# TEST REPORT

| | |
|---|---|
| **Application No.:** | SZCR2501000071AT |
| **Applicant:** | SZ DJI TECHNOLOGY CO., LTD. |
| **Address of Applicant:** | Lobby of T2, DJI Sky City, No. 53 Xianyuan Road, Xili Community, Xili Street, Nanshan District, 518055 Shenzhen, China |
| **Manufacturer:** | SZ DJI TECHNOLOGY CO., LTD. |
| **Address of Manufacturer:** | Lobby of T2, DJI Sky City, No. 53 Xianyuan Road, Xili Community, Xili Street, Nanshan District, 518055 Shenzhen, China |
| **Equipment Under Test (EUT):** | |
| **EUT Name:** | Active Phased Array Radar (REAR) |
| **Model No.:** | RD600811FR |
| **Trade Mark:** | DJI |
| **FCC ID:** | SS3-RD602412 |
| **Standard(s) :** | 47 CFR Part 15, Subpart C 15.255 |
| **Date of Receipt:** | 2025-01-06 |
| **Date of Test:** | 2025-03-15 to 2025-04-15 |
| **Date of Issue:** | 2025-04-17 |
| **Test Result:** | **Pass*** |

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager


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| Revision Record | | | | |
|---|---|---|---|---|
| **Version** | **Chapter** | **Date** | **Modifier** | **Remark** |
| 01 | | 2025-04-17 | | Original |
| | | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| **Authorized for issue by:** | | | | |
| | | Darren Yuan | | |
| | | **Darren Yuan/Project Engineer** | | |
| | | Eric Fu | | |
| | | **Eric Fu/Reviewer** | | |


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# 2 Test Summary

| Test Item | FCC Rule No. | Test Method | Result |
|---|---|---|---|
| Antenna Requirement | 15.203 | -- | PASS |
| Transmitter power and Transmitter off-times | 15.255(b)(3) | ANSI C63.10-2020 Section 9.2.1/9.2.2 | PASS |
| Occupied bandwidth | 15.215 (c), 15.255 (b)(3) | ANSI C63.10-2020 Section 9.4 | PASS |
| Radiated spurious emissions below 40 GHz | 15.255 (d)(2) | ANSI C63.10-2020 Section 9.11 | PASS |
| Radiated emissions outside assigned band and above 40 GHz up to 200 GHz | 15.255 (d)(3) | ANSI C63.10-2020 Section 9.10 | PASS |
| Frequency stability | 15.255 (f) | ANSI C63.10-2020 Section 9.5 | PASS |

# 3 Contents

# 4 General Information

## 4.1 Details of E.U.T.

| | |
|---|---|
| Power supply: | DC 15V |
| Operation Frequency: | 60GHz-64GHz |
| Modulation Type: | FMCW |
| Antenna Type: | linear Antenna |
| Antenna Gain: | 5dBi |

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

## 4.2 Description of Support Units

| Description | Manufacturer | Model No. | Serial No. |
|---|---|---|---|
| DC power supply | Chroma | 62012P-80-60 | REF. No.SEA27C00 |

## 4.3 Measurement Uncertainty

| Test Item | Measurement Uncertainty |
|---|---|
| Transmitter power and power spectral density | ± 4.8dB |
| Occupied bandwidth | ± 3% |
| Radiated Spurious Emissions Below 1GHz | ± 6.0dB for 3m; ± 5.0dB for 10m |
| Radiated Spurious Emissions Above 1GHz | ± 4.6dB (1-18GHz);± 4.8dB (Above 18GHz) |

Remark:
The $U_{lab}$ (lab Uncertainty) is less than $U_{cispr/ETSI}$ (CISPR/ETSI Uncertainty), so the test results
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

## 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

## 4.5 Test Facility

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

**• A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

**• VCCI (Member No. 1937)**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

**• FCC –Designation Number: CN1336**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

**• Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

## 4.6 Deviation from Standards

None

## 4.7 Abnormalities from Standard Conditions

None

# 5 Equipment List

| Equipment | Manufacturer | Model No. | Inventory No. | Cal Date | Cal Due Date |
|---|---|---|---|---|---|
| Loop Antenna | ETS-Lindgren | 6502 | SEM003-08 | 2023-11-20 | 2025-11-19 |
| 3m Semi-Anechoic Chamber | ETS-LINDGREN | N/A | SEM001-01 | 2023-06-19 | 2026-06-18 |
| MXE EMI Receiver | Agilent Technologies | N9038A | SEM004-15 | 2024-08-14 | 2025-08-13 |
| BiConiLog Antenna | ETS-LINDGREN | 3142C | SEM003-01 | 2023-09-16 | 2025-09-15 |
| Pre-Amplifier | Agilent Technologies | 8447D | SEM005-01 | 2024-03-14 | 2025-03-13 |
| | | | | 2025-03-13 | 2026-03-12 |
| Measurement Software | AUDIX | e3 V8.2014-6-27 | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM025-01 | 2024-07-06 | 2025-07-05 |
| 3m Fully-Anechoic Chamber | AUDIX | N/A | SEM001-02 | 2024-05-11 | 2027-05-10 |
| EXA Signal Analyzer(10Hz-44GHz) | Keysight | N9010A | SEM004-20 | 2024-03-30 | 2025-03-29 |
| | | | | 2025-03-29 | 2026-03-28 |
| Horn Antenna(800MHz-18GHz) | Rohde&Schwarz | HF907 | SEM003-07 | 2023-07-23 | 2025-07-22 |
| Microwave system amplifier (0.5GHz-26.5GHz) | Agilent | 83017A | SEM005-25 | 2024-09-14 | 2025-09-13 |
| Broad-Band Horn Antenna(15GHz-40GHz) | SCHWARZBECK | BBHA 9170 | SEM003-15 | 2024-08-10 | 2025-08-09 |
| Programmable Temperature Humidity Chamber | Votsch Industrietechnik GmbH | VT 4002 | SEM002-15 | 2024-03-19 | 2025-03-18 |
| | | | | 2025-03-18 | 2026-03-17 |
| Pre-amplifier (26GHz-40GHz) | Compliance Directions Systems Inc. | PAP-2640-50 | SEM005-08 | 2024-03-15 | 2025-03-14 |
| | | | | 2025-03-14 | 2026-03-13 |
| Coaxial Cable | SGS | N/A | SEM026-01 | 2024-07-06 | 2025-07-05 |
| Waveguide(40-60GHz) | REBES | SWG-19025-FB | 06303-01 | 2025-02-18 | 2028-02-17 |
| Waveguide(50-75GHz) | REBES | SWG-15025-FB | 01525-09 | 2025-02-18 | 2028-02-17 |
| Waveguide(75-110GHz) | REBES | SWG-10025-FB | 01509-01 | 2025-02-18 | 2028-02-17 |
| Waveguide(110-170GHz) | REBES | SWG-06025-FB | 06302-01 | 2025-02-18 | 2028-02-17 |
| Waveguide(140-220GHz) | REBES | SWG-05025-FB | SEM020-12 | 2025-02-18 | 2028-02-17 |
| Waveguide Harmonic Mixer(40-60GHz) | REBES | STH-19SF-S1 | 06937-01 | 2025-02-18 | 2028-02-17 |

| | | | | | |
|---|---|---|---|---|---|
| Waveguide Harmonic Mixer(50-75GHz) | KEYSIGHT | M1970V | MY51390966 | 2025-02-18 | 2028-02-17 |
| Waveguide Harmonic Mixer(75-110GHz) | KEYSIGHT | M1970W | MY51430883 | 2025-02-18 | 2028-02-17 |
| Waveguide Harmonic Mixer(110-170GHz) | REBES | STH-06SF-S1 | 06110-01 | 2025-02-18 | 2028-02-17 |
| Waveguide Harmonic Mixer(140-220GHz) | Rohde&Schwarz | HM140-220 | SEM020-18 | 2025-02-18 | 2028-02-17 |
| Signal Analyzer | Rohde & Schwarz | FSV40 | SEM008-04 | 2024-03-14 | 2025-03-13 |
| | | | | 2025-03-13 | 2026-03-12 |

**General used equipment**

| Equipment | Manufacturer | Model No. | Inventory No. | Cal Date | Cal Due Date |
|---|---|---|---|---|---|
| Humidity/ Temperature Indicator | deli | 8838 | SEM002-32 | 2024-07-24 | 2025-07-23 |
| Humidity/ Temperature Indicator | deli | 8838 | SEM002-33 | 2024-07-24 | 2025-07-23 |
| Barometer | Changchun Meteorological Industry Factory | DYM3 | SEM002-01 | 2024-03-18 | 2025-03-17 |
| | | | | 2025-03-17 | 2026-03-16 |

# 6 Radio Spectrum Technical Requirement

## 6.1 Antenna Requirement

### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

### 6.1.2 Conclusion

15.203 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 5dBi.

Antenna location: Refer to internal photos

# 7 Radio Spectrum Matter Test Results

## 7.1 Transmitter power and Transmitter off-times

Test Requirement 47 CFR Part 15C Section 15.255 (b)(3)

Test Method: ANSI C63.10-2020 Section 9.2.1, 9.2.2

Limit:

The peak EIRP shall not exceed 20 dBm, and The sum of continuous transmitter off-times of at least two milliseconds shall equal at least 16.5 milliseconds within any contiguous interval of 33 milliseconds.

