# TEST REPORT

## Client Information:

Applicant: SHENZHEN FENGMINGYI TECHNOLOGY CO.,LTD

Applicant add.: 1,3 Buidings,ShengTong Industry Area,ZhangKengJing Village,GuanLan,LongHua District,Shenzhen,China

Manufacturer: SHENZHEN FENGMINGYI TECHNOLOGY CO.,LTD

Manufacturer add.: 1,3 Buidings,ShengTong Industry Area,ZhangKengJing Village,GuanLan,LongHua District,Shenzhen,China

## Product Information:

Product Name: Portable Speaker

Model No.: P172

Brand Name: N/A

FCC ID: 2ASLD-P172

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

## Prepared By:

**Dongguan Yaxu (AiT) Technology Limited**

No.22, Jinqianling 3rd Street, Jitigang, Huangjiang,Dongguan, Guangdong, China

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Date of Receipt: Mar. 24, 2025 Date of Test: Mar. 24, 2025~Apr. 06, 2025

Date of Issue: Apr. 07, 2025 Test Result: Pass

This device described above has been tested by Dongguan Yaxu (AiT) Technology Limited and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Reviewed by:** Emiya Lin
Emiya Lin

**Approved by:** Simba Huang
Simba Huang

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**REPORT REVISE RECORD**

| Report Version | Revise Time | Issued Date | Valid Version | Notes |
|---|---|---|---|---|
| V1.0 | / | Apr. 07, 2025 | Valid | Initial release |

# 2 Test Summary

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| Maximum Conducted Output Power | §15.247(b) | Pass |
| 20dB Bandwidth | §15.247(a) | Pass |
| Frequency Separation | §15.247(a) | Pass |
| Number Of Hopping Frequency | §15.247(a) | Pass |
| Time Of Occupancy (Dwell Time) | §15.247(a) | Pass |
| Conducted Spurious Emissions and Band Edges Emissions | §15.205, §15.247(d) | Pass |
| Radiated Spurious Emissions | §15.209, §15.247(d) | Pass |
| Emissions at Restricted Band | §15.205 | Pass |
| AC Mains Conducted Emissions | §15.207(a) | Pass |
| Antenna Requirements | §15.203 | Pass |

*Note*

1. *Test according to ANSI C63.10:2013 and RSS-Gen.*
2. *The measurement uncertainty is not included in the test result.*
3. *Test results in other test report (RF Exposure Evaluation Report)*

## 2.1 Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the AiT quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

## 2.2 Measurement Uncertainty

| Test Item | Frequency Range | Measurement Uncertainty | Notes |
|---|---|---|---|
| Radiated Emission | 0.009MHz-30MHz | 3.10dB | (1) |
| Radiated Emission | 30MHz-1GHz | 3.75dB | (1) |
| Radiated Emission | 1GHz-18GHz | 3.88dB | (1) |
| Radiated Emission | 18GHz-40GHz | 3.88dB | (1) |
| AC Power Line Conducted Emission | 0.15MHz ~ 30MHz | 1.20dB | (1) |
| Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%. | | | |

# 3 Test Facility

**The test facility is recognized, certified or accredited by the following organizations:**

**.CNAS- Registration No: L6177**

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2017 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on April 18, 2022

**FCC-Registration No.: 703111 Designation Number: CN1313**

Dongguan Yaxu (AiT) technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

**IC —Registration No.: 6819A CAB identifier: CN0122**

The 3m Semi-anechoic chamber of Dongguan Yaxu (AiT) technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 6819A

**A2LA-Lab Cert. No.: 6317.01**

Dongguan Yaxu (AiT) technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

## 3.1 Deviation from standard

None

## 3.2 Abnormalities from standard conditions

None

## 3.3 Test Location

**Dongguan Yaxu (AiT) Technology Limited**

Address: No.22, Jinqianling 3rd Street, Jitigang, Huangjiang,Dongguan, Guangdong, China

Tel.: +86-769-8202 0499

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# 4 General Information

| | |
|---|---|
| EUT Name: | Portable Speaker |
| Model No: | P172 |
| Serial Model: | N/A |
| Test sample(s) ID: | AiTDG-250324002-1 |
| Sample(s) Status: | Engineer sample |
| Serial No.: | N/A |
| Operation frequency: | 2402MHz-2480MHz |
| Channel Number: | 79 Channels |
| Channel separation: | 1MHz |
| Modulation Technology: | GFSK, π/4-DQPSK, 8-DPSK |
| Antenna Type: | PCB Antenna |
| Antenna gain: | -0.58dBi |
| Hardware version.: | N/A |
| Software version.: | N/A |
| Power supply: | DC 5.0V from adapter and DC 3.7V from battery |
| Battery: | DC 3.7V 2400mAh 8.88Wh |
| Model different: | N/A |
| Note: | For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. |

## 4.1 Test frequencies

EUT channels and frequencies list:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 00 | 2402 | 27 | 2429 | 54 | 2456 |
| 01 | 2403 | 28 | 2430 | 55 | 2457 |
| 02 | 2404 | 29 | 2431 | 56 | 2458 |
| 03 | 2405 | 30 | 2432 | 57 | 2459 |
| 04 | 2406 | 31 | 2433 | 58 | 2460 |
| 05 | 2407 | 32 | 2434 | 59 | 2461 |
| 06 | 2408 | 33 | 2435 | 60 | 2462 |
| 07 | 2409 | 34 | 2436 | 61 | 2463 |
| 08 | 2410 | 35 | 2437 | 62 | 2464 |
| 09 | 2411 | 36 | 2438 | 63 | 2465 |
| 10 | 2412 | 37 | 2439 | 64 | 2466 |
| 11 | 2413 | 38 | 2440 | 65 | 2467 |
| 12 | 2414 | 39 | 2441 | 66 | 2468 |
| 13 | 2415 | 40 | 2442 | 67 | 2469 |
| 14 | 2416 | 41 | 2443 | 68 | 2470 |
| 15 | 2417 | 42 | 2444 | 69 | 2471 |
| 16 | 2418 | 43 | 2445 | 70 | 2472 |
| 17 | 2419 | 44 | 2446 | 71 | 2473 |
| 18 | 2420 | 45 | 2447 | 72 | 2474 |
| 19 | 2421 | 46 | 2448 | 73 | 2475 |
| 20 | 2422 | 47 | 2449 | 74 | 2476 |
| 21 | 2423 | 48 | 2450 | 75 | 2477 |
| 22 | 2424 | 49 | 2451 | 76 | 2478 |
| 23 | 2425 | 50 | 2452 | 77 | 2479 |
| 24 | 2426 | 51 | 2453 | 78 | 2480 |
| 25 | 2427 | 52 | 2454 | -- | -- |
| 26 | 2428 | 53 | 2455 | -- | -- |

## 4.2 EUT Peripheral List

| No. | Equipment | Manufacturer | Model No. | Serial No. | Power cord | Signal cord |
|---|---|---|---|---|---|---|
| 1 | N/A | N/A | N/A | N/A | N/A | N/A |

## 4.3 Test Peripheral List

| No. | Equipment | Manufacturer | Model No. | Serial No. | Power cord | Signal cord |
|---|---|---|---|---|---|---|
| 1 | Adapter | NOKIA | AD-10WU | N/A | N/A | N/A |

## 4.4 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR PART 15C 15.207, 15.209, 15.247 and DA 00-705.

**EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

**EUT Exercise**

The EUT was operated in the normal operating mode for Hopping Numbers and Dwell Time test and a continuous transmits mode for other tests.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209, 15.247, ANSI C63.10-2013 under the FCC Rules Part 15 Subpart C

**General Test Procedures**

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013.

