

FCC Test Report

Report No.: AGC16740241205FR01

| FCC ID | : | WQ8-DV2411 |
|-----------------------|---|--|
| APPLICATION PURPOSE | : | Original Equipment |
| PRODUCT DESIGNATION | : | PROFESSIONAL SCAN TOOL |
| BRAND NAME | : | AUTEL |
| MODEL NAME | : | MaxiDiag MD909 Pro, MaxiDiag MD906 Pro |
| APPLICANT | : | Autel Intelligent Technology Corp., Ltd. |
| DATE OF ISSUE | : | Jan. 08, 2025 |
| STANDARD(S) | : | FCC Part 15 Subpart C §15.247 |
| REPORT VERSION | : | V1.0 |







Report Revise Record

| Report Version | Revise Time | Issued Date Valid Version | | Notes | |
|----------------|-------------|---------------------------|-------|-----------------|--|
| V1.0 | / | Jan. 08, 2025 | Valid | Initial Release | |



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1. General Information

| Applicant | Autel Intelligent Technology Corp., Ltd. |
|------------------------------|--|
| Address | Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili, Nanshan, Shenzhen 518055, China |
| Manufacturer | Autel Intelligent Technology Corp., Ltd. |
| Address | Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili, Nanshan, Shenzhen 518055, China |
| Factory | Autel Intelligent Technology Corp., Ltd. Guangming Branch |
| Address | 7F&6F, East Wing, Building 2, and 6F of Electronical Building, Yanxiang Industrial Zone, Gaoxin Rd, Dongzhou Community of Guangming New District, Shenzhen |
| Product Designation | PROFESSIONAL SCAN TOOL |
| Brand Name | AUTEL |
| Test Model | MaxiDiag MD909 Pro |
| Series Model(s) | MaxiDiag MD906 Pro |
| Difference Description | All the series models are the same as the test model except for the model names and the color of appearance. |
| Date of receipt of test item | Dec. 23, 2024 |
| Date of Test | Dec. 23, 2024~Jan. 07, 2025 |
| Deviation from Standard | No any deviation from the test method |
| Condition of Test Sample | Normal |
| Test Result | Pass |
| Test Report Form No | AGCER-FCC-BR_EDR-V1 |

Note: The test results of this report relate only to the tested sample identified in this report.

Thea Huang Prepared By Thea Huang Jan. 08, 2025 (Project Engineer) liin Lin **Reviewed By** Calvin Liu Jan. 08 2025 (Reviewer) Approved By Angela Li Jan. 08, 2025 (Authorized Officer)



2. Product Information

2.1 Product Technical Description

| Frequency Band | 2400MHz-2483.5MHz |
|---------------------------|--|
| Operation Frequency Range | 2402MHz-2480MHz |
| Bluetooth Version | V5.0 |
| Modulation Type | BR 🖾 GFSK, EDR 🖾 π /4-DQPSK, 🖾 8DPSK |
| Number of channels | 79 Channels |
| Channel Separation | 1 MHz |
| Maximum Transmitter Power | 6.007dBm |
| Hardware Version | DV2411_MAIN_V1 |
| Software Version | V01.01.00 |
| Antenna Designation | PIFA Antenna |
| Antenna Gain | 1.7dBi |
| Power Supply | DC 3.8V by battery or DC 5V by adapter |

2.2 Test Frequency List

| Frequency Band | Channel Number | Test Frequency | | |
|---|----------------|----------------|--|--|
| | 0 | 2402 MHz | | |
| | 1 | 2403 MHz | | |
| | : | : | | |
| 2400~2483.5MHz | 39 | 2441MHz | | |
| | : | : | | |
| | 77 | 2479 MHz | | |
| | 78 | 2480 MHz | | |
| Note: f = 2402 + 1k MHz, k = 0,, 78 ; "f "is the operating frequency (MHz); "k" is the operating channel. | | | | |



2.3 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: WQ8-DV2411, filing to comply with Part 2, Part 15 of the Federal Communication Commission rules.