### 7.1.1 E.U.T. Operation

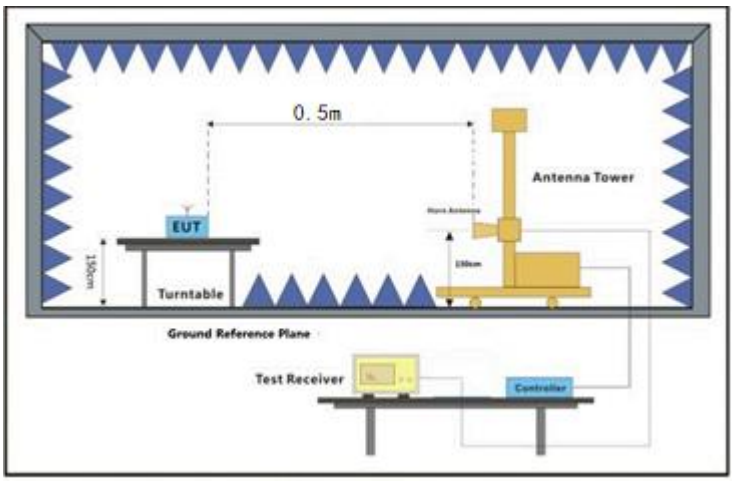
Operating Environment:

Temperature: 21.4 °C Humidity: 52.7 % RH Atmospheric Pressure: 1020 mbar

### 7.1.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Final test | 00 | TX mode_Keep the EUT in transmitting mode. |

### 7.1.3 Test Setup Diagram



### 7.1.4 Measurement Procedure and Data

a. For transmitter power test, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 0.5 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation

b. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

c. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the same hight and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

d. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

e. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

g. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor

Spectrum analyser setting during test.

1. Place the EUT on the table and set it in the transmitting mode.
2. SA set RBW=1MHz, VBW=3*RBW, Detector=Peak Trace: Max Hold, Peak Search.
3. During test, the EUT will be rotate for 0 degrees to 360 degrees in X, Y, Z axis to find the maximum reading base on the previous test in different host-specific condition and the worst data was record in the report.

Please Refer to Appendix for Details

## 7.2 Occupied Bandwidth

Test Requirement 47 CFR Part 15C Section 15.215(c), 15.255 (b)(3)

Test Method: ANSI C63.10-2020 Section 9.4

Limit: 57-64GHz

### 7.2.1 E.U.T. Operation

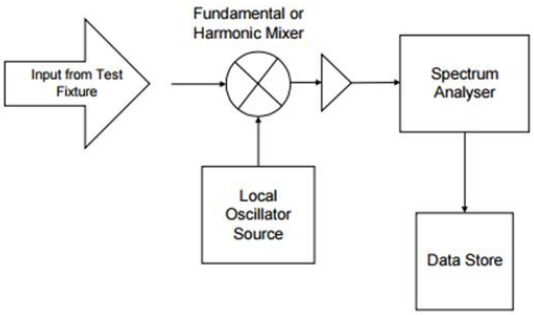
Operating Environment:

Temperature: 21.4 °C Humidity: 52.7 % RH Atmospheric Pressure: 1020 mbar

### 7.2.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Final test | 00 | TX mode_Keep the EUT in transmitting mode. |

### 7.2.3 Test Setup Diagram




### 7.2.4 Measurement Procedure and Data

1. Place the EUT on the table and set it in the transmitting mode.
2. SA set RBW=1%~5% OBW, or a minimum of 1 MHz if this is not possible due to a large OBW, VBW=3*RBW and Detector=Peak.
3. Measure and record the result of 20dB and 99% bandwidth.

Please Refer to Appendix for Details

## 7.3 Radiated spurious emissions below 40 GHz

Test Requirement 47 CFR Part 15C Section 15.255 (d)(2)
Test Method: ANSI C63.10-2020 Section 9.11

Limit:

**Below 30MHz:**

| Frequency | Field Strength (μV/m) | Measurement Distance (metres) |
|---|---|---|
| 9 - 490 kHz | 2,400/F (kHz) | 300 |
| 490 - 1,705 kHz | 24,000/F (kHz) | 30 |
| 1.705-30 MHz | 30 | 30 |
| Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. | | |

**Above 30MHz:**

| Frequency (MHz) | Field Strength (μV/m) | Measurement Distance (metres) |
|---|---|---|
| 30-88 | 100** | 3 |
| 88-216 | 150** | 3 |
| 216-960 | 200** | 3 |
| Above 960 | 500 | 3 |
| ** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. | | |

| Frequency (MHz) | Field strength at 3 m, dB(uV/m)* Within restricted bands | | |
|---|---|---|---|
| | Peak | Quasi Peak | Average |
| 0.009 - 0.090 | 148.5 - 128.5 | NA | 128.5 - 108.5** |
| 0.090 - 0.110 | NA | 108.5 - 106.8** | NA |
| 0.110 - 0.490 | 126.8 - 113.8 | NA | 106.8 - 93.8** |
| 0.490 - 1.705 | NA | 73.8 - 63.0** | NA |
| 1.705 - 30.0* | | 69.5 | |
| 30 - 88 | | 40.0 | |
| 88 - 216 | | 43.5 | |

| | | | |
|---|---|---|---|
| 216 - 960 | | 46.0 | |
| Above 960 | | 54.0 | |
| 1000 - 200000 | 74.0 | N/A | 54.0 |

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

LimS2 = LimS1 + 20 log (S1/S2),

where S1 and S2 - standard defined and test distance respectively in meters.

**- The limit decreases linearly with the logarithm of frequency.

Note: The above field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency but not exceeding 40 GHz for intentional radiators operated below 10 GHz and up to the fifth harmonic of the highest fundamental frequency but not exceeding 200 GHz for intentional radiators operated above 30 GHz.

| Frequency (MHz) | Field strength at 1 m, dB(uV/m)* Within restricted bands | | |
|---|---|---|---|
| | Peak | Quasi Peak | Average |
| 1000 - 200000 | 83.5 | N/A | 63.5 |

### 7.3.1 E.U.T. Operation

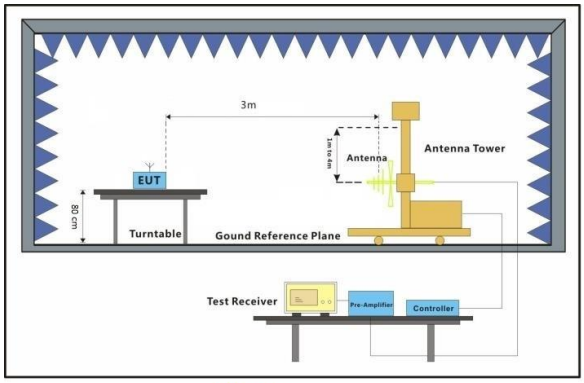
Operating Environment:

Temperature: 21.4 °C Humidity: 52.7 % RH Atmospheric Pressure: 1000 mbar

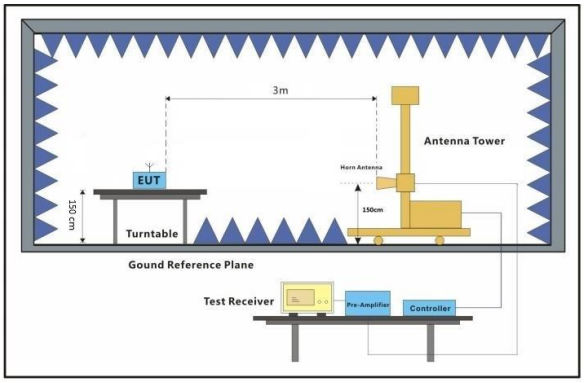
### 7.3.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Final test | 00 | TX mode_Keep the EUT in transmitting mode. |

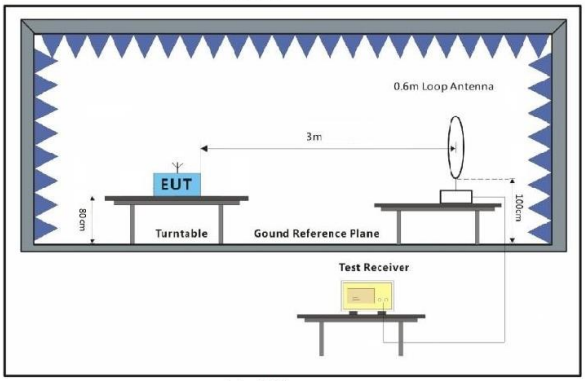
### 7.3.3 Test Setup Diagram



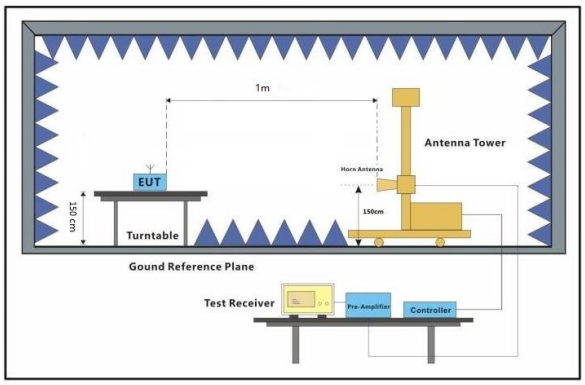

30MHz-1GHz




1GHz-18GHz




Below 30MHz




18GHz-40GHz

### 7.3.4 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For 1-18GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. For 18-40GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 1 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was t tuned to the same hight (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

