# APPLICATION FOR CERTIFICATION
On Behalf of
GoodWe Technologies Co., Ltd.
Smart Dongle

| | | |
|---|---|---|
| Model No. | : | WiFi Kit-20 |
| Brand | : | GOODWE |
| FCC ID | : | 2AU7J-WIFIKIT20 |

Prepared for

**GoodWe Technologies Co., Ltd.**
No.90 Zijin Rd., New District, Suzhou, 215011, China

Prepared by

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| | | |
|---|---|---|
| Report Number | : | ACWE-F2308015 |
| Date of Test | : | Apr.04~May 10, 2024 |
| Date of Report | : | May 31, 2024 |

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# TEST REPORT CERTIFICATION

| | | |
|---|---|---|
| Applicant | : | GoodWe Technologies Co., Ltd. |
| Manufacturer | : | GoodWe Technologies Co., Ltd. |
| EUT Description | : | Smart Dongle |
| FCC ID | : | 2AU7J-WIFIKIT20 |
| (A) Model No. | : | WiFi Kit-20 |
| (B) Brand | : | GOODWE |
| (C) Test Voltage | : | DC 5V |

Applicable Standards:

Title 47 CFR FCC Part 15 Subpart C
ANSI C63.10:2020
KDB 558074 D01 DTS Meas Guidance v05r02

The device described above was tested by Audix Technology (Wujiang) Co., Ltd. EMC Dept.to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C section 15.247 limits.

The measurement results are contained in this test report and Audix Technology (Wujiang) Co., Ltd. EMC Dept. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Wujiang) Co., Ltd. EMC Dept.

Date of Test: Apr.04~May 10, 2024 Date of Report: May 31, 2024

Prepared by : Emma Hu
(Emma Hu/Assistant Administrator)

Approved & Authorized Signer : Kan Tong
(K.M Tong/Assistant Manager)

TESTING
NVLAP LAB CODE 200786-0

# 1. DESCRIPTION OF VERSION

| Edition No. | Date of Rev. | Summary | Report No. |
|---|---|---|---|
| 0 | May 31, 2024 | Original Report. | ACWE-F2308015 |

# 2. SUMMARY OF MEASUREMENTS AND RESULTS

The EUT have been tested according to the applicable standards as referenced below.

| Rule | Description | Results |
|---|---|---|
| 15.207 | Conducted Emission | **PASS** |
| 15.247(d)/ 15.205 | Radiated Band Edge and Radiated Spurious Emission | **PASS** |
| 15.247(a)(2) | 6dB Bandwidth | **PASS** |
| 15.247(b)(3) | Maximum Output Power | **PASS** |
| 15.247(d) | Conducted Band Edges and Conducted Spurious Emission | **PASS** |
| 15.247 (e) | Peak Power Spectral Density | **PASS** |
| 15.203 | Antenna Requirement | **Compliance** |

# 3. GENERAL INFORMATION

3.1. Description of Device (EUT)

| | | |
|---|---|---|
| Product | : | Smart Dongle |
| Model Number | : | WiFi Kit-20 |
| FCC ID | : | 2AU7J-WIFIKIT20 |
| Brand | : | GOODWE |
| Applicant | : | GoodWe Technologies Co.,Ltd.<br>No.90 Zijin Rd., New District, Suzhou, 215011, China |
| Manufacturer | : | GoodWe Technologies Co.,Ltd.<br>No.90 Zijin Rd., New District, Suzhou, 215011, China |
| I/O Ports | : | USB port*1 |
| Date of Receipt of Sample | : | Aug.01, 2023 |

3.2. Antenna Information

| Type | Frequency (MHz) | Gain(dBi) |
|---|---|---|
| PCB Antenna | 2400-2500 | 3.76 |

3.3. EUT Specification Assessed in Current Report

| Mode | Fundamental Range (MHz) | Channel Number | Modulation |
|---|---|---|---|
| 802.11b | 2412-2462 | 11 | DSSS (DBPSK/DQPSK/CCK) |
| 802.11g | 2412-2462 | 11 | OFDM (BPSK/QPSK/16QAM/64QAM) |
| 802.11n-HT20 | | | |
| BLE-1M | 2402-2480 | 40 | GFSK |
| Remark: The information of test software, fixture and antenna gain is provided by customer. | | | |

3.4. Duty Cycle

| Mode | Duty Cycle | Duty Cycle Factor |
|---|---|---|
| BLE 2402 | 0.84 | 0.78 |
| BLE 2440 | 0.83 | 0.78 |
| BLE 2480 | 0.84 | 0.78 |

3.5. Tested Supporting System Details (AE)

3.5.1. Notebook

Manufacturer/Brand : DELL
Model Number : Vostro 14-5459
Serial Number : 8P9C4K2

3.6. Description of Test Facility

| | | |
|---|---|---|
| Name of Firm | : | **Audix Technology (Wujiang) Co., Ltd. EMC Dept.** |
| Site Location | : | No. 1289 Jiangxing East Road, the Eastern Part of Wujiang Economic Development Zone Jiangsu China 215200 |
| Test Facilities | : | **No.2 Conducted Shielding Enclosure**<br>**No.2 3m Semi-anechoic Chamber**<br>**RF Fully Chamber** |
| NVLAP Lab Code | : | 200786-0<br>Valid until on Sep.30, 2024<br>(NVLAP is a signatory member of ILAC MRA)<br>Remark: This report shall not be imply endorsement, certification or approval by NVLAP, NIST, or any agency of the U.S. Federal Government. |

3.7. Measurement Uncertainty

| Test Item | Range Frequency | Uncertainty |
|---|---|---|
| No.2 Conducted Disturbance Measurement | 0.15MHz ~ 30MHz | ± 3.06dB |
| Radiated Disturbance Measurement (At 3m Chamber) | 30MHz ~ 1GHz | ± 3.95dB |
| | 1GHz ~ 6GHz | ± 4.46dB |
| | 6GHz ~ 18GHz | ± 5.00dB |

| Test items | Uncertainty |
|---|---|
| Unwanted Emission(Conducted measurement) | y(dBm/Hz) ±U=y(dBm/Hz) ±0.61dB |
| RF Output Power | y(dBm) ±U=y(dBm) ±0.73 |
| RF Frequency | y(Volt) ±U=y(Volt) ±1.4x10($^{-3}$)Hz |
| Temperature and Humidity | y(℃)±U=y(℃) ±0.532℃<br>y(%)±U=y(%) ±3.36% |
| RF DC Voltage | y(Volt) ±U=y(Volt) ±0.044 |
| Power Density | y(dBm/Hz) ±U=y(dBm/Hz) ±2.76dB |
| Radiated Spurious Emission(30MHz~1GHz) | y(dBm) ±U=y(dBm) ±4.96dB |
| Radiated Spurious Emission(1GHz~26.5GHz) | y(dBm) ±U=y(dBm) ±3.40dB |

Remark: Uncertainty = $ku_c(y)$

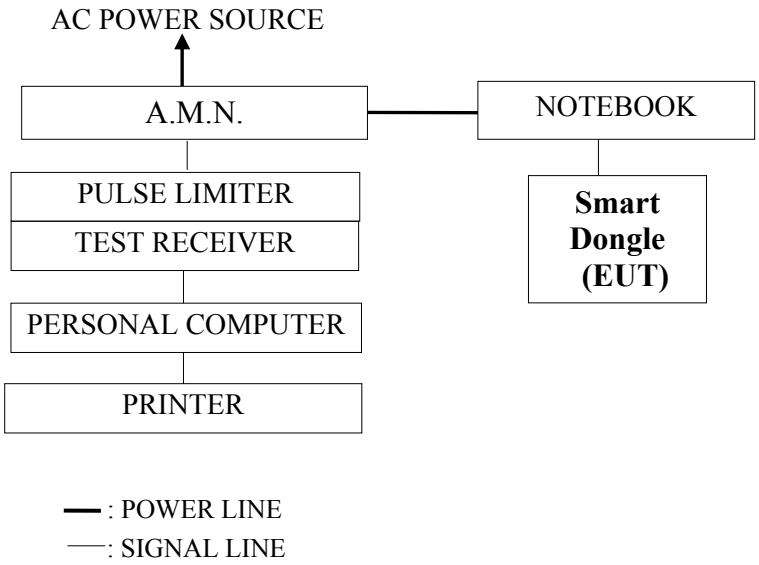
The standards listed in this report only require the uncertainty to be listed, and the measurement uncertainty is not required to be calculated in the measurement results. Therefore, the conformity judgment results are in accordance with the quality document TMC-205, and the test results in this report meet the requirements of the standards listed in this report.

# 4. CONDUCTED EMISSION MEASUREMET

## 4.1. Test Equipment

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Period |
|---|---|---|---|---|---|---|
| 1. | Test Receiver | R & S | ESCI | 100839 | 2024-03-24 | 1 Year |
| 2. | A.M.N. | Schwarzbeck | NNLK 8129 | 8129-164 | 2023-12-13 | 1 Year |
| 3. | L.I.S.N. | Kyoritsu | KNW-407 | 8-1793-4 | 2024-03-24 | 1 Year |
| 4. | I.S.N. | TESEQ | T800 | 58414 | 2024-03-24 | 1 Year |
| 5. | Pulse Limiter | R&S | ESH3-Z2 | 101832 | 2023-12-13 | 1 Year |
| 6. | 50Ω Terminator | Tektronis | MS4630B | 001-CON | 2023-12-13 | 1 Year |
| 7. | RF Cable | Shengxuan | ROS400 | 59/3 | 2023-12-13 | 1 Year |
| 8. | Software | Audix /e3 (210616) | | | | |

## 4.2. Block Diagram of Test Setup




## 4.3. Power line Conducted Emission Limit

| Frequency | Maximum RF Line Voltage | |
|---|---|---|
| | Quasi-Peak Level | Average Level |
| 150kHz ~ 500kHz | 66 ~ 56 dBμV | 56 ~ 46 dBμV |
| 500kHz ~ 5MHz | 56 dBμV | 46 dBμV |
| 5MHz ~ 30MHz | 60 dBμV | 50 dBμV |

Remark1: If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2: The lower limit applies at the band edges.

## 4.4. Test Procedure

The measuring process is according to ANSI C63.10-2020 and laboratory internal procedure TKC-301-004. (For FCC Part15 Subpart C)

In the conducted emission measurement, the EUT and all peripheral devices were set up on a non-metallic table which was 0.8 meter height above the ground plane, and 0.4 meter far away from the vertical plane. The mains cable of the EUT connected to one Artificial Main Network(AMN). All other unit of the EUT and AE connected to a second Line Impedance Stabilization Network(L.I.S.N.). The telecommunication cable connected to the AE through a Impedance Stabilization Network(ISN) which terminated a 50Ω resistor. For the measurement, the A.M.N measuring port was terminated by a 50Ω measuring equipment and the second L.I.S.N measuring port was terminated by a 50Ω terminator. All measurements were done between the phase lead and the reference ground, and between the neutral lead and the reference ground. All cables or wires placement were verified to find out the maximum emission.

The bandwidth of measuring receiver was set at 9 kHz.

The required frequency band (0.15 MHz ~ 30 MHz) was pre-scanned with peak detector; the final measurement was measured with quasi-peak detector and average detector. (If the average limit is met when using a quasi-peak detector, the average detector is unnecessary).

The emission level is calculated automatically by the test system which uses the following equation:

Emission level (dBμV) = Reading (dBμV) + A.M.N factor (dB) + Cable loss (dB).
(Cable loss includes Pulse Att+Cable+Switch)

## 4.5. Conducted Emission Measurement Results

For FCC Part15 Subpart C

**PASSED**.

EUT was performed during this section testing and all the test results are attached in next pages.

Test Date: May 10, 2024 Temperature: 22.2℃ Humidity: 49%

| Mode | Test Condition | Reference Test Data No. | |
|---|---|---|---|
| | | Neutral | Line |
| 1 | BLE Mode | # 6 | # 5 |

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No.1289,Jiang Xing East Road,The Eastern Part of WuJiang
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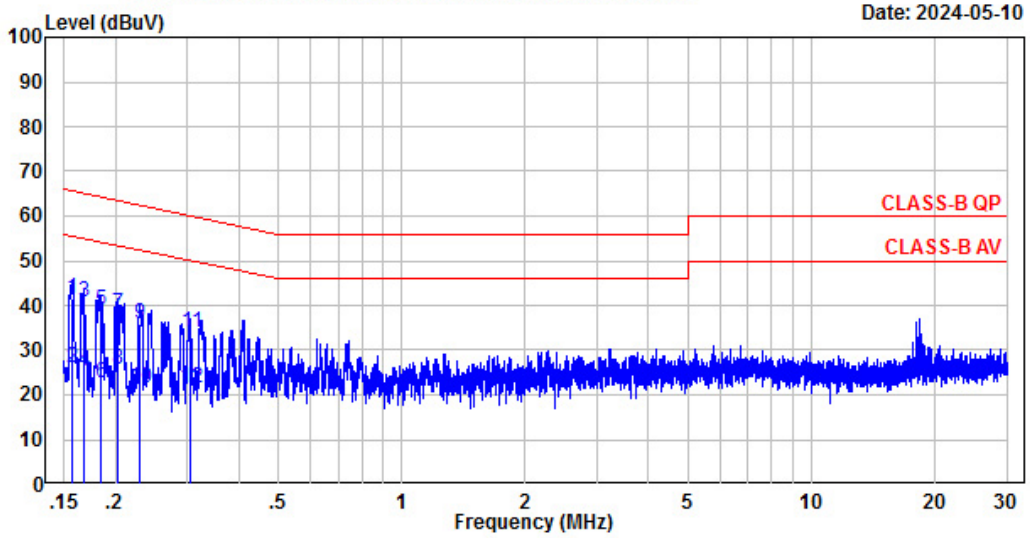
Tel : (0512)63403993 Fax:(0512)63403339

File: D:\TEST DATA\2023\Report\7\C1W2307083\1_00006.EMI

Date: 2024-05-10




Site NO. : NO.2 shielded Room
Instrument 1 : Receiver ESCI (839)
Instrument 2 : NNLK 8129(164)|59/3|ESH3-Z2 (832)
Dis. / Ant. : NNLK8129-2312
Limit : CLASS-B QP
Env. / Ins. : 22.2℃& 49 %
EUT : Smart Dongle
M/N : WiFi Kit-20
Power Rating : DC 5V
Test Mode : BLETX Mode
Memo :

Ant. pol.: Neutral Data NO.:6

Engineer : Yinyarong

| Freq. MHz | LISN Factor dB | Cable Loss dB | Reading dBuV | Emission Level dBuV | Limits dBuV | Margin dB | Remark |
|---|---|---|---|---|---|---|---|
| 0.157 | 0.10 | 10.03 | 31.19 | 41.32 | 65.61 | 24.29 | QP |
| 0.157 | 0.10 | 10.03 | 15.81 | 25.94 | 55.61 | 29.67 | Average |
| 0.168 | 0.10 | 10.03 | 30.44 | 40.57 | 65.08 | 24.51 | QP |
| 0.168 | 0.10 | 10.03 | 15.16 | 25.29 | 55.08 | 29.79 | Average |
| 0.184 | 0.10 | 10.03 | 28.77 | 38.90 | 64.28 | 25.38 | QP |
| 0.184 | 0.10 | 10.03 | 12.33 | 22.46 | 54.28 | 31.82 | Average |
| 0.203 | 0.10 | 10.03 | 27.87 | 38.00 | 63.49 | 25.49 | QP |
| 0.203 | 0.10 | 10.03 | 15.71 | 25.84 | 53.49 | 27.65 | Average |
| 0.230 | 0.10 | 10.03 | 25.70 | 35.83 | 62.44 | 26.61 | QP |
| 0.230 | 0.10 | 10.03 | 11.20 | 21.33 | 52.44 | 31.11 | Average |
| 0.306 | 0.10 | 10.03 | 23.80 | 33.93 | 60.09 | 26.16 | QP |
| 0.306 | 0.10 | 10.03 | 11.56 | 21.69 | 50.09 | 28.40 | Average |

