 2015 |
| Note 1: | This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. |
| Note 2: | When determining the test conclusion, the Measurement Uncertainty of test has been considered. |

## 2.2 Additional information about the EUT

The customer confirmed #7416, #7416-CN, #7416-LG, #7416-K, #7416-FE, #7416-BUKI, #7416ITA, #7416-IQ, #7416-EL, 1617389, 620375 are identical in cosmetics, electrical, mechanical and physical design, including software/ firmware with previous model no. #7416-US except the item numbers which depend on different countries for the buyers and packaging.

## 2.3 Description of EUT

| Modulation mode | Transmit path |
|---|---|
| | Chain 0 / Main |
| BT4.0 | V |

Product SW/HW version : OCTOPUS_V02
Radio SW/HW version : F-Octopus-V004
Test SW Version : 1.0.0

## 2.4 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : -1.5 dBi
Antenna Type : PIFA antenna
Connector Type : Fixed

## 2.5 Operation mode

The EUT was supplied with DC 4.5V from battery
We execute “uEnergy Test” to set EUT in TX-Mode, and select different frequency.

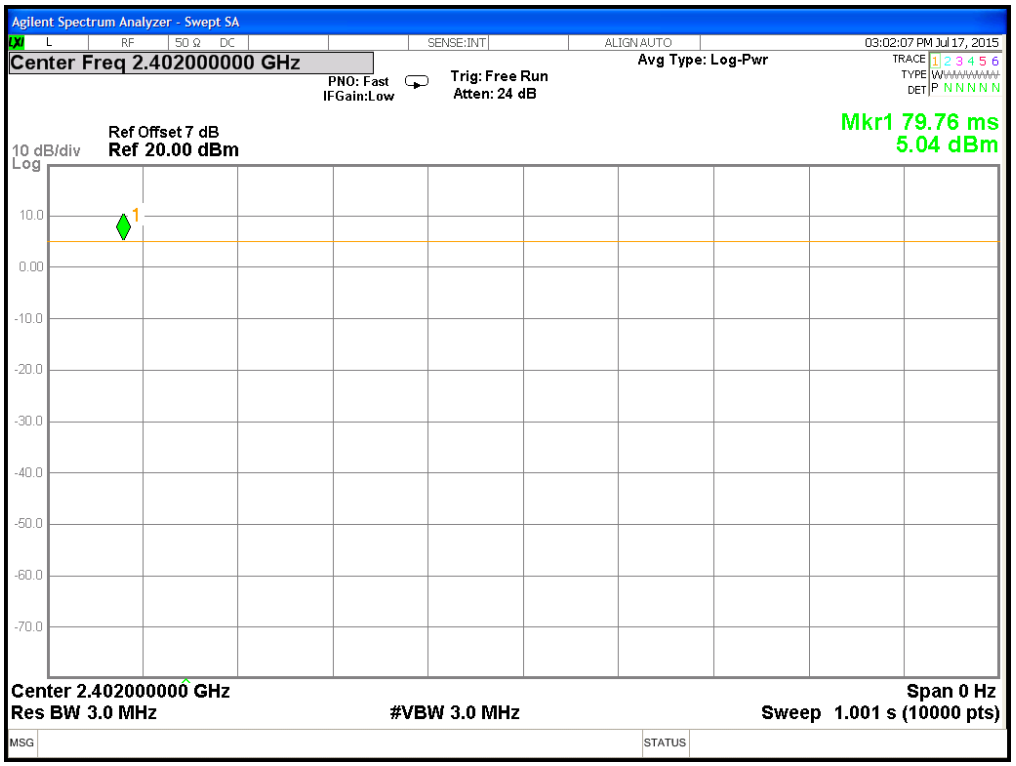
## 2.6 Applied test modes and channels

| Test items | Mode | Channel | Antenna |
|---|---|---|---|
| Minimum 6 dB Bandwidth | BT4.0 | Low , Middle , High | Chain0 |
| Maximum peak conducted output power | BT4.0 | Low , Middle , High | Chain0 |
| Power Spectral Density | BT4.0 | Low , Middle , High | Chain0 |
| RF Antenna Conducted Spurious | BT4.0 | Low , Middle , High | Chain0 |
| Radiated spurious Emission 30MHz~1GHz | BT4.0 | Low , Middle , High | Chain0 |
| Radiated Spurious Emission 10GHz~10th Harmonic | BT4.0 | Low , Middle , High | Chain0 |
| Emission on the Band Edge | BT4.0 | Low , High | Chain0 |

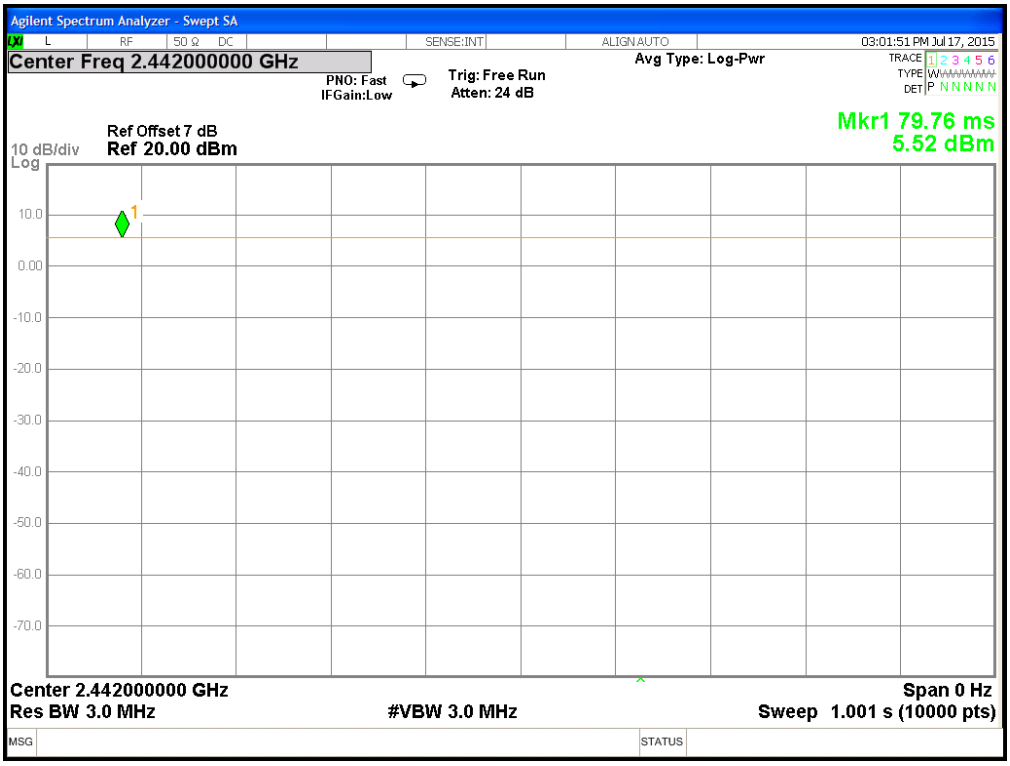
## 2.7 Duty cycle of EUT

| Mode | Channel | Frequency (MHz) | Signal on time(s) | Total signal transmit time(s) | Duty cycle | Duty Cycle factor |
|---|---|---|---|---|---|---|
| BT4.0 | Low | 2402 | 1.001 | 1.001 | 1.000 | 0.000 |
| | Middle | 2442 | 1.001 | 1.001 | 1.000 | 0.000 |
| | High | 2480 | 1.001 | 1.001 | 1.000 | 0.000 |

