# FCC - TEST REPORT

| | | | | |
|---|---|---|---|---|
| Report Number | : | 68.950.17.643.01 | Date of Issue: | September 25, 2017 |
| Model | : | BN-500 | | |
| Product Type | : | BN-500 FIC BT & ANC Over Ear Headsets | | |
| Applicant | : | Fujikon Industrial Co., Ltd. | | |
| Address | : | 16/F., Tower 1, Grand Central Plaza 138 Shatin Rural Committee | | |
| | : | Road Shatin, N.T. Hong Kong | | |
| Production Facility | : | Charter Media (Dongguan) Co., Ltd. | | |
| Address | : | Dabandi Industrial Zone, Daning District, Humen Town, 523930 | | |
| | : | Dongguan City, Guangdong Province, PEOPLE'S REPUBLIC | | |
| | : | OF CHINA | | |
| Test Result | : | n **Positive** o **Negative** | | |
| Total pages including Appendices | : | 44 | | |

# 1 Table of Contents





TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District
Shenzhen 518052, P.R. China

# 2 Details about the Test Laboratory

## Details about the Test Laboratory

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
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Telephone: 86 755 8828 6998
Fax: 86 755 828 5299

FCC Registration No.: 514049

# 3 Description of the Equipment Under Test

| | |
|---|---|
| Product: | BN-500 FIC BT & ANC Over Ear Headsets |
| Model no.: | BN-500 |
| FCC ID: | TTC-BN-500 |
| Options and accessories: | USB Cable, AUX IN Cable |
| Rating: | DC3.7V, 610mAh (Supplied by Li-ion rechargeable battery)<br>DC5.0V, 0.5A (Charged by the mini-USB port) |
| RF Transmission Frequency: | 2402MHz-2480MHz |
| No. of Operated Channel: | 79 |
| Modulation: | GFSK, π/4-DQPSK, 8-DPSK |
| Antenna Type: | Integrated antenna |
| Antenna Gain: | 2.0dBi |
| Description of the EUT: | The Equipment Under Test (EUT) is a BN-500 FIC BT & ANC Over Ear Headsets operated at 2.4GHz |

# 4 Summary of Test Standards

| Test Standards | |
|---|---|
| FCC Part 15 Subpart C<br>10-1-2016 Edition | PART 15 - RADIO FREQUENCY DEVICES<br>Subpart C - Intentional Radiators |

All the test methods were according to Public Notice DA 00-705 -Frequency Hopper Spread Spectrum Test Procedure released by FCC on March 30, 2000 and ANSI C63.10-2013.

# 5 Summary of Test Results

| Technical Requirements | | | |
|---|---|---|---|
| **FCC Part 15 Subpart C** | | | |
| Test Condition | | Pages | Test Result |
| §15.207 | Conducted emission AC power port | -- | N/A |
| §15.247(b)(1) | Conducted peak output power | 10 | Pass |
| §15.247(e) | Power spectral density* | -- | N/A |
| §15.247(a)(2) | 6dB bandwidth | -- | N/A |
| §15.247(a)(1) | 20dB bandwidth and 99% Occupied Bandwidth | 17 | Pass |
| §15.247(a)(1) | Carrier frequency separation | 24 | Pass |
| §15.247(a)(1)(iii) | Number of hopping frequencies | 27 | Pass |
| §15.247(a)(1)(iii) | Dwell Time | 29 | Pass |
| §15.247(d) | Spurious RF conducted emissions | 32 | Pass |
| §15.247(d) | Band edge | 36 | Pass |
| §15.247(d) & §15.209 & | Spurious radiated emissions for transmitter and receiver | 39 | Pass |
| §15.203 | Antenna requirement | See note 1 | Pass |

Note 1: N/A=Not Applicable.
Note 2: The EUT uses a Integrated antenna, which gain is 2.0dBi. In accordance to §15.203, it is considered sufficiently to comply with the provisions of this section.

# 6 General Remarks

**Remarks**

This submittal(s) (test report) is intended for FCC ID: TTC-BN-500, complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C rules.

BN-500 is a BN-500 FIC BT & ANC Over Ear Headsets with Bluetooth 4.1+EDR. The TX and RX range is 2402MHz-2480MHz for 4.1+EDR.

This is Report Bluetooth BDR+EDR only.

**SUMMARY:**

All tests according to the regulations cited on page 5 were

n - Performed

o - **Not** Performed

The Equipment Under Test

n - **Fulfills** the general approval requirements.

o - **Does not** fulfill the general approval requirements.

Sample Received Date: August 7, 2017

Testing Start Date: August 7, 2017

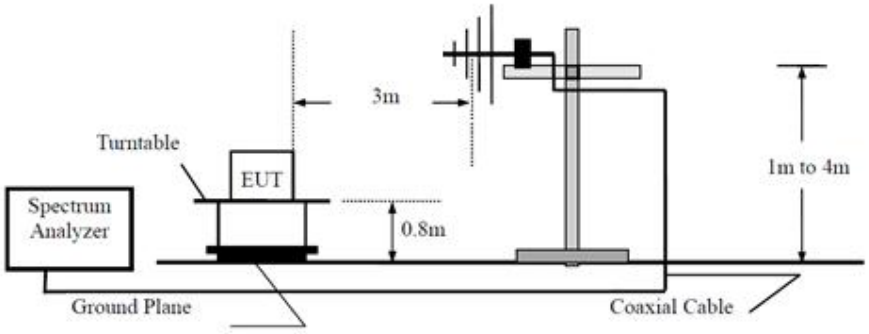
Testing End Date: September 8, 2017

| Reviewed by: | Prepared by: | Tested by: |
|---|---|---|
| Phoebe Hu | Mark Chen | Endy Xie |
| EMC Section Manager | EMC Project Engineer | EMC Test Engineer |

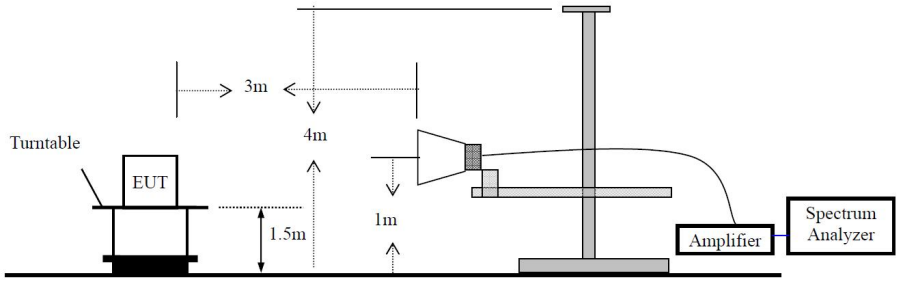
# 7 Test Setups

## 7.1 Radiated test setups

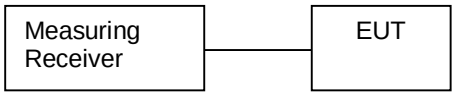
Below 1GHz




Above 1GHz




## 7.2 Conducted RF test setups



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# 8 Systems test configuration

Auxiliary Equipment Used during Test:

| DESCRIPTION | MANUFACTURER | MODEL NO. | S/N |
|---|---|---|---|
| Notebook | lenovo | X220 | --- |

Test software: CRS test tool, which used to control the EUT in continues transmitting mode

The system was configured to hopping mode and non-hopping mode.

Hopping mode: typical working mode (normal hopping status)

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power

# 9 Technical Requirement

## 9.1 Conducted peak output power

**Test Method**

1. Use the following spectrum analyzer settings:
   Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
   RBW > the 20 dB bandwidth of the emission being measured, VBW≥RBW,
   Sweep = auto, Detector function = peak, Trace = max hold
2. Add a correction factor to the display.
3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power

**Limits**

| Frequency Range<br>MHz | Limit<br>W | Limit<br>dBm |
|---|---|---|
| 2400-2483.5 | ≤1 | ≤30 |


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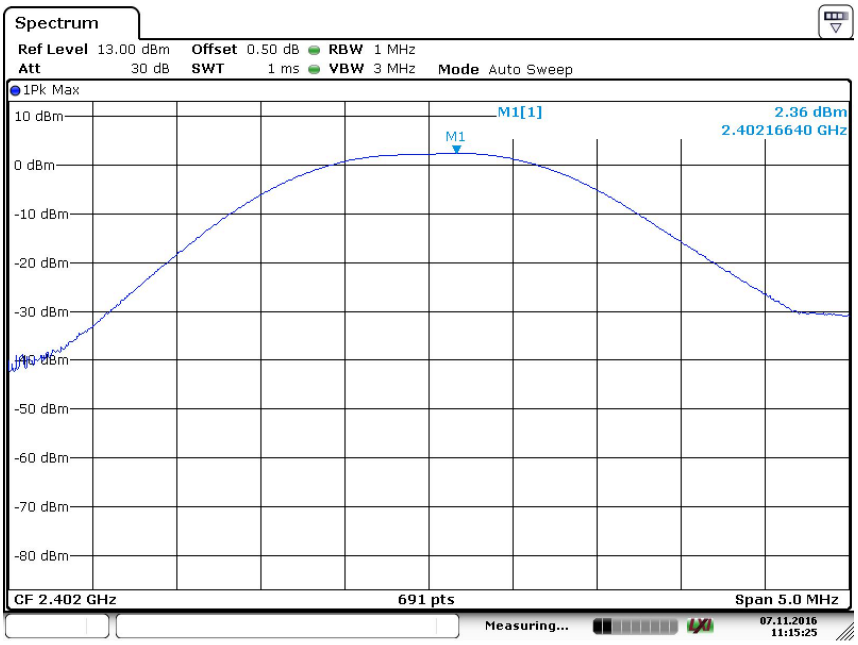
## Conducted peak output power

Bluetooth Mode GFSK modulation Test Result

| Frequency MHz | Conducted Peak Output Power dBm | Result |
|---|---|---|
| Low channel 2402MHz | 2.36 | Pass |
| Middle channel 2441MHz | 5.38 | Pass |
| High channel 2480MHz | 5.04 | Pass |

