Certificate Number: 5055.02

# TEST REPORT FOR BLE TESTING

Report No.: SRTC2022-9004(F)-22020801(E)

Product ID : AEE001

Applicant: Sharp Corporation

Manufacturer: Sharp Corporation

Specification: FCC Part 15 Subpart C (2021)

FCC ID: APYHRO00305

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District, Beijing, P.R.China

Tel: 86-10-57996183 Fax: 86-10-57996388

# CONTENTS

**1. GENERAL INFORMATION ..... 2**

1.1 Notes of the test report ..... 2
1.2 Information about the testing laboratory ..... 2
1.3 Applicant's details ..... 2
1.4 Manufacturer's details ..... 2
1.5 Test Environment ..... 3

**2 DESCRIPTION OF THE DEVICE UNDER TEST ..... 4**

2.1 Final Equipment Build Status ..... 4
2.2 Description of Test Modes ..... 5
2.2.1 Test Mode Applicability and Tested Channel Detail ..... 5
2.3 Duty Cycle of Test Signal ..... 6
2.4 EUT Operating conditions ..... 7
2.5 Support Equipment ..... 7

**3 REFERENCE SPECIFICATION ..... 7**

**4 KEY TO NOTES AND RESULT CODES ..... 7**

**5 RESULT SUMMARY ..... 8**

**6 TEST RESULT ..... 9**

6.1 6dB Bandwidth ..... 9
6.2 Transmitter Output Power ..... 10
6.3 Transmitter Power Spectral Density ..... 11
6.4 Conducted Out of band emission measurement ..... 12
6.5 Band-edge measurement ..... 13
6.6 Spurious Radiated Emissions ..... 14
6.7 AC Power line Conducted Emission ..... 19

**7 MEASUREMENT UNCERTAINTIES ..... 21**

**8 TEST EQUIPMENTS ..... 22**

**APPENDIX A – TEST DATA OF CONDUCTED EMISSION ..... 23**

**APPENDIX B – TEST DATA OF RADIATED EMISSION ..... 42**

# 1. GENERAL INFORMATION

## 1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC). The test results relate only to individual items of the samples which have been tested. The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

## 1.2 Information about the testing laboratory

| | |
|---|---|
| Company: | The State Radio_monitoring_center Testing Center (SRTC) |
| Address: | 15th Building, No.30 Shixing Street, Shijingshan District, P.R.China |
| City: | Beijing |
| Country or Region: | P.R.China |
| Contacted person: | Liu Jia |
| Tel: | +86 10 57996183 |
| Fax: | +86 10 57996388 |
| Email: | liujiaf@srtc.org.cn |
| Designation Number: | CN1267 |
| Registration number: | 239125 |

## 1.3 Applicant's details

| | |
|---|---|
| Company: | Sharp Corporation |
| Address: | 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan |

## 1.4 Manufacturer's details

| | |
|---|---|
| Company: | Sharp Corporation |
| Address: | 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan |

## 1.5 Test Environment

| | |
|---|---|
| Date of Receipt of test sample at SRTC: | 2022-02-08 |
| Testing Start Date: | 2022-02-10 |
| Testing End Date: | 2022-02-24 |

| Environmental Data: | Temperature (°C) | Humidity (%) |
|---|---|---|
| Ambient | 25 | 40 |
| Maximum Extreme | 55 | --- |
| Minimum Extreme | -10 | --- |

| | |
|---|---|
| Normal Supply Voltage (V d.c.): | 4.0 |
| Maximum Extreme Supply Voltage (V d.c.): | 4.0 |
| Minimum Extreme Supply Voltage (V d.c.): | 3.7 |

# 2 DESCRIPTION OF THE DEVICE UNDER TEST

## 2.1 Final Equipment Build Status

| | |
|---|---|
| Frequency Range: | 2.402GHz~2.480GHz |
| Number of Channel: | 40 |
| Modulation Type: | GFSK |
| Equipment Class: | DTS |
| Channel Spacing: | 2MHz |
| Data Rate: | LE 1Mbps/2Mbps<br>LE Coded 125kbps/500kbps |
| Power Supply: | DC supply |
| Software Revision: | A126A |
| Hardware Revision: | DVT(Remodelled to the equivalent of MP products) |
| IMEI: | 004401230696045 |
| Antenna type: | Refer to Note |
| Antenna connector: | Refer to Note |

Note: There are two types of products: single card and dual card. After verification, dual card is the worst case, so the data reflected in this report are dual card models.

**Antenna requirement (FCC part 15.203)**

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 antenna(s) of the EUT are permanently attached.

•There are no provisions for connection to an external antenna.

Note: The antenna provide to the EUT, please refer to the following table:

| Brand | Model | Antenna gain | Frequency band (GHz) | Antenna type | Connecter Type |
|---|---|---|---|---|---|
| N/A | N/A | -5.0dBi | 2.4GHz~2.4835GHz | Inverted-F Antenna | N/A |
| The antenna gain is provided by the customer and involved in the calculation and influence of the test results. Our laboratory takes the value declared by the customer as the criterion, and the customer is responsible for the antenna gain value. Manufacturers ensure that their designs will not be modified by the user or third party's arbitrary antenna parameters and performance. | | | | | |

## 2.2 Description of Test Modes

40 channels are provided to this EUT:

| CHANNEL | FREQ. (MHz) | CHANNEL | FREQ. (MHz) | CHANNEL | FREQ. (MHz) | CHANNEL | FREQ. (MHz) |
|---|---|---|---|---|---|---|---|
| 0 | 2402 | 10 | 2422 | 20 | 2442 | 30 | 2462 |
| 1 | 2404 | 11 | 2424 | 21 | 2444 | 31 | 2464 |
| 2 | 2406 | 12 | 2426 | 22 | 2446 | 32 | 2466 |
| 3 | 2408 | 13 | 2428 | 23 | 2448 | 33 | 2468 |
| 4 | 2410 | 14 | 2430 | 24 | 2450 | 34 | 2470 |
| 5 | 2412 | 15 | 2432 | 25 | 2452 | 35 | 2472 |
| 6 | 2414 | 16 | 2434 | 26 | 2454 | 36 | 2474 |
| 7 | 2416 | 17 | 2436 | 27 | 2456 | 37 | 2476 |
| 8 | 2418 | 18 | 2438 | 28 | 2458 | 38 | 2478 |
| 9 | 2420 | 19 | 2440 | 29 | 2460 | 39 | 2480 |

### 2.2.1 Test Mode Applicability and Tested Channel Detail

| EUT CONFIGURE MODE | APPLICABLE TO | | | | DESCRIPTION |
|---|---|---|---|---|---|
| | RE ≥ 1G | RE<1G | PLC | APCM | - |
| GFSK | √ | √ | √ | √ | - |

Where
RE ≥ 1G: Radiated Emission above 1GHz
RE<1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission
APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE | DATA RATE (Mbps) |
|---|---|---|---|
| 0 to 39 | 19 | GFSK | 1 |

Radiated Emission Test (Below 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE | DATA RATE (Mbps) |
|---|---|---|---|
| 0 to 39 | 19 | GFSK | 1 |

Power Line Conducted Emission Test:
Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE | DATA RATE (Mbps) |
|---|---|---|---|
| 0 to 39 | 19 | GFSK | 1 |

**Antenna Port Conducted Measurement:**
This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE | DATA RATE (Mbps) |
|---|---|---|---|
| 0 to 39 | 0, 19, 39 | GFSK | 1 |

## 2.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor shall be considered.

| Modulation Type | Duty Cycle | Correction factor(dB) |
|---|---|---|
| GFSK (LE 1Mbps) | 65.90% | 1.81 |
| GFSK (LE 2Mbps) | 60.70% | 2.17 |
| GFSK (CODED125K) | 91.60% | 0.38 |
| GFSK (CODED500K) | 97.90% | 0.09 |

### 2.4 EUT Operating conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

### 2.5 Support Equipment

The following support equipment was used to exercise the DUT during testing:
N/A

## 3 REFERENCE SPECIFICATION

| Specification | Version | Title |
|---|---|---|
| FCC part15 Subpart C | 2020 | Intentional radiators |
| ANSI C63.10 | 2013 | Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
| KDB 558074D01 V05R02r02 | April 2, 2019 | Guidance for compliance measurements on Digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules |

## 4 KEY TO NOTES AND RESULT CODES

| Code | Meaning |
|---|---|
| PASS | Test result shows that the requirements of the relevant specification have been met. |
| FAIL | Test result shows that the requirements of the relevant specification have not been met. |
| N/T | Test case is not tested. |

# 5 RESULT SUMMARY

| No. | Test case | Reference | Verdict |
|---|---|---|---|
| 1 | 6dB Bandwidth | 15.247(a)(2) | Pass |
| 2 | Transmitter Output Power | 15.247(b)(3) ) | Pass |
| 3 | Transmitter Power Spectral Density | 15.247(e) ) | Pass |
| 4 | Conducted Out of band emission measurement | 15.247(d) | Pass |
| 5 | Band-edge | 15.247(d) | Pass |
| 6 | Spurious Radiated Emissions | 15.205/15.209/15.247(d) | Pass |
| 7 | AC Power line Conducted Emission | 15.207 | Pass |
| 8 | Antenna requirement | 15.203 | Pass(refer to section 2.1) |

| | |
|---|---|
| This Test Report Is Issued by:<br>Mr. Peng Zhen | Checked by:<br>Mr. Li Bin |
| Tested by:<br>Mr. Wang Hao | Issued date:<br>20220315 |

# 6 TEST RESULT

## 6.1 6dB Bandwidth

### 6.1.1 Test limit

Part15.247 (a) (2)
The minimum permissible 6dB bandwidth is 500 kHz

### 6.1.2 Test Procedure Used

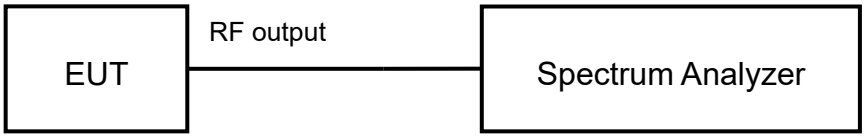
ANSI C63.10-2013 – Section 11.8.2 Option 2
KDB 558074 D01 v05r02 – Section 8.2

### 6.1.3 Test Settings

1. The signal analyzers' automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 100 kHz
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize

### 6.1.4 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.




### 6.1.5 Test result

The test results are shown in Appendix A.

## 6.2 Transmitter Output Power

### 6.2.1 Test limit

Part15.247 (b) (3)
The maximum permissible conducted output power is 1 Watt.

### 6.2.2 Test Procedure Used

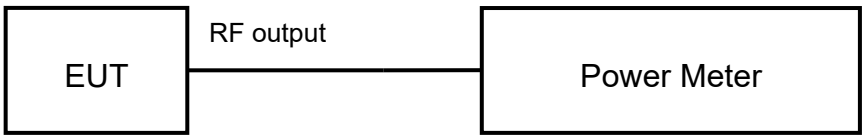
ANSI C63.10-2013 – Section 11.9.1.3
ANSI C63.10-2013 – Section 11.9.2.3.2
KDB 558074 D01 v05r02 – Section 8.3.1.3

### 6.2.3 Test Settings

Peak Power Measurement
The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.
Average Power Measurement
Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

### 6.2.4 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.




### 6.2.5 Test result

The test results are shown in Appendix A.

## 6.3 Transmitter Power Spectral Density

### 6.3.1 Test limit

Part15.247 (e)
The maximum permissible power spectral density is 8.0dBm in any 3 kHz band.

### 6.3.2 Test Procedure Used

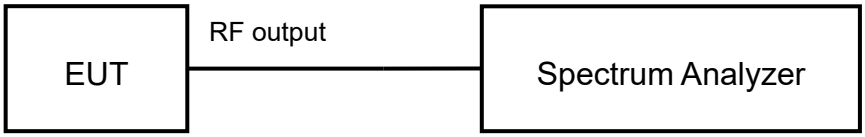
ANSI C63.10-2013 – Section 11.10.2 Method PKPSD
KDB 558074 D01 v05r02 – Section 8.4

### 6.3.3 Test Settings

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the DTS channel bandwidth
3. RBW = 3 kHz
4. VBW = 10 kHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

### 6.3.4 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.




### 6.3.5 Test result

The test results are shown in Appendix A.

## 6.4 Conducted Out of band emission measurement

### 6.4.1 Test limit

Part 15.247(d): The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth.

### 6.4.2 Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3
KDB 558074 D01 v05r02 – Section 8.5

### 6.4.3 Reference level measurement Settings

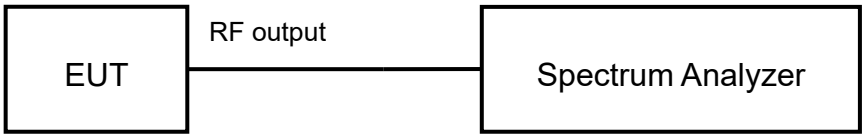
Establish a reference level by using the following procedure:
a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to ≥ 1.5 MHz
c) Set the RBW = 100 kHz.
d) Set the VBW ≥ 300 kHz.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.

### 6.4.4 Test Settings

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ 300 kHz.
d) Detector = peak.
e) Set span to encompass the spectrum to be examined
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level.

### 6.4.5 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.




### 6.4.6 Test result

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement. The test results are shown in Appendix A.

## 6.5 Band-edge measurement

### 6.5.1 Test limit

Part 15.247(d): The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth.

### 6.5.2 Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3
KDB 558074 D01 v05r02 – Section 8.7.2

### 6.5.3 Reference level measurement Settings

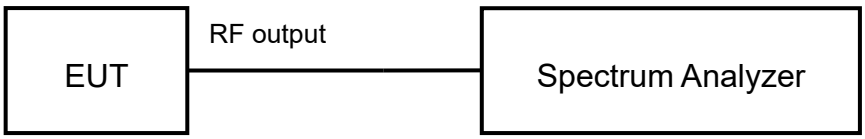
Establish a reference level by using the following procedure:
a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to ≥ 1.5 MHz
c) Set the RBW = 100 kHz.
d) Set the VBW ≥ 300 kHz.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.

### 6.5.4 Test Settings

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ 300 kHz.
d) Detector = peak.
e) Set span to encompass the spectrum to be examined
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level.

