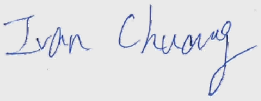
Testing Laboratory
3023

Test Report No:
2530121R-RFUSV10S-A

# TEST REPORT
## FCC Rules&Regulations

| | |
|---|---|
| Product Name | 8 inch Touch Screen Table top, 10.1 inch Touch Screen Table top |
| Brand Name | CRESTRON |
| Model No. | M202404005, M202404006 |
| FCC ID | EROTS80 |
| Applicant´s Name / Address | Crestron Electronics, Inc.<br>15 Volvo Drive, Rockleigh, NJ 07647 |
| Manufacturer's Name | Crestron Electronics, Inc. |
| Test Method Requested, Standard | FCC CFR Title 47 Part 15 Subpart C<br>ANSI C63.10-2020 |
| Verdict Summary | IN COMPLIANCE |
| Documented By April Chen |  |
| Tested By Ivan Chuang |  |
| Approved By Alan Chen |  |
| Date of Receipt | 2025/03/05 |
| Date of Issue | 2025/05/27 |
| Report Version | V1.0 |

# INDEX

## Competences and Guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.
In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.



## General Conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

## Revision History

| Version | Description | Issued Date |
|---|---|---|
| V1.0 | Initial issue of report | 2025/05/27 |

## Summary of Test Result

| Report Clause | Test Items | Result (PASS/FAIL) | Remark |
|---|---|---|---|
| 3 | AC Power Line Conducted Emission | -- | - |
| 4 | Occupied Bandwidth | PASS | - |
| 5 | Maximum output power (EIRP) | PASS | - |
| 6 | Radiated Emission | PASS | - |
| 7 | Frequency Stability | PASS | - |

| Comments and Explanations |
|---|
| The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification. |

# 1. General Information

## 1.1. EUT Description

| | |
|---|---|
| Frequency Band | 61.0 ~ 61.5 GHz |
| Operating Frequency / Channel Number | 61.20 GHz / 1 Channel |
| Type of Modulation | FMCW |

The difference for each model is shown as below:

| Model No. | Description |
|---|---|
| M202404005 | Screen size 8 Inch Table top |
| M202404006 | Screen size 10.1 Inch Table top |

From the above models, model: M202404006 was selected as representative model for the test and its data was recorded in this report.

| Antenna Information | | | | |
|---|---|---|---|---|
| Item. | Brand Name | Model No. | Type | Antenna Gain (dBi) |
| 1 | infineon | BGT60LTR11SAIP | Microstrip | 6 |

| Working Frequency of Each Channel | |
|---|---|
| Channel | Frequency (GHz) |
| 1 | 61.2 |

Note: The above EUT information is declared by the manufacturer.

## 1.2. EUT Information

| | |
|---|---|
| EUT Power Type | From PoE |

## 1.3. Testing Location Information

| | |
|---|---|
| USA | FCC Designation Number: TW0033 |
| Canada | CAB Identifier Number: TW3023 / Company Number: 26930 |

| | |
|---|---|
| Site Description | Accredited by TAF |
| | Accredited Number: 3023 |

| | |
|---|---|
| Test Laboratory | DEKRA Testing and Certification Co., Ltd. |
| | Linkou Laboratory |
| Address | No. 85, Wenlin St., Linkou Dist., New Taipei City 244017, Taiwan, R.O.C. |
| Performed Location | No. 26, Huaya 1st Rd., Guishan Dist.,Taoyuan City 333411, Taiwan, R.O.C. |
| Phone Number | +886-3-275-7255 |
| Fax Number | +886-3-327-8031 |

Ambient conditions in the laboratory:

| Performed Item | Items | Required | Actual | Test Date |
|---|---|---|---|---|
| Radiated Emission | Temperature (°C) | 10~40 °C | 23.8 °C | 2025/03/24~2025/04/02 |
| | Humidity (%RH) | 10~90 % | 61.3 % | |
| RF Conducted Emission | Temperature (°C) | 10~40 °C | 24.3 °C | 2025/03/28 |
| | Humidity (%RH) | 10~90 % | 61.4 % | |

## 1.4. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document.

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

| Test item | Uncertainty |
|---|---|
| AC Power Line Conducted Emission | ±3.50 dB |
| Occupied Bandwidth | ±1580.61 Hz |
| Maximum output power (EIRP) | ±4.02 dB |
| Radiated Emission | 9kHz~30MHz: ±3.88dB<br>30MHz~1GHz: ±4.42dB<br>1GHz~18GHz: ±4.28dB<br>18GHz~40GHz: ±3.90dB<br>40GHz~50GHz: ±5.06dB<br>50GHz~325GHz: ±5.71dB |
| Frequency Stability | ±1580.61 Hz |

## 1.5. List of Test Equipment

**For RF Conducted Emission / HY-SR03**

| | Equipment | Manufacturer | Model No. | Serial No. | Cal. Date | Due Date |
|---|---|---|---|---|---|---|
| V | Temperature Chamber | KSON | THS-D4T-100 | A0606 | 2025/02/24 | 2026/02/23 |
| V | DC Power Supply | GW Instek | SPD-3606 | GEQ820915 | 2024/08/05 | 2025/08/04 |
| V | Spectrum Analyzer | Keysight | N9030B | MY56320509 | 2024/07/19 | 2025/07/18 |
| V | Horn Antenna | VDI | RCH015 (50-75GHz) | N/A | 2024/12/17 | 2027/12/16 |

Note:
1. The mm-Wave VDI equipment (above 50GHz) is calibrated every three years, the other equipment is calibrated every year.
2. The test instruments marked with “V” are used to measure the final test results.

**For Radiated Measurements / HY-CB02**

| | Equipment | Manufacturer | Model No. | Serial No. | Cal. Date | Due Date |
|---|---|---|---|---|---|---|
| V | Loop Antenna | AMETEK | HLA6121 | 49611 | 2025/02/18 | 2026/02/17 |
| V | Bi-Log Antenna | SCHWARZBECK | VULB9168 | 9168-675 | 2023/08/09 | 2025/08/08 |
| V | Horn Antenna | RF SPIN | DRH18-E | 210503A18ES | 2024/02/29 | 2026/02/28 |
| V | Horn Antenna | Com-Power | AH-840 | 101101 | 2023/12/04 | 2025/12/03 |
| V | Horn Antenna with waveguide adapter | QuinStar | QWH-QPRR00 | 1409700013 | 2023/10/19 | 2026/10/18 |
| V | Pre-Amplifier | SGH | SGH0301 | 20230308-1 | 2025/02/06 | 2026/02/05 |
| V | Pre-Amplifier | SGH | PRAMP118 | 20200702 | 2025/01/10 | 2026/01/09 |
| V | Pre-Amplifier | MICZEN | MZLNA1850GAC40 | WB0103001 | 2025/01/10 | 2026/01/09 |
| V | Preamplifier | EMCI | EMC335045SE | 980639 | 2025/01/10 | 2026/01/09 |
| V | Coaxial Cable | SGH | SGH40 | HC360-2.4M2.4M-1M-202108-1 | 2025/01/10 | 2026/01/09 |
| V | Coaxial Cable | SGH | SGH40 | HC360-2.4M/2.4M-3M-202108-1 | 2025/01/10 | 2026/01/09 |
| V | Horn Antenna | VDI | RCH015 (50-75GHz) | -- | 2024/12/17 | 2027/12/16 |
| V | Horn Antenna | VDI | RCH010 (75-110GHz) | -- | 2024/12/17 | 2027/12/16 |
| V | Horn Antenna | VDI | RCH08 (90-140GHz) | -- | 2024/12/17 | 2027/12/16 |
| V | Horn Antenna | VDI | RCH05 (140-220GHz) | -- | 2024/12/17 | 2027/12/16 |
| | Horn Antenna | VDI | RCH03 (220-330GHz) | -- | 2024/12/17 | 2027/12/16 |
| V | Down Convertor (SAX156) | VDI | N9029AV15(AT0-55847) | US54250119 | 2024/12/17 | 2027/12/16 |
| V | Down Convertor (SAX902) | VDI | N9029AV10(AT0-74929) | US53250010 | 2024/12/17 | 2027/12/16 |
| V | Down Convertor (SAX091) | VDI | N9029AV08(AT0-59571) | US53250004 | 2024/12/17 | 2027/12/16 |
| V | Down Convertor (SAX090) | VDI | N9029AV05(AT0-60029) | US53250004 | 2024/12/17 | 2027/12/16 |
| | Down Convertor (SAX214) | VDI | N9029AV03(AT0-57775) | US53250006 | 2024/12/17 | 2027/12/16 |
| V | EMI Test Receiver | R&S | ESR3 | 102793 | 2024/12/06 | 2025/12/05 |
| V | Spectrum Analyzer | R&S | FSV3044 | 101113 | 2025/01/22 | 2026/01/21 |
| V | Spectrum Analyzer | Keysight | N9030B | MY56320509 | 2024/07/19 | 2025/07/18 |
| V | Coaxial Cable | SGH | HA800 | GD20110223-2 | 2025/01/10 | 2026/01/09 |
| V | Coaxial Cable | SGH | HA800 | GD20110222-4 | 2025/01/10 | 2026/01/09 |
| V | Coaxial Cable | SGH | SGH18 | 2021005-2 | 2025/01/10 | 2026/01/09 |
| V | Coaxial Cable | SGH | SGH18 | 202108-5 | 2025/01/10 | 2026/01/09 |

Note:
1. Bi-Log Antenna and Horn Antenna (AH-840) are calibrated every two years, VDI and Millitech equipment are calibrated every three years, other equipment is calibrated every year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version: e3 230303 dekra V9.