Low channel 2402MHz



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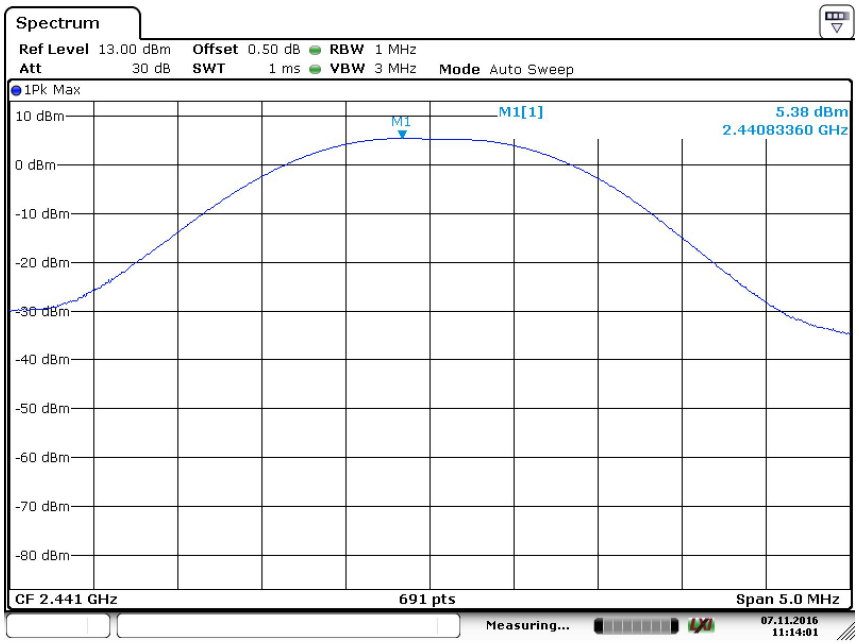
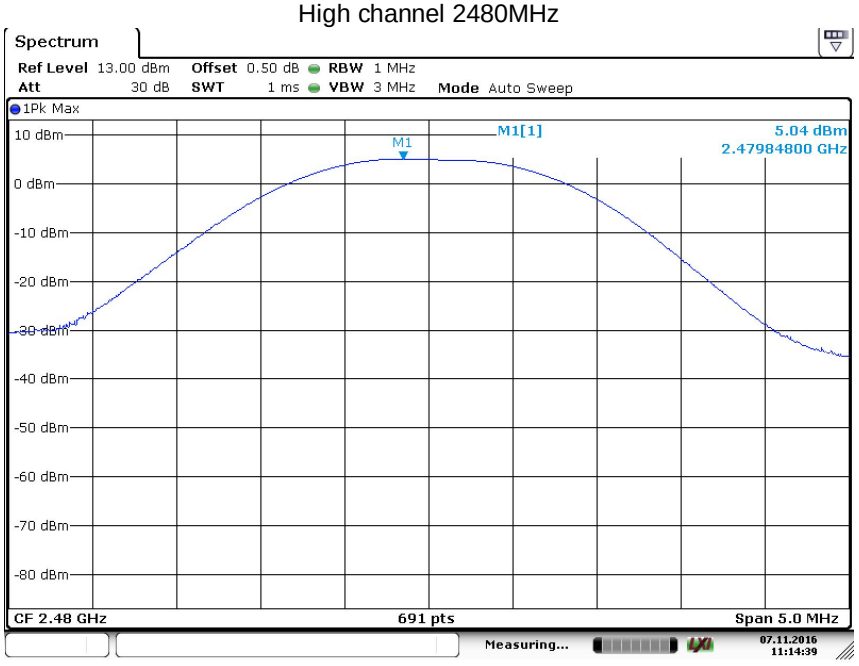
Middle channel 2441MHz




High channel 2480MHz



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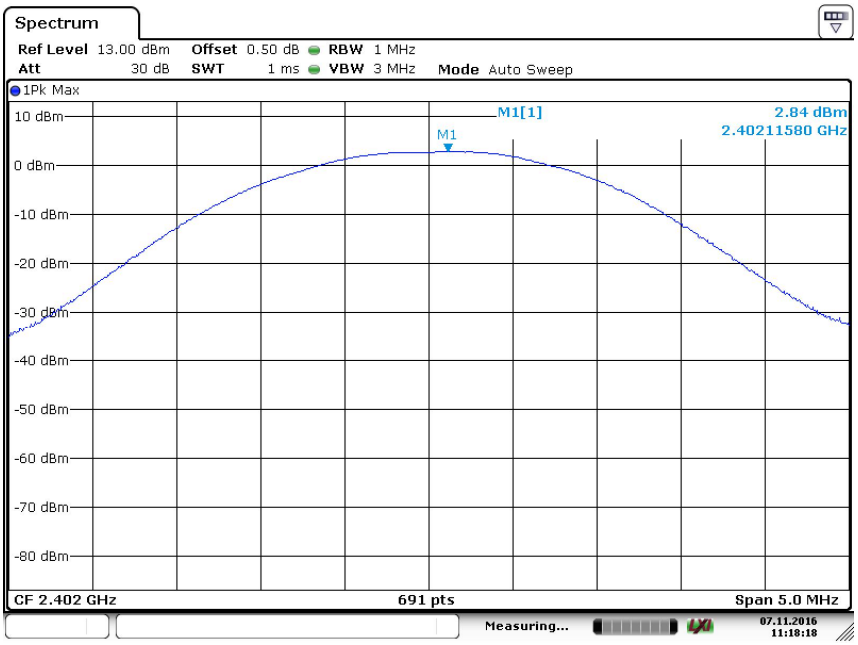
## Bluetooth Mode π/4-DQPSK modulation Test Result

| Frequency MHz | Conducted Peak Output Power dBm | Result |
|---|---|---|
| Low channel 2402MHz | 2.84 | Pass |
| Middle channel 2441MHz | 5.33 | Pass |
| High channel 2480MHz | 5.04 | Pass |

Low channel 2402MHz



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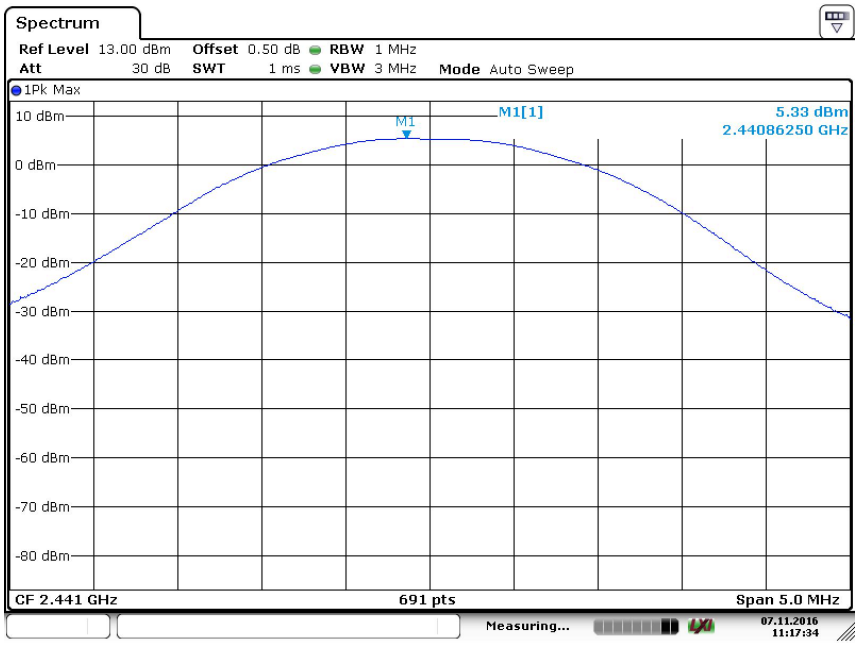
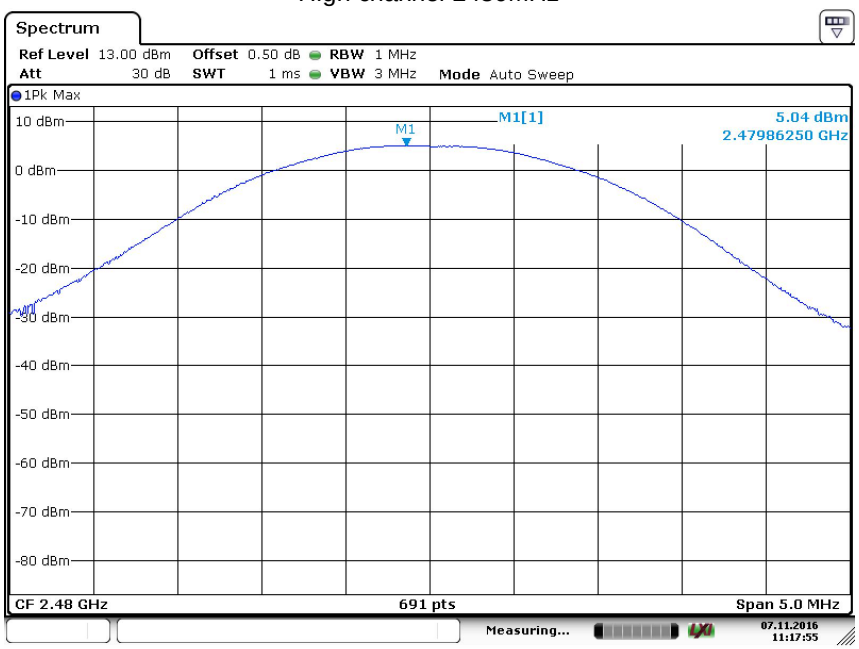
Middle channel 2441MHz



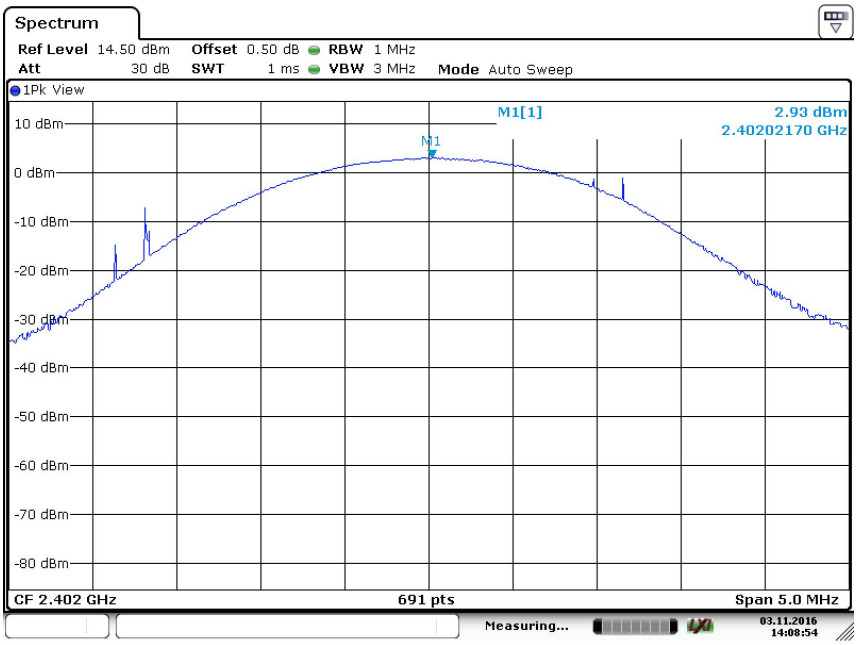

High channel 2480MHz



## Bluetooth Mode 8DPSK modulation Test Result

| Frequency MHz | Conducted Peak Output Power dBm | Result |
|---|---|---|
| Low channel 2402MHz | 2.93 | Pass |
| Middle channel 2441MHz | 5.44 | Pass |
| High channel 2480MHz | 5.20 | Pass |