## 4.5 Description of Test Modes

The EUT has been tested under operating condition.

AC main conducted emission pre-test voltage at both AC 120V/60Hz and AC 240V/50Hz, recorded worst case;

AC main conducted emission pre-test at charge from power adapter modes, recorded worst case;

Worst-case mode and channel used for 150 KHz-30 MHz power line conducted emissions was the mode and channel with the highest output power that was determined to be TX (3Mbps-Middle Channel).

Worst-case mode and channel used for 9 KHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be TX(3Mbps-Middle Channel).

This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position.

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Transmitting mode | Keep the EUT in continuously transmitting mode. | | |
|---|---|---|---|
| Test software: | FCC_assist_1.0.2.2 | | |
| Frequency | 2402 MHz | 2441 MHz | 2480 MHz |
| Parameters(1Mbps) | 10 | 10 | 10 |
| Parameters(2Mbps) | 10 | 10 | 10 |
| Parameters(3Mbps) | 10 | 10 | 10 |

# 5 Equipment Used during Test

| No | Test Equipment | Manufacturer | Model No | Serial No | Cal. Date | Cal. Due Date |
|---|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | R&S | FSV40 | 101470 | 2024.09.23 | 2025.09.22 |
| 2 | EMI Measuring Receiver | R&S | ESR | 101660 | 2024.09.23 | 2025.09.22 |
| 3 | Low Noise Pre Amplifier | HP | HP8447E | 1937A01855 | 2024.09.23 | 2025.09.22 |
| 4 | Low Noise Pre Amplifier | Tsj | MLA-0120-A02-34 | 2648A04738 | 2024.09.23 | 2025.09.22 |
| 5 | Passive Loop | ETS | 6512 | 00165355 | 2024.09.04 | 2026.09.03 |
| 6 | TRILOG Super Broadband test Antenna | SCHWARZBECK | VULB9160 | 9160-3206 | 2024.08.29 | 2026.08.28 |
| 7 | Broadband Horn Antenna | SCHWARZBECK | BBHA9120D | 452 | 2024.08.29 | 2026.08.28 |
| 8 | SHF-EHF Horn Antenna 15-40GHz | SCHWARZBECK | BBHA9170 | BBHA9170367d | 2023.09.12 | 2026.09.11 |
| 9 | EMI Test Receiver | R&S | ESCI | 100124 | 2024.09.23 | 2025.09.22 |
| 10 | LISN | R&S | ESH3-Z5 | 892785/016 | 2024.09.23 | 2025.09.22 |
| 11 | Pro.Temp&Humi.chamber | MENTEK | MHP-150-1C | MAA08112501 | 2024.09.23 | 2025.09.22 |
| 12 | RF Automatic Test system | MW | MW100-RFCB | 21033016 | 2024.09.23 | 2025.09.22 |
| 13 | Signal Generator | Agilent | N5182A | MY50143009 | 2024.09.23 | 2025.09.22 |
| 14 | Wideband Radio communication tester | R&S | CMW500 | 1201.0002K50 | 2024.09.23 | 2025.09.22 |
| 15 | RF Automatic Test system | MW | MW100-RFCB | 21033016 | 2024.09.23 | 2025.09.22 |
| 16 | Pulse Limiter | R&S | ESH3-Z2 | 03578810.54 | 2024.09.23 | 2025.09.22 |
| 17 | Switch | MFJ Rhinos | MFJ-2702 | CZ3457 | 2024.09.23 | 2025.09.22 |
| 18 | DC power supply | ZHAOXIN | RXN-305D-2 | 28070002559 | N/A | N/A |
| 19 | RE Software | EZ | EZ-EMC_RE | Ver.AIT-03A | N/A | N/A |
| 20 | CE Software | EZ | EZ-EMC_CE | Ver.AIT-03A | N/A | N/A |
| 21 | RF Software | MW | MTS 8310 | 2.0.0.0 | N/A | N/A |
| 22 | temporary antenna connector(Note) | NTS | R001 | N/A | N/A | N/A |

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

# 6 Test results and Measurement Data

## 6.1 Antenna requirement

| 6.1.1 Standard requirement: |
|---|
| 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 re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.<br>And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi. |
| **6.1.2 EUT Antenna:** |
| *Refer to Section 4(General Information)* |

## 6.2 Peak Power Measurement

### 6.2.1 Standard requirement:

According to §15.247(b)(1), For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

### 6.2.2 Measuring Instruments:

Please refer to equipment's list in this report.

### 6.2.3 Test Procedures:

The transmitter output (antenna port) was connected to the spectrum analyzer. According to ANSI C63.10:2013 Output power test procedure for frequency-hopping spread-spectrum (FHSS) devices; this is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

a) Use the following spectrum analyzer settings:

1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.

2) RBW > 20 dB bandwidth of the emission being measured.

3) VBW ≥ RBW.

4) Sweep: Auto.

5) Detector function: Peak.

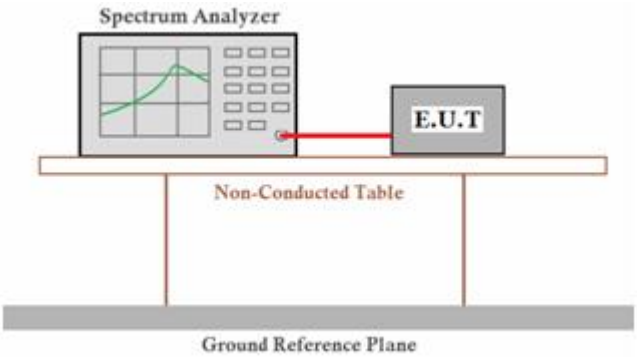
6) Trace: Max hold.

b) Allow trace to stabilize.

c) Use the marker-to-peak function to set the marker to the peak of the emission.

d) The indicated level is the peak output power, after any corrections for external attenuators and cables.