### 6.5.5 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.




### 6.5.6 Test result

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement. The test results are shown in Appendix A.

## 6.6 Spurious Radiated Emissions

### 6.6.1 Test Description

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

### 6.6.2 Test limit

Part15.205, 15.209, 15.247(d)

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in below Table per Section 15.209. The spectrum shall be investigated from the lowest radio frequency signal generated in the device

| Frequency [MHz] | Field strength [ μV/m ] | Measured Distance [meters] |
|---|---|---|
| 0.009~0.490 | 2400/F(kHz) | 300 |
| 0.490~1.705 | 24000/F(kHz) | 30 |
| 1.705~30.0 | 30 | 30 |
| 30～88 | 100 | 3 |
| 88～216 | 150 | 3 |
| 216～960 | 200 | 3 |
| Above 960 | 500 | 3 |

**Radiated Limits**

Part15.35(b):

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit

**Used conversion factor: Limit (dBμV/m) = 20 log (Limit (μV/m)/1μV/m)**

| Frequency [MHz] | Detector | Unit (dBμV/m) |
|---|---|---|
| 30～88 | Quasi-peak | 40.0 |
| 88～216 | Quasi-peak | 43.5 |
| 216～960 | Quasi-peak | 46.0 |
| 960～1000 | Quasi-peak | 54.0 |
| 1000～5th harmonic of the highest frequency or 40GHz, whichever is lower | Average | 54.0 |
| | Peak | 74.0 |

**Conversion Radiated limits**

### 6.6.3 Test Procedure Used

KDB 558074 D01 DTS Meas Guidance v05r02– Section 12.2.7

**For Radiated emission below 30MHz**

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. Both X and Y axes of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Quasi-Peak Detect Function and recorded the reading with Maximum Hold Mode.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer complied the following setting:

| Frequency | RBW |
|---|---|
| 9-150kHz | 200-300Hz |
| 0.15-30MHz | 9-10kHz |

2. Signals below 30MHz are not recorded in the report because they are lower than the limits by more than 20dB.

**For Radiated emission above 30MHz**
a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground in chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and recorded the reading with Maximum Hold Mode when the test frequency is below 1 GHz.
f. The test-receiver system was set to peak and average detector and recorded the reading with Maximum Hold Mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

**For the radiated emission test above 1GHz:**
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Average detection (AV) at frequency above 1GHz. If duty cycle of test signal is < 98%, the duty factor need added to measured value.
4. All modes of operation were investigated and the worst-case emissions are reported.

### 6.6.4 Test Settings

**Average Field Strength Measurements per Section 12.2.7 of KDB 558074 (Part 15.35)**

| Frequency | Detector |
|---|---|
| ＜1000MHz | Quasi-peak |
| >1000MHz | Peak and average |

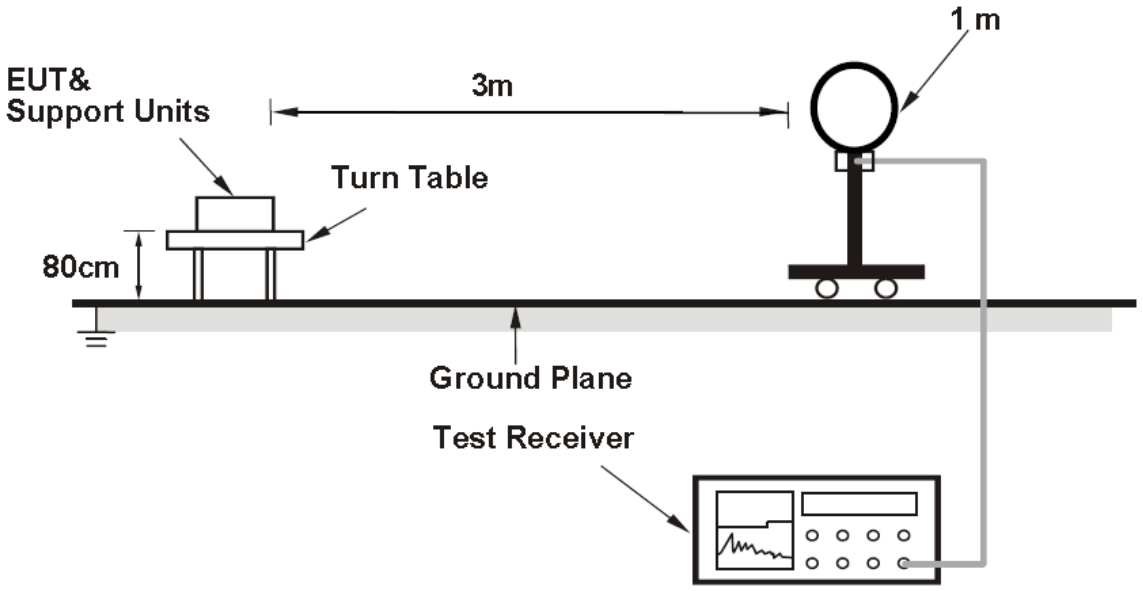
**Peak Field Strength Measurements per Section 12.2.7of KDB 558074 (Part 15.35)**
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW is set depending on measurement frequency, as specified in following table

| Frequency | RBW |
|---|---|
| 9-150kHz | 200-300Hz |
| 0.15-30MHz | 9-10kHz |
| 30-1000MHz | 100-120kHz |
| >1000MHz | 1MHz |

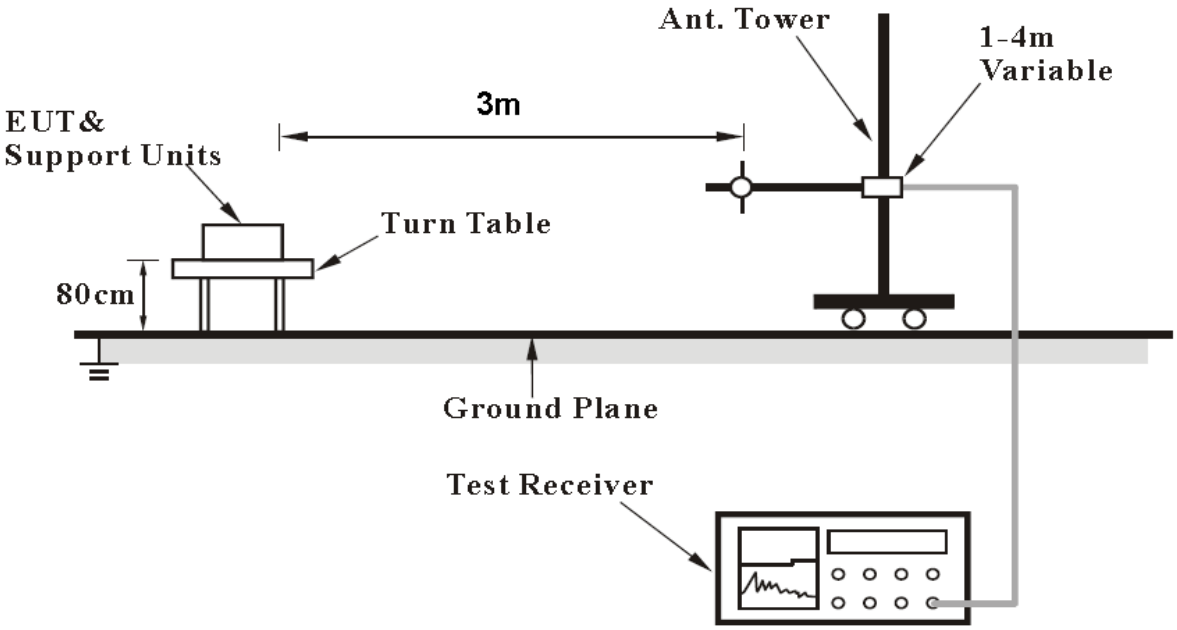
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

### 6.6.5 Test Setup

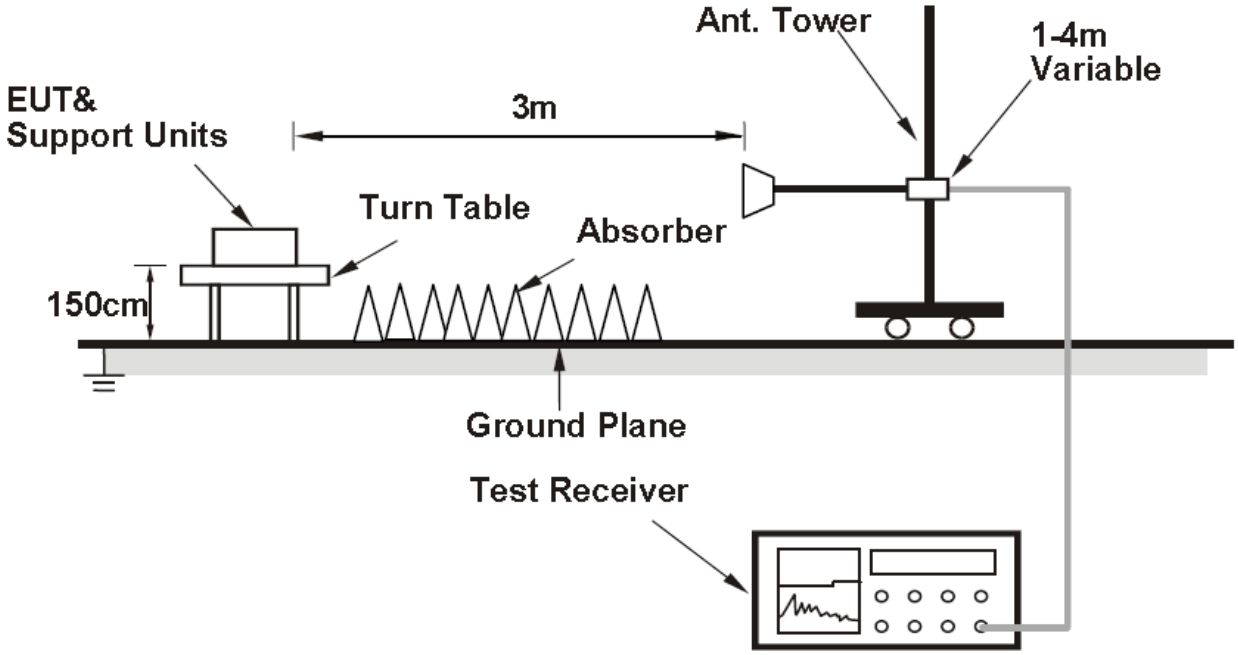
**For Radiated emission below 30MHz**




**For Radiated emission 30MHz to 1GHz**



**For Radiated emission above 1GHz**




### 6.6.6 Test result

The test results are shown in Appendix B.

## 6.7 AC Power line Conducted Emission

### 6.7.1 Test limit

FCC Part15.207

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* Decreases with the logarithm of the frequency.

The measurement is made according to ANSI C63.10-2013

### 6.7.2 Test Procedures

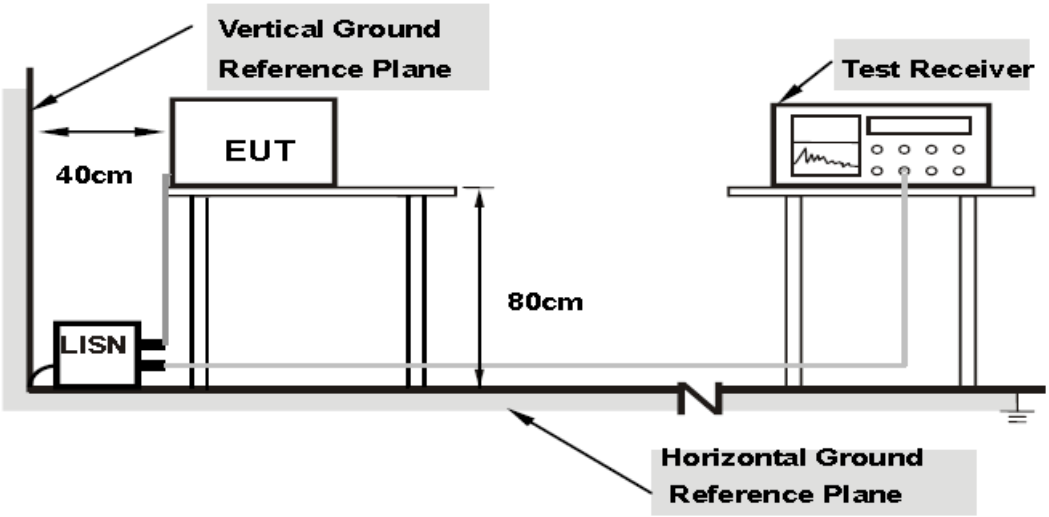
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit -20dB) were not recorded.

**NOTE:** The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.
The EUT shall test under the power AC120V/60Hz.

### 6.7.3 Test Setup




For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 6.7.4 Test result

The test results are shown in Appendix B.