Remarks:Emisson Level = LISN factor+Cable loss(Cable+Pulse Att+Switch)+Reading

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No.1289,Jiang Xing East Road,The Eastern Part of WuJiang
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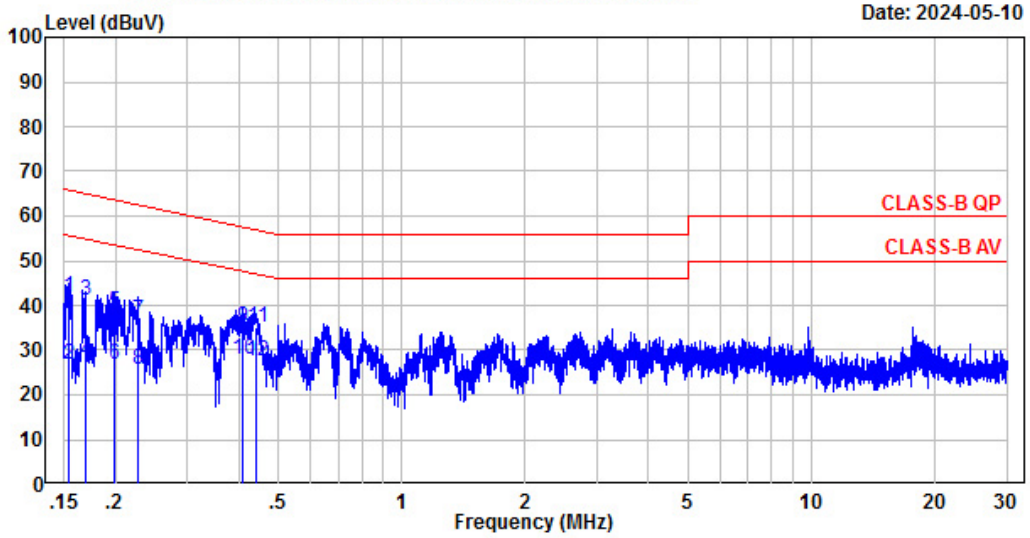
Tel : (0512)63403993 Fax:(0512)63403339

File: D:\TEST DATA\2023\Report\7\C1W2307083\1_00005.EMI

Date: 2024-05-10




Site NO. : NO.2 shielded Room
Instrument 1 : Receiver ESCI (839)
Instrument 2 : NNLK 8129(164)|59/3|ESH3-Z2 (832)
Dis. / Ant. : NNLK8129-2312
Limit : CLASS-B QP
Env. / Ins. : 22.2℃& 49 %
EUT : Smart Dongle
M/N : WiFi Kit-20
Power Rating : DC 5V
Test Mode : BLETX Mode
Memo :

Ant. pol.: Line1 Data NO.:5

Engineer : Yinyarong

| Freq. MHz | LISN Factor dB | Cable Loss dB | Reading dBuV | Emission Level dBuV | Limits dBuV | Margin dB | Remark |
|---|---|---|---|---|---|---|---|
| 0.154 | 0.10 | 10.03 | 31.94 | 42.07 | 65.78 | 23.71 | QP |
| 0.154 | 0.10 | 10.03 | 16.77 | 26.90 | 55.78 | 28.88 | Average |
| 0.169 | 0.10 | 10.03 | 30.92 | 41.05 | 65.00 | 23.95 | QP |
| 0.169 | 0.10 | 10.03 | 17.26 | 27.39 | 55.00 | 27.61 | Average |
| 0.198 | 0.10 | 10.03 | 28.51 | 38.64 | 63.68 | 25.04 | QP |
| 0.198 | 0.10 | 10.03 | 16.48 | 26.61 | 53.68 | 27.07 | Average |
| 0.227 | 0.10 | 10.03 | 26.54 | 36.67 | 62.57 | 25.90 | QP |
| 0.227 | 0.10 | 10.03 | 15.48 | 25.61 | 52.57 | 26.96 | Average |
| 0.409 | 0.10 | 10.04 | 25.01 | 35.15 | 57.68 | 22.53 | QP |
| 0.409 | 0.10 | 10.04 | 17.61 | 27.75 | 47.68 | 19.93 | Average |
| 0.443 | 0.10 | 10.04 | 24.85 | 34.99 | 57.00 | 22.01 | QP |
| 0.443 | 0.10 | 10.04 | 17.49 | 27.63 | 47.00 | 19.37 | Average |

Remarks:Emisson Level = LISN factor+Cable loss(Cable+Pulse Att+Switch)+Reading

# 5. RADIATED EMISSION MEASUREMENT

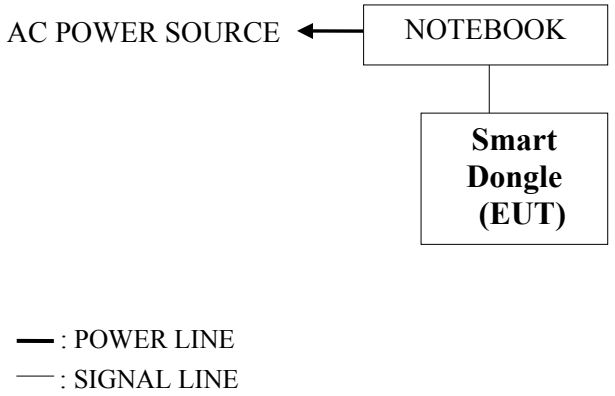
## 5.1. Test Equipment

The following test equipment was used during the radiated emission measurement:
At 3m Semi-Anechoic Chamber

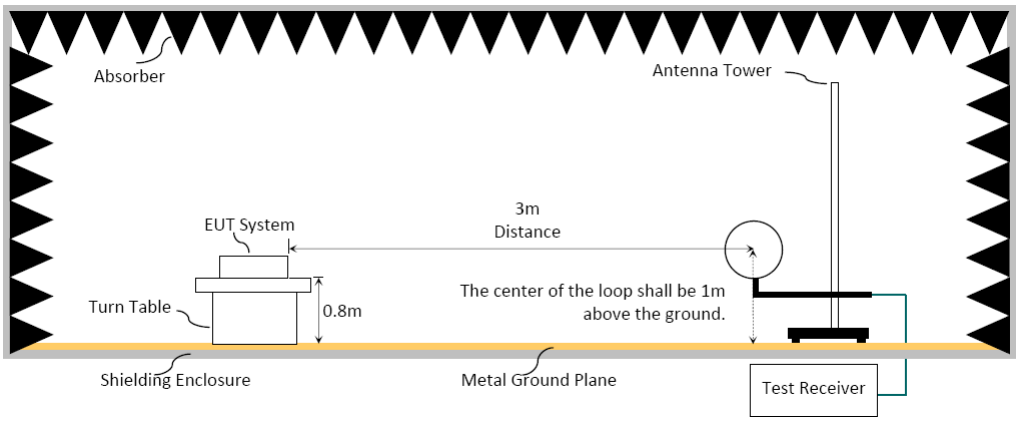
| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Period |
|---|---|---|---|---|---|---|
| 1. | Preamplifier | Agilent | 8447D | 2944A10918 | 2023-12-13 | 1 Year |
| 2. | PXA signal analyzer | Agilent | N9030A | MY53120367 | 2023-07-12 | 1 Year |
| 3. | Bi-log Antenna | SCHWARZBECK | VULB 9168 | 705 | 2023-12-26 | 1 Year |
| 4. | Horn Antenna | ETS | 3115 | 00062593 | 2023-10-23 | 1 Year |
| 5. | Microwave Preamplifier | Agilent | 8449B | 3008A02232 | 2024-03-24 | 1 Year |
| 6. | EMI Test Receiver | R&S | ESR7 | 101956 | 2024-03-24 | 1 Year |
| 7. | RF Cable | Chengyi+Shengxuan | NM500+ROS400 | 190945+6000+3000 | 2023-07-12 | 1 Year |
| 8. | RF Cable | Chengyi | EMC104-SF-SM-8000/NM-1000 | 190938+190942 | 2023-07-11 | 1 Year |
| 9. | Software | Audix /e3 (210616) | | | | |

## 5.2. Block Diagram of Test Setup

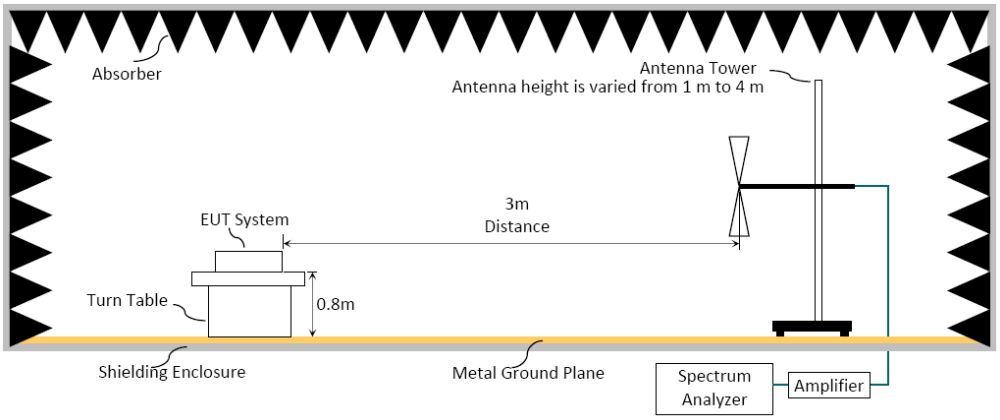
### 5.2.1. Block Diagram of Test Setup between EUT and simulators



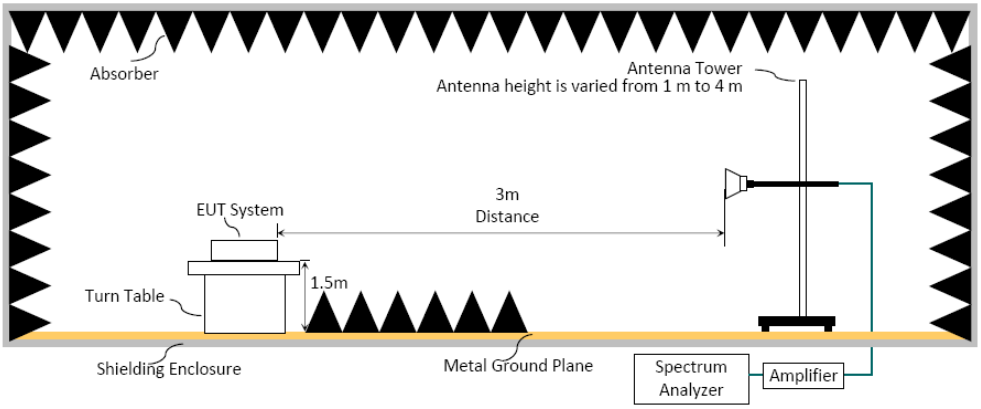
5.2.2. No. 2 3m Semi-Anechoic Chamber Setup Diagram (Test distance: 3m) for 9kHz-30MHz




5.2.3. No. 2 3m Semi-Anechoic Chamber Setup Diagram (Test distance: 3m) for 30MHz-1GHz




5.2.4. No. 2 3m Semi-Anechoic Chamber Setup Diagram (Test distance: 3m) for Above 1GHz



## 5.3. Radiated Emission Limits

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified as below.

| Frequency (MHz) | Distance (m) | Limits | |
|---|---|---|---|
| | | dBμV/m | μV/m |
| 0.009 - 0.490 | 300 | 67.6-20 log f(kHz) | 2400/f kHz |
| 0.490 - 1.705 | 30 | 87.6-20 log f(kHz) | 24000/f kHz |
| 1.705 - 30 | 30 | 29.5 | 30 |
| 30 - 88 | 3 | 40.0 | 100 |
| 88- 216 | 3 | 43.5 | 150 |
| 216- 960 | 3 | 46.0 | 200 |
| Above 960 | 3 | 54.0 | 500 |
| Above 1000 | 3 | 74.0 dBμV/m (Peak)<br>54.0 dBμV/m (Average) | |

Remark: (1) dBμV/m = 20 log (μV/m)

(2)The tighter limit applies to the edge between two frequency bands.

(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.

(4)Fundamental and emission fall within operation band are exempted from this section.

(5)Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

## 5.4. Test Procedure

**Frequency Range 9kHz~30MHz:**
The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level.
In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

(1) RBW = 9kHz with peak and average detector.
(2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

**Frequency Range 30MHz ~ 25GHz:**
The EUT setup on the turn table which has 80 cm (for 30-1000 MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

**Frequency below 1 GHz:**
Spectrum Analyzer is used for pre-testing with following setting:

(1)RBW = 120KHz
(2)VBW ≥ 3 x RBW.
(3)Detector = Peak.
(4)Sweep time = auto.
(5)Trace mode = max hold.
(6)Allow sweeps to continue until the trace stabilizes.
(7)When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required, otherwise using Q.P. for final measurement.

**Frequency above 1GHz to 10th harmonic (up to 25GHz):**
**Peak Dector:**

(1)RBW = 1MHz
(2)VBW ≥ 3 x RBW.
(3)Detector = Peak.
(4)Sweep time = auto.
(5)Trace mode = max hold.
(6)Allow sweeps to continue until the trace stabilizes.
(7)When peak-detected value is lower than limit that the measurement using the average detector is not required, otherwise using average detector for final measurement.

## 5.5. Measurement Results

**PASSED**

The EUT was tested in restricted bands and all the test results are listed in next page.
The frequency range from 9kHz to 10th harmonic(25GHz) are checked, and the emission (9kHz~30MHz,18GHz~25GHz)not reported for there is no emission be found.

5.5.1. Emission Measurement Results (For Below 1GHz)

| |
|---|
| EUT: Smart Dongle |
| M/N: WiFi Kit-20 |
| Test Site: No.2 3m Chamber |

| Test Mode: TX BLE 2402MHz | | | | | |
|---|---|---|---|---|---|
| Frequency (MHz) | Antenna Polarization | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Conclusion |
| 30.000 | H | 23.27 | 40.00 | 16.73 | PASS |
| 69.770 | H | 23.27 | 40.00 | 16.73 | PASS |
| 100.810 | H | 26.76 | 43.50 | 16.74 | PASS |
| 110.510 | H | 27.85 | 43.50 | 15.65 | PASS |
| 177.440 | H | 23.50 | 43.50 | 20.00 | PASS |
| 870.020 | H | 34.94 | 46.00 | 11.06 | PASS |
| 31.940 | V | 29.57 | 40.00 | 10.43 | PASS |
| 111.480 | V | 34.92 | 43.50 | 8.58 | PASS |
| 183.260 | V | 24.84 | 43.50 | 18.66 | PASS |
| 750.710 | V | 30.11 | 46.00 | 15.89 | PASS |
| 870.990 | V | 31.51 | 46.00 | 14.49 | PASS |
| 948.590 | V | 31.67 | 46.00 | 14.33 | PASS |

5.5.2. Emission Measurement Results (For Above 1GHz)

| |
|---|
| EUT: Smart Dongle |
| M/N: WiFi Kit-20 |
| Test Site: No.2 3m Chamber |

| Test Mode: TX BLE 2402MHz | | | | | |
|---|---|---|---|---|---|
| Frequency (MHz) | Antenna Polarization | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Conclusion |
| 9974.459 | H | 41.54 | 54.00 | 12.46 | PASS |
| 9976.000 | H | 52.99 | 74.00 | 21.01 | PASS |
| 14651.000 | H | 54.48 | 74.00 | 19.52 | PASS |
| 14652.620 | H | 42.94 | 54.00 | 11.06 | PASS |
| 17932.000 | H | 58.39 | 74.00 | 15.61 | PASS |
| 17935.420 | H | 45.84 | 54.00 | 8.16 | PASS |
| 10195.490 | V | 42.39 | 54.00 | 11.61 | PASS |
| 10197.000 | V | 52.03 | 74.00 | 21.97 | PASS |
| 14311.000 | V | 54.61 | 74.00 | 19.39 | PASS |
| 14311.260 | V | 41.97 | 54.00 | 12.03 | PASS |
| 17898.000 | V | 57.31 | 74.00 | 16.69 | PASS |
| 17899.640 | V | 45.10 | 54.00 | 8.90 | PASS |
| Test Mode: TX BLE 2440MHz | | | | | |
| 10042.630 | H | 40.33 | 54.00 | 13.67 | PASS |
| 10044.000 | H | 52.52 | 74.00 | 21.48 | PASS |
| 14275.870 | H | 43.27 | 54.00 | 10.73 | PASS |
| 14277.000 | H | 53.90 | 74.00 | 20.10 | PASS |
| 17898.000 | H | 58.26 | 74.00 | 15.74 | PASS |
| 17899.220 | H | 44.71 | 54.00 | 9.29 | PASS |
| 10433.380 | V | 40.51 | 54.00 | 13.49 | PASS |
| 10435.000 | V | 52.25 | 74.00 | 21.75 | PASS |
| 14413.000 | V | 54.45 | 74.00 | 19.55 | PASS |
| 14415.620 | V | 43.81 | 54.00 | 10.19 | PASS |
| 17965.850 | V | 46.11 | 54.00 | 7.89 | PASS |
| 17966.000 | V | 58.78 | 74.00 | 15.22 | PASS |
| Test Mode: TX BLE 2480MHz | | | | | |
| 10756.540 | H | 40.06 | 54.00 | 13.94 | PASS |
| 10758.000 | H | 52.16 | 74.00 | 21.84 | PASS |
| 14260.000 | H | 54.12 | 74.00 | 19.88 | PASS |
| 14262.620 | H | 41.25 | 54.00 | 12.75 | PASS |
| 17672.030 | H | 44.84 | 54.00 | 9.16 | PASS |
| 17677.000 | H | 57.16 | 74.00 | 16.84 | PASS |
| 10297.660 | V | 41.26 | 54.00 | 12.74 | PASS |
| 10299.000 | V | 52.81 | 74.00 | 21.19 | PASS |
| 14294.000 | V | 54.12 | 74.00 | 19.88 | PASS |
| 14299.620 | V | 42.23 | 54.00 | 11.77 | PASS |
| 17775.480 | V | 44.76 | 54.00 | 9.24 | PASS |
| 17779.000 | V | 58.47 | 74.00 | 15.53 | PASS |