# 2. Test Configuration of EUT

## 2.1. Test Condition

| EUT Operational Condition | |
|---|---|
| Testing Voltage | DC 48V |

## 2.2. Test Frequency Mode

| Test Software Version | N/A |
|---|---|

| Modulation | Frequency (GHz) | Power Setting |
|---|---|---|
| FMCW | 61.2 | NA |

## 2.3. Measurement Configuration

| Test Mode | Mode 1: Transmit |
|---|---|

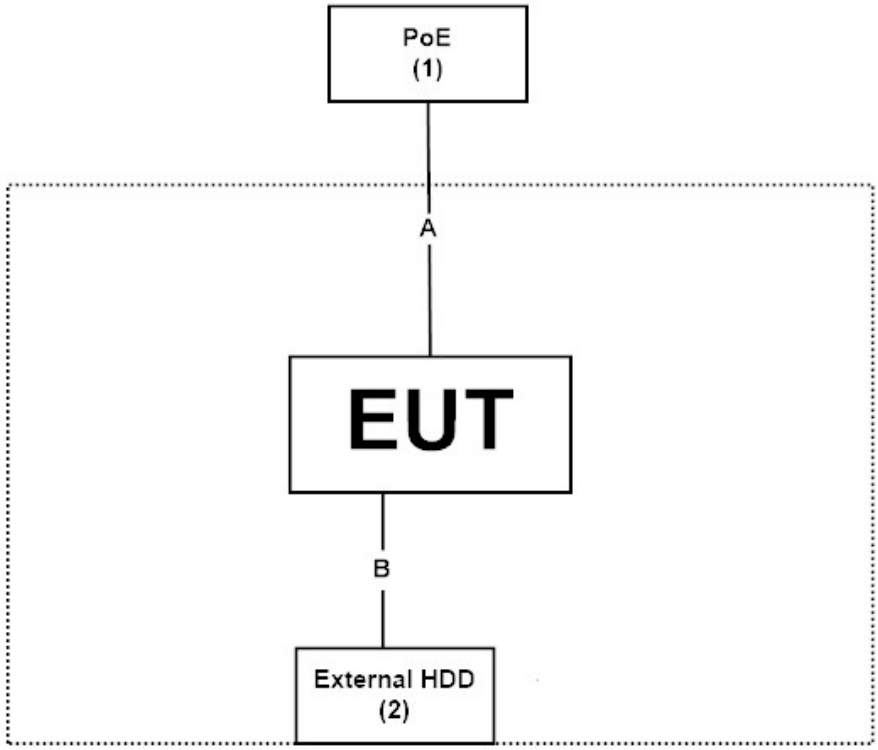
Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

## 2.4. Tested System Details

| No. | Equipment | Brand Name | Model No. | Serial No. | Power Cord |
|---|---|---|---|---|---|
| 1 | PoE | NETGEAR | GS305EPP | N/A | N/A |
| 2 | External HDD | Transcend | TS1TSJ25MC | F30467-0003 | N/A |

## 2.5. Configuration of tested System

Connection Diagram



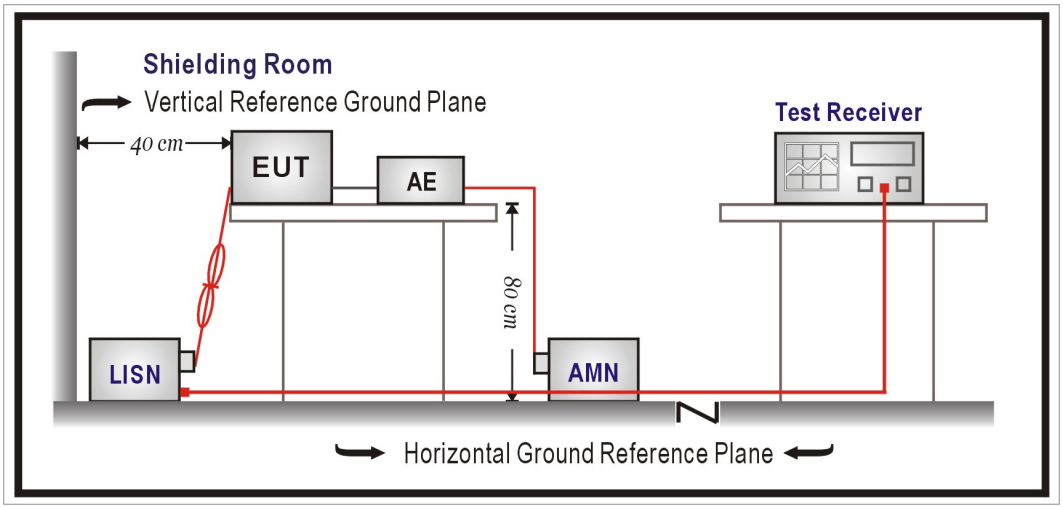

| Signal Cable Type | | Signal Cable Description |
|---|---|---|
| A | LAN Cable | Shielded,5m |
| B | USB Cable | Shielded,0.5m |

## 2.6. EUT Operating Procedures

| | |
|---|---|
| 1 | Setup the EUT as shown in Section 2.5. |
| 2 | Provide the DC Power Source, Start transmits continually |
| 3 | Configure the test mode, the test channel. |
| 4 | Verify that the EUT works properly. |

# 3. AC Power Line Conducted Emission

## 3.1. Test Setup




## 3.2. Test Limit

| Frequency (MHz) | QP (dBuV) | AV (dBuV) |
|---|---|---|
| 0.15 - 0.50 | 66 - 56 | 56 - 46 |
| 0.50 - 5.0 | 56 | 46 |
| 5.0 - 30 | 60 | 50 |

Remarks: In the above table, the tighter limit applies at the band edges.

## 3.3. Test Procedure

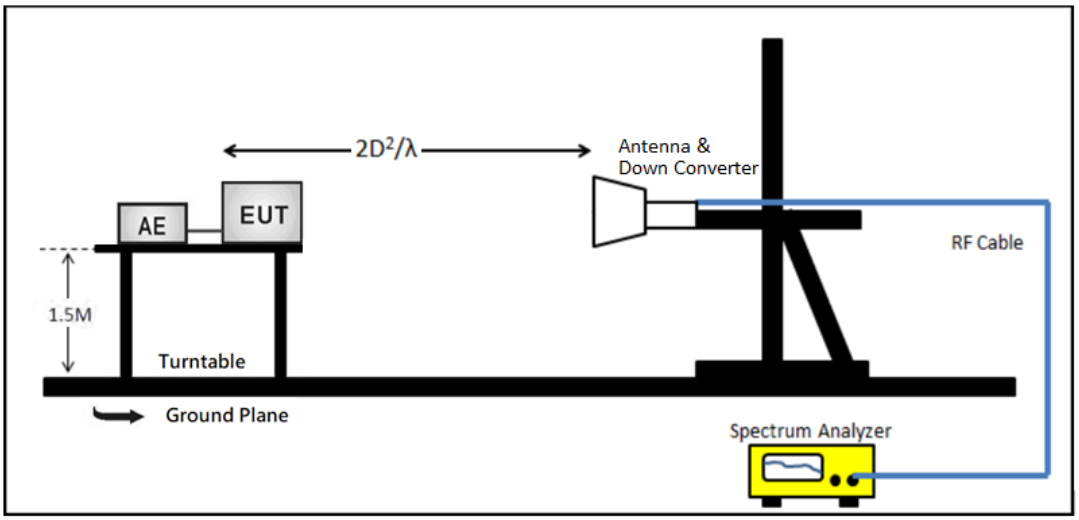
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm /50 uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2020 on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

## 3.4. Test Result of AC Power Line Conducted Emission

Refer as Appendix A

# 4. Occupied Bandwidth

## 4.1. Test Setup




## 4.2. Test Limit

Within the designated 57-71GHz frequency band.

(15.255(c)(2)(v) For fixed field disturbance sensors within the frequency band 61.0-61.5 GHz)

## 4.3. Test Procedures

The occupied bandwidth (OBW) is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

The following procedure shall be used for measuring 99% power bandwidth:

Use the followingspectrum analyzer settings:

1. Span equal to approximately 1.5 times the OBW, centered on the carrier frequency.
2. RBW, prefer 1% to 5% of OBW, or a minimum of 1 MHz if this is not possible due to a large OBW
3. VBW approximately 3 × RBW
4. Set the reference level of the instrument as required to reduce the chance of the signal amplitude exceeding the maximum spectrum analyzer input mixer level for linear operation.
5. Sweep = No faster than coupled (auto) time.
6. Detector function = peak.
7. Trace = max-hold.

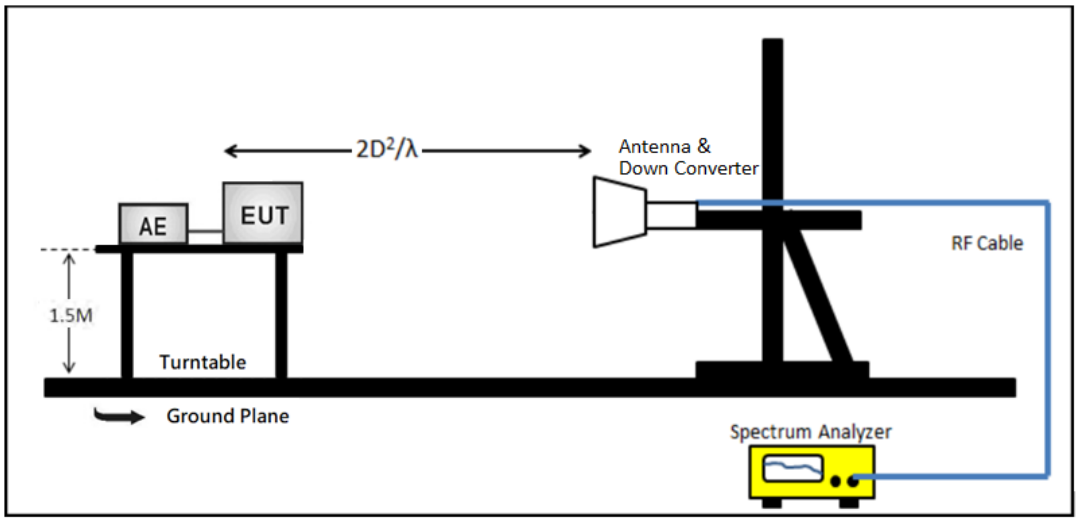
Note: The RBW and VBW were setting up to the limitations of the test equipment.

## 4.4. Test Result of Occupied Bandwidth

Refer as Appendix B

# 5. Maximum output power (EIRP)

## 5.1. Test Setup




## 5.2. Test Limit

FCC 15.255(c)(2)(v): Within the 57-71 GHz band, emission levels shall not exceed the following equivalent isotropically radiated power (EIRP):
For fixed field disturbance sensors other than those operating under the provisions of paragraph (c)(2)(v) of this section, For field disturbance sensors/radars that occupy 500 MHz bandwidth or less that are contained wholly within the frequency band 61.0-61.5 GHz, the average power of any emission, measured during the transmit interval, shall not exceed 40 dBm, and the peak power of any emission shall not exceed 43 dBm. In addition, the average power of any emission outside of the 61.0-61.5 GHz band.