# 7 MEASUREMENT UNCERTAINTIES

| Items | Uncertainty | |
|---|---|---|
| 6dB Bandwidth | 3kHz | |
| Peak power output | 0.67dB | |
| Transmitter Power Spectral Density | 0.75dB | |
| Band edge compliance | 1.20dB | |
| Conducted Out of band emission measurement | 30MHz～1GHz | 2.83dB |
| | 1GHz～12.75GHz | 2.50dB |
| | 12.75GHz～25GHz | 2.75dB |
| Spurious Radiated Emissions | 30MHz～200MHz | 4.88dB |
| | 200MHz～1GHz | 4.87dB |
| | 1GHz～18GHz | 4.58dB |
| | 18GHz~40GHz | 4.35dB |
| AC Power line Conducted Emission | 3.92dB | |

# 8 TEST EQUIPMENTS

| No. | Name/ Model | Manufacturer | S/N | Cal date | Cal Due date |
|---|---|---|---|---|---|
| 1. | Spectrum Analyzer / FSV | ROHDE & SCHWARZ | 101065 | 2021.06.21 | 2022.06.20 |
| 2. | Signal Analyzer / N9020A | Agilent | MY48010771 | 2021.05.18 | 2022.05.17 |
| 3. | Bluetooth Test Set / MT8852B | Anritsu | 1329003 | 2021.06.21 | 2022.06.20 |
| 4. | Power Divider / 11667A | HP | 19632 | 2021.06.21 | 2022.06.20 |
| 5. | Power Meter E4416A | Agilent | MY52370013 | 2021.04.13 | 2022.04.12 |
| 6. | Power Sensor E9323A | Agilent | MY52150008 | 2021.04.13 | 2022.04.12 |
| 7. | Signal Generator / SMBV100A | R&S | 260910 | 2021.06.21 | 2022.06.20 |
| 8. | Temperature chamber / SH241 | ESPEC | 92013758 | 2021.06.21 | 2022.06.20 |
| 9. | Fully-Anechoic Chamber / 12.65m×8.03m×7.50m | FRANKONIA | ----- | ----- | ----- |
| 10. | Semi-Anechoic/Chamber / 23.18m×16.88m×9.60m | FRANKONIA | --- | ----- | ----- |
| 11. | Turn table Diameter:1m | FRANKONIA | ----- | ----- | ----- |
| 12. | Turn table Diameter:5m | FRANKONIA | ----- | ----- | ----- |
| 13. | Antenna master FAC(MA4.0) | MATURO | ----- | ----- | ----- |
| 14. | Antenna master SAC(MA4.0) | MATURO | ----- | ----- | ----- |
| 15. | Shielding room / 9.080m×5.255m×3.525m | FRANKONIA | ----- | ----- | ----- |
| 16. | Double-Ridged Waveguide Horn Antenna / HF 907 | R&S | 100512 | 2021.06.21 | 2022.06.20 |
| 17. | Double-Ridged Waveguide Horn Antenna / HF 907 | R&S | 100513 | 2021.06.21 | 2022.06.20 |
| 18. | Ultra log antenna / HL562 | R&S | 100016 | 2021.06.21 | 2022.06.20 |
| 19. | Receive antenna /3160-09 | SCHWARZ-BECK | 002058-002 | 2021.06.21 | 2022.06.20 |
| 20. | EMI test receiver / ESI 40 | R&S | 100015 | 2021.06.21 | 2022.06.20 |
| 21. | EMI test receiver / ESCS30 | R&S | 100029 | 2021.06.21 | 2022.06.20 |
| 22. | Receive antenna / HL562 | R&S | 100167 | 2021.06.21 | 2022.06.20 |
| 23. | AMN / ENV216 | R&S | 3560.6550.12 | 2021.06.21 | 2022.06.20 |
| 24. | WLAN AP WIA3300-20 | SKSpruce | 8152017060700339 | --- | --- |
| 25. | Notebook E470c | Lenovo | PF10UZW7 | --- | --- |
| 26. | Loop Antenna | R&S | 100340 | 2021.08.20 | 2022.08.20 |

# APPENDIX A – TEST DATA OF CONDUCTED EMISSION

Offset 1.2dB = Attenuator + Temporary antenna connector loss + Cable loss

**BLE**

**1 Duty Cycle and Antenna Gain**

| Test Mode | Frequency (MHz) | Duty Cycle | Correction Factor(dB) | Antenna Gain(dBi) |
|---|---|---|---|---|
| GFSK (LE 1Mbps) | 2402 | 65.90% | 1.81 | -5.00 |
| GFSK (LE 2Mbps) | 2402 | 60.70% | 2.17 | -5.00 |
| Coded (125Kbps) | 2402 | 91.60% | 0.38 | -5.00 |
| Coded (500Kbps) | 2402 | 97.90% | 0.09 | -5.00 |

Note: Correction Factor=10*log (1/Duty Cycle)

**2 EIRP**

**Conducted Power**

| Modulation type | Conducted Peak Power(dBm) | | |
|---|---|---|---|
| | 2402MHz | 2440MHz | 2480MHz |
| GFSK (LE 1Mbps) | 5.62 | 6.23 | 7.56 |
| GFSK (LE 2Mbps) | 5.67 | 6.26 | 7.54 |
| Coded 125K | 5.56 | 6.14 | 7.47 |
| Coded 500K | 5.54 | 6.14 | 7.46 |

| Modulation type | Conducted Average Power(dBm) | | |
|---|---|---|---|
| | 2402MHz | 2440MHz | 2480MHz |
| GFSK (LE 1Mbps) | 3.32 | 3.93 | 5.31 |
| GFSK (LE 2Mbps) | 2.90 | 3.44 | 4.88 |
| Coded 125K | 4.96 | 5.54 | 6.91 |
| Coded 500K | 5.24 | 5.87 | 7.19 |

**EIRP**

| Modulation type | Peak EIRP(dBm) | | |
|---|---|---|---|
| | 2402MHz | 2440MHz | 2480MHz |
| GFSK (LE 1Mbps) | 0.62 | 1.23 | 2.56 |
| GFSK (LE 2Mbps) | 0.67 | 1.26 | 2.54 |
| Coded 125K | 0.57 | 1.14 | 2.47 |
| Coded 500K | 0.54 | 1.14 | 2.46 |

| Modulation type | Average EIRP(dBm) | | |
|---|---|---|---|
| | 2402MHz | 2440MHz | 2480MHz |
| GFSK (LE 1Mbps) | -1.68 | -1.07 | 0.31 |
| GFSK (LE 2Mbps) | -2.10 | -1.56 | -0.12 |
| Coded 125K | -0.04 | 0.54 | 1.91 |
| Coded 500K | 0.24 | 0.87 | 2.19 |

EIRP (dBm)=Conducted Power(dBm)+Antenna Gain(dBi)

## 3 Occupied Bandwidth

### 6dB Bandwidth

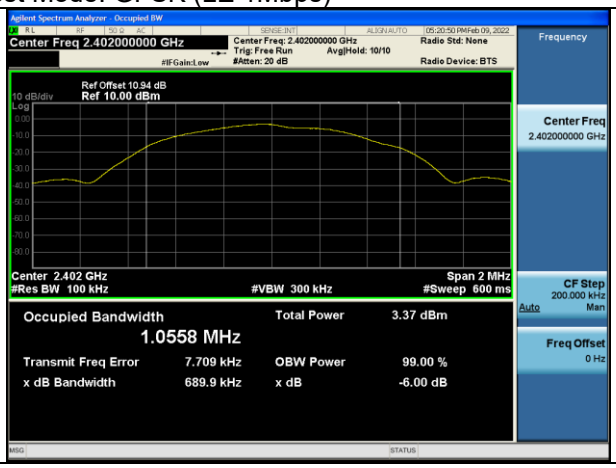
| Test Mode | Carrier frequency (MHz) | 6dB Bandwidth(KHz) |
|---|---|---|
| GFSK (LE 1Mbps) | 2402 | 689.9 |
| GFSK (LE 1Mbps) | 2440 | 683.7 |
| GFSK (LE 1Mbps) | 2480 | 689.8 |

| Test Mode | Carrier frequency (MHz) | 6dB Bandwidth(KHz) |
|---|---|---|
| GFSK (LE 2Mbps) | 2402 | 1423.6 |
| GFSK (LE 2Mbps) | 2440 | 1409.8 |
| GFSK (LE 2Mbps) | 2480 | 1406.8 |

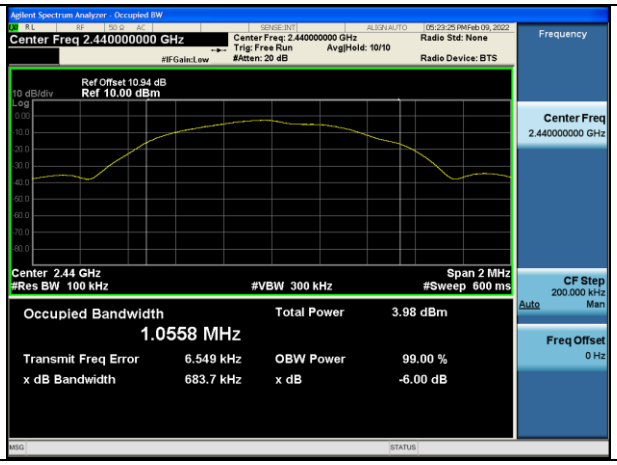
| Test Mode | Carrier frequency (MHz) | 6dB Bandwidth(KHz) |
|---|---|---|
| Coded 125K | 2402 | 730.9 |
| Coded 125K | 2440 | 717.0 |
| Coded 125K | 2480 | 723.2 |

| Test Mode | Carrier frequency (MHz) | 6dB Bandwidth(KHz) |
|---|---|---|
| Coded 500K | 2402 | 649.6 |
| Coded 500K | 2440 | 649.2 |
| Coded 500K | 2480 | 646.1 |

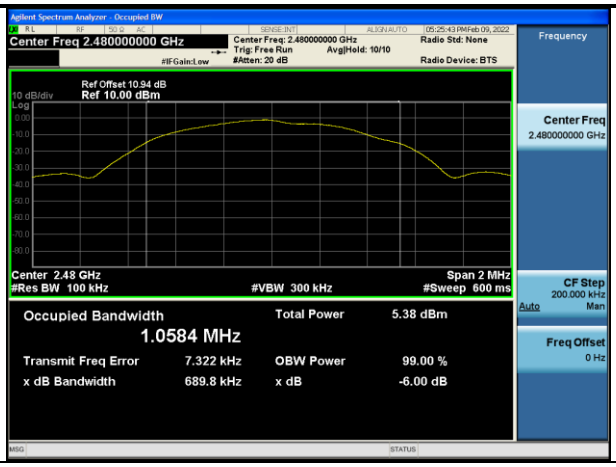
Test Mode: GFSK (LE 1Mbps)




Test Mode:GFSK (LE 1Mbps) MHz

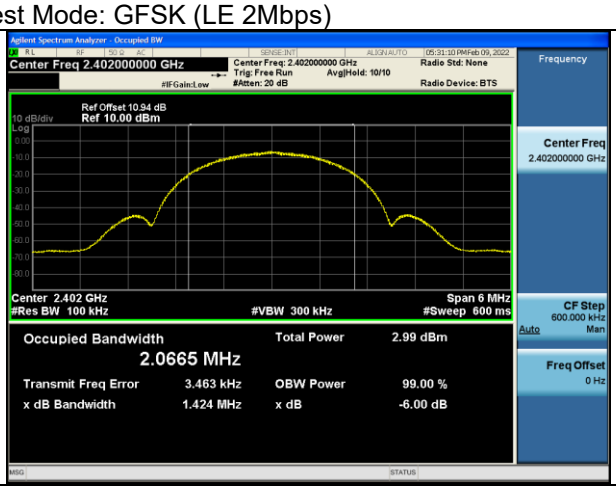



Test Mode:GFSK (LE 1Mbps) MHz

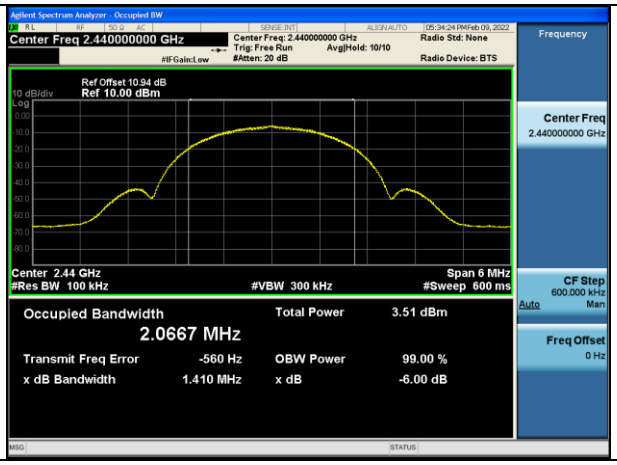



Test Mode:GFSK (LE 1Mbps) MHz

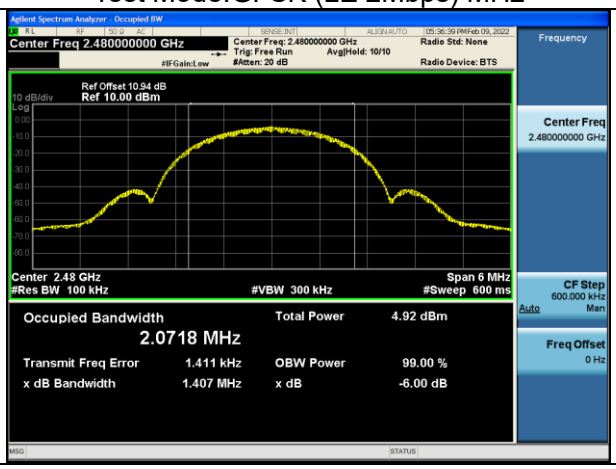
Test Mode: GFSK (LE 2Mbps)