Low channel 2402MHz



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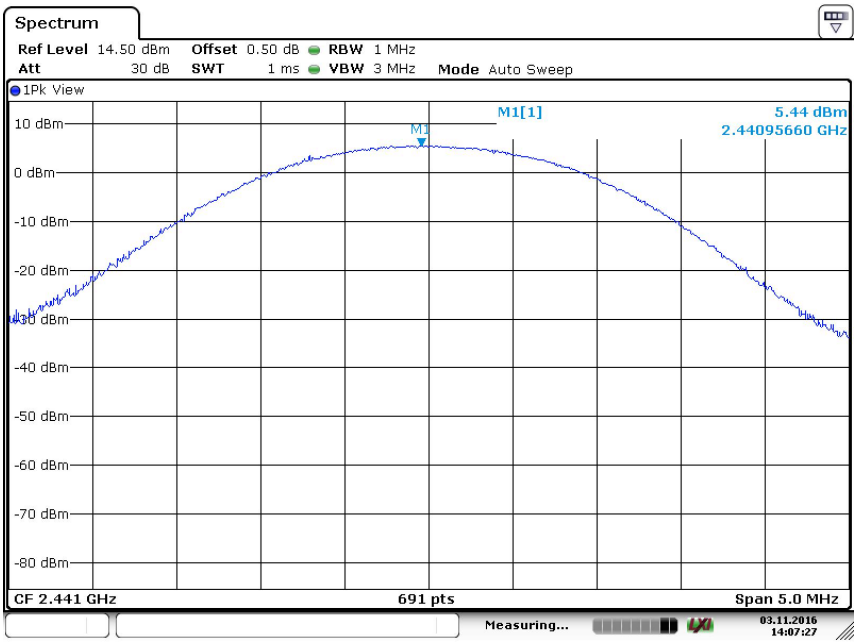
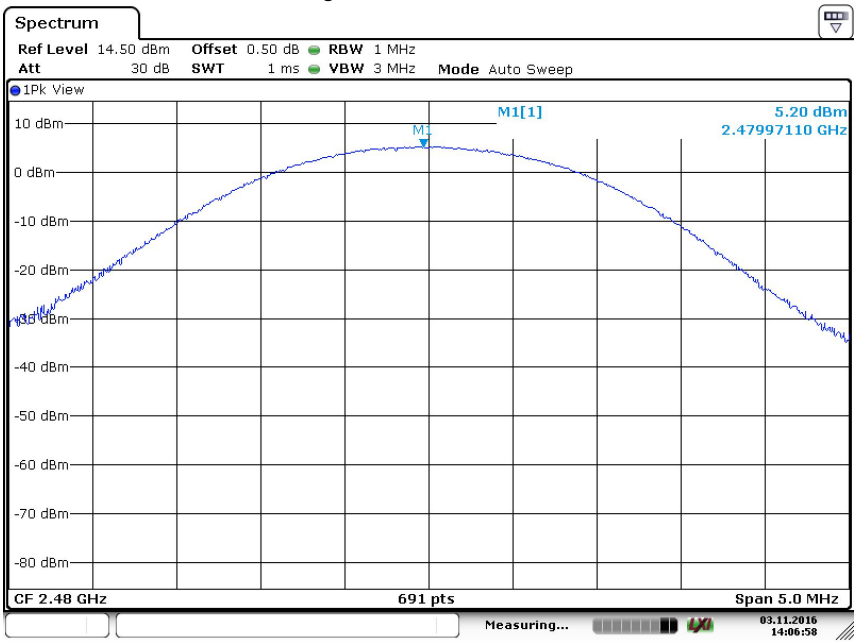
Middle channel 2441MHz




High channel 2480MHz



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## 9.2 20 dB bandwidth and 99% Occupied Bandwidth

**Test Method**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

**Limit**

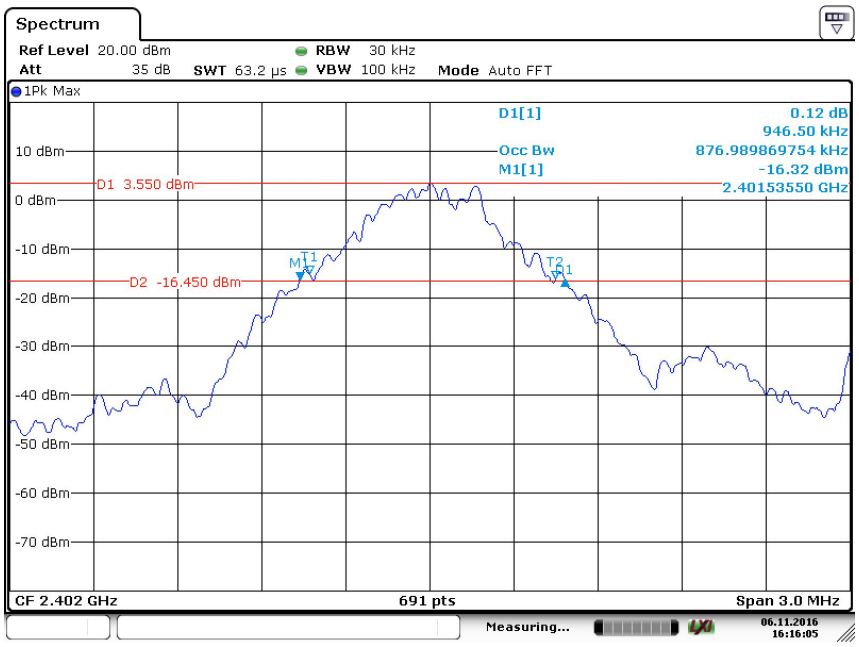
| Limit [kHz] |
|---|
| N/A |

## 20 dB bandwidth and 99% Occupied Bandwidth

Bluetooth Mode GFSK Modulation test result

| Frequency MHz | 20 dB Bandwidth kHz | 99% Bandwidth kHz | Limit kHz | Result |
|---|---|---|---|---|
| 2402 | 946.5 | 876.99 | -- | Pass |
| 2441 | 950.8 | 863.97 | -- | Pass |
| 2480 | 950.8 | 863.97 | -- | Pass |

Low channel 2402MHz



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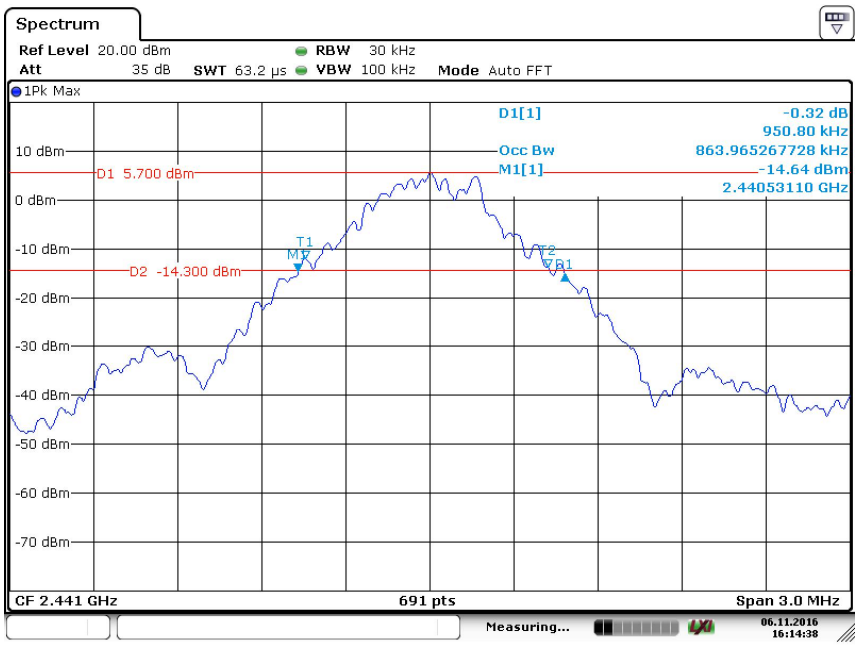
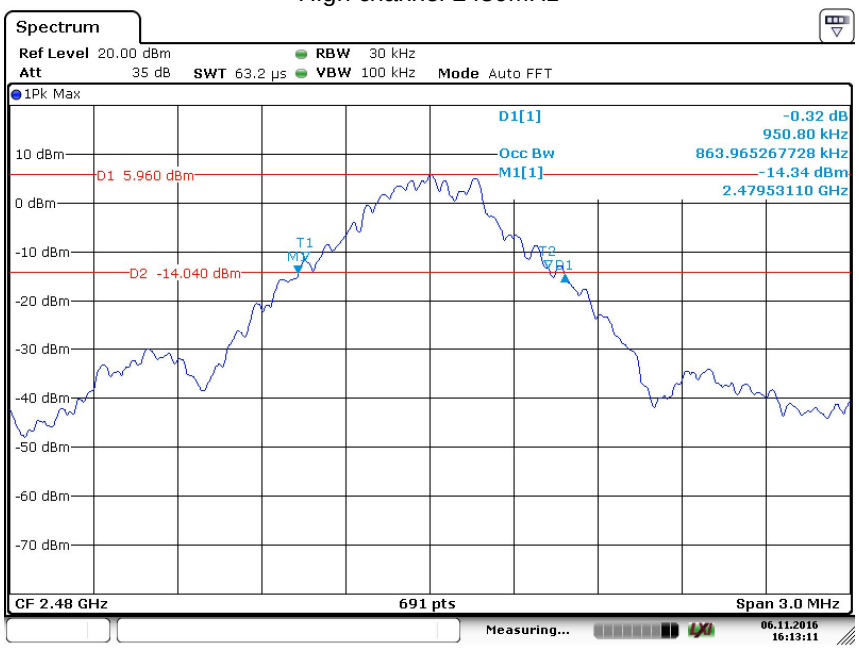
Middle channel 2441MHz




High channel 2480MHz



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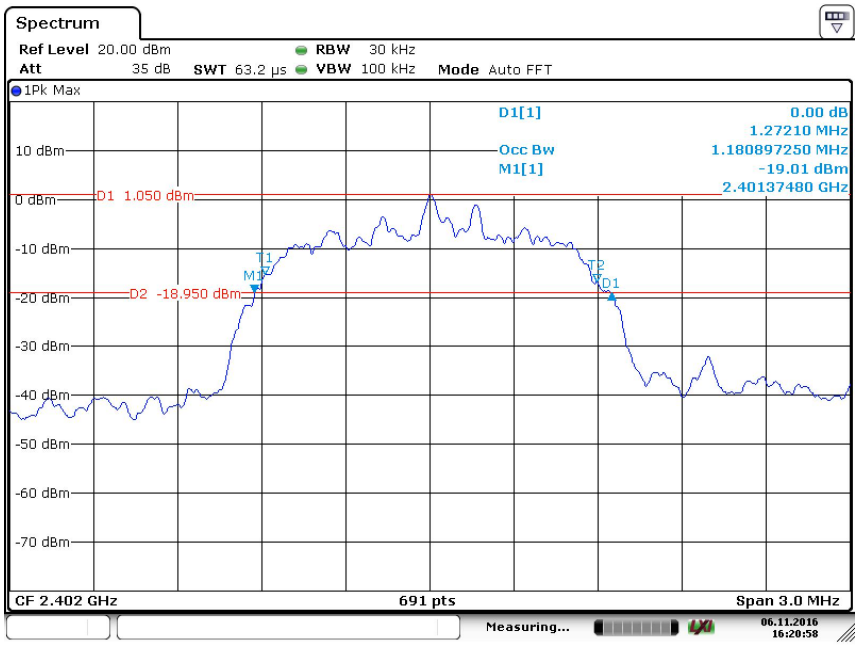
## 20 dB bandwidth and 99% Occupied Bandwidth