2.4 Test Methodology

The tests were performed according to following standards:

| No. | Identity | Document Title | | |
|-----|--|---|--|--|
| 1 | FCC 47 CFR Part 2 | Frequency allocations and radio treaty matters; general rules and regulations | | |
| 2 | FCC 47 CFR Part 15 Radio Frequency Devices | | | |
| 3 | ANSI C63.10-2013 | American National Standard for Testing Unlicensed Wireless Devices | | |
| 4 | KDB 558074 D01 15.247 Meas Guidance v05r02 | Guidance for compliance measurements on Digital Transmission Systems, Frequency Hopping Spread Spectrum system, and Hybrid system devices operating under Section 15.247 of the FCC rules | | |

2.5 Receiver Input Bandwidth

The input bandwidth of the receiver is 1.3MHz, in every connection one Bluetooth device is the master and the other one is slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally, the type of connection (e.g. single of multi slot packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also, the slave of the connection will use these settings. Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

2.6 Equally Average Use of Frequencies and Behaviour.

The generation of the hopping sequence in connection mode depends essentially on two input values:

1. LAP/UAP of the master of the connection.

2. Internal master clock.

The LAP (lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24MSB's of the 48BD_ADDRESS

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For behavior action with other units only offset is used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5us. The clock has a cycle of about one day(23h30).

In most case it is implemented as 28 bits counter. For the deriving of the hopping sequence the entire. LAP (24 bits),4LSB's(4bits) (Input 1) and the 27MSB's of the clock (Input 2) are used. With this input values different mathematical procedures (permutations, additions, XOR-operations) are performed to generate the Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following behavior:

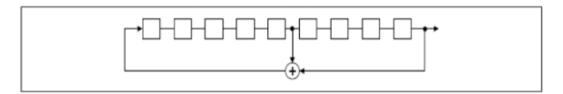
The first connection between the two devices is established, a hopping sequence was generated. For Transmitting the wanted data the complete hopping sequence was not used. The connection ended. The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value, because the period between the two transmission is longer (and it Cannot be shorter) than the minimum resolution of the clock(312.5us). The hopping sequence will always differ from the first one.



2.7 Pseudorandom Frequency Hopping Sequence

The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

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



Linear Feedback Shift Register for Generation of The PRBS Sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:

| 44 | 35 | 78 | 03 | 20 | 76 | 02 | 19 | | 21 | 64 75 |
|----|----|----|----|----|----|----------|----|---|-----|-------|
| | | | | | | | | 1 | | |
| | | | li | | | | | | | |
| | | | | 1 | | | | | i i | |
| | | | | i | | <u>-</u> | | 1 | i | |

Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their Corresponding transmitters and shift frequencies in synchronization with the transmitted signals.



2.8 Special Accessories

Not available for this EUT intended for grant.

2.9 Equipment Modifications

Not available for this EUT intended for grant.

2.10 Antenna Requirement

Standard Requirement

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.

15.247(b) (4) requirement:

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

EUT Antenna:

The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna is 1.7dBi.



3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

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

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories.)

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842(CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.



3.3 Environmental Conditions

| | Normal Conditions |
|-------------------------|--|
| Temperature range (°C) | 15 - 35 |
| Relative humidity range | 20 % - 75 % |
| Pressure range (kPa) | 86 - 106 |
| Power supply | DC 3.8V by battery or DC 5V by adapter |