Test Mode:GFSK (LE 2Mbps) MHz

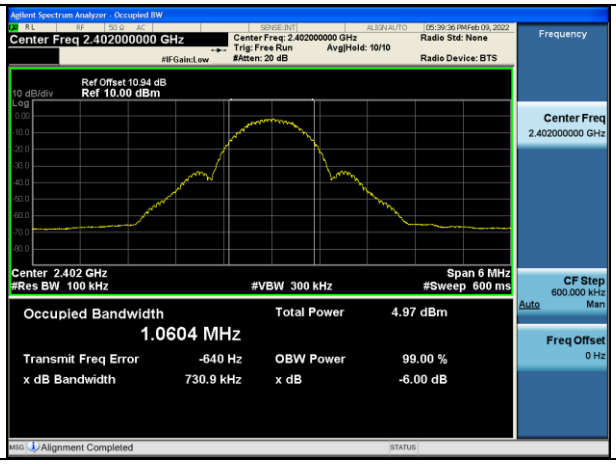



Test Mode:GFSK (LE 2Mbps) MHz

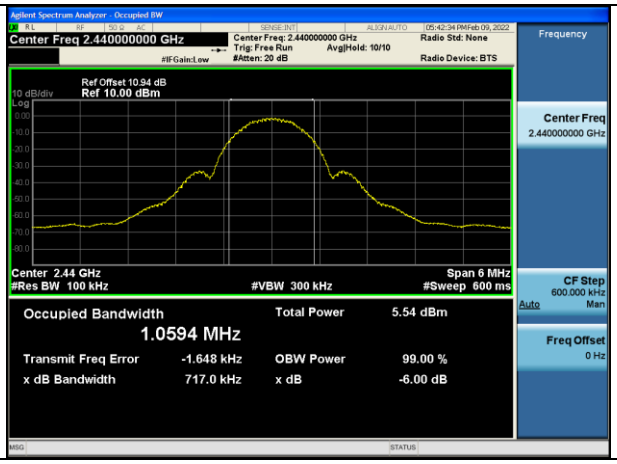



Test Mode:GFSK (LE 2Mbps) MHz

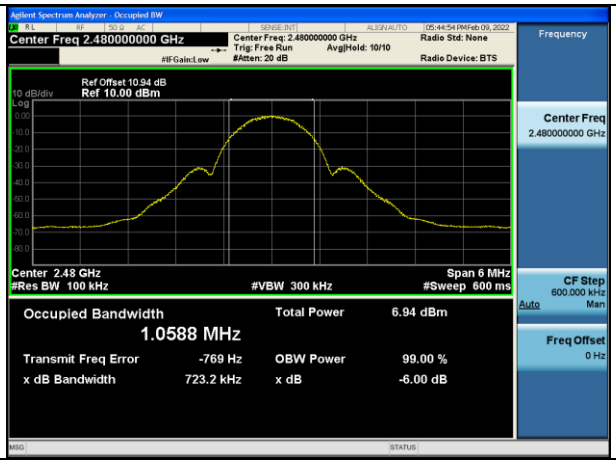
Test Mode: Coded 125K




Test Mode:Coded 125K MHz

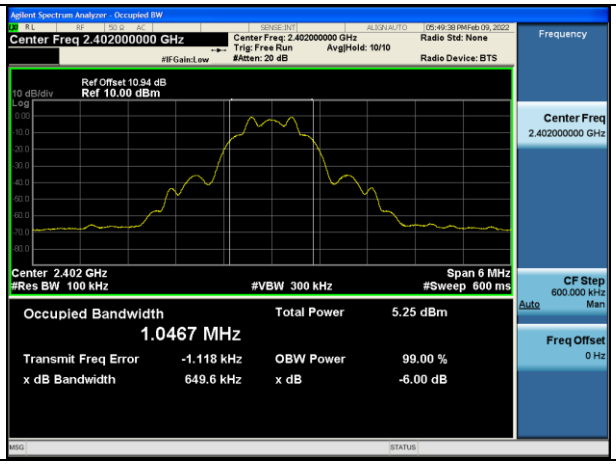



Test Mode:Coded 125K MHz

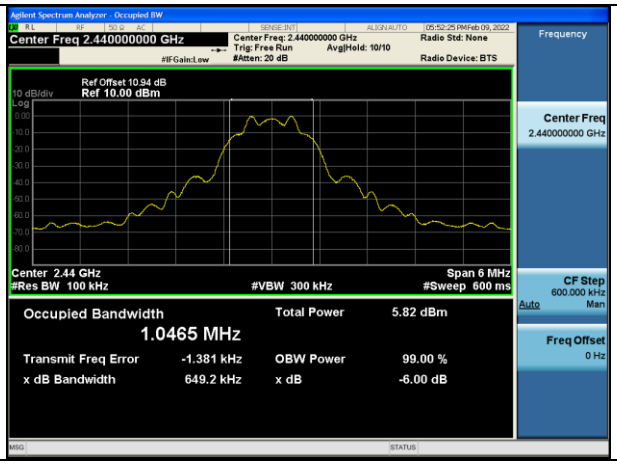



Test Mode:Coded 125K MHz

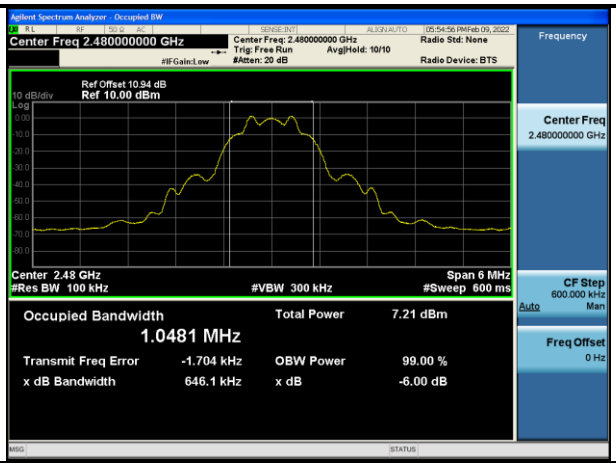
Test Mode: Coded 500K




Test Mode:Coded 500K MHz




Test Mode:Coded 500K MHz

| | |
|---|---|
|  | |
| Test Mode:Coded 500K MHz | |

**99% Bandwidth**

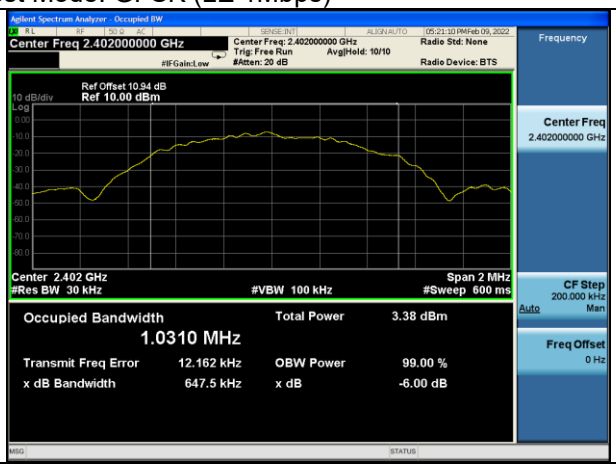
| Test Mode | Carrier frequency (MHz) | 99% Bandwidth(kHz) |
|---|---|---|
| GFSK (LE 1Mbps) | 2402 | 1031.0 |
| GFSK (LE 1Mbps) | 2440 | 1031.0 |
| GFSK (LE 1Mbps) | 2480 | 1033.2 |

| Test Mode | Carrier frequency (MHz) | 99% Bandwidth(kHz) |
|---|---|---|
| GFSK (LE 2Mbps) | 2402 | 2056.0 |
| GFSK (LE 2Mbps) | 2440 | 2055.2 |
| GFSK (LE 2Mbps) | 2480 | 2058.8 |

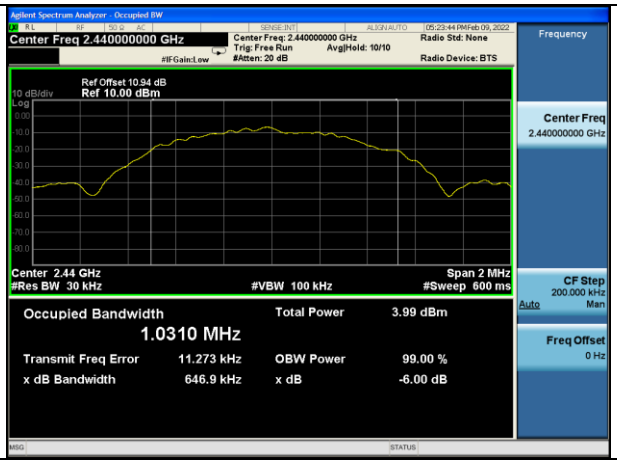
| Test Mode | Carrier frequency (MHz) | 99% Bandwidth(kHz) |
|---|---|---|
| Coded 125K | 2402 | 1038.1 |
| Coded 125K | 2440 | 1036.0 |
| Coded 125K | 2480 | 1036.4 |

| Test Mode | Carrier frequency (MHz) | 99% Bandwidth(kHz) |
|---|---|---|
| Coded 500K | 2402 | 1023.7 |
| Coded 500K | 2440 | 1025.9 |
| Coded 500K | 2480 | 1023.7 |

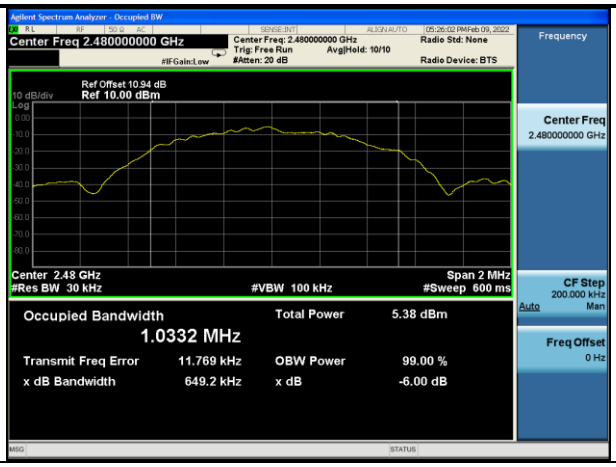
Test Mode: GFSK (LE 1Mbps)




Test Mode:GFSK (LE 1Mbps) MHz

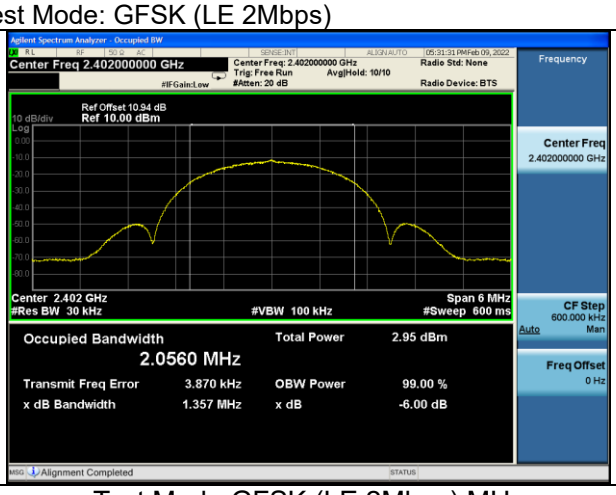



Test Mode:GFSK (LE 1Mbps) MHz

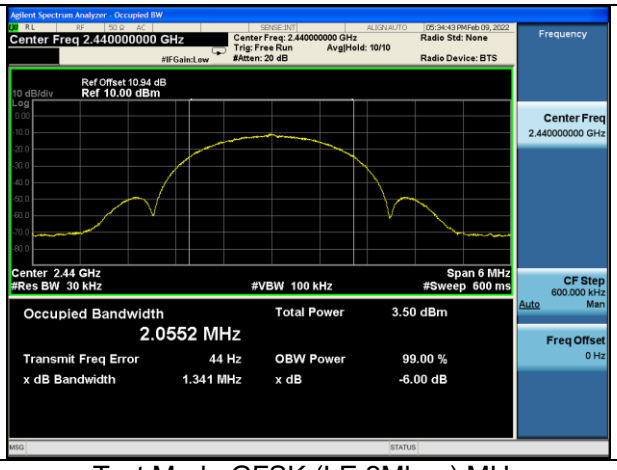



Test Mode:GFSK (LE 1Mbps) MHz

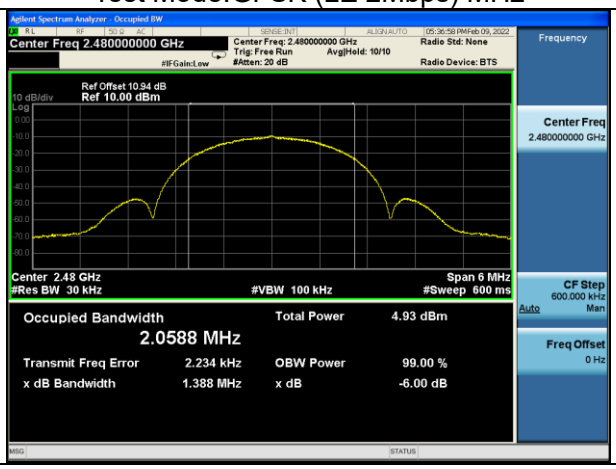
Test Mode: GFSK (LE 2Mbps)