5.5.3. Spurious Emission Measurement Results in Band Edge Emission

| Mode | BLE | Frequency | 2402MHz |
|---|---|---|---|

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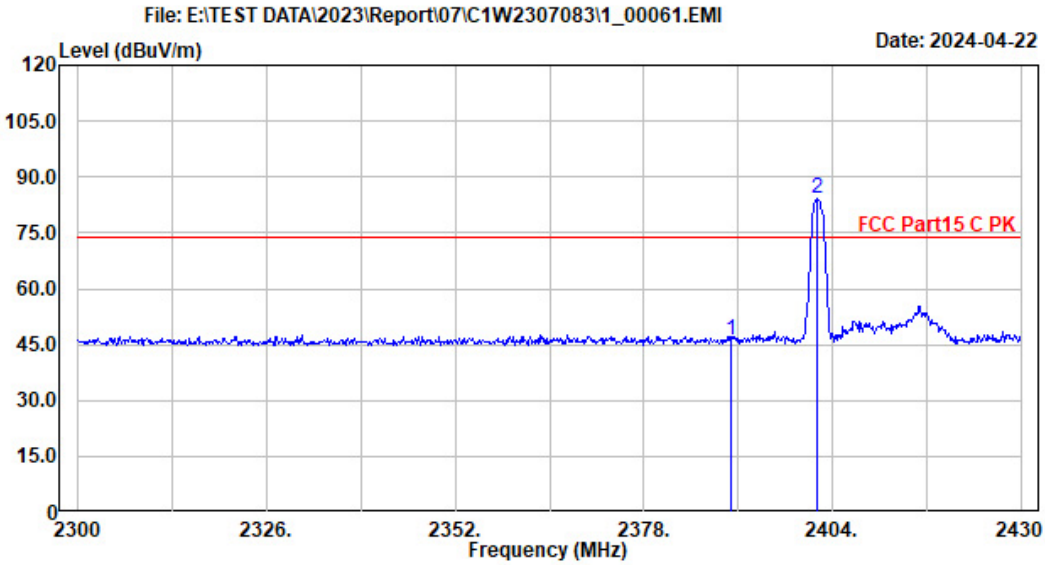


Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(367)
Instrument 2 : Preamplifier 8449B(232)|000
Dis. / Ant. : 3115-593-2310
Limit : FCC Part15 C PK
Env. / Ins. : 21.3°C/54%
EUT : Smart Dongle
M/N : Wifi Kit-20
Power Rating : DC 5V
Test Mode : TX BLE 2402MHz
Memo :

Ant. pol.: Horizontal Data NO.:61

Engineer : Liuyujie

| Freq. MHz | Ant. Factor dB/m | Cable Loss dB | Reading dBuV | Preamp Factor dB | Emission Level dBuV/m | Limits dBuV/m | Margin dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2390.000 | 28.46 | 3.10 | 47.22 | 32.51 | 46.27 | 74.00 | 27.73 | Peak |
| 2401.920 | 28.50 | 3.11 | 84.92 | 32.50 | 84.03 | 74.00 | -10.03 | Peak |

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

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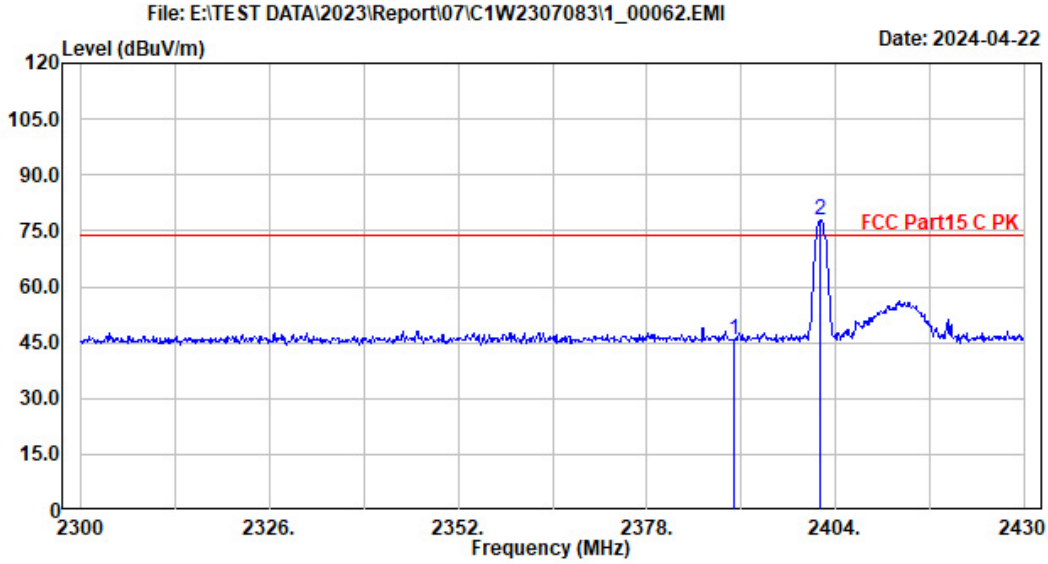


Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(367)
Instrument 2 : Preamplifier 8449B(232)|000
Dis. / Ant. : 3115-593-2310
Limit : FCC Part15 C PK
Env. / Ins. : 21.3°C/54%
EUT : Smart Dongle
M/N : Wifi Kit-20
Power Rating : DC 5V
Test Mode : TX BLE 2402MHz
Memo :

Ant. pol.: Vertical Data NO.:62

Engineer : Liuyujie

| Freq. MHz | Ant. Factor dB/m | Cable Loss dB | Reading dBuV | Preamp Factor dB | Emission Level dBuV/m | Limits dBuV/m | Margin dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2390.000 | 28.46 | 3.10 | 46.81 | 32.51 | 45.86 | 74.00 | 28.14 | Peak |
| 2401.920 | 28.50 | 3.11 | 78.74 | 32.50 | 77.85 | 74.00 | -3.85 | Peak |

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

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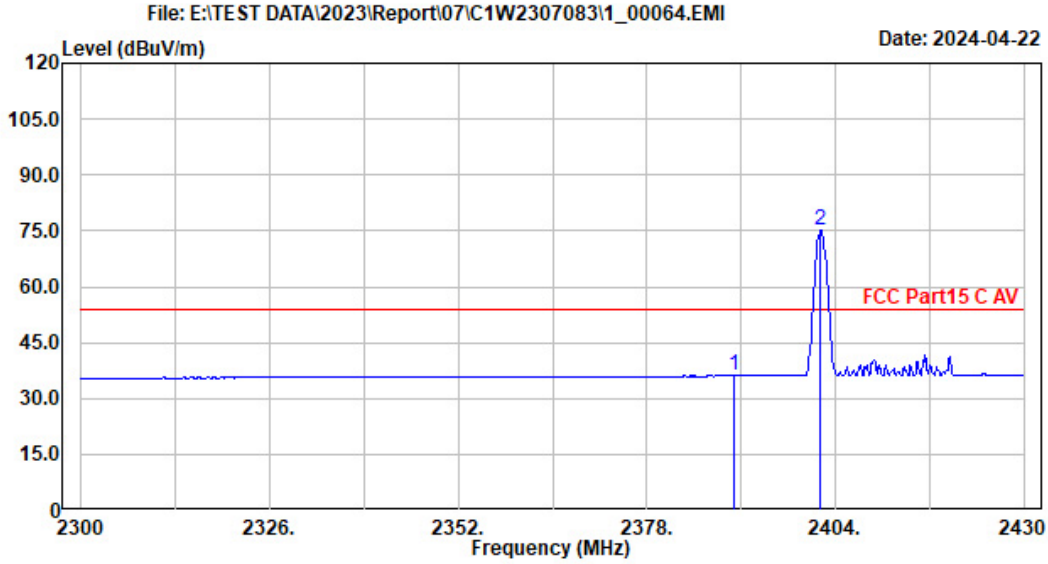


Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(367)
Instrument 2 : Preamplifier 8449B(232)|000
Dis. / Ant. : 3115-593-2310
Limit : FCC Part15 C AV
Env. / Ins. : 21.3°C/54%
EUT : Smart Dongle
M/N : Wifi Kit-20
Power Rating : DC 5V
Test Mode : TX BLE 2402MHz
Memo :

Ant. pol.: Horizontal Data NO.:64

Engineer : Liuyujie

| Freq. MHz | Ant. Factor dB/m | Cable Loss dB | Reading dBuV | Preamp Factor dB | Emission Level dBuV/m | Limits dBuV/m | Margin dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2390.000 | 28.46 | 3.10 | 37.00 | 32.51 | 36.05 | 54.00 | 17.95 | Average |
| 2401.920 | 28.50 | 3.11 | 76.05 | 32.50 | 75.16 | 54.00 | -21.16 | Average |

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

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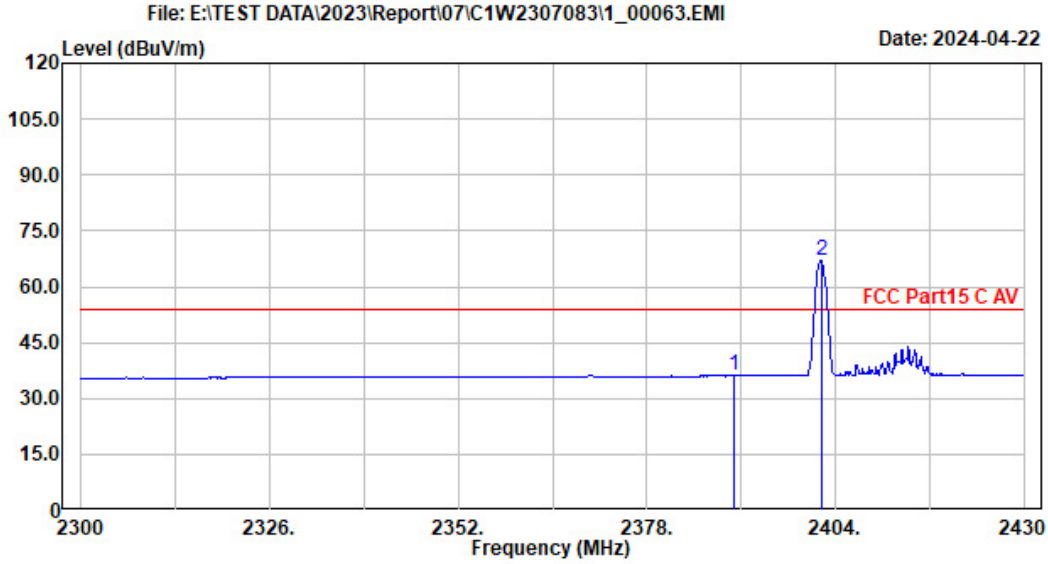


Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(367)
Instrument 2 : Preamplifier 8449B(232)|000
Dis. / Ant. : 3115-593-2310
Limit : FCC Part15 C AV
Env. / Ins. : 21.3°C/54%
EUT : Smart Dongle
M/N : Wifi Kit-20
Power Rating : DC 5V
Test Mode : TX BLE 2402MHz
Memo :

Ant. pol.: Vertical Data NO.:63

Engineer : Liuyujie

| Freq. MHz | Ant. Factor dB/m | Cable Loss dB | Reading dBuV | Preamp Factor dB | Emission Level dBuV/m | Limits dBuV/m | Margin dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2390.000 | 28.46 | 3.10 | 37.04 | 32.51 | 36.09 | 54.00 | 17.91 | Average |
| 2402.050 | 28.50 | 3.11 | 67.90 | 32.50 | 67.01 | 54.00 | -13.01 | Average |

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

| Mode | BLE | Frequency | 2480MHz |
|---|---|---|---|

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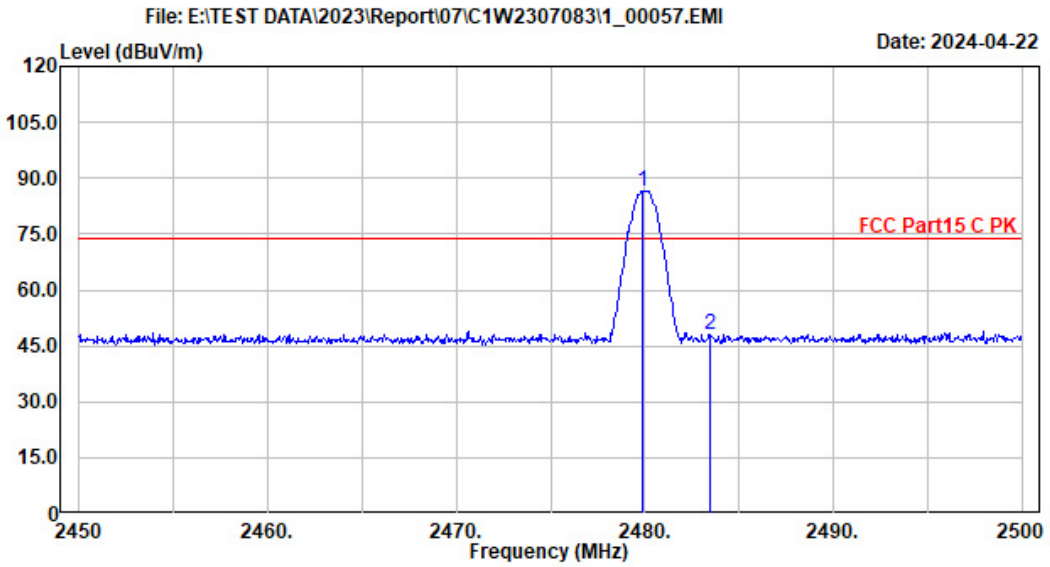


Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(367)
Instrument 2 : Preamplifier 8449B(232)|000
Dis. / Ant. : 3115-593-2310
Limit : FCC Part15 C PK
Env. / Ins. : 21.3°C/54%
EUT : Smart Dongle
M/N : Wifi Kit-20
Power Rating : DC 5V
Test Mode : TX BLE 2480MHz
Memo :

Ant. pol.: Horizontal Data NO.:57

Engineer : Liuyujie

| Freq. MHz | Ant. Factor dB/m | Cable Loss dB | Reading dBuV | Preamp Factor dB | Emission Level dBuV/m | Limits dBuV/m | Margin dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2479.900 | 28.50 | 3.19 | 87.46 | 32.46 | 86.69 | 74.00 | -12.69 | Peak |
| 2483.500 | 28.50 | 3.19 | 48.55 | 32.46 | 47.78 | 74.00 | 26.22 | Peak |