3.4 Measurement Uncertainty

The reported uncertainty of measurement y \pm U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

| Item | Measurement Uncertainty |
|---|----------------------------|
| Uncertainty of Conducted Emission for AC Port | $U_c = \pm 2.9 \text{ dB}$ |
| Uncertainty of Radiated Emission below 1GHz | $U_c = \pm 3.9 \text{ dB}$ |
| Uncertainty of Radiated Emission above 1GHz | $U_c = \pm 4.9 \text{ dB}$ |
| Uncertainty of total RF Power, Conducted | $U_c = \pm 0.8 \text{ dB}$ |
| Uncertainty of RF Power Density, Conducted | $U_c = \pm 2.6 \text{ dB}$ |
| Uncertainty of Spurious Emissions, Conducted | U _c = ±2 % |
| Uncertainty of Occupied Channel Bandwidth | $U_c = \pm 2 \%$ |
| Uncertainty of Dwell Time | $U_c = \pm 2 \%$ |



3.5 List of Equipment Used

| RF Conducted Test System | | | | | | | | |
|--------------------------|---------------|------------------------|--------------|------------|------------|------------------------------|------------------------------|--|
| Used | Equipment No. | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) | |
| \boxtimes | AGC-ER-E036 | Spectrum Analyzer | Agilent | N9020A | MY49100060 | 2024-05-24 | 2025-05-23 | |
| \boxtimes | AGC-ER-E062 | Power Sensor | Agilent | U2021XA | MY54110007 | 2024-02-01 | 2025-01-31 | |
| \boxtimes | AGC-ER-E063 | Power Sensor | Agilent | U2021XA | MY54110009 | 2024-02-01 | 2025-01-31 | |
| \boxtimes | AGC-ER-A001 | 6dB Attenuator | Eeatsheep | LM-XX-6-5W | N/A | 2023-09-21 | 2025-09-20 | |
| | AGC-ER-E083 | Signal Generator | Agilent | E4421B | US39340815 | 2024-05-23 | 2025-05-22 | |
| | N/A | RF Connection Cable | N/A | 1# | N/A | Each time | N/A | |
| \boxtimes | N/A | RF Connection Cable | N/A | 2# | N/A | Each time | N/A | |

| ● F | Radiated Spurious Emission | | | | | | | |
|-------------|----------------------------|----------------------------------|--------------|------------|------------|------------------------------|------------------------------|--|
| Used | Equipment No. | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) | |
| | AGC-EM-E046 | EMI Test Receiver | R&S | ESCI | 10096 | 2024-02-01 | 2025-01-31 | |
| \boxtimes | AGC-EM-E116 | EMI Test Receiver | R&S | ESCI | 100034 | 2024-05-24 | 2025-05-23 | |
| \square | AGC-EM-E061 | Spectrum Analyzer | Agilent | N9010A | MY53470504 | 2024-05-28 | 2025-05-27 | |
| \boxtimes | AGC-EM-E086 | Loop Antenna | ZHINAN | ZN30900C | 18051 | 2024-03-05 | 2026-03-04 | |
| \boxtimes | AGC-EM-E001 | Wideband Antenna | SCHWARZBECK | VULB9168 | D69250 | 2023-05-11 | 2025-05-10 | |
| \boxtimes | AGC-EM-E029 | Broadband Ridged Horn Antenna | ETS | 3117 | 00034609 | 2024-03-31 | 2025-03-30 | |
| \boxtimes | AGC-EM-E082 | Horn Antenna | SCHWARZBECK | BBHA 9170 | #768 | 2023-09-24 | 2025-09-23 | |
| \boxtimes | AGC-EM-E146 | Pre-amplifier | ETS | 3117-PA | 00246148 | 2024-07-24 | 2026-07-23 | |
| \square | AGC-EM-A119 | 2.4G Filter | SongYi | N/A | N/A | 2024-05-23 | 2025-05-22 | |
| \square | AGC-EM-A138 | 6dB Attenuator | Eeatsheep | LM-XX-6-5W | N/A | 2023-06-09 | 2025-06-08 | |
| | AGC-EM-A139 | 6dB Attenuator | Eeatsheep | LM-XX-6-5W | N/A | 2023-06-09 | 2025-06-08 | |