### 6.2.4 Test Setup Layout




### 6.2.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 6.2.6 Test result

*Please refer to Appendix A.2*

*Remark:*

1. *Test results including cable loss;*
2. *Measured output power at difference Packet Type for each mode and recorded worst case for each mode.*

## 6.3 Frequency Separation and 20 dB Bandwidth

### 6.3.1 Standard requirement:

According to §15.247(a) (1), 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, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

### 6.3.2 Measuring Instruments:

Please refer to equipment's list in this report.

### 6.3.3 Test Procedures

Frequency separation test procedure：

1). Place the EUT on the table and set it in transmitting mode.

2). Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set center frequency of Spectrum Analyzer = middle of hopping channel.

4). Set the Spectrum Analyzer as RBW = 30 kHz, VBW =100 kHz, Span = wide enough to capture the peaks of two adjacent channels, Sweep = auto.

5). Max hold, mark 2 peaks of hopping channel and record the 2 peaks frequency.

20dB bandwidth test procedure：

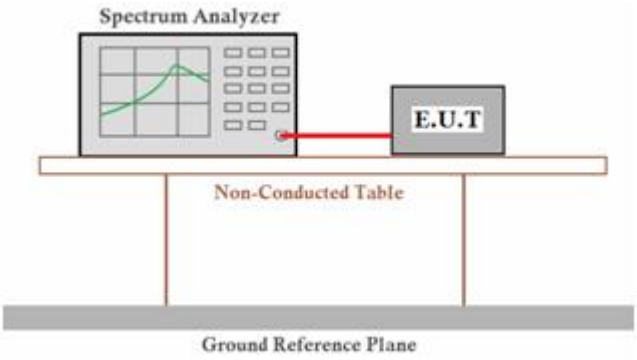
1). Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel.

2). RBW ≥1% of the 20 dB bandwidth, VBW ≥RBW.

3). Detector function = peak.

4). Trace = max hold.

### 6.3.4 Test Setup Layout




### 6.3.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 6.3.6 Test result

*PASS*

*Please refer to Appendix A.3 for 20 dB bandwidth*

*Please refer to Appendix A.4 for Frequency separation*

*Remark:*

*1). Test results including cable loss;*

*2). Measured at difference Packet Type for each mode and recorded worst case for each mode.*

## 6.4 Number of Hopping Frequency

### 6.4.1 Standard requirement:

According to §15.247(a)(1)(ii), Frequency hopping systems operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels.

### 6.4.2 Measuring Instruments and Setting:

Please refer to equipment's list in this report.

### 6.4.3 Test Procedures

1). Place the EUT on the table and set it in transmitting mode.

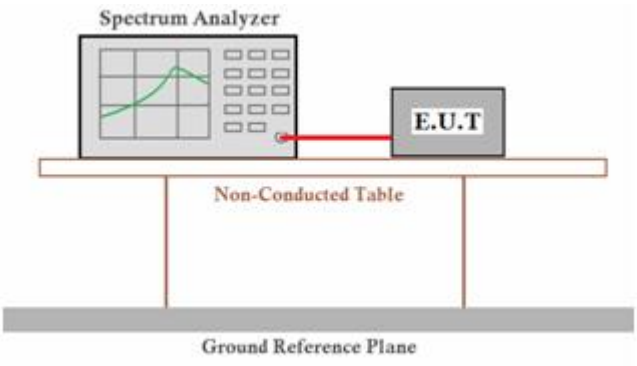
2). Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set Spectrum Analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.

4). Set the Spectrum Analyzer as RBW/VBW=100KHz/300KHz.

5). Max hold, view and count how many channel in the band.

### 6.4.4 Test Setup Layout




### 6.4.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 6.4.6 Test result

*PASS*

*Please refer to Appendix A.5*

*Remark:*

*1). Test results including cable loss;*

*2). Measured at difference Packet Type for each mode and recorded worst case for each mode.*

## 6.5 Time of Occupancy (Dwell Time)

### 6.5.1 Standard requirement:

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz- 2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

### 6.5.2 Measuring Instruments and Setting:

Please refer to equipment's list in this report. The following table is the setting of Spectrum Analyzer.

### 6.5.3 Test Procedures

1). Place the EUT on the table and set it in transmitting mode.

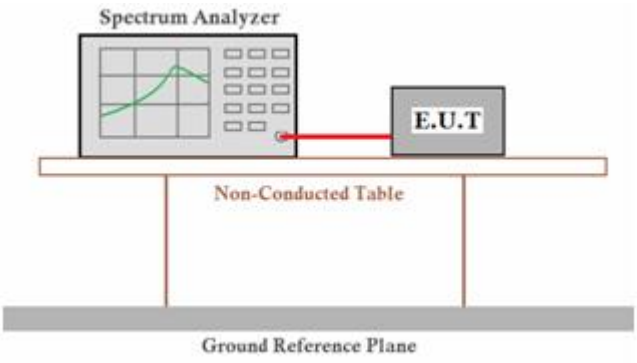
2). Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set center frequency of Spectrum Analyzer = operating frequency.

4). Set the Spectrum Analyzer as RBW=1MHz, VBW=3MHz, Span = 0Hz, Sweep = auto.

5). Repeat above procedures until all frequency measured was complete.

### 6.5.4 Test Setup Layout




### 6.5.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 6.5.6 Test result

*PASS*

*Please refer to Appendix A.6*

*Remark:*

*1). Test results including cable loss;*

*2). Measured at difference Packet Type for each mode and recorded worst case for each mode.*

*3). 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 [ms/hop/ch], which is directly measured, refers to the duration on one channel hop.*

*The hops per second for all channels: The selected EUT Conf uses a slot type of 5-Tx&1-Rx and a hopping rate of 1600 [ch*hop/s] for all channels. So the final hopping rate for all channels is 1600/6=266.67 [ch*hop/s]*

*The hops per second on one channel: 266.67 [ch*hops/s]/79 [ch]=3.38 [hop/s];*

*The total hops for all channels within the dwell time calculation duration: 3.38 [hop/s]*31.6[s*ch]=106.67 [hop*ch];*

*The dwell time for all channels hopping: 106.67 [hop*ch]*Burst Width [ms/hop/ch].*

*Dwell Time Calculate formula:*

*DH1: Dwell time=Pulse time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second*

*DH3: Dwell time=Pulse time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second*

*DH5: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second*

*4). Measured at low, middle and high channel, recorded the worst case.*

*5). Only Recorded DH5.*

## 6.6 Conducted Spurious Emissions and Band Edges Test

### 6.6.1 Standard requirement:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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. Attenuation below the general limits specified in Section 15.209(a) is not required.

