# FCC/IC - TEST REPORT

| | | | | |
|---|---|---|---|---|
| Report Number | : | **68.950.20.0652.01** | Date of Issue: | December 17, 2020 |
| Model | : | PI7 | | |
| Product Type | : | In-ear True Wireless Headphone (Charging case of TWS headphones) | | |
| Applicant | : | B&W Group Ltd. | | |
| Address | : | Dale Road Worthing United Kingdom BN11 2BH | | |
| Factory | : | Charter Media (Dongguan) Co., Ltd. | | |
| Address | : | Dabandi Industrial Zone, Daning District, Humen Town, | | |
| | : | 523930 Dongguan City, Guangdong Province, | | |
| | : | PEOPLE'S REPUBLC OF CHINA | | |

| | | | |
|---|---|---|---|
| Test Result | : | **n Positive** | **o Negative** |
| Total pages including Appendices | : | **37** | |

*TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.*

*TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch issued reports.*





TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

# 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 City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

## 2 Details about the Test Laboratory

**Details about the Test Laboratory**
Test Site 1

| | |
|---|---|
| Company name: | TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch<br>Building 12 & 13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District<br>Shenzhen 518052<br>P.R. China |
| Telephone: | 86 755 8828 6998 |
| Fax: | 86 755 8288 5299 |
| FCC Registration No.: | 514049 |
| ISED#: | 10320A |

# 3 Description of the Equipment Under Test

| | |
|---|---|
| Product: | In-ear True Wireless Headphone (Charging case of TWS headphones) |
| Model no/HVIN/PMN: | PI7 |
| FVIN: | V.1.0.X |
| FCC ID: | 2ACIX-PI7C |
| IC: | 11946B-PI7C |
| Options and accessories: | Type-C Cable, Aux in Cable |
| Rating: | Charging Case: Input:5VDC, 0.5A, 2.5W<br>Battery Capacity: 3.7VDC, 2×350mAh/2.59Wh |
| RF Transmission Frequency: | 2402MHz-2480MHz |
| No. of Operated Channel: | 40 |
| Modulation: | GFSK |
| Antenna Type: | PCB antenna |
| Antenna Gain: | 2.2dBi |
| Description of the EUT: | The Equipment Under Test (EUT) is a In-ear True Wireless Headphone (Charging case of TWS headphones) support Bluetooth function. |


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

# 4 Summary of Test Standards

| Test Standards | |
|---|---|
| FCC Part 15 Subpart C<br>10-1-2019 Edition | PART 15 - RADIO FREQUENCY DEVICES<br>Subpart C - Intentional Radiators |
| RSS-Gen<br>Issue 5, Amendment 1,<br>March 2019 | General Requirements for the Certification of Radio Apparatus |
| RSS-247 Issue 2<br>February 2017 | Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices |

All the test methods were according to KDB558074 D01 v05r02 DTS Measurement Guidance and ANSI C63.10 (2013).


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

# 5 Summary of Test Results

| Technical Requirements | | | | |
|---|---|---|---|---|
| **FCC Part 15 Subpart C/ RSS-247 Issue 2/RSS-Gen Issue 5** | | | | |
| Test Condition | | | Test Site | Test Result |
| §15.207 | RSS-GEN 8.8 | Conducted emission AC power port | -- | N/A |
| §15.247 (b) (1) | RSS-247 Clause 5.4(d) | Conducted peak output power | Site 1 | PASS |
| §15.247(a)(1) | RSS-247 Clause 5.1 (b) | 20dB bandwidth | --- | N/A |
| §15.247(a)(1) | RSS-247 Clause 5.1(b) | Carrier frequency separation | --- | N/A |
| §15.247(a)(1)(iii) | RSS-247 Clause 5.1(d) | Number of hopping frequencies | --- | N/A |
| §15.247(a)(1)(iii) | RSS-247 Clause 5.1(d) | Dwell Time | --- | N/A |
| §15.247(a)(2) | RSS-247 Clause 5.2(5) & RSS-GEN 6.7 | 6dB bandwidth and 99% Occupied Bandwidth | Site 1 | PASS |
| §15.247(e) | RSS-247 Clause 5.2(b) | Power spectral density | Site 1 | PASS |
| §15.247(d) | RSS-247 Clause 5.5 | Spurious RF conducted emissions | Site 1 | PASS |
| §15.247(d) | RSS-247 Clause 5.5 | Band edge | Site 1 | PASS |
| §15.247(d) & §15.209 & §15.205 | RSS-247 Clause 5.5 & RSS-GEN 6.13 | Spurious radiated emissions for transmitter | Site 1 | PASS |
| §15.203 | RSS-GEN 6.8 | Antenna requirement | See note 2 | PASS |

Note 1: N/A=Not Applicable.
Note 2: The EUT uses a PCB antenna, which gain is 2.2dBi. In accordance to §15.203 and RSS-GEN 6.8, it is considered sufficiently to comply with the provisions of this section.


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

# 6 General Remarks

**Remarks**

This submittal(s) (test report) is intended for FCC ID: 2ACIX-PI7C, IC: 11946B-PI7C complies with Section 15.205, 15.209, 15.247 of the FCC Part 15, Subpart C and RSS-247 issue 2 and RSS-Gen issue 5 rules.

Note: The report is for BLE 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.

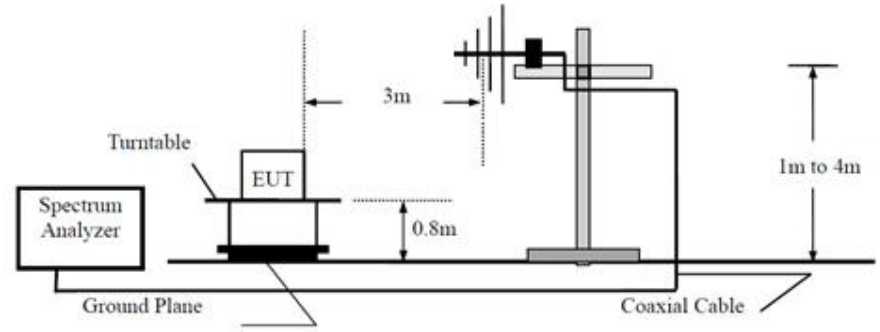
| | |
|---|---|
| Sample Received Date: | August 27, 2020 |
| Testing Start Date: | August 27, 2020 |
| Testing End Date: | October 23, 2020 |

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

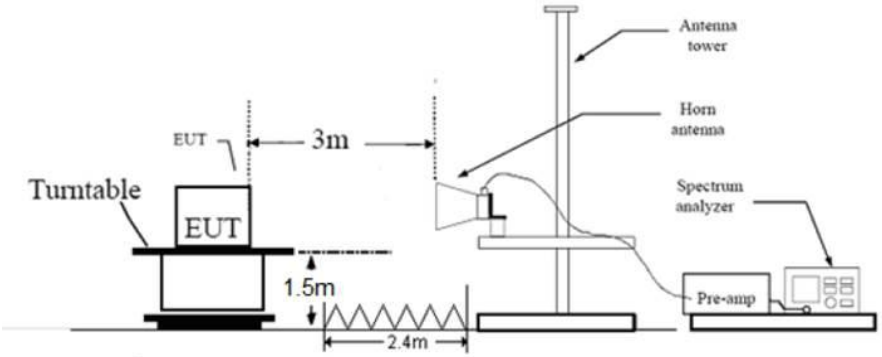
| Reviewed by: | Prepared by: | Tested by: |
|---|---|---|
| John Zhi | Mark Chen | Tree Zhan |
| EMC Project Manager | EMC Project Engineer | EMC Test Engineer |

# 7 Test Setups

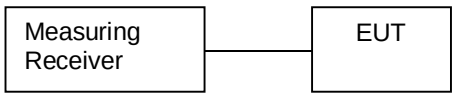
Below 1GHz




Above 1GHz




Conducted RF test setups






TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

# 8 Systems test configuration

Auxiliary Equipment Used during Test:

| DESCRIPTION | MANUFACTURER | MODEL NO.(SHIELD) | S/N(LENGTH) |
|---|---|---|---|
| Notebook | Lenovo | X220 | --- |
| -- | --- | --- | |

Test software: Bluetooth 3 Test Tool, which used to control the EUT in continues transmitting mode.

The system was configured to channel 0, 19, and 39 for the test.