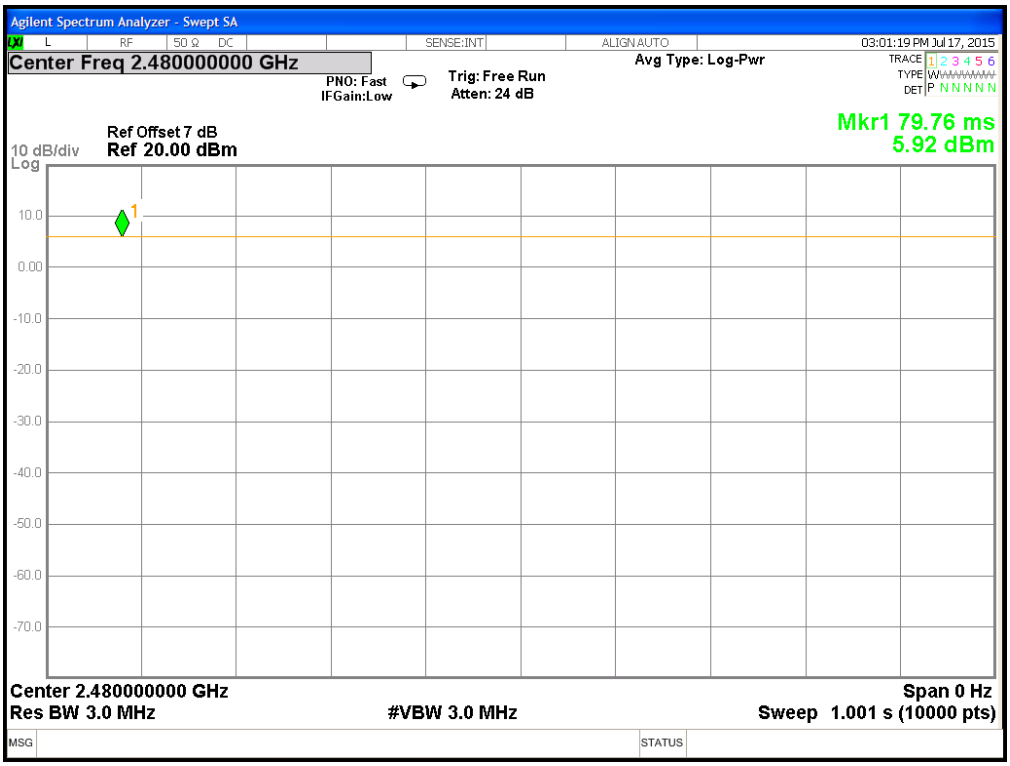
Duty Cycle @ GFSK mode Low Channel




Duty Cycle @ GFSK mode Middle Channel



Duty Cycle @ GFSK mode High Channel



# 3. Minimum 6 dB Bandwidth

## 3.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 25 | ℃ |
| Relative Humidity: | 50 | % |
| Atmospheric Pressure | 1008 | hPa |
| Requirement & Test method | 15.247(a)(2)<br>KDB 558074 D01 v03r03 | |

## 3.2 Limit for minimum 6dB bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

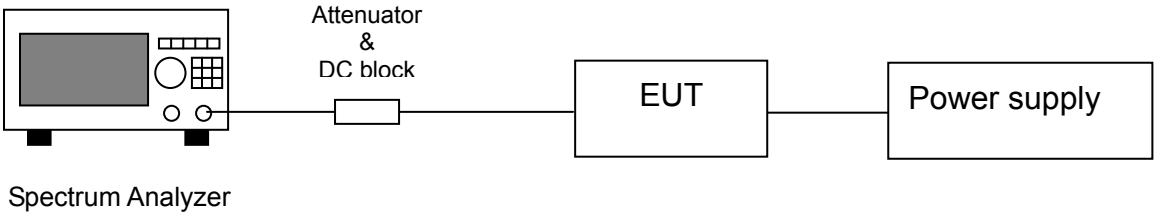
## 3.3 Measuring instrument setting

| Spectrum analyzer settings | |
|---|---|
| **Spectrum Analyzer function** | **Setting** |
| Detector | Peak |
| RBW | 100kHz |
| VBW | ≧3 x RBW |
| Sweep | Auto couple |
| Trace | Allow the trace to stabilize. |
| Span | Between two times and five times the occupied bandwidth |
| Attenuation | Auto |

## 3.4 Test procedure

1. The transmitter output was connected to the spectrum analyzer.
2. Test was performed in accordance with clause 8.1 option1 of KDB 558074 D01
3. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

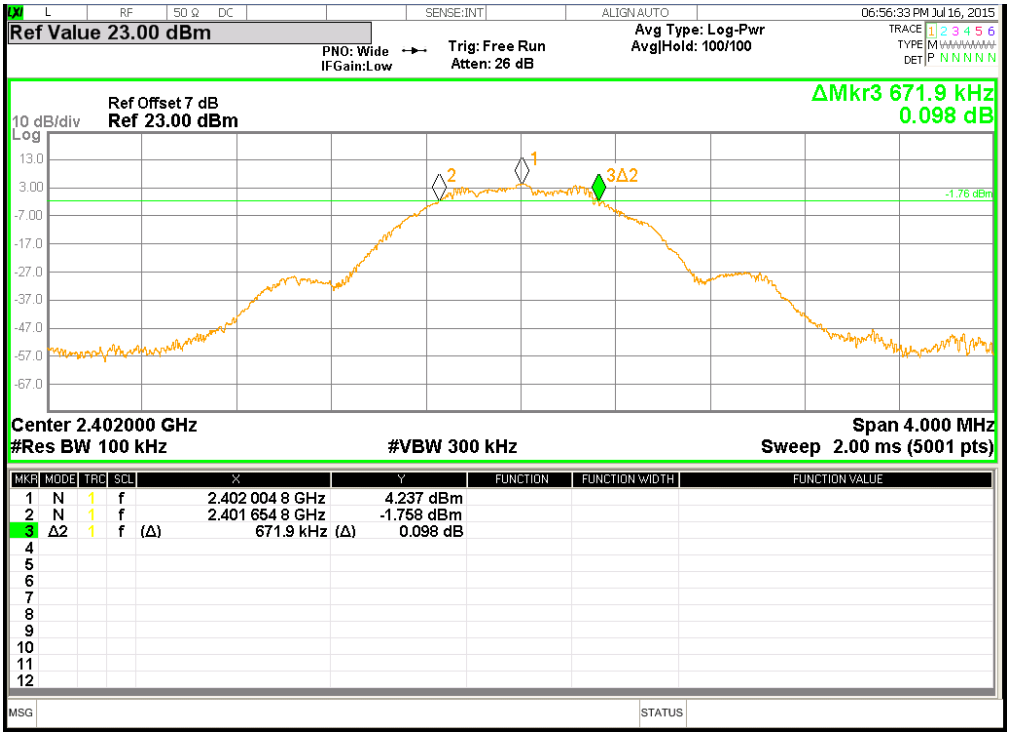
### 3.5 Test diagram




### 3.6 Test results

| Mode | Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (MHz) | Pass/Fail |
|---|---|---|---|---|---|
| BT4.0 | Low | 2402 | 0.6719 | 0.5 | Pass |
| | Middle | 2442 | 0.6910 | 0.5 | Pass |
| | High | 2480 | 0.6784 | 0.5 | Pass |