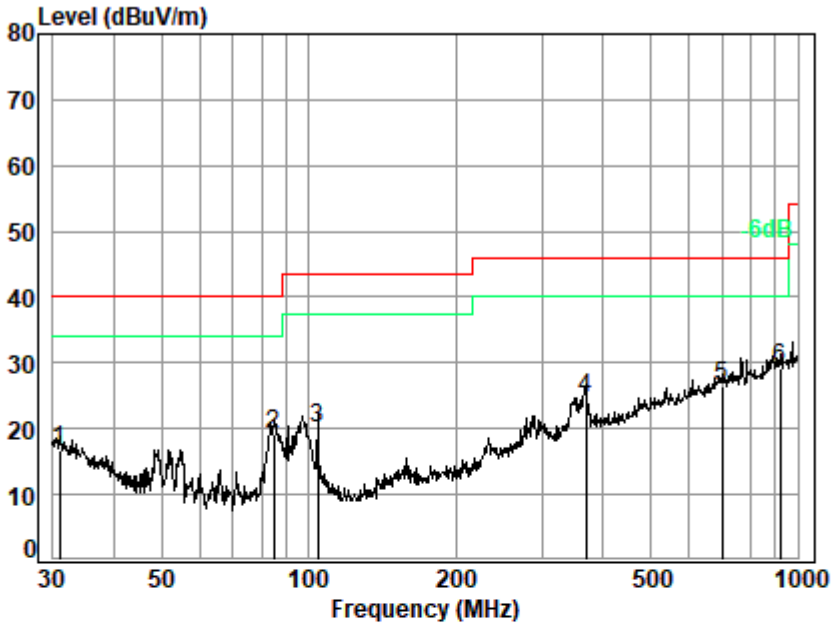
i. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Remark 3: Scan from 9kHz to 40GHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

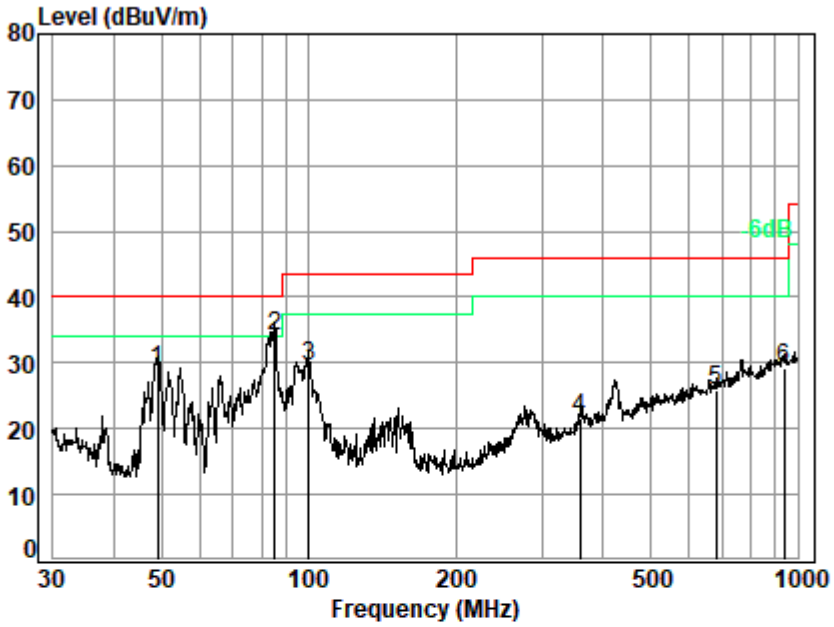
Test Mode: 00; Polarity: Horizontal




Site : chamber
Condition: 3m HORIZONTAL
Job No. : 00070AT/00071AT
Test Mode: 00

| | Freq | Ant Factor | Cable Loss | Preamp Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dB | dBuV | dBuV/m | dBuV/m | dB | |
| 1 | 30.962 | 20.76 | 0.68 | 27.79 | 23.11 | 16.76 | 40.00 | -23.24 | QP |
| 2 | 84.999 | 11.03 | 1.13 | 27.63 | 34.66 | 19.19 | 40.00 | -20.81 | QP |
| 3 | 104.170 | 12.22 | 1.25 | 27.57 | 34.19 | 20.09 | 43.50 | -23.41 | QP |
| 4 | 369.405 | 20.41 | 2.47 | 27.03 | 28.80 | 24.65 | 46.00 | -21.35 | QP |
| 5 | 699.305 | 25.93 | 3.54 | 27.73 | 24.58 | 26.32 | 46.00 | -19.68 | QP |
| 6 q | 919.287 | 28.17 | 4.17 | 26.63 | 23.48 | 29.19 | 46.00 | -16.81 | QP |

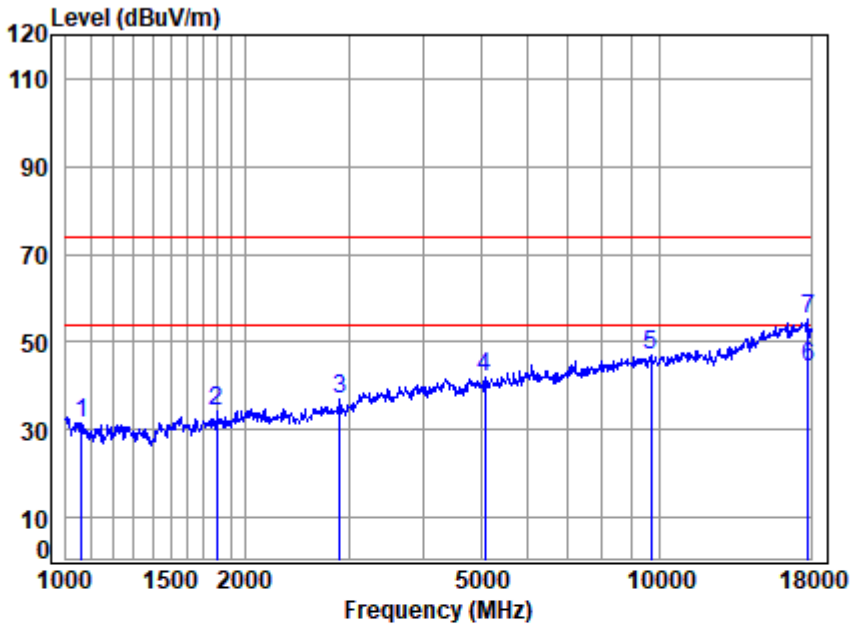
Test Mode: 00; Polarity: Vertical




Site : chamber
Condition: 3m VERTICAL
Job No. : 00070AT/00071AT
Test Mode: 00

| | Freq | Ant Factor | Cable Loss | Preamp Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dB | dBuV | dBuV/m | dBuV/m | dB | |
| 1 | 49.187 | 12.95 | 0.85 | 27.74 | 42.82 | 28.88 | 40.00 | -11.12 | QP |
| 2 q | 85.298 | 11.07 | 1.13 | 27.63 | 49.48 | 34.05 | 40.00 | -5.95 | QP |
| 3 | 100.229 | 12.31 | 1.22 | 27.59 | 43.62 | 29.56 | 43.50 | -13.94 | QP |
| 4 | 359.186 | 20.20 | 2.44 | 26.99 | 26.10 | 21.75 | 46.00 | -24.25 | QP |
| 5 | 682.348 | 25.80 | 3.49 | 27.77 | 24.30 | 25.82 | 46.00 | -20.18 | QP |
| 6 | 938.833 | 28.15 | 4.22 | 26.49 | 23.34 | 29.22 | 46.00 | -16.78 | QP |