## 5.3. Test Procedures

Maximum power (EIRP) –Averaging detector

Note: The maximum power (averaging detector) measurements are performed using the “channel power” measurement capability and integrated over the 99% OBW to obtain the result.

1. Measurement capability of instrument = channel power
2. Set RBW = 1MHz
3. Set VBW ≥ 3 x RBW
4. span to 2 x to 3 x the OBW
5. Channel bandwidth setting of instrument ≥OBW
6. Detector = power averaging (rms)
7. Set number of points in sweep ≥ 2 × span / RBW
8. Sweep time=auto-couple
9. Trace = averaging

Maximum peak power (EIRP) –Peak detector

1. Set RBW = 1MHz
2. Set VBW ≥ 3 x RBW
3. span to 2 x to 3 x the OBW
4. Detector = Peak
5. Set number of points in sweep ≥ 2 × span / RBW
6. Sweep time=auto-couple
7. Trace = max-hold

Measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.
The turn table is rotated 360 degrees to determine the position of the maximum emission level.
The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2020 Section 9. on radiated measurement.
The resolution bandwidth below 30MHz setting on the field strength meter is above 1GHz is 1MHz.
Radiated emission measurements above 1GHz are made using Horn Antennas.
The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

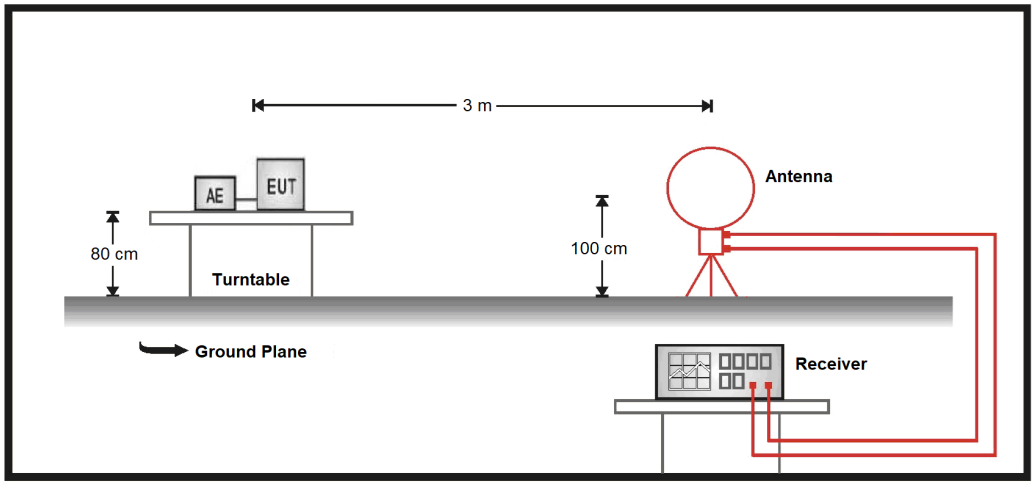
## 5.4. Test Result of Maximum output power (EIRP)

Refer as Appendix C

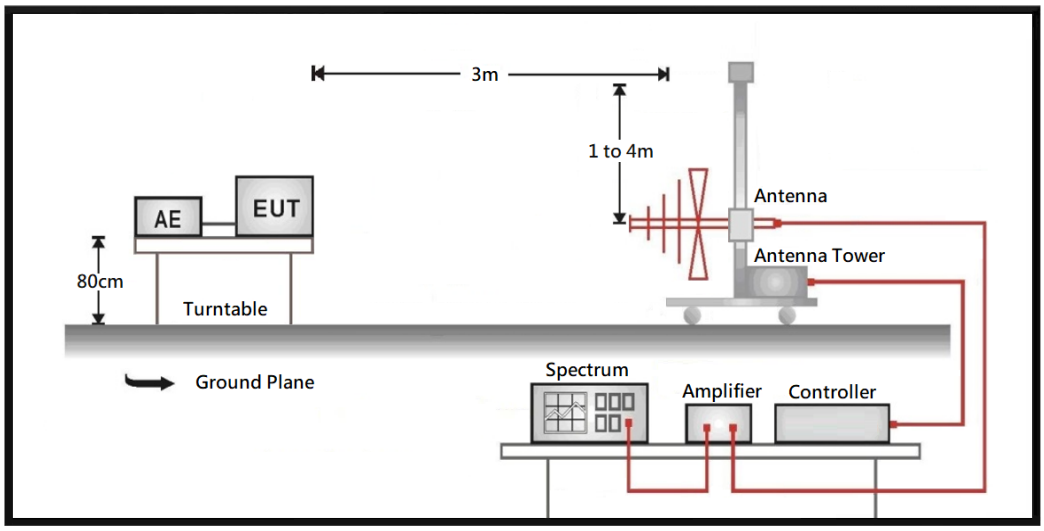
# 6. Radiated Emission

## 6.1. Test Setup

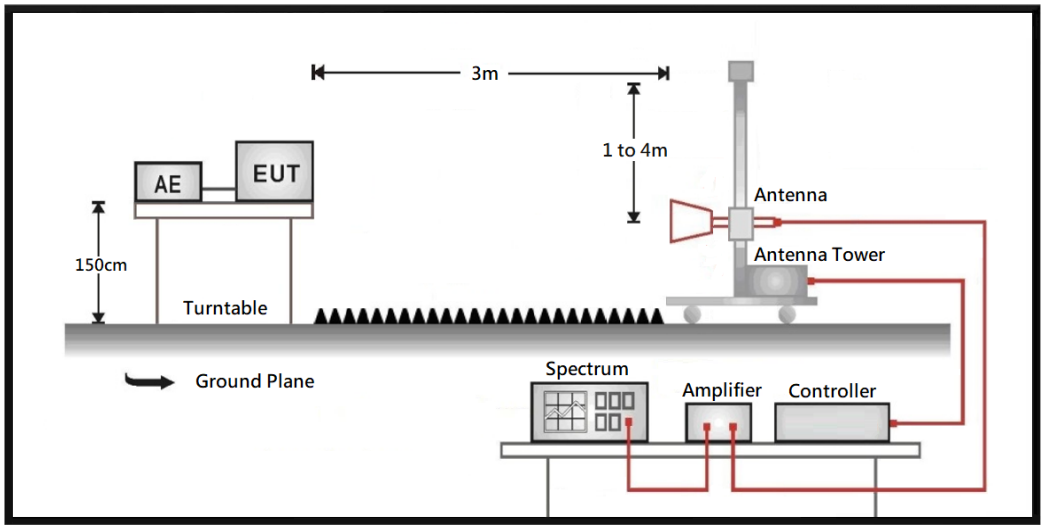
9kHz ~ 30 MHz



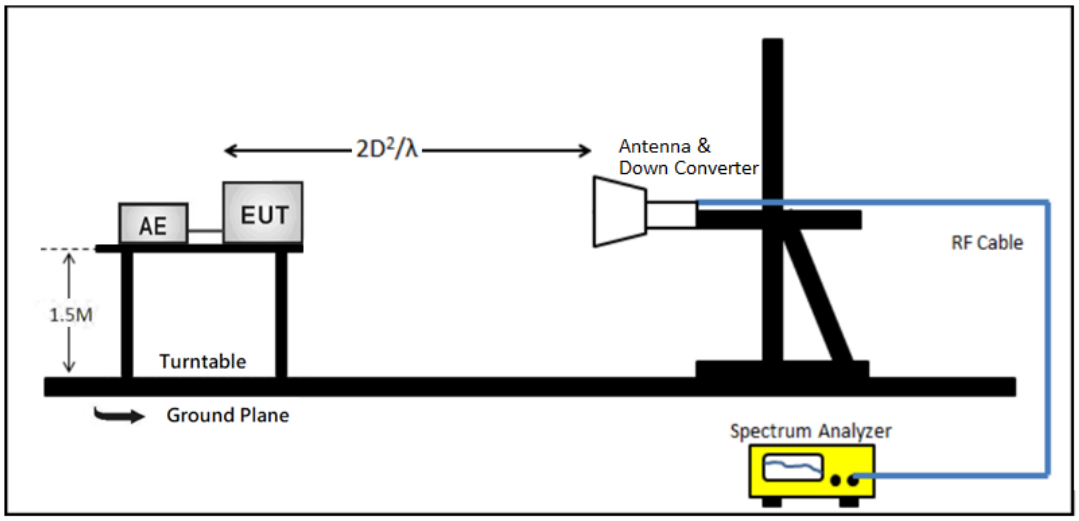

30 MHz ~ 1 GHz




Above 1 GHz



Above 50 GHz




## 6.2. Test Limit

| Frequency (MHz) | Field strength (uV/m) | Field strength (dBuV/m) | Measurement distance (m) |
|---|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 20 log (2400/F(kHz)) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 20 log (24000/F(kHz)) | 30 |
| 1.705 - 30 | 30 | 29.5 | 30 |
| 30 - 88 | 100 | 40 | 3 |
| 88 - 216 | 150 | 43.5 | 3 |
| 216 - 960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

Between 40 GHz and 200 GHz, the level of these emissions shall not exceed 90 pW / cm² at a distance of 3 meters.

Remarks:

1. Field strength (dBuV/m) = 20 log Field strength (uV/m)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

## 6.3. Test Procedure

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2020 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bi-Log antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range form 9kHz – 200GHz was investigated.