Chain0 : 6dB Bandwidth @ GFSK mode Ch Low




Chain0 : 6dB Bandwidth @ GFSK mode Ch Middle

Chain0 : 6dB Bandwidth @ GFSK mode Ch High

# 4. Maximum Peak Conducted Output Power

## 4.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 25 | ℃ |
| Relative Humidity: | 50 | % |
| Atmospheric Pressure | 1008 | hPa |
| Requirement & Test method | 15.247(b)(3)<br>KDB 558074 D01 v03r03<br>KDB 662911 D01 v02r01 | |

## 4.2 Limit for maximum peak conducted output power

For systems using digital modulation in the 2400-2483.5 MHz: 1 Watt (30dBm)

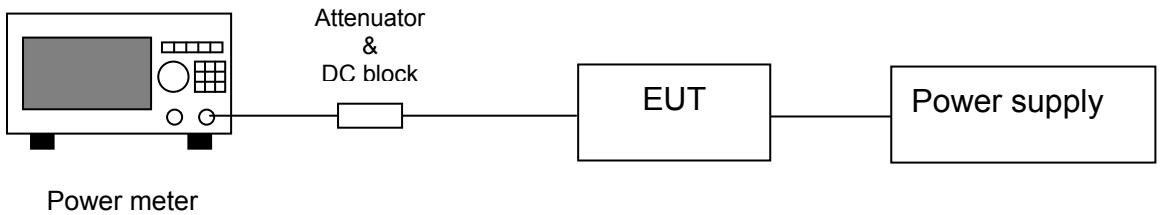
## 4.3 Measuring instrument setting

| Power meter | |
|---|---|
| **Power meter** | **Setting** |
| Bandwidth | 65MHz bandwidth is greater than the EUT emission bandwidth |
| Detector | Peak & Average |

## 4.4 Test procedure

Test procedures refer to clause 9.1.3 peak power meter method and clause 9.2.3.2 measurement using a gated RF average power meter of KDB 558074 D01.

## 4.5 Test diagram



### 4.6 Test result

| Mode | Channel | Frequency (MHz) | Output Power (AV) (dBm) | Total Power (AV) (mW) | Maximum (PK) (dBm) | Maximum (PK) (mW) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| BT4.0 | Low | 2402 | 4.95 | 3.13 | 5.56 | 3.597 | 30 | -24.44 |
| | Middle | 2442 | 5.41 | 3.48 | 5.93 | 3.917 | 30 | -24.07 |
| | High | 2480 | 5.91 | 3.90 | 6.41 | 4.375 | 30 | -23.59 |

# 5. Power Spectral Density

## 5.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 25 | ℃ |
| Relative Humidity: | 50 | % |
| Atmospheric Pressure | 1008 | hPa |
| Requirement & Test method | 15.247(e)<br>KDB 558074 D01 v03r03<br>KDB 662911 D01 v02r01 | |

## 5.2 Limit for power spectrum density

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

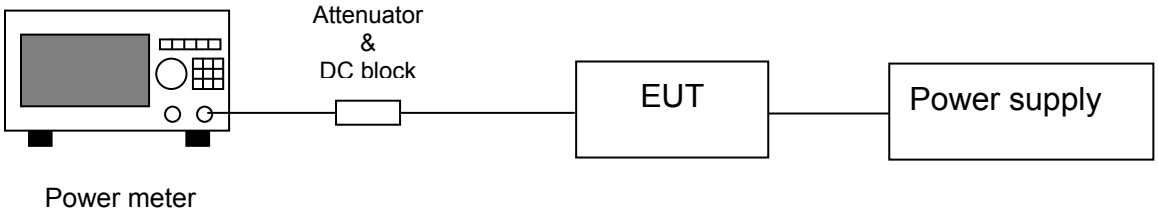
## 5.3 Measuring instrument setting

| **Spectrum analyzer settings** | |
|---|---|
| **Spectrum Analyzer function** | **Setting** |
| Detector | Peak |
| RBW | ≧3 kHz |
| VBW | ≧3 x RBW |
| Sweep | Auto couple |
| Trace | Max hold |
| Span | 1.5 times x 6dB bandwidth |
| Attenuation | Auto |

### 5.4 Test procedure

1. Test procedure refer to clause 10.2 method PKPSD (peak PSD) of KDB 558074 D01 and clause E) 2) b) measure and sum spectral maxima across the outputs of KDB 662911
2. Using the maximum conducted output power in the fundamental emission demonstrates compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Use the peak marker function to determine the maximum amplitude level within the RBW.