### 6.6.2 Measuring Instruments and Setting:

Please refer to equipment list in this report. The following table is the setting of the spectrum analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Detector | Peak |
| Attenuation | Auto |
| RB / VB (Emission in restricted band) | 100KHz/300KHz |
| RB / VB (Emission in non-restricted band) | 100KHz/300KHz |

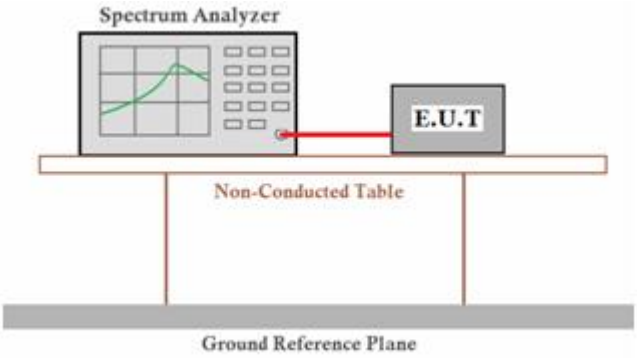
### 6.6.3 Test Procedures

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 300 KHz.

Measurements are made over the 9kHz to 25GHz range with the transmitter set to the lowest, middle, and highest channels.

### 6.6.4 Test Setup Layout




### 6.6.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 6.6.6 Test result

*PASS*

No non-compliance noted. Only record the worst test result in this report. The test data refer to the following page.

*PASS*

*Please refer to Appendix A.7 for conducted spurious emission.*

*Please refer to Appendix A.8 for conducted band edge.*

*Remark:*

1. *Test results including cable loss;*
2. *Measured at difference Packet Type for each mode and recorded worst case for each mode. Worst case data at DH5 for GFSK, 2DH5 for π/4-DQPSK and 3DH5 for 8DPSK modulation type;*
3. *"---"means that the fundamental frequency not for 15.209 limits requirement.*

*Not recorded emission from 9 KHz to 30 MHz as emission level at least 20dBc lower than emission limit.*

## 6.7 Restrict-band Band-edge Measurements

### 6.7.1 Standard requirement:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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 the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### 6.7.2 Measuring Instruments:

Please refer to equipment list in this report.

### 6.7.3 Test Procedures

According to KDB 412172 section 1.1 Field Strength Approach (linear terms):

$$eirp = p_t \times g_t = (E \times d)^2/30$$

Where:

$p_t$ = transmitter output power in watts,

$g_t$ = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m,

d = measurement distance in meters (m).

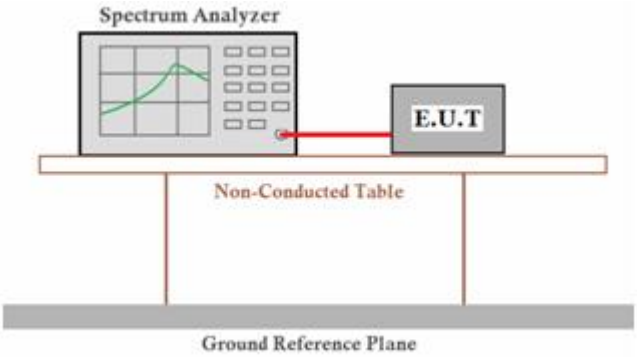
$$erp = eirp/1.64 = (E \times d)^2/(30 \times 1.64)$$

Where all terms are as previously defined.

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=1/T for AV detector.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.
6. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
7. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)

8. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
9. For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
10. Compare the resultant electric field strength level to the applicable regulatory limit.
11. Perform radiated spurious emission test duress until all measured frequencies were complete.

### 6.7.4 Test Setup Layout




### 6.7.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 6.7.6 Test result

*PASS*

*Please refer to Appendix A.9*

*Remark:*

1. *Measured at difference Packet Type for each mode and recorded worst case for each mode.*
2. *Worst case data at DH5 for GFSK, 2DH5 for π/4DQPSK modulation type;*
3. *Measured at Hopping and Non-Hopping mode, recorded worst at Non-Hopping mode.*
4. *The other emission levels were very low against the limit.*
5. *The average measurement was not performed when the peak measured data under the limit of average detection.*
6. *Detector AV is setting spectrum/receiver. RBW=1MHz/VBW=330Hz/Sweep time=Auto/Detector=Peak;*

*Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.*

## 6.8 Radiated Emissions Measurement

### 6.8.1 Standard requirement:

According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

I

| Frequencies (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 |
| 30~88 | 100 | 3 |
| 88~216 | 150 | 3 |
| 216~960 | 200 | 3 |
| Above 960 | 500 | 3 |

### 6.8.2 Measuring Instruments and Setting:

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | $10^{th}$ carrier harmonic |
| RB / VB (Emission in restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average |
| RB / VB (Emission in non-restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average |

| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG |
| Start ~ Stop Frequency | 150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB/VB 120kHz/1MHz for QP |

### 6.8.3 Test Procedures

**1) Sequence of testing 9 kHz to 30 MHz**

**Setup:**

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

**Premeasurement:**

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna height is 1.5 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

**Final measurement:**

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

**2) Sequence of testing 30 MHz to 1 GHz**

**Setup:**

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

**Premeasurement:**

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

**Final measurement:**

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

**3) Sequence of testing 1 GHz to 18 GHz**

**Setup:**

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

**Premeasurement:**

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

**Final measurement:**

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

**4) Sequence of testing above 18 GHz**

**Setup:**

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

**Premeasurement:**

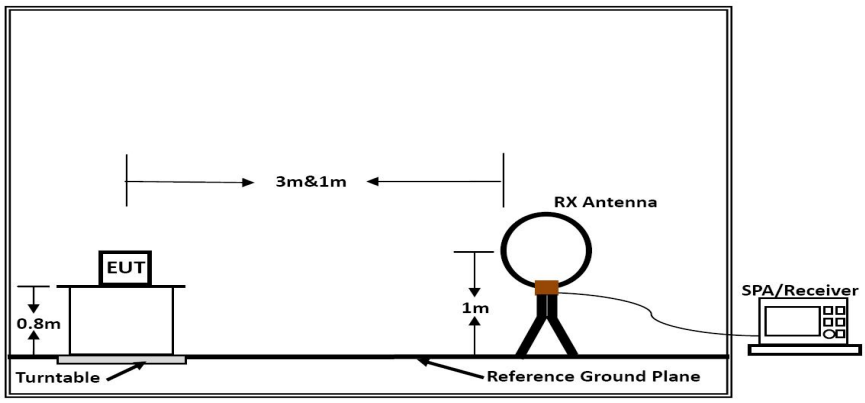
--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

**Final measurement:**

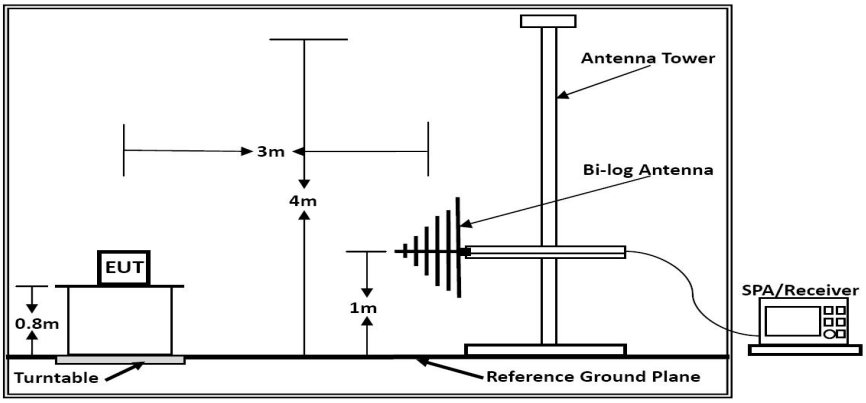
--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