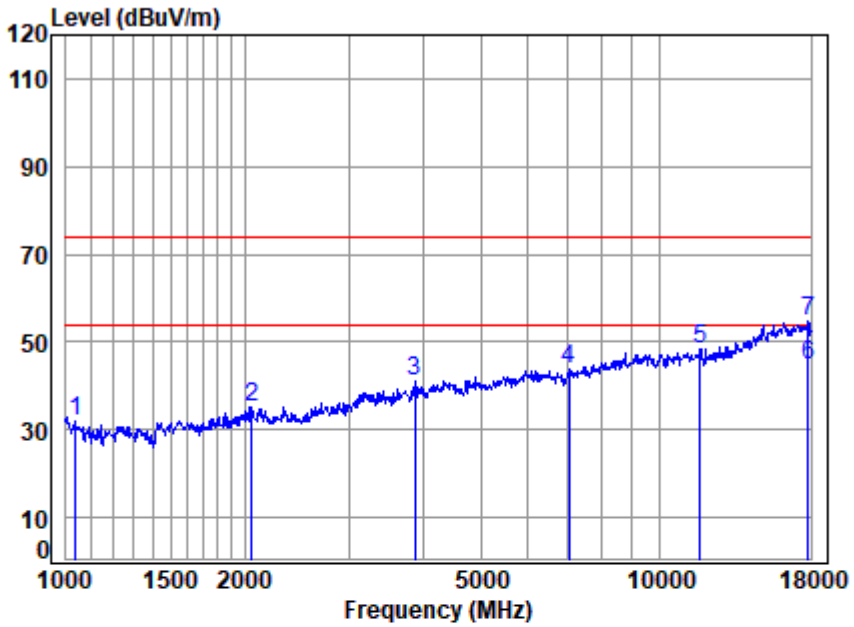
Test Mode: 00; Polarity: Horizontal




Site : chamber
Condition: 3m HORIZONTAL
Job No : 00071AT\00070AT
Mode : RSE TX

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | |
| 1 | 1062.578 | 5.79 | 24.45 | 54.63 | 55.97 | 31.58 | 74.00 | -42.42 | Peak |
| 2 | 1792.937 | 5.00 | 26.97 | 54.85 | 57.23 | 34.35 | 74.00 | -39.65 | Peak |
| 3 | 2896.945 | 5.85 | 30.19 | 54.99 | 55.75 | 36.80 | 74.00 | -37.20 | Peak |
| 4 | 5075.317 | 7.74 | 34.05 | 54.11 | 54.26 | 41.94 | 74.00 | -32.06 | Peak |
| 5 | 9669.164 | 10.58 | 37.50 | 53.33 | 52.38 | 47.13 | 74.00 | -26.87 | Peak |
| 6 | q17793.090 | 14.74 | 43.89 | 52.50 | 38.28 | 44.41 | 54.00 | -9.59 | Average |
| 7 | p17793.090 | 14.74 | 43.89 | 52.50 | 48.94 | 55.07 | 74.00 | -18.93 | Peak |

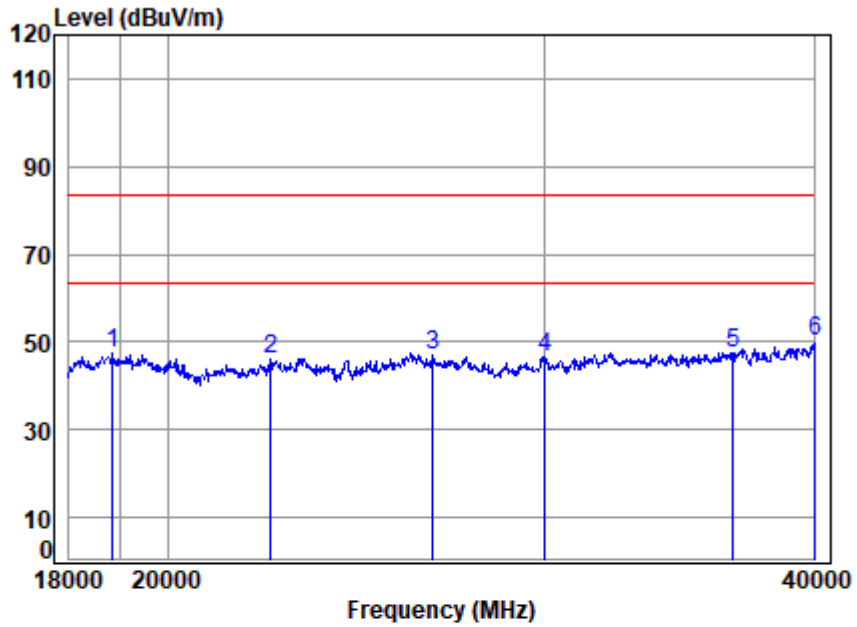
Test Mode: 00; Polarity: Vertical




Site : chamber
Condition: 3m VERTICAL
Job No : 00071AT\00070AT
Mode : RSE TX

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | |
| 1 | 1038.290 | 5.85 | 25.07 | 54.62 | 55.58 | 31.88 | 74.00 | -42.12 | Peak |
| 2 | 2059.767 | 5.11 | 28.96 | 54.91 | 56.00 | 35.16 | 74.00 | -38.84 | Peak |
| 3 | 3867.831 | 6.65 | 33.35 | 54.38 | 55.38 | 41.00 | 74.00 | -33.00 | Peak |
| 4 | 7056.092 | 8.59 | 35.71 | 53.19 | 52.82 | 43.93 | 74.00 | -30.07 | Peak |
| 5 | 11735.250 | 12.09 | 37.90 | 53.15 | 51.56 | 48.40 | 74.00 | -25.60 | Peak |
| 6 | q17793.090 | 14.74 | 43.89 | 52.50 | 38.52 | 44.65 | 54.00 | -9.35 | Average |
| 7 | p17793.090 | 14.74 | 43.89 | 52.50 | 48.54 | 54.67 | 74.00 | -19.33 | Peak |

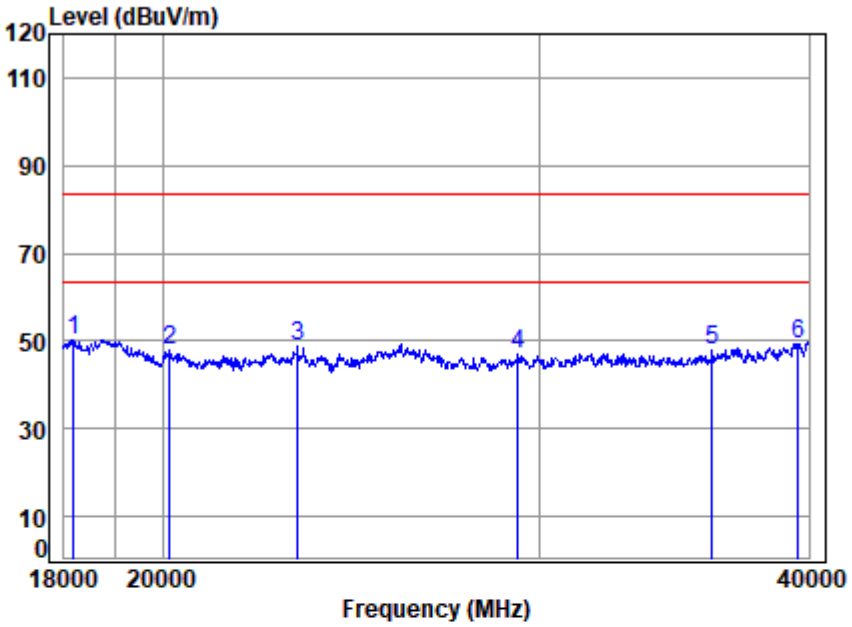
Test Mode: 00; Polarity: Horizontal




Site : chamber
Condition: 1m HORIZONTAL
Job No : 00071AT\00070AT
Mode : RSE TX
Note :

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | |
| 1 | 18853.250 | 5.89 | 36.82 | 54.74 | 59.49 | 47.46 | 83.54 | -36.08 | Peak |
| 2 | 22348.680 | 6.21 | 36.70 | 53.18 | 56.41 | 46.14 | 83.54 | -37.40 | Peak |
| 3 | 26598.160 | 7.44 | 38.48 | 52.22 | 53.26 | 46.96 | 83.54 | -36.58 | Peak |
| 4 | 29982.630 | 7.37 | 39.94 | 53.01 | 52.42 | 46.72 | 83.54 | -36.82 | Peak |
| 5 | 36636.450 | 7.76 | 41.71 | 50.33 | 48.51 | 47.65 | 83.54 | -35.89 | Peak |
| 6 | p40000.000 | 7.74 | 43.20 | 51.80 | 50.88 | 50.02 | 83.54 | -33.52 | Peak |

Test Mode: 00; Polarity: Vertical




Site : chamber
Condition: 1m VERTICAL
Job No : 00071AT\00070AT
Mode : RSE TX
Note :

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | |
| 1 | p18173.310 | 4.93 | 35.67 | 54.47 | 64.24 | 50.37 | 83.54 | -33.17 | Peak |
| 2 | 20145.110 | 5.98 | 37.13 | 55.47 | 60.25 | 47.89 | 83.54 | -35.65 | Peak |
| 3 | 23110.910 | 6.60 | 36.93 | 52.72 | 58.03 | 48.84 | 83.54 | -34.70 | Peak |
| 4 | 29296.310 | 7.19 | 38.64 | 53.35 | 54.30 | 46.78 | 83.54 | -36.76 | Peak |
| 5 | 36056.010 | 8.36 | 40.97 | 50.21 | 48.80 | 47.92 | 83.54 | -35.62 | Peak |
| 6 | 39555.320 | 7.54 | 42.74 | 52.11 | 51.16 | 49.33 | 83.54 | -34.21 | Peak |

## 7.4 Radiated emissions outside assigned band and above 40 GHz up to 200 GHz

Test Requirement 47 CFR Part 15C Section 15.255 (d)(3)

Test Method: ANSI C63.10-2020 Section 9.10

Limit:

**Above 40GHz:**

| Frequency (GHz) | Power density at 3 m distance (pW/cm2) | Distance (m) | Field strength (dBuV/m)*, peak | Field strength (dBuV/m)*, average |
|---|---|---|---|---|
| 40 - 200 | 90 | 3.0 | 105.31 | 85.31 |
| 40 - 200 | 90 | 1.0 | 114.85** | 94.85** |

* - Field strength was calculated per equation (26) of ANSI C63.10-2020 section 9 as follows: E=sqrt(PD×377), where PD is the power density at the distance specified by the limit in W/m2, E-field strength in V/m.