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

# 9 Technical Requirement

## 9.1 Conducted peak output power and e.i.r.p.

**Test Method**

1. Use the following spectrum analyzer settings:
   RBW > the 6dB bandwidth of the emission being measured, VBW≥3RBW, Span≥3RBW
   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：**

**Conducted peak output power:**

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

**For e.i.r.p**

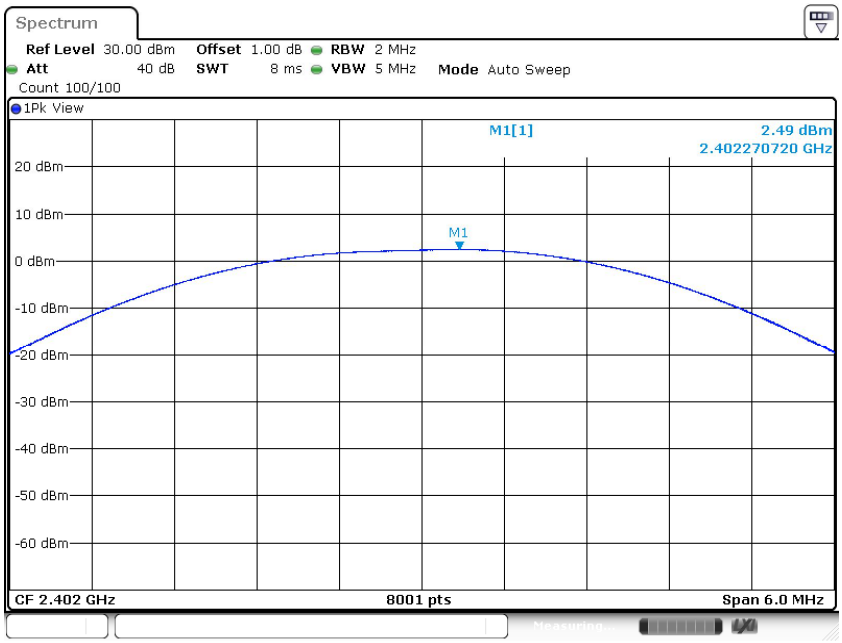
| Frequency Range MHz | Limit W | Limit dBm |
|---|---|---|
| 2400-2483.5 | ≤4 | ≤36 |

Test result as below

| Frequency MHz | Conducted Peak Output Power dBm | e.i.r.p dBm | Result |
|---|---|---|---|
| Low channel 2402MHz | 2.49 | 4.69 | Pass |
| Middle channel 2440MHz | 4.3 | 6.5 | Pass |
| High channel 2480MHz | 5.46 | 7.66 | Pass |

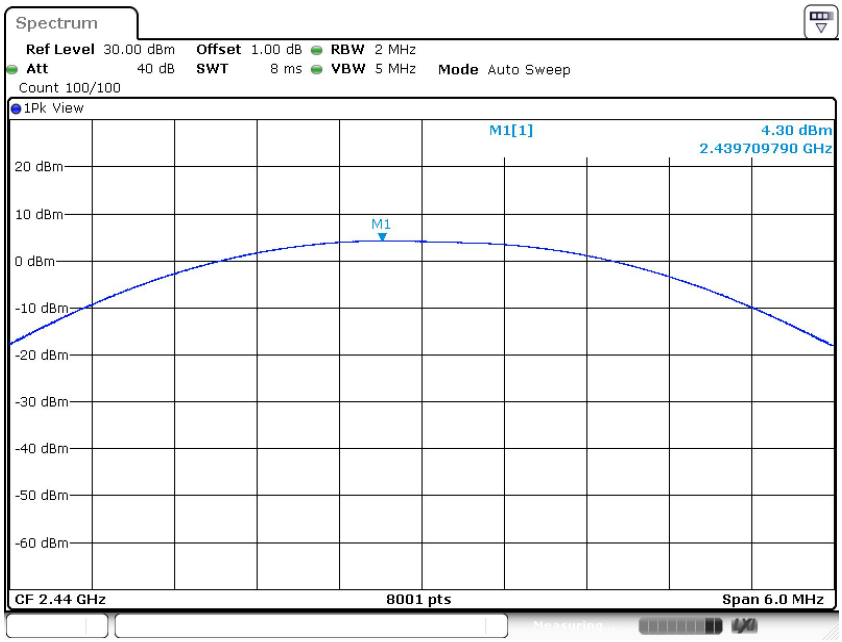

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Low channel 2402MHz




Date: 2.NOV.2020 17:15:44

Middle channel 2440MHz

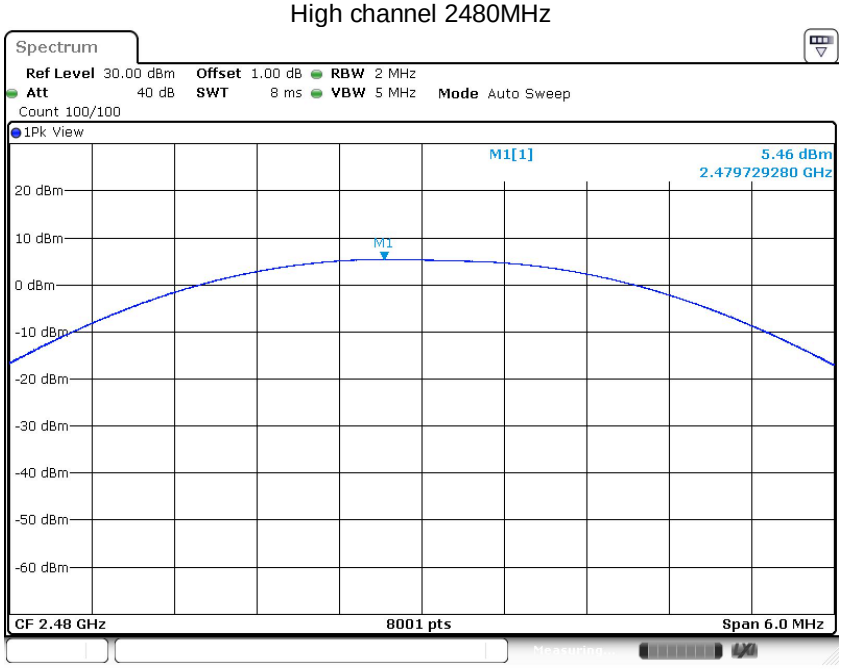



Date: 2.NOV.2020 17:17:30



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

High channel 2480MHz




Date: 2.NOV.2020 17:19:14



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

## 9.2 Power spectral density

**Test Method**

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency. RBW=3kHz, VBW≥3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed.

**Limit**

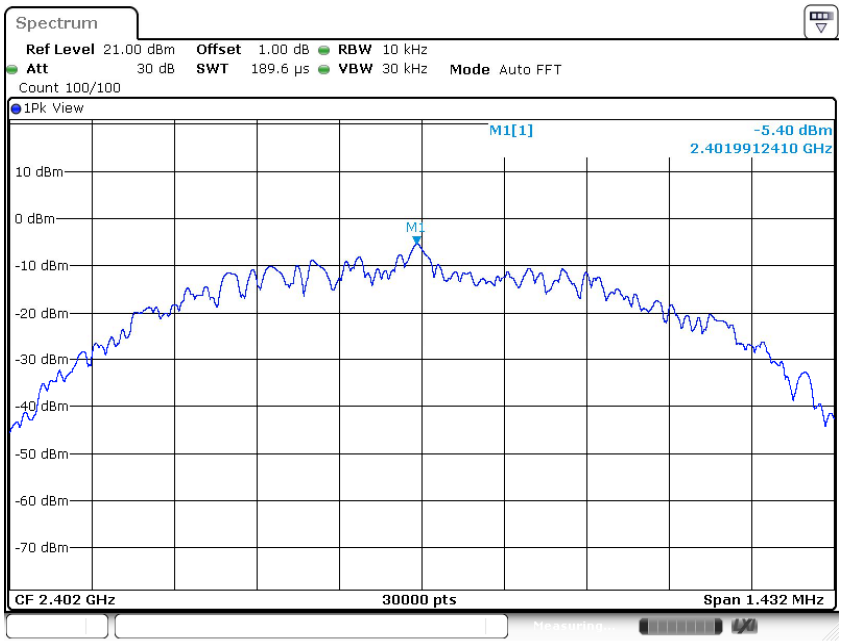
| Limit [dBm/3KHz] |
|---|
| ≤8dBm/3KHz |

Test result

| Frequency<br>**MHz** | Power spectral density<br>**dBm/3KHz** | Result |
|---|---|---|
| Top channel 2402MHz | -5.4 | Pass |
| Middle channel 2440MHz | -3.77 | Pass |
| Bottom channel 2480MHz | -2.39 | Pass |

