**CFR 47 FCC PART 15 SUBPART C**
**ISED RSS-247 ISSUE 3 (DSS)**

# TEST REPORT

*For*

**Outdoor Phone**

**MODEL NUMBER: ClicknSeeYoo**

**REPORT NUMBER: E04A24100096F00101**

**ISSUE DATE: November 5, 2024**

**FCC ID: 2BEHY-CLICKNS**

**IC: 31445-CLICKNS**

*Prepared for*

**MCD Limited**
**631, MY LOFT, 9 Hoi Wing Rd, Tuen Mun, Hong Kong, 999077,China**

*Prepared by*

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**This report is based on a single evaluation of the submitted sample(s) of the above mentioned Product, it does not imply an assessment of the production of the products.**
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Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V0 | November 5, 2024 | Initial Issue | |

## Summary of Test Results

| Test Item | Clause | Limit/Requirement | Result |
|---|---|---|---|
| Antenna Requirement | N/A | FCC Part 15.203/15.247 (c) | Pass |
| AC Power Line Conducted Emission | ANSI C63.10-2013 Clause 6.2 | FCC Part 15.207 | Pass |
| Conducted Output Power | ANSI C63.10-2013 Clause 7.8.5 | FCC Part 15.247 (b)(1) | Pass |
| 20 dB Bandwidth and 99% Occupied Bandwidth | ANSI C63.10-2013 Clause 6.9.2 | FCC Part 15.247 (a)(1) | Pass |
| Carrier Hopping Channel Separation | ANSI C63.10-2013 Clause 7.8.2 | FCC Part 15.247 (a)(1) | Pass |
| Number of Hopping Frequency | ANSI C63.10-2013 Clause 7.8.3 | FCC Part 15.247 (b)(1) | Pass |
| Time of Occupancy (Dwell Time) | ANSI C63.10-2013 Clause 7.8.4 | FCC Part 15.247 (a)(1) | Pass |
| Conducted Bandedge and Spurious Emission | ANSI C63.10-2013 Clause 6.10.4 & Clause 7.8.8 | FCC Part 15.247(d) | Pass |
| Radiated Band edge and Spurious Emission | ANSI C63.10-2013 Clause 6.3 & 6.5 & 6.6 | FCC Part 15.205/15.209 | Pass |

*This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
*The measurement result for the sample received is <Pass> according to <CFR 47 FCC PART 15 SUBPART C, ISED RSS-247 ISSUE 3 (DSS)> when <Accuracy Method> decision rule is applied.

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# 1. ATTESTATION OF TEST RESULTS

**Applicant Information**

| | |
|---|---|
| Company Name: | MCD Limited |
| Address: | 631, MY LOFT, 9 Hoi Wing Rd, Tuen Mun, Hong Kong, 999077, China |

**Manufacturer Information**

| | |
|---|---|
| Company Name: | MC DEVICES CO., LTD. |
| Address: | The 23rd floor, Overseas Chinese Mansion II, Kejinanhuan Rd, Nanshan, Shenzhen, China |

**EUT Information**

| | |
|---|---|
| Product Description: | Outdoor Phone |
| Model: | ClicknSeeYoo |
| Brand: | / |
| Sample Received Date: | October 18, 2024 |
| Sample Status: | Normal |
| Sample ID: | A24100096 002 |
| Date of Tested: | October 18, 2024 to November 5, 2024 |

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| **CFR 47 FCC PART 15 SUBPART C**<br>**ISED RSS-247 ISSUE 3 (DSS)** | **Pass** |

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Laboratory Leader

## 2. TEST METHODOLOGY

All tests were performed in accordance with the standard CFR 47 FCC PART 15 SUBPART C ISED RSS-247 ISSUE 3 (DSS)

## 3. FACILITIES AND ACCREDITATION

| | |
|---|---|
| Accreditation Certificate | **A2LA (Certificate No.: 6947.01)**<br>Guangdong Global Testing Technology Co., Ltd.<br>has been assessed and proved to be in compliance with A2LA.<br>**FCC (FCC Designation No.: CN1343)**<br>Guangdong Global Testing Technology Co., Ltd.<br>has been recognized to perform compliance testing on equipment subject to Supplier's Declaration of Conformity (SDoC) and Certification rules<br>**ISED (Company No.: 30714)**<br>Guangdong Global Testing Technology Co., Ltd.<br>has been registered and fully described in a report filed with ISED. The Company Number is 30714 and the test lab Conformity Assessment Body Identifier (CABID) is CN0148. |

Note: All tests measurement facilities use to collect the measurement data are located at Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People’s Republic of China, 523808

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

## 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Test Items | k | Uncertainty |
|---|---|---|
| DTS Bandwidth | 1.96 | ±9.2 PPM |
| 20dB Emission Bandwidth | 1.96 | ±9.2 PPM |
| Carrier Frequency Separation | 1.96 | ±9.2 PPM |
| Time of Occupancy | 1.96 | ±0.57% |
| Conducted Output Power | 1.96 | ±1.5 dB |
| Power Spectral Density Level | 1.96 | ±1.9 dB |
| Conducted Spurious Emission | 1.96 | 9 kHz-30 MHz: ± 0.95 dB<br>30 MHz-1 GHz: ± 1.5 dB<br>1GHz-12.75GHz: ± 1.8 dB<br>12.75 GHz-26.5 GHz: ± 2.1dB |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96. | | |

| Test Item | Measurement Frequency Range | K | U(dB) |
|---|---|---|---|
| Conducted emissions from the AC mains power ports (AMN) | 150 kHz ~ 30 MHz | 2 | 3.37 |
| Radiated emissions | 9 kHz ~ 30 MHz | 2 | 4.16 |
| Radiated emissions | 30 MHz ~ 1 GHz | 2 | 3.79 |
| Radiated emissions | 1 GHz ~ 18 GHz | 2 | 5.62 |
| Radiated emissions | 18 GHz ~ 40 GHz | 2 | 5.54 |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. | | | |

# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

| | | |
|---|---|---|
| EUT Name | | Outdoor Phone |
| Model | | ClicknSeeYoo |
| Hardware Version | | V1.0 |
| Software Version | | V1.0 |
| Ratings | | DC 5V (powered by the USB-C port)<br>DC 5-30V (powered by the external DC power supply)<br>Battery 3.7V (powered by two 3.7V batteries in parallel) |
| Battery Ratings | | 3.7V 2000mAh 7.4Wh |
| Power Supply | DC | 5V |
| | DC | 30V |
| | Battery | 3.7V |

| | |
|---|---|
| Frequency Band: | 2400 MHz to 2483.5 MHz |
| Frequency Range: | 2410 MHz to 2473 MHz |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS) |
| Type of Modulation: | GFSK |
| Number of Channels: | 19 |
| Maximum Peak Power: | 3.34 dBm |
| Antenna Type: | Internal Antenna |
| Antenna Gain: | 0 dBi |
| EUT Test software: | / |

## 5.2. CHANNEL LIST

| Channel | Frequency (MHz) |
|---|---|
| 1 | 2410 |
| 2 | 2413.5 |
| 3 | 2417 |
| 4 | 2420.5 |
| 5 | 2424 |
| 6 | 2427.5 |
| 7 | 2431 |
| 8 | 2434.5 |
| 9 | 2438 |
| 10 | 2441.5 |
| 11 | 2445 |
| 12 | 2448.5 |
| 13 | 2452 |
| 14 | 2455.5 |
| 15 | 2459 |
| 16 | 2462.5 |
| 17 | 2466 |
| 18 | 2469.5 |
| 19 | 2473 |

## 5.3. MAXIMUM PEAK OUTPUT POWER

| Test Mode | Frequency (MHz) | Channel Number | Maximum Peak Output Power (dBm) | Maximum EIRP (dBm) |
|---|---|---|---|---|
| GFSK | 2410 ~ 2473 | 1-19[19] | 3.34 | 3.34 |

## 5.4. TEST CHANNEL CONFIGURATION

| Test Mode | Test Channel | Frequency |
|---|---|---|
| GFSK | CH 1(Low Channel), CH 10(MID Channel), CH 19(High Channel) | 2410 MHz, 2441.5 MHz, 2473 MHz |

Note: The hop is hopping mode.

## 5.5. THE WORSE CASE POWER SETTING PARAMETER

| The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band | | | | |
|---|---|---|---|---|
| Test Software | | / | | |
| Modulation Type | Transmit Antenna Number | Test Software setting value | | |
| | | CH 1 | CH 10 | CH 19 |
| GFSK | 1 | Default | Default | Default |

## 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

| Antenna | Frequency (MHz) | Antenna Type | MAX Antenna Gain (dBi) |
|---|---|---|---|
| 1 | 2410-2473 | Internal Antenna | 0 |

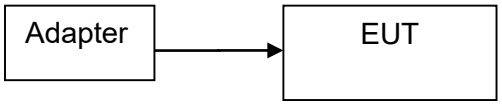
| Test Mode | Transmit and Receive Mode | Description |
|---|---|---|
| GFSK | ☒1TX, 1RX | Antenna 1 can be used as transmitting/receiving antenna. |

## 5.7. SUPPORT UNITS FOR SYSTEM TEST

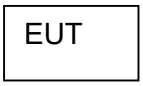
| No. | Equipment | Manufacturer | Model No. | Serial No. |
|---|---|---|---|---|
| 1 | Adapter | UGREEN | CD170 | / |

## 5.8. SETUP DIAGRAM

AC conducted emission:




Radiated Emission:




RF conducted:

# 6. MEASURING EQUIPMENT AND SOFTWARE USED

| Test Equipment of Conducted RF | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Due Date** |
| Spectrum Analyzer | Rohde & Schwarz | FSV40 | 102257 | 2024/09/14 | 2025/09/13 |
| Spectrum Analyzer | KEYSIGHT | N9020A | MY51285127 | 2024/09/14 | 2025/09/13 |
| EXG Analog Signal Generator | KEYSIGHT | N5173B | MY61253075 | 2024/09/14 | 2025/09/13 |
| Vector Signal Generator | Rohde & Schwarz | SMM100A | 101899 | 2024/09/14 | 2025/09/13 |
| RF Control box | MWRF-test | MW100-RFCB | MW220926GTG | 2024/09/14 | 2025/09/13 |
| Wideband Radio Communication Tester | Rohde & Schwarz | CMW270 | 102792 | 2024/09/14 | 2025/09/13 |
| Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | 103235 | 2024/09/14 | 2025/09/13 |
| temperature humidity chamber | Espec | SH-241 | SH-241-2014 | 2024/09/14 | 2025/09/13 |
| RF Test Software | MWRF-test | MTS8310E (Ver. V2/0) | N/A | N/A | N/A |

| Test Equipment of Radiated emissions below 1GHz | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Due Date** |
| 3m Semi-anechoic Chamber | ETS | 9m*6m*6m | Q2146 | 2022/08/30 | 2025/08/29 |
| EMI Test Receiver | Rohde & Schwarz | ESCI3 | 101409 | 2024/09/14 | 2025/09/13 |
| Spectrum Analyzer | KEYSIGHT | N9020A | MY51283932 | 2024/09/14 | 2025/09/13 |
| Pre-Amplifier | HzEMC | HPA-9K0130 | HYPA21001 | 2024/09/14 | 2025/09/13 |
| Biconilog Antenna | Schwarzbeck | VULB 9168 | 01315 | 2022/10/10 | 2025/10/09 |
| Biconilog Antenna | ETS | 3142E | 00243646 | 2022/03/23 | 2025/03/22 |
| Loop Antenna | ETS | 6502 | 243668 | 2022/03/30 | 2025/03/29 |
| Test Software | Farad | EZ-EMC (Ver.FA-03A2 RE) | N/A | N/A | N/A |

| Test Equipment of Radiated emissions above 1GHz | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Due Date** |
| 3m Semi-anechoic Chamber | ETS | 9m*6m*6m | Q2149 | 2022/08/30 | 2025/08/29 |
| Spectrum Analyzer | Rohde & Schwarz | FSV40 | 101413 | 2024/09/14 | 2025/09/13 |
| Spectrum Analyzer | KEYSIGHT | N9020A | MY51283932 | 2024/09/14 | 2025/09/13 |
| Pre-Amplifier | A-INFO | HPA-1G1850 | HYPA21003 | 2024/09/14 | 2025/09/13 |

| | | | | | |
|---|---|---|---|---|---|
| Horn antenna | A-INFO | 3117 | 246069 | 2022/03/11 | 2025/03/10 |
| Pre-Amplifier | ZKJC | HPA-184057 | HYPA21004 | 2024/09/14 | 2025/09/13 |
| Horn antenna | ZKJC | 3116C | 246265 | 2022/03/29 | 2025/03/28 |
| Test Software | Farad | EZ-EMC (Ver.FA-03A2 RE+) | N/A | N/A | N/A |

| Test Equipment of Conducted emissions | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Due Date** |
| Shielded Room | CHENG YU | 8m*5m*4m | N/A | 2022/10/29 | 2025/10/28 |
| EMI Test Receiver | Rohde & Schwarz | ESR3 | 102647 | 2024/09/14 | 2025/09/13 |
| LISN/AMN | Rohde & Schwarz | ENV216 | 102843 | 2024/09/14 | 2025/09/13 |
| NNLK 8129 RC | Schwarzbeck | NNLK 8129 RC | 5046 | 2024/09/14 | 2025/09/13 |
| Test Software | Farad | EZ-EMC (Ver. EMC-con-3A1 1+) | N/A | N/A | N/A |

# 7. ANTENNA PORT TEST RESULTS

## 7.1. CONDUCTED OUTPUT POWER

**LIMITS**

| CFR 47 FCC Part15 (15.247) Subpart C<br>ISED RSS-247 ISSUE 3 | | | |
|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) |
| CFR 47 FCC 15.247(b)(3)<br>ISED RSS-247 5.4 (d) | Peak Conduct Output Power | 1 watt or 30 dBm | 2400-2483.5 |

**TEST PROCEDURE**

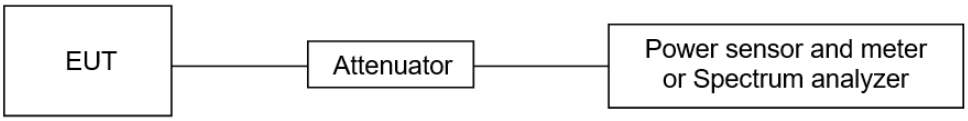
Refer to ANSI C63.10-2013 clause 7.8.5.

Connect the EUT to the spectrum Analyzer and use the following settings:

| | |
|---|---|
| Center Frequency | The center frequency of the channel under test |
| Detector | Peak |
| RBW | >20 dB bandwidth of the emission being measured |
| VBW | ≥RBW |
| Span | Approximately five times the 20 dB bandwidth, centered on a hopping channel. |
| Trace | Max hold |
| Sweep time | Auto |

Allow trace to stabilize.
Use the marker-to-peak function to set the marker to the peak of the emission.

**TEST SETUP**




**TEST ENVIRONMENT**

| | | | |
|---|---|---|---|
| Temperature | 25.8℃ | Relative Humidity | 52% |
| Atmosphere Pressure | 101kPa | | |

**TEST RESULTS**

Please refer to section "Test Data" - Appendix A

## 7.2. 20 DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

**LIMITS**

| CFR 47FCC Part15 (15.247) Subpart C<br>ISED RSS-247 ISSUE 3 | | | |
|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) |
| CFR 47 FCC 15.247 (a) (1)<br>RSS-247 Clause 5.1 (a) | 20 dB Bandwidth | None; for reporting purposes only. | 2400-2483.5 |
| ISED RSS-Gen Clause 6.7 | 99 % Occupied Bandwidth | None; for reporting purposes only. | 2400-2483.5 |

**TEST PROCEDURE**

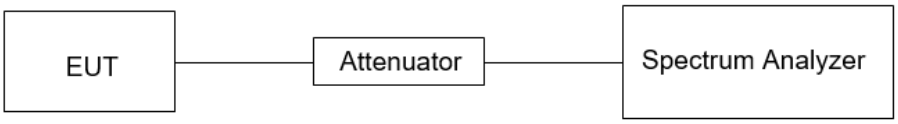
Refer to ANSI C63.10-2013 clause 6.9.2.

Connect the EUT to the spectrum analyser and use the following settings:

| | |
|---|---|
| Center Frequency | The center frequency of the channel under test |
| Detector | Peak |
| RBW | For 20 dB Bandwidth: 1 % to 5 % of the 20 dB bandwidth<br>For 99 % Occupied Bandwidth: 1 % to 5 % of the occupied bandwidth |
| VBW | For 20 dB Bandwidth: approximately 3×RBW<br>For 99 % Occupied Bandwidth: ≥ 3×RBW |
| Span | Approximately 2 to 3 times the 20dB bandwidth |
| Trace | Max hold |
| Sweep | Auto couple |

a) Use the occupied bandwidth function of the instrument, allow the trace to stabilize and report the measured 99 % occupied bandwidth and 20 dB Bandwidth.

**TEST SETUP**




**TEST ENVIRONMENT**

| | | | |
|---|---|---|---|
| Temperature | 25.8℃ | Relative Humidity | 52% |
| Atmosphere Pressure | 101kPa | | |

**TEST RESULTS**

Please refer to section "Test Data" - Appendix A

## 7.3. CARRIER HOPPING CHANNEL SEPARATION

**LIMITS**

| CFR 47 FCC Part15 (15.247), Subpart C ISED RSS-247 ISSUE 3 | | | |
|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) |
| CFR 47 FCC 15.247 (a) (1) ISED RSS-247 Clause 5.1 (b) | Carrier Frequency Separation | Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel. | 2400-2483.5 |

**TEST PROCEDURE**

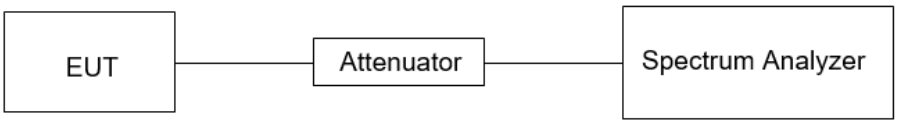
Refer to ANSI C63.10-2013 clause 7.8.2.

Connect the EUT to the spectrum analyzer and use the following settings:

| | |
|---|---|
| Center Frequency | The center frequency of the channel under test |
| Span | wide enough to capture the peaks of two adjacent channels |
| Detector | Peak |
| RBW | Start with the RBW set to approximately 30 % of the channel spacing; adjust as necessary to best identify the center of each individual channel. |
| VBW | ≥RBW |
| Trace | Max hold |
| Sweep time | Auto couple |

Allow the trace to stabilize and use the marker-delta function to determine the separation between the peaks of the adjacent channels.
Compliance of an EUT with the appropriate regulatory limit shall be determined.

**TEST SETUP**



**TEST ENVIRONMENT**

| | | | |
|---|---|---|---|
| Temperature | 25.8℃ | Relative Humidity | 52% |
| Atmosphere Pressure | 101kPa | | |

**TEST RESULTS**

Please refer to section "Test Data" - Appendix A

## 7.4. NUMBER OF HOPPING FREQUENCY

**LIMITS**

| CFR 47 FCC Part15 (15.247), Subpart C<br>ISED RSS-247 ISSUE 3 | | |
|---|---|---|
| Section | Test Item | Limit |
| CFR 47 15.247 (a) (1) III<br>ISED RSS-247 Clause 5.1 (d) | Number of Hopping Frequency | at least 15 hopping channels |

**TEST PROCEDURE**

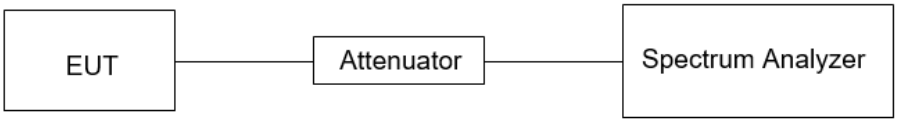
Refer to ANSI C63.10-2013 clause 7.8.3.

Connect the EUT to the spectrum Analyzer and use the following settings:

| | |
|---|---|
| Detector | Peak |
| RBW | To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller. |
| VBW | ≥RBW |
| Span | The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen. |
| Trace | Max hold |
| Sweep time | Auto couple |

Set EUT to transmit maximum output power and switch on frequency hopping function. then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer, count the quantity of peaks to get the number of hopping channels.

**TEST SETUP**




**TEST ENVIRONMENT**

| | | | |
|---|---|---|---|
| Temperature | 25.8℃ | Relative Humidity | 52% |
| Atmosphere Pressure | 101kPa | | |

**TEST RESULTS**

Please refer to section "Test Data" - Appendix A

## 7.5. TIME OF OCCUPANCY (DWELL TIME)

**LIMITS**

| CFR 47 FCC Part15 (15.247), Subpart C<br>ISED RSS-247 ISSUE 3 | | |
|---|---|---|
| Section | Test Item | Limit |
| CFR 47 15.247 (a) (1) III<br>ISED RSS-247 Clause 5.1 (d) | Time of Occupancy (Dwell Time) | The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed. |

**TEST PROCEDURE**

Refer to ANSI C63.10-2013 clause 7.8.4.

Connect the EUT to the spectrum Analyzer and use the following settings:

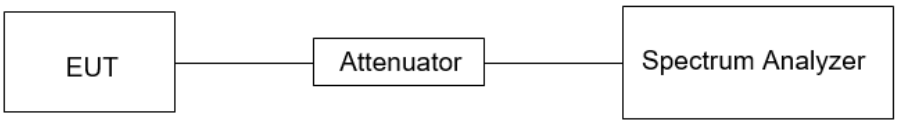
| | |
|---|---|
| Center Frequency | The center frequency of the channel under test |
| Detector | Peak |
| RBW | 1 MHz |
| VBW | ≥RBW |
| Span | Zero span, centered on a hopping channel |
| Trace | Max hold |
| Sweep time | As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel |

Use the marker-delta function to determine the transmit time per hop (Burst Width). If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.