**- The limit for other test distance was calculated using the inverse distance extrapolation factor as follows:

LimS2 = LimS1 + 20 log (S1/S2), where S1 and S2 - standard defined and test distance respectively in meters.

### 7.4.1 E.U.T. Operation

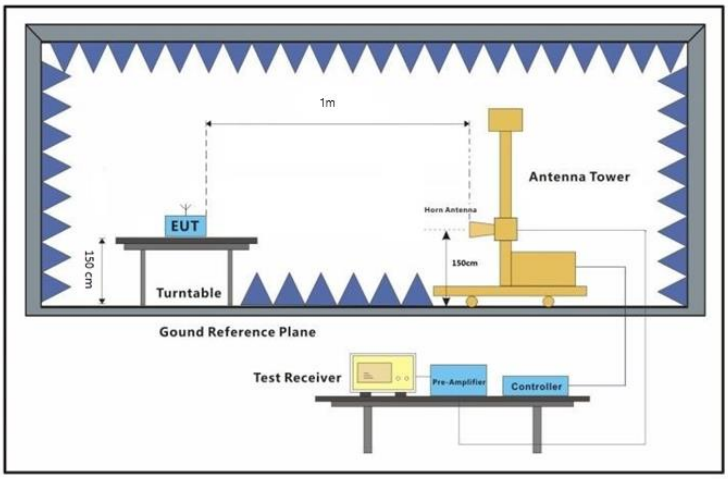
Operating Environment:

Temperature: 23.2 °C Humidity: 45.8 % RH Atmospheric Pressure: 1020 mbar

### 7.4.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Final test | 00 | TX mode_Keep the EUT in transmitting mode. |

### 7.4.3 Test Setup Diagram




Above 40GHz

### 7.4.4 Measurement Procedure and Data

a. For above 40GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 1 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation

b. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

c. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the same hight (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

d. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

e. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

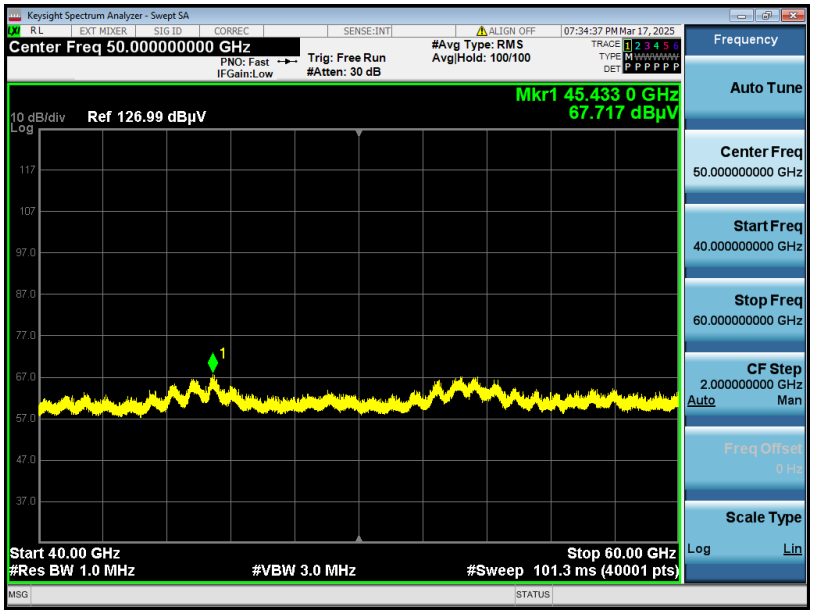
f. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

g. Repeat above procedures until all frequencies measured was complete.

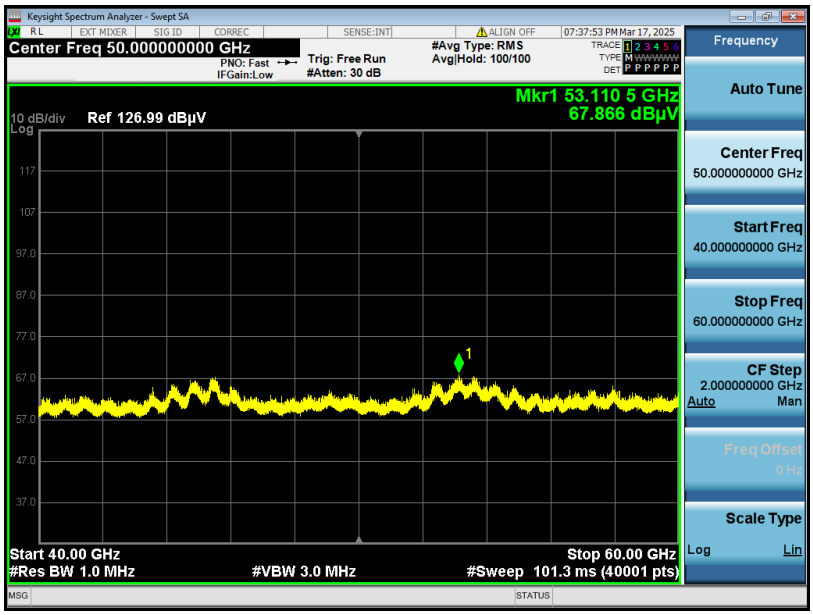
Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Test Mode: 00; Polarity: Horizontal

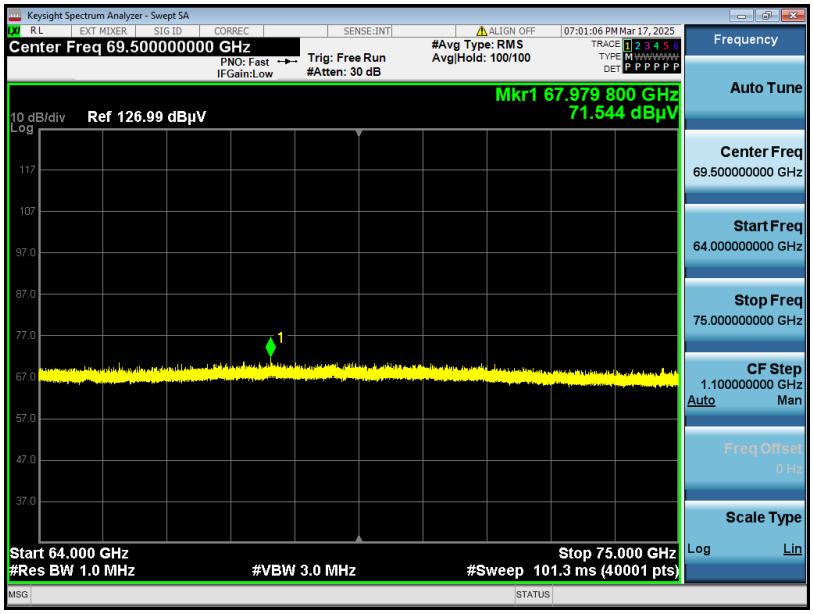



Test Mode: 00; Polarity: Vertical

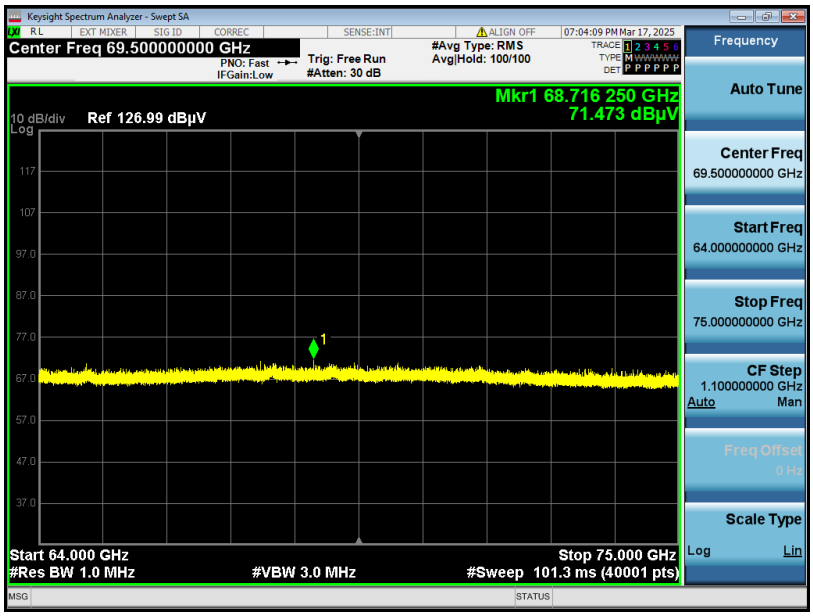



| Frequency (GHz) | Distance (M) | PK Value (dBuV/m) | PK Limit (dBuV/m) | AV Limit (dBuV/m) | Polarization | Result |
|---|---|---|---|---|---|---|
| 45.433 | 1 | 67.717 | 114.85 | 94.85 | H | PASS |
| 53.110 | 1 | 67.866 | 114.85 | 94.85 | V | PASS |