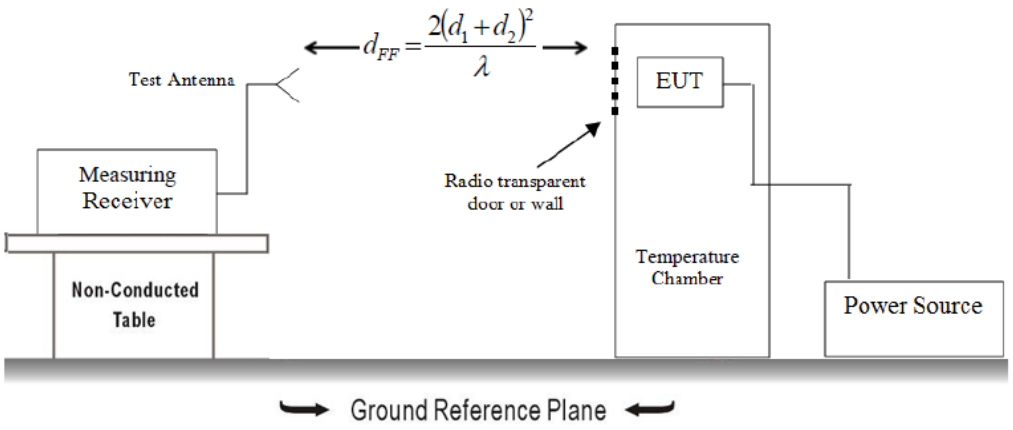
For measurements above 40 GHz, the effects of reflections were minimized as required by KDB 414788 D01 and ANSI C63.10-2020 Clause 5.2, and a site source (signal generator with up-converter) was used before testing to confirm that the measurement results are not affected by reflections.

## 6.4. Test Result of Radiated Emissions

Refer as Appendix D

# 7. Frequency Stability

## 7.1. Test Setup




## 7.2. Limit

Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation.

## 7.3. Test Procedure

The carrier frequency of the transmitter is measured at room temperature. (20°C to provide a reference)
At 10 °C intervals of temperatures between -30 °C and +50 °C at the manufacturer's rated supply voltage, and At +20 °C temperature and ±15% supply voltage variations. If a product is specified to operate over a range of input voltage then the -15% variation is applied to the lowermost voltage and the +15% is applied to the uppermost voltage.
Measurement data showing variation in transmitter output frequency from a cold start and the elapsed time necessary for the frequency to stabilize within the applicable tolerance. Tests shall be made after temperature stabilization at each of the ambient temperature levels; the lower temperature limit, 0° centigrade and + 30° centigrade with no primary power applied.
Beginning at each temperature level, While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 min, 5 min, and 10 min after the EUT is energized. Four measurements in total are made.. During each test, the ambient temperature shall not be allowed to rise more than 10° centigrade above the respective beginning ambient temperature level.

## 7.4. Test Result of Frequency Stability

Refer as Appendix E

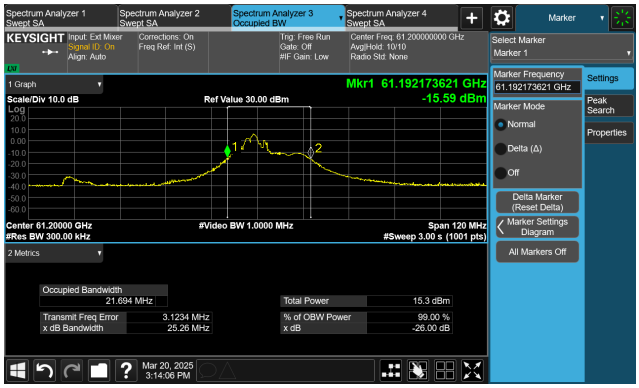
## Appendix A. Test Result of AC Power Line Conducted Emission

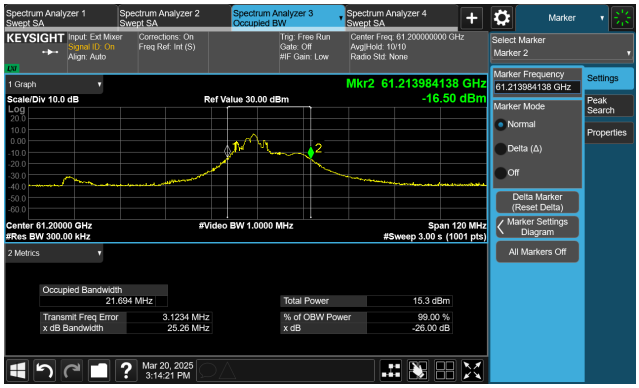
Owing to the EUT use DC-Powered, the test item is not performed.

# Appendix B. Test Result of Occupied Bandwidth

## M202404006

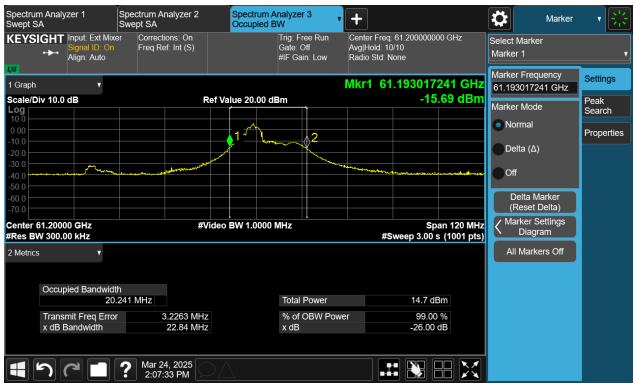
| Test Frequency (GHz) | Measurement Value (fL) (GHz) | Measurement Value (fH) (GHz) | Measurement Level (MHz) | Limit (dBm) |
|---|---|---|---|---|
| 61.2 | 61.192 | 61.213 | 21.694 | <500MHz |

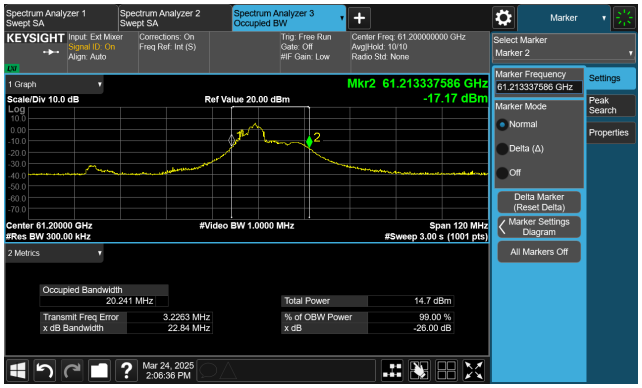



## M202404005

| Test Frequency (GHz) | Measurement Value (fL) (GHz) | Measurement Value (fH) (GHz) | Measurement Level (MHz) | Limit (dBm) |
|---|---|---|---|---|
| 61.2 | 61.193 | 61.213 | 20.241 | <500MHz |



## Appendix C. Test Result of Maximum output power (EIRP)

**M202404006**

Peak Output Power

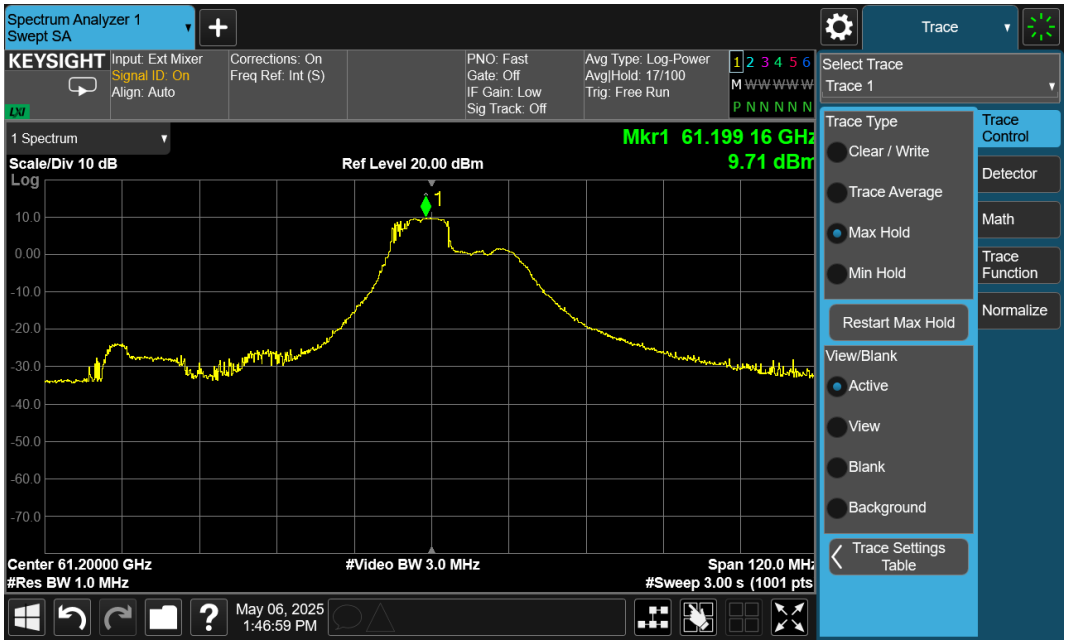
| Test Frequency (GHz) | Measurement Level (dBm) | FMCW Desensitization factor (dB) | EIRP (dBm) | EIRP Limit (dBm) |
|---|---|---|---|---|
| 61.2 | 9.71 | -2.75 | 12.46 | 43 |

Note: EIRP= Measurement Level - FMCW Desensitization factor.