For FHSS Mode (19 Channel):
GFSK Dwell Time: Pulse Time * Burst Count

Note:1. Pulse Time: The time of a single pulse.
2. Burst Count: The number of pulses observed during a 7.6s period.

**TEST SETUP**



**TEST ENVIRONMENT**

| | | | |
|---|---|---|---|
| Temperature | 25.8℃ | Relative Humidity | 52% |
| Atmosphere Pressure | 101kPa | | |

**TEST RESULTS**

Please refer to section "Test Data" - Appendix A

## 7.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSION

**LIMITS**

| CFR 47 FCC Part15 (15.247), Subpart C<br>ISED RSS-247 ISSUE 3 | | |
|---|---|---|
| Section | Test Item | Limit |
| CFR 47 FCC §15.247 (d)<br>ISED RSS-247 5.5 | Conducted Spurious Emission | at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power |

**TEST PROCEDURE**

Refer to ANSI C63.10-2013 clause 7.8.6 and 7.8.8.

Connect the EUT to the spectrum analyser and use the following settings for reference level measurement:

| | |
|---|---|
| Center Frequency | The center frequency of the channel under test |
| Detector | Peak |
| RBW | 100 kHz |
| VBW | ≥3 × RBW |
| Span | 1.5 x DTS bandwidth |
| Trace | Max hold |
| Sweep time | Auto couple. |

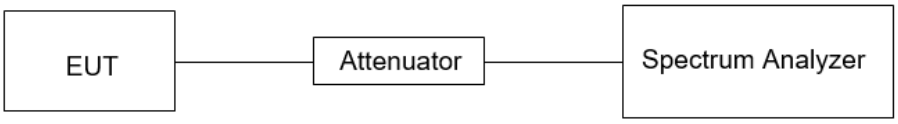
Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level.

Change the settings for emission level measurement:

| | |
|---|---|
| Span | Set the center frequency and span to encompass frequency range to be measured |
| Detector | Peak |
| RBW | 100 kHz |
| VBW | ≥3 × RBW |
| measurement points | ≥span/RBW |
| Trace | Max hold |
| Sweep time | Auto couple. |

Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum

**TEST SETUP**




**TEST ENVIRONMENT**

| | | | |
|---|---|---|---|
| Temperature | 25.8℃ | Relative Humidity | 52% |
| Atmosphere Pressure | 101kPa | | |

**TEST RESULTS**

Please refer to section "Test Data" - Appendix A

# 8. RADIATED TEST RESULTS

**LIMITS**

Please refer to CFR 47 FCC §15.205 and §15.209.

Please refer to ISED RSS-GEN Clause 8.9 and Clause 8.10.

Radiation Disturbance Test Limit for FCC (Class B) (9 kHz-1 GHz)

| Emissions radiated outside of the specified frequency bands above 30 MHz | | | |
|---|---|---|---|
| Frequency Range (MHz) | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m | |
| | | Quasi-Peak | |
| 30 - 88 | 100 | 40 | |
| 88 - 216 | 150 | 43.5 | |
| 216 - 960 | 200 | 46 | |
| Above 960 | 500 | 54 | |
| Above 1000 | 500 | Peak | Average |
| | | 74 | 54 |

| FCC Emissions radiated outside of the specified frequency bands below 30 MHz | | |
|---|---|---|
| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |

ISED General field strength limits at frequencies below 30 MHz

| Table 6 – General field strength limits at frequencies below 30 MHz | | |
|---|---|---|
| **Frequency** | **Magnetic field strength (H-Field) (µA/m)** | **Measurement distance (m)** |
| 9 - 490 kHz[Note 1] | 6.37/F (F in kHz) | 300 |
| 490 - 1705 kHz | 63.7/F (F in kHz) | 30 |
| 1.705 - 30 MHz | 0.08 | 30 |

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

ISED Restricted bands please refer to ISED RSS-GEN Clause 8.10

| Table 7 – Restricted frequency bands[Note 1] | | |
|---|---|---|
| MHz | MHz | GHz |
| 0.090 - 0.110 | 149.9 - 150.05 | 9.0 - 9.2 |
| 0.495 - 0.505 | 156.52475 - 156.52525 | 9.3 - 9.5 |
| 2.1735 - 2.1905 | 156.7 - 156.9 | 10.6 - 12.7 |
| 3.020 - 3.026 | 162.0125 - 167.17 | 13.25 - 13.4 |
| 4.125 - 4.128 | 167.72 - 173.2 | 14.47 - 14.5 |
| 4.17725 - 4.17775 | 240 – 285 | 15.35 - 16.2 |
| 4.20725 - 4.20775 | 322 - 335.4 | 17.7 - 21.4 |
| 5.677 - 5.683 | 399.9 - 410 | 22.01 - 23.12 |
| 6.215 - 6.218 | 608 - 614 | 23.6 - 24.0 |
| 6.26775 - 6.26825 | 960 - 1427 | 31.2 - 31.8 |
| 6.31175 - 6.31225 | 1435 - 1626.5 | 36.43 - 36.5 |
| 8.291 - 8.294 | 1645.5 - 1646.5 | Above 38.6 |
| 8.362 - 8.366 | 1660 - 1710 | |
| 8.37625 - 8.38675 | 1718.8 - 1722.2 | |
| 8.41425 - 8.41475 | 2200 - 2300 | |
| 12.29 - 12.293 | 2310 - 2390 | |
| 12.51975 - 12.52025 | 2483.5 - 2500 | |
| 12.57675 - 12.57725 | 2655 - 2900 | |
| 13.36 - 13.41 | 3260 – 3267 | |
| 16.42 - 16.423 | 3332 - 3339 | |
| 16.69475 - 16.69525 | 3345.8 - 3358 | |
| 16.80425 - 16.80475 | 3500 - 4400 | |
| 25.5 - 25.67 | 4500 - 5150 | |
| 37.5 - 38.25 | 5350 - 5460 | |
| 73 - 74.6 | 7250 - 7750 | |
| 74.8 - 75.2 | 8025 – 8500 | |
| 108 – 138 | | |

**Note 1:** Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

FCC Restricted bands of operation refer to FCC §15.205 (a):

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| [1]0.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 108-121.94 | 1718.8-1722.2 | 13.25-13.4 |
| 6.31175-6.31225 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | ([2]) |
| 13.36-13.41 | | | |

Note: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c

**TEST PROCEDURE**

Below 30 MHz

The setting of the spectrum analyser

| | |
|---|---|
| RBW | 200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz) |
| VBW | 200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz) |
| Sweep | Auto |

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.

2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.

5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.

7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.

8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X KHz resulted in a level of Y dBuV/m, which is equivalent to Y-51.5 = Z dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

Below 1 GHz and above 30 MHz

The setting of the spectrum analyser

| | |
|---|---|
| RBW | 120 kHz |
| VBW | 300 kHz |
| Sweep | Auto |
| Detector | Peak/QP |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

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

5. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1 GHz

The setting of the spectrum analyser

| | |
|---|---|
| RBW | 1 MHz |
| VBW | PEAK: 3 MHz<br>AVG: see note 6 |
| Sweep | Auto |
| Detector | Peak |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.6.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

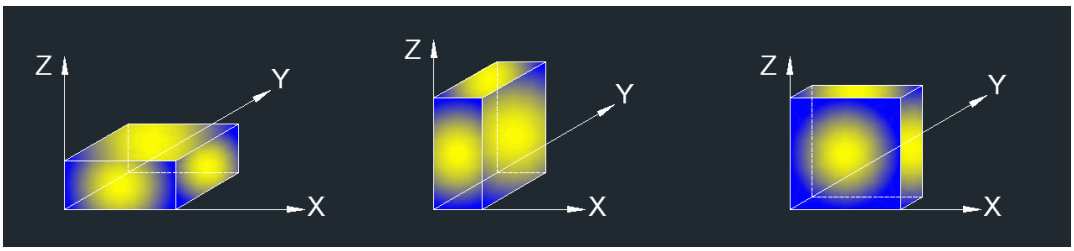
3. The EUT was placed on a turntable with 1.5 m above ground.

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

5. For measurement above 1 GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 7.1.ON TIME AND DUTY CYCLE.

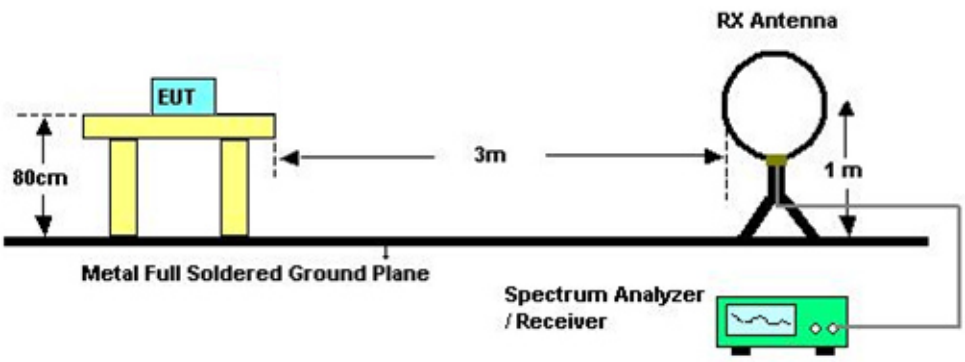
X axis, Y axis, Z axis positions:

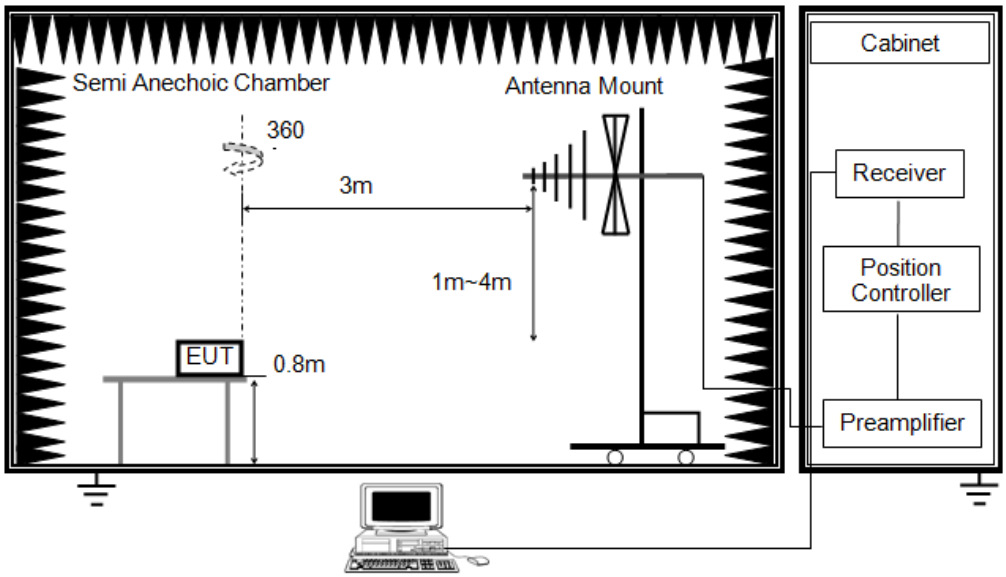


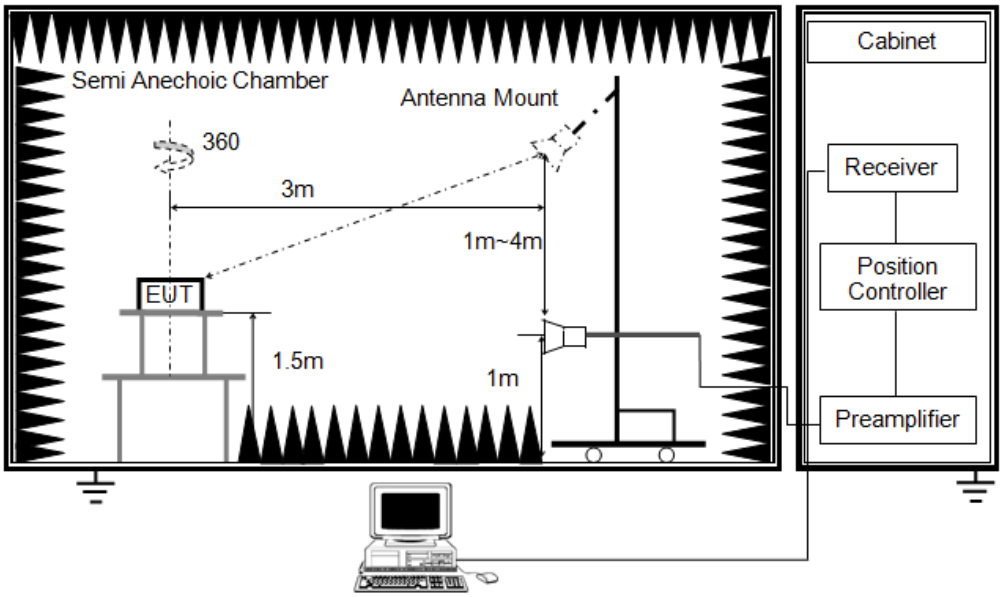

Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

**TEST SETUP**






**TEST ENVIRONMENT**

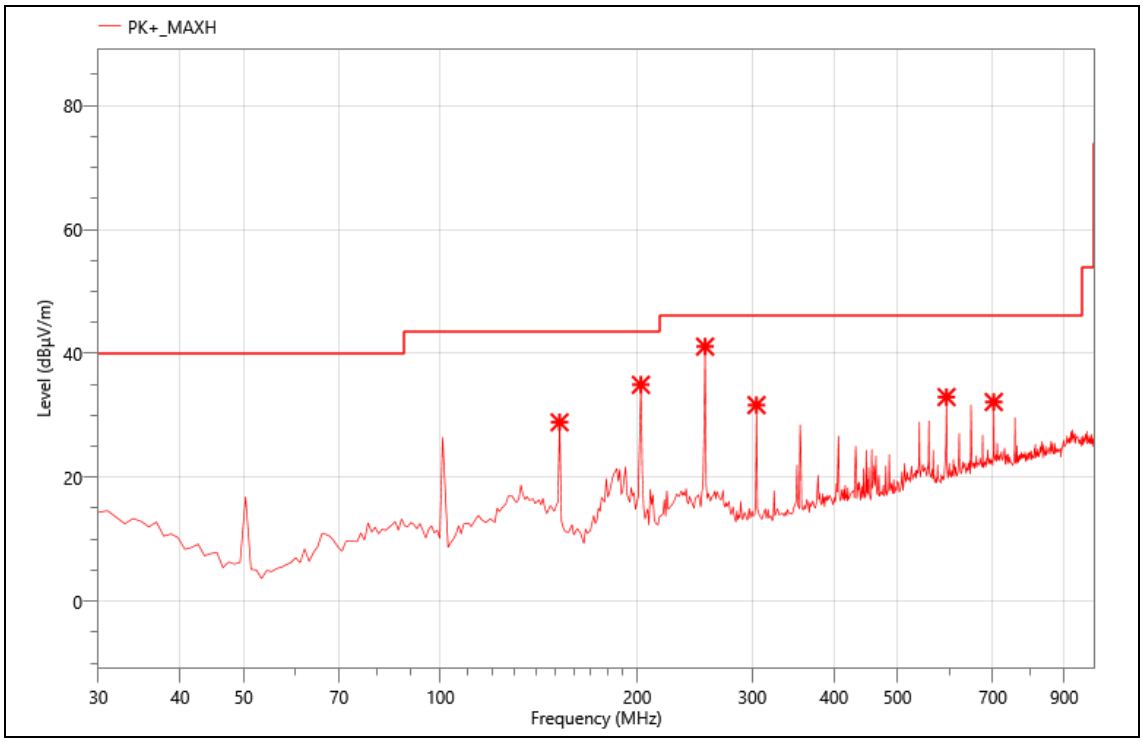
| | | | |
|---|---|---|---|
| Temperature | 23.3℃ | Relative Humidity | 51% |
| Atmosphere Pressure | 101kPa | | |

**TEST RESULTS**

Please refer to section 8.1.

## 8.1. RADIATED BAND EDGE AND SPURIOUS EMISSION

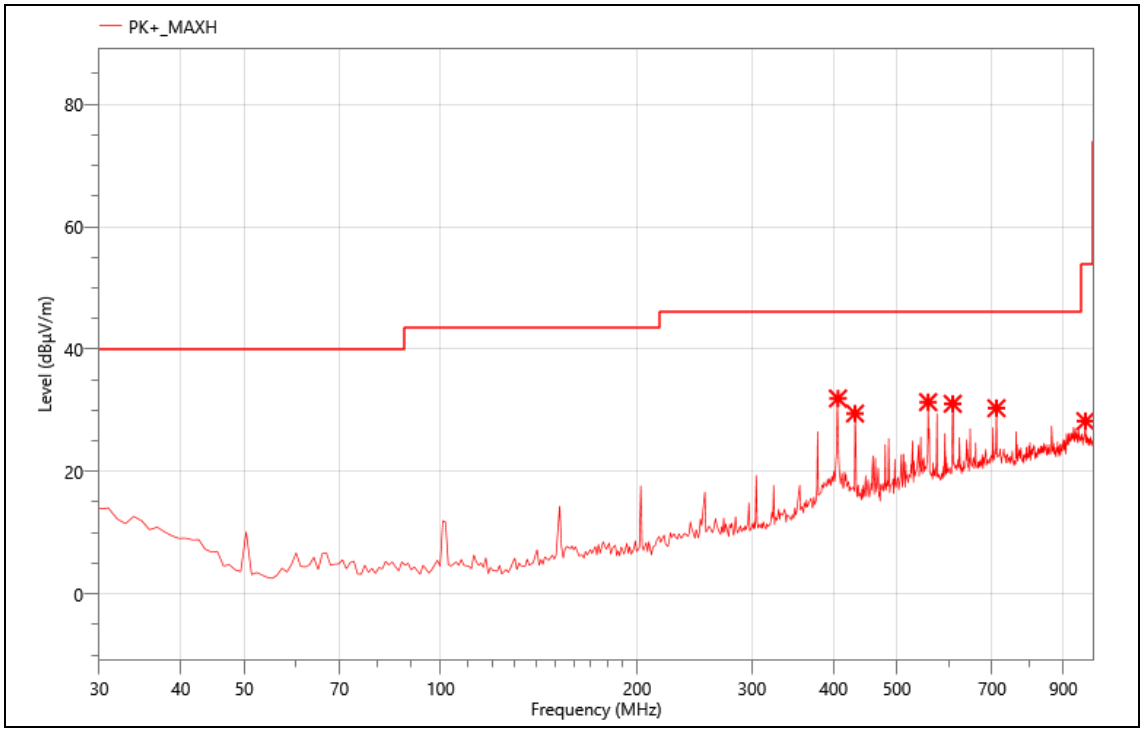
| | |
|---|---|
| Mode: | 2473MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




### Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 152.220 | 51.00 | -22.13 | 28.87 | 43.50 | 14.63 | PK+ | V |
| 2 | 202.660 | 56.82 | -21.89 | 34.93 | 43.50 | 8.57 | PK+ | V |
| 3 | 254.070 | 59.98 | -18.89 | 41.09 | 46.00 | 4.91 | PK+ | V |
| 4 | 304.510 | 50.31 | -18.66 | 31.65 | 46.00 | 14.35 | PK+ | V |
| 5 | 594.540 | 42.96 | -10.01 | 32.95 | 46.00 | 13.05 | PK+ | V |
| 6 | 702.210 | 39.51 | -7.36 | 32.15 | 46.00 | 13.85 | PK+ | V |

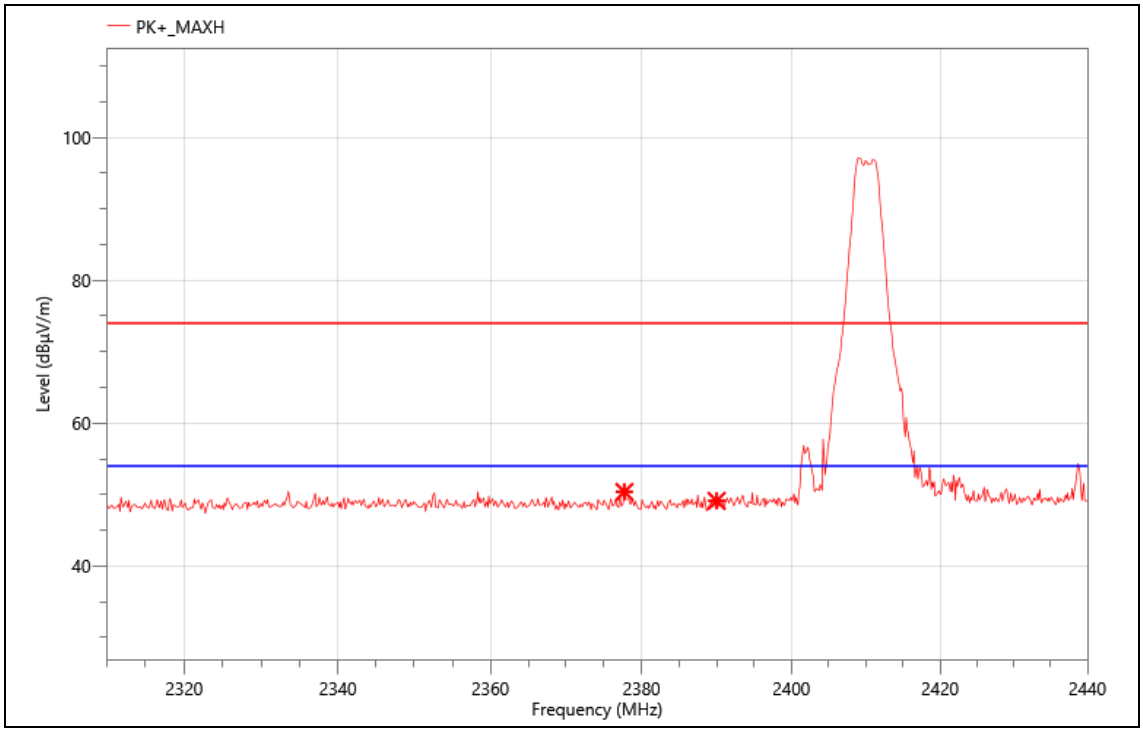
| | |
|---|---|
| Mode: | 2473 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 406.360 | 45.65 | -13.73 | 31.92 | 46.00 | 14.08 | PK+ | H |
| 2 | 431.580 | 43.62 | -14.16 | 29.46 | 46.00 | 16.54 | PK+ | H |
| 3 | 558.650 | 41.58 | -10.25 | 31.33 | 46.00 | 14.67 | PK+ | H |
| 4 | 609.090 | 40.64 | -9.58 | 31.06 | 46.00 | 14.94 | PK+ | H |
| 5 | 710.940 | 37.43 | -7.09 | 30.34 | 46.00 | 15.66 | PK+ | H |
| 6 | 972.840 | 31.93 | -3.71 | 28.22 | 53.90 | 25.68 | PK+ | H |