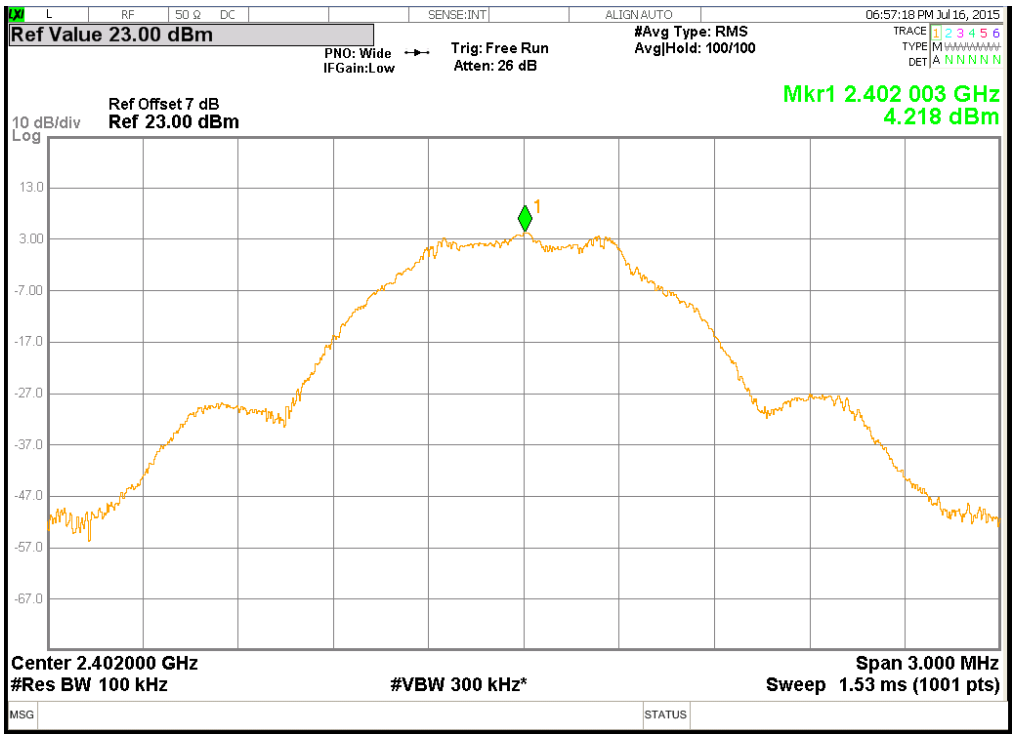
### 5.5 Test diagram



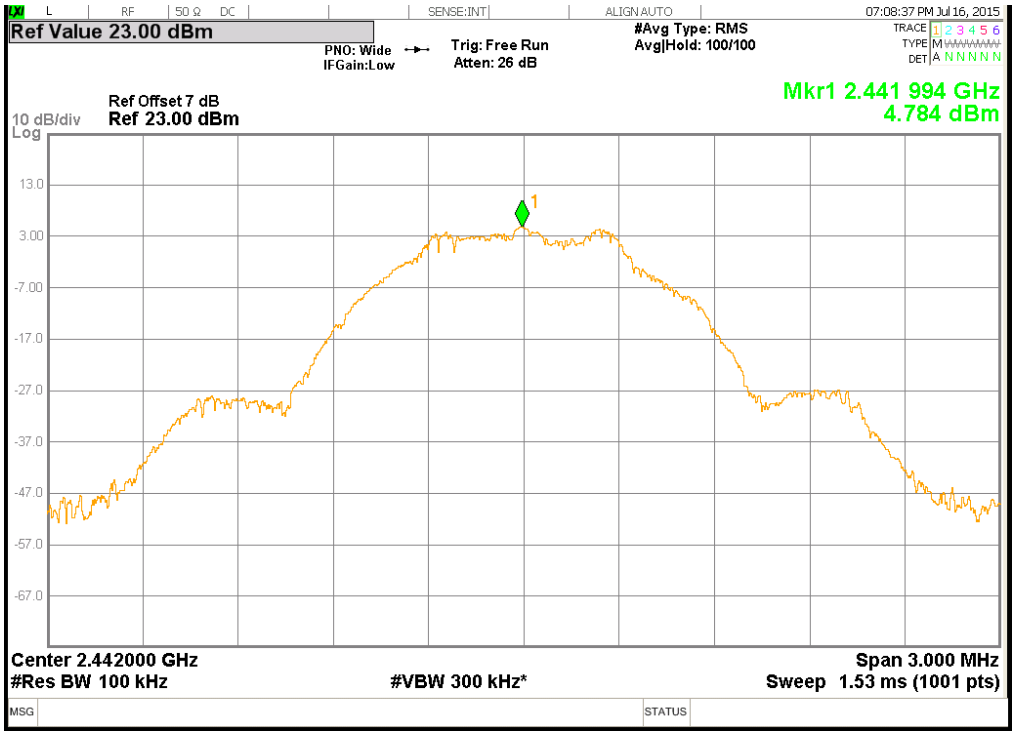

### 5.6 Test results

| Mode | Channel | Frequency (MHz) | PSD | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|
| | | | (dBm) | (mw) | | |
| BT4.0 | Low | 2402 | 4.218 | 2.64 | 8 | -3.78 |
| | Middle | 2442 | 4.780 | 3.01 | 8 | -3.22 |
| | High | 2480 | 5.260 | 3.36 | 8 | -2.74 |

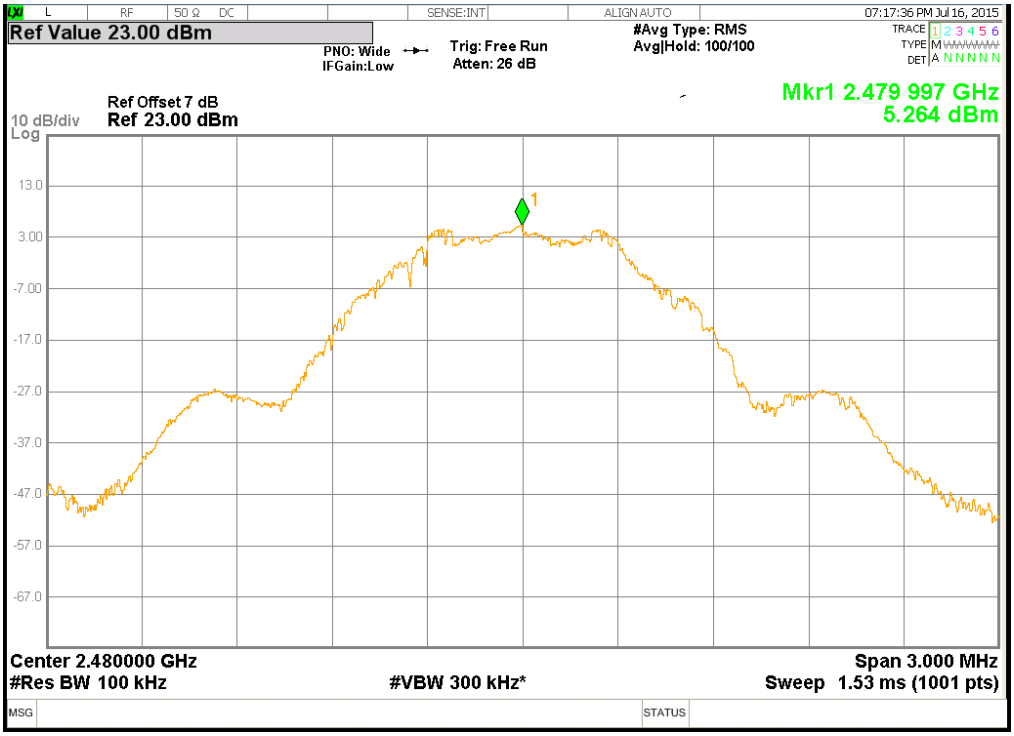
Power Spectral Density @ GFSK mode Ch Low




Power Spectral Density @ GFSK mode Ch Middle



Power Spectral Density @ GFSK mode Ch High



# 6. Emissions In Non-Restricted Frequency Bands

## 6.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 20 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |
| Requirement | 15.247(d) | |

## 6.2 Limit for emissions in non-restricted frequency bands

The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz

## 6.3 Measuring instruments setting

**Reference level measurement**

| Spectrum analyzer settings | |
|---|---|
| **Spectrum Analyzer function** | **Setting** |
| Detector | Peak |
| RBW | ≧100 kHz |
| VBW | ≧3 x RBW |
| Sweep | Auto couple |
| Trace | Max hold |
| Span | ≧1.5 time 6dB bandwidth |
| Attenuation | Auto |

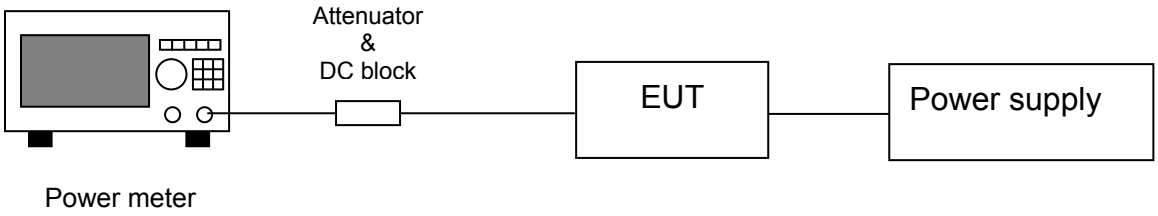
**Emission level measurement**

| Spectrum analyzer settings | |
|---|---|
| **Spectrum Analyzer function** | **Setting** |
| Detector | Peak |
| RBW | ≧100 kHz |
| VBW | ≧3 x RBW |
| Sweep | Auto couple |
| Trace | Max hold |
| Attenuation | Auto |