Test Mode:GFSK (LE 2Mbps) MHz

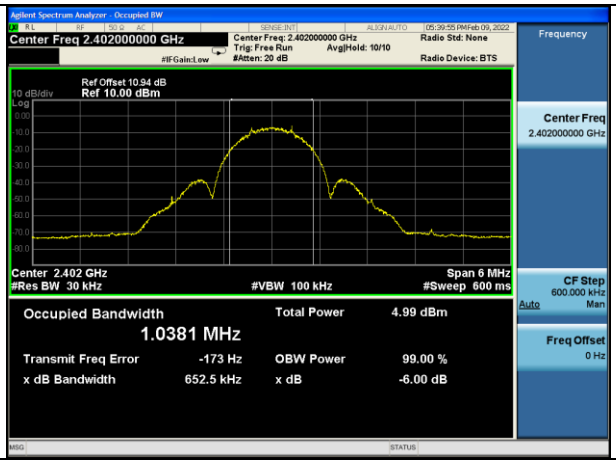



Test Mode:GFSK (LE 2Mbps) MHz

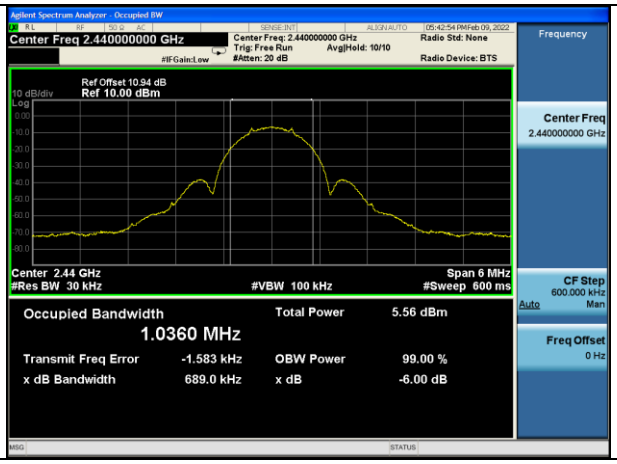



Test Mode:GFSK (LE 2Mbps) MHz

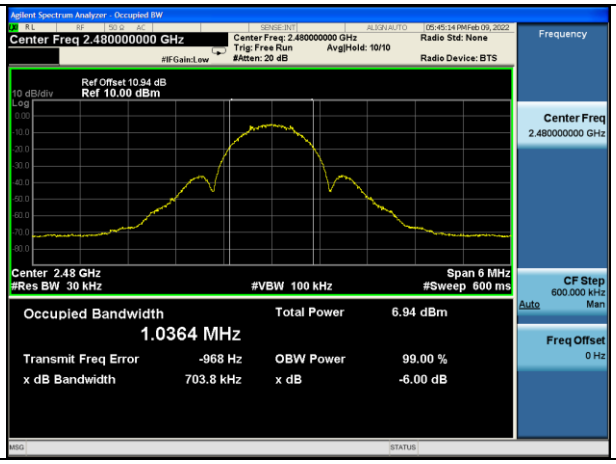
Test Mode: Coded 125K




Test Mode:Coded 125K MHz

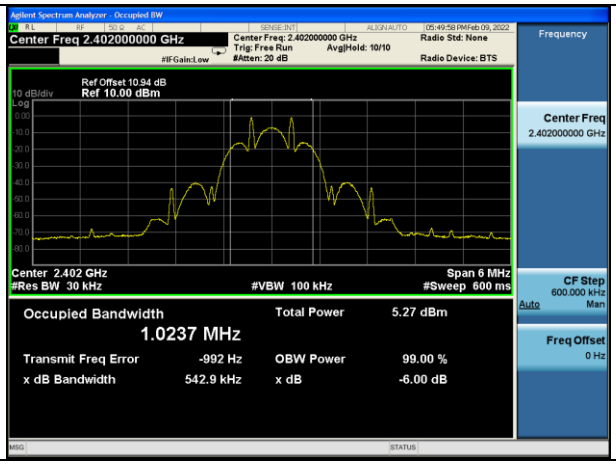



Test Mode:Coded 125K MHz

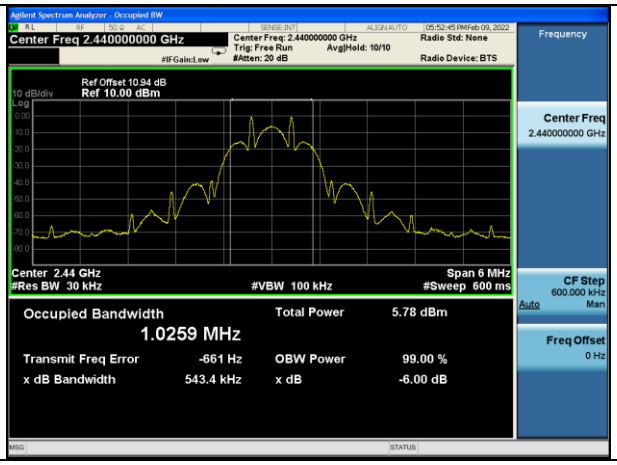



Test Mode:Coded 125K MHz

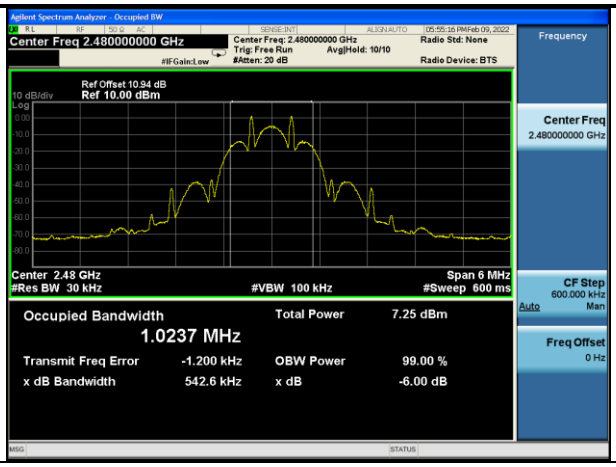
Test Mode: Coded 500K




Test Mode:Coded 500K MHz




Test Mode:Coded 500K MHz

| | |
|---|---|
|  | |
| Test Mode:Coded 500K MHz | |

## 4 Transmitter PowerSpectral Density

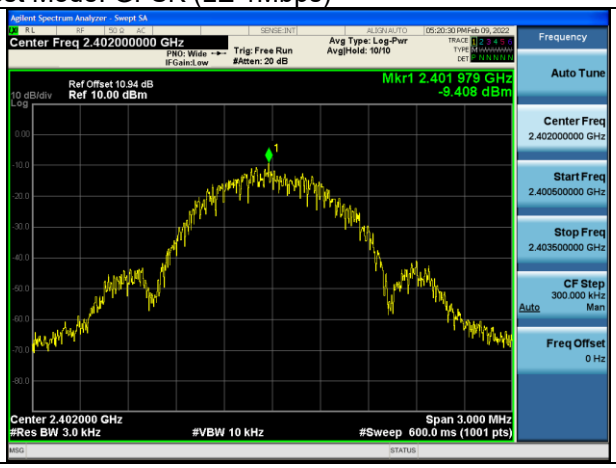
| Test Mode | Carrier frequency (MHz) | Channel No. | Power Density (dBm/3kHz) |
|---|---|---|---|
| GFSK (LE 1Mbps) | 2402 | 0 | -9.4 |
| GFSK (LE 1Mbps) | 2440 | 19 | -8.8 |
| GFSK (LE 1Mbps) | 2480 | 39 | -7.4 |

| Test Mode | Carrier frequency (MHz) | Channel No. | Power Density (dBm/3kHz) |
|---|---|---|---|
| GFSK (LE 2Mbps) | 2402 | 0 | -13.4 |
| GFSK (LE 2Mbps) | 2440 | 19 | -12.8 |
| GFSK (LE 2Mbps) | 2480 | 39 | -11.5 |

| Test Mode | Carrier frequency (MHz) | Channel No. | Power Density (dBm/3kHz) |
|---|---|---|---|
| Coded 125K | 2402 | 0 | -1.1 |
| Coded 125K | 2440 | 19 | -7.7 |
| Coded 125K | 2480 | 39 | 0.1 |

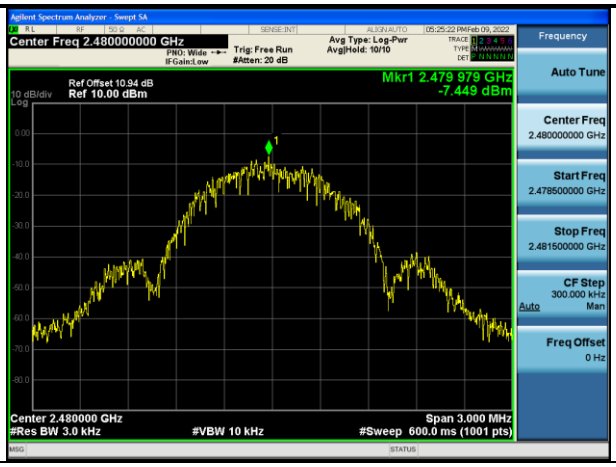
| Test Mode | Carrier frequency (MHz) | Channel No. | Power Density (dBm/3kHz) |
|---|---|---|---|
| Coded 500K | 2402 | 0 | -0.7 |
| Coded 500K | 2440 | 19 | -0.2 |
| Coded 500K | 2480 | 39 | 1.2 |

Test Mode: GFSK (LE 1Mbps)



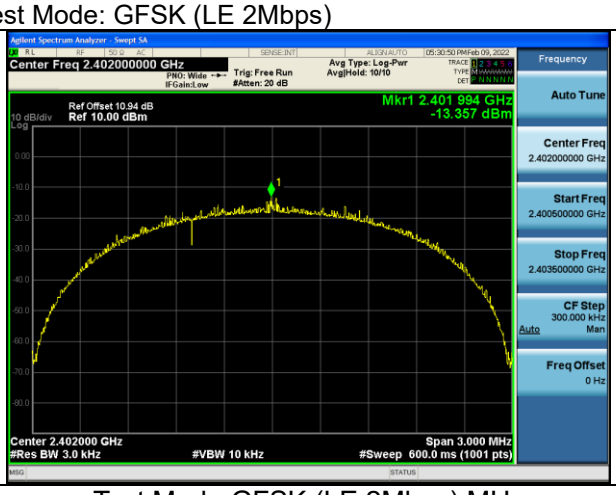

Test Mode:GFSK (LE 1Mbps) MHz

Test Mode:GFSK (LE 1Mbps) MHz




Test Mode:GFSK (LE 1Mbps) MHz

Test Mode: GFSK (LE 2Mbps)

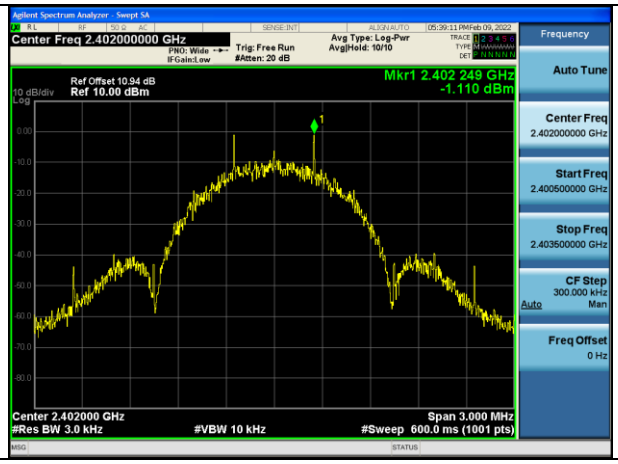



Test Mode:GFSK (LE 2Mbps) MHz

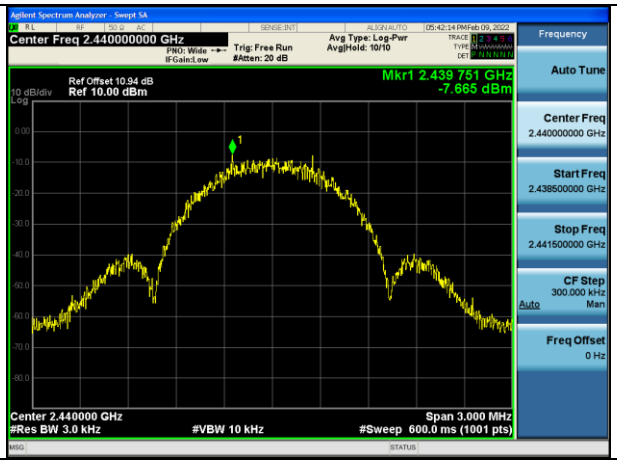
Test Mode:GFSK (LE 2Mbps) MHz

Test Mode:GFSK (LE 2Mbps) MHz

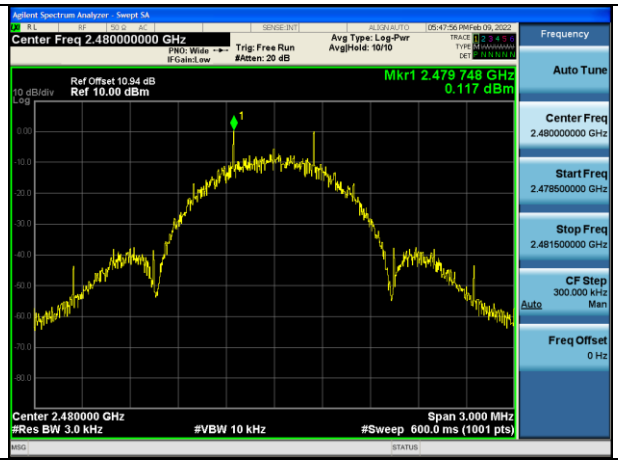
Test Mode: Coded 125K




Test Mode:Coded 125K MHz




Test Mode:Coded 125K MHz




Test Mode:Coded 125K MHz

Test Mode: Coded 500K

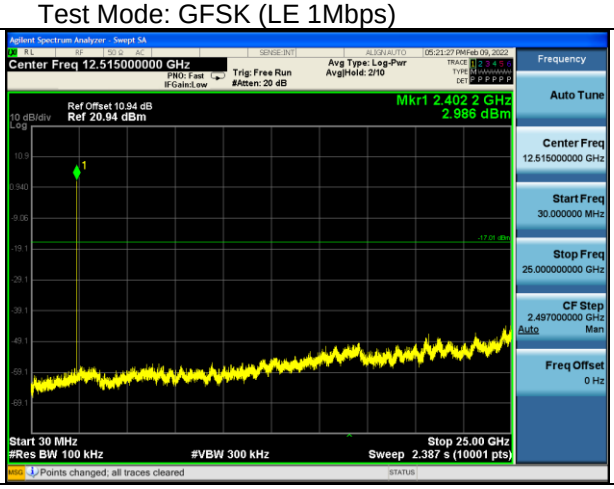
Test Mode:Coded 500K MHz

Test Mode:Coded 500K MHz

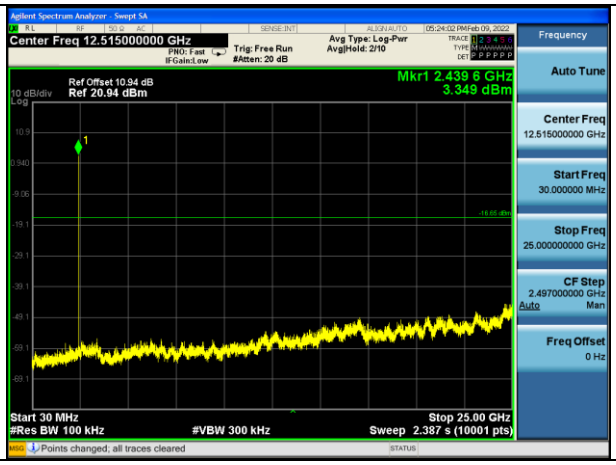
| | |
|---|---|
| | |
| Test Mode:Coded 500K MHz | |

## 5 Conducted Out of band emission measurement

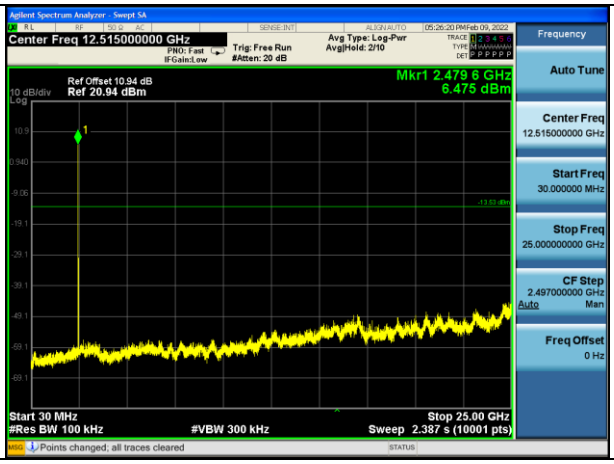
Test Mode: GFSK (LE 1Mbps)