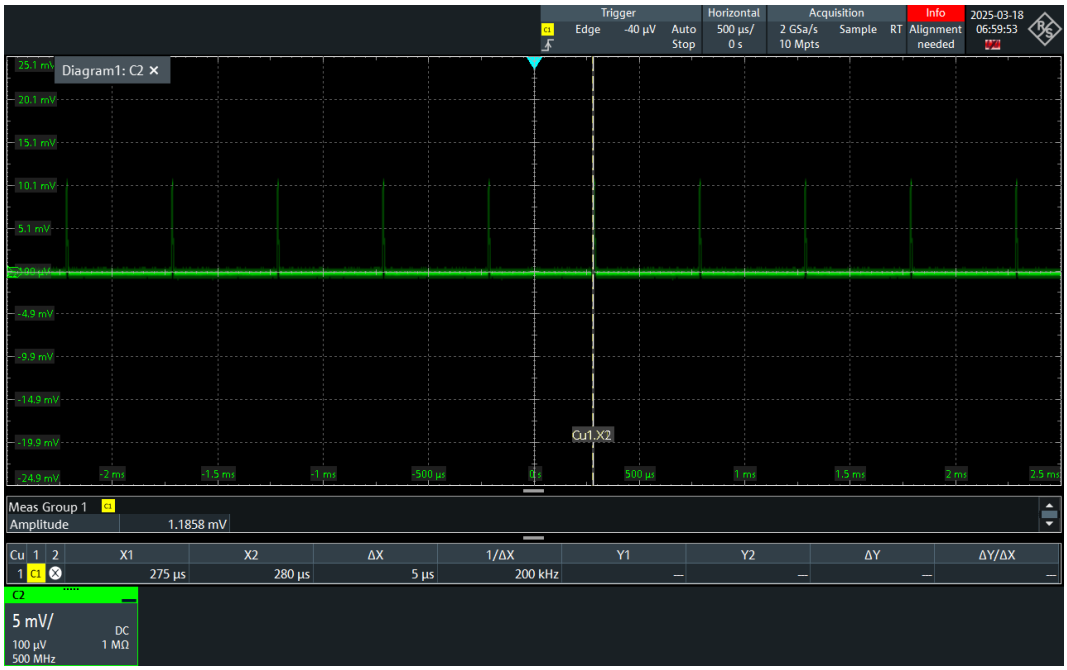
Average Output Power

| Test Frequency (GHz) | Measurement Level (dBm) | Limit (dBm) |
|---|---|---|
| 61.2 | -10.03 | 40 |

Measurement Level




FMCW Desensitization factor (Chirp Time= 8us)



| BWchirp (MHz) | Tchirp (us) | B (MHz) | $\alpha$ (dB) | FMCW Desensitization factor (dB) |
|---|---|---|---|---|
| 21.694 | 6.000 | 1.000 | 0.729 | -2.75 |

Note:

Desensitization factor was calculated from follow equation;

$$\alpha = \frac{1}{\left(1+\left[\left(\frac{2\times\ln(2)}{\pi}\right)^2\times\left(\frac{BW_{\text{Chirp}}}{T_{\text{Chirp}}\times RBW^2}\right)^2\right]\right)^{0.25}}$$

and

FMCW Desensitization factor = 20 Log ($\alpha$)

where

$\alpha\ BW_{\text{Chirp}}$ is the reduction in amplitudes the FMCW Chirp Bandwidth

$T_{\text{Chirp}}$ is the FMCW Chirp Time

$B$ is the 3 dB IF Bandwidth = RBW

**M202404005**

Peak Output Power

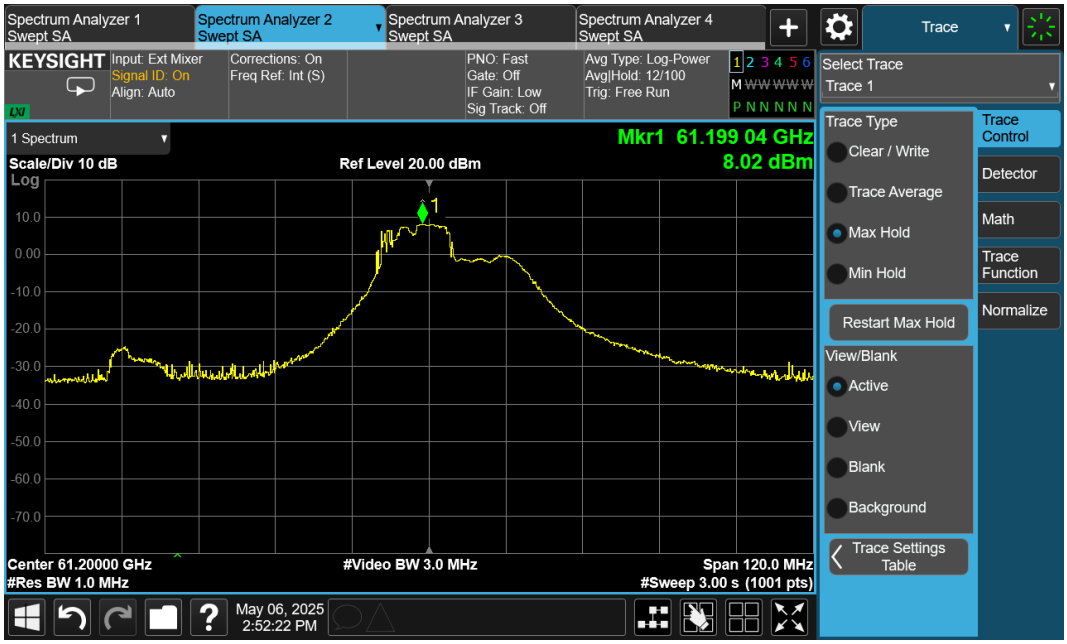
| Test Frequency (GHz) | Measurement Level (dBm) | FMCW Desensitization factor (dB) | EIRP (dBm) | EIRP Limit (dBm) |
|---|---|---|---|---|
| 61.2 | 8.02 | -1.76 | 9.80 | 43 |

Note: EIRP= Measurement Level - FMCW Desensitization factor.

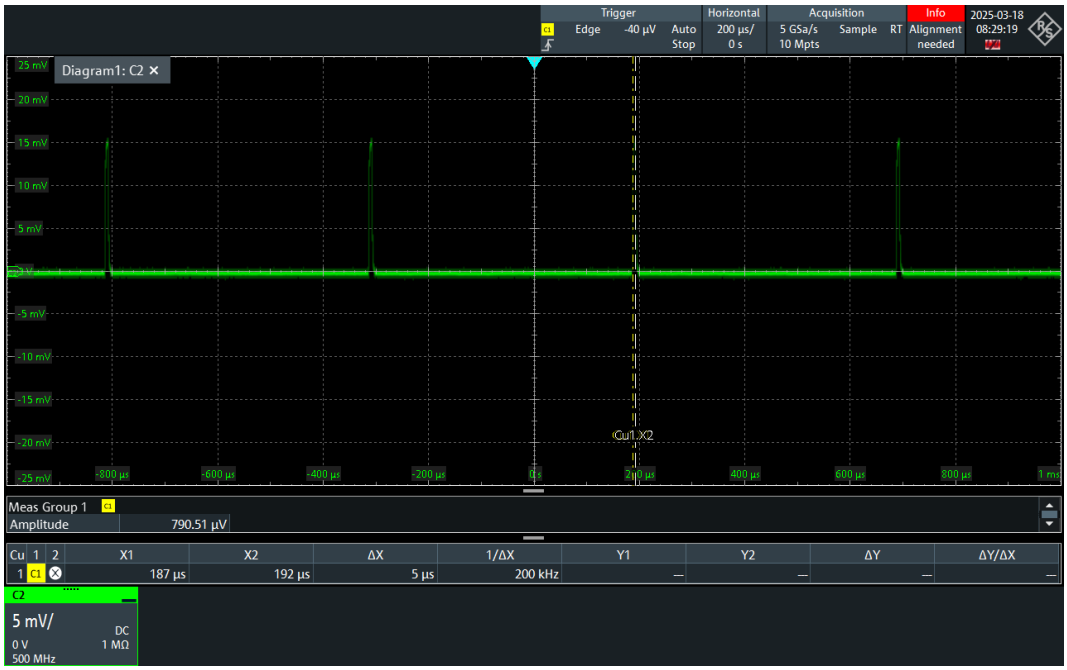
Average Output Power

| Test Frequency (GHz) | Measurement Level (dBm) | Limit (dBm) |
|---|---|---|
| 61.2 | -11.87 | 40 |

Measurement Level




FMCW Desensitization factor (Chirp Time= 8us)



| BWchirp (MHz) | Tchirp (us) | B (MHz) | $\alpha$ (dB) | FMCW Desensitization factor (dB) |
|---|---|---|---|---|
| 20.241 | 8.000 | 1.000 | 0.817 | -1.76 |

Note:

Desensitization factor was calculated from follow equation;

$$\alpha = \frac{1}{\left(1+\left[\left(\frac{2\times\ln(2)}{\pi}\right)^2\times\left(\frac{BW_{\text{Chirp}}}{T_{\text{Chirp}}\times RBW^2}\right)^2\right]\right)^{0.25}}$$

and

FMCW Desensitization factor = 20 Log ($\alpha$)

where

$\alpha\ BW_{\text{Chirp}}$ is the reduction in amplitudes the FMCW Chirp Bandwidth

$T_{\text{Chirp}}$ is the FMCW Chirp Time

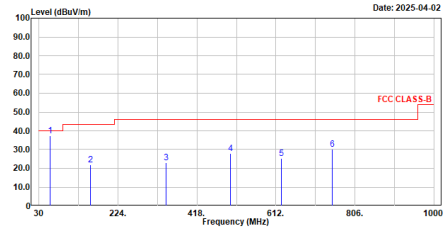
$B$ is the 3 dB IF Bandwidth = RBW

# Appendix D. Test Result of Radiated Emissions

## M202404006

### TX_30M-1GHz_61.2GHz_H

Site :HY-CB02
Condition :3m ,Horizontal
mode :TX_30M-1GHz_61.2GHz
Test by :Peter

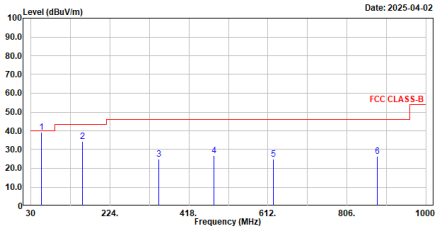



| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 57.160 | 37.54 | 40.00 | -2.46 | 62.06 | -24.52 | QP |
| 2 | 157.070 | 21.79 | 43.50 | -21.71 | 46.27 | -24.48 | QP |
| 3 | 342.340 | 23.09 | 46.00 | -22.91 | 45.67 | -22.58 | QP |
| 4 | 500.450 | 28.04 | 46.00 | -17.96 | 46.72 | -18.68 | QP |
| 5 | 625.580 | 25.40 | 46.00 | -20.60 | 41.32 | -15.92 | QP |
| 6 | 750.710 | 30.21 | 46.00 | -15.79 | 44.02 | -13.81 | QP |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