### 6.4 Test procedure

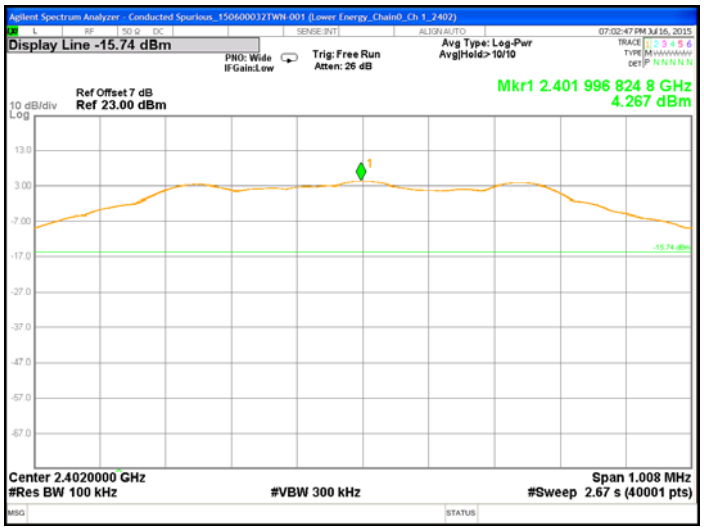
1. The procedure was used in antenna-port conducted and connected to the spectrum analyzer.
2. Set instrument center frequency to center frequency
3. Use the parameter configured in clause 6.3 to measure
4. Use the peak marker function to determine the maximum amplitude level.

### 6.5 Test diagram

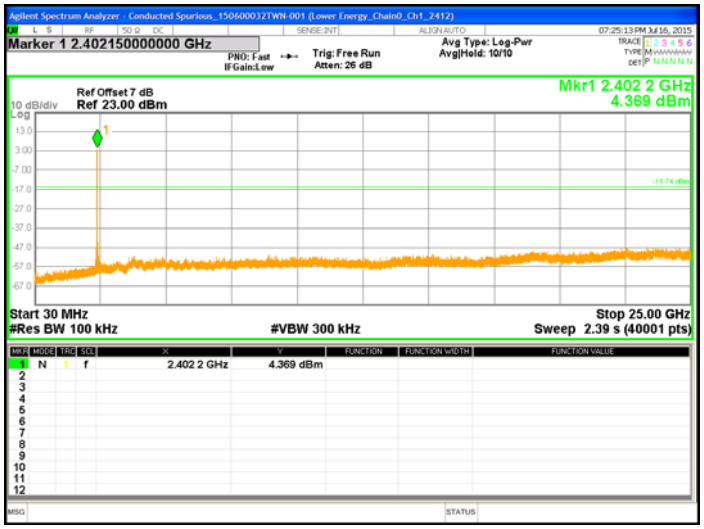


## 6.6 Test results

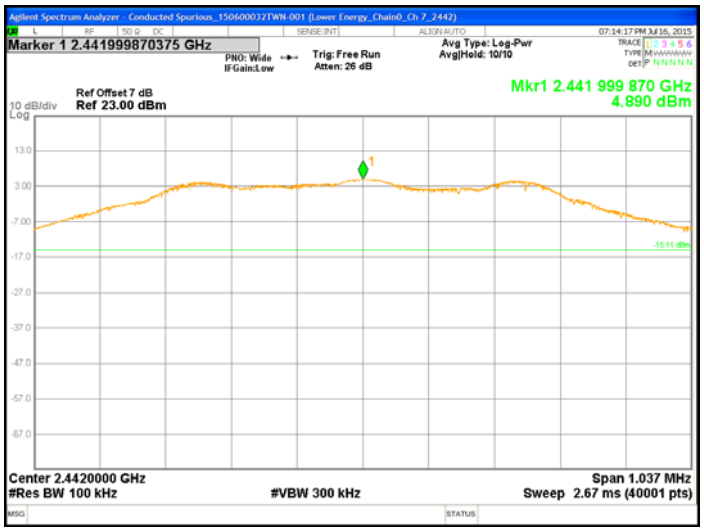
Chain0 : Conducted Spurious @ Ch Low



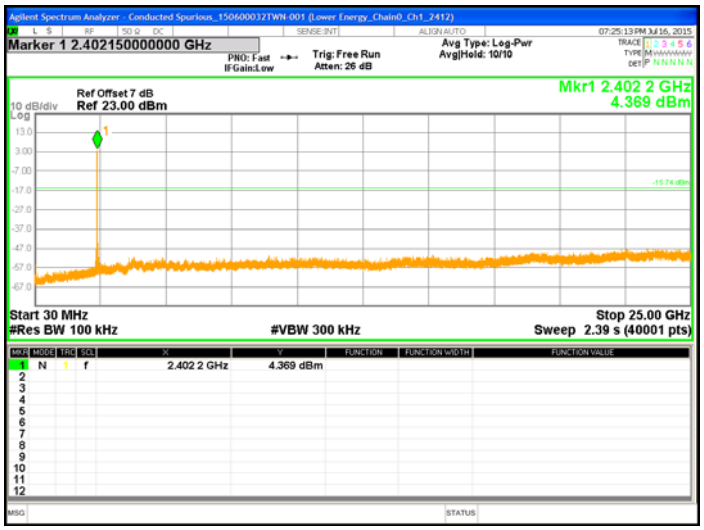

Chain0 : Conducted Spurious @ Ch Low



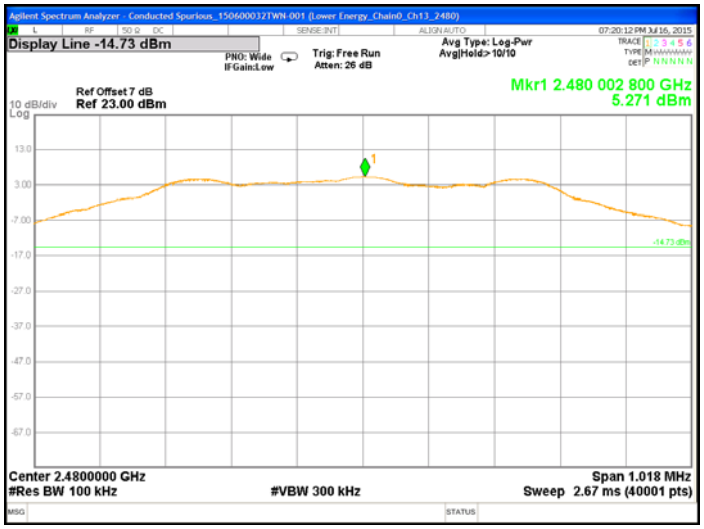

Chain0 : Conducted Spurious @ Ch Middle



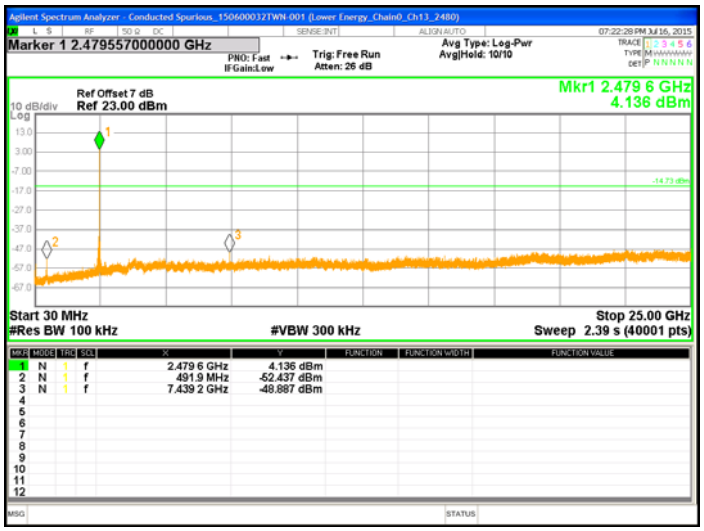
Chain0 : Conducted Spurious @ Lower Energy mode Ch Middle