Test Mode: 00; Polarity: Horizontal

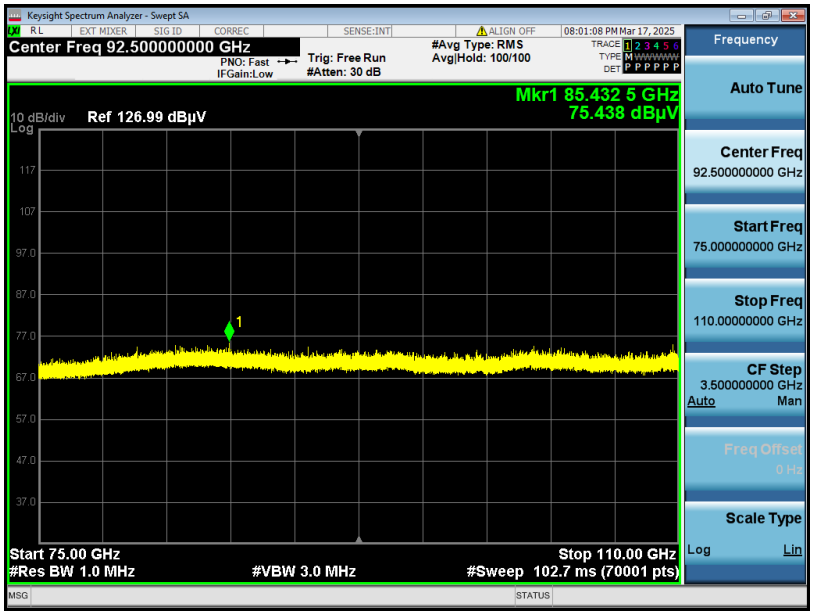



Test Mode: 00; Polarity: Vertical

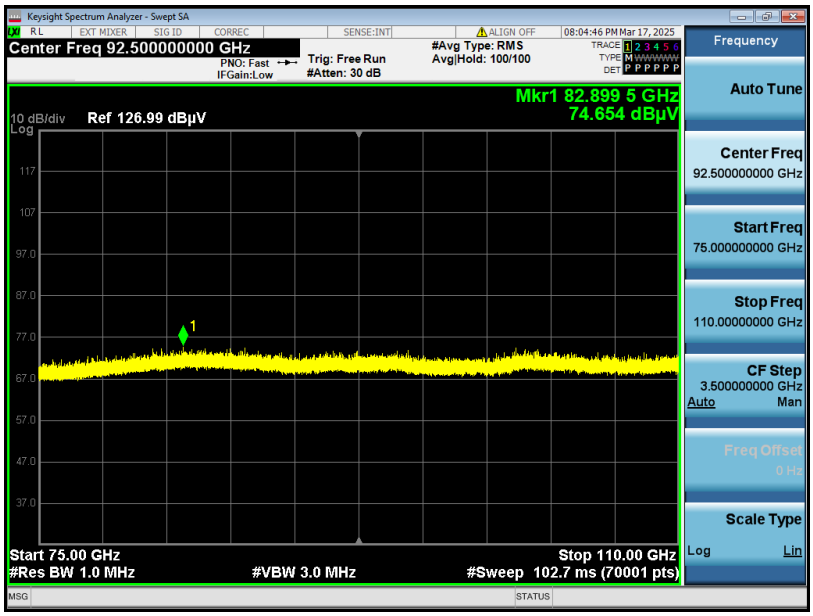



| Frequency (GHz) | Distance (M) | PK Value (dBuV/m) | PK Limit (dBuV/m) | AV Limit (dBuV/m) | Polarization | Result |
|---|---|---|---|---|---|---|
| 67.979 | 1 | 71.544 | 114.85 | 94.85 | H | PASS |
| 68.716 | 1 | 71.473 | 114.85 | 94.85 | V | PASS |

Test Mode: 00; Polarity: Horizontal

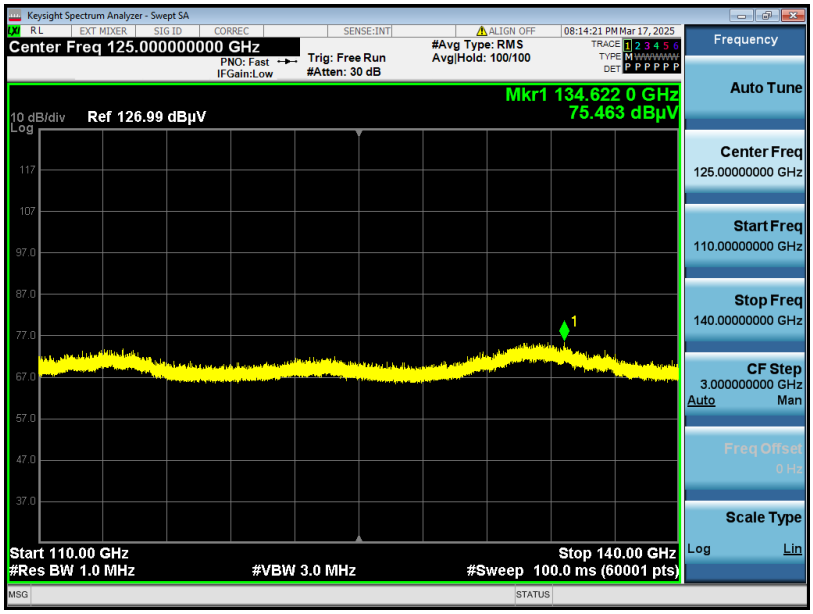



Test Mode: 00; Polarity: Vertical

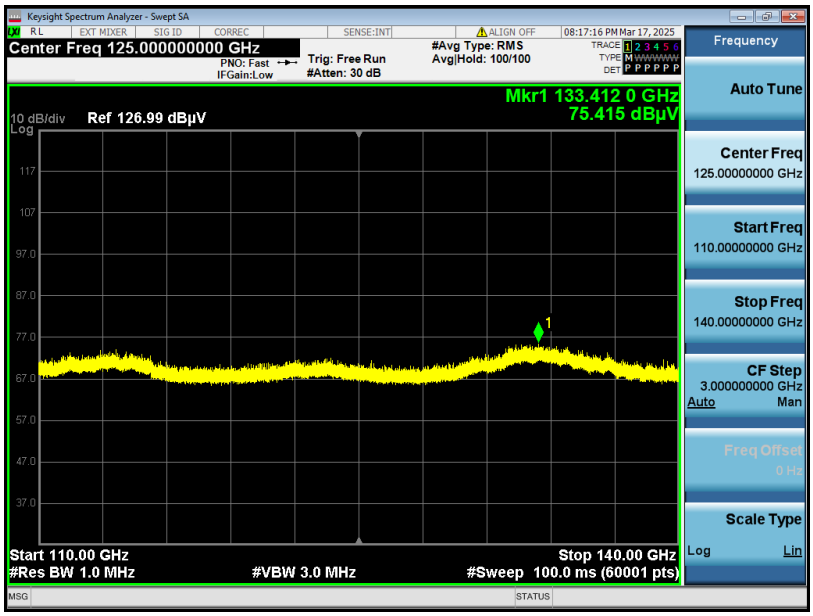



| Frequency (GHz) | Distance (M) | PK Value (dBuV/m) | PK Limit (dBuV/m) | AV Limit (dBuV/m) | Polarization | Result |
|---|---|---|---|---|---|---|
| 85.432 | 1 | 75.438 | 114.85 | 94.85 | H | PASS |
| 82.899 | 1 | 74.654 | 114.85 | 94.85 | V | PASS |

Test Mode: 00; Polarity: Horizontal




Test Mode:00; Polarity: Vertical



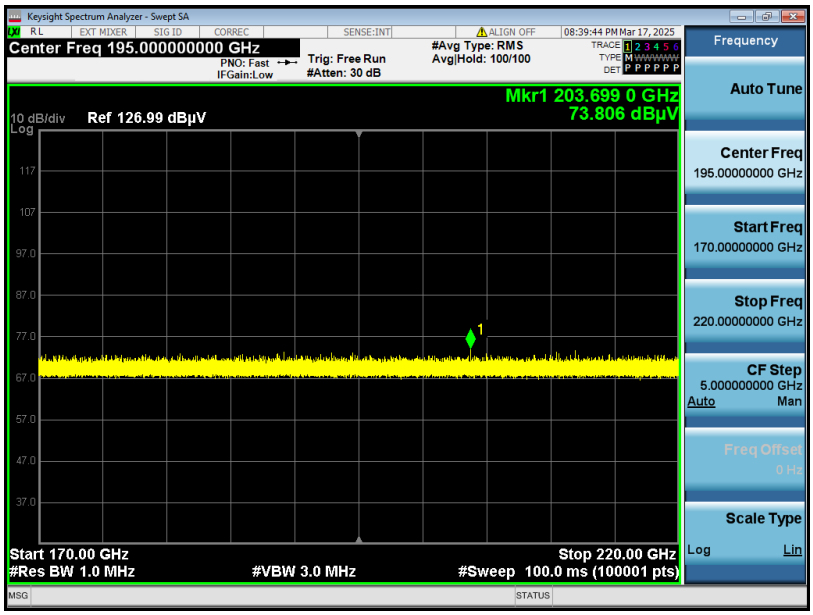

| Frequency (GHz) | Distance (M) | PK Value (dBuV/m) | PK Limit (dBuV/m) | AV Limit (dBuV/m) | Polarization | Result |
|---|---|---|---|---|---|---|
| 134.622 | 1 | 75.463 | 114.85 | 94.85 | H | PASS |
| 133.412 | 1 | 75.415 | 114.85 | 94.85 | V | PASS |