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

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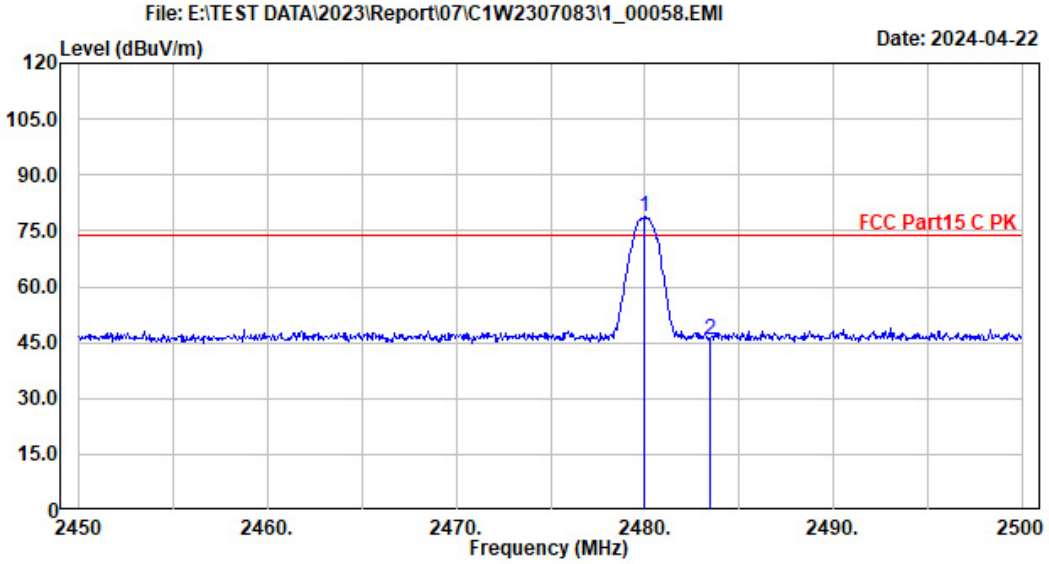


Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(367)
Instrument 2 : Preamplifier 8449B(232)|000
Dis. / Ant. : 3115-593-2310
Limit : FCC Part15 C PK
Env. / Ins. : 21.3°C/54%
EUT : Smart Dongle
M/N : Wifi Kit-20
Power Rating : DC 5V
Test Mode : TX BLE 2480MHz
Memo :

Ant. pol.: Vertical Data NO.:58

Engineer : Liuyujie

| Freq. MHz | Ant. Factor dB/m | Cable Loss dB | Reading dBuV | Preamp Factor dB | Emission Level dBuV/m | Limits dBuV/m | Margin dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2479.950 | 28.50 | 3.19 | 79.41 | 32.46 | 78.64 | 74.00 | -4.64 | Peak |
| 2483.500 | 28.50 | 3.19 | 46.62 | 32.46 | 45.85 | 74.00 | 28.15 | Peak |

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

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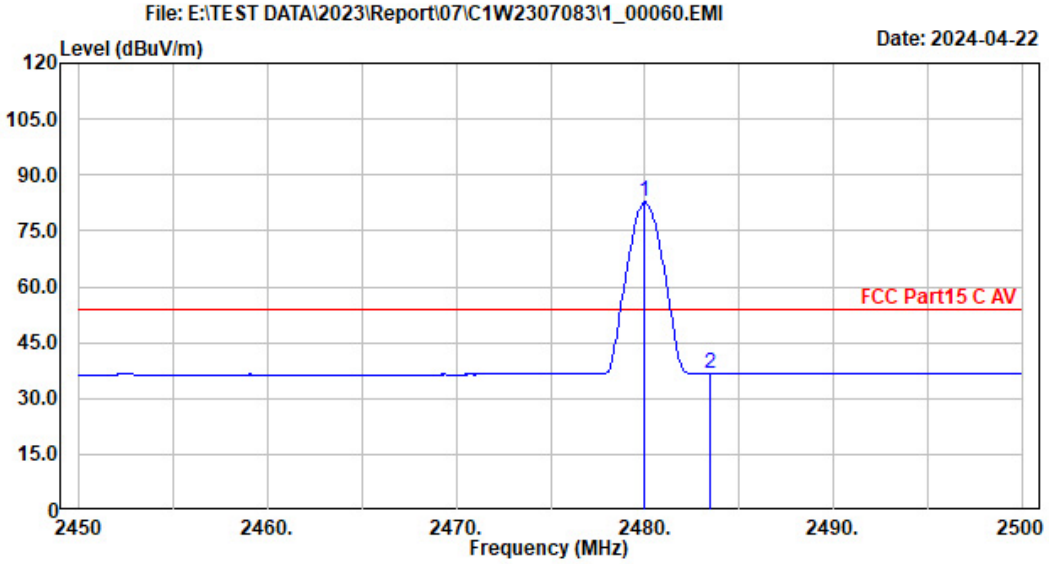


Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(367)
Instrument 2 : Preamplifier 8449B(232)|000
Dis. / Ant. : 3115-593-2310
Limit : FCC Part15 C AV
Env. / Ins. : 21.3°C/54%
EUT : Smart Dongle
M/N : Wifi Kit-20
Power Rating : DC 5V
Test Mode : TX BLE 2480MHz
Memo :

Ant. pol.: Horizontal Data NO.:60

Engineer : Liuyujie

| Freq. MHz | Ant. Factor dB/m | Cable Loss dB | Reading dBuV | Preamp Factor dB | Emission Level dBuV/m | Limits dBuV/m | Margin dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2480.000 | 28.50 | 3.19 | 83.54 | 32.46 | 82.77 | 54.00 | -28.77 | Average |
| 2483.500 | 28.50 | 3.19 | 37.36 | 32.46 | 36.59 | 54.00 | 17.41 | Average |

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

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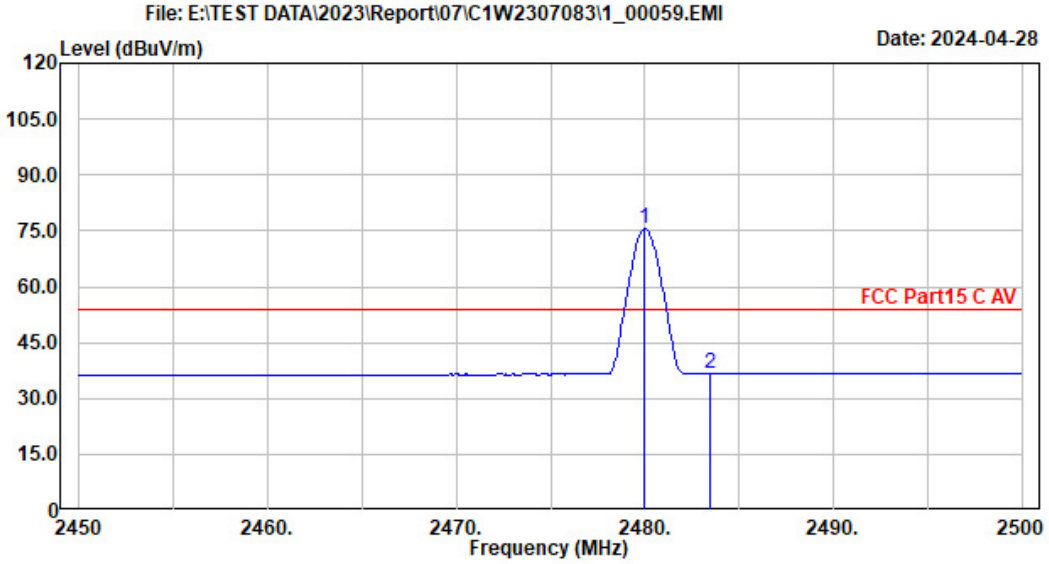



Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(367)
Instrument 2 : Preamplifier 8449B(232)|000
Dis. / Ant. : 3115-593-2310
Limit : FCC Part15 C AV
Env. / Ins. : 21.3°C/54%
EUT : Smart Dongle
M/N : Wifi Kit-20
Power Rating : DC 5V
Test Mode : TX BLE 2480MHz
Memo :

Ant. pol.: Vertical Data NO.:59

Engineer : Liuyujie

| Freq. MHz | Ant. Factor dB/m | Cable Loss dB | Reading dBuV | Preamp Factor dB | Emission Level dBuV/m | Limits dBuV/m | Margin dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2480.000 | 28.50 | 3.19 | 76.34 | 32.46 | 75.57 | 54.00 | -21.57 | Average |
| 2483.500 | 28.50 | 3.19 | 37.30 | 32.46 | 36.53 | 54.00 | 17.47 | Average |

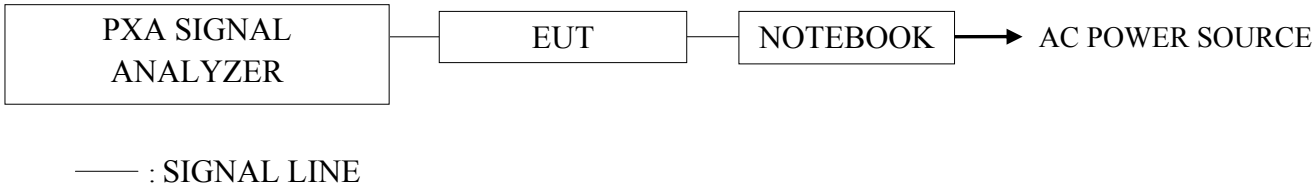
Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

# 6. 6dB BANDWIDTH MEASUREMENT

6.1. Test Equipment

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Period |
|---|---|---|---|---|---|---|
| 1. | PXA signal analyzer | Agilent | N9030A | MY53120217 | 2024-03-24 | 1 Year |

6.2. Block Diagram of Test Setup




6.3. Specification Limits

The minimum 6dB bandwidth shall be at least 500kHz.

6.4. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v05:

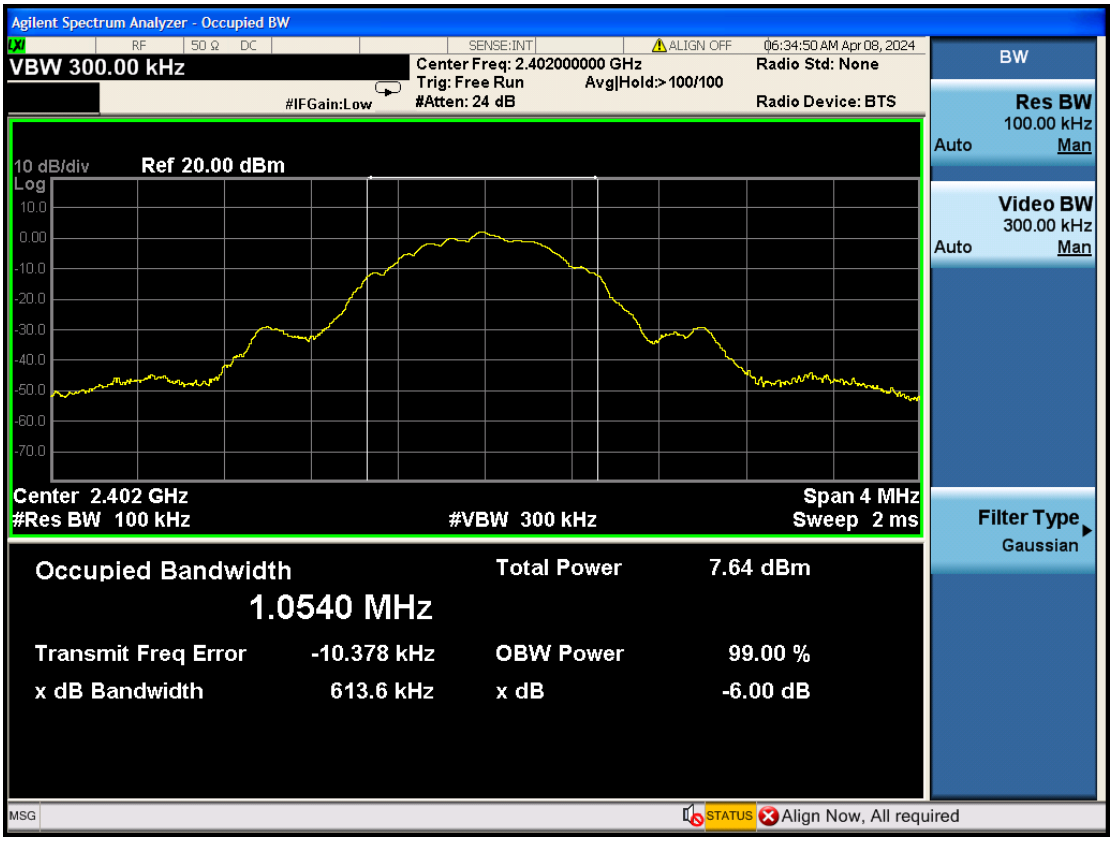
(1) Set RBW = 100 kHz.
(2) Set the video bandwidth (VBW) ≥ 3 × RBW.
(3) Detector = Peak.
(4) Trace mode = max hold.
(5) Sweep = auto couple.
(6) Allow the trace to stabilize.
(7) Setting channel bandwidth function x dB to -6 dB to record the final bandwidth.

## 6.5. Test Results

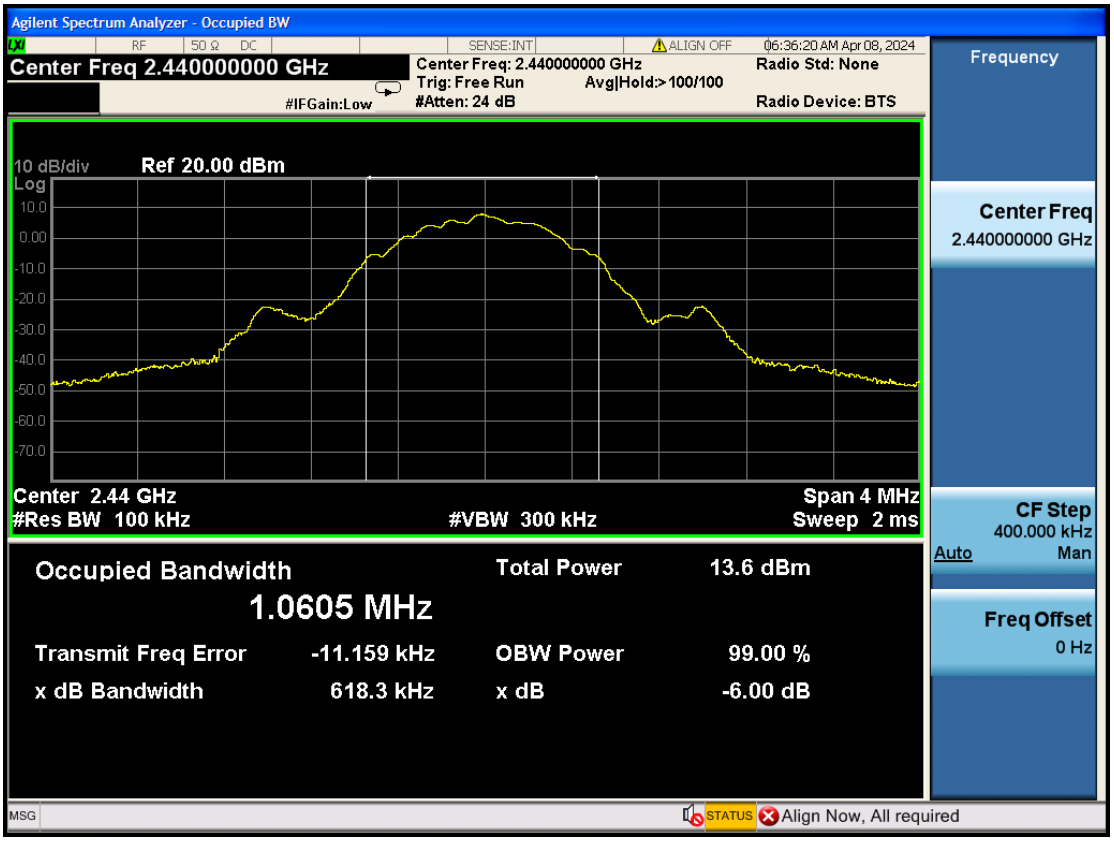
**PASSED.** All the test results are attached in next pages.

| Item | Test Frequency (MHz) | 6dB Bandwidth (kHz) |
|---|---|---|
| BLE | 2402 | 613.6 |
| | 2440 | 618.3 |
| | 2480 | 617.1 |