Bluetooth Mode π/4-DQPSK Modulation test result

| Frequency | 20 dB Bandwidth | 99% Bandwidth | Limit | Result |
|---|---|---|---|---|
| MHz | kHz | kHz | kHz | |
| 2402 | 1272.1 | 1180.9 | -- | Pass |
| 2441 | 1237.3 | 1167.9 | -- | Pass |
| 2480 | 1237.3 | 1167.9 | -- | Pass |

Low channel 2402MHz



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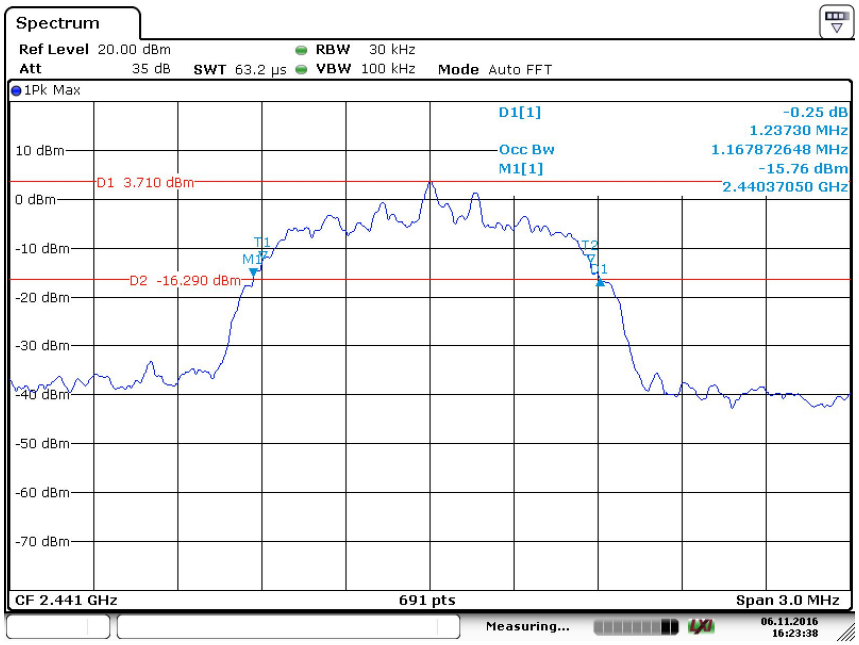
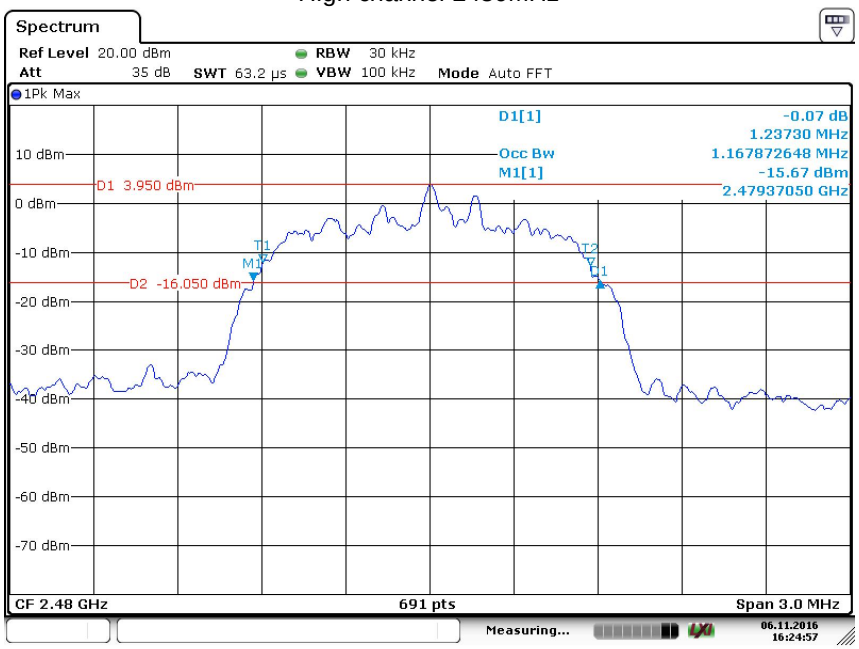
Middle channel 2441MHz




High channel 2480MHz



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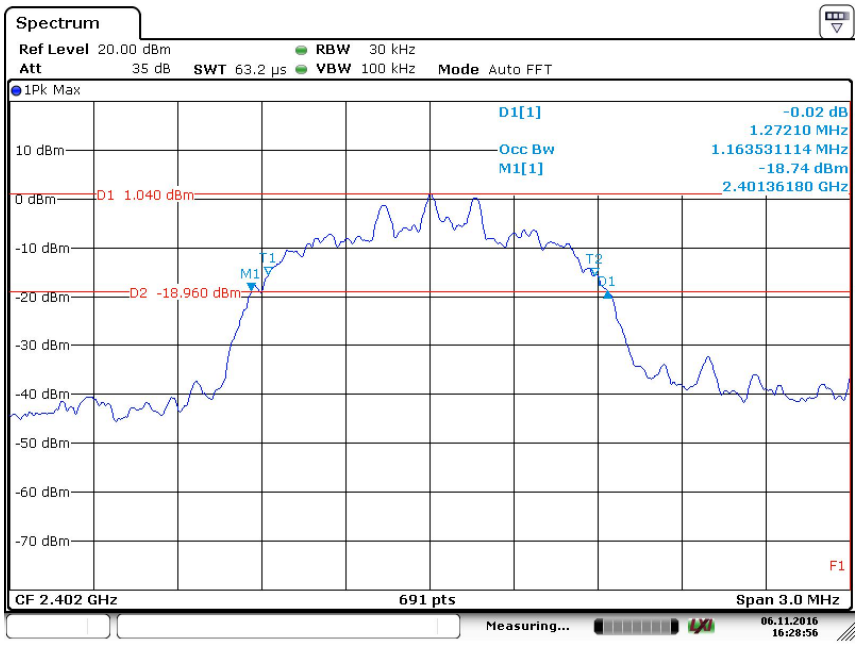
## 20 dB bandwidth and 99% Occupied Bandwidth

Bluetooth Mode 8DPSK Modulation test result

| Frequency MHz | 20 dB Bandwidth kHz | 99% Bandwidth kHz | Limit kHz | Result |
|---|---|---|---|---|
| 2402 | 1272.1 | 1163.5 | -- | Pass |
| 2441 | 1259.0 | 1163.5 | -- | Pass |
| 2480 | 1259.0 | 1159.2 | -- | Pass |

Low channel 2402MHz



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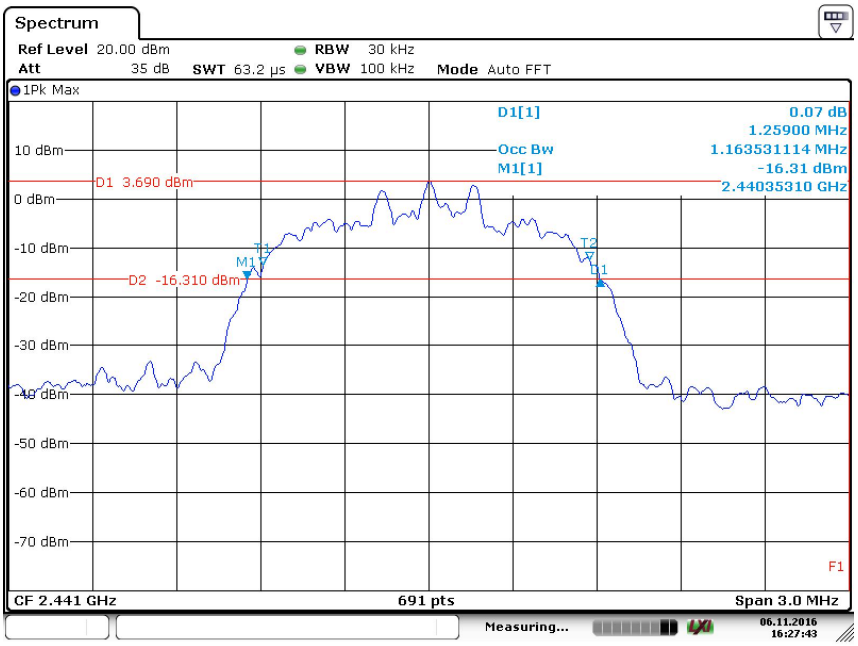
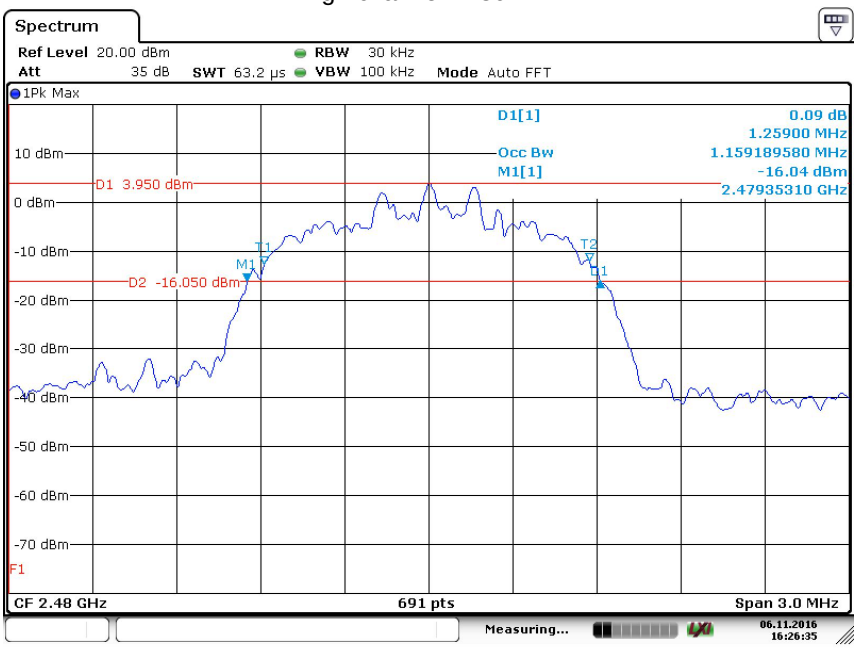
Middle channel 2441MHz




High channel 2480MHz



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## 9.3 Carrier Frequency Separation

**Test Method**

1. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels, RBW ≥ 1% of the span, VBW) ≥RBW, Sweep = auto, Detector function = peak
2. By using the Max-Hold function record the separation of two adjacent channels.
3. Measure the frequency difference of these two adjacent channels by spectrum analyzer marker function.
4. Repeat above procedures until all frequencies measured were complete.