CH0

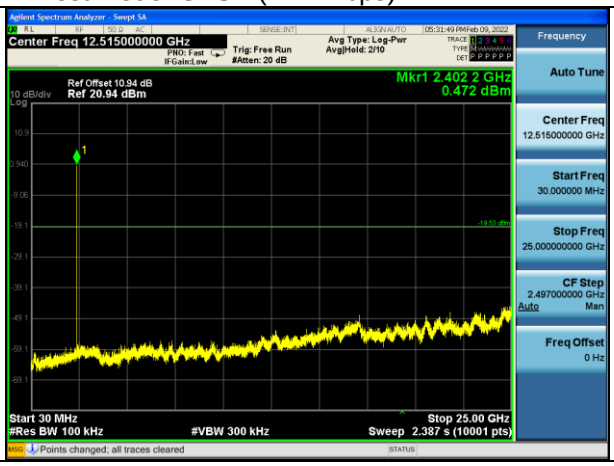



CH39

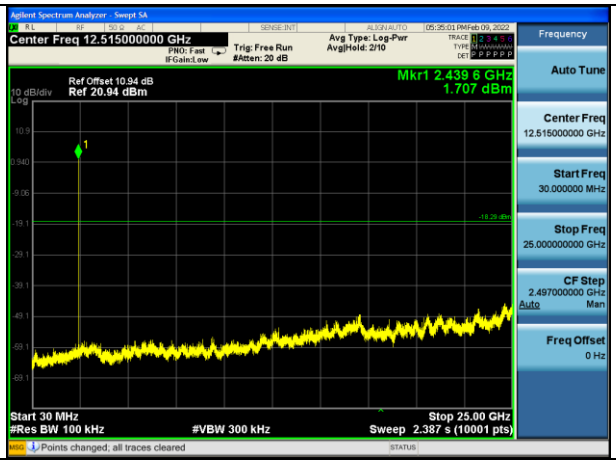



CH78

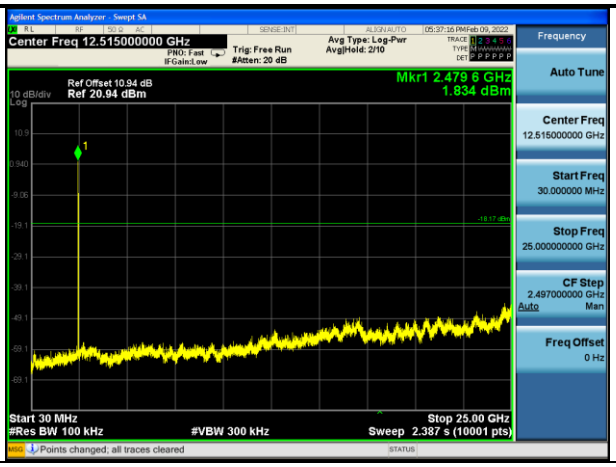
Test Mode: GFSK (LE 2Mbps)




CH0

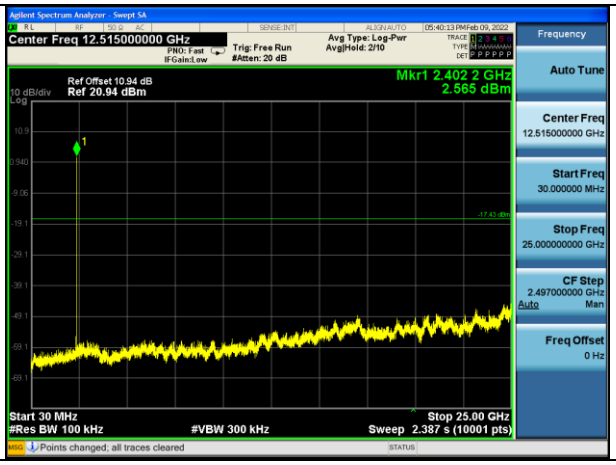



CH19

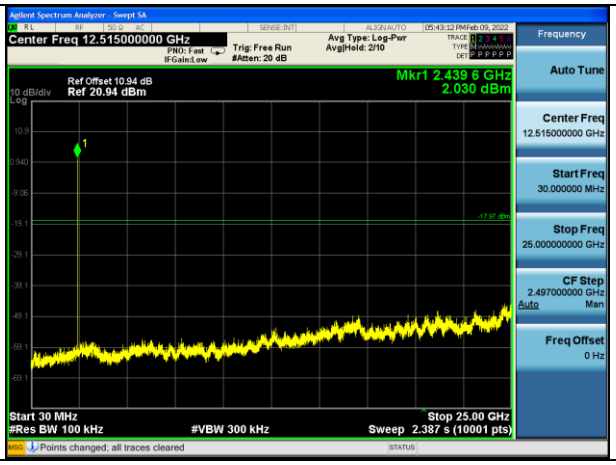



CH39

Test Mode: Coded 125K



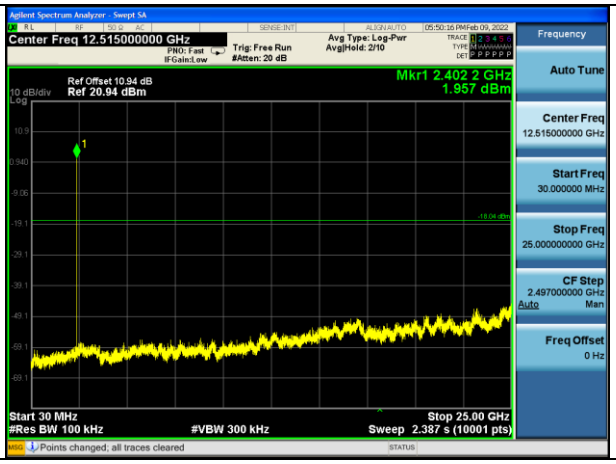

CH0



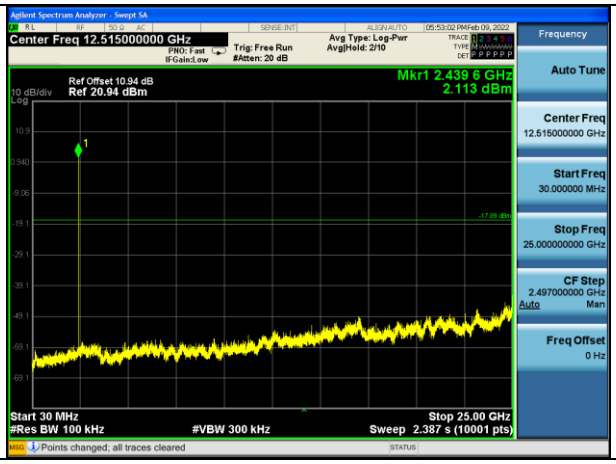

CH39

CH78

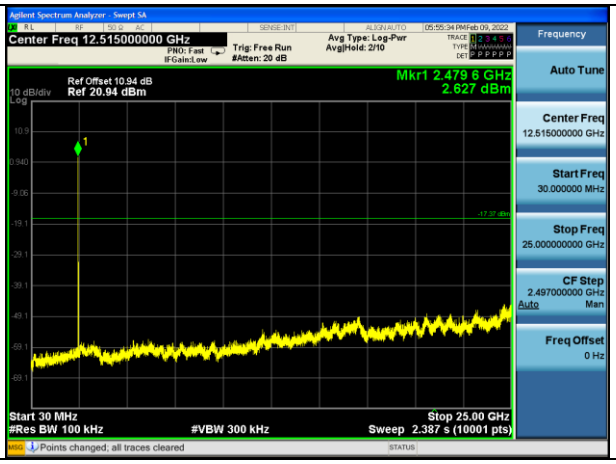
Test Mode: Coded 500K




CH0



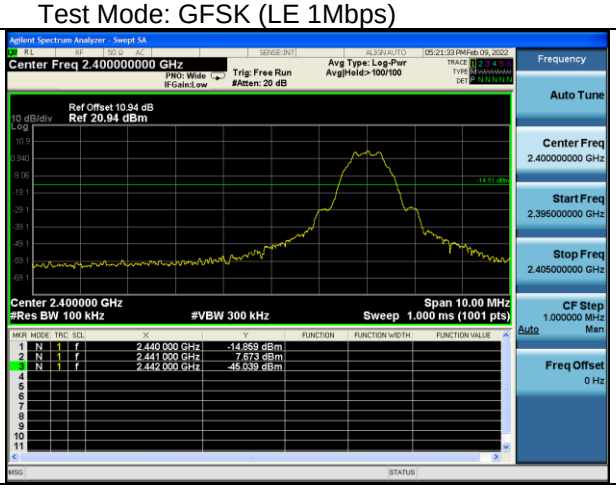

CH39



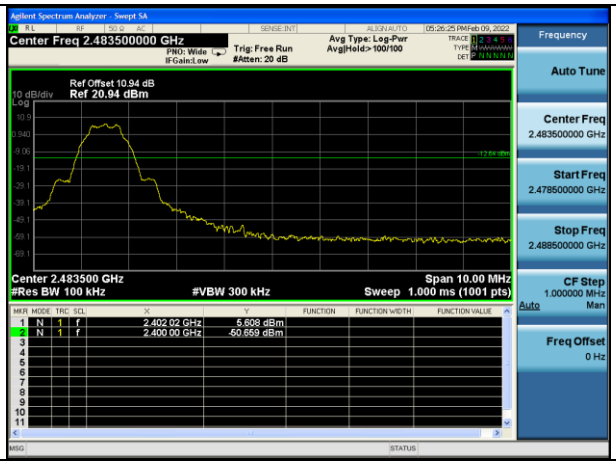

CH78

## 6 Band Edge measurement

Test Mode: GFSK (LE 1Mbps)

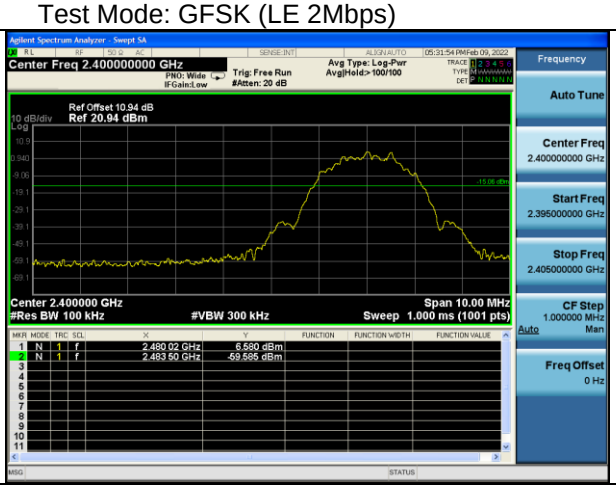



CH0

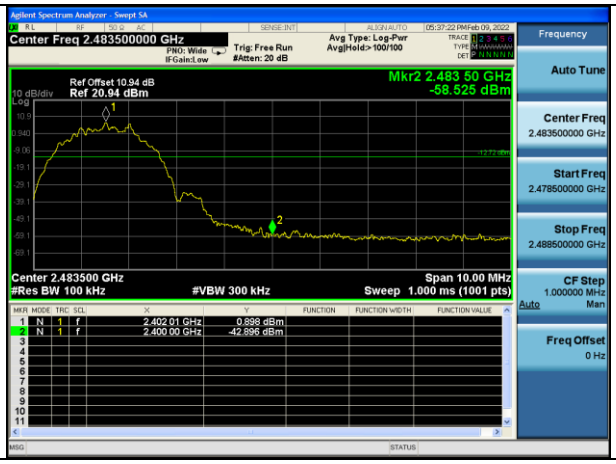



CH78

Test Mode: GFSK (LE 2Mbps)

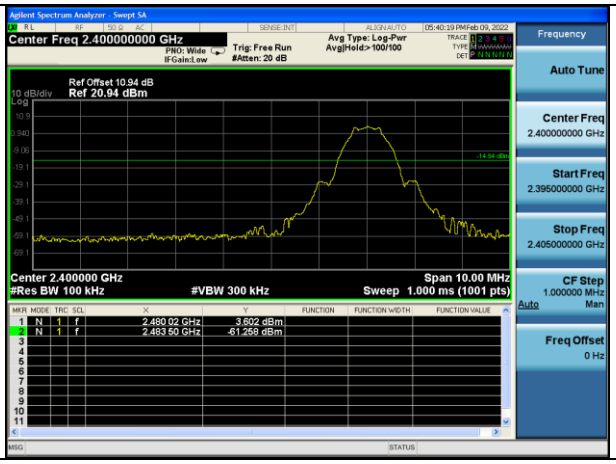



CH0

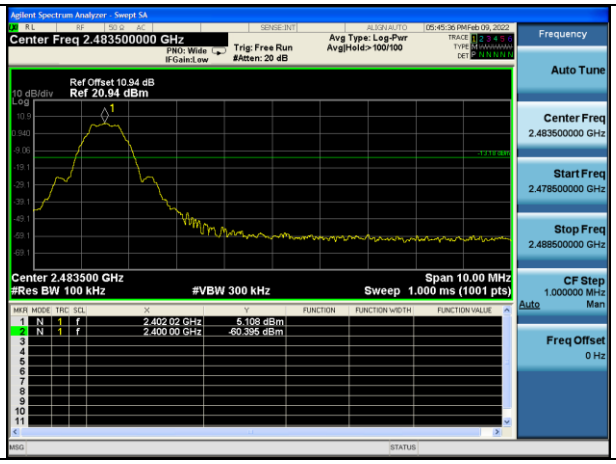



CH39

Test Mode: Coded 125K

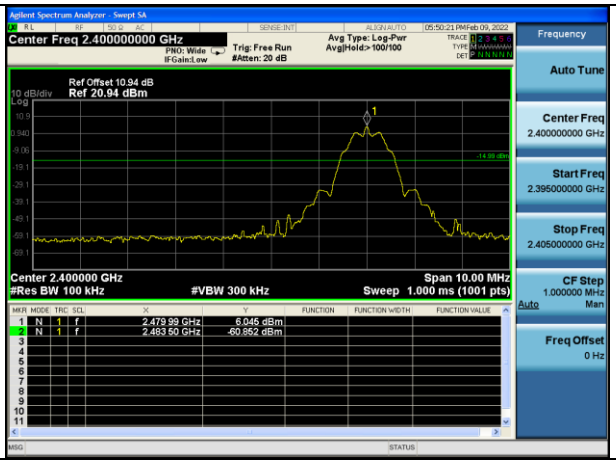
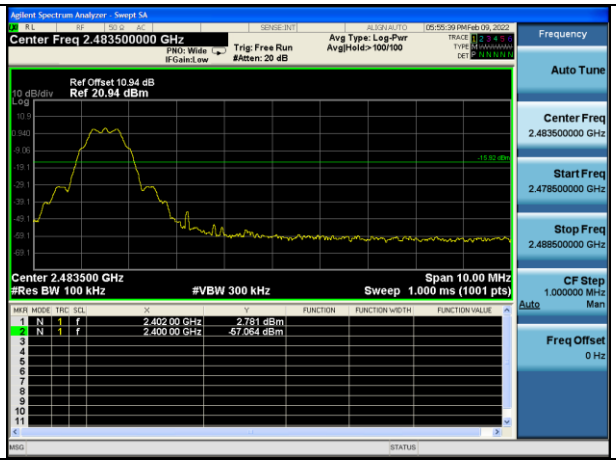



CH0




CH78

Test Mode: Coded 500K

| | |
|---|---|
|  |  |
| CH0 | CH78 |

# APPENDIX B – TEST DATA OF RADIATED EMISSION

**Radiated Emission Band Edge**

The worst case attitude: The mobile lay down.
The measurement results are obtained as described below:
Measure Level = Reading Level + Cable loss + Antenna factor Sample calculation: (89.30 dBuV/m) = (55.30 dBμV) + (8.90 dB) + (25.10 dB), the corresponding frequency is 2402MHz.