| • A | AC Power Line Conducted Emission | | | | | | |
|-------------|----------------------------------|-------------------|--------------|------------|------------|------------------------------|------------------------------|
| Used | Equipment No. | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| \boxtimes | AGC-EM-E045 | EMI Test Receiver | R&S | ESPI | 101206 | 2024-05-28 | 2025-05-27 |
| | AGC-EM-A130 | 6dB Attenuator | Eeatsheep | LM-XX-6-5W | DC-6GZ | 2023-06-09 | 2025-06-08 |
| \boxtimes | AGC-EM-E023 | AMN | R&S | 100086 | ESH2-Z5 | 2024-05-28 | 2025-05-27 |



| • Tes | Test Software | | | | | | |
|-------------|---------------|---------------------|--------------|----------------------|---------------------|--|--|
| Used | Equipment No. | Test Equipment | Manufacturer | Model No. | Version Information | | |
| \boxtimes | AGC-EM-S001 | CE Test System | R&S | ES-K1 | V1.71 | | |
| | AGC-EM-S003 | RE Test System | FARA | EZ-EMC | VRA-03A | | |
| | AGC-EM-S004 | RE Test System | Tonscend | TS+Ver2.1(JS32-RE) | 4.0.0.0 | | |
| \boxtimes | AGC-ER-S012 | BT/WIFI Test System | Tonscend | JS1120-2 | 2.6 | | |
| \boxtimes | AGC-EM-S011 | RSE Test System | Tonscend | TS+-Ver2.1(JS36-RSE) | 4.0.0.0 | | |



4.System Test Configuration

4.1 EUT Configuration

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

4.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

4.3 Configuration of Tested System

Radiated Emission Configure:



Conducted Emission Configure:

| EUT | AE |
|-----|----|
| | , |

4.4 Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☐ Test Accessories Come From The Laboratory

| No. | Equipment | Manufacturer | Model No. | Specification Information | Cable |
|-----|-------------|--------------|--------------|---------------------------|-------|
| 1 | Adapter | Huawei | HW-200440C00 | | |
| 2 | Control Box | RISYM | USB-TTL | | |
| | | ~ | | | |

Test Accessories Come From The Manufacturer

| No. | Equipment | Manufacturer | Model No. | Specification Information | Cable |
|-----|-----------|--------------|-----------|---------------------------|-------|
| 1 | | | | | |



4.5 Summary of Test Results

| Item | FCC Rules | Description of Test | Result |
|------|----------------------|---|--------|
| 1 | §15.203&15.247(b)(4) | Antenna Equipment | Pass |
| 2 | §15.247 (b)(1) | RF Output Power | Pass |
| 3 | §15.247 (a)(1) | 20 dB Bandwidth | Pass |
| 4 | §15.247 (d) | Conducted Band Edge and Out-of-Band Emissions | Pass |
| 5 | §15.209 | Radiated Spurious Emission | Pass |
| 6 | §15.247 (a)(1)(iii) | Number of Hopping Frequency | Pass |
| 7 | §15.247 (a)(1)(iii) | Time of Occupancy | Pass |
| 8 | §15.247 (a)(1) | Frequency Separation | Pass |
| 9 | §15.207 | AC Power Line Conducted Emission | Pass |