**Limit**

| Limit<br>kHz |
|---|
| ≥25KHz or 2/3 of the 20 dB bandwidth which is greater |

GFSK Modulation Limit

| Frequency<br>MHz | 2/3 of 20 dB Bandwidth<br>kHz |
|---|---|
| 2402 | 631 |
| 2441 | 633.9 |
| 2480 | 633.9 |


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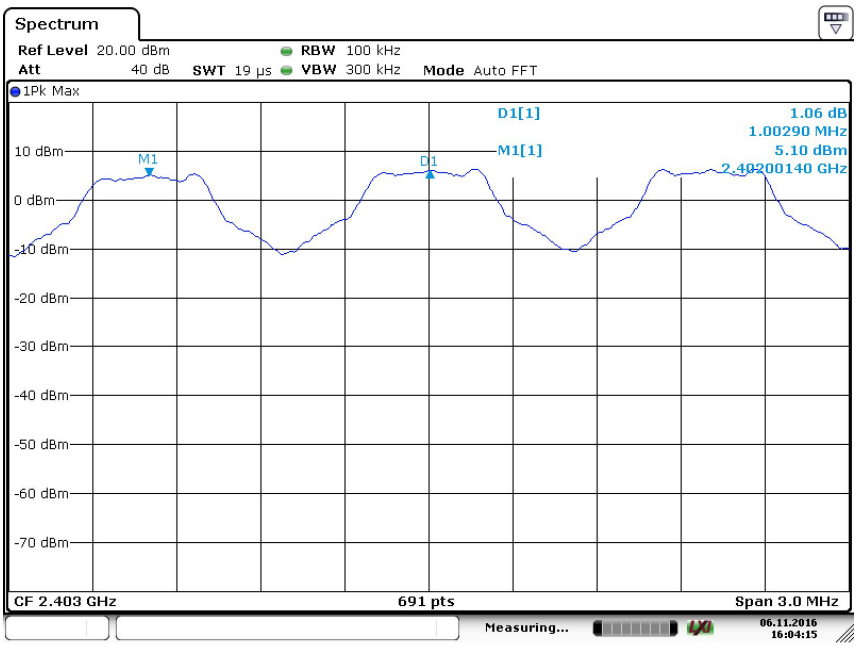
## Carrier Frequency Separation

Test result: The measurement was performed with the typical configuration (normal hopping status), here GFSK modulation mode was used to show compliance.

GFSK Modulation test result

| Frequency MHz | Carrier Frequency Separation kHz | Result |
|---|---|---|
| 2402 | 1002.9 | Pass |
| 2441 | 1002.9 | Pass |
| 2480 | 1002.9 | Pass |

Low channel 2402MHz



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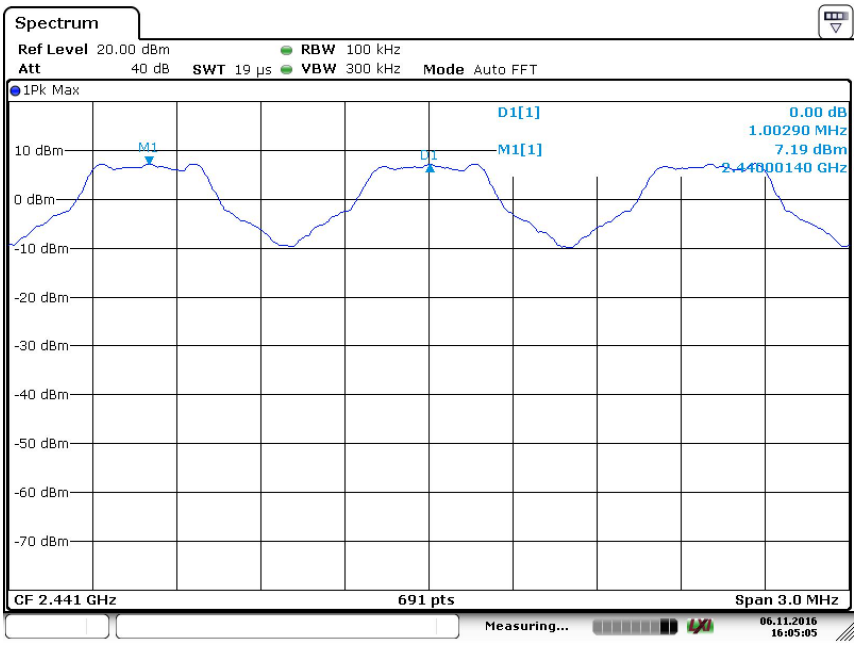
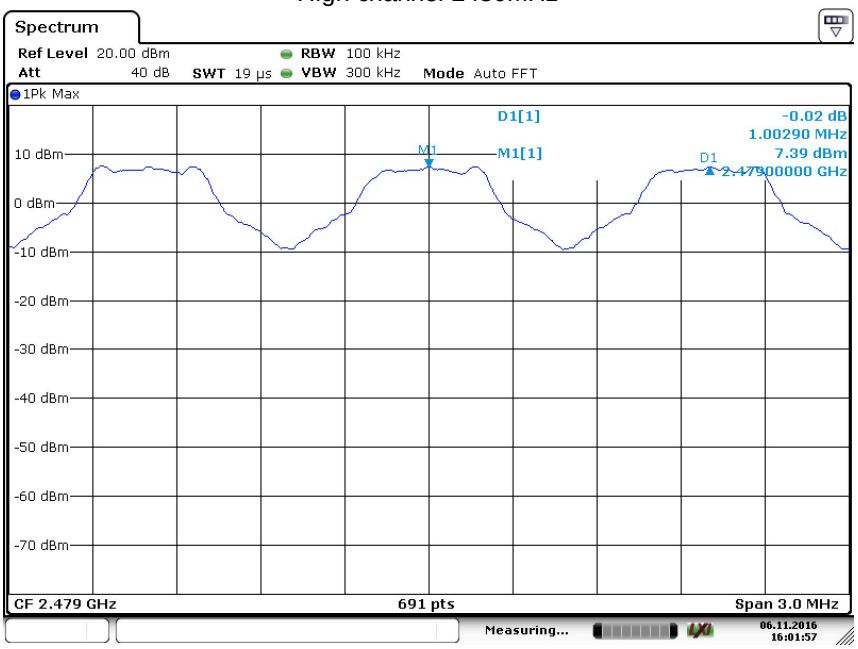
Middle channel 2441MHz




High channel 2480MHz



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## 9.4 Number of hopping frequencies

**Test Method**

1. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels, RBW ≥ 1% of the span, VBW) ≥RBW, Sweep = auto, Detector function = peak
2. Set the spectrum analyzer on Max-Hold Mode, and then keep the EUT in hopping mode.
3. Record all the signals from each channel until each one has been recorded.
4. Repeat above procedures until all frequencies measured were complete.

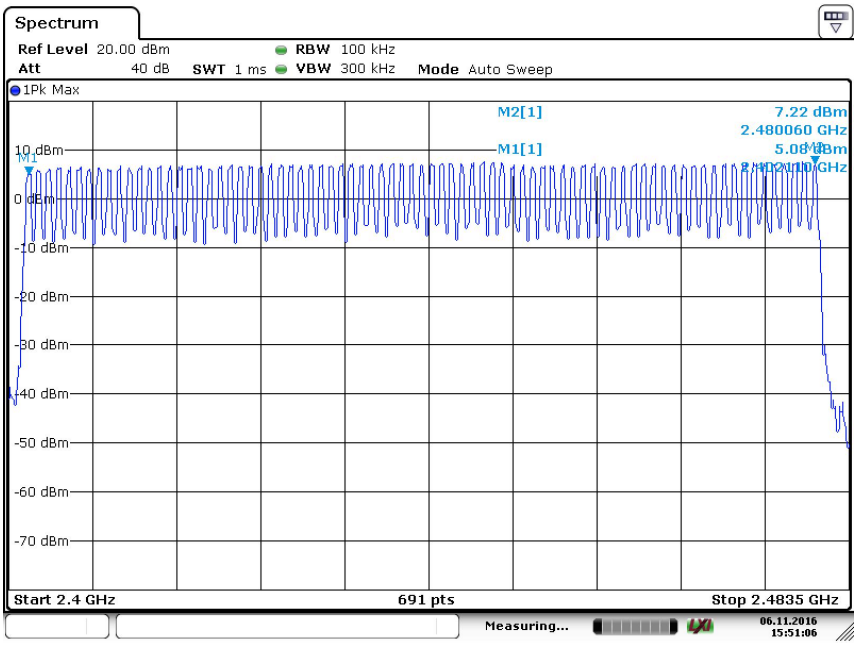
**Limit**

| Limit number |
|---|
| ≥ 15 |

## Number of hopping frequencies

Test result: The measurement was performed with the typical configuration (normal hopping status), and the total hopping channels is constant for the all modulation mode according with the Bluetooth Core Specification. Here GFSK modulation mode was used to show compliance.

| Number of hopping frequencies | Result |
|---|---|
| 79 | Pass |



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## 9.5 Dwell Time

**Test Method**

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable. Equipment mode: Spectrum analyzer
2. RBW: 1MHz; VBW: 1MHz; SPAN: Zero Span
3. Adjust the center frequency of spectrum analyzer on any frequency be measured.
4. Measure the Dwell Time by spectrum analyzer Marker function.
5. Repeat above procedures until all frequencies measured were complete.

**Limit**

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

## Dwell Time

**Dwell time**

The maximum dwell time shall be 0.4 s.
According to the Bluetooth Core Specification, the worse result (DH5 mode) was reported to show compliance.

The Dwell Time = Burst Width * Total Hops. The detailed calculations are showed as follows:
The duration for dwell time calculation: 0.4 [s] * hopping number = 0.4 [s] * 79 [ch] = 31.6 [s*ch];

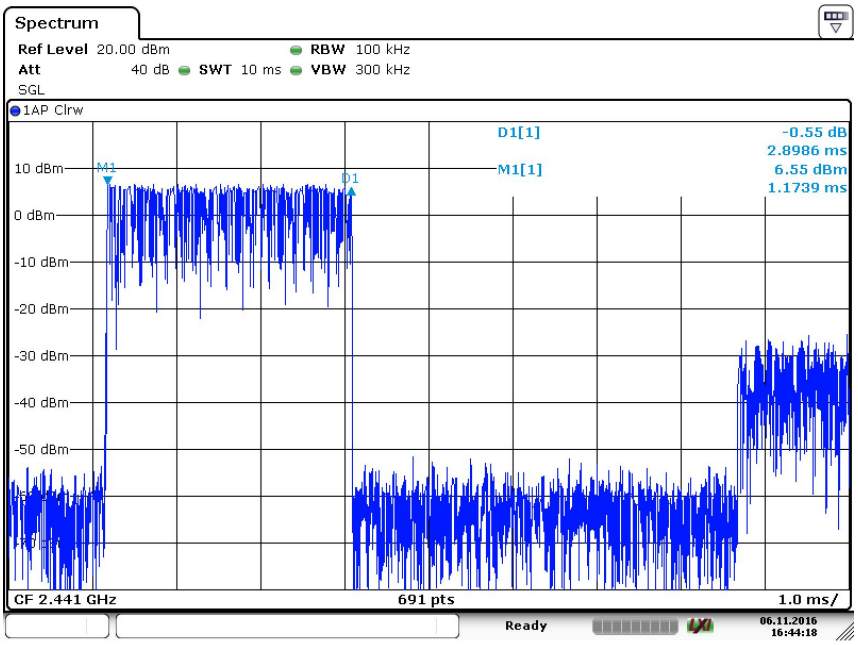
The burst width, which is directly measured, refers to the duration on one channel hop.