Chain0 : Conducted Spurious @ Ch High




Chain0 : Conducted Spurious @ Ch High



# 7. Emissions In Restricted Frequency Bands (Radiated emission measurements)

## 7.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 20 | ℃ |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |
| Requirement | 15.247(d), 15.205, 15.209 | |

## 7.2 Limit for emission in restricted frequency bands (Radiated emission measurement)

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009~0.490 | 2400/F(kHz) | 300 |
| 0.490~1.705 | 2400/F(kHz) | 30 |
| 1.705~30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

## 7.3 Measuring instrument setting

### Below 1GHz measurement

| Receiver settings | |
|---|---|
| **Receiver function** | **Setting** |
| Detector | QP |
| RBW | 9-150 kHz ; 200-300 Hz<br>0.15-30 MHz; 9-10 kHz<br>30-1000 MHz; 100-120 kHz |
| VBW | ≧3 x RBW |
| Sweep | Auto couple |
| Attenuation | Auto |

### Above 1GHz measurement

| Spectrum analyzer settings | |
|---|---|
| **Spectrum Analyzer function** | **Setting** |
| Detector | Peak |
| RBW | 1MHz |
| VBW | 3MHz for Peak; 10Hz for Average |
| Sweep | Auto couple |
| Start Frequency | 1GHz |
| Stop Frequency | Tenth harmonic |
| Attenuation | Auto |

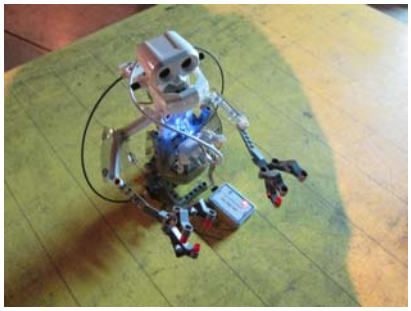
### 7.4 Test procedure

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the companion devices. The turntable was rotated by 360 degree to find the position of the maximum emission level.
3. The height of the receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of the both horizontal and vertical polarization
4. If find the frequencies above the limit or below within 3dB, the antenna tower was scan (from 1m to 4m) and then the turntable was rotated to find the maximum reading.
5. Set the test-receiver system to peak or CISPR quasi-peak detector with specified bandwidth under maximum hold mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3dB lower than the average limit specified then testing will be stopped and peak values of the EUT will be reported. Otherwise, the emissions which do not have 3dB margin will be measured using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, The emissions level of the EUT in peak mode was lower than average limit, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be quasi-peak measured by receiver.

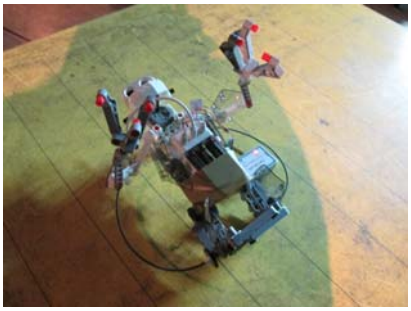
### 7.5 Test diagram

The signal is maximized through rotation and placement in the two orthogonal axes.