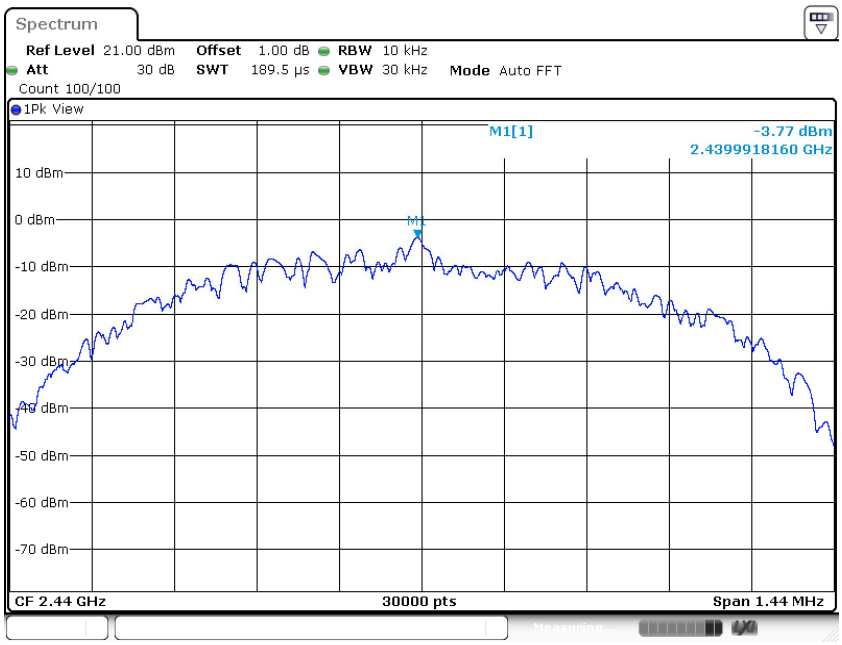

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Low channel 2402MHz




Date: 2.NOV.2020 17:15:50

Middle channel 2440MHz

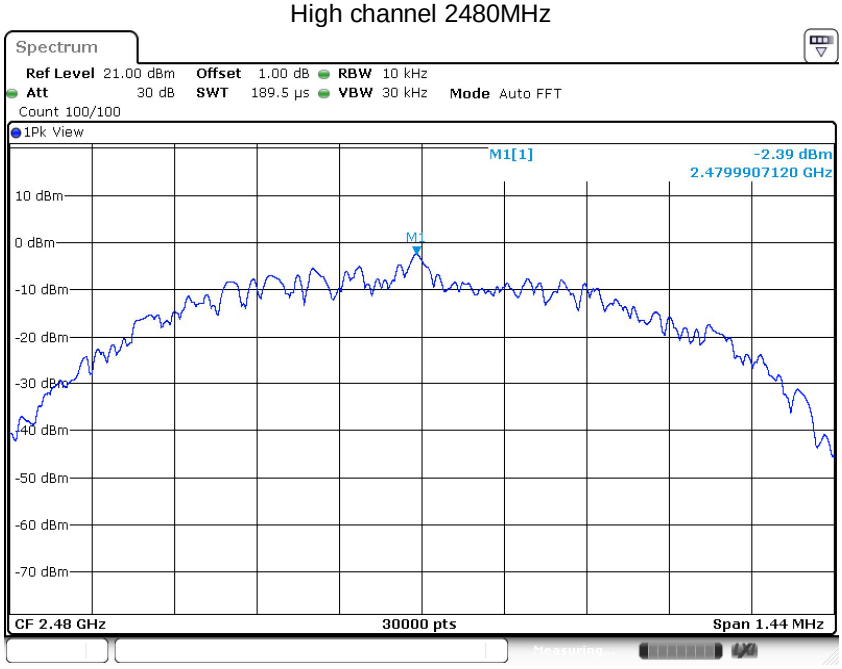



Date: 2.NOV.2020 17:17:35



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

High channel 2480MHz




Date: 2.NOV.2020 17:19:19



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

## 9.3 6 dB Bandwidth and 99% Occupied Bandwidth

**Test Method**

1. Use the following spectrum analyzer settings:
RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

**Limit**

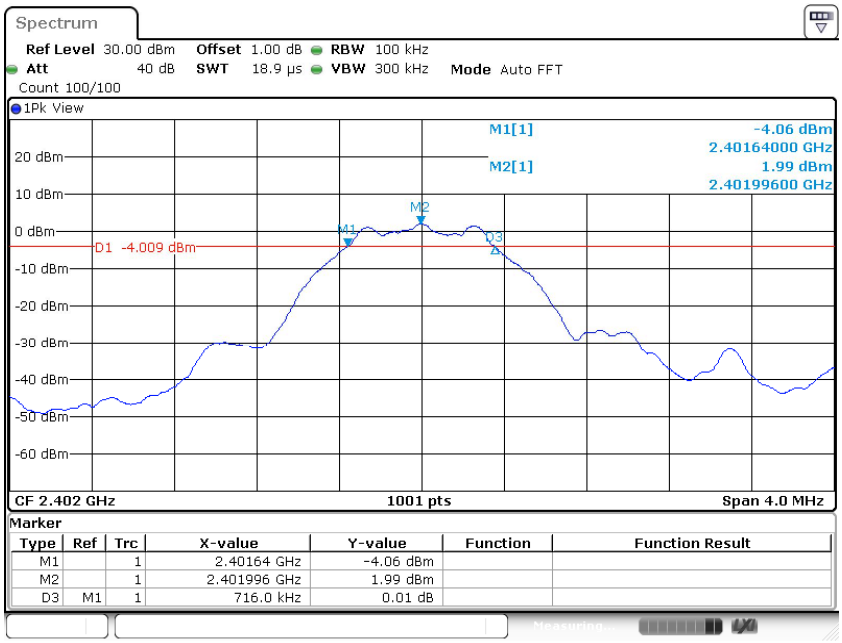
| Limit [kHz] |
|---|
| ≥500 |

Test result

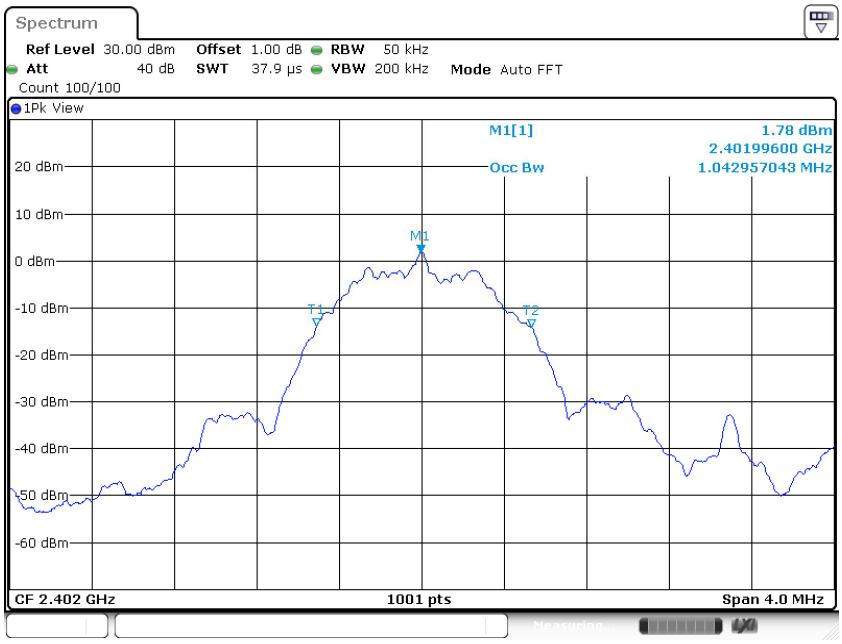
| Frequency MHz | 6dB bandwidth kHz | 99% bandwidth kHz | Result |
|---|---|---|---|
| Bottom channel 2402MHz | 716 | 1043 | Pass |
| Middle channel 2440MHz | 720 | 1039 | Pass |
| Top channel 2480MHz | 720 | 1039 | Pass |