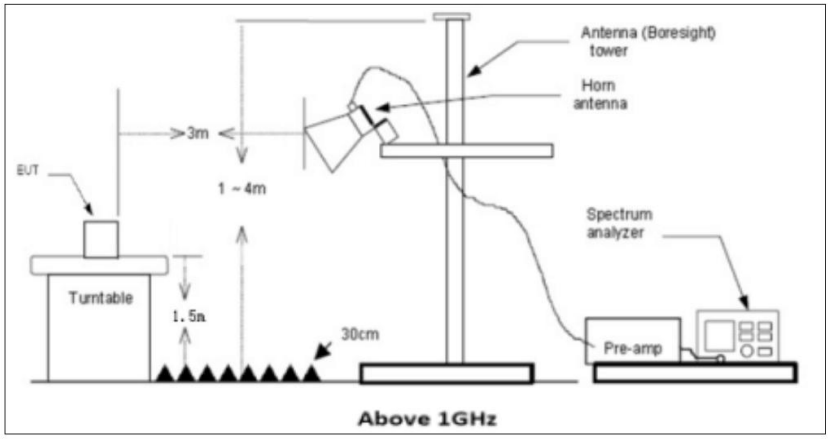
### 6.8.4 Test Setup Layout




Below 30MHz




Below 1GHz




Above 1GHz

Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

### 6.8.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 6.8.6 Test result

.

| | | | |
|---|---|---|---|
| Temperature | 25.5℃ | Humidity | 52.2% |
| Test Engineer | Emiya Lin | Configurations | BT |

*Remarks:*

1. *Only the worst case Main Antenna test data.*
2. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

■ **Results of Radiated Emissions (9 KHz~30MHz)**

| Freq. (MHz) | Level (dBuV) | Over Limit (dB) | Over Limit (dBuV) | Remark |
|---|---|---|---|---|
| - | - | - | - | See Note |

Note:

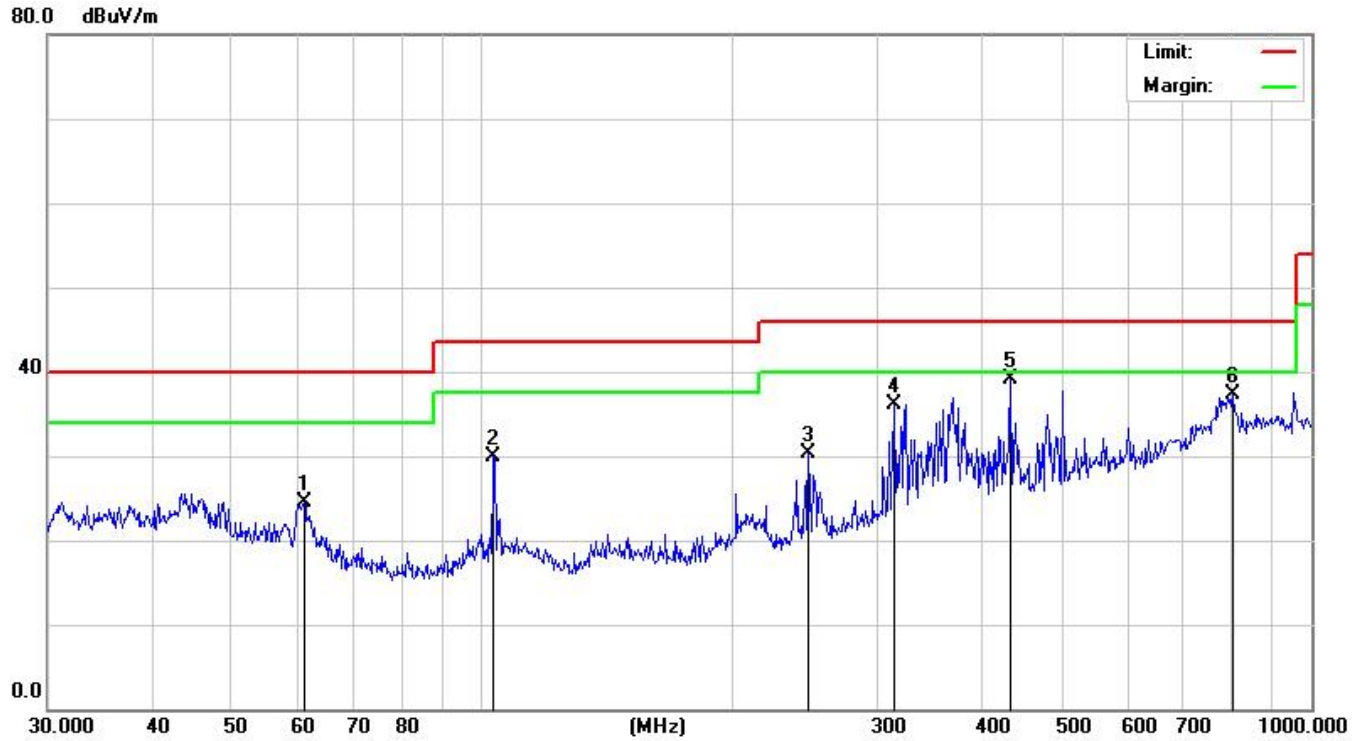
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
Limit line = specific limits (dBuV) + distance extrapolation factor.

■ **Results of Radiated Emissions (30MHz~1GHz)**

Pre-scan all test modes, found worst case at 8DPSK (MCH), and so only show the test result of 8DPSK (MCH).