5. Description of Test Modes

| | Summary table of | of Test Cases | | | | |
|---|--|---|---|--|--|--|
| — | | Data Rate / Modulation | | | | |
| Test Item | Bluetooth – Bl | BR_EDR (GFSK/π /4-DQPSK/8DPSK) | | | | |
| Radiated & Conducted Test Cases | Node 1: Bluetooth Tx CH00_2402 MHz_1Mbps (Battery powered or AC/DC adapter Node 2: Bluetooth Tx CH39_2441 MHz_1Mbps (Battery powered or AC/DC adapter Node 3: Bluetooth Tx CH78_2480 MHz_1Mbps (Battery powered or AC/DC adapter Node 4: Bluetooth Tx CH00_2402 MHz_2Mbps (Battery powered or AC/DC adapter Node 5: Bluetooth Tx CH39_2441 MHz_2Mbps (Battery powered or AC/DC adapter Node 6: Bluetooth Tx CH78_2480 MHz_2Mbps (Battery powered or AC/DC adapter Node 6: Bluetooth Tx CH78_2480 MHz_3Mbps (Battery powered or AC/DC adapter Node 7: Bluetooth Tx CH39_2441 MHz_3Mbps (Battery powered or AC/DC adapter Node 8: Bluetooth Tx CH39_2441 MHz_3Mbps (Battery powered or AC/DC adapter Node 9: Bluetooth Tx CH78_2480 MHz_3Mbps (Battery powered or AC/DC adapter Node 10: Bluetooth Tx Hopping-1Mbps (Battery powered or AC/DC adapter) Mode11: Bluetooth Tx Hopping-3Mbps (Battery powered or AC/DC adapter) Mode12: Bluetooth Tx Hopping-3Mbps (Battery powered or AC/DC adapter) | | | | | |
| AC Conducted Emission | Mode 1: Bluetooth Link + E | Battery + USB Cable (Charging from AC Adapter | 1 | | | |
| B. For Radiated Emission, 3axis were chosen for testing for each applicable mode. For Conducted Test method, a temporary antenna connector is provided by the manufacture. Software Setting Diagram Non Signaling Test Tool(20201117) File Device Periode Periode Stotest Voo Test BLE TA TEST SETTING COMB OxEEEEEEEEEE DUT Private IDLE UNDEFL Transait Frequency Octuber Power Level 1 It Address 1 Fast scenario 00-output Private IDLE UNDEFL | | | | | | |
| < | | Hopping Node 00-off Vayload Size 339 | | | | |
| Traces X Local Perice Traces I Reset I Reset I[16:59:23:607] DUT : CHD_CMEL_EVT (RESET (SUCCESS)) - I Reset I RESSISSING DUT : CHD(RESET)-> I (VENT RANS) pki_counters: 0 I (VENT RANS) pki_counters: 0 I (VENT RANS) payload_errors: 0 I (VENT RANS) payload_errors: 0 I (VENT RANS) payload_errors: 0 I (VENT RANS) pelload_errors: 0 I (VENT RANS) pelload_errors: 0 I (VENT RANS) pelload_errors: 0 I (VENT RANS) PER: 100.00000% | | | | | | |
| Local Device Traces | 25SET (SUCCESS)) - | Extra Laterval 0 Package Mumber Ox FFFFFFFF Send | | | | |



6. RF Output Power Measurement

6.1 Provisions Applicable

The maximum out power permissible output power is 1 Watt for all frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels.

The maximum out power permissible output power is 0.125 watts for all other frequency hopping systems in the 2400-2483.5 MHz band.

6.2 Measurement Procedure

⊠For Peak power test:

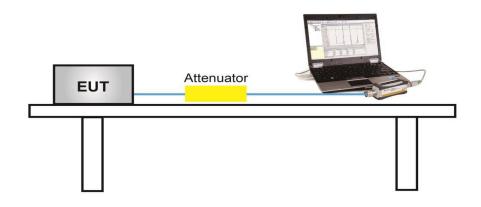
- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- 3. RBW > 20 dB bandwidth of the emission being measured.
- 4. VBW \geq RBW.
- 5. Sweep: Auto.
- 6. Detector function: Peak.
- 7. Trace: Max hold.
- 8. Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

For Average power test:

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required

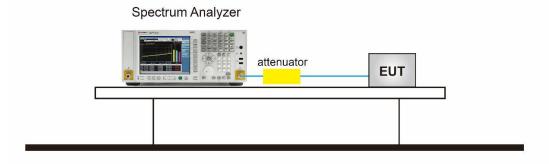
6.3 Measurement Setup (Block Diagram of Configuration)