Note: The scanned graph represents the maximum of both horizontal and vertical polarizations and is not a single horizontal or vertical polarization scan.

Note: There were no emissions above 18GHz found within 20dB of the limit. Thus the test result was not reported according to §15.31（o）

LE-1Mbps
Carrier Frequency (MHz): 2402
Channel No.: 0
Test Mode: GFSK（LE-1Mbps）
Detector: Peak

| Frequency (MHz) | Reading Level (dBuV) | Measure Level (dBuV/m) | Over Limit (dB) | Limit (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB) |
|---|---|---|---|---|---|---|
| 2402.0 | 55.30 | 89.30 | N/A | N/A | 8.90 | 25.10 |
| 2390.0 | 5.50 | 39.50 | -34.50 | 74.00 | 8.90 | 25.10 |

Detector: Average

| Frequency (MHz) | Reading Level (dBuV) | Measure Level (dBuV/m) | Over Limit (dB) | Limit (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB) |
|---|---|---|---|---|---|---|
| 2402.0 | 42.70 | 76.70 | N/A | N/A | 8.90 | 25.10 |
| 2390.0 | -10.20 | 23.80 | -30.20 | 54.00 | 8.90 | 25.10 |

Carrier Frequency (MHz): 2480
Channel No.: 39
Test Mode: GFSK（LE-1Mbps）
Detector: Peak

| Frequency (MHz) | Reading Level (dBuV) | Measure Level (dBuV/m) | Over Limit (dB) | Limit (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB) |
|---|---|---|---|---|---|---|
| 2480.0 | 56.70 | 90.70 | N/A | N/A | 8.90 | 25.10 |
| 2483.5 | 5.50 | 39.50 | -34.50 | 74.00 | 8.90 | 25.10 |

Detector: Average

| Frequency (MHz) | Reading Level (dBuV) | Measure Level (dBuV/m) | Over Limit (dB) | Limit (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB) |
|---|---|---|---|---|---|---|
| 2480.0 | 40.60 | 74.60 | N/A | N/A | 8.90 | 25.10 |
| 2483.5 | -10.90 | 23.10 | -30.90 | 54.00 | 8.90 | 25.10 |

LE-2Mbps
Carrier Frequency (MHz): 2402
Channel No.: 0
Test Mode: GFSK（LE-2Mbps）
Detector: Peak

| Frequency (MHz) | Reading Level (dBuV) | Measure Level (dBuV/m) | Over Limit (dB) | Limit (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB) |
|---|---|---|---|---|---|---|
| 2402.0 | 58.50 | 92.50 | N/A | N/A | 8.90 | 25.10 |
| 2390.0 | 9.20 | 43.20 | -30.80 | 74.00 | 8.90 | 25.10 |

Detector: Average

| Frequency (MHz) | Reading Level (dBuV) | Measure Level (dBuV/m) | Over Limit (dB) | Limit (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB) |
|---|---|---|---|---|---|---|
| 2402.0 | 43.30 | 77.30 | N/A | N/A | 8.90 | 25.10 |
| 2390.0 | -6.30 | 27.70 | -26.30 | 54.00 | 8.90 | 25.10 |

Carrier Frequency (MHz): 2480
Channel No.: 39
Test Mode: GFSK（LE-2Mbps）
Detector: Peak

| Frequency (MHz) | Reading Level (dBuV) | Measure Level (dBuV/m) | Over Limit (dB) | Limit (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB) |
|---|---|---|---|---|---|---|
| 2480.0 | 57.56 | 91.56 | N/A | N/A | 8.90 | 25.10 |
| 2483.5 | 9.70 | 43.70 | -30.30 | 74.00 | 8.90 | 25.10 |

Detector: Average

| Frequency (MHz) | Reading Level (dBuV) | Measure Level (dBuV/m) | Over Limit (dB) | Limit (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB) |
|---|---|---|---|---|---|---|
| 2480.0 | 47.80 | 81.80 | N/A | N/A | 8.90 | 25.10 |
| 2483.5 | -1.50 | 32.50 | -21.50 | 54.00 | 8.90 | 25.10 |

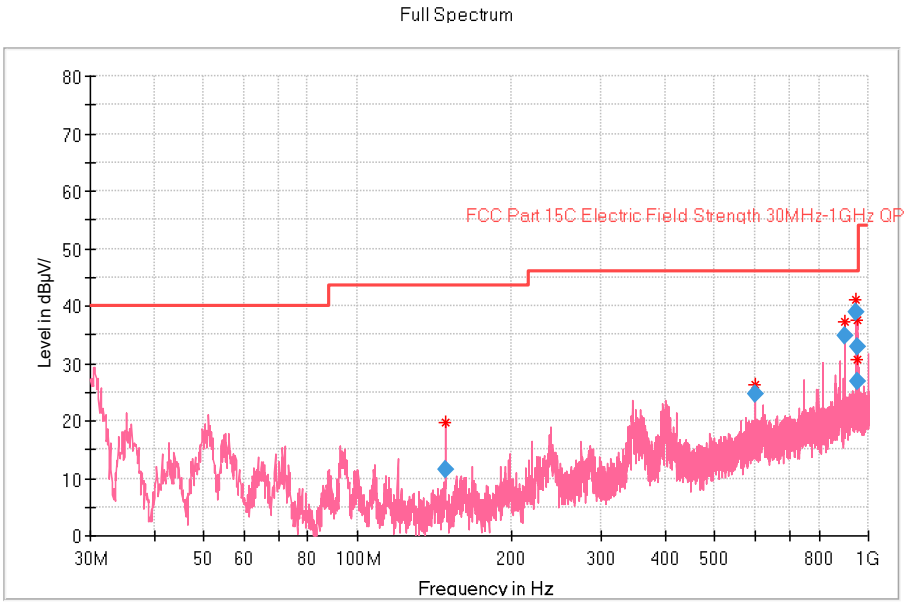
**Sample Calculations**

Determining Spurious Emissions Levels

A “reference path loss” is established and the $A_{Rpl}$ is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.
The measurement results are obtained as described below:
Below 1GHz：
QuasiPeak=Reading Value + $A_{Rpl}$
Above 1GHz:
MaxPeak=Reading MaxPeak + $A_{Rpl}$
OR
Average=Reading Average + $A_{Rpl}$
Sample calculation: (11.56 dBμV/m) = (35.36 dBμV) + (-23.80 dB/m), the corresponding frequency is 148.437MHz.
The worst case attitude：The mobile lay down.

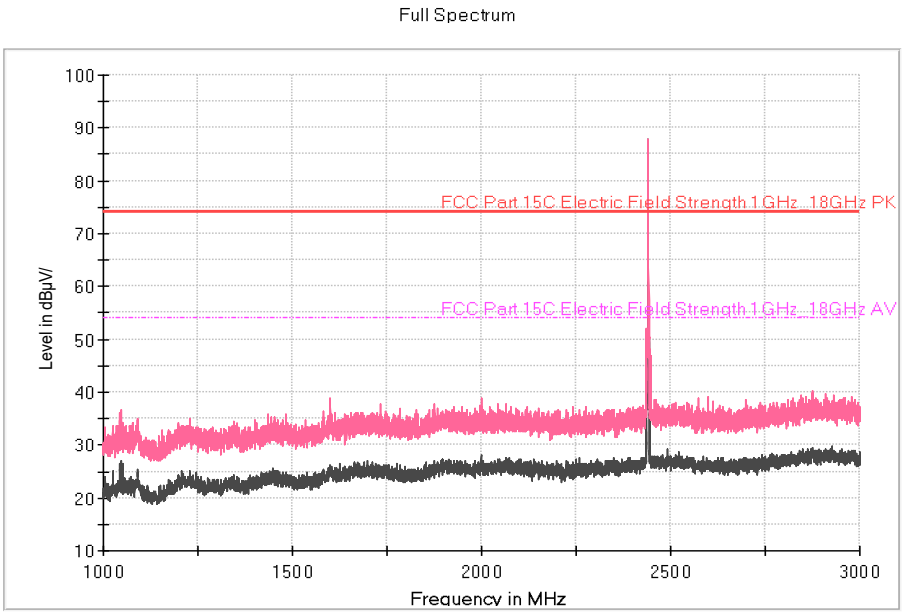
Spurious Radiated Emissions below 30MHz:
There were no emissions from 9 kHz to 30MHz found within 20dB of the limit. Thus, the test result was not reported according to §15.31 (o).

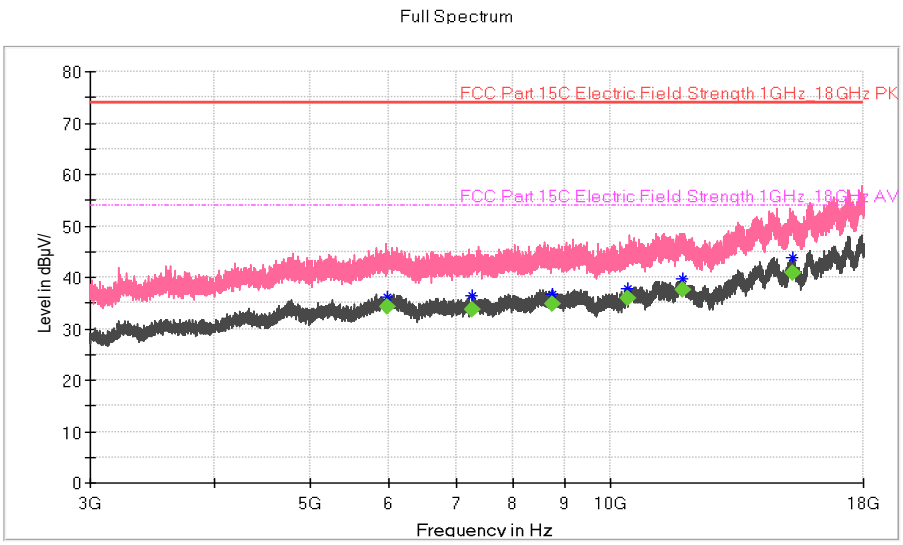
LE-1Mbps
Spurious Radiated Emissions from 30MHz to 1GHz:
GFSK:
CH Middle (No.19)



| Frequency (MHz) | Reading (dBuV) | QuasiPeak (dBuV/m) | Limit (dBuV/m) | Margin (dB) | $A_{Rpl}$ (dB) | Polarity |
|---|---|---|---|---|---|---|
| 148.437 | 35.36 | 11.56 | 43.50 | 31.94 | -23.80 | Vertical |
| 599.972 | 32.59 | 24.59 | 46.00 | 21.41 | -8.00 | Vertical |
| 900.090 | 37.69 | 34.89 | 46.00 | 11.11 | -2.80 | Vertical |
| 945.389 | 41.22 | 38.82 | 46.00 | 7.18 | -2.40 | Vertical |
| 950.239 | 35.29 | 32.89 | 46.00 | 13.11 | -2.40 | Vertical |
| 952.276 | 29.13 | 26.73 | 46.00 | 19.27 | -2.40 | Vertical |

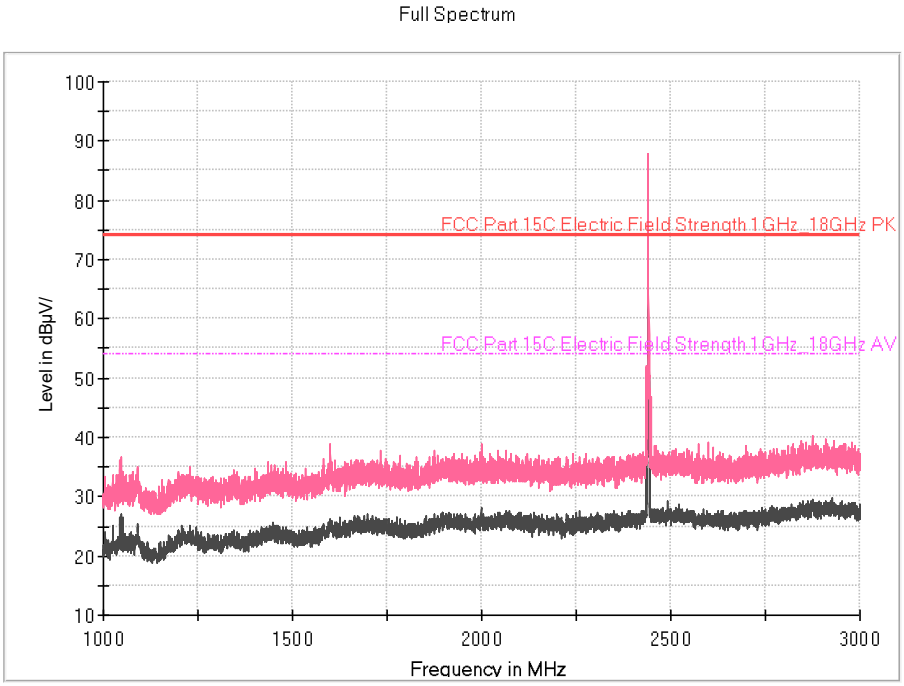
LE-1Mbps
Spurious Radiated Emissions from 1GHz to 18GHz:
GFSK:
CH Middle (No.19)