Test Mode: 00; Polarity: Horizontal

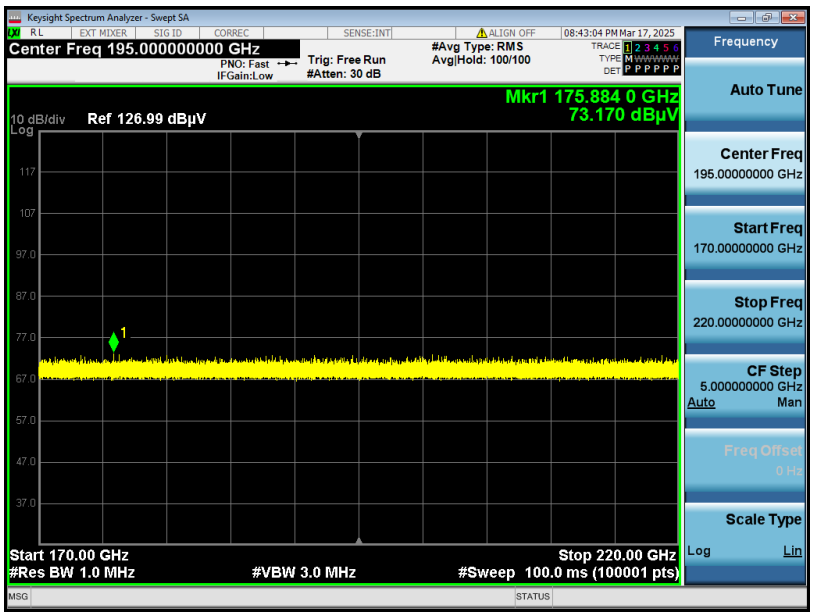

Test Mode:00; Polarity: Vertical


| Frequency (GHz) | Distance (M) | PK Value (dBuV/m) | PK Limit (dBuV/m) | AV Limit (dBuV/m) | Polarization | Result |
|---|---|---|---|---|---|---|
| 157.079 | 1 | 76.956 | 114.85 | 94.85 | H | PASS |
| 157.198 | 1 | 76.342 | 114.85 | 94.85 | V | PASS |

Test Mode: 00; Polarity: Horizontal




Test Mode:00; Polarity: Vertical




| Frequency (GHz) | Distance (M) | PK Value (dBuV/m) | PK Limit (dBuV/m) | AV Limit (dBuV/m) | Polarization | Result |
|---|---|---|---|---|---|---|
| 203.699 | 1 | 73.806 | 114.85 | 94.85 | H | PASS |
| 175.884 | 1 | 73.170 | 114.85 | 94.85 | V | PASS |

## 7.5 Frequency Stability

Test Requirement 47 CFR Part 15C Section 15.255 (f)

Test Method: ANSI C63.10-2020 Section 9.5

Limit:

| Frequency (GHz) | Limit |
|---|---|
| 57 - 64 | The signal must be contained within assigned frequency band. |

### 7.5.1 E.U.T. Operation

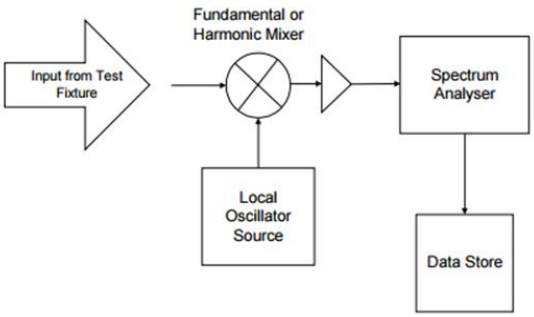
Operating Environment:

Temperature: 21.4 °C Humidity: 47.4 % RH Atmospheric Pressure: 1020 mbar

### 7.5.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Final test | 00 | TX mode_Keep the EUT in transmitting mode. |

### 7.5.3 Test Setup Diagram



### 7.5.4 Measurement Procedure and Data

1. Temperature conditions:

a) The RF output port of the EUT was connected to Frequency Meter;

b) Set the working Frequency in the middle channel;

c) record the 20°C and norminal voltage frequency value as reference point;

d) vary the temperature from 0°C to 40°C with step 10°C

e) when reach a temperature point, keep the temperature banlance at least 1 hour to make the product working in this status;

f) read the frequency at the relative temperature.

2. Voltage conditions:

a) record the 20°C and norminal voltage frequency value as reference point;

b) vary the voltage from -15% norminal voltage to +15% voltage;

read the frequency at the relative voltage.

Remark: Manufacturer declared that the minimum temperature for normal operation of this product is 0℃.

Please Refer to Appendix for Details

# 8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SZCR2501000071AT

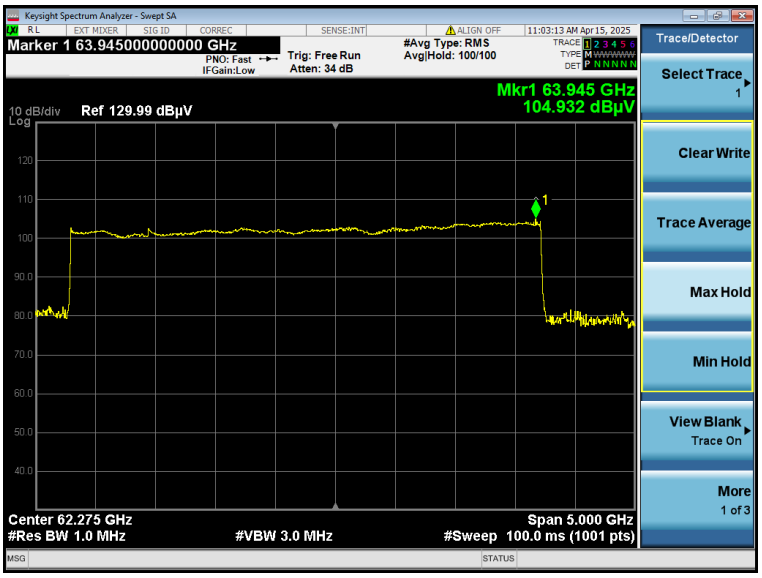
# 9 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for SZCR2501000071AT

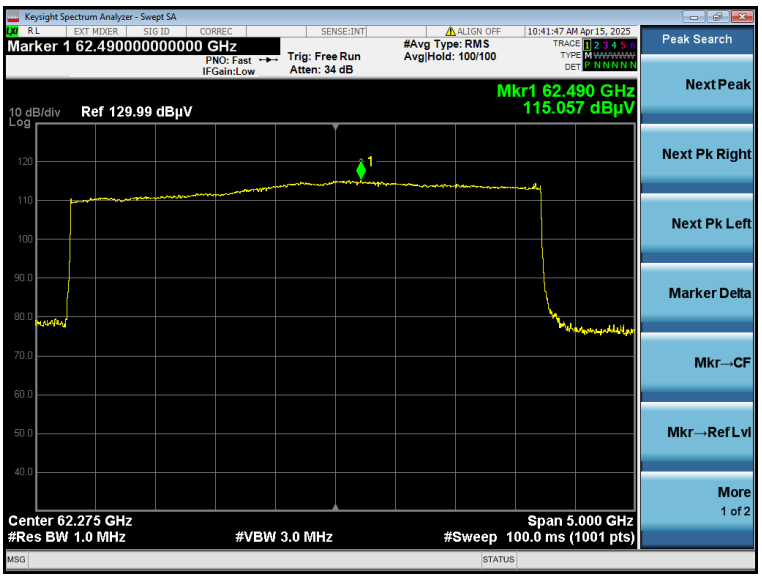
# 10 Appendix

## 1. Transmitter power and Transmitter off-times

**Peak Power- Horizontal**




**Peak Power- Vertical**



## Average Power- Horizontal


## Average Power - Vertical

| Frequency (GHz) | Polarity | dBuV/m @ 0.5m | Mesured EIRP (dBm) | Desensitization Factor(dB) | Final EIRP (dBm) | EIRP Limit (dBm) | Result | Remark |
|---|---|---|---|---|---|---|---|---|
| 62.370 | Horizontal | 104.932 | -5.86 | 14.58 | 8.72 | 20 | Pass | peak |
| | Vertical | 115.057 | 4.27 | 14.58 | 18.85 | 20 | Pass | peak |

Remark:

E[dBμV/m] = EIRP[dBm] - 20 log(d[meters]) + 104.77, where E = field strength and d = distance at which field strength limit is specified in the rules

EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77

Final EIRP[dBm]=Mesured EIRP[dBm]+ Desensitization Factor[dB]

The FMCW Desensitization factor

| FMCW Witdh(MHz) | $T_{chirp}$(us) | RBW(MHz) | Desensitization Factor(lin) | Desensitization Factor(dB) |
|---|---|---|---|---|
| 3892.3 | 60 | 1 | 0.035 | 14.58 |