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Low channel 2402MHz




Date: 2.NOV.2020 17:15:27

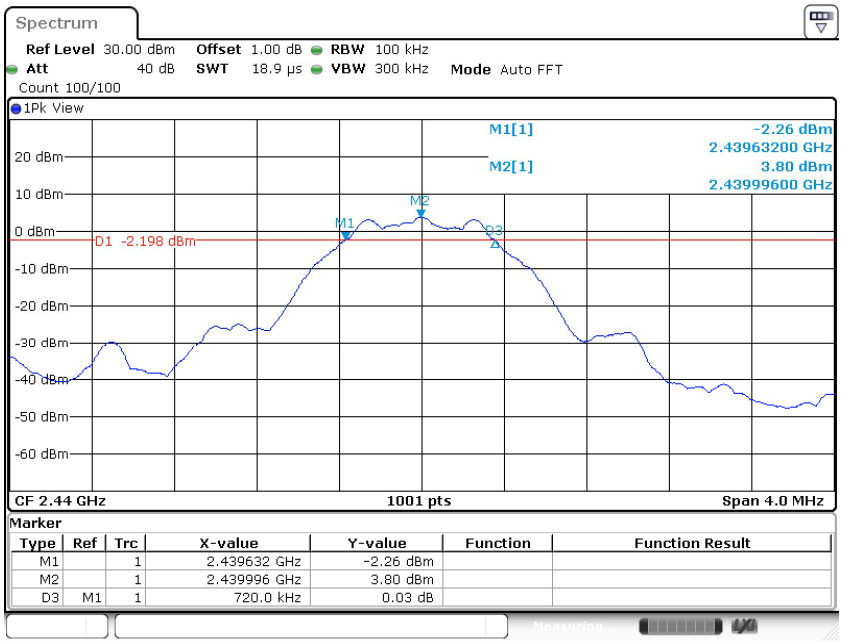



Date: 2.NOV.2020 17:15:38

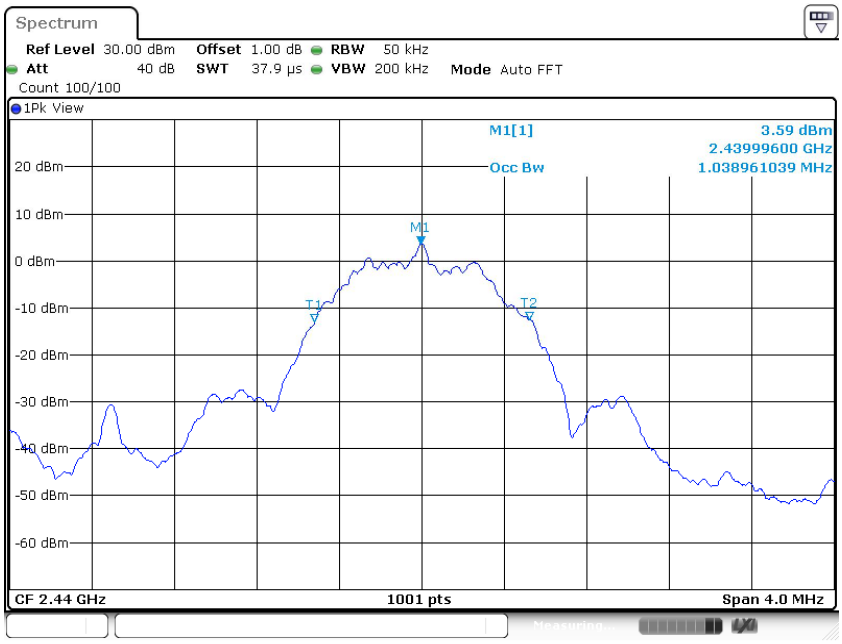


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

Middle channel 2440MHz




Date: 2.NOV.2020 17:17:13

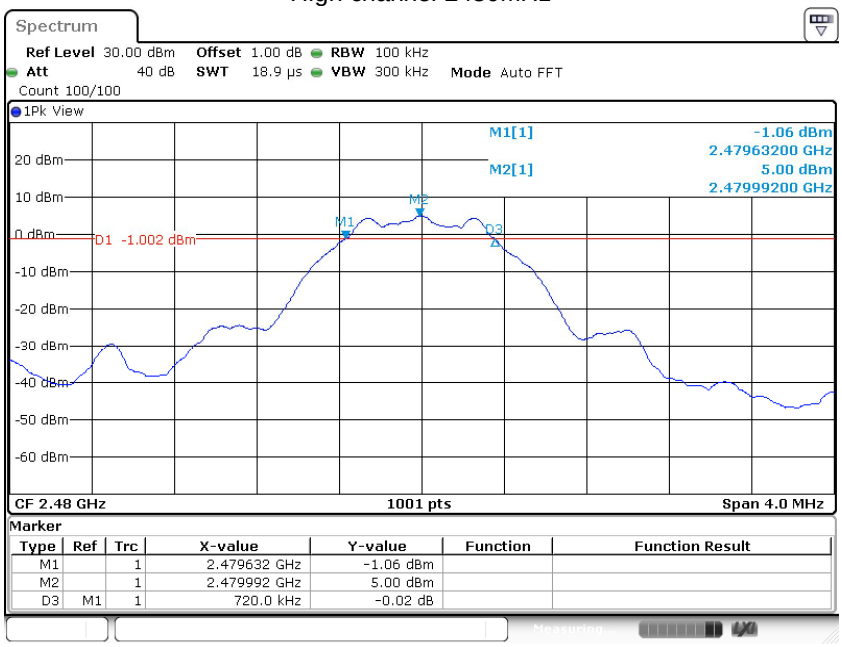



Date: 2.NOV.2020 17:17:23

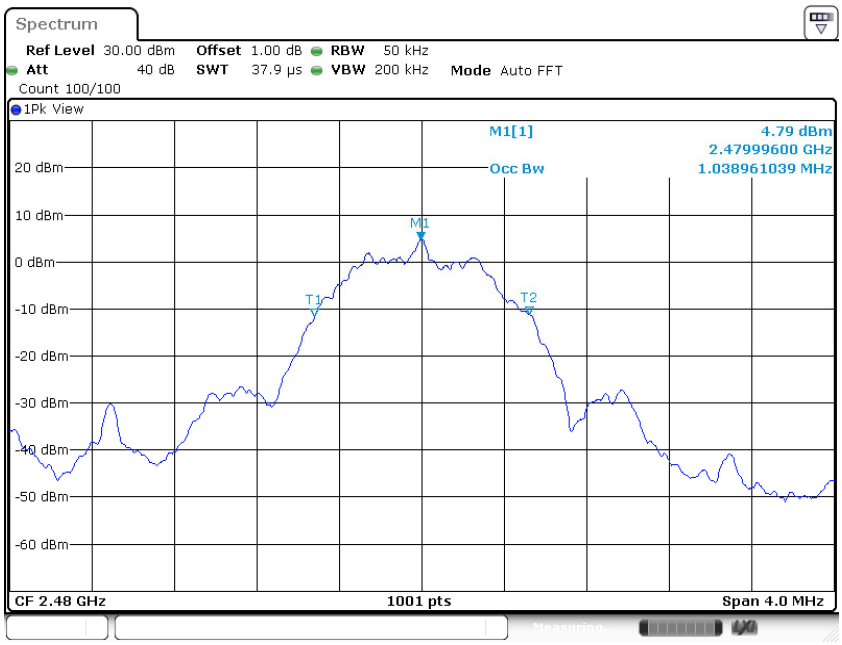


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

High channel 2480MHz




Date: 2.NOV.2020 17:18:57




Date: 2.NOV.2020 17:19:07



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

## 9.4 Spurious RF conducted emissions

**Test Method**

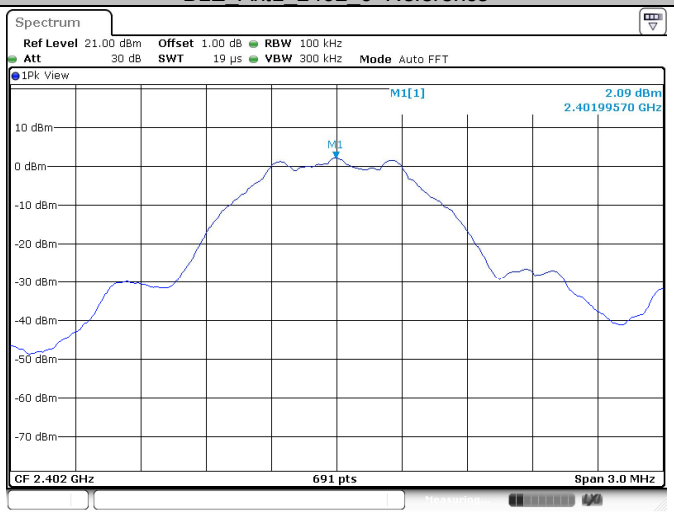
1. Establish a reference level by using the following procedure:
   a. Set RBW=100 kHz. VBW≥3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
   b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
2. Use the maximum PSD level to establish the reference level.
   a. Set the center frequency and span to encompass frequency range to be measured.
   b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
3. Repeat above procedures until other frequencies measured were completed.