The maximum number of hopping channels in 31.6s for DH5=1600 / 6 / 79 *31.6=106.67

Test Result

| Modulation | Mode | Reading (us) | Total Hops | Test Result (ms) | Limit (ms) | Result |
|---|---|---|---|---|---|---|
| GFSK | DH5 | 2898.6 | 106.67 | 309.19 | < 400 | Pass |
| π/4-DQPSK | 2DH5 | 2913 | 106.67 | 310.73 | < 400 | Pass |
| 8-DPSK | 3DH5 | 2898.6 | 106.67 | 309.19 | < 400 | Pass |

GFSK Modulation




DH5



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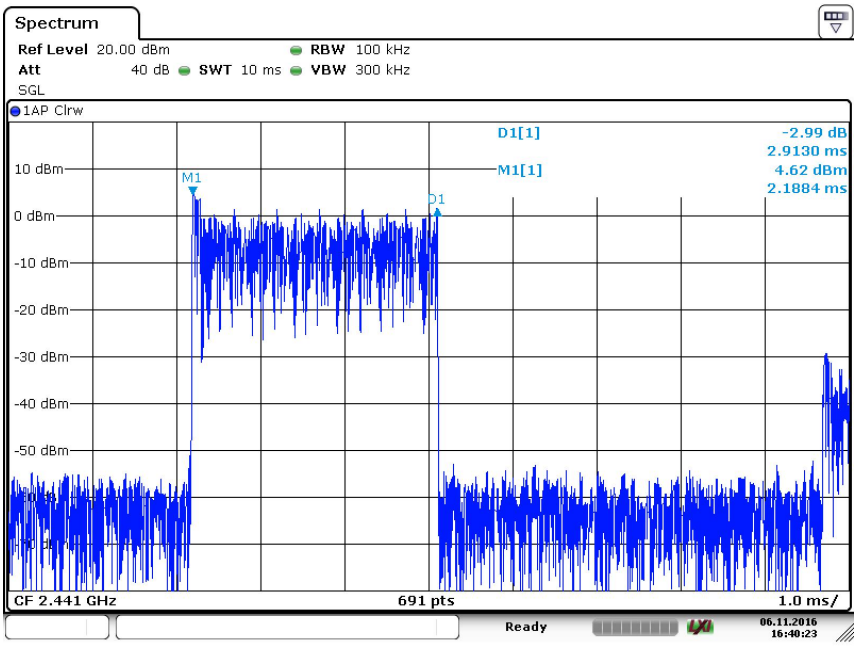
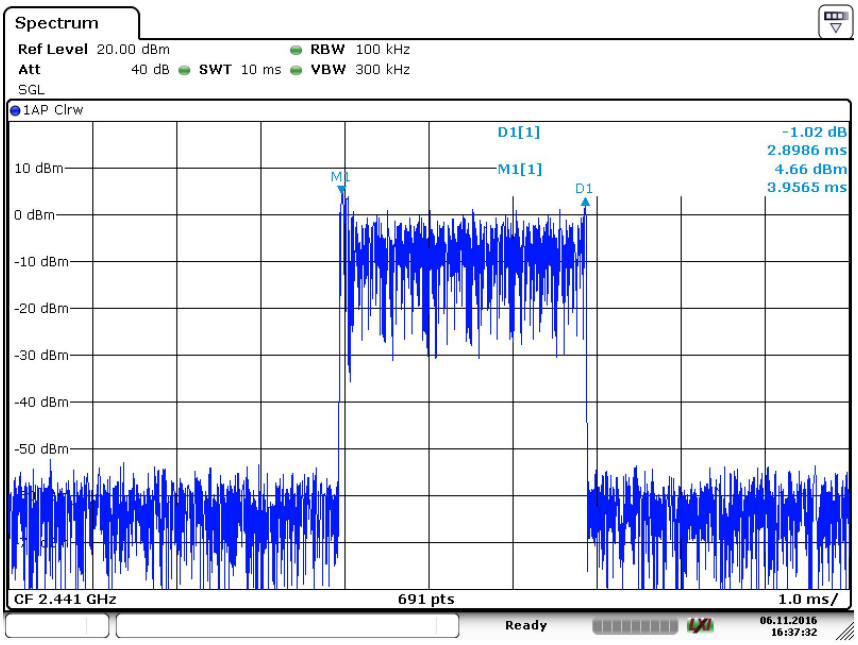
π/4-DQPSK Modulation




2DH5

8-DPSK Modulation




3DH5



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## 9.6 Spurious RF conducted emissions

**Test Method**

1. 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 10$^{th}$ harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
3. The level displayed must comply with the limit specified in this Section. Submit these plots.
4. Repeat above procedures until all frequencies measured were complete.

**Limit**

| Frequency Range MHz | Limit (dBc) |
|---|---|
| 30-25000 | -20 |


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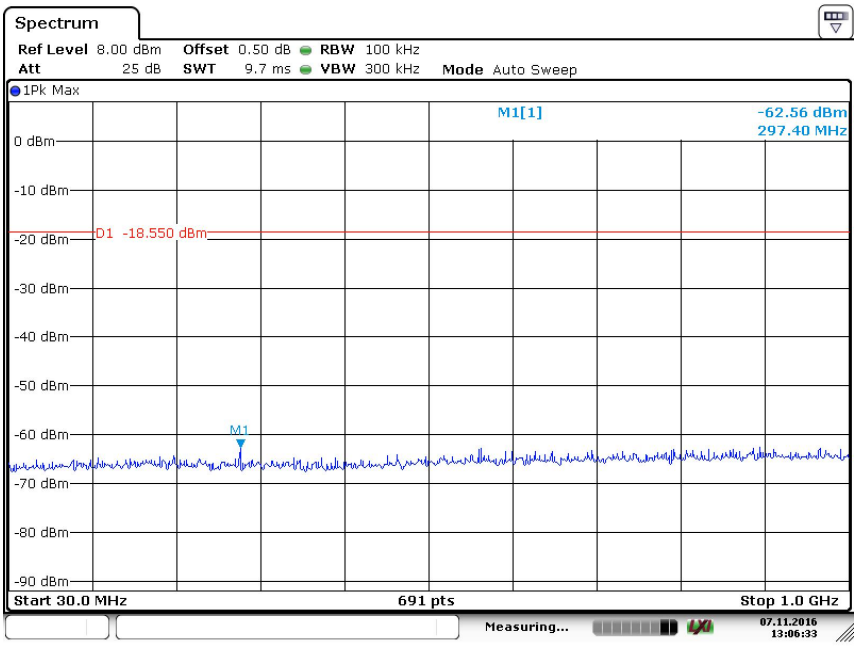
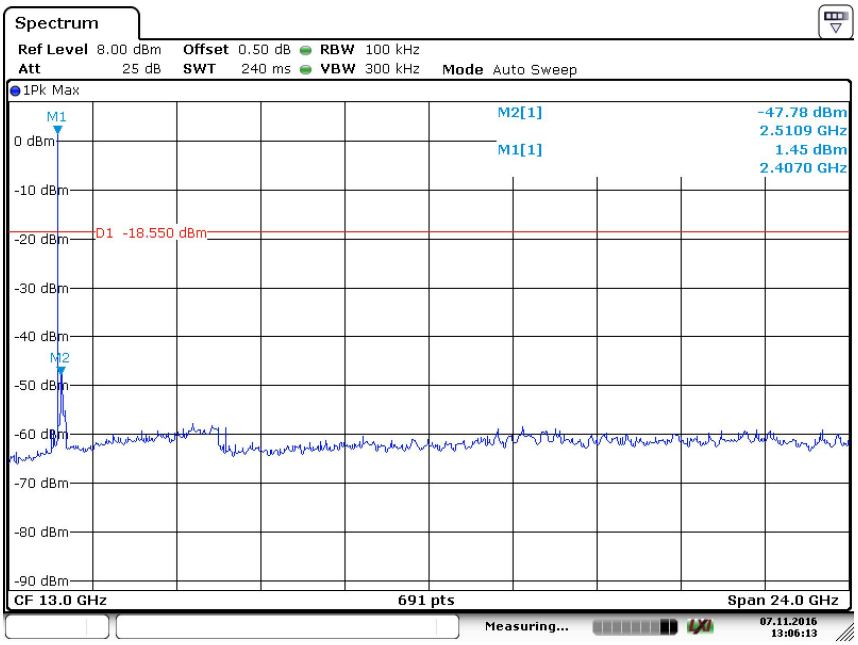
## Spurious RF conducted emissions

Only the worse case (which is subject to the maximum EIRP, GFSK mode) test result is listed in the report.
BT3.0 GFSK Modulation:

Low channel 2402MHz



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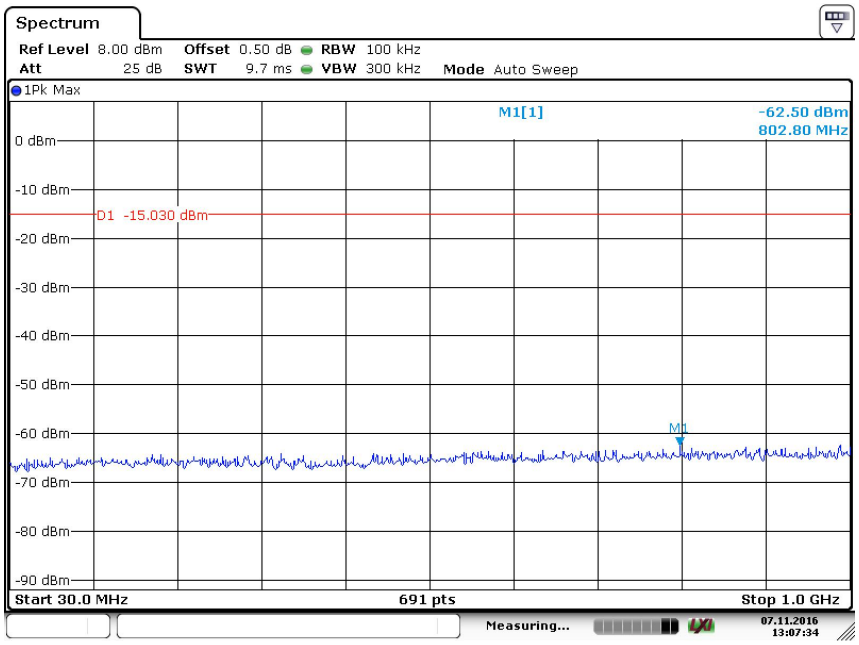
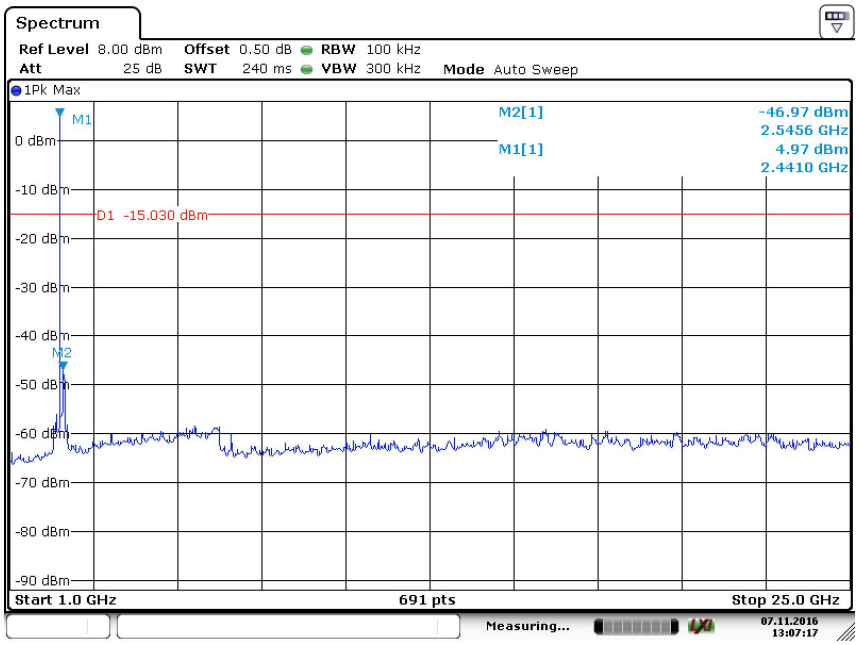
Middle channel 2441MHz