### TX_30M-1GHz_61.2GHz_V

Site :HY-CB02
Condition :3m ,Vertical
mode :TX_30M-1GHz_61.2GHz
Test by :Peter

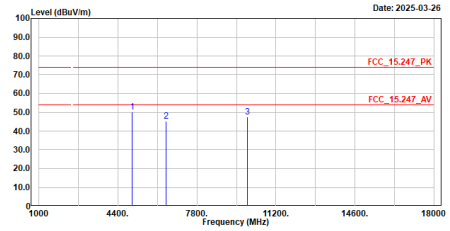



| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 56.190 | 39.31 | 40.00 | -0.69 | 63.70 | -24.39 | QP |
| 2 | 156.100 | 34.25 | 43.50 | -9.25 | 58.73 | -24.48 | QP |
| 3 | 343.310 | 25.06 | 46.00 | -20.94 | 47.64 | -22.58 | QP |
| 4 | 480.080 | 26.87 | 46.00 | -19.13 | 45.89 | -19.02 | QP |
| 5 | 625.580 | 24.94 | 46.00 | -21.06 | 40.86 | -15.92 | QP |
| 6 | 880.690 | 26.55 | 46.00 | -19.45 | 39.33 | -12.78 | QP |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

### TX_1G-18GHz_61.2GHz_H

Site :HY-CB02
Condition :3m ,HORIZONTAL
mode :TX_1G-18GHz_61.2GHz
Test by :Peter

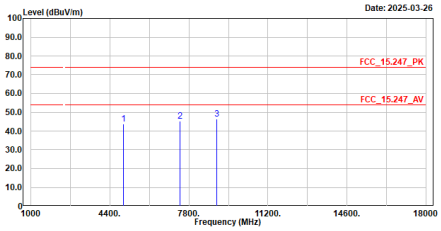



| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 4998.400 | 50.33 | 74.00 | -23.67 | 56.86 | -6.53 | Peak |
| 2 | 6480.800 | 45.28 | 74.00 | -28.72 | 47.65 | -2.37 | Peak |
| 3 | 9984.500 | 47.64 | 74.00 | -26.36 | 45.08 | 2.56 | Peak |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

### TX_1G-18GHz_61.2GHz_V

Site :HY-CB02
Condition :3m ,VERTICAL
mode :TX_1G-18GHz_61.2GHz
Test by :Peter

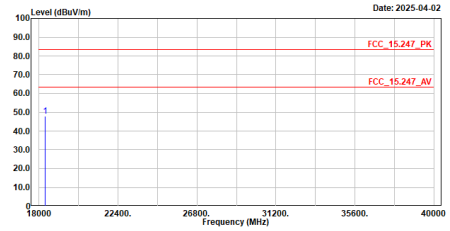



| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 4984.800 | 43.78 | 74.00 | -30.22 | 50.34 | -6.56 | Peak |
| 2 | 7407.300 | 45.16 | 74.00 | -28.84 | 45.24 | -0.08 | Peak |
| 3 | 9008.700 | 46.33 | 74.00 | -27.67 | 44.84 | 1.49 | Peak |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

| TX_18G-40GHz_61.2GHz_H | TX_18G-40GHz_61.2GHz_V |
|---|---|

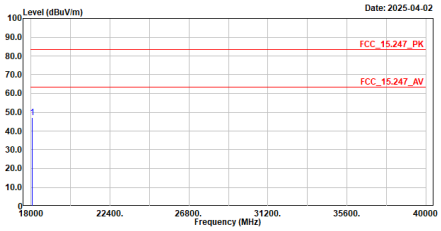
Site :HY-CB02
Condition :1m ,Horizontal
mode :TX_18G-40GHz_61.2GHz
Test by :Peter




| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 18352.000 | 48.07 | 83.54 | -35.47 | 42.99 | 5.08 | Peak |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Site :HY-CB02
Condition :1m ,Vertical
mode :TX_18G-40GHz_61.2GHz
Test by :Peter



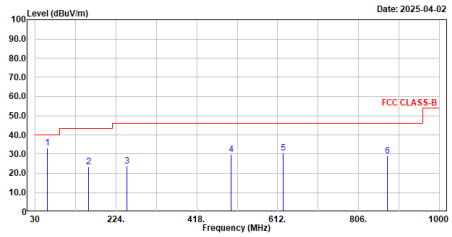

| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 18066.000 | 47.15 | 83.54 | -36.39 | 42.36 | 4.79 | Peak |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

**M202404005**

## TX_30M-1GHz_61.2GHz_H

Site :HY-CB02
Condition :3m ,Horizontal
mode :TX_30M-1GHz_61.2GHz
Test by :Peter

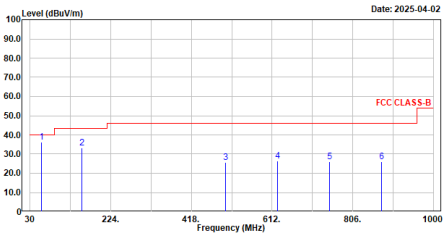



| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 59.100 | 33.29 | 40.00 | -6.71 | 58.16 | -24.87 | QP |
| 2 | 158.040 | 23.44 | 43.50 | -20.06 | 47.92 | -24.48 | QP |
| 3 | 250.190 | 23.95 | 46.00 | -22.05 | 49.48 | -25.53 | QP |
| 4 | 500.450 | 29.77 | 46.00 | -16.23 | 48.45 | -18.68 | QP |
| 5 | 625.580 | 30.46 | 46.00 | -15.54 | 46.38 | -15.92 | QP |
| 6 | 875.840 | 29.07 | 46.00 | -16.93 | 41.88 | -12.81 | QP |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

## TX_30M-1GHz_61.2GHz_V

Site :HY-CB02
Condition :3m ,Vertical
mode :TX_30M-1GHz_61.2GHz
Test by :Peter

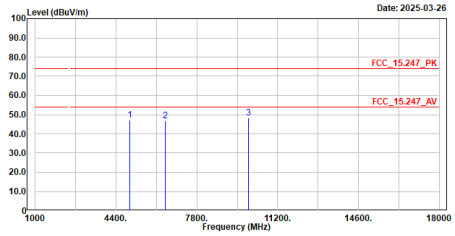



| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 58.130 | 36.37 | 40.00 | -3.63 | 61.15 | -24.78 | QP |
| 2 | 154.160 | 33.09 | 43.50 | -10.41 | 57.57 | -24.48 | QP |
| 3 | 500.450 | 25.48 | 46.00 | -20.52 | 44.16 | -18.68 | QP |
| 4 | 625.580 | 26.33 | 46.00 | -19.67 | 42.25 | -15.92 | QP |
| 5 | 750.710 | 25.95 | 46.00 | -20.05 | 39.76 | -13.81 | QP |
| 6 | 875.840 | 26.03 | 46.00 | -19.97 | 38.84 | -12.81 | QP |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

## TX_1-18GHz_61.2GHz_H

Site :HY-CB02
Condition :3m ,HORIZONTAL
mode :TX_1-18GHz_61.2GHz
Test by :Peter

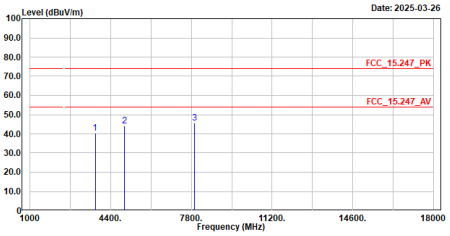



| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 4979.700 | 47.14 | 74.00 | -26.86 | 53.71 | -6.57 | Peak |
| 2 | 6479.100 | 46.65 | 74.00 | -27.35 | 49.02 | -2.37 | Peak |
| 3 | 9977.700 | 48.22 | 74.00 | -25.78 | 45.66 | 2.56 | Peak |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

## TX_1-18GHz_61.2GHz_V

Site :HY-CB02
Condition :3m ,VERTICAL
mode :TX_1-18GHz_61.2GHz
Test by :Peter

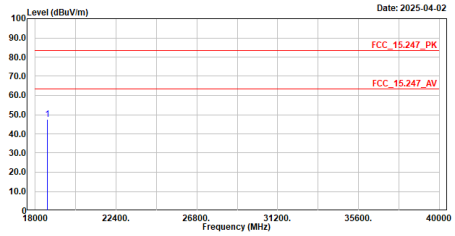



| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 3748.900 | 40.20 | 74.00 | -33.80 | 49.60 | -9.40 | Peak |
| 2 | 4981.400 | 44.13 | 74.00 | -29.87 | 50.70 | -6.57 | Peak |
| 3 | 7927.500 | 45.67 | 74.00 | -28.33 | 45.72 | -0.05 | Peak |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

| TX_18G-40GHz_61.2GHz_H | TX_18G-40GHz_61.2GHz_V |
|---|---|

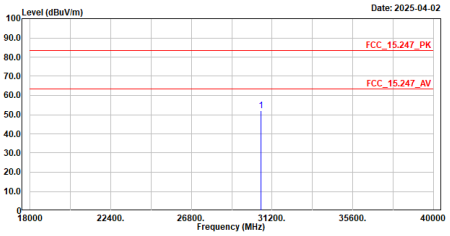
Site :HY-CB02
Condition :1m ,Horizontal
mode :TX_18G-40GHz_61.2GHz
Test by :Peter




| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 18660.000 | 47.74 | 83.54 | -35.80 | 42.47 | 5.27 | Peak |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Site :HY-CB02
Condition :1m ,Vertical
mode :TX_18G-40GHz_61.2GHz
Test by :Peter




| No. | Frequency | Level | Limit Line | Over Limit | Read Level | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | |
| 1 | 30606.000 | 52.26 | 83.54 | -31.28 | 42.23 | 10.03 | Peak |

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

**M202404006**

**Above 40 GHz**

| Frequency Range (GHz) | Measurement Frequency (GHz) | EIRP (dBm) | EIRP (W) | Specification Distance (m) | Power Density (W / m2) | Power Density (pW / cm²) | Limit (pW / cm²) |
|---|---|---|---|---|---|---|---|
| 40-50 | 49.981 | -47.05 | 0.00000002 | 3 | 1.7454E-10 | 0.02 | 90 |
| 50-75 | 70.74 | -31.20 | 0.000001 | 3 | 6.7121E-09 | 0.67 | 90 |
| 75-90 | 75.1944 | -28.07 | 0.000002 | 3 | 1.3801E-08 | 1.38 | 90 |
| 90-140 | 120.9188 | -22.55 | 0.000006 | 3 | 4.9149E-08 | 4.91 | 90 |
| 140-200 | 142.0775 | -20.46 | 0.000009 | 3 | 7.7904E-08 | 7.79 | 90 |