**Limit**

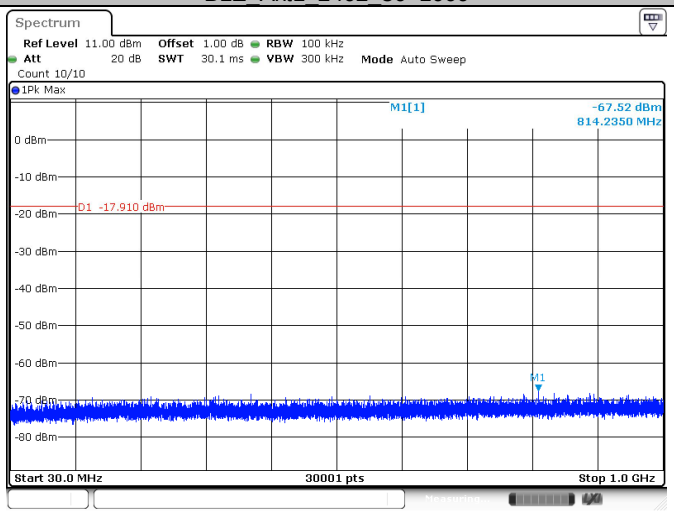
| Frequency Range MHz | Limit (dBc) |
|---|---|
| 30-25000 | -20 |


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

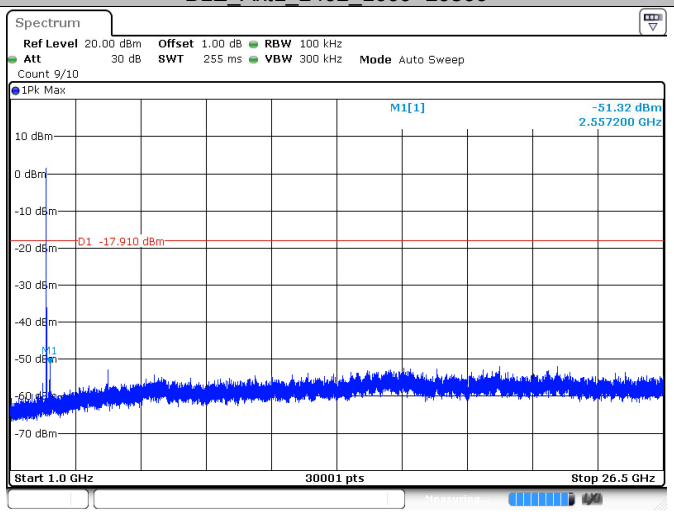
BLE_Ant1_2402_0~Reference




BLE_Ant1_2402_30~1000



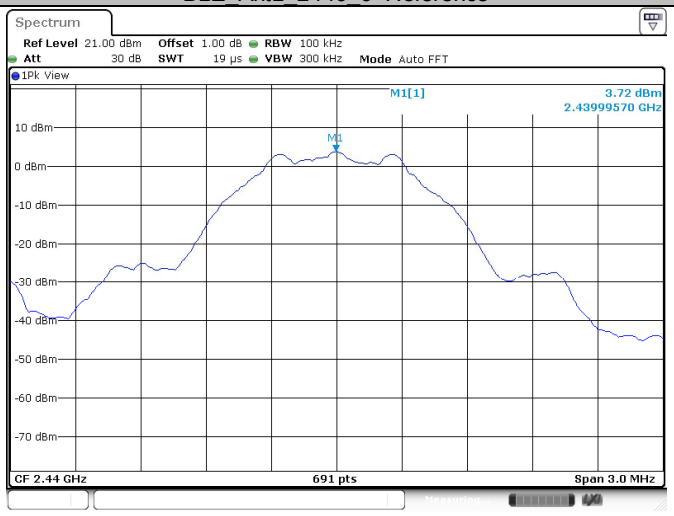

BLE_Ant1_2402_1000~26500



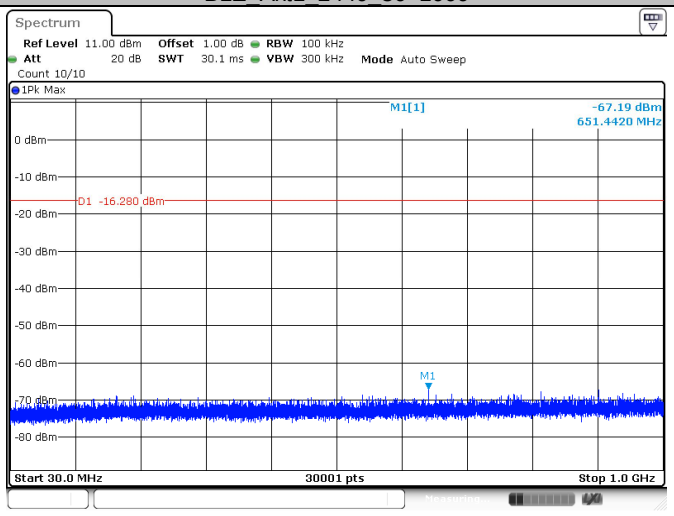



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

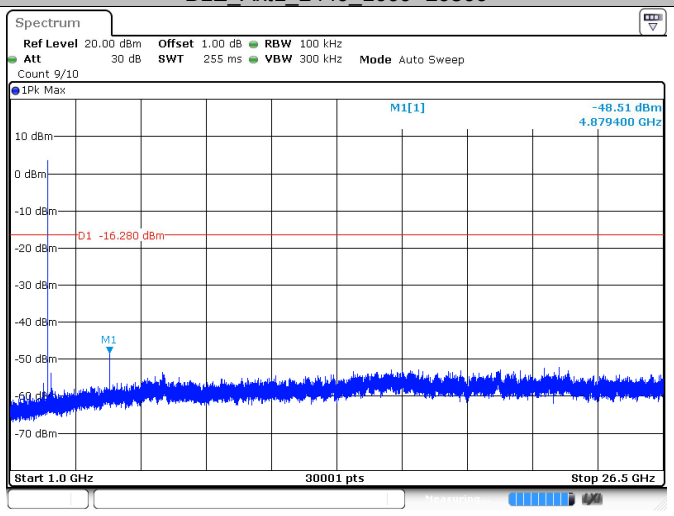
BLE_Ant1_2440_0~Reference




BLE_Ant1_2440_30~1000



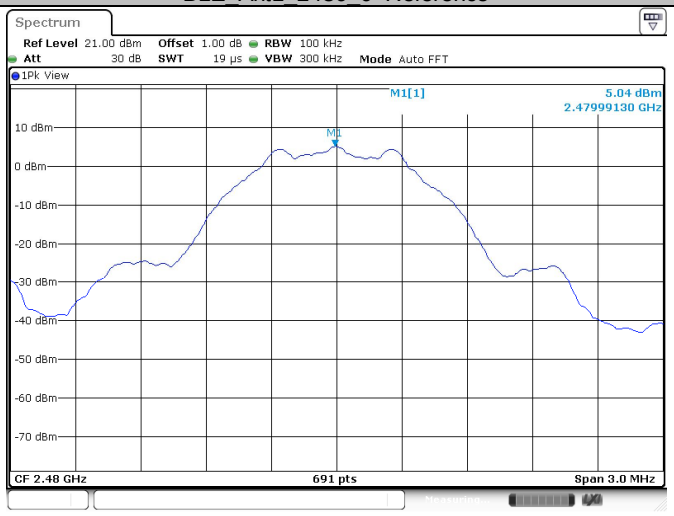

BLE_Ant1_2440_1000~26500



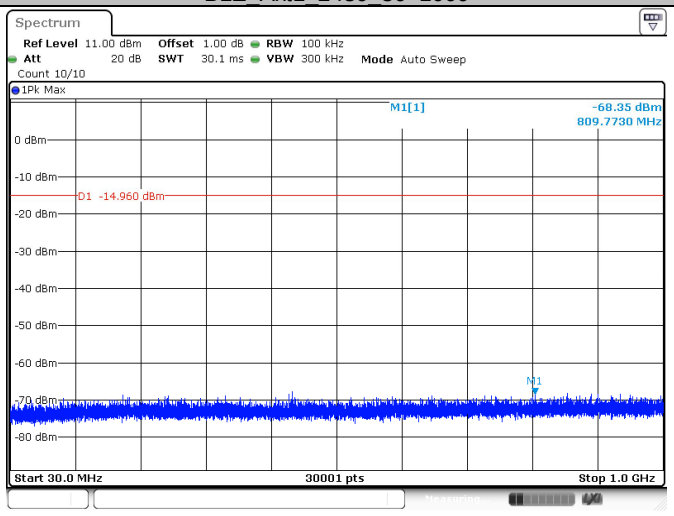



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan
District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