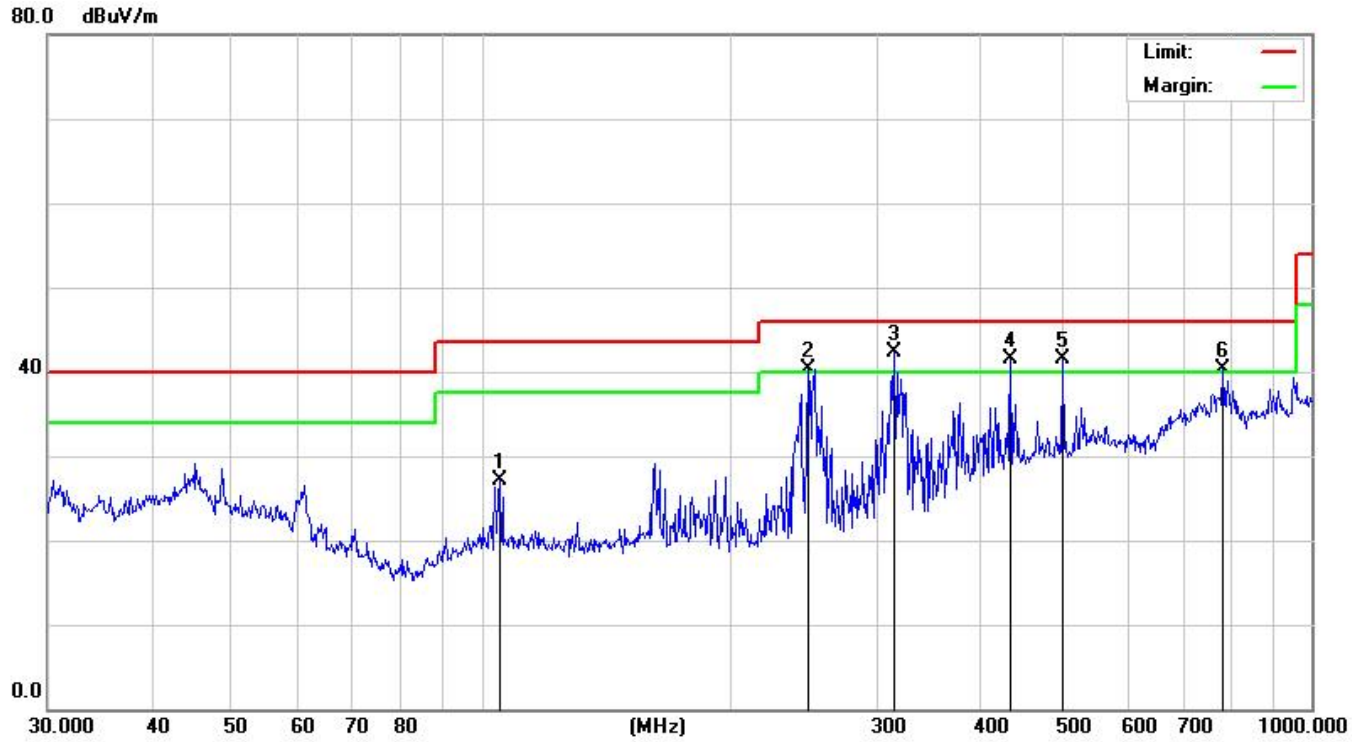
| Model name: | P172 | Test Date : | 2025-03-29 |
|---|---|---|---|
| Polarization : | Vertical | Test Result: | ☒ Pass ☐ Fail |




Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Measurement Result=Reading Level +Correct Factor;
Over Limit= Measurement Result- Limit;

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 61.1316 | 26.31 | -1.86 | 24.45 | 40.00 | -15.55 | QP |
| 2 | | 103.4421 | 32.10 | -2.19 | 29.91 | 43.50 | -13.59 | QP |
| 3 | | 247.6819 | 30.77 | -0.46 | 30.31 | 46.00 | -15.69 | QP |
| 4 | | 314.3765 | 33.49 | 2.69 | 36.18 | 46.00 | -9.82 | QP |
| 5 | * | 434.0651 | 34.27 | 4.83 | 39.10 | 46.00 | -6.90 | QP |
| 6 | | 804.6028 | 24.57 | 12.81 | 37.38 | 46.00 | -8.62 | QP |

| | | | |
|---|---|---|---|
| Model name: | P172 | Test Date : | 2025-03-29 |
| Polarization : | Horizontal | Test Result: | ☒ Pass ☐ Fail |




Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Measurement Result=Reading Level +Correct Factor;
Over Limit= Measurement Result- Limit;

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 105.2718 | 28.35 | -1.33 | 27.02 | 43.50 | -16.48 | QP |
| 2 | ! | 247.6819 | 40.74 | -0.46 | 40.28 | 46.00 | -5.72 | QP |
| 3 | * | 314.3765 | 40.54 | 1.86 | 42.40 | 46.00 | -3.60 | QP |
| 4 | ! | 434.0651 | 34.10 | 7.41 | 41.51 | 46.00 | -4.49 | QP |
| 5 | ! | 501.1790 | 33.02 | 8.44 | 41.46 | 46.00 | -4.54 | QP |
| 6 | ! | 782.3453 | 27.60 | 12.76 | 40.36 | 46.00 | -5.64 | QP |

**Results for Radiated Emissions (1- 26 GHz)**

| Test channel: | Lowest channel |
|---|---|

H

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB/m) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 4804.000 | 47.63 | 5.06 | 52.69 | 74.00 | -21.31 | PEAK |
| 4804.000 | 34.71 | 5.06 | 39.77 | 54.00 | -14.23 | AVG |
| 7206.000 | 43.29 | 7.03 | 50.32 | 74.00 | -23.68 | PEAK |
| 7206.000 | 31.32 | 7.03 | 38.35 | 54.00 | -15.65 | AVG |

V

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 4804.000 | 45.91 | 5.06 | 50.97 | 74.00 | -23.03 | PEAK |
| 4804.000 | 35.64 | 5.06 | 40.70 | 54.00 | -13.30 | AVG |
| 7206.000 | 42.00 | 7.03 | 49.03 | 74.00 | -24.97 | PEAK |
| 7206.000 | 31.00 | 7.03 | 38.03 | 54.00 | -15.97 | AVG |

| Test channel: | Middle channel |
|---|---|

H

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB/m) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 4882.000 | 47.18 | 5.14 | 52.32 | 74.00 | -21.68 | PEAK |
| 4882.000 | 35.96 | 5.14 | 41.10 | 54.00 | -12.90 | AVG |
| 7323.000 | 41.35 | 7.52 | 48.87 | 74.00 | -25.13 | PEAK |
| 7323.000 | 30.39 | 7.52 | 37.91 | 54.00 | -16.09 | AVG |

V

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 4882.000 | 44.28 | 5.14 | 49.42 | 74.00 | -24.58 | PEAK |
| 4882.000 | 33.37 | 5.14 | 38.51 | 54.00 | -15.49 | AVG |
| 7323.000 | 41.21 | 7.52 | 48.73 | 74.00 | -25.27 | PEAK |
| 7323.000 | 29.36 | 7.52 | 36.88 | 54.00 | -17.12 | AVG |

| Test channel: | Highest channel |
|---|---|

H

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB/m) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 4960.000 | 45.09 | 5.22 | 50.31 | 74.00 | -23.69 | PEAK |
| 4960.000 | 36.61 | 5.22 | 41.83 | 54.00 | -12.17 | AVG |
| 7440.000 | 39.45 | 8.06 | 47.51 | 74.00 | -26.49 | PEAK |
| 7440.000 | 30.95 | 8.06 | 39.01 | 54.00 | -14.99 | AVG |