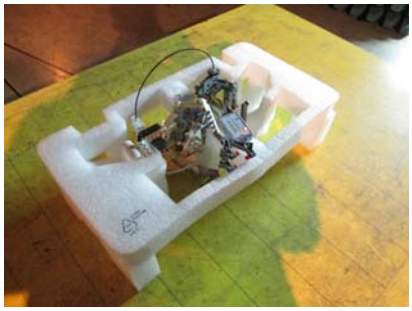
X-plane



Y-plane



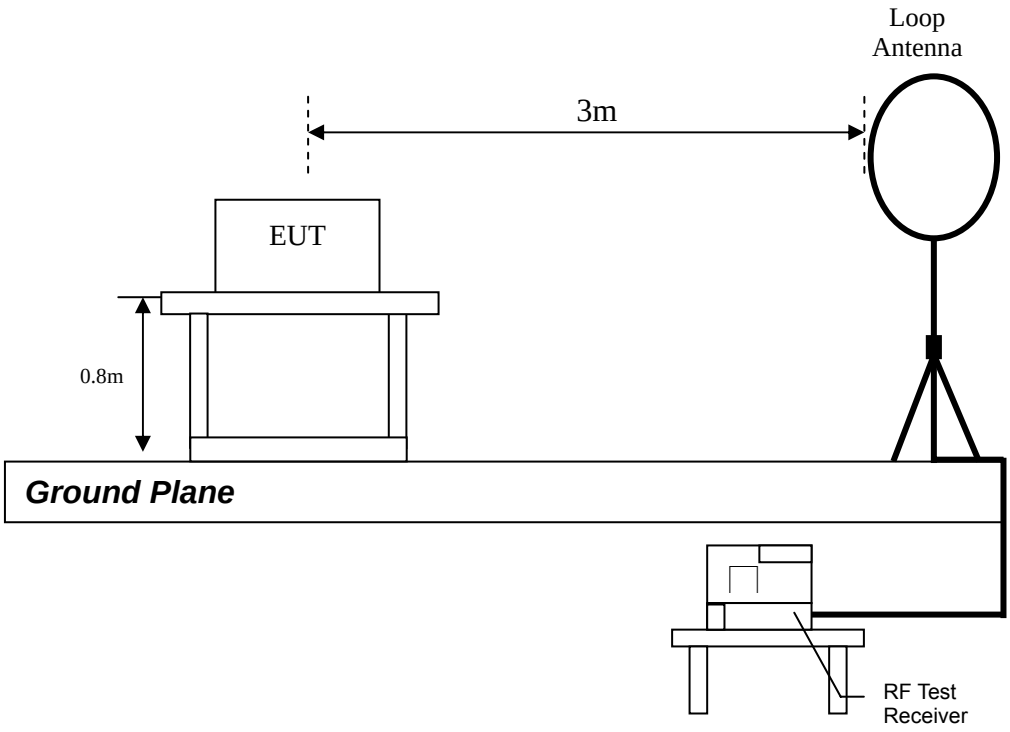
Z-plane



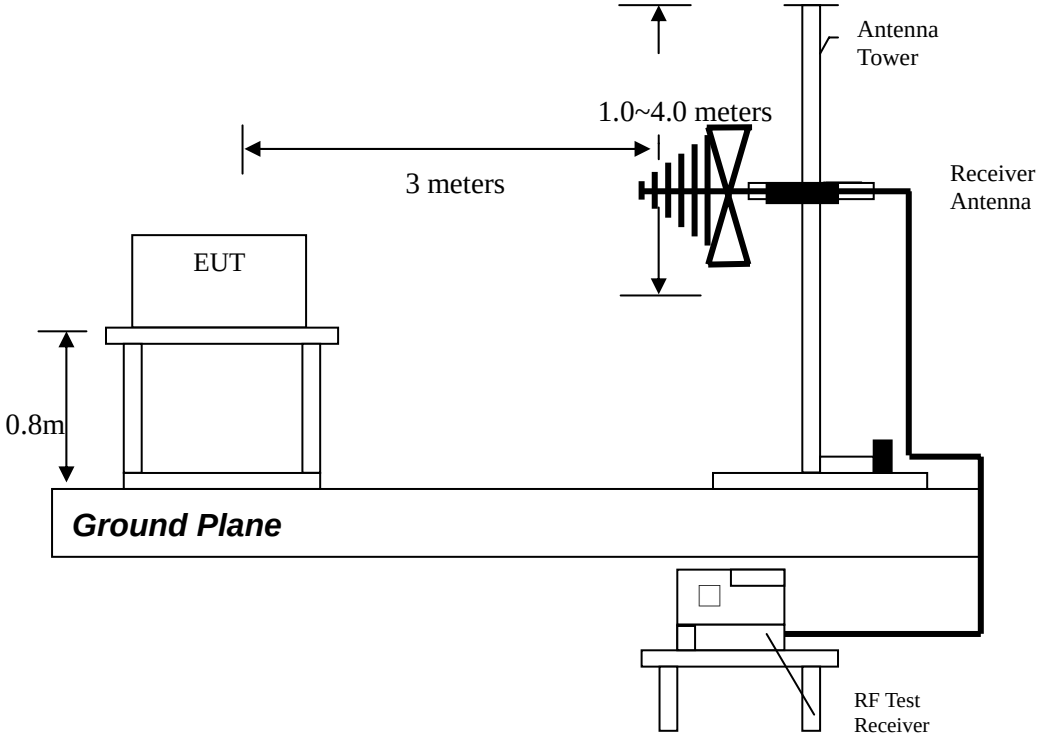
After verifying three axes, we found the maximum electromagnetic field was occurred at Z-plane configuration. The final test data was executed under this configuration.

### 7.6 Test configuration

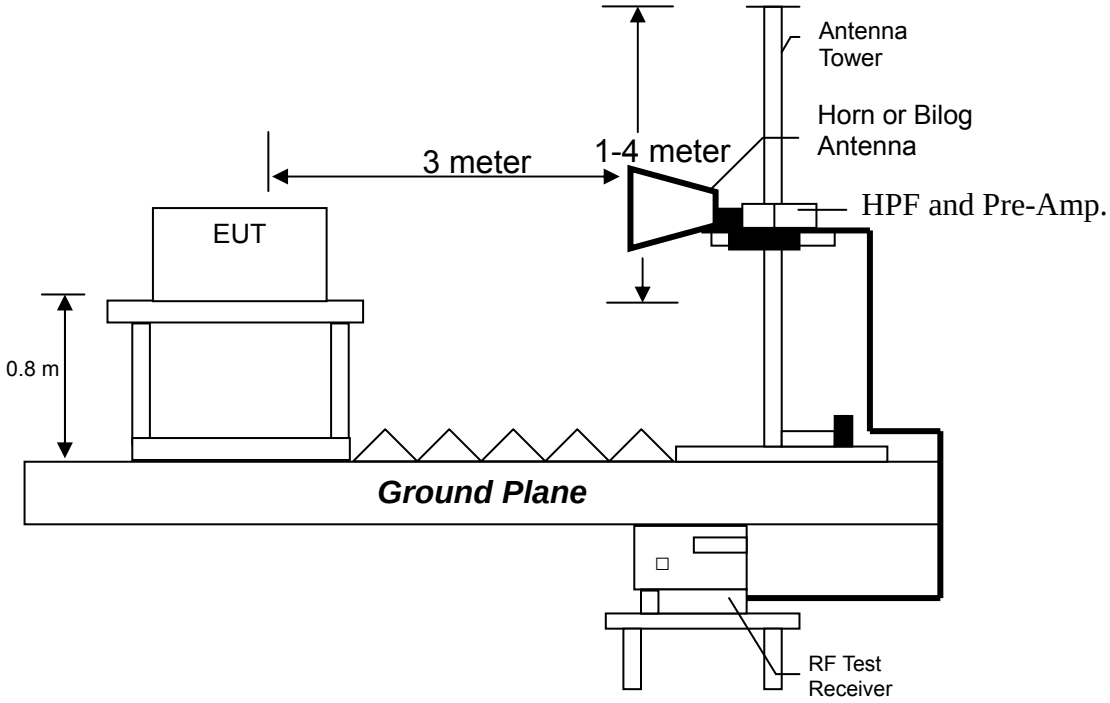
#### 7.6.1 Radiated emission from 9kHz to 30MHz uses Loop Antenna:



### 7.6.2 Radiated emission below 1GHz using Bilog Antenna



### 7.6.3 Radiated emission above 1GHz using Horn Antenna



## 7.7 Test result

### 7.7.1 Measurement results: frequencies 9 kHz to 30 MHz

EUT : #7416-US
Test mode : TX mode High channel
Test Voltage : DC4.5 V

| Polarity (circle) | Frequency (MHz) | Detection value | Corr. Factor (dB/m) | Reading (dBμV) | value (dBμV/m) | Limit @ 3m (dBμV/m) | Tolerance (dB) |
|---|---|---|---|---|---|---|---|
| Plane | 0.02 | QP | 91.56 | 16.99 | 109.64 | 121.58 | -11.94 |
| Plane | 0.04 | QP | 84.18 | 22.35 | 105.37 | 115.56 | -10.19 |
| Plane | 0.07 | QP | 66.09 | 17.12 | 84.62 | 110.70 | -26.08 |
| Coaxial | 0.02 | QP | 91.56 | 16.33 | 106.55 | 121.58 | -15.03 |
| Coaxial | 0.04 | QP | 84.18 | 19.47 | 102.13 | 115.56 | -13.43 |
| Coaxial | 0.07 | QP | 66.09 | 19.00 | 81.59 | 110.70 | -29.11 |
| Remark: Corr. Factor = Antenna Factor + Cable Loss | | | | | | | |

### 7.7.2 Measurement results: frequencies below 1 GHz

The test was performed on EUT under GFSK continuously transmitting mode. The worst case occurred at Tx Low channel

EUT : #7416-US
Worst Case : GFSK at Tx High channel
Test Voltage : DC 4.5 V

| Antenna Polariz. (V/H) | Freq. (MHz) | **Receiver Detector** | **Corr. Factor (dB/m)** | **Reading (dBμV)** | **Corrected Level (dBμV/m)** | **Limit @ 3 m (dBμV/m)** | **Margin (dB)** |
|---|---|---|---|---|---|---|---|
| Vertical | 322.64 | QP | 18.01 | 8.92 | 26.93 | 46.00 | -19.07 |
| Vertical | 386.96 | QP | 19.60 | 9.25 | 28.85 | 46.00 | -17.15 |
| Vertical | 412.18 | QP | 20.22 | 12.69 | 32.91 | 46.00 | -13.09 |
| Vertical | 419.94 | QP | 20.42 | 13.42 | 33.84 | 46.00 | -12.16 |
| Vertical | 487.84 | QP | 21.83 | 14.52 | 36.35 | 46.00 | -9.65 |
| Vertical | 520.82 | QP | 22.44 | 13.09 | 35.53 | 46.00 | -10.47 |
| Horizontal | 280.26 | QP | 16.89 | 13.66 | 30.55 | 46.00 | -15.45 |
| Horizontal | 340.40 | QP | 18.48 | 10.64 | 29.12 | 46.00 | -16.88 |
| Horizontal | 419.94 | QP | 20.42 | 18.68 | 39.10 | 46.00 | -6.90 |
| Horizontal | 460.68 | QP | 21.38 | 19.67 | 41.05 | 46.00 | -4.95 |
| Horizontal | 495.60 | QP | 21.96 | 17.70 | 39.66 | 46.00 | -6.34 |
| Horizontal | 520.82 | QP | 22.44 | 14.67 | 37.11 | 46.00 | -8.89 |