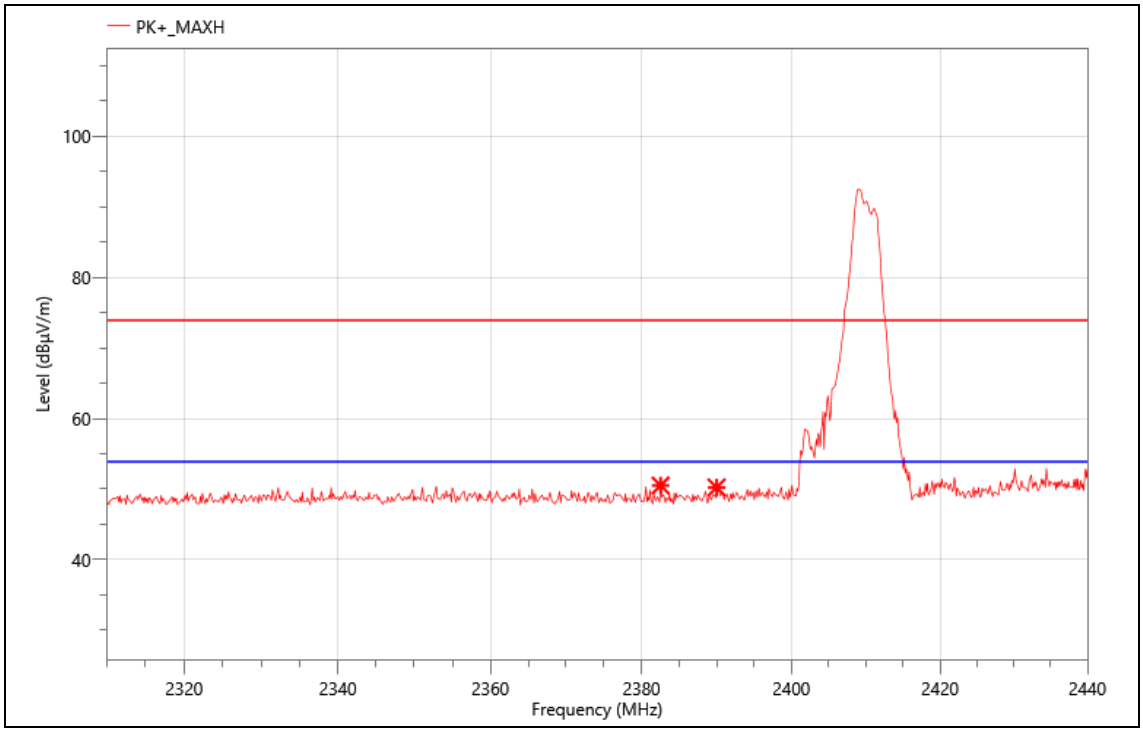
| | |
|---|---|
| Mode: | 2410 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2377.730 | 27.83 | 22.55 | 50.38 | 74.00 | 23.62 | PK+ | V |
| 2 | 2390.000 | 26.40 | 22.72 | 49.12 | 74.00 | 24.88 | PK+ | V |

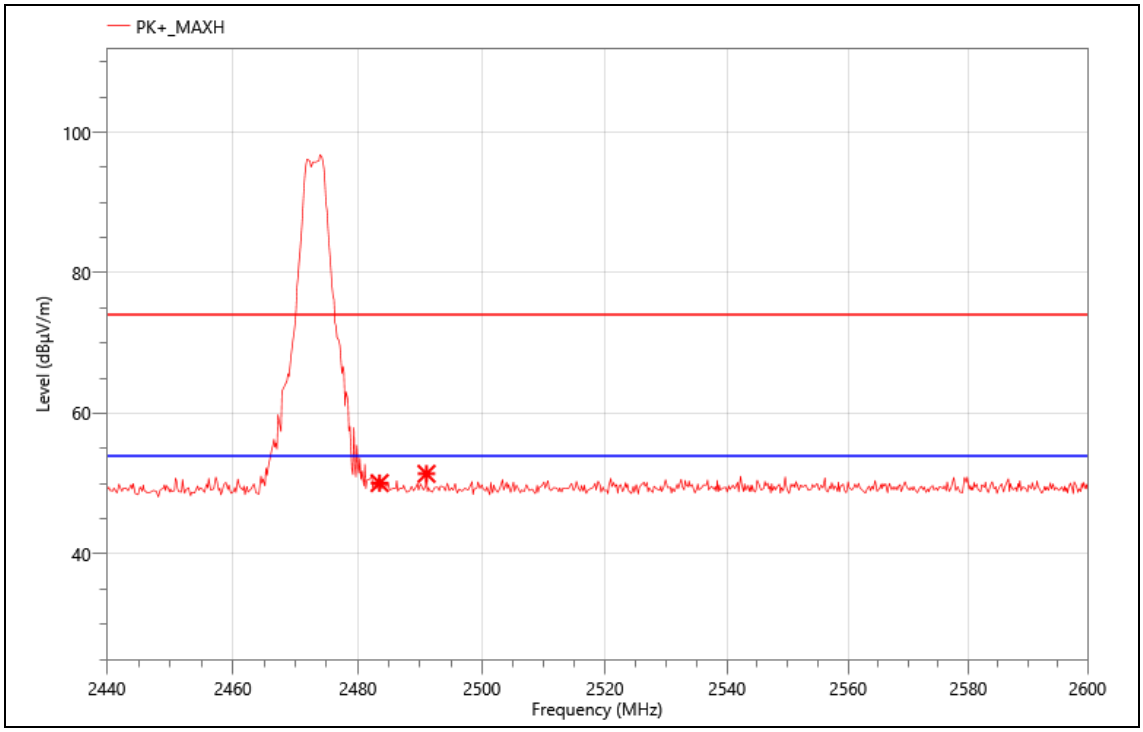
| | |
|---|---|
| Mode: | 2410 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2382.540 | 27.92 | 22.58 | 50.50 | 74.00 | 23.50 | PK+ | H |
| 2 | 2390.000 | 27.51 | 22.72 | 50.23 | 74.00 | 23.77 | PK+ | H |

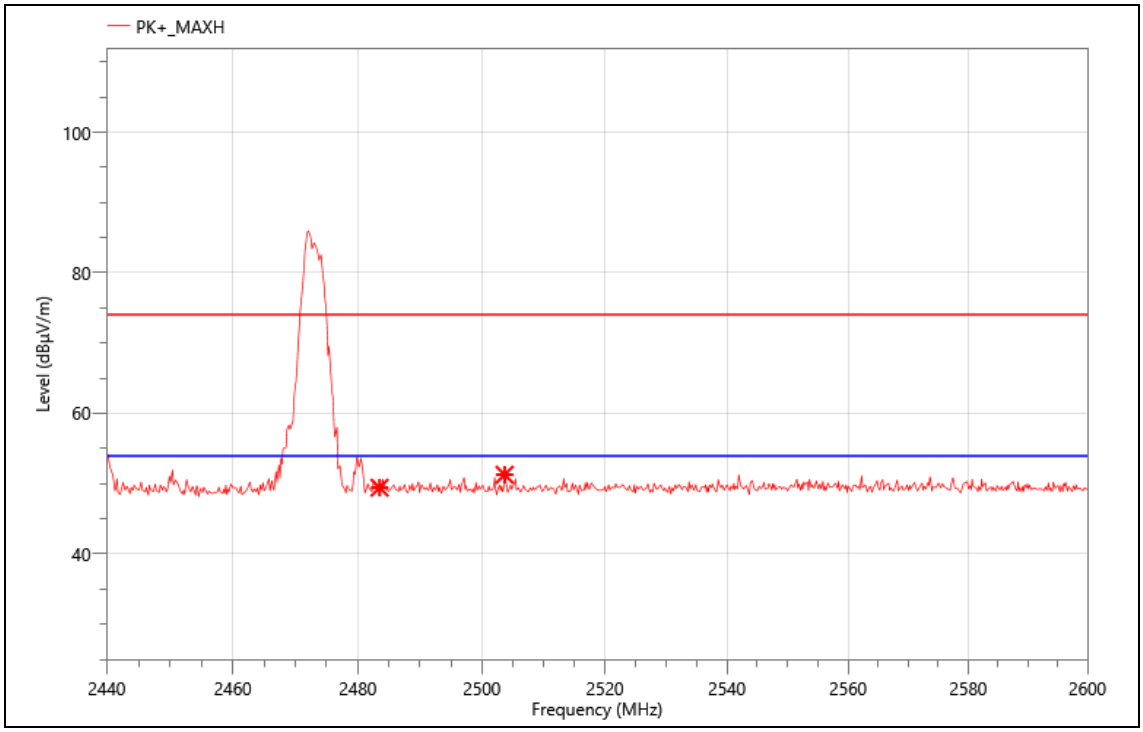
| | |
|---|---|
| Mode: | 2473 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.500 | 26.90 | 23.15 | 50.05 | 74.00 | 23.95 | PK+ | V |
| 2 | 2491.040 | 28.24 | 23.13 | 51.37 | 74.00 | 22.63 | PK+ | V |