Note: Power densiny was calculated from follow equation;

$$PD = \frac{EIRP_{Linear}}{4\pi d^2}$$

where

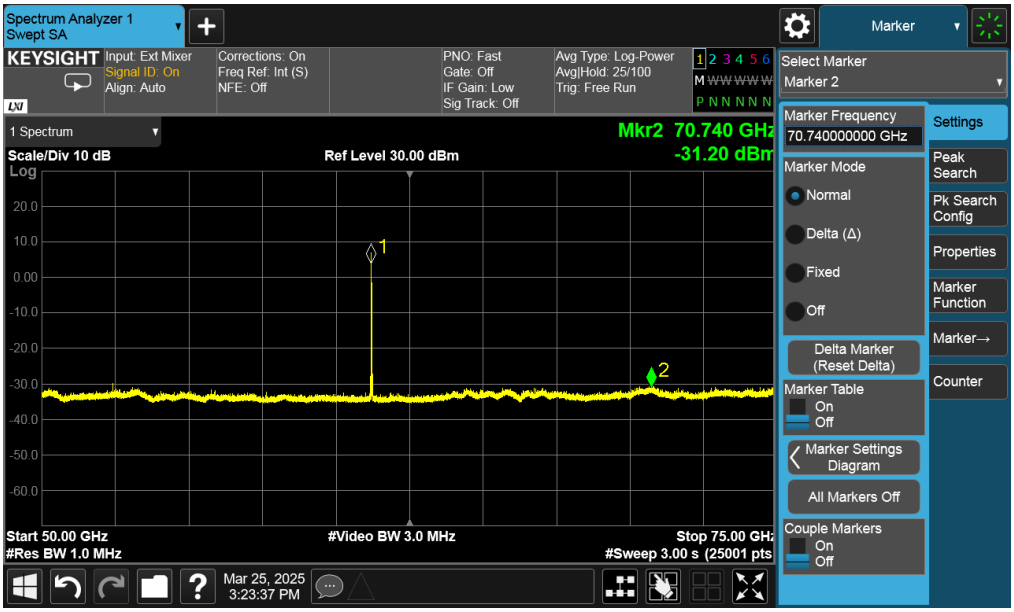
PD is the power density at the distance specified by the limit, in $W/m^2$

EIRPLinear is the equivalent isotropically radiated power, in watts

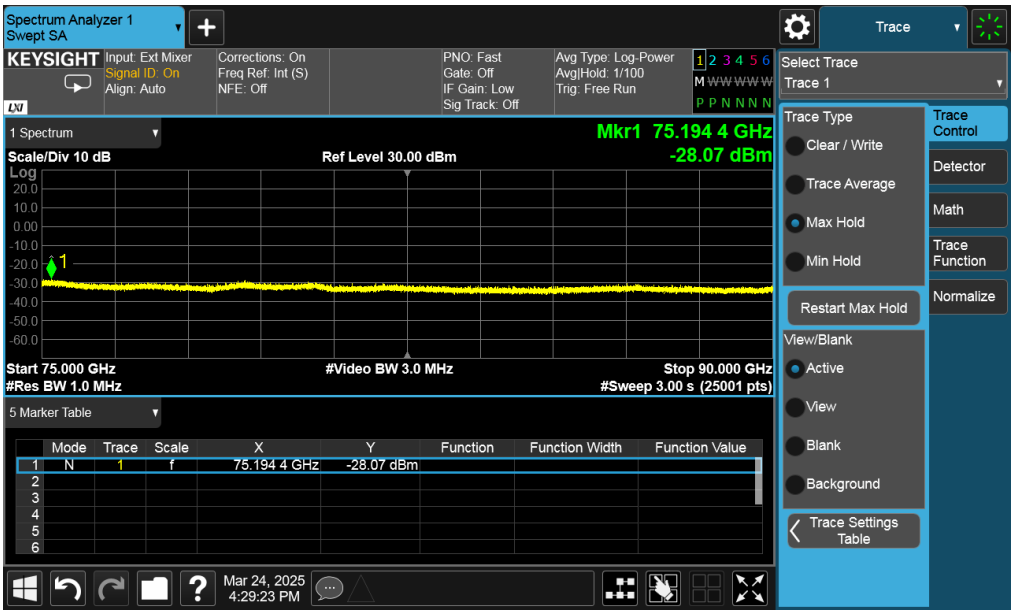
d is the distance at which the power density limit is specified, in m

40~50GHz

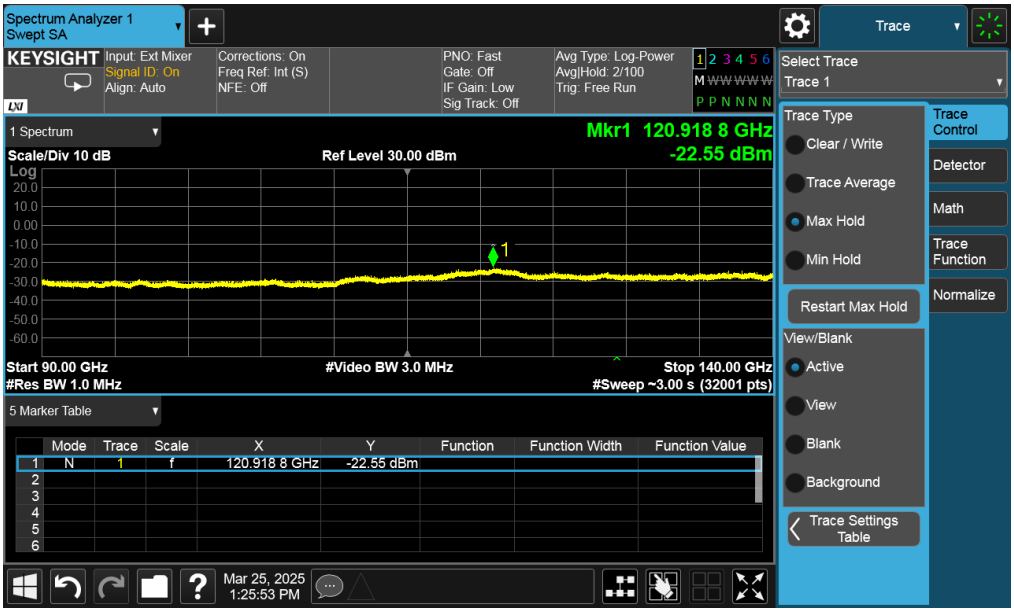
50~75GHz



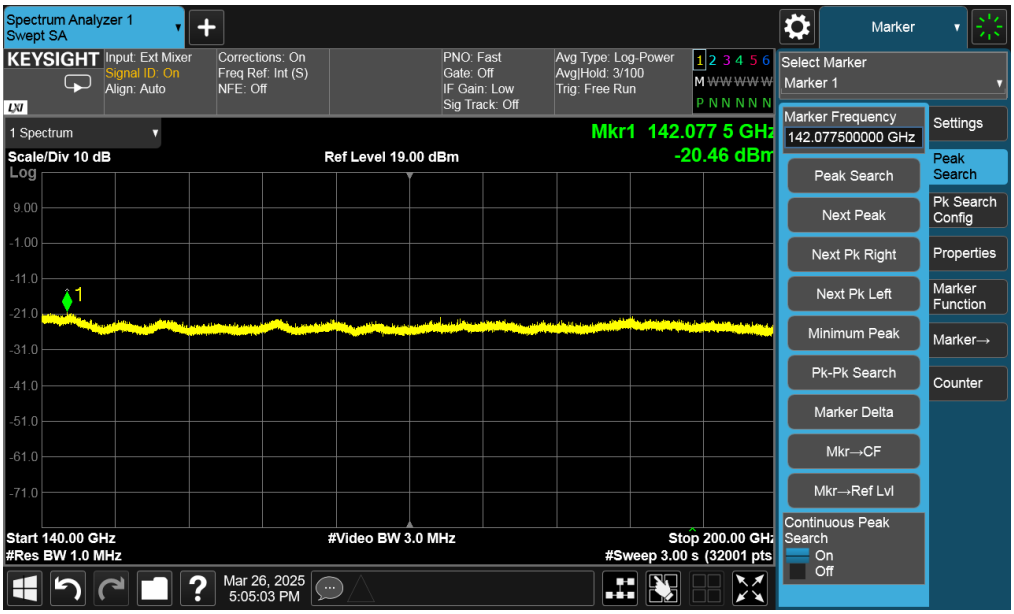

75~90GHz



90-140GHz




140-200GHz



**M202404005**

**Above 40 GHz**

| Frequency Range (GHz) | Measurement Frequency (GHz) | EIRP (dBm) | EIRP (W) | Specification Distance (m) | Power Density (W / m2) | Power Density (pW / cm²) | Limit (pW / cm²) |
|---|---|---|---|---|---|---|---|
| 40-50 | 49.993 | -47.20 | 0.000000 | 3 | 1.6851E-10 | 0.02 | 90 |
| 50-75 | 70.534 | -31.68 | 0.000001 | 3 | 6.0087E-09 | 0.60 | 90 |
| 75-90 | 75.276 | -27.36 | 0.000002 | 3 | 1.6249E-08 | 1.62 | 90 |
| 90-140 | 121.0313 | -22.25 | 0.000006 | 3 | 5.2641E-08 | 5.26 | 90 |
| 140-200 | 140.8031 | -20.18 | 0.000010 | 3 | 8.4845E-08 | 8.48 | 90 |