Remark: Corr. Factor = Antenna Factor + Cable Loss

### 7.7.3 Measurement results: frequency above 1GHz

EUT : #7416-US
Test Voltage : DC 4.5 V

| Mode | Freq. (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Channel Low | 4804 | PK | V | 40.13 | -0.10 | 47.94 | 47.84 | 74.00 | -26.16 |
| | 4980 | PK | V | 39.81 | 0.48 | 42.73 | 43.21 | 74.00 | -30.79 |
| | 7206 | PK | V | 38.11 | 8.10 | 41.63 | 49.73 | 74.00 | -24.27 |
| | 4804 | PK | H | 40.13 | -0.10 | 45.71 | 45.61 | 74.00 | -28.39 |
| | 4980 | PK | H | 39.81 | 0.48 | 38.04 | 38.52 | 74.00 | -35.48 |
| | 7206 | PK | H | 38.11 | 8.10 | 37.50 | 45.60 | 74.00 | -28.40 |
| Channel Middle | 4884 | PK | V | 39.99 | 0.16 | 48.94 | 49.10 | 74.00 | -24.90 |
| | 4980 | PK | V | 39.81 | 0.48 | 45.30 | 45.78 | 74.00 | -28.22 |
| | 7326 | PK | V | 38.01 | 8.47 | 44.54 | 53.01 | 74.00 | -20.99 |
| | 4884 | PK | H | 39.99 | 0.16 | 46.27 | 46.43 | 74.00 | -27.57 |
| | 7326 | PK | H | 38.01 | 8.47 | 40.96 | 49.43 | 74.00 | -24.57 |
| Channel High | 4960 | PK | V | 39.84 | 0.41 | 47.55 | 47.96 | 74.00 | -26.04 |
| | 7440 | PK | V | 37.91 | 8.82 | 49.01 | 57.83 | 74.00 | -16.17 |
| | 7440 | AV | V | 37.91 | 8.82 | 35.92 | 44.74 | 54.00 | -9.26 |
| | 4960 | PK | H | 39.84 | 0.41 | 45.08 | 45.49 | 74.00 | -28.51 |
| | 7440 | PK | H | 37.91 | 8.82 | 45.56 | 54.38 | 74.00 | -19.62 |
| | 7440 | AV | H | 37.91 | 8.82 | 32.44 | 41.26 | 74.00 | -32.74 |

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

# 8. Emission On Band Edge

## 8.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 25 | ℃ |
| Relative Humidity: | 50 | % |
| Atmospheric Pressure | 1008 | hPa |
| Requirement | 15.247(d), 15.205, | |

## 8.2 Measuring instrument setting

| Spectrum analyzer settings | |
|---|---|
| **Spectrum Analyzer function** | **Setting** |
| Detector | Peak |
| RBW | 1MHz |
| VBW | 3MHz for Peak; 10Hz for Average |
| Sweep | Auto couple |
| Restrict bands | 2310~2390MHz |
| | 2483.5 ~2500MHz |
| Attenuation | Auto |

## 8.3 Test procedure

The test procedure is the same as clause 7.4

### 8.4 Test results

EUT : #7416-US
Test Voltage : DC 4.5 V

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) | Restricted band (MHz) |
|---|---|---|---|---|---|---|---|---|---|
| BT4.0 | 2384.40 | PK | V | 33.83 | 25.13 | 58.96 | 74 | -15.04 | 2310~2390 |
| | 2390.00 | AV | V | 33.85 | 12.21 | 46.06 | 54 | -7.94 | |
| | 2483.50 | PK | V | 34.30 | 25.16 | 59.46 | 74 | -14.54 | 2483.5~2500 |
| | 2483.50 | AV | V | 34.30 | 13.99 | 48.29 | 54 | -5.71 | |
| Remark: Correction Factor = Antenna Factor + Cable Loss | | | | | | | | | |

## 9. AC Power Line Conducted Emission

Since the EUT is not connected to AC source, therefore, the test can be waived.

# Appendix A: Test equipment list

| Equipment | Brand | Model No. | Serial No. | Calibration Date | Next Calibration Date |
|---|---|---|---|---|---|
| ESCI EMI Test Receiver | Rohde & Schwarz | ESCI | 100018 | 2014/12/02 | 2015/12/01 |
| Spectrum Analyzer | Rohde & Schwarz | FSP30 | 100245 | 2015/01/27 | 2016/01/26 |
| Horn Antenna (1-18G) | Schwarzbeck | BBHA 9120 D | 9120D-456 | 2014/08/29 | 2017/08/27 |
| Horn Antenna (14-42G) | SHWARZBECK | BBHA 9170 | BBHA9170159 | 2014/09/16 | 2017/09/14 |
| Broadband Antenna | Schwarzbeck | VULB 9168 | 9168-172 | 2013/08/08 | 2015/08/07 |
| Loop Antenna | RolfHeine | LA-285 | 02/10033 | 2014/03/18 | 2016/03/16 |
| Pre-Amplifier | MITEQ | JS4-26004000--27-8A | 828825 | 2014/09/15 | 2015/09/14 |
| Power Meter | Anritsu | ML2495A | 0844001 | 2014/11/12 | 2015/11/11 |
| Power Senor | Anritsu | MA2411B | 0738452 | 2014/11/12 | 2015/11/11 |
| Two-Line V-Network | Rohde & Schwarz | ESH3-Z5 | 838979/014 | 2014/10/05 | 2015/10/04 |
| Signal Analyzer | Agilent | N9030A | MY51380492 | 2014/09/19 | 2015/09/18 |
| 966-2(A) Cable | SUHNER | SMA / EX 100 | N/A | 2015/05/06 | 2016/05/04 |
| 966-2(B) Cable | JUNFLON | SMA / J12J100880-00 | AUG-26-08-002 | 2015/05/09 | 2016/05/07 |
| RF Cable | SUHNER | SUCOFLEX 102 | CB0006 | 2015/05/06 | 2016/05/04 |
| 966-2_3m Semi-Anechoic Chamber | 966_2 | CEM-966_2 | N/A | 2015/02/24 | 2016/02/23 |
| Brand | | Software | | Version | |
| ADT | | Radiated test system | | 7.5.14 | |
| Audix | | e3 | | 4.2004-1-12k | |

## Measurement Uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of *k*=2.

| Item | Uncertainty |
|---|---|
| Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m | 5.15 dB |
| Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m | 5.23 dB |
| Vertically polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m | 4.19 dB |
| Horizontally polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m | 4.3 dB |
| Vertically polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m | 4.19 dB |
| Horizontally polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m | 4.3 dB |
| Conducted Output power | 0.86 dB |
| Radiated electromagnetic disturbances in the frequency range from 9kHz to 30MHz | 2.92 dB |
| Conducted disturbance measurements at a mains port from 9 kHz to 30 MHz using a 50 Ω/50 μH +5Ω artificial mains network (AMN) | 2.5 dB |