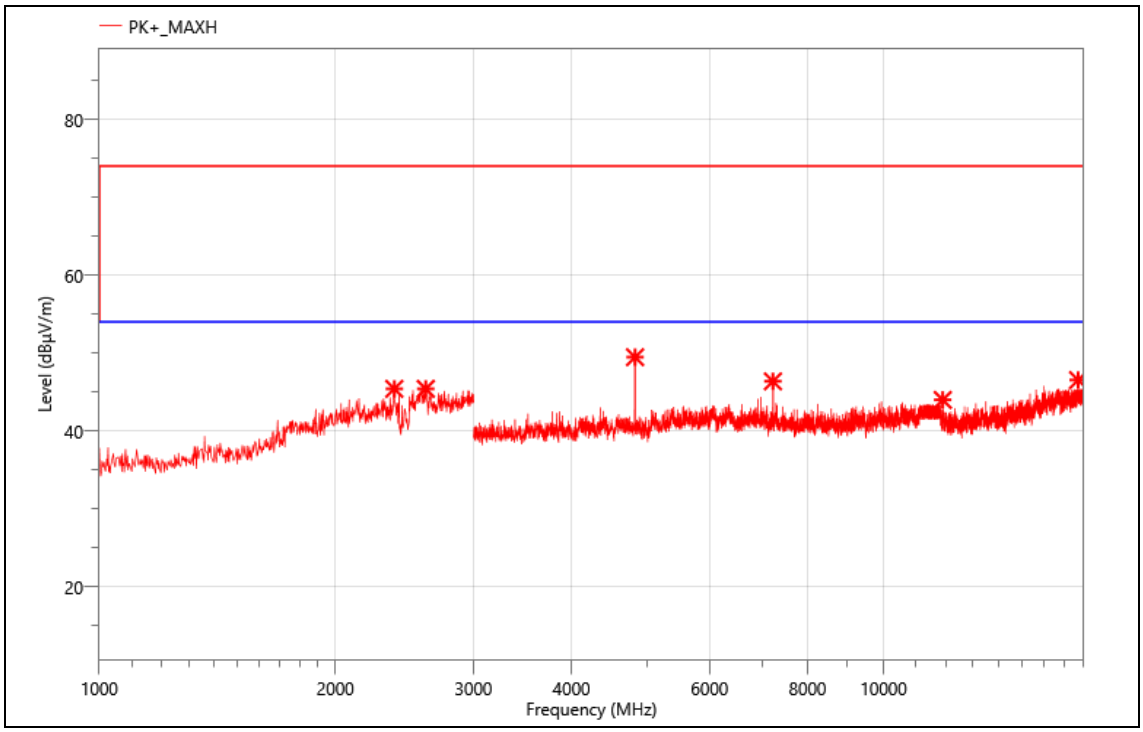
| | |
|---|---|
| Mode: | 2473 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.500 | 26.24 | 23.15 | 49.39 | 74.00 | 24.61 | PK+ | H |
| 2 | 2503.680 | 28.14 | 23.1 | 51.24 | 74.00 | 22.76 | PK+ | H |

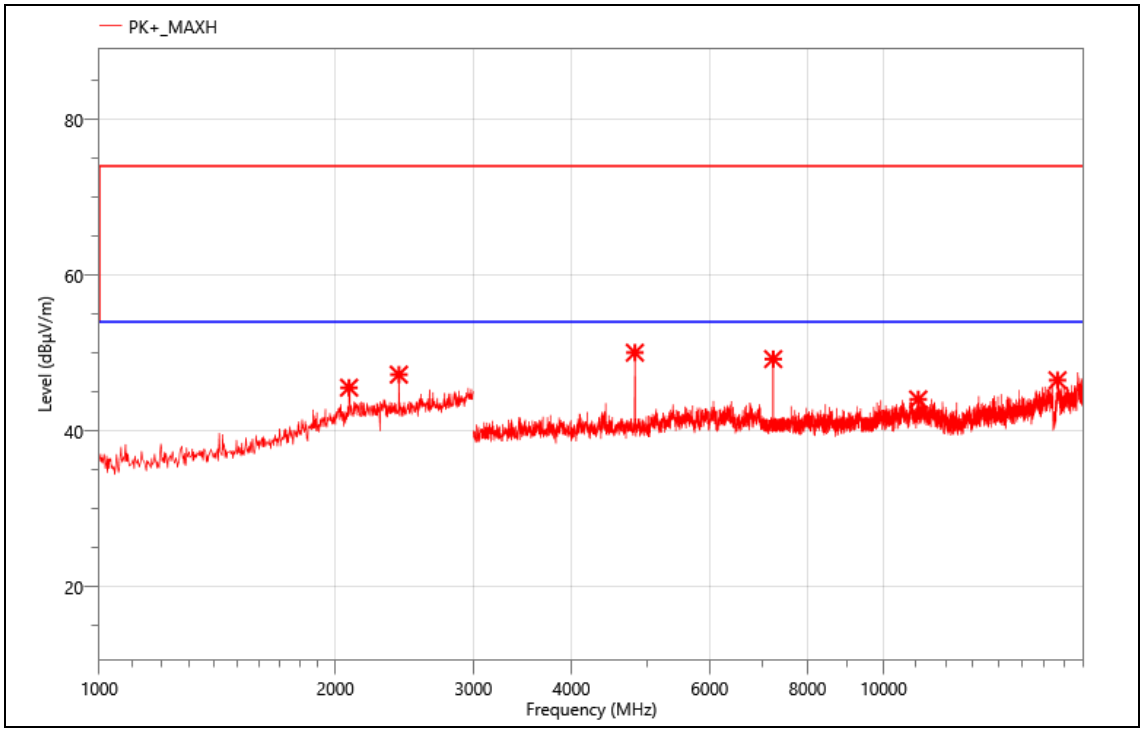
| | |
|---|---|
| Mode: | 2410 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2378.000 | 53.91 | -8.52 | 45.39 | 74.00 | 28.61 | PK+ | V |
| 2 | 2608.000 | 53.62 | -8.23 | 45.39 | 74.00 | 28.61 | PK+ | V |
| 3 | 4821.000 | 60.90 | -11.45 | 49.45 | 74.00 | 24.55 | PK+ | V |
| 4 | 7227.000 | 54.43 | -8.08 | 46.35 | 74.00 | 27.65 | PK+ | V |
| 5 | 11898.000 | 48.21 | -4.25 | 43.96 | 74.00 | 30.04 | PK+ | V |
| 6 | 17706.000 | 46.46 | 0.05 | 46.51 | 74.00 | 27.49 | PK+ | V |

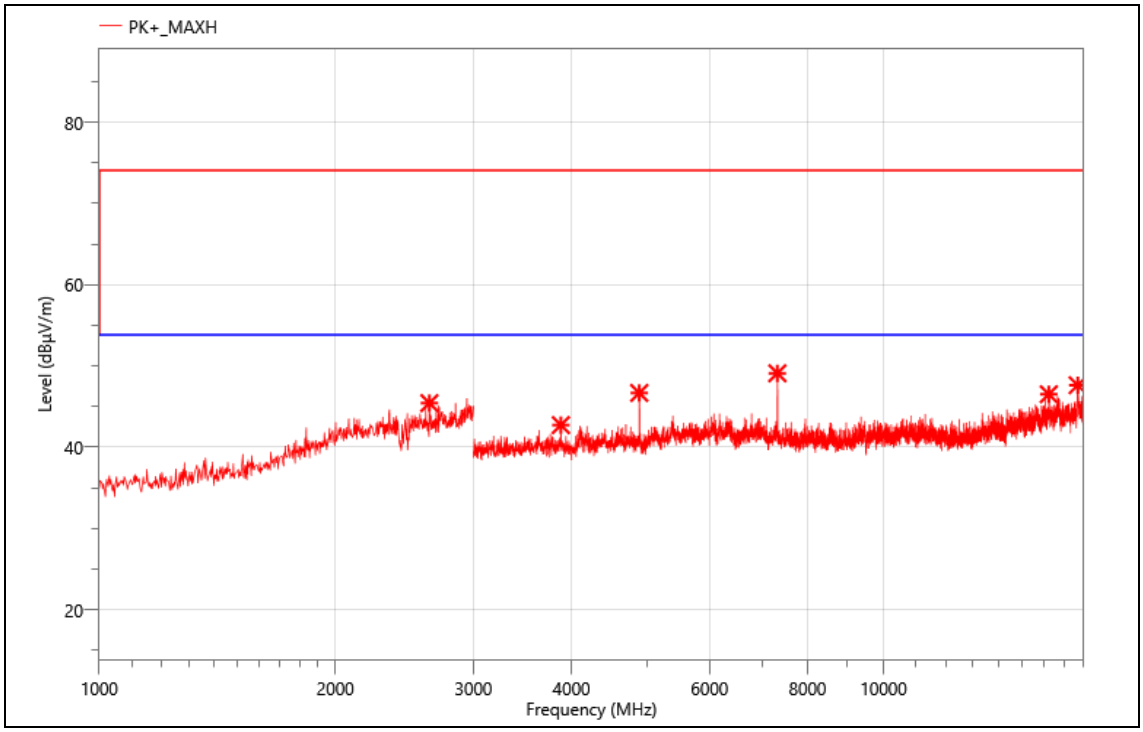
| | |
|---|---|
| Mode: | 2410 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2082.000 | 55.01 | -9.48 | 45.53 | 74.00 | 28.47 | PK+ | H |
| 2 | 2410.000 | 55.73 | -8.52 | 47.21 | 74.00 | 26.79 | PK+ | H |
| 3 | 4818.000 | 61.46 | -11.43 | 50.03 | 74.00 | 23.97 | PK+ | H |
| 4 | 7233.000 | 57.33 | -8.12 | 49.21 | 74.00 | 24.79 | PK+ | H |
| 5 | 11071.500 | 48.70 | -4.67 | 44.03 | 74.00 | 29.97 | PK+ | H |
| 6 | 16665.000 | 47.09 | -0.6 | 46.49 | 74.00 | 27.51 | PK+ | H |