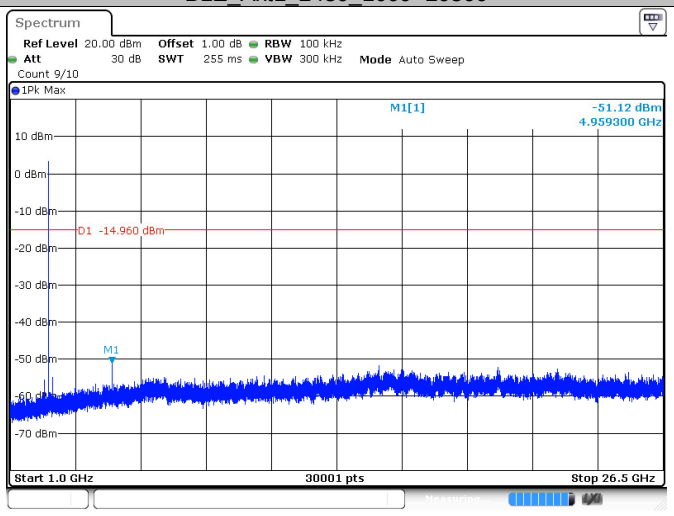
BLE_Ant1_2480_0~Reference




BLE_Ant1_2480_30~1000




BLE_Ant1_2480_1000~26500






TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

## 9.5 Band edge

**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.

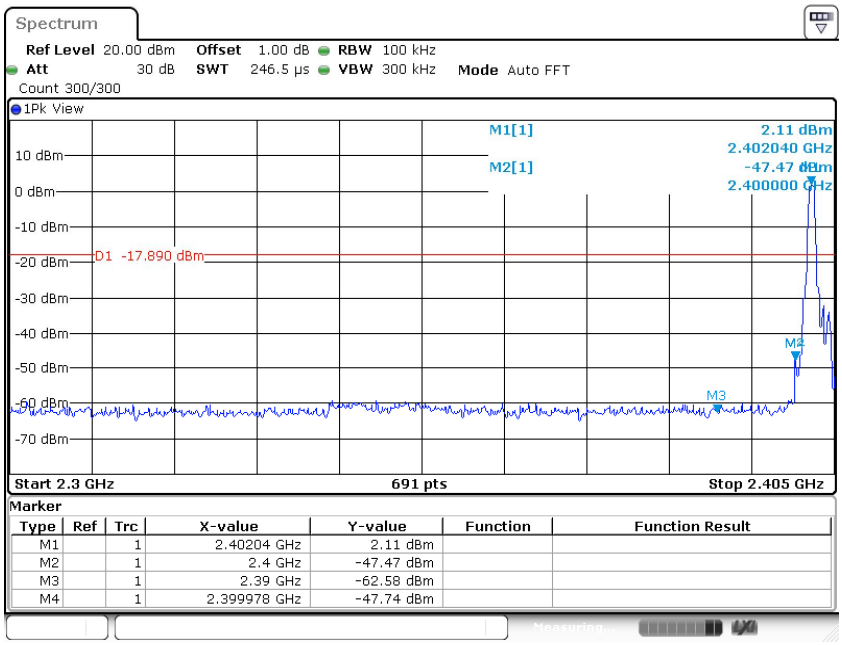
**Limit**

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


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

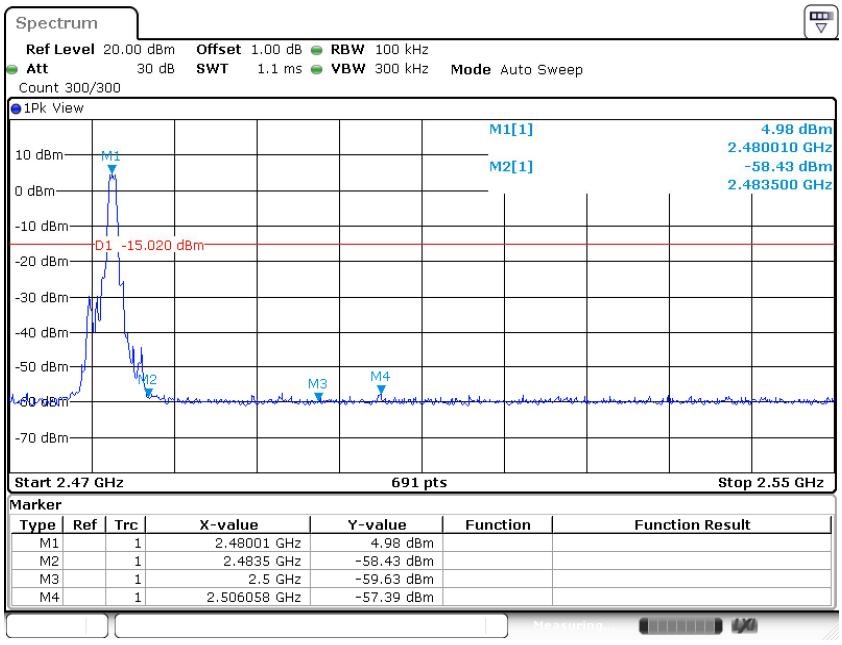
## Band edge testing

2402MHz




Date: 2.NOV.2020 17:15:59

2480MHz




Date: 2.NOV.2020 17:19:28



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

## 9.6 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 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 to 120KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

For Peak unwanted emissions 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 ,Sweep = auto, Detector function = peak, Trace = max hold.

Procedures for average unwanted emissions measurements above 1000 MHz

a) RBW = 1 MHz.

b) VBW ≥[3 × RBW].

c) Detector = RMS (power averaging), if [span / (# of points in sweep)] \ RBW / 2. Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.

d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)

e) Sweep time = auto.

f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D,where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)

g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is [10 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

2) If linear voltage averaging mode was used in the preceding step e), then the correction

factor is [20 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

**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.
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 the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

| 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 |

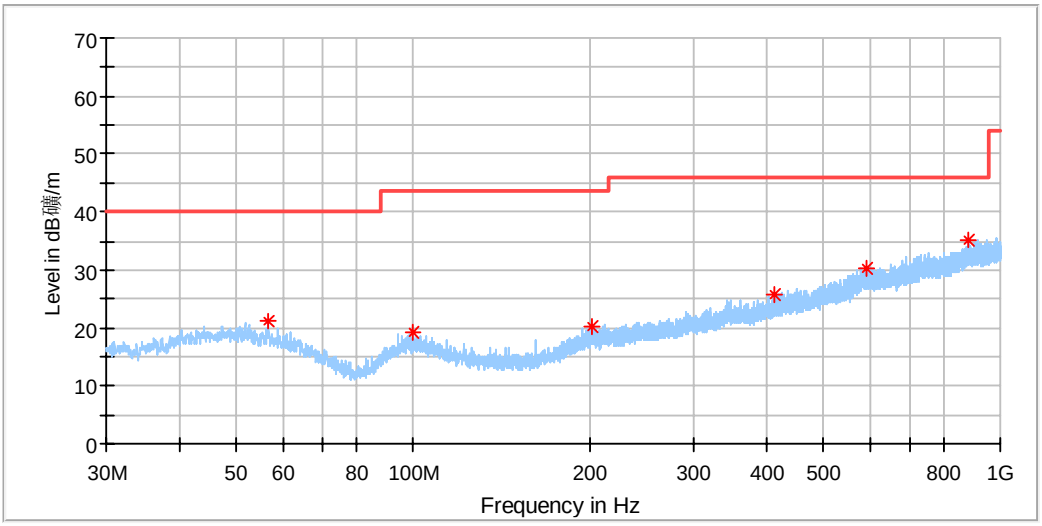

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

## 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.

### Transmitting spurious emission test result as below:

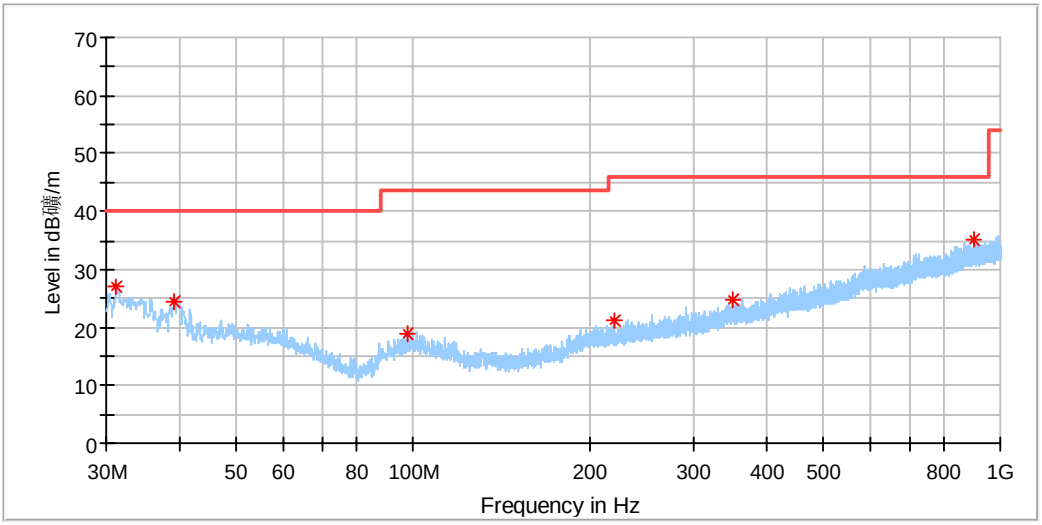
EUT: In-ear True Wireless Headphone
M/N: PI7
Operating Condition: Tx 2402MHz, lowest Channel