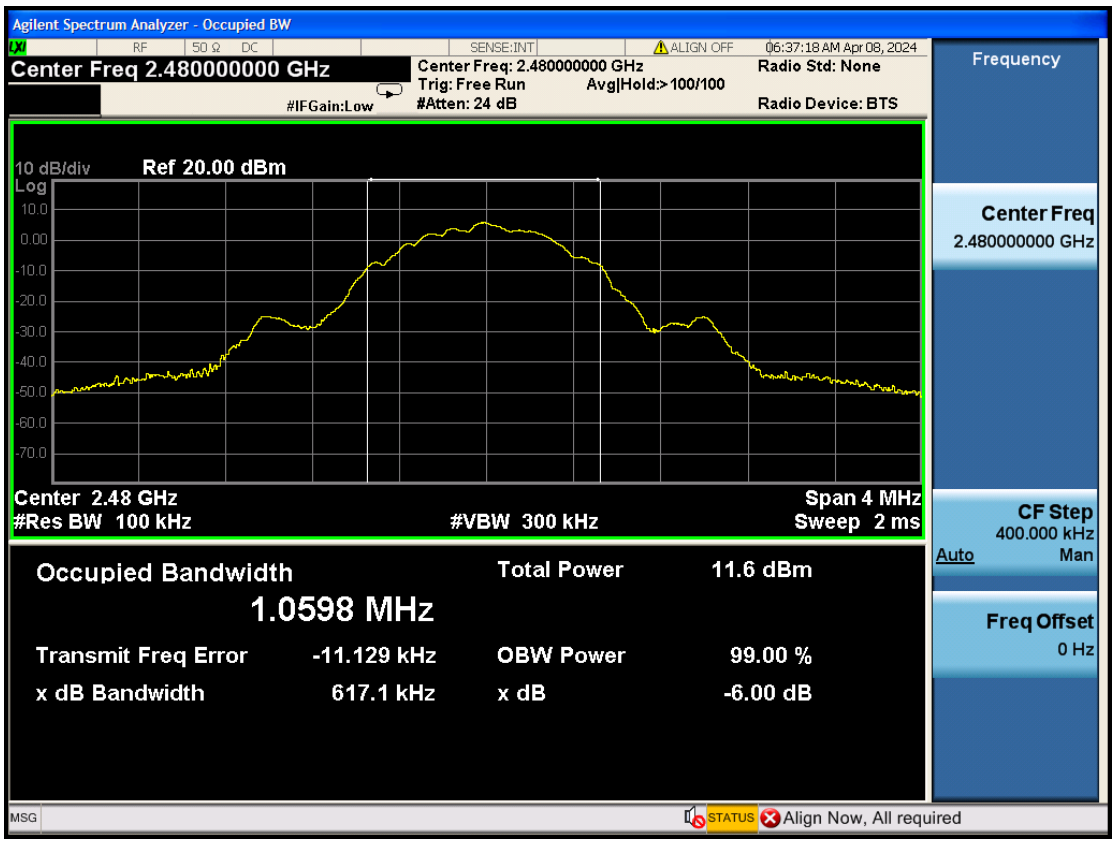
BLE 2402MHz




BLE 2440MHz



BLE 2480MHz

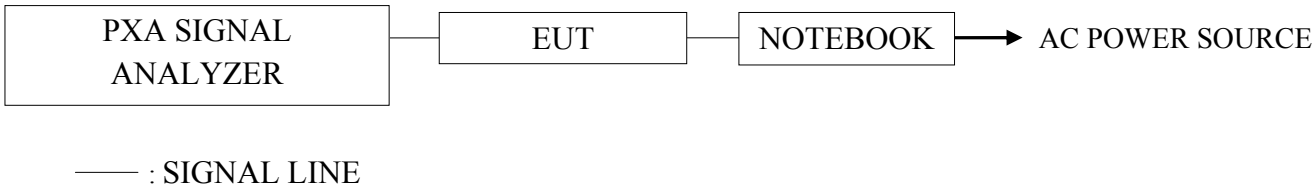

Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω DC
SENSE:INT
ALIGN OFF
06:37:18 AM Apr 08, 2024
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4 MHz
Sweep 2 ms
CF Step
400.000 kHz
Auto
Man
Occupied Bandwidth
1.0598 MHz
Total Power
11.6 dBm
Transmit Freq Error
-11.129 kHz
OBW Power
99.00 %
x dB Bandwidth
617.1 kHz
x dB
-6.00 dB
Freq Offset
0 Hz
MSG
STATUS
Align Now, All required

# 7. OUTPUT POWER MEASUREMENT

7.1. Test Equipment

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Period |
|---|---|---|---|---|---|---|
| 1. | PXA signal analyzer | Agilent | N9030A | MY53120217 | 2024-03-24 | 1 Year |

7.2. Block Diagram of Test Setup




7.3. Specification Limits (§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm), and E.I.R.P.: 4Watt (36dBm)

7.4. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v05:

☐**Method AVGSA-2 (Spectrum channel power)**

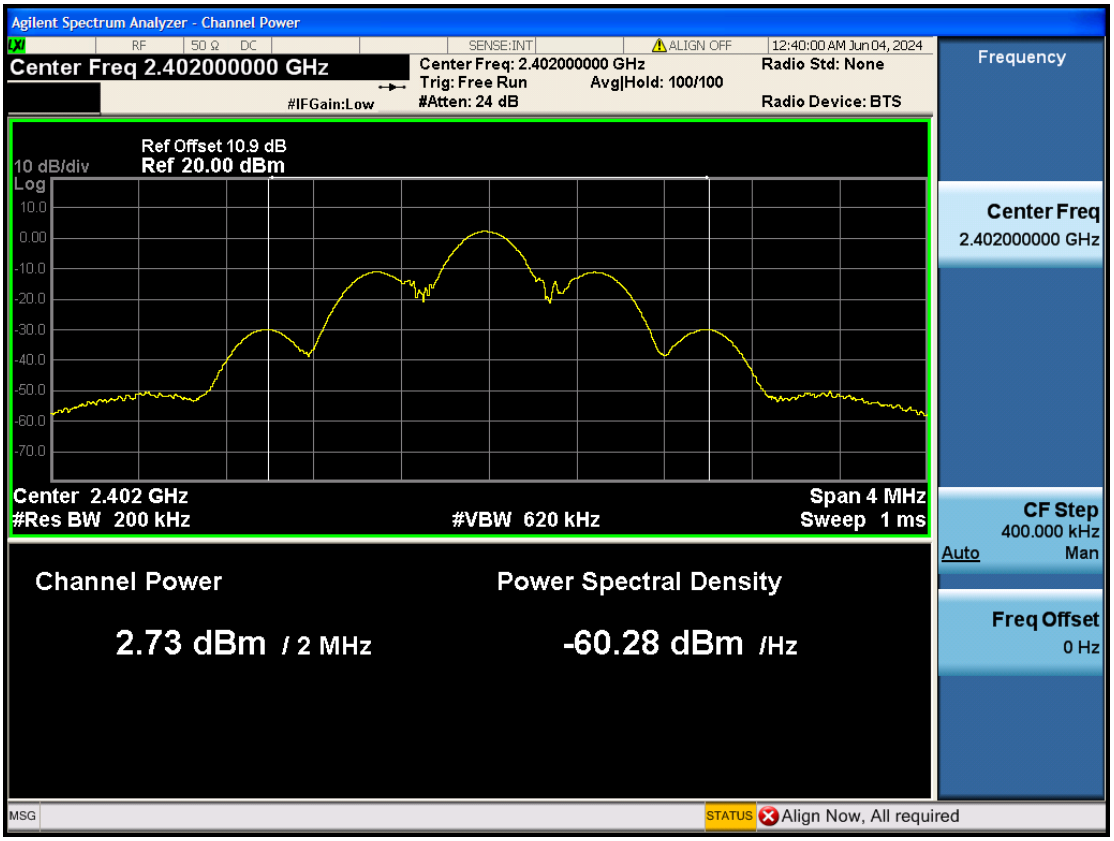
(1) Set span to at least 1.5 times the OBW
(2) Set RBW = 1 -5% of OBW
(3) Set the video bandwidth (VBW) ≥ 3 × RBW.
(4) Detector = RMS.
(5) Trace mode = trace average at least 100 traces
(6) Sweep = auto couple.
(7) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
(8) Duty cycle factor is added when duty cycle presented in chapter3.5 is < 98%.

7.5. Test Results

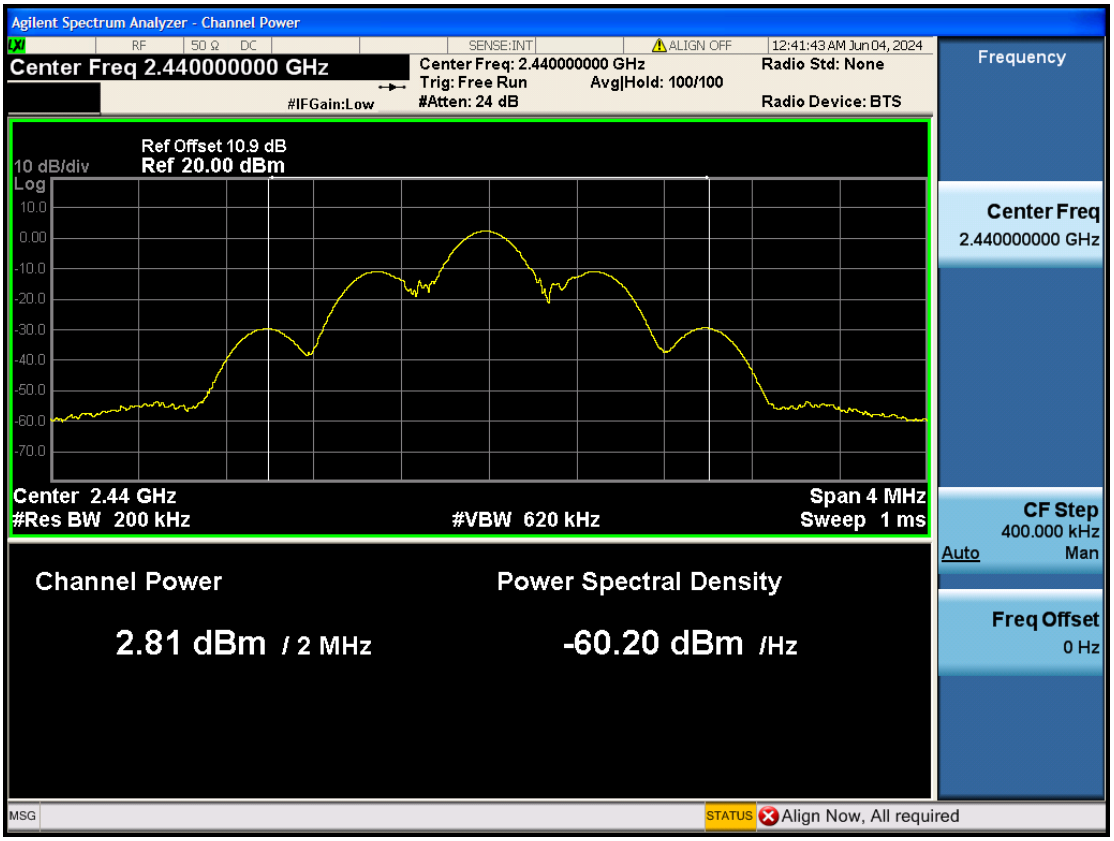
**PASSED.**

| Mode | Frequency (MHz) | Duty Cycle Factor | Reading (dBm) | Average Output Power (dBm) | Limit (dBm) |
|---|---|---|---|---|---|
| BLE | 2402 | 0.78 | 2.73 | 3.51 | 30 |
| | 2440 | 0.78 | 2.81 | 3.59 | |
| | 2480 | 0.78 | 3.54 | 4.32 | |

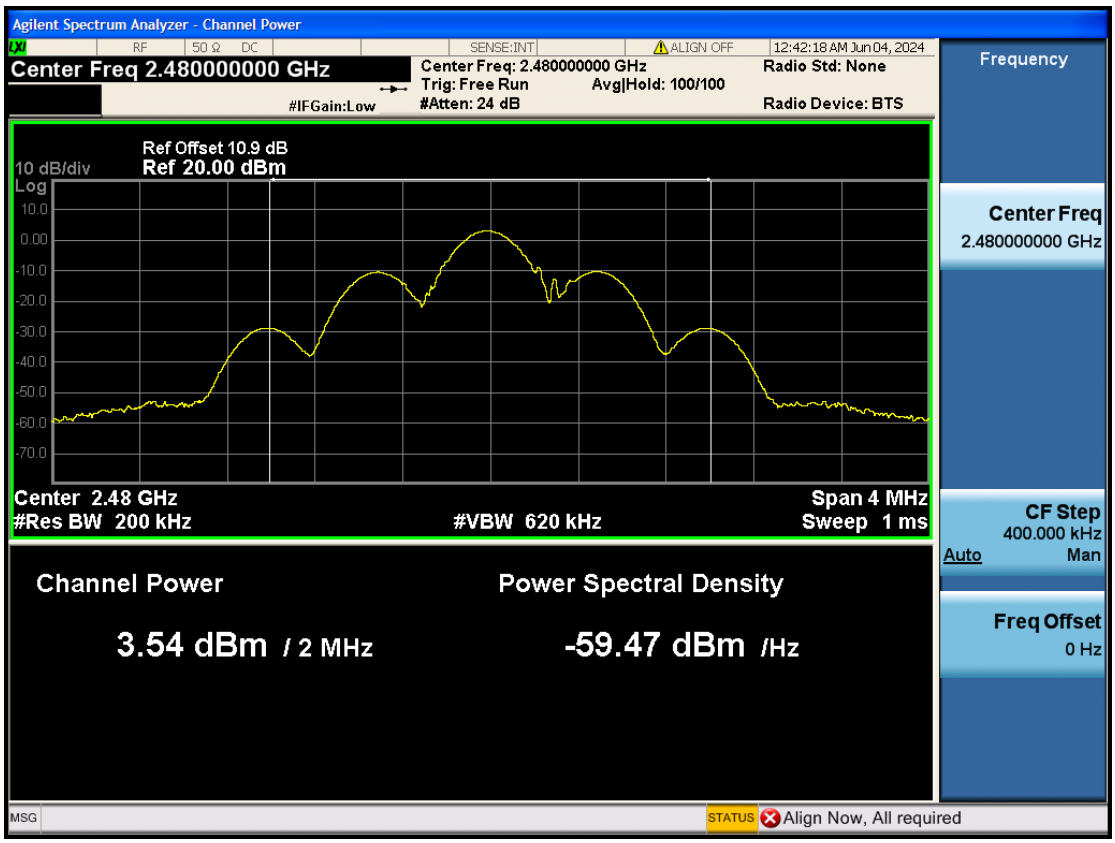
BLE 2402MHz




BLE 2440MHz



BLE 2480MHz


Agilent Spectrum Analyzer - Channel Power
RF
50 Ω DC
SENSE:INT
ALIGN OFF
12:42:18 AM Jun 04, 2024
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.48 GHz
#Res BW 200 kHz
#VBW 620 kHz
Span 4 MHz
Sweep 1 ms
Center Freq
2.480000000 GHz
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
Channel Power
3.54 dBm / 2 MHz
Power Spectral Density
-59.47 dBm /Hz
MSG
STATUS
Align Now, All required

# 8. POWER SPECTRAL DENSITY MEASUREMENT

8.1. Test Equipment

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Period |
|---|---|---|---|---|---|---|
| 1. | PXA signal analyzer | Agilent | N9030A | MY53120217 | 2024-03-24 | 1 Year |

8.2. Block Diagram of Test Setup

The same as section 6.2.

8.3. Specification Limits

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

8.4. Test Procedure

(1) Set analyzer center frequency to DTS channel center frequency.
(2) Set the span to 1.5 times the DTS bandwidth.
(3) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
(4) Set the VBW ≥ 3 × RBW.
(5) Detector = peak.
(6) Sweep time = auto couple.
(7) Trace mode = max hold.
(8) Allow trace to fully stabilize.
(9) Use the peak marker function to determine the maximum amplitude level.