V

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 4960.000 | 43.85 | 5.22 | 49.07 | 74.00 | -24.93 | PEAK |
| 4960.000 | 34.05 | 5.22 | 39.27 | 54.00 | -14.73 | AVG |
| 7440.000 | 40.14 | 8.06 | 48.20 | 74.00 | -25.80 | PEAK |
| 7440.000 | 31.30 | 8.06 | 39.36 | 54.00 | -14.64 | AVG |

*Remarks:*

*1). Measuring frequencies from 9 KHz - 10th harmonic or 26.5GHz (which is less), No emission found between lowest internal used/generated frequency to 30MHz.*
2). Radiated emissions *measured in frequency range from 9 KHz~10th harmonic or 26.5GHz (which is less) were made with an instrument using Peak detector mode.*
*3). Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
*4). Margin= Final Level – Limit*
*5).Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
*6). All the modes have been tested and the only shows the worst case 8DPSK mode*

## 6.9 Conducted Emissions

### 6.9.1 Standard requirement:

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

| Frequency Range (MHz) | Limits (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

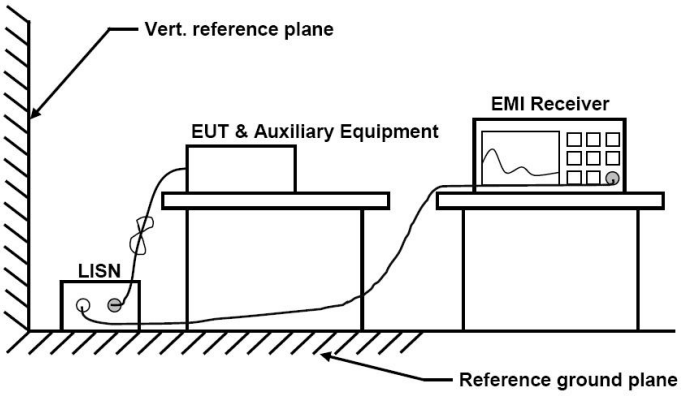
* Decreasing linearly with the logarithm of the frequency

### 6.9.2 Test Procedures

The transmitter output is connected to EMI receiver. The resolution bandwidth is set to 9 kHz. The video bandwidth is set to 30 kHz, Sweep time=Auto

The spectrum from 150 kHz to 30MHz is investigated with the transmitter set to the lowest, middle, and highest channels.

### 6.9.3 Test Setup Layout




### 6.9.4 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 6.9.5 Test result

PASS

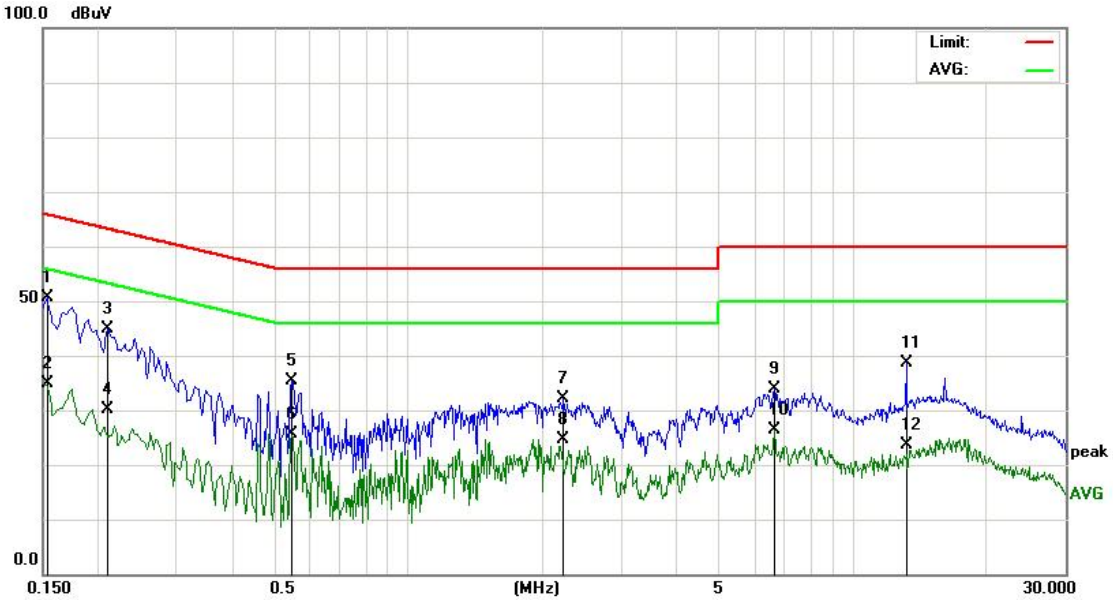
The test data please refer to following page.

| | | | |
|---|---|---|---|
| Temperature | 25.5℃ | Humidity | 52.2% |
| Test Engineer | Emiya Lin | Configurations | BT |

**Measurement data:**

Pre-scan all test modes, found worst case at 8DPSK (MCH), and so only show the test result of 8DPSK (MCH).

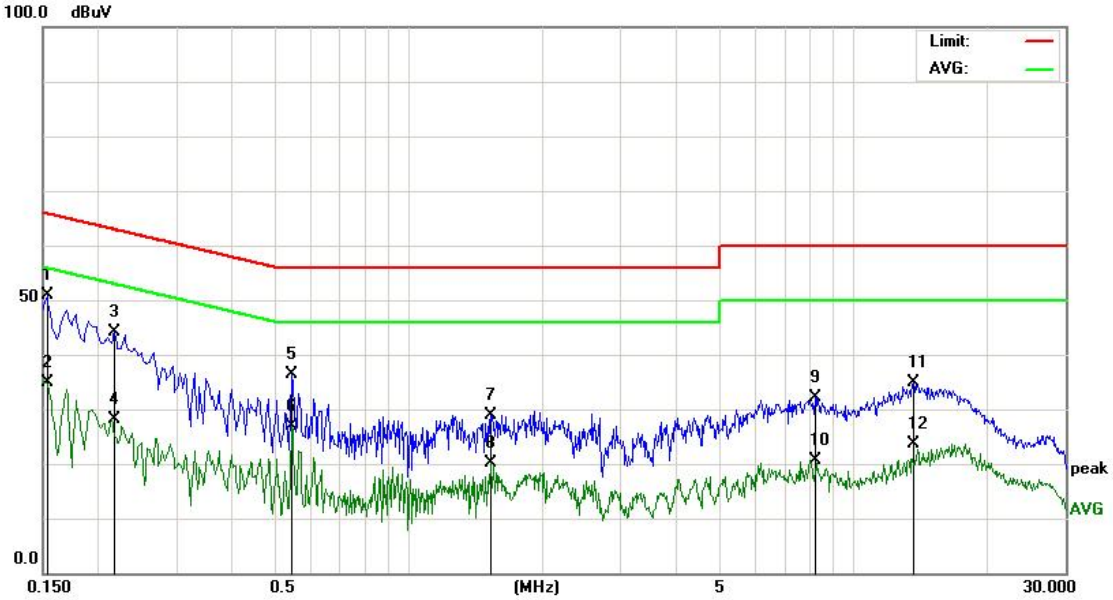
| | | | |
|---|---|---|---|
| Model name: | P172 | Test Date : | 2025-03-29 |
| ATM Pressure: | 101 kPa | Test by: | Emiya Lin |
| Phase : | Line | Test Result: | ☒ Pass ☐ Fail |