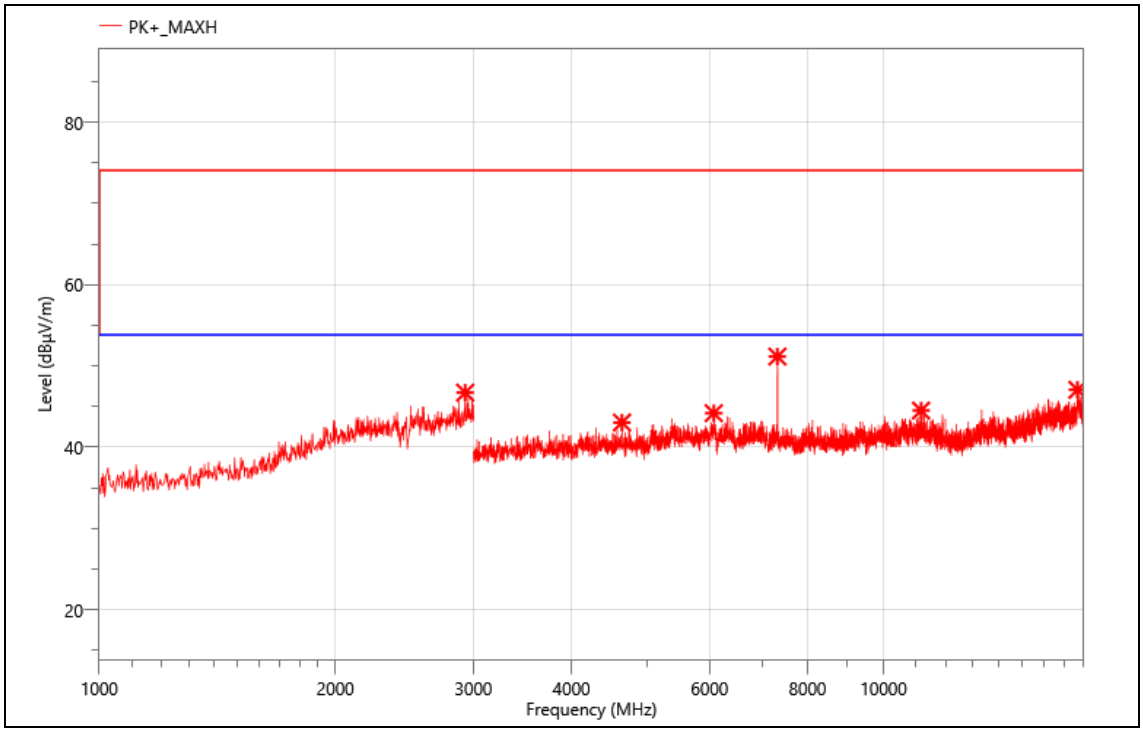
| | |
|---|---|
| Mode: | 2441.5 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2636.000 | 54.08 | -8.65 | 45.43 | 74.00 | 28.57 | PK+ | V |
| 2 | 3877.500 | 55.99 | -13.27 | 42.72 | 74.00 | 31.28 | PK+ | V |
| 3 | 4881.000 | 57.82 | -11.14 | 46.68 | 74.00 | 27.32 | PK+ | V |
| 4 | 7321.500 | 57.01 | -7.91 | 49.10 | 74.00 | 24.90 | PK+ | V |
| 5 | 16242.000 | 47.18 | -0.66 | 46.52 | 74.00 | 27.48 | PK+ | V |
| 6 | 17683.500 | 47.36 | 0.27 | 47.63 | 74.00 | 26.37 | PK+ | V |

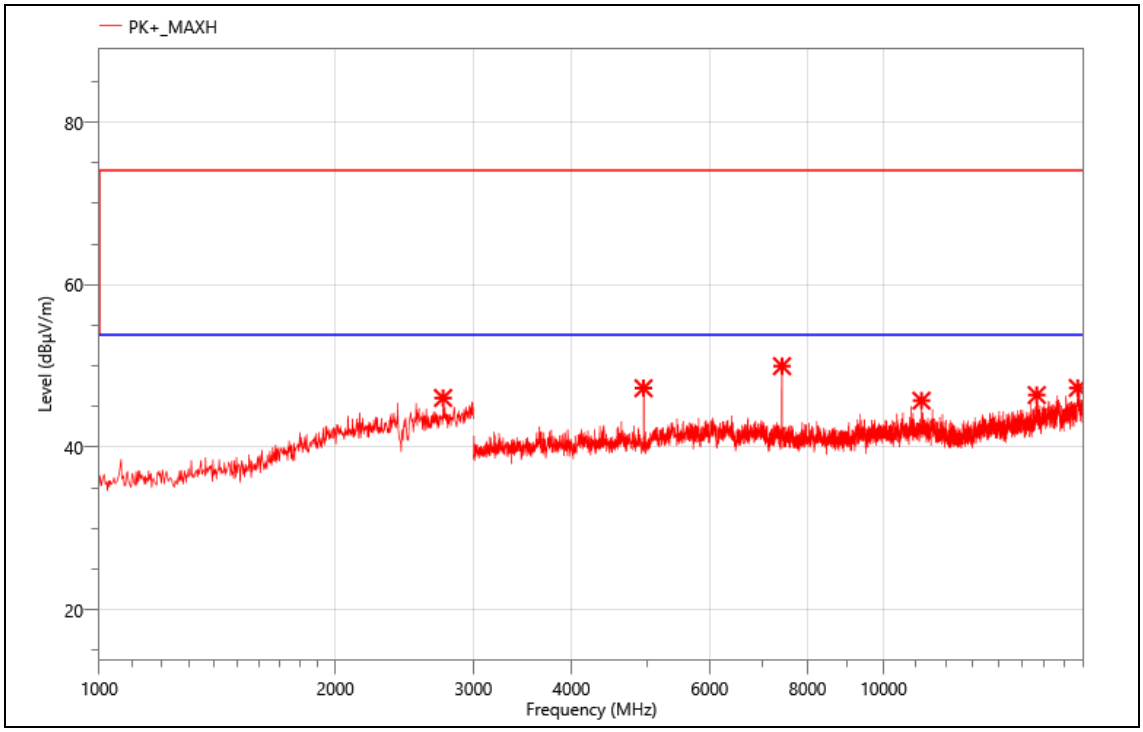
| | |
|---|---|
| Mode: | 2441.5 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2928.000 | 54.27 | -7.55 | 46.72 | 74.00 | 27.28 | PK+ | H |
| 2 | 4639.500 | 54.55 | -11.51 | 43.04 | 74.00 | 30.96 | PK+ | H |
| 3 | 6075.000 | 52.27 | -8.08 | 44.19 | 74.00 | 29.81 | PK+ | H |
| 4 | 7321.500 | 59.07 | -7.91 | 51.16 | 74.00 | 22.84 | PK+ | H |
| 5 | 11164.500 | 48.80 | -4.29 | 44.51 | 74.00 | 29.49 | PK+ | H |
| 6 | 17671.500 | 46.78 | 0.28 | 47.06 | 74.00 | 26.94 | PK+ | H |

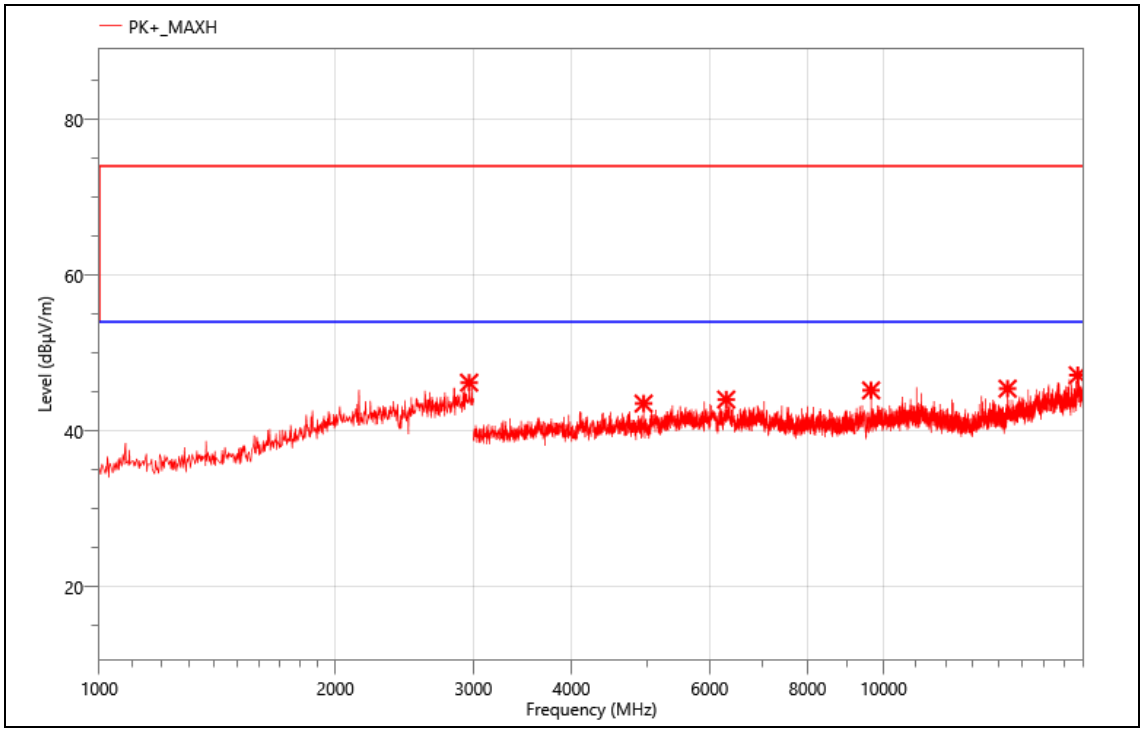
| | |
|---|---|
| Mode: | 2473 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2744.000 | 54.30 | -8.24 | 46.06 | 74.00 | 27.94 | PK+ | H |
| 2 | 4942.500 | 58.45 | -11.19 | 47.26 | 74.00 | 26.74 | PK+ | H |
| 3 | 7422.000 | 57.97 | -7.99 | 49.98 | 74.00 | 24.02 | PK+ | H |
| 4 | 11178.000 | 50.21 | -4.48 | 45.73 | 74.00 | 28.27 | PK+ | H |
| 5 | 15679.500 | 48.76 | -2.34 | 46.42 | 74.00 | 27.58 | PK+ | H |
| 6 | 17686.500 | 47.04 | 0.25 | 47.29 | 74.00 | 26.71 | PK+ | H |

| | |
|---|---|
| Mode: | 2473 MHz |
| Power: | Battery 3.7V |
| TE: | Berny |
| Date | 2024/10/29 |
| T/A/P | 23.3℃/51%/101Kpa |




## Critical_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2962.000 | 53.48 | -7.3 | 46.18 | 74.00 | 27.82 | PK+ | V |
| 2 | 4944.000 | 54.71 | -11.21 | 43.50 | 74.00 | 30.50 | PK+ | V |
| 3 | 6300.000 | 51.74 | -7.72 | 44.02 | 74.00 | 29.98 | PK+ | V |
| 4 | 9640.500 | 52.07 | -6.88 | 45.19 | 74.00 | 28.81 | PK+ | V |
| 5 | 14392.500 | 48.90 | -3.49 | 45.41 | 74.00 | 28.59 | PK+ | V |
| 6 | 17683.500 | 46.87 | 0.27 | 47.14 | 74.00 | 26.86 | PK+ | V |

Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.
5. The frequency, which started from 18 GHz to 26.5GHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

# 9. ANTENNA REQUIREMENT

**REQUIREMENT**

Please refer to FCC §15.203
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

| Standard | Requirement |
|---|---|
| RSS-Gen issue 5 6.8. | The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.<br>For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).<br>When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.<br>The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.<br>For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:<br>This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device. |

| | |
|---|---|
| | Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type. |

**DESCRIPTION**

Pass

# 10. AC POWER LINE CONDUCTED EMISSION

**LIMITS**

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8

| FREQUENCY (MHz) | Quasi-peak | Average |
|---|---|---|
| 0.15 -0.5 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 56.00 | 46.00 |
| 5.0 -30.0 | 60.00 | 50.00 |