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 56.553750 | 21.13 | 40.00 | 18.87 | 100.0 | H | 0.0 | 17 |
| 100.203750 | 19.32 | 43.50 | 24.18 | 100.0 | H | 0.0 | 16 |
| 201.811250 | 20.09 | 43.50 | 23.41 | 100.0 | H | 0.0 | 17 |
| 412.665000 | 25.78 | 46.00 | 20.22 | 100.0 | H | 359.0 | 22 |
| 592.539375 | 30.41 | 46.00 | 15.59 | 100.0 | H | 0.0 | 25 |
| 882.690625 | 35.25 | 46.00 | 10.75 | 100.0 | H | 348.0 | 29 |

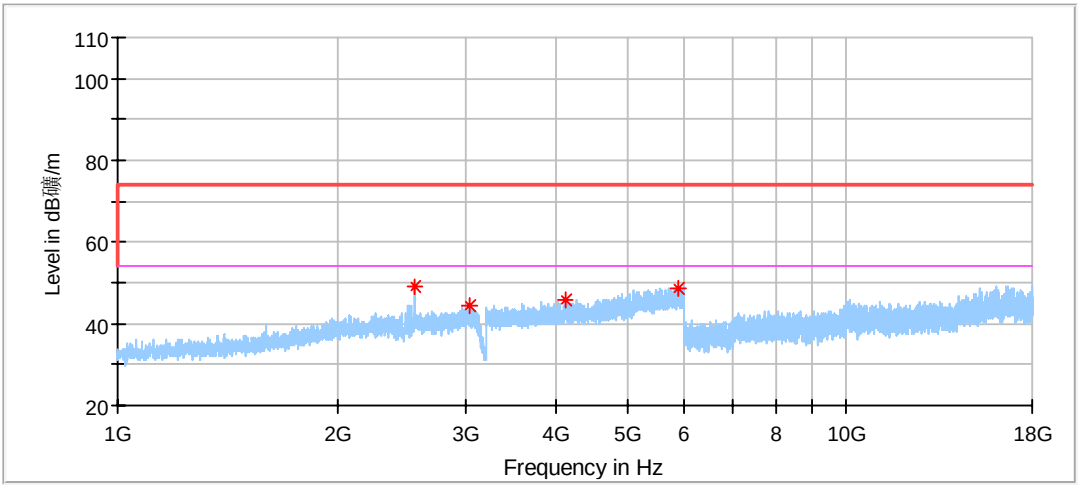

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 31.151875 | 27.01 | 40.00 | 12.99 | 100.0 | V | 1.0 | 14 |
| 39.215000 | 24.28 | 40.00 | 15.72 | 200.0 | V | 1.0 | 16 |
| 97.475625 | 19.01 | 43.50 | 24.49 | 100.0 | V | 163.0 | 16 |
| 220.726250 | 21.03 | 46.00 | 24.97 | 100.0 | V | 0.0 | 17 |
| 349.796875 | 24.63 | 46.00 | 21.37 | 100.0 | V | 184.0 | 21 |
| 901.423750 | 35.29 | 46.00 | 10.71 | 100.0 | V | 7.0 | 30 |

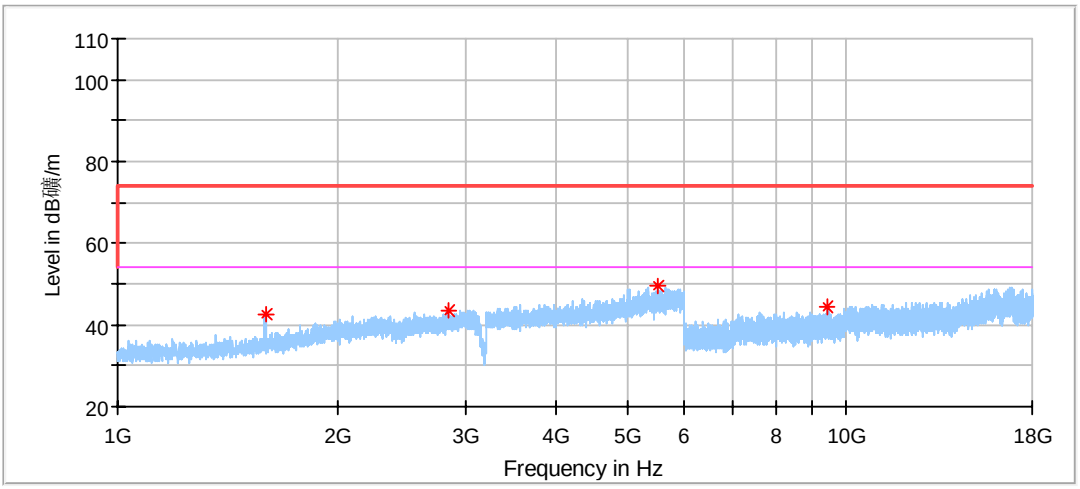

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2558.000000 | 49.19 | 74.00 | 24.81 | 150.0 | H | 42.0 | -2.7 |
| 3048.000000 | 44.64 | 74.00 | 29.36 | 150.0 | H | 351.0 | -1.3 |
| 4117.000000 | 46.07 | 74.00 | 27.93 | 150.0 | H | 1.0 | 1.6 |
| 5889.000000 | 48.72 | 74.00 | 25.28 | 150.0 | H | 65.0 | 5.5 |

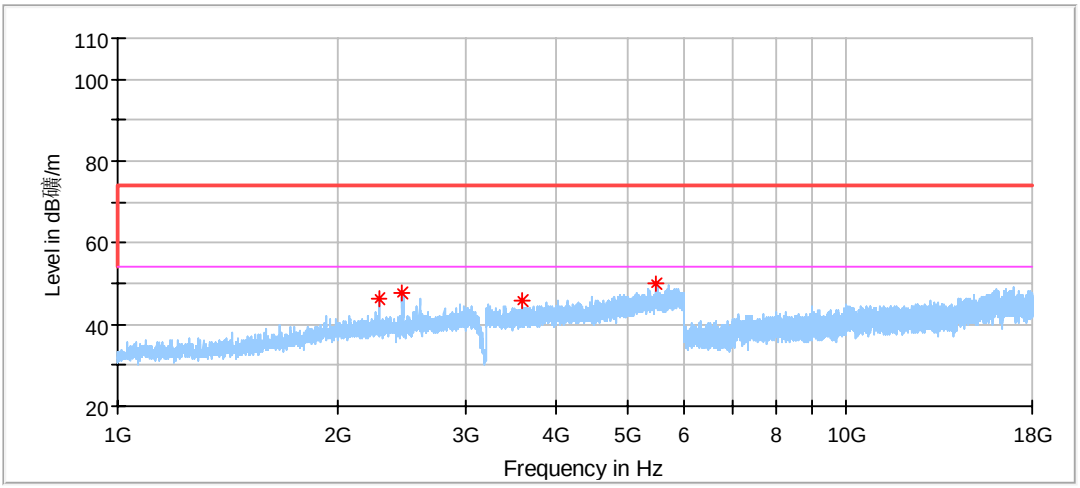

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 1598.500000 | 42.54 | 74.00 | 31.46 | 150.0 | V | 188.0 | -7.3 |
| 2840.000000 | 43.37 | 74.00 | 30.63 | 150.0 | V | 172.0 | -1.9 |
| 5501.500000 | 49.48 | 74.00 | 24.52 | 150.0 | V | 314.0 | 4.2 |
| 9402.000000 | 44.42 | 74.00 | 29.58 | 150.0 | V | 261.0 | 7.2 |

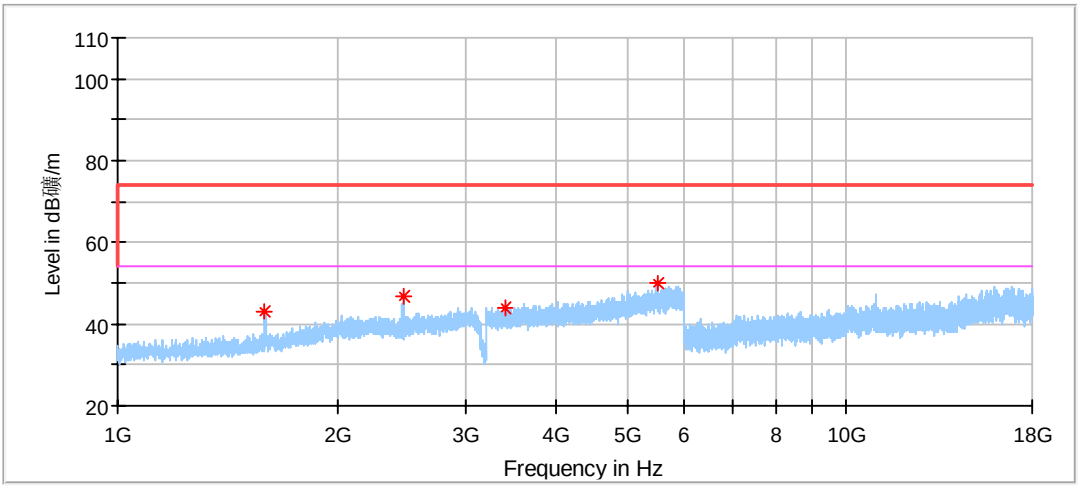
EUT: In-ear True Wireless Headphone
M/N: PI7
Operating Condition: Tx 2440MHz, Middle Channel