8.5. Test Results

**PASSED.** All the test results are attached in next page.

| Mode | Frequency (MHz) | Duty Cycle Factor | Reading (dBm) | Result (dBm) | Limit (dBm/3kHz) |
|---|---|---|---|---|---|
| BLE | 2402 | 0.78 | 4.025 | 4.805 | 8 |
| | 2440 | 0.78 | 4.464 | 5.25 | |
| | 2480 | 0.78 | 5.554 | 6.34 | |

BLE 2402MHz

BLE 2440MHz

BLE 2480MHz

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.479992000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 24 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
06:53:19 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 992 GHz
5.554 dBm
Center 2.480000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 4.000 MHz
Sweep 421.8 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

# 9. EMISSION LIMITATIONS MEASUREMENT

9.1. Test Equipment

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Period |
|---|---|---|---|---|---|---|
| 1. | PXA signal analyzer | Agilent | N9030A | MY53120217 | 2024-03-24 | 1 Year |

9.2. Block Diagram of Test Setup

The same as section 6.2.

9.3. Specification Limits

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, that the required attenuation shall be 30 dB instead of 20 dB.

9.4. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v05r02:

(1) Set analyzer center frequency to DTS channel center frequency.

(2) Set the span to 1.5 times the DTS bandwidth.

(3) Set the RBW to: 100 kHz.

(4) Set the VBW ⩾ 3 × RBW.

(5) Detector = peak.

(6) Sweep time = auto couple.

(7) Trace mode = max hold.

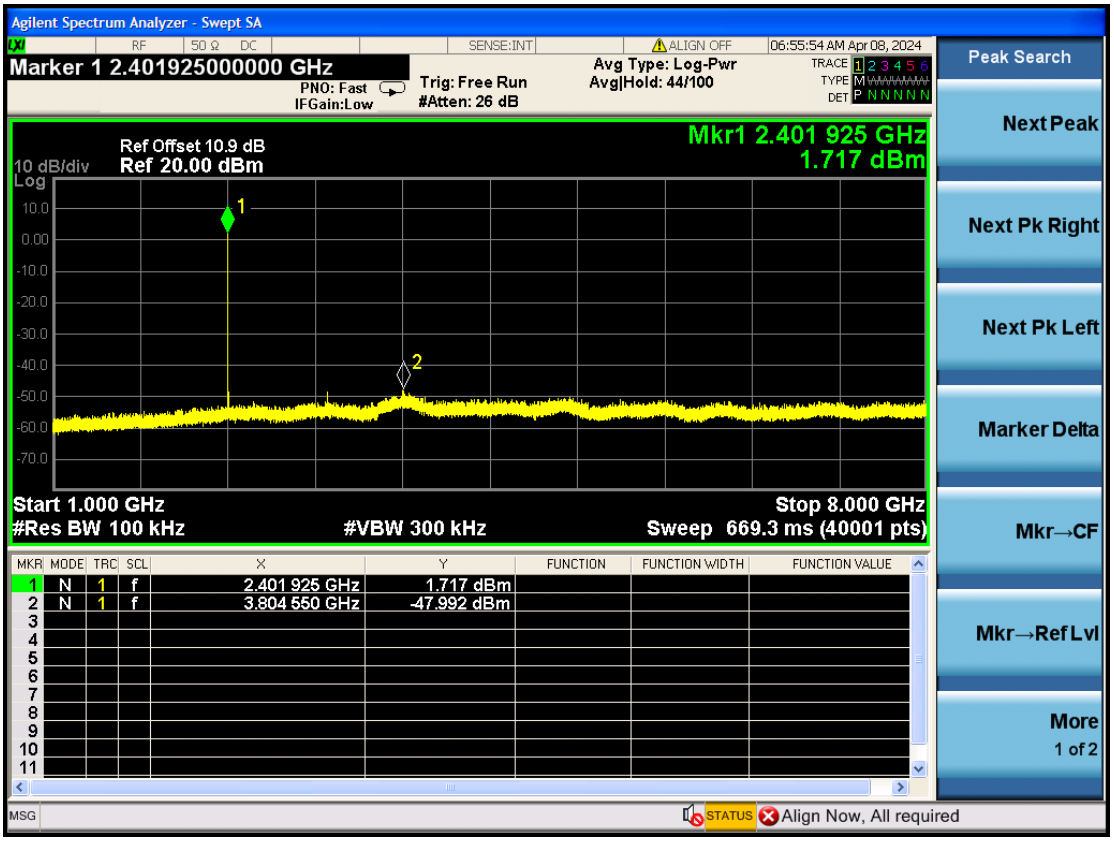
(8) Allow trace to fully stabilize to find the max level.

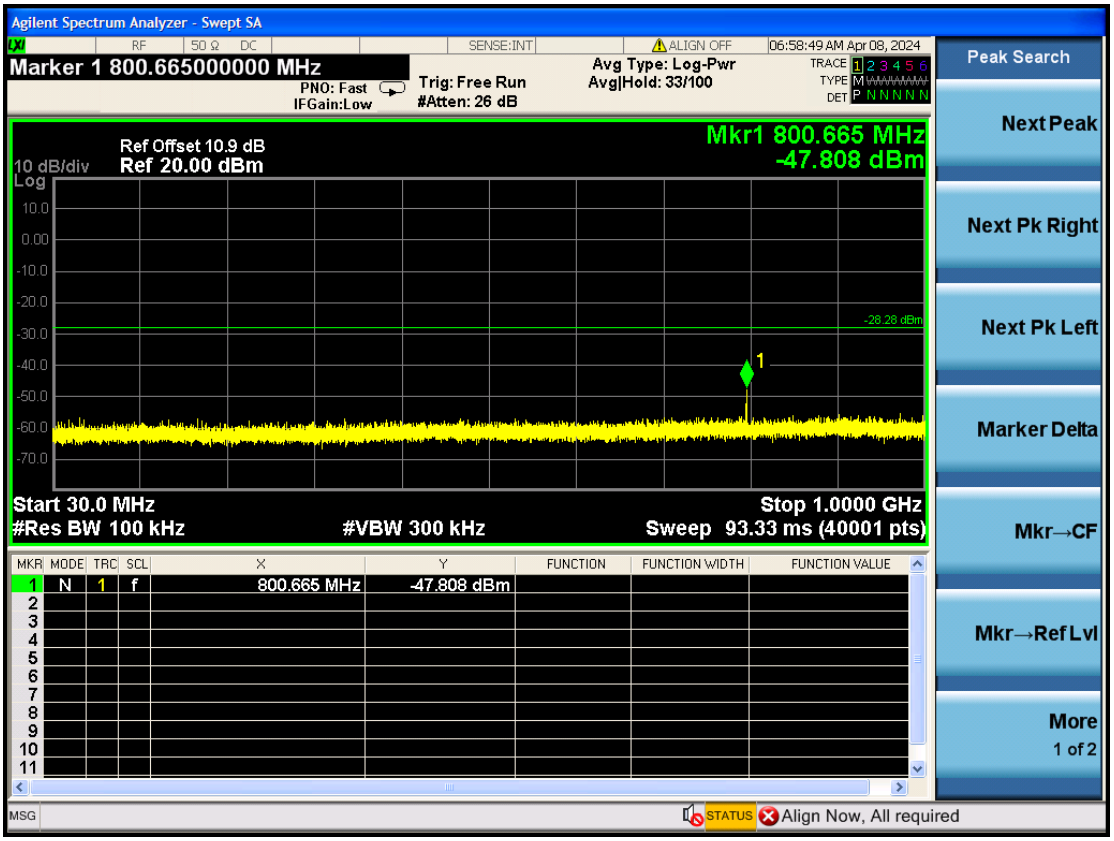
9.5. Test Results

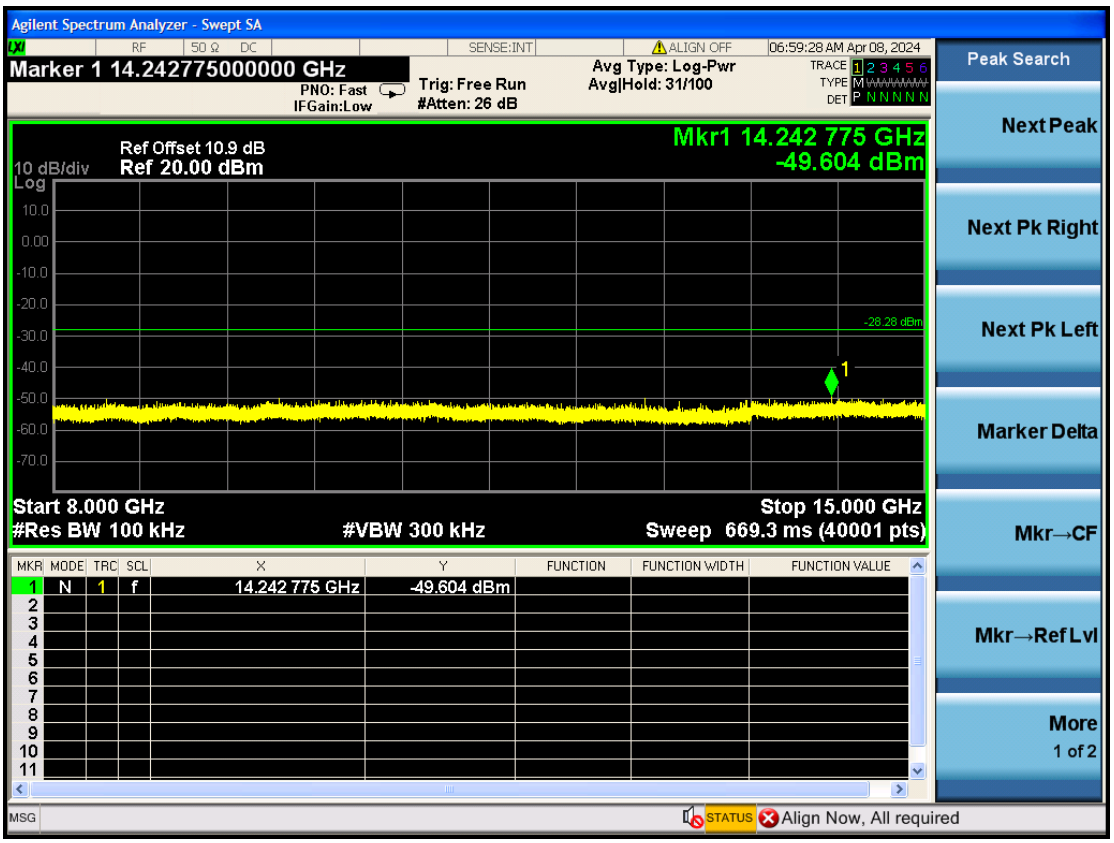
**PASSED.** All the test results are attached in next pages.

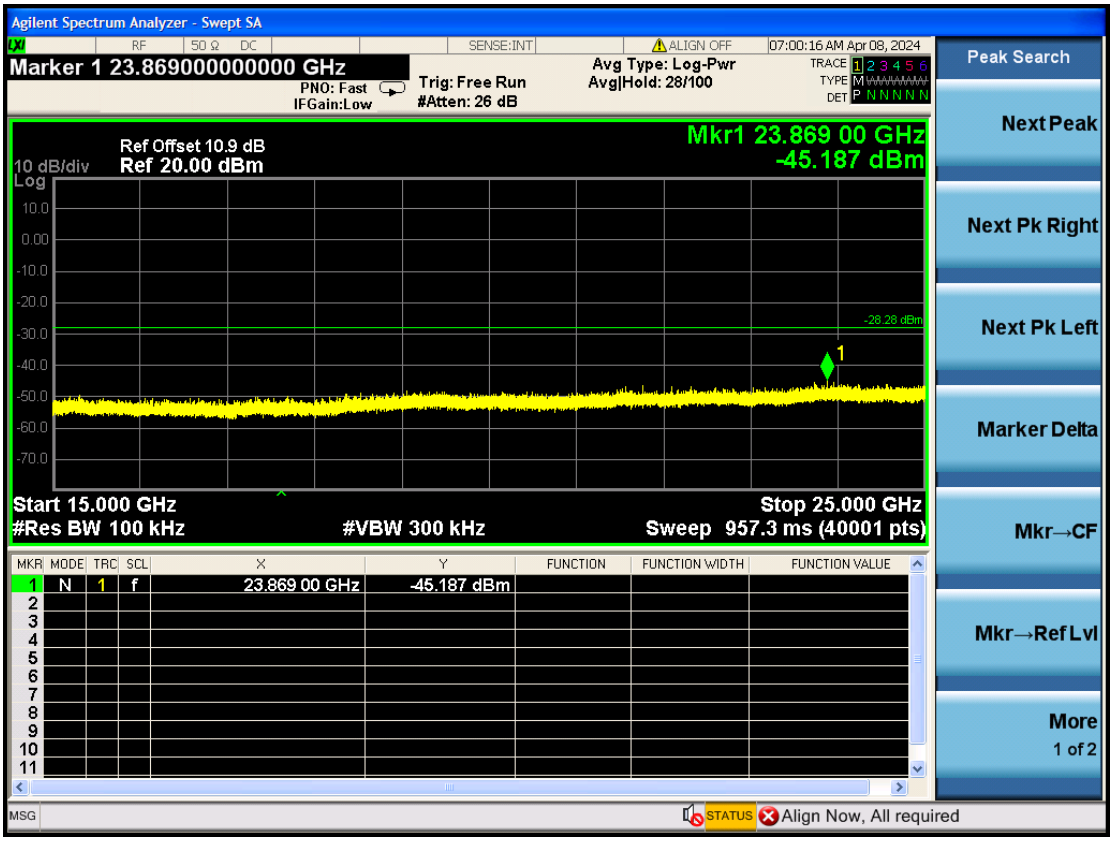
| Item | Frequency (MHz) | Frequency (MHz) | Amplitude (dBm) |
|---|---|---|---|
| BLE | 2402 | 2401.925 | 1.717 |
| | | 3804.55 | -47.992 |
| | | 800.665 | -47.808 |
| | | 14242.775 | -49.604 |
| | | 23869 | -45.187 |
| | | 2390 | -56.162 |
| | | 2400 | -50.796 |
| | 2440 | 2440.075 | 4.610 |
| | | 3863 | -48.651 |
| | | 813.324 | -46.170 |
| | | 14139.525 | -50.351 |
| | | 24772.5 | -45.548 |
| | 2480 | 2479.975 | 5.619 |
| | | 3830.1 | -48.948 |
| | | 826.661 | -45.365 |
| | | 14049.75 | -50.268 |
| | | 23162.75 | -46.537 |
| | | 2483.5 | -55.777 |

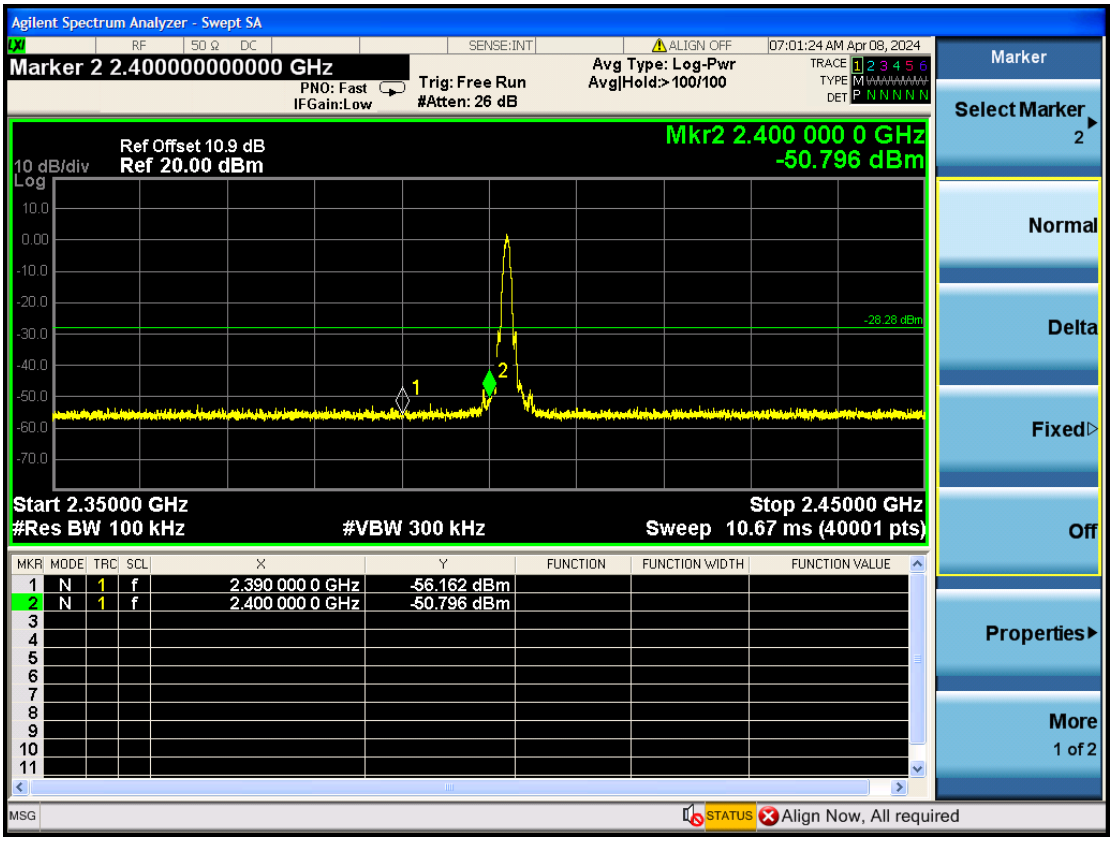
BLE 2402MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.401925000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 44/100
06:55:54 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Mkr1 2.401 925 GHz
1.717 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 8.000 GHz
Sweep 669.3 ms (40001 pts)
1 N 1 f 2.401 925 GHz 1.717 dBm
2 N 1 f 3.804 550 GHz -47.992 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