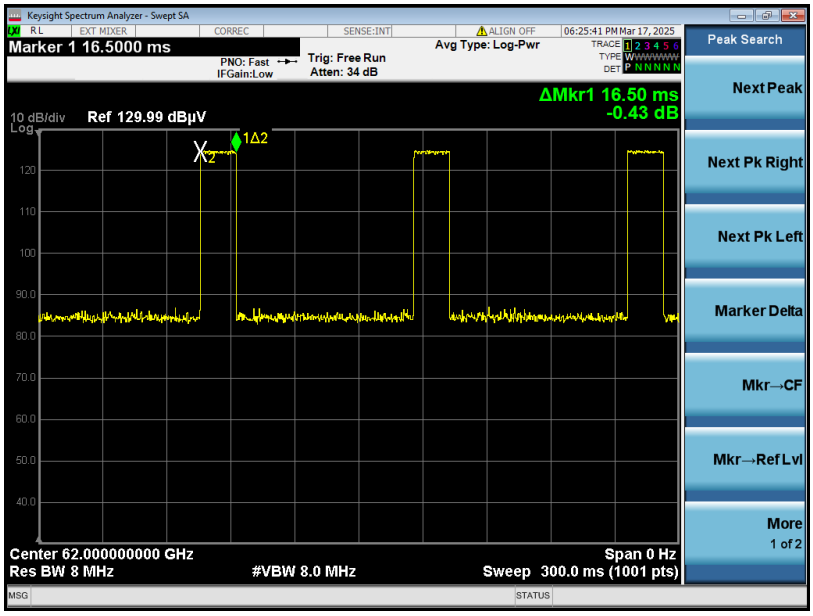
FMCW desensitization factor =-10*Log(α)=-10*Log(0.035)= 14.58dB

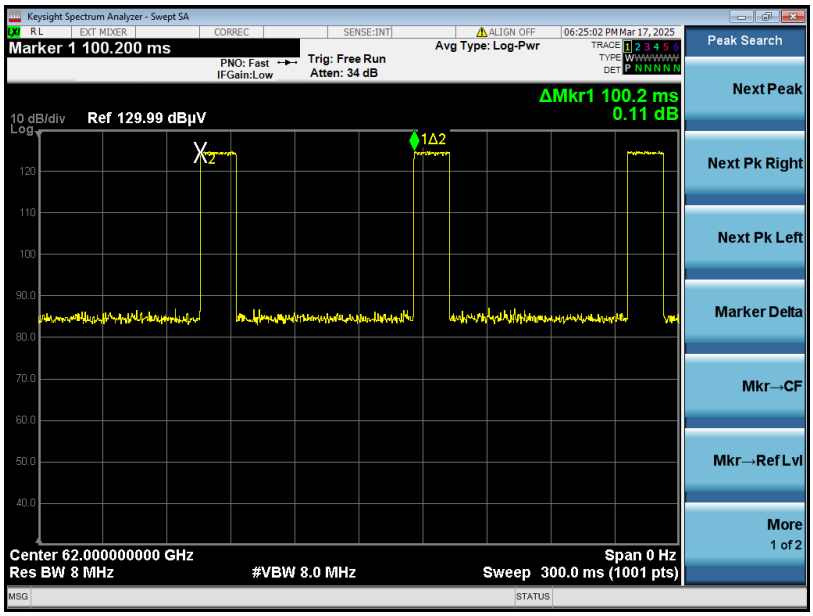
$$\alpha = \frac{1}{\sqrt{1+\left(\frac{2\ln(2)}{\pi}\right)^2\left(\frac{BW_{Chirp}}{T_{Chirp}B^2}\right)^2}}$$

where

| | |
|---|---|
| $\alpha$ | is the reduction in amplitude |
| $BW_{Chirp}$ | is the FMCW Chirp Bandwidth |
| $T_{Chirp}$ | is the FMCW Chirp Time |
| $B$ | is the 3 dB IF Bandwidth = RBW |

**Transmitter off-times (ms)**

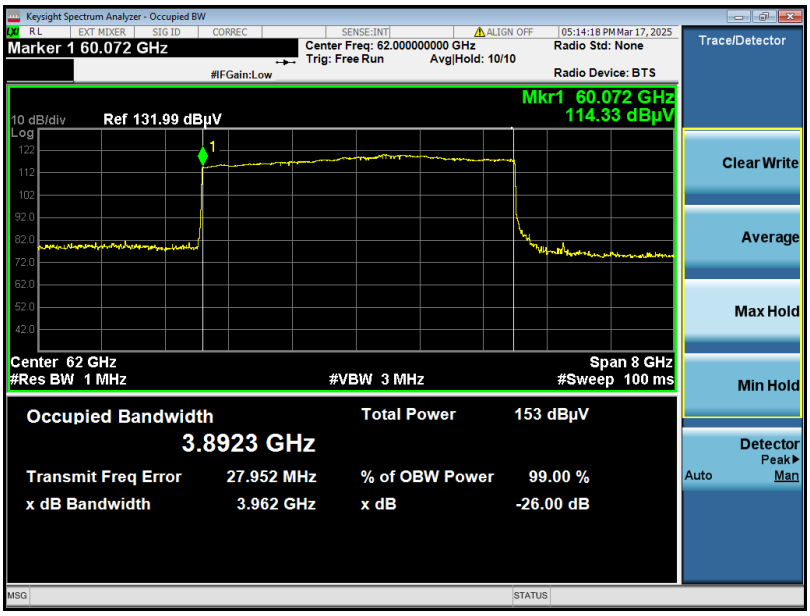


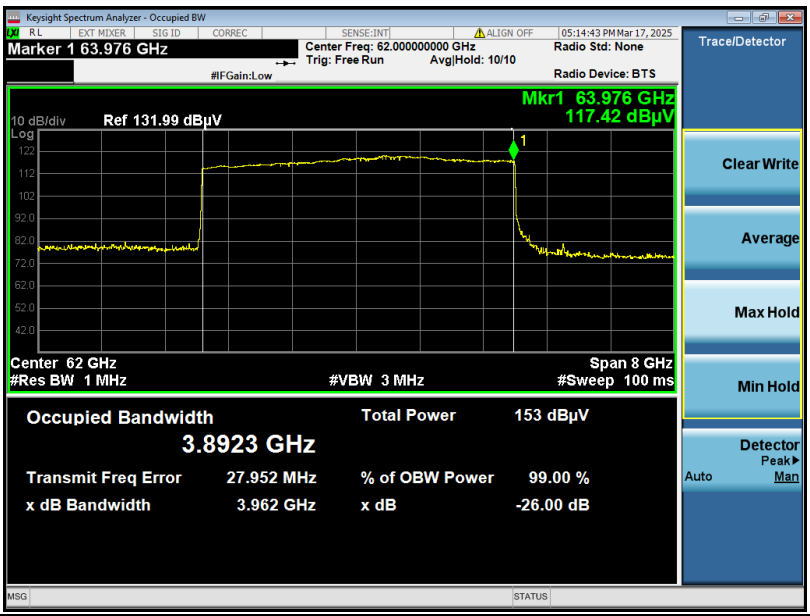




| Frequency (GHz) | Transmitter off-times (ms) | Limit (ms) | Result |
|---|---|---|---|
| 62 | 83.7 | ⩾16.5 | Pass |

## 2. Occupied bandwidth

**99% Occupied Channel Bandwidth**




| Frequency Range (GHz) | 99% OCW (GHz) | $F_L$ (GHz) | Limit (GHz) | $F_H$ (GHz) | Limit (GHz) | Result |
|---|---|---|---|---|---|---|
| 60-64 | 3.8923 | 60.072 | ⩾60 | 63.976 | ⩽64 | Pass |

Remark: $F_L$: Frequency Low Band Edge, $F_H$: Frequency High Band Edge

## 3. Frequency stability

Frequency Stability vs temperature:

1. Test for 60GHz to 64GHz

| Frequency (GHz) | Temperature (°C) | Voltage (V DC) | $F_L$ (GHz) | Limit (GHz) | $F_H$ (GHz) | Limit (GHz) | Result |
|---|---|---|---|---|---|---|---|
| 60-64 | 40 | 15.0 | 60.070 | 60 | 63.973 | 64 | Pass |
| | 30 | 15.0 | 60.071 | 60 | 63.974 | 64 | Pass |
| | 20 | 15.0 | 60.072 | 60 | 63.976 | 64 | Pass |
| | 10 | 15.0 | 60.072 | 60 | 63.976 | 64 | Pass |
| | 0 | 15.0 | 60.0711 | 60 | 63.975 | 64 | Pass |

Frequency Stability vs voltage:

1. Test for 60GHz to 64GHz

| Frequency (GHz) | Voltage (V DC) | Temperature (°C) | $F_L$ (GHz) | Limit (GHz) | $F_H$ (GHz) | Limit (GHz) | Result |
|---|---|---|---|---|---|---|---|
| 60-64 | 17.15 | 20 | 60.072 | 60 | 63.976 | 64 | Pass |
| | 15.00 | 20 | 60.072 | 60 | 63.976 | 64 | Pass |
| | 12.75 | 20 | 60.071 | 60 | 63.975 | 64 | Pass |

Remark:

$F_L$: Frequency Low Band Edge, $F_H$: Frequency High Band Edge

- End of the Report -