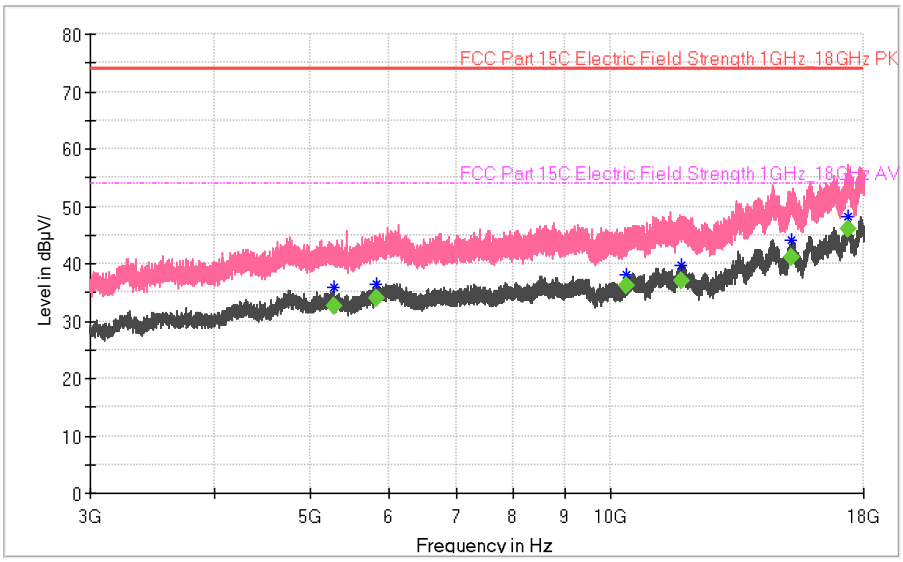



| Frequency (MHz) | Reading MaxPeak (dBuV) | Reading Average (dBuV) | MaxPeak (dBuV/m) | Average (dBuV/m) | Limit (dBuV/m) | Margin (dB) | $A_{Rpl}$ (dB) | Polarity |
|---|---|---|---|---|---|---|---|---|
| 5979.000 | --- | 54.52 | --- | 34.32 | 54.00 | 19.68 | -20.20 | Vertical |
| 7277.000 | --- | 55.11 | --- | 33.81 | 54.00 | 20.19 | -21.30 | Vertical |
| 8763.500 | --- | 55.04 | --- | 34.84 | 54.00 | 19.16 | -20.20 | Vertical |
| 10442.500 | --- | 54.67 | --- | 35.87 | 54.00 | 18.13 | -18.80 | Vertical |
| 11841.500 | --- | 54.10 | --- | 37.40 | 54.00 | 16.60 | -16.70 | Vertical |
| 15274.500 | --- | 54.34 | --- | 40.84 | 54.00 | 13.16 | -13.50 | Vertical |

LE-2Mbps
Spurious Radiated Emissions from 1GHz to 18GHz:
GFSK:
CH Middle (No.19)

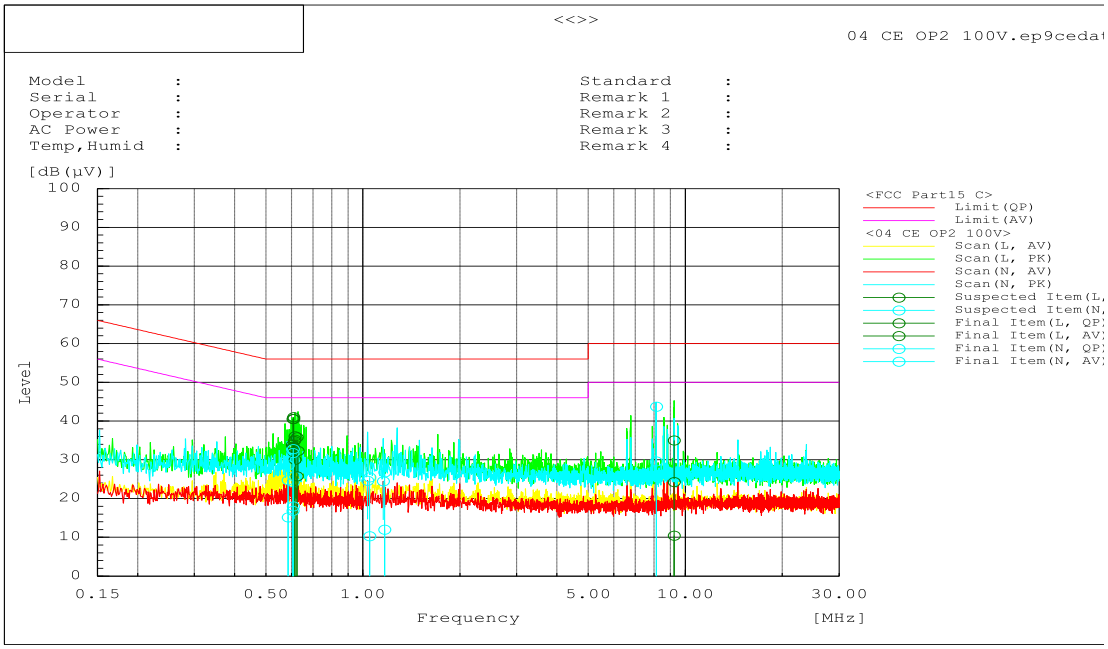


Full Spectrum




| Frequency (MHz) | Reading MaxPeak (dBuV) | Reading Average (dBuV) | MaxPeak (dBuV/m) | Average (dBuV/m) | Limit (dBuV/m) | Margin (dB) | $A_{Rpl}$ (dB) | Polarity |
|---|---|---|---|---|---|---|---|---|
| 5269.000 | --- | 53.60 | --- | 32.50 | 54.00 | 21.50 | -21.10 | Vertical |
| 5817.000 | --- | 54.03 | --- | 34.03 | 54.00 | 19.97 | -20.00 | Vertical |
| 10391.000 | --- | 55.00 | --- | 36.10 | 54.00 | 17.90 | -18.90 | Vertical |
| 11817.000 | --- | 53.79 | --- | 37.09 | 54.00 | 16.91 | -16.70 | Vertical |
| 15243.000 | --- | 54.73 | --- | 41.23 | 54.00 | 12.77 | -13.50 | Vertical |
| 17369.500 | --- | 57.49 | --- | 45.99 | 54.00 | 8.01 | -11.50 | Vertical |

## AC Power line Conducted Emission
## 100V

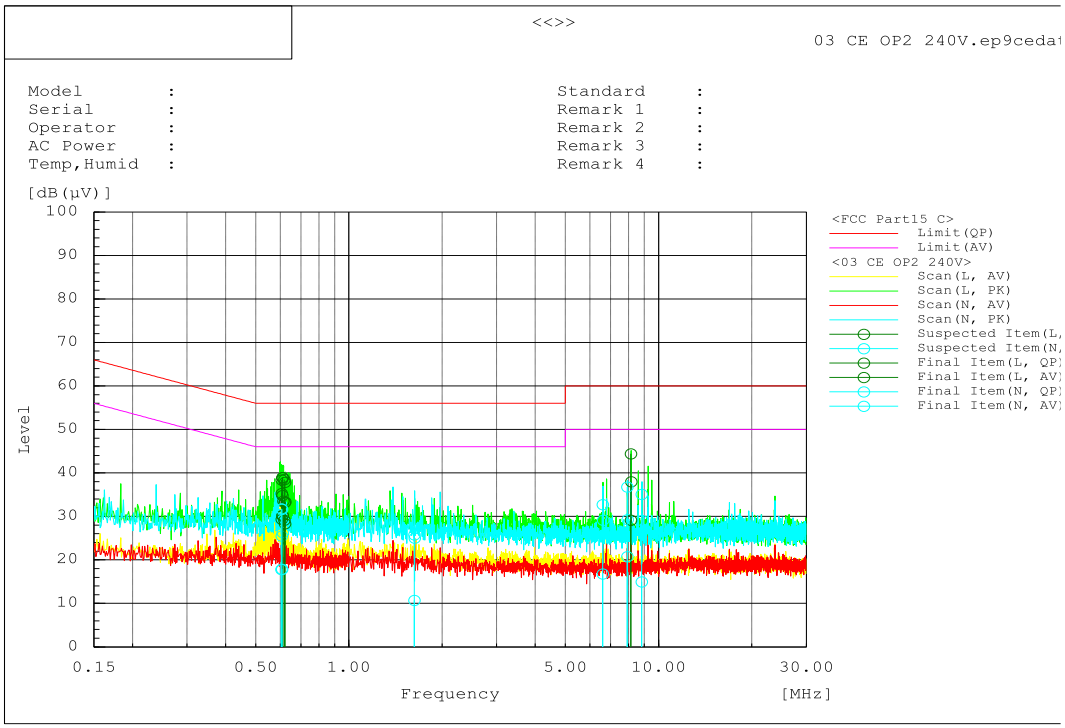



L+N Line

MEASUREMENT RESULT:

| Range | Frequency | Line | Reading | | | Factor | Level | | | Limit | Limit | | | Margin | | | Pass/Fail |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | | dB(µV) | | | dB | dB(µV) | | | dB(µV) | dB(µV) | | | dB | | | |
| | | | QP | AV | PK | | QP | AV | PK | | QP | AV | PK | QP | AV | PK | |
| Band1 | 0.586 | N | 8.7 | -4.7 | | 19.9 | 28.6 | 15.2 | | | 56 | 46 | | 27.4 | 30.8 | | Pass |
| Band1 | 0.607 | N | 11.9 | -3.1 | | 19.9 | 31.8 | 16.8 | | | 56 | 46 | | 24.2 | 29.2 | | Pass |
| Band1 | 0.608 | N | 12.9 | -1.9 | | 19.9 | 32.8 | 18 | | | 56 | 46 | | 23.2 | 28 | | Pass |
| Band1 | 1.05 | N | 5.6 | -9.6 | | 19.9 | 25.5 | 10.3 | | | 56 | 46 | | 30.5 | 35.7 | | Pass |
| Band1 | 1.167 | N | 6.9 | -7.9 | | 19.9 | 26.8 | 12 | | | 56 | 46 | | 29.2 | 34 | | Pass |
| Band1 | 8.137 | N | 23.8 | 6 | | 19.9 | 43.7 | 25.9 | | | 60 | 50 | | 16.3 | 24.1 | | Pass |
| Band1 | 0.607 | L | 20.6 | 13.5 | | 19.9 | 40.5 | 33.4 | | | 56 | 46 | | 15.5 | 12.6 | | Pass |
| Band1 | 0.61 | L | 21.1 | 13.4 | | 19.9 | 41 | 33.3 | | | 56 | 46 | | 15 | 12.7 | | Pass |
| Band1 | 0.61 | L | 20.6 | 13.1 | | 19.9 | 40.5 | 33 | | | 56 | 46 | | 15.5 | 13 | | Pass |
| Band1 | 0.616 | L | 16.2 | 10.1 | | 19.9 | 36.1 | 30 | | | 56 | 46 | | 19.9 | 16 | | Pass |
| Band1 | 0.625 | L | 15.9 | 5.9 | | 19.9 | 35.8 | 25.8 | | | 56 | 46 | | 20.2 | 20.2 | | Pass |
| Band1 | 9.231 | L | 4.4 | -9.5 | | 19.9 | 24.3 | 10.4 | | | 60 | 50 | | 35.7 | 39.6 | | Pass |

**240V**




L+N Line

MEASUREMENT RESULT:

| Range | Frequency | Line | Reading | | | Factor | Level | | | Limit | Limit | | | Margin | | | Pass/Fail |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | | dB(µV) | | | dB | dB(µV) | | | dB(µV) | dB(µV) | | | dB | | | |
| | | | QP | AV | PK | | QP | AV | PK | | QP | AV | PK | QP | AV | PK | |
| Band1 | 0.606 | L | 18.5 | 9.4 | | 19.9 | 38.4 | 29.3 | | | 56 | 46 | | 17.6 | 16.7 | | Pass |
| Band1 | 0.612 | L | 19.1 | 10.4 | | 19.9 | 39 | 30.3 | | | 56 | 46 | | 17 | 15.7 | | Pass |
| Band1 | 0.609 | L | 19 | 10.3 | | 19.9 | 38.9 | 30.2 | | | 56 | 46 | | 17.1 | 15.8 | | Pass |
| Band1 | 0.618 | L | 18.5 | 9.3 | | 19.9 | 38.4 | 29.2 | | | 56 | 46 | | 17.6 | 16.8 | | Pass |
| Band1 | 0.621 | L | 17.9 | 8.4 | | 19.9 | 37.8 | 28.3 | | | 56 | 46 | | 18.2 | 17.7 | | Pass |
| Band1 | 8.138 | L | 24.5 | 9.2 | | 19.9 | 44.4 | 29.1 | | | 60 | 50 | | 15.6 | 20.9 | | Pass |
| Band1 | 0.604 | N | 11.9 | -2.1 | | 19.9 | 31.8 | 17.8 | | | 56 | 46 | | 24.2 | 28.2 | | Pass |
| Band1 | 0.608 | N | 11.8 | -2.1 | | 19.9 | 31.7 | 17.8 | | | 56 | 46 | | 24.3 | 28.2 | | Pass |
| Band1 | 1.626 | N | 5.9 | -9.2 | | 19.9 | 25.8 | 10.7 | | | 56 | 46 | | 30.2 | 35.3 | | Pass |
| Band1 | 6.597 | N | 12.8 | -3.1 | | 19.9 | 32.7 | 16.8 | | | 60 | 50 | | 27.3 | 33.2 | | Pass |
| Band1 | 7.924 | N | 16.9 | 0.8 | | 19.9 | 36.8 | 20.7 | | | 60 | 50 | | 23.2 | 29.3 | | Pass |
| Band1 | 8.811 | N | 15.2 | -5 | | 19.9 | 35.1 | 14.9 | | | 60 | 50 | | 24.9 | 35.1 | | Pass |

---End of Test Report---