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2285.500000 | 46.33 | 74.00 | 27.67 | 150.0 | H | 101.0 | -3.4 |
| 2460.000000 | 47.66 | 74.00 | 26.34 | 150.0 | H | 229.0 | -3.0 |
| 3599.000000 | 45.92 | 74.00 | 28.08 | 150.0 | H | 276.0 | 0.0 |
| 5494.500000 | 49.78 | 74.00 | 24.22 | 150.0 | H | 355.0 | 4.2 |

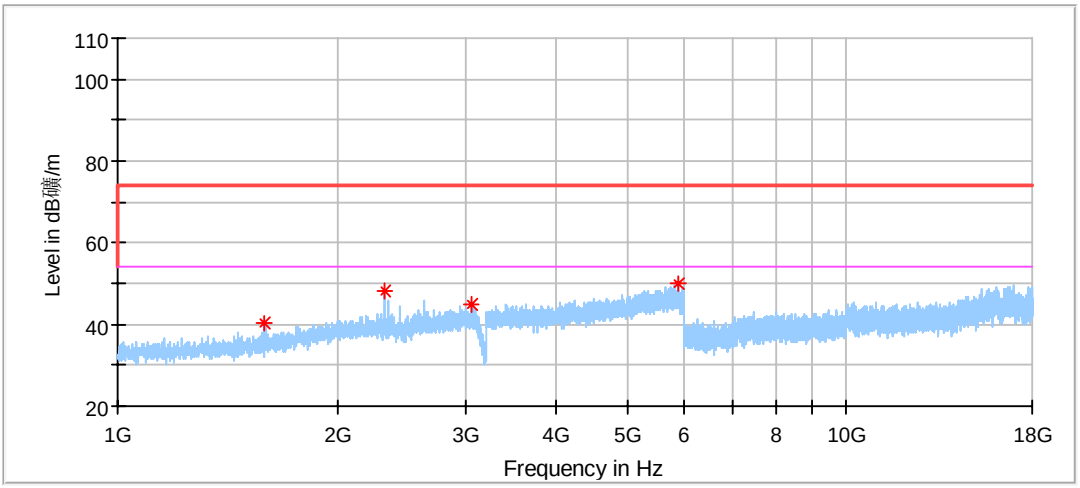

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 1593.000000 | 43.04 | 74.00 | 30.96 | 150.0 | V | 62.0 | -7.4 |
| 2464.000000 | 46.88 | 74.00 | 27.12 | 150.0 | V | 158.0 | -2.9 |
| 3401.000000 | 43.89 | 74.00 | 30.11 | 150.0 | V | 140.0 | -0.6 |
| 5521.500000 | 49.96 | 74.00 | 24.04 | 150.0 | V | 0.0 | 4.2 |

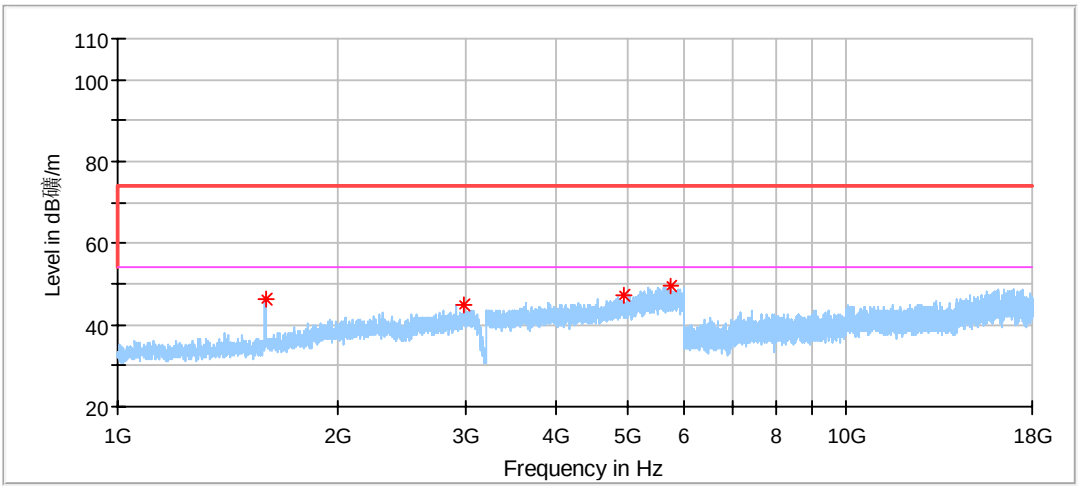
EUT: In-ear True Wireless Headphone
M/N: PI7
Operating Condition: Tx 2480MHz, High Channel




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 1594.000000 | 40.20 | 74.00 | 33.80 | 150.0 | H | 56.0 | -7.4 |
| 2324.500000 | 48.14 | 74.00 | 25.86 | 150.0 | H | 88.0 | -3.2 |
| 3061.500000 | 45.13 | 74.00 | 28.87 | 150.0 | H | 4.0 | -1.3 |
| 5884.500000 | 49.87 | 74.00 | 24.13 | 150.0 | H | 22.0 | 5.5 |


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 1595.500000 | 46.51 | 74.00 | 27.49 | 150.0 | V | 205.0 | -7.3 |
| 2990.000000 | 44.98 | 74.00 | 29.02 | 150.0 | V | 220.0 | -1.5 |
| 4960.000000 | 47.39 | 74.00 | 26.61 | 150.0 | V | 244.0 | 2.7 |
| 5737.500000 | 49.51 | 74.00 | 24.49 | 150.0 | V | 337.0 | 5.0 |

Remark:

(1) Data of measurement within frequency range18-26GHz are the noise floor or attenuated more than 20dB below the permissible limits or the field strength is too small to be measured, so test data does not present in this report.

(2) Level=Reading Level + Correction Factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

# 10 Test Equipment List

## List of Test Instruments

### Radiated Emission Test

| Description | Manufacturer | Model no. | Equipment ID | Serial no. | cal interval (year) | cal. due date |
|---|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESR 26 | 68-4-74-14-002 | 101269 | 1 | 2021-6-29 |
| Trilog Super Broadband Test Antenna | Schwarzbeck | VULB 9162 | 68-4-80-19-003 | 284 | 1 | 2021-2-24 |
| Wave Guide Antenna | ETS | 3117 | 68-4-80-19-001 | 00218954 | 1 | 2021-6-15 |
| Pre-amplifier | Rohde & Schwarz | SCU 18F | 68-4-29-19-001 | 100745 | 1 | 2020-12-14 |
| Pre-amplifier | Rohde & Schwarz | SCU 08F2 | 68-4-29-19-004 | 08400018 | 1 | 2020-12-14 |
| Sideband Horn Antenna | Q-PAR | QWH-SL-18-40-K-SG | 68-4-80-14-008 | 12827 | 1 | 2021-8-5 |
| Pre-amplifier | Rohde & Schwarz | SCU 40A | 68-4-29-14-002 | 100432 | 1 | 2021-7-30 |
| 3m Semi-anechoic chamber | TDK | 9X6X6 | 68-4-90-19-006 | ---- | 3 | 2022-12-29 |
| Test software | Rohde & Schwarz | EMC32 | 68-4-90-19-006-A01 | Version10.35.02 | N/A | N/A |

RF Conducted Test

| Description | Manufacturer | Model no. | Equipment ID | Serial no. | cal interval (year) | cal. due date |
|---|---|---|---|---|---|---|
| Signal Analyzer | Rohde & Schwarz | FSV40 | 68-4-74-14-004 | 101030 | 1 | 2021-6-21 |


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

## 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 |
| Radiated Spurious Emission 30MHz-1000MHz | Horizontal: 4.70dB;<br>Vertical: 4.67dB; |
| Radiated Spurious Emission 1000MHz-18000MHz | Horizontal: 4.65dB;<br>Vertical: 4.63dB; |
| Conducted RF test with TS 8997 | RF Power Conducted: 1.16dB<br>Frequency test involved:<br>$0.6\times10^{-7}$ or 1% |


TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299