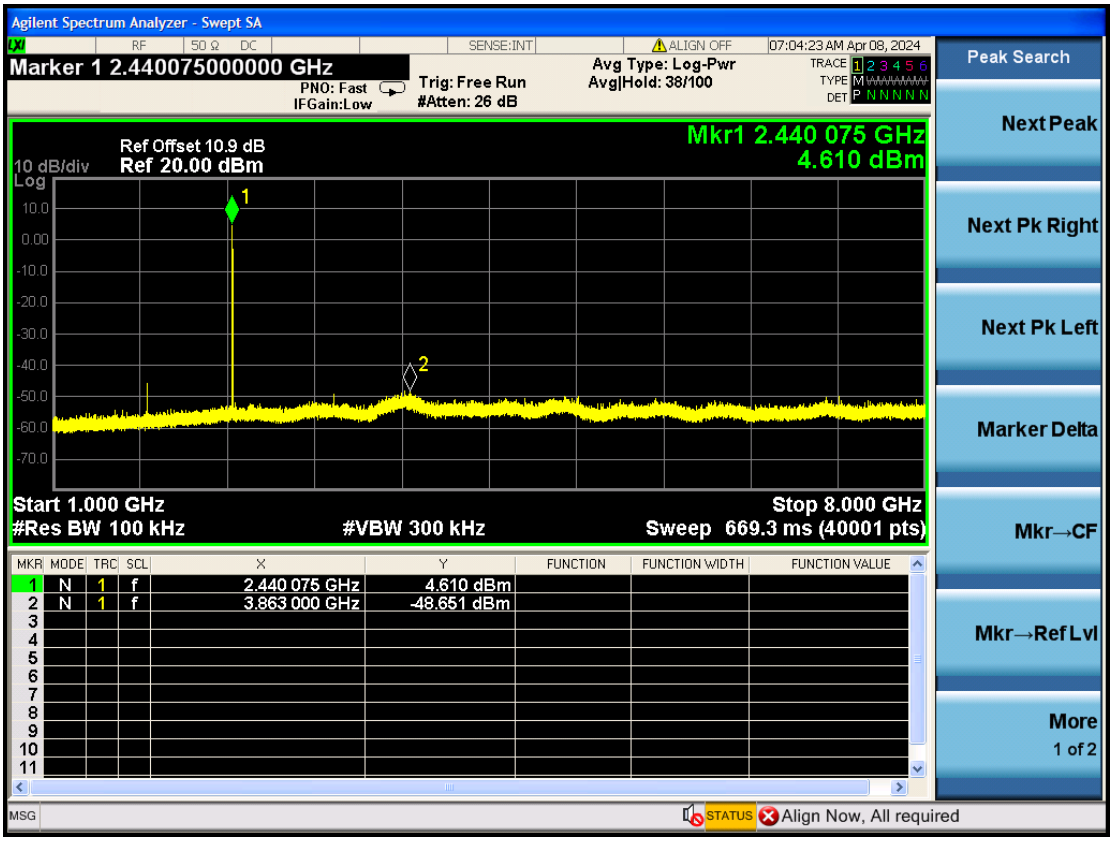

Agilent Spectrum Analyzer - Swept SA
Marker 1 800.665000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 33/100
06:58:49 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Mkr1 800.665 MHz
-47.808 dBm
-28.28 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 93.33 ms (40001 pts)
1 N 1 f 800.665 MHz -47.808 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

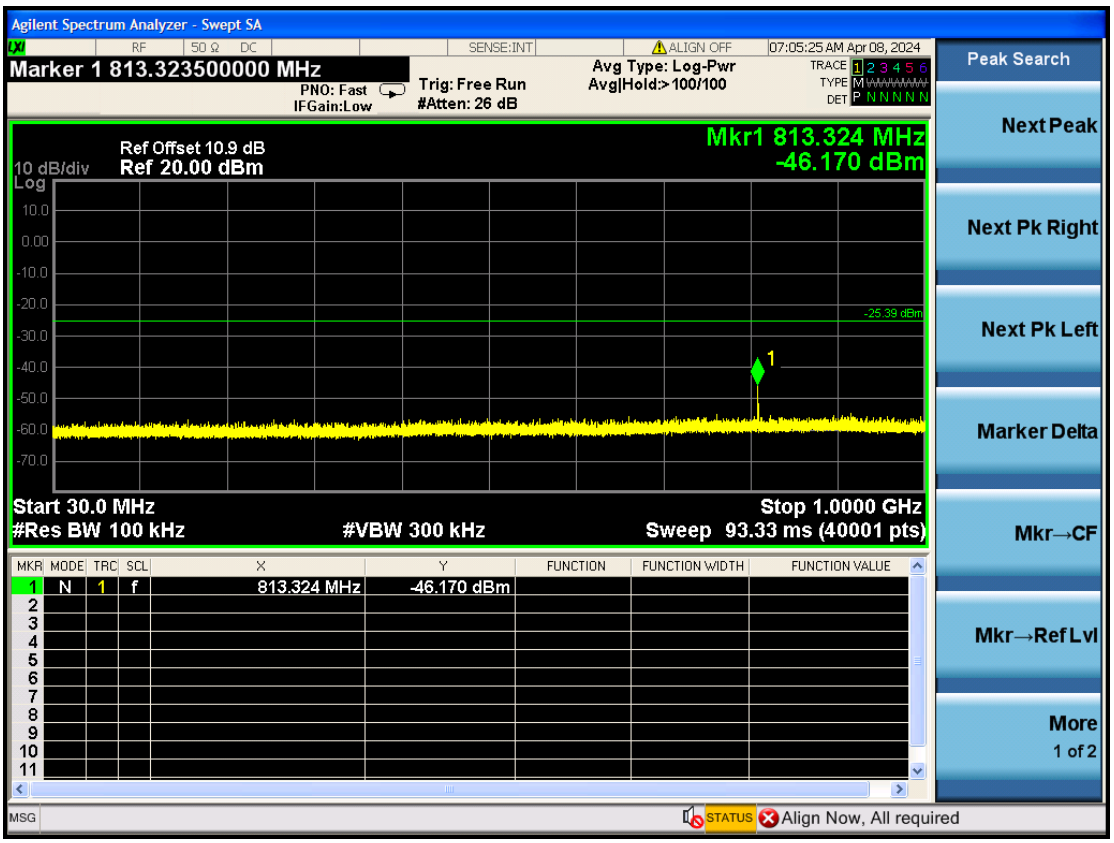

Agilent Spectrum Analyzer - Swept SA
Marker 1 14.242775000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 31/100
06:59:28 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Mkr1 14.242 775 GHz
-49.604 dBm
-28.28 dBm
Start 8.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 15.000 GHz
Sweep 669.3 ms (40001 pts)
1 N 1 f 14.242 775 GHz -49.604 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

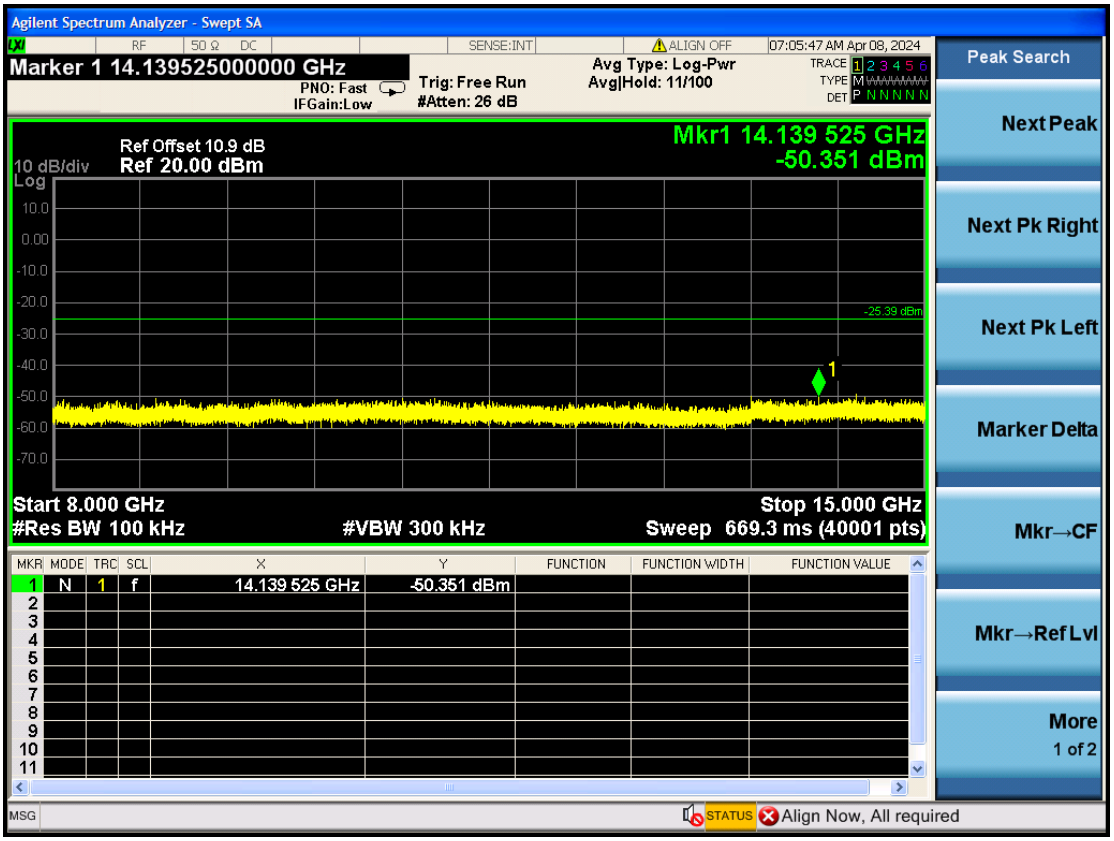

Agilent Spectrum Analyzer - Swept SA
Marker 1 23.869000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 28/100
07:00:16 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Mkr1 23.869 00 GHz
-45.187 dBm
-28.28 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 957.3 ms (40001 pts)
1 N 1 f 23.869 00 GHz -45.187 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

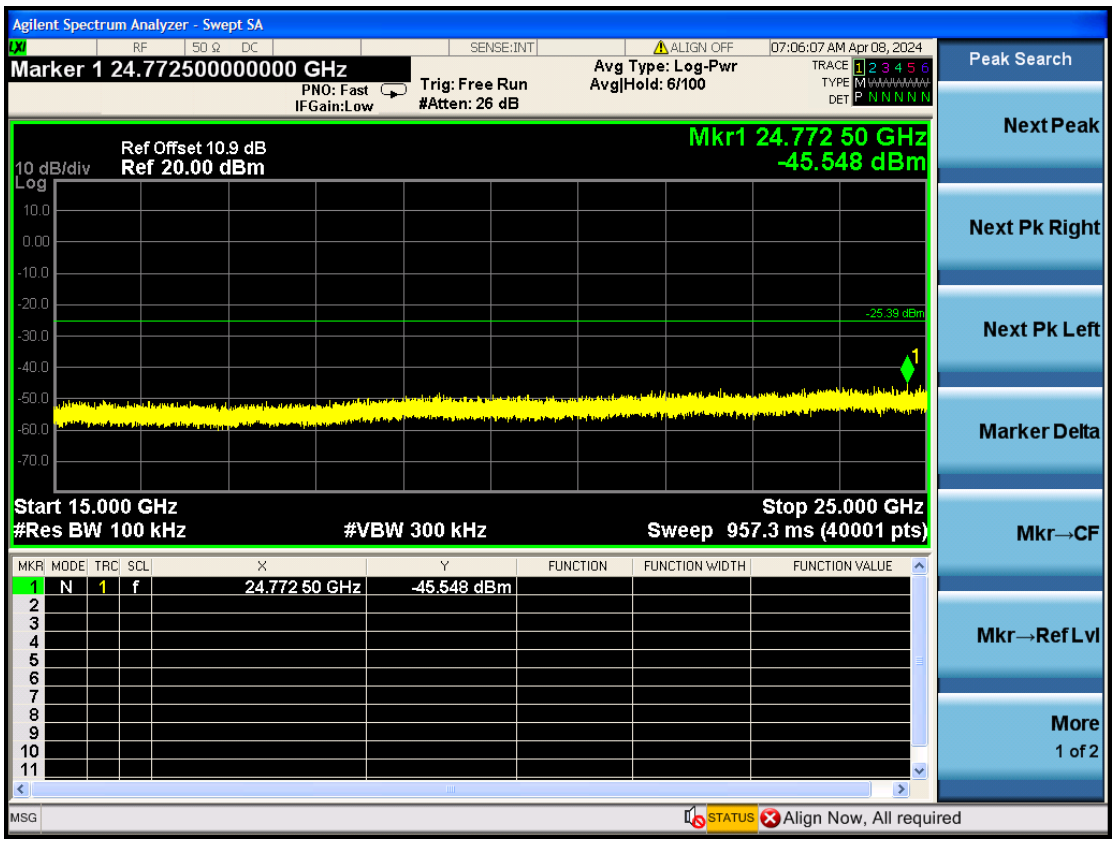

Agilent Spectrum Analyzer - Swept SA
Marker 2 2.400000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
07:01:24 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Mkr2 2.400 000 0 GHz
-50.796 dBm
-28.28 dBm
Start 2.35000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.45000 GHz
Sweep 10.67 ms (40001 pts)
1 N 1 f 2.390 000 0 GHz -56.162 dBm
2 N 1 f 2.400 000 0 GHz -50.796 dBm
Marker
Select Marker 2
Normal
Delta
Fixed
Off
Properties
More 1 of 2
Align Now, All required