Remark: Factor =insertion loss of LISN + Cable loss +insertion loss of Pulse Limiter +insertion loss of Switch.
Measurement Result=Reading Level +Correct Factor;
Over Limit= Measurement Result- Limit;

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | * | 0.1539 | 38.77 | 11.84 | 50.61 | 65.78 | -15.17 | QP |
| 2 | | 0.1539 | 23.03 | 11.84 | 34.87 | 55.78 | -20.91 | AVG |
| 3 | | 0.2100 | 33.86 | 11.06 | 44.92 | 63.20 | -18.28 | QP |
| 4 | | 0.2100 | 19.15 | 11.06 | 30.21 | 53.20 | -22.99 | AVG |
| 5 | | 0.5460 | 25.47 | 10.00 | 35.47 | 56.00 | -20.53 | QP |
| 6 | | 0.5460 | 15.66 | 10.00 | 25.66 | 46.00 | -20.34 | AVG |
| 7 | | 2.2260 | 22.04 | 10.00 | 32.04 | 56.00 | -23.96 | QP |
| 8 | | 2.2260 | 14.62 | 10.00 | 24.62 | 46.00 | -21.38 | AVG |
| 9 | | 6.6380 | 23.63 | 10.15 | 33.78 | 60.00 | -26.22 | QP |
| 10 | | 6.6380 | 16.24 | 10.15 | 26.39 | 50.00 | -23.61 | AVG |
| 11 | | 13.1460 | 37.16 | 1.36 | 38.52 | 60.00 | -21.48 | QP |
| 12 | | 13.1460 | 22.21 | 1.36 | 23.57 | 50.00 | -26.43 | AVG |

| | | | |
|---|---|---|---|
| Model name: | P172 | Test Date : | 2025-03-29 |
| ATM Pressure: | 101 kPa | Test by: | Emiya Lin |
| Phase : | Neutral | Test Result: | ☒ Pass ☐ Fail |




Remark: Factor =insertion loss of LISN + Cable loss +insertion loss of Pulse Limiter +insertion loss of Switch.
Measurement Result=Reading Level +Correct Factor;
Over Limit= Measurement Result- Limit;

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | * | 0.1539 | 38.96 | 11.84 | 50.80 | 65.78 | -14.98 | QP |
| 2 | | 0.1539 | 23.16 | 11.84 | 35.00 | 55.78 | -20.78 | AVG |
| 3 | | 0.2180 | 33.21 | 11.00 | 44.21 | 62.89 | -18.68 | QP |
| 4 | | 0.2180 | 17.10 | 11.00 | 28.10 | 52.89 | -24.79 | AVG |
| 5 | | 0.5460 | 26.42 | 10.00 | 36.42 | 56.00 | -19.58 | QP |
| 6 | | 0.5460 | 16.91 | 10.00 | 26.91 | 46.00 | -19.09 | AVG |
| 7 | | 1.5339 | 18.99 | 9.97 | 28.96 | 56.00 | -27.04 | QP |
| 8 | | 1.5339 | 10.13 | 9.97 | 20.10 | 46.00 | -25.90 | AVG |
| 9 | | 8.2260 | 22.05 | 10.19 | 32.24 | 60.00 | -27.76 | QP |
| 10 | | 8.2260 | 10.35 | 10.19 | 20.54 | 50.00 | -29.46 | AVG |
| 11 | | 13.6300 | 33.40 | 1.37 | 34.77 | 60.00 | -25.23 | QP |
| 12 | | 13.6300 | 22.30 | 1.37 | 23.67 | 50.00 | -26.33 | AVG |

*Notes:*

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

## 6.10 Pseudorandom frequency hopping sequence

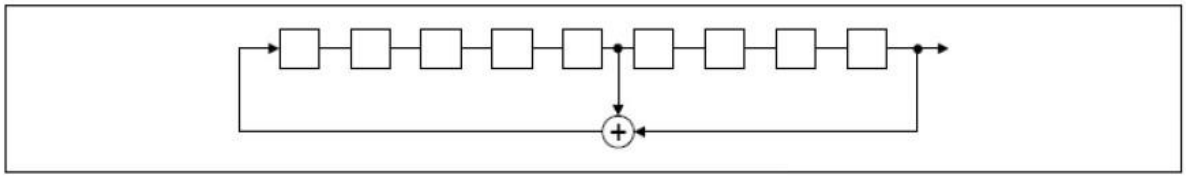
For 47 CFR Part 15C sections §15.247(a)(1) or RSS-247§5.1 requirement:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hop-ping 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, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hop-ping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

EUT Pseudorandom Frequency Hopping Sequence Requirement:

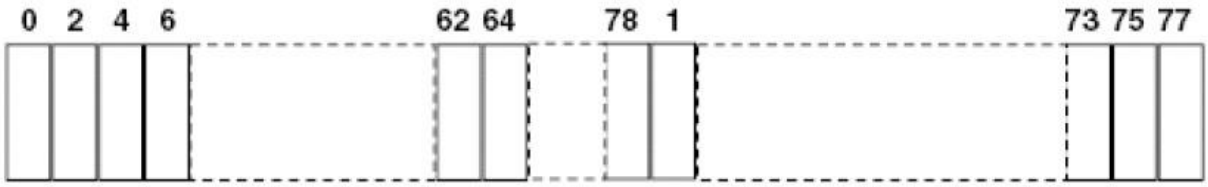
The pseudorandom frequency hopping sequence may be generated in a nice-stage shift register whose 5th first stage. The sequence begins with the first one of 9 consecutive ones, for example: the shift register is initialized with nine ones.

- Number of shift register stages:9
- Length of pseudo-random sequence:29-1=511 bits
- Longest sequence of zeros:8(non-inverted signal)



*Linear Feedback Shift Register for Generation of the PRBS sequence*

An example of pseudorandom frequency hopping sequence as follows:




Each frequency used equally one the average by each transmitter.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitter and shift frequencies in synchronization with the transmitted signals.

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# 7 Test Setup Photographs of EUT

Please refer to separated files for Test Setup Photos of the EUT.

# 8 External Photographs of EUT

Please refer to separated files for External Photos of the EUT.

# 9 Internal Photographs of EUT

Please refer to separated files for Internal Photos of the EUT.

------End------