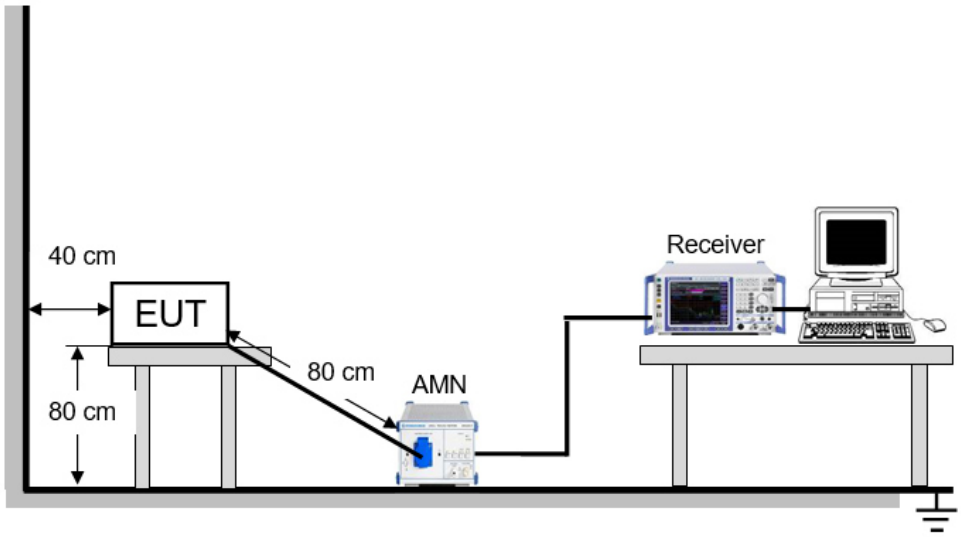
**TEST PROCEDURE**

Refer to ANSI C63.10-2013 clause 6.2.

The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver is used to test the emissions from the AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

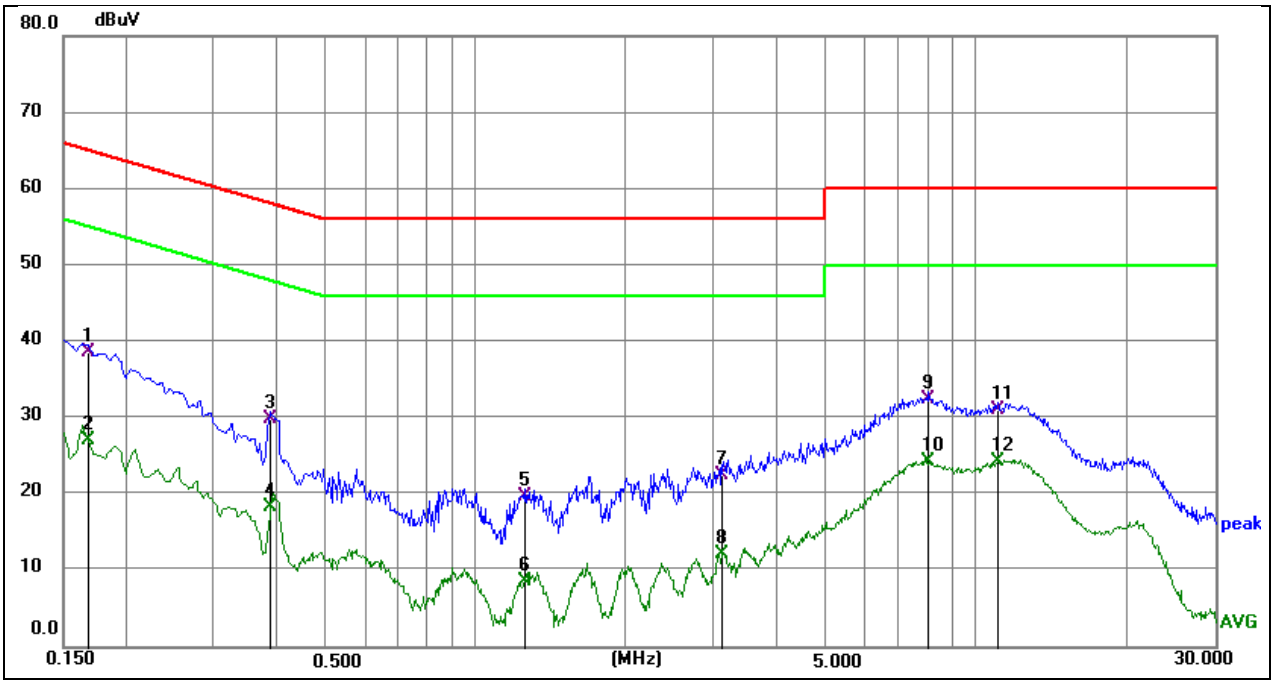
**TEST SETUP**




**TEST ENVIRONMENT**

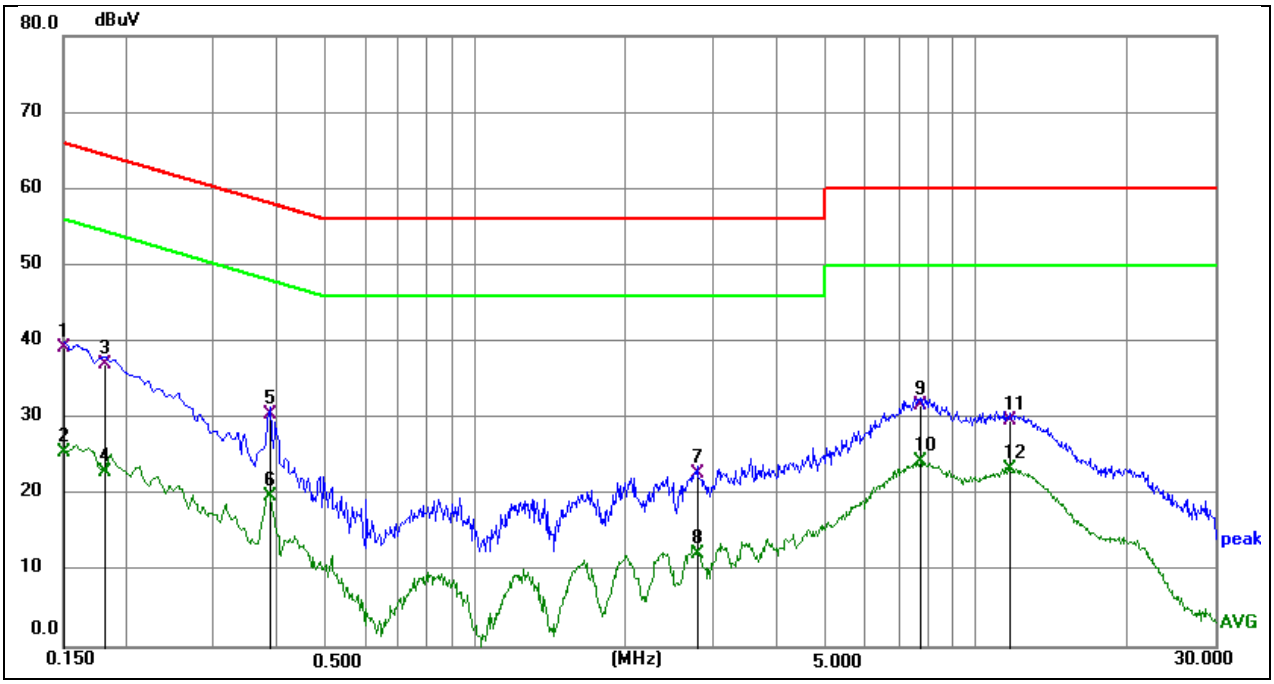
| | | | |
|---|---|---|---|
| Temperature | 22.2℃ | Relative Humidity | 52% |
| Atmosphere Pressure | 101kPa | | |

**TEST RESULTS**




| Phase: L1 | Mode: 2473MHz |
|---|---|

| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.1680 | 28.86 | 9.77 | 38.63 | 65.06 | -26.43 | QP |
| 2 | 0.1680 | 17.27 | 9.77 | 27.04 | 55.06 | -28.02 | AVG |
| 3 | 0.3885 | 20.09 | 9.79 | 29.88 | 58.10 | -28.22 | QP |
| 4 | 0.3885 | 8.57 | 9.79 | 18.36 | 48.10 | -29.74 | AVG |
| 5 | 1.2615 | 9.99 | 9.81 | 19.80 | 56.00 | -36.20 | QP |
| 6 | 1.2615 | -1.15 | 9.81 | 8.66 | 46.00 | -37.34 | AVG |
| 7 | 3.1110 | 12.79 | 9.84 | 22.63 | 56.00 | -33.37 | QP |
| 8 | 3.1110 | 2.32 | 9.84 | 12.16 | 46.00 | -33.84 | AVG |
| 9 | 8.0250 | 22.46 | 10.00 | 32.46 | 60.00 | -27.54 | QP |
| 10 | 8.0250 | 14.22 | 10.00 | 24.22 | 50.00 | -25.78 | AVG |
| 11 | 11.0310 | 20.98 | 10.10 | 31.08 | 60.00 | -28.92 | QP |
| 12 | 11.0310 | 14.20 | 10.10 | 24.30 | 50.00 | -25.70 | AVG |




| Phase: N | Mode: 2473MHz |
|---|---|

| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.1500 | 29.60 | 9.67 | 39.27 | 66.00 | -26.73 | QP |
| 2 | 0.1500 | 15.84 | 9.67 | 25.51 | 56.00 | -30.49 | AVG |
| 3 | 0.1815 | 27.41 | 9.67 | 37.08 | 64.42 | -27.34 | QP |
| 4 | 0.1815 | 13.30 | 9.67 | 22.97 | 54.42 | -31.45 | AVG |
| 5 | 0.3885 | 20.84 | 9.69 | 30.53 | 58.10 | -27.57 | QP |
| 6 | 0.3885 | 10.10 | 9.69 | 19.79 | 48.10 | -28.31 | AVG |
| 7 | 2.7780 | 13.06 | 9.74 | 22.80 | 56.00 | -33.20 | QP |
| 8 | 2.7780 | 2.52 | 9.74 | 12.26 | 46.00 | -33.74 | AVG |
| 9 | 7.7280 | 21.60 | 9.98 | 31.58 | 60.00 | -28.42 | QP |
| 10 | 7.7280 | 14.27 | 9.98 | 24.25 | 50.00 | -25.75 | AVG |
| 11 | 11.7420 | 19.48 | 10.11 | 29.59 | 60.00 | -30.41 | QP |
| 12 | 11.7420 | 13.16 | 10.11 | 23.27 | 50.00 | -26.73 | AVG |

Note: 1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

**END OF REPORT**