BLE 2440MHz

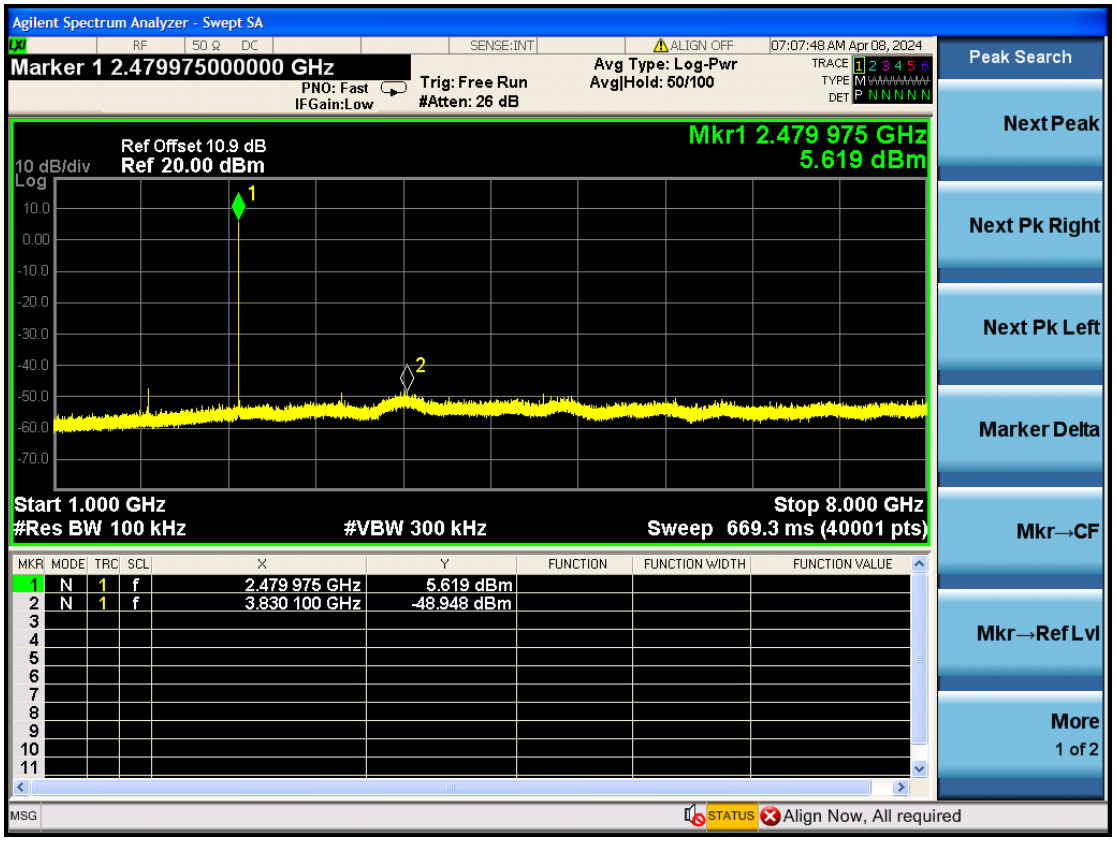

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.440075000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 38/100
07:04:23 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Mkr1 2.440 075 GHz
4.610 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 8.000 GHz
Sweep 669.3 ms (40001 pts)
1 N 1 f 2.440 075 GHz 4.610 dBm
2 N 1 f 3.863 000 GHz -48.651 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More 1 of 2
Align Now, All required

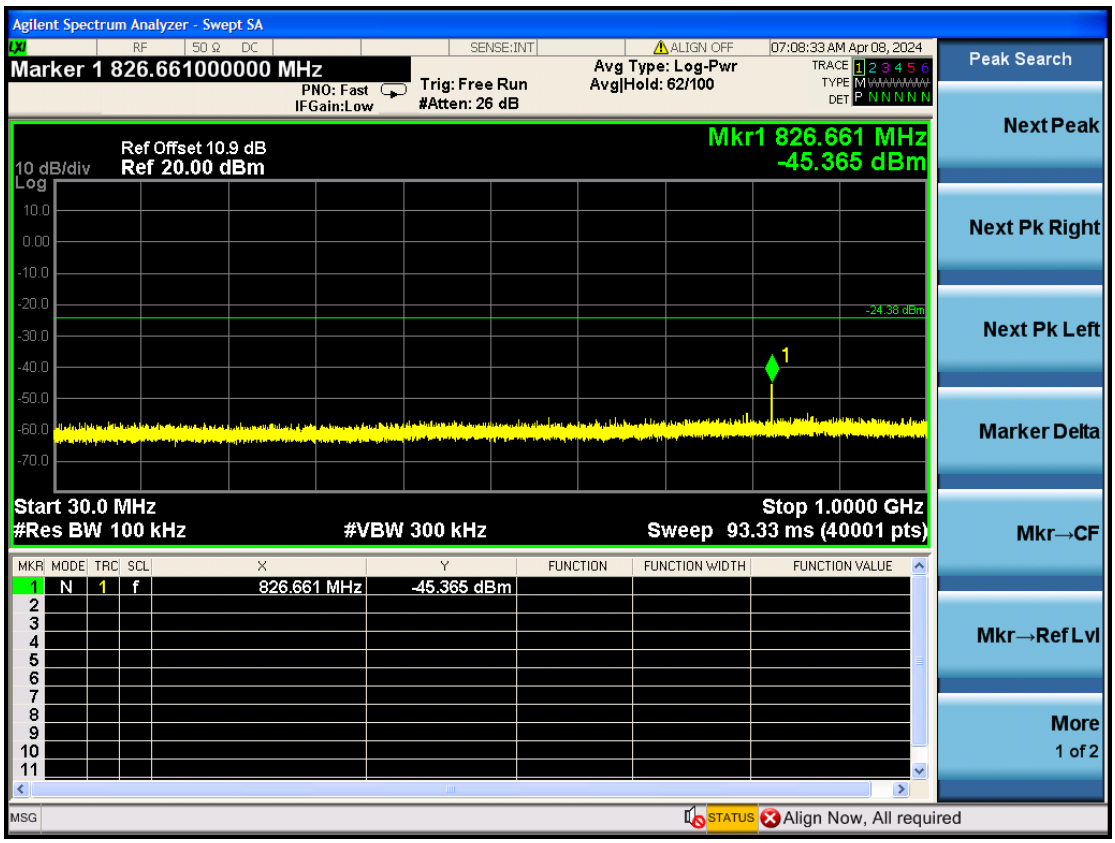

Agilent Spectrum Analyzer - Swept SA
Marker 1 813.323500000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
07:05:25 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Mkr1 813.324 MHz
-46.170 dBm
-25.39 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 93.33 ms (40001 pts)
1 N 1 f 813.324 MHz -46.170 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

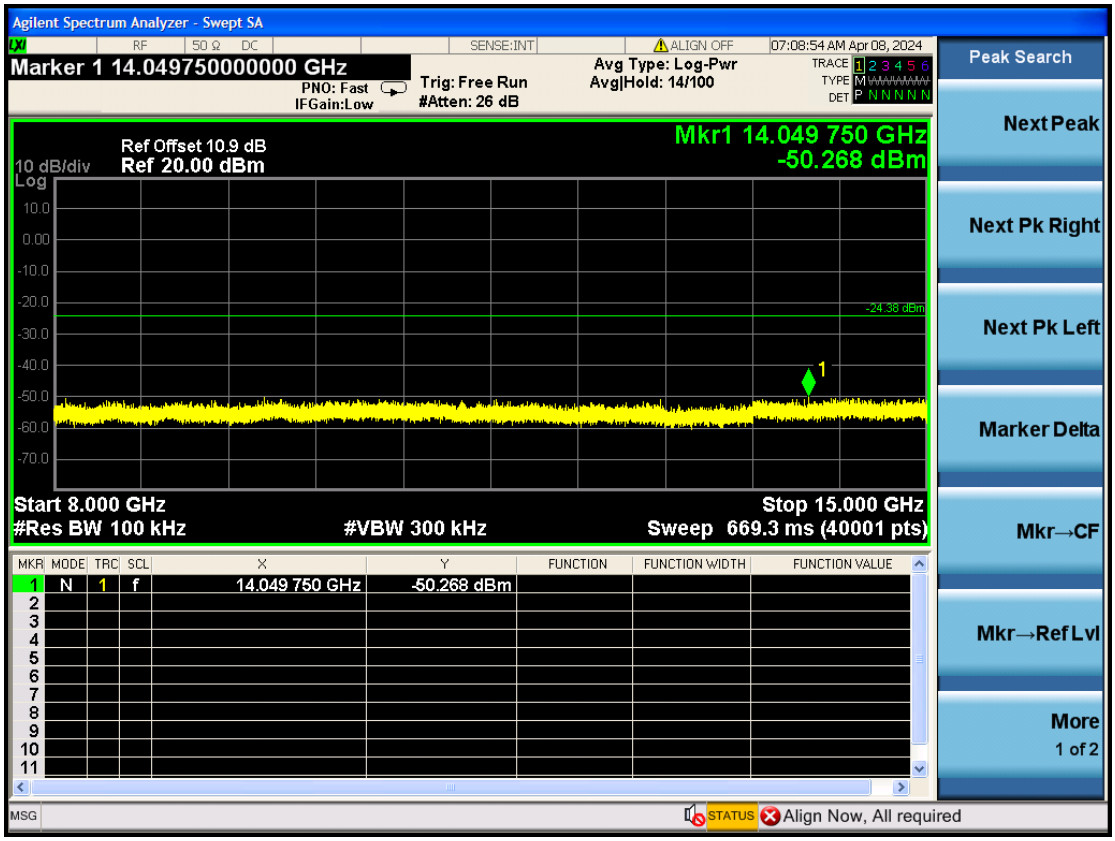

Agilent Spectrum Analyzer - Swept SA
Marker 1 14.139525000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 11/100
07:05:47 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Mkr1 14.139 525 GHz
-50.351 dBm
-25.39 dBm
Start 8.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 15.000 GHz
Sweep 669.3 ms (40001 pts)
1 N 1 f 14.139 525 GHz -50.351 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

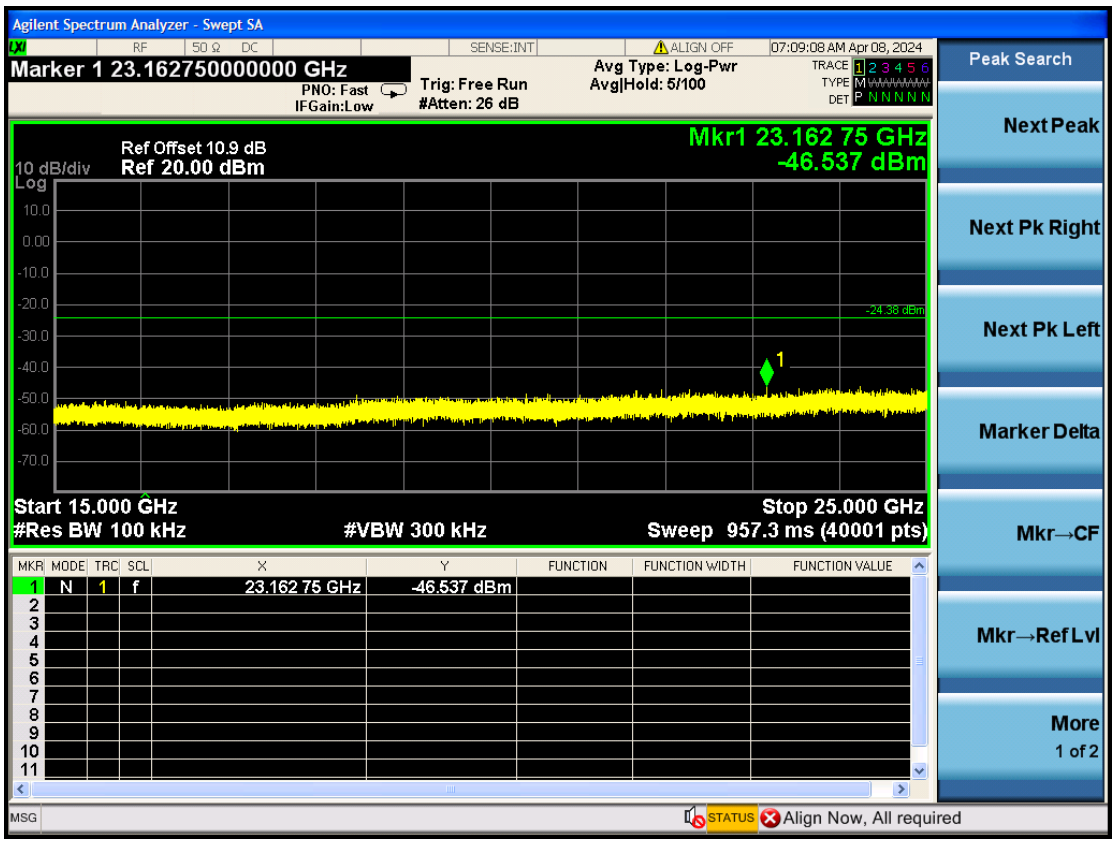

Agilent Spectrum Analyzer - Swept SA
Marker 1 24.772500000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 6/100
07:06:07 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 24.772 50 GHz
-45.548 dBm
-25.39 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 957.3 ms (40001 pts)
1 N 1 f 24.772 50 GHz -45.548 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

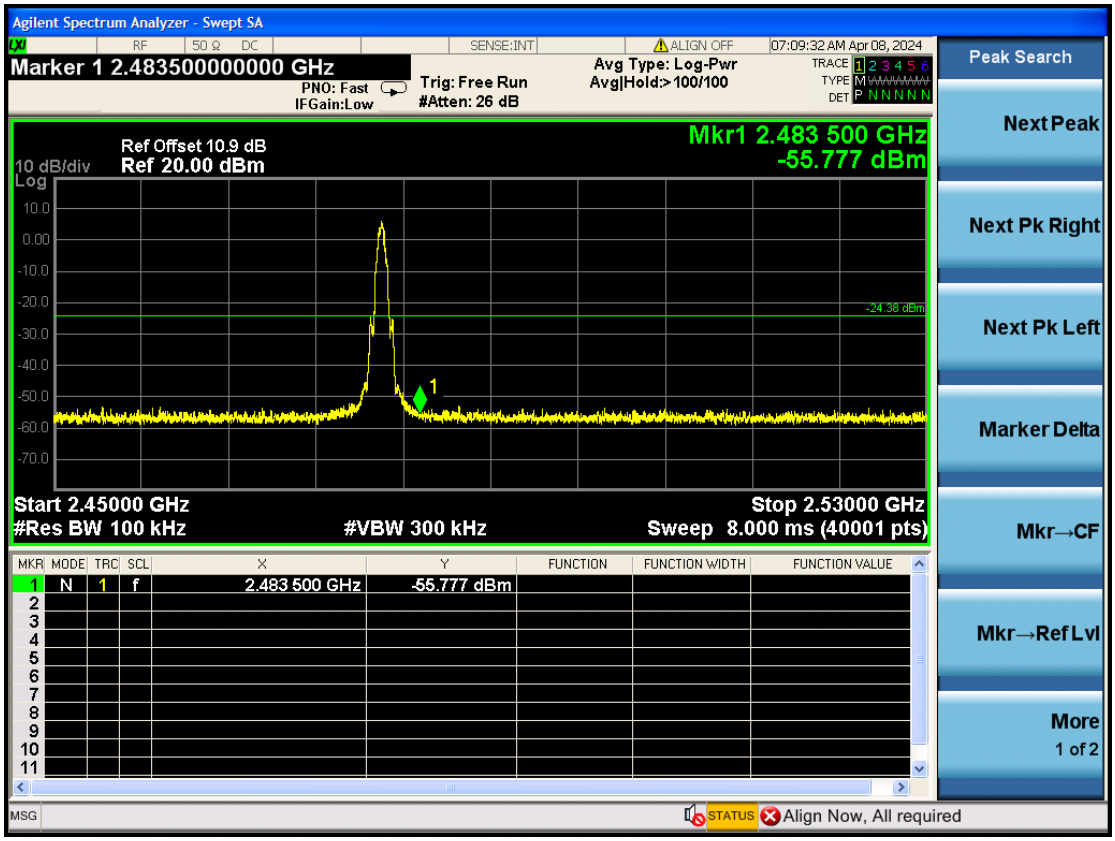
BLE 2480MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.479975000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 50/100
07:07:48 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 975 GHz
5.619 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 8.000 GHz
Sweep 669.3 ms (40001 pts)
1 N 1 f 2.479 975 GHz 5.619 dBm
2 N 1 f 3.830 100 GHz -48.948 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required


Agilent Spectrum Analyzer - Swept SA
Marker 1 826.661000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 62/100
07:08:33 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 826.661 MHz
-45.365 dBm
-24.38 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 93.33 ms (40001 pts)
1 N 1 f 826.661 MHz -45.365 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required


Agilent Spectrum Analyzer - Swept SA
Marker 1 14.049750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 14/100
07:08:54 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 14.049 750 GHz
-50.268 dBm
-24.38 dBm
Start 8.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 15.000 GHz
Sweep 669.3 ms (40001 pts)
1 N 1 f 14.049 750 GHz -50.268 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required


Agilent Spectrum Analyzer - Swept SA
Marker 1 23.162750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
07:09:08 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 23.162 75 GHz
-46.537 dBm
-24.38 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 957.3 ms (40001 pts)
1 N 1 f 23.162 75 GHz -46.537 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.483500000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
07:09:32 AM Apr 08, 2024
Ref Offset 10.9 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.483 500 GHz
-55.777 dBm
-24.38 dBm
Start 2.45000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.53000 GHz
Sweep 8.000 ms (40001 pts)
1 N 1 f 2.483 500 GHz -55.777 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

# 10.DEVIATION TO TEST SPECIFICATIONS

【NONE】

----------The End----------