Note: Power densiny was calculated from follow equation;

$$PD = \frac{EIRP_{Linear}}{4\pi d^2}$$

where

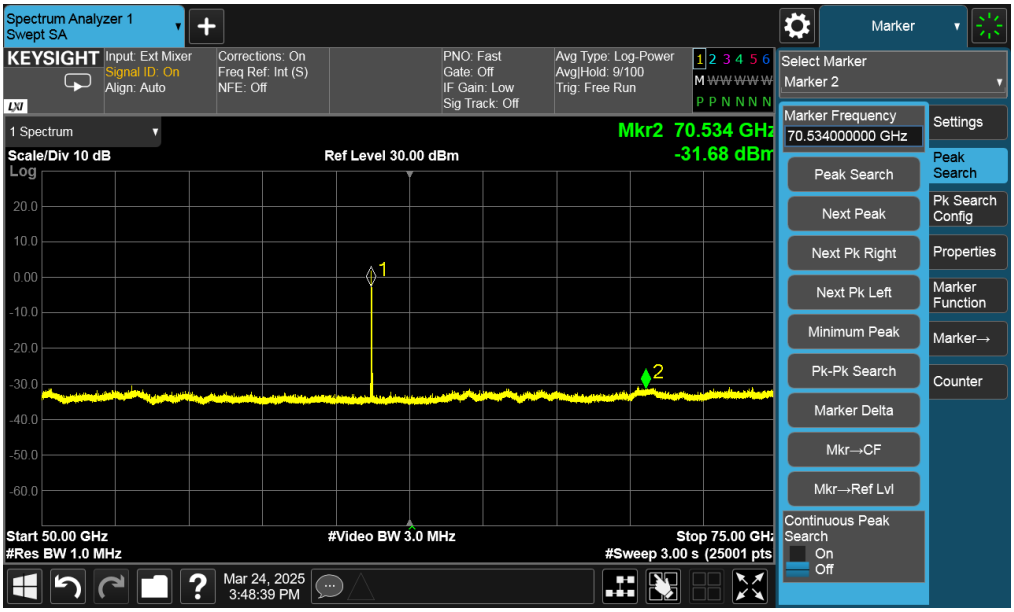
PD is the power density at the distance specified by the limit, in W/m$^2$

EIRPLinear is the equivalent isotropically radiated power, in watts

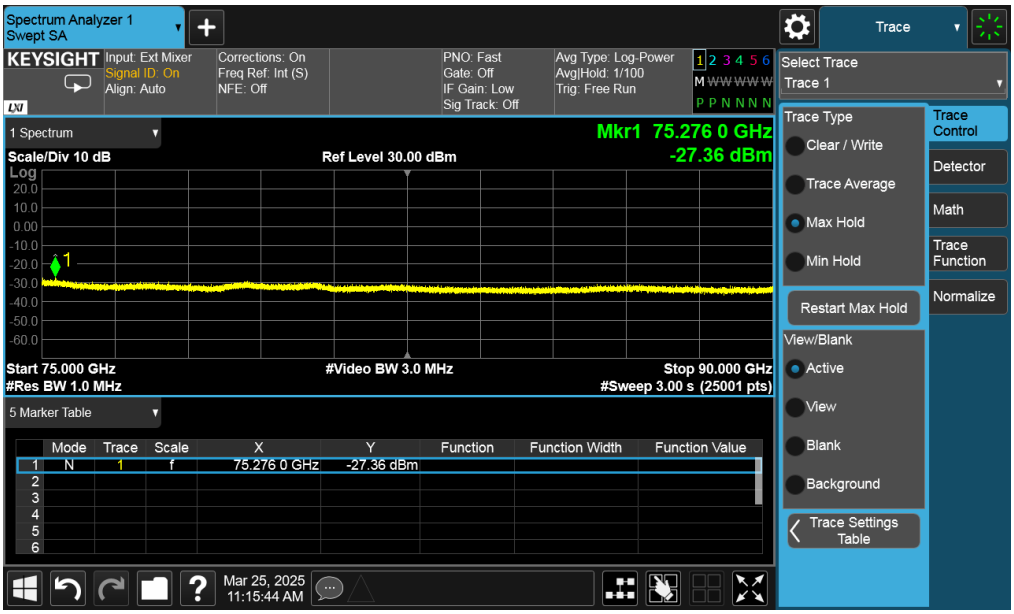
d is the distance at which the power density limit is specified, in m

40~50GHz

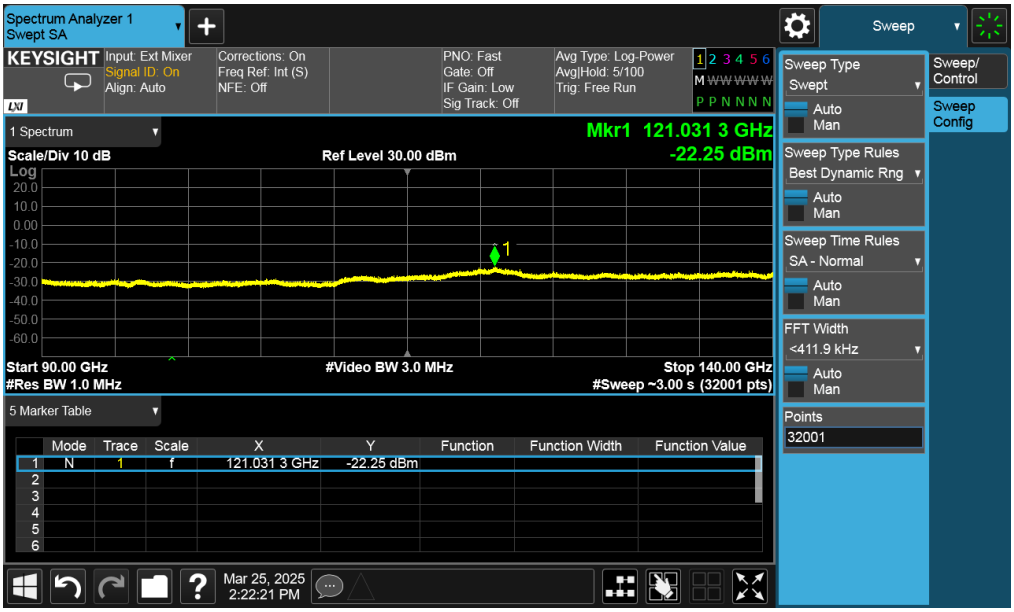
50~75GHz



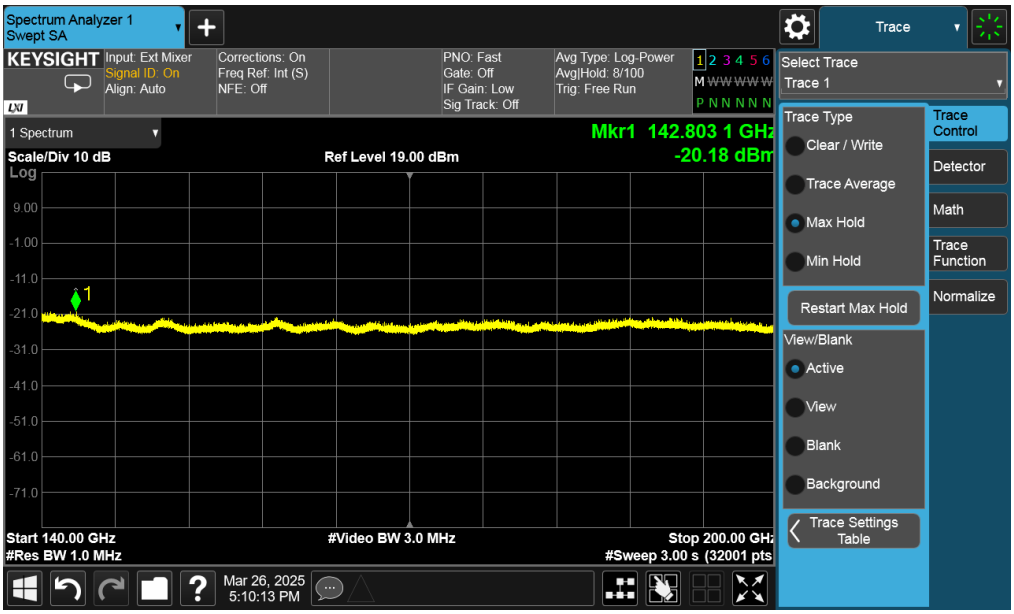

75~90GHz



90-140GHz




140-200GHz



## Appendix E. Test Result of Frequency Stability

**M202404006**

| Voltage (V) | Measurement Frequency (fL) (GHz) | Measurement Frequency (fH) (GHz) | Limit fL ≥ 57 GHz fH ≤ 64 GHz |
|---|---|---|---|
| 138 | 61.1905 | 61.2205 | Within band |
| 120 | 61.1914 | 61.220 | Within band |
| 102 | 61.1917 | 61.2199 | Within band |

| Temperature (°C) | Observe Time | Measurement Frequency (fL) (GHz) | Measurement Frequency (fH) (GHz) | Limit fL ≥ 57 GHz fH ≤ 64 GHz |
|---|---|---|---|---|
| 50 | start | 61.1899 | 61.2173 | Within band |
| | 2 mins | 61.1899 | 61.2173 | Within band |
| | 5 mins | 61.1899 | 61.2173 | Within band |
| | 10 mins | 61.1899 | 61.2173 | Within band |
| 40 | start | 61.1899 | 61.2172 | Within band |
| | 2 mins | 61.1899 | 61.2172 | Within band |
| | 5 mins | 61.1899 | 61.2172 | Within band |
| | 10 mins | 61.1899 | 61.2172 | Within band |
| 30 | start | 61.1904 | 61.2178 | Within band |
| | 2 mins | 61.1904 | 61.2178 | Within band |
| | 5 mins | 61.1904 | 61.2178 | Within band |
| | 10 mins | 61.1904 | 61.2178 | Within band |
| 20 | start | 61.1904 | 61.2178 | Within band |
| | 2 mins | 61.1904 | 61.2178 | Within band |
| | 5 mins | 61.1904 | 61.2178 | Within band |
| | 10 mins | 61.1904 | 61.2178 | Within band |
| 10 | start | 61.1932 | 61.2197 | Within band |
| | 2 mins | 61.1932 | 61.2197 | Within band |
| | 5 mins | 61.1932 | 61.2197 | Within band |
| | 10 mins | 61.1932 | 61.2197 | Within band |
| 0 | start | 61.1926 | 61.2187 | Within band |
| | 2 mins | 61.1926 | 61.2187 | Within band |
| | 5 mins | 61.1926 | 61.2187 | Within band |
| | 10 mins | 61.1908 | 61.2183 | Within band |
| -10 | start | 61.1908 | 61.2183 | Within band |
| | 2 mins | 61.1926 | 61.2187 | Within band |
| | 5 mins | 61.1926 | 61.2187 | Within band |
| | 10 mins | 61.1906 | 61.2165 | Within band |
| -20 | start | 61.1906 | 61.2165 | Within band |
| | 2 mins | 61.1906 | 61.2165 | Within band |
| | 5 mins | 61.1906 | 61.2165 | Within band |
| | 10 mins | 61.1906 | 61.2165 | Within band |