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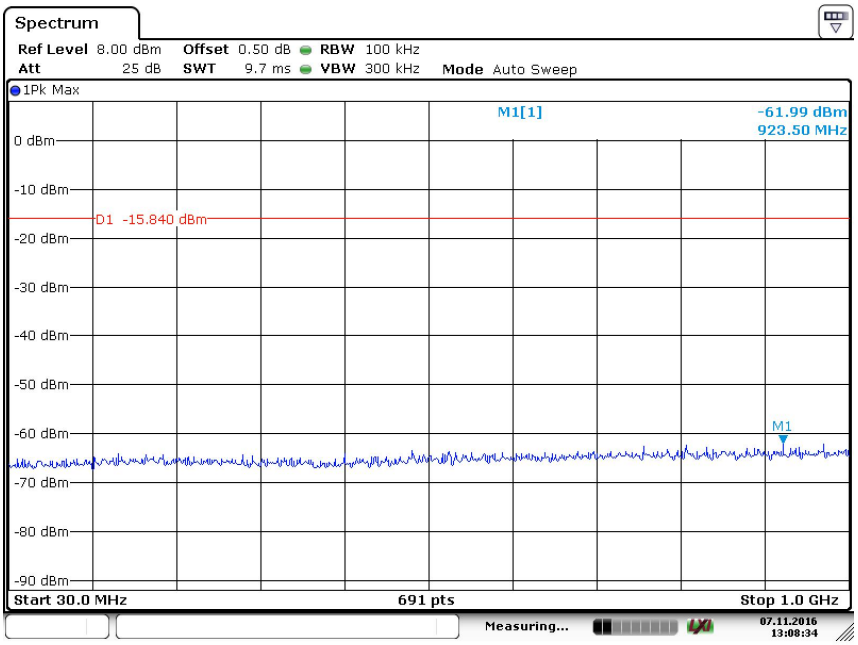
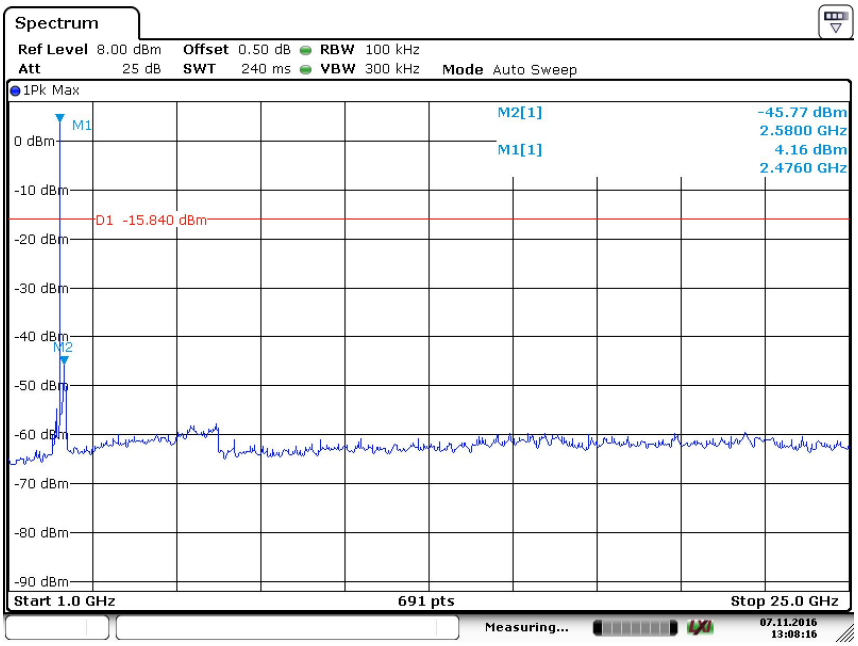
High channel 2480MHz



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## 9.7 Band edge testing

**Test Method**

1 Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
3 The level displayed must comply with the limit specified in this Section. .
4 Repeat the test at the hopping off and hopping on mode, submit all the plots.

**Limit:**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.


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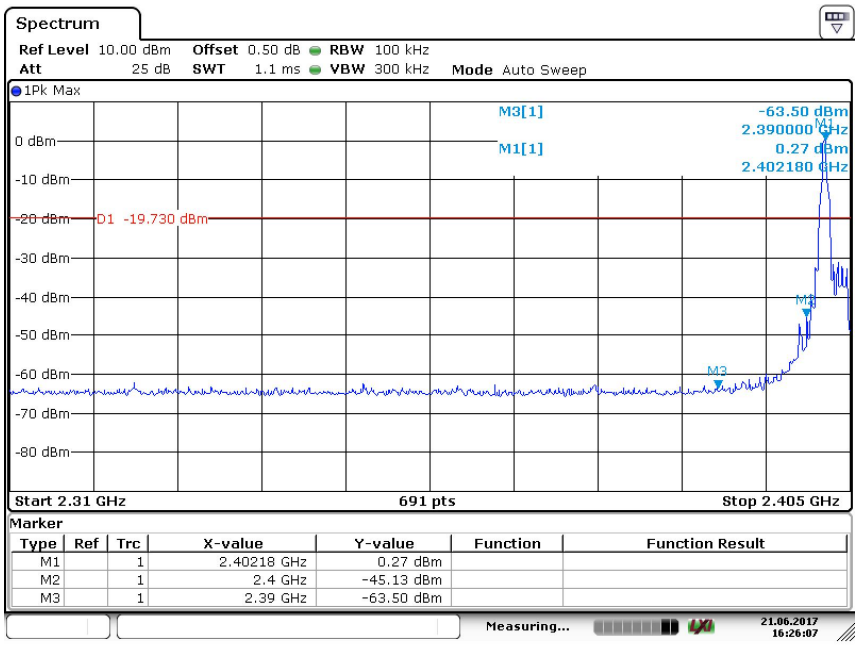
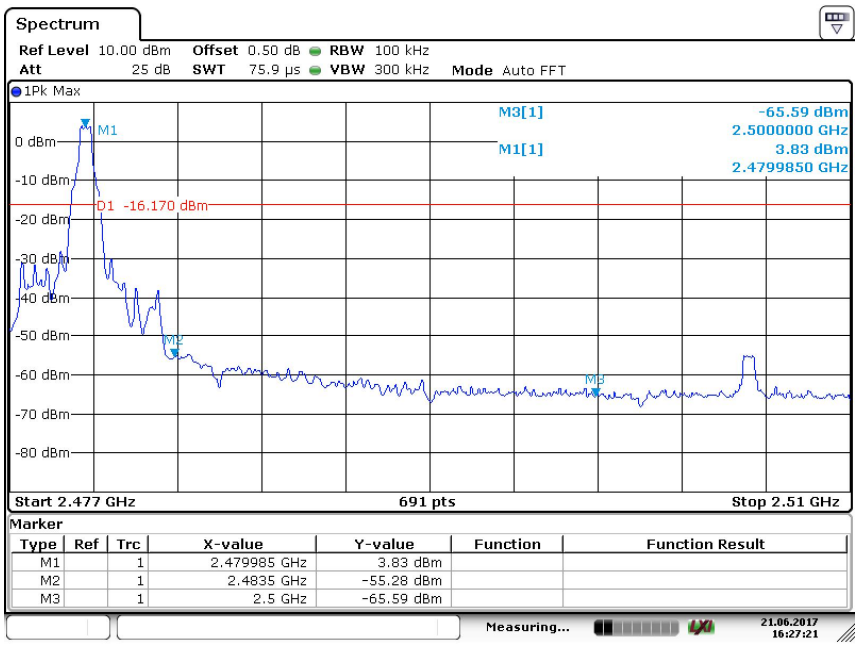
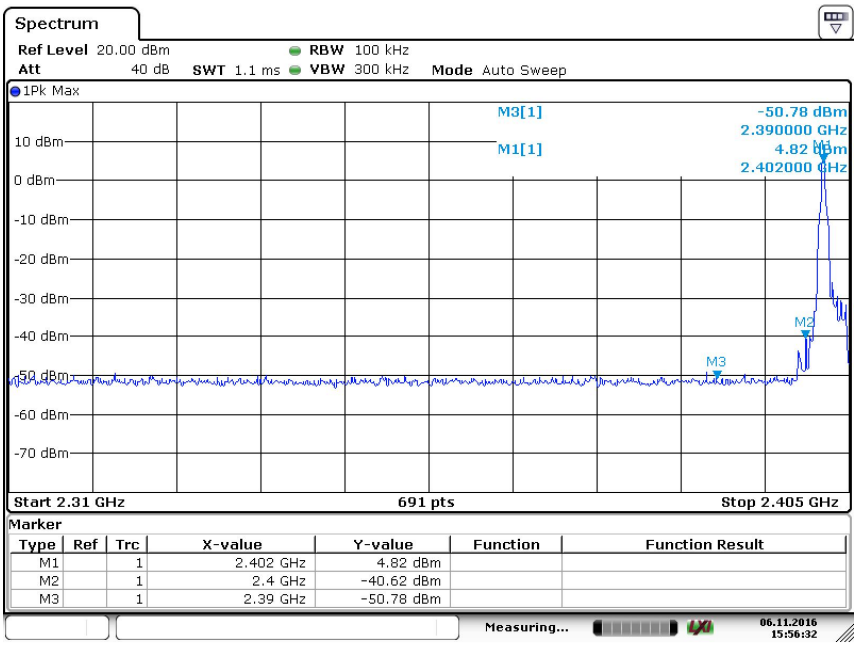
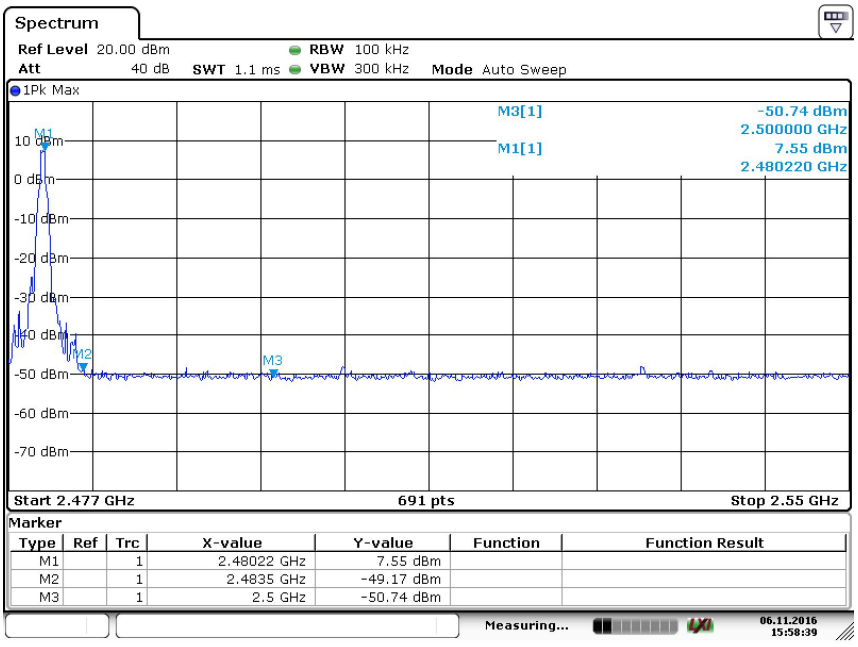
GFSK mode:


Spectrum
Ref Level 10.00 dBm Offset 0.50 dB RBW 100 kHz
Att 25 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M3[1] -63.50 dBm
2.390000 GHz
M1[1] 0.27 dBm
2.402180 GHz
D1 -19.730 dBm
Start 2.31 GHz 691 pts Stop 2.405 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.40218 GHz 0.27 dBm
M2 1 2.4 GHz -45.13 dBm
M3 1 2.39 GHz -63.50 dBm
Measuring...
21.06.2017
16:26:07


Spectrum
Ref Level 10.00 dBm Offset 0.50 dB RBW 100 kHz
Att 25 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M3[1] -65.59 dBm
2.5000000 GHz
M1[1] 3.83 dBm
2.4799850 GHz
D1 -16.170 dBm
Start 2.477 GHz 691 pts Stop 2.51 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.479985 GHz 3.83 dBm
M2 1 2.4835 GHz -55.28 dBm
M3 1 2.5 GHz -65.59 dBm
Measuring...
21.06.2017
16:27:21

8DPSK mode:


Spectrum
Ref Level 20.00 dBm
RBW 100 kHz
Att 40 dB
SWT 1.1 ms
VBW 300 kHz
Mode Auto Sweep
1Pk Max
M3[1]
-50.78 dBm
2.390000 GHz
M1[1]
4.82 dBm
2.402000 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.31 GHz
691 pts
Stop 2.405 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.402 GHz 4.82 dBm
M2 1 2.4 GHz -40.62 dBm
M3 1 2.39 GHz -50.78 dBm
Measuring...
06.11.2016
15:56:32


Spectrum
Ref Level 20.00 dBm
RBW 100 kHz
Att 40 dB
SWT 1.1 ms
VBW 300 kHz
Mode Auto Sweep
1Pk Max
M3[1]
-50.74 dBm
2.500000 GHz
M1[1]
7.55 dBm
2.480220 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.477 GHz
691 pts
Stop 2.55 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.48022 GHz 7.55 dBm
M2 1 2.4835 GHz -49.17 dBm
M3 1 2.5 GHz -50.74 dBm
Measuring...
06.11.2016
15:58:39

## 9.8 Spurious radiated emissions for transmitter

**Test Method**

1: The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.

3: 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.

4: 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.

5: Use the following spectrum analyzer settings According to C63.10:

For Above 1GHz

Span = wide enough to capture the peak level of the in-band emission and all spurious RBW = 1MHz, VBW≥RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.

For Below 1GHz

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious RBW = 100 KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

**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 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.

3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).

4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.

## Limit

The radio emission outside the operating frequency band 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. Radiated emissions which fall in the restricted bands, as defined in section15.205, must comply with the radiated emission limits specified in section 15.209.

| Frequency MHz | Field Strength uV/m | Field Strength dBµV/m | Detector |
|---|---|---|---|
| 30-88 | 100 | 40 | QP |
| 88-216 | 150 | 43.5 | QP |
| 216-960 | 200 | 46 | QP |
| 960-1000 | 500 | 54 | QP |
| Above 1000 | 500 | 54 | AV |
| Above 1000 | 5000 | 74 | PK |

## Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

The only worse case (which is subject to the maximum EIRP, GFSK mode) test result is listed in the report.

**Transmitting spurious emission test result as below:**

GFSK Modulation 2402MHz Test Result

| Frequency Band | Frequency | Emission Level | Polarization | Limit | Detector | Margin | Correct factor | Result |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | | dBµV/m | | dBuV/m | (dB) | |
| 30-1000MHz | 43.74 | 23.21 | H | 40 | QP | 16.79 | -25.3 | Pass |
| | 43.74 | 22.93 | V | 40 | QP | 17.07 | -25.3 | Pass |
| 1000-25000MHz | -- | --- | H | 74 | PK | -- | -- | Pass |
| | -- | -- | H | 54 | AV | -- | -- | Pass |
| | -- | -- | V | 74 | PK | -- | -- | Pass |
| | -- | -- | V | 54 | AV | -- | -- | Pass |

GFSK Modulation 2441MHz Test Result

| Frequency Band | Frequency | Emission Level | Polarization | Limit | Detector | Margin | Correct factor | Result |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | | dBµV/m | | dBuV/m | (dB) | |
| 30-1000MHz | -- | -- | H | 43.5 | QP | -- | -- | Pass |
| | -- | -- | H | 46 | QP | -- | -- | Pass |
| 1000-25000MHz | -- | --- | H | 74 | PK | -- | -- | Pass |
| | -- | -- | H | 54 | AV | -- | -- | Pass |
| | -- | -- | V | 74 | PK | -- | -- | Pass |
| | -- | -- | V | 54 | AV | -- | -- | Pass |

GFSK Modulation 2480MHz Test Result

| Frequency Band | Frequency | Emission Level | Polarization | Limit | Detector | Margin | Correct factor | Result |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | | dBµV/m | | dBuV/m | (dB) | |
| 30-1000MHz | -- | -- | H | 43.5 | QP | -- | -- | Pass |
| | -- | -- | H | 46 | QP | -- | -- | Pass |
| 1000-25000MHz | -- | --- | H | 74 | PK | -- | -- | Pass |
| | -- | -- | H | 54 | AV | -- | -- | Pass |
| | -- | -- | V | 74 | PK | -- | -- | Pass |
| | -- | -- | V | 54 | AV | -- | -- | Pass |

Remark:

(1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

(2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(3) Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss

# 10 Test Equipment List

## List of Test Instruments

Radiated Emission Test

| Description | Manufacturer | Model no. | Serial no. | cal. due date |
|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESR 26 | 101269 | 2018-7-14 |
| Trilog Super Broadband Test Antenna | Schwarzbeck | VULB 9163 | 707 | 2018-7-14 |
| Horn Antenna | Rohde & Schwarz | HF907 | 102294 | 2018-7-14 |
| Pre-amplifier | Rohde & Schwarz | SCU 18 | 102230 | 2018-7-14 |
| Signal Generator | Rohde & Schwarz | SMY01 | 839369/005 | 2018-7-7 |
| Attenuator | Agilent | 8491A | MY39264334 | 2018-7-7 |
| 3m Semi-anechoic chamber | TDK | 9X6X6 | ---- | 2020-7-7 |
| Test software | Rohde & Schwarz | EMC32 | Version 9.15.00 | N/A |

Conducted Emission Test

| Description | Manufacturer | Model no. | Serial no. | cal. due date |
|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESR 3 | 101782 | 2018-7-14 |
| LISN | Rohde & Schwarz | ENV4200 | 100249 | 2018-7-14 |
| LISN | Rohde & Schwarz | ENV432 | 101318 | 2018-7-14 |
| LISN | Rohde & Schwarz | ENV216 | 100326 | 2018-7-14 |
| ISN | Rohde & Schwarz | ENY81 | 100177 | 2018-7-14 |
| ISN | Rohde & Schwarz | ENY81-CA6 | 101664 | 2018-7-14 |
| High Voltage Probe | Rohde & Schwarz | TK9420(VT9420) | 9420-584 | 2018-7-14 |
| RF Current Probe | Rohde & Schwarz | EZ-17 | 100816 | 2018-7-14 |
| Attenuator | Shanghai Huaxiang | TS2-26-3 | 080928189 | 2018-7-7 |
| Test software | Rohde & Schwarz | EMC32 | Version9.15.00 | N/A |

TS8997 Test System

| Description | Manufacturer | Model no. | Serial no. | cal. due date |
|---|---|---|---|---|
| Signal Generator | Rohde & Schwarz | SMB100A | 108272 | 2018-7-7 |
| Signal Analyzer | Rohde & Schwarz | FSV40 | 101030 | 2018-7-7 |
| Vector Signal Generator | Rohde & Schwarz | SMU 200A | 105324 | 2018-7-7 |
| RF Switch Module | Rohde & Schwarz | OSP120/OSP-B157 | 101226/100851 | 2018-7-7 |
| Power Splitter | Weinschel | 1580 | SC319 | 2018-7-7 |
| 10dB Attenuator | Weinschel | 56-10 | 58764 | 2018-7-14 |
| 10dB Attenuator | R&S | DNF | DNF-001 | 2018-7-14 |
| 10dB Attenuator | R&S | DNF | DNF-002 | 2018-7-14 |
| 10dB Attenuator | R&S | DNF | DNF-003 | 2018-7-14 |
| 10dB Attenuator | R&S | DNF | DNF-004 | 2018-7-14 |
| Test software | Rohde & Schwarz | EMC32 | Version 9.26.01 | N/A |

## 11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

| System Measurement Uncertainty | |
|---|---|
| Test Items | Extended Uncertainty |
| Uncertainty for Conducted Emission 150kHz-30MHz (for test using High Voltage Probe TK9420(VT9420)) | 2.92 dB |
| Uncertainty for Radiated Spurious Emission 25MHz-3000MHz | Horizontal: 4.98dB;<br>Vertical: 5.06dB; |
| Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz | Horizontal: 4.95dB;<br>Vertical: 4.94dB; |
| Uncertainty for Radiated Spurious Emission 18000MHz-40000MHz | Horizontal: 5.14dB;<br>Vertical: 5.12dB; |
| Uncertainty for Conducted RF test with TS 8997 | Power level test involved:<br>2.06dB<br>Frequency test involved:<br>1.16×10-7 |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