For Average power test setup





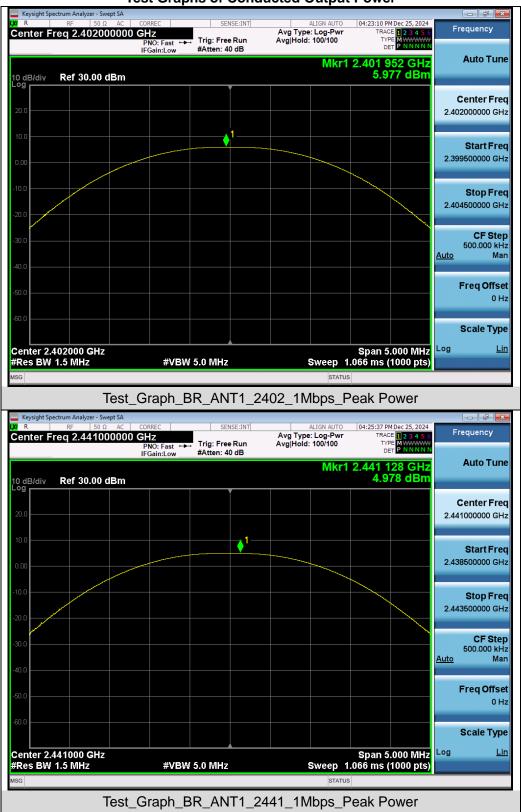
For peak power test setup



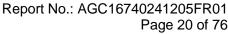
6.4 Measurement Result

| Test Data of Conducted Output Power | | | | | |
|-------------------------------------|-------------------------|---------------------|-----------------|--------------|--|
| Test Mode | Test Frequency (MHz) | Peak Power (dBm) | Limits (dBm) | Pass or Fail | |
| | 2402 | 5.977 | ≪21 | Pass | |
| GFSK | 2441 | 4.978 | ≪21 | Pass | |
| | 2480 | 4.168 | ≪21 | Pass | |
| | 2402 | 6.001 | ≪21 | Pass | |
| π /4-DQPSK | 2441 | 4.991 | ≤21 | Pass | |
| | 2480 | 4.173 | ≤21 | Pass | |
| | 2402 | 6.007 | ≪21 | Pass | |
| 8DPSK | 2441 | 4.988 | ≪21 | Pass | |
| | 2480 | 4.176 | ≪21 | Pass | |

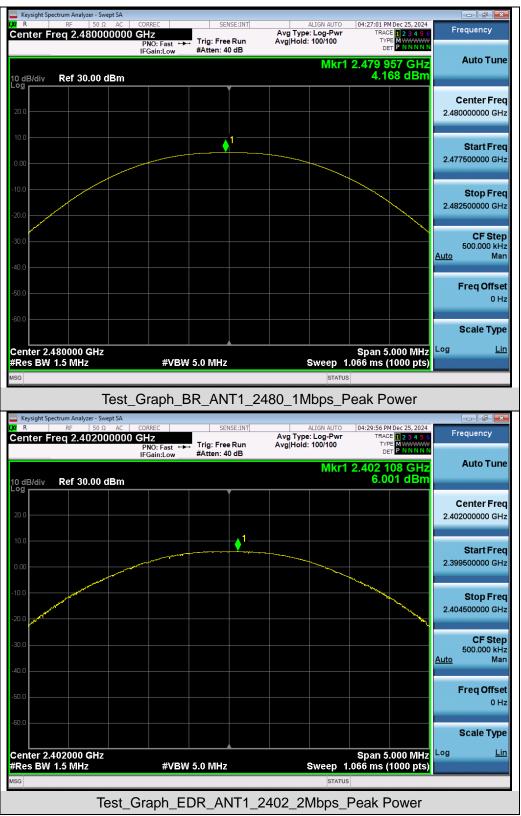


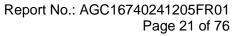


Test Graphs of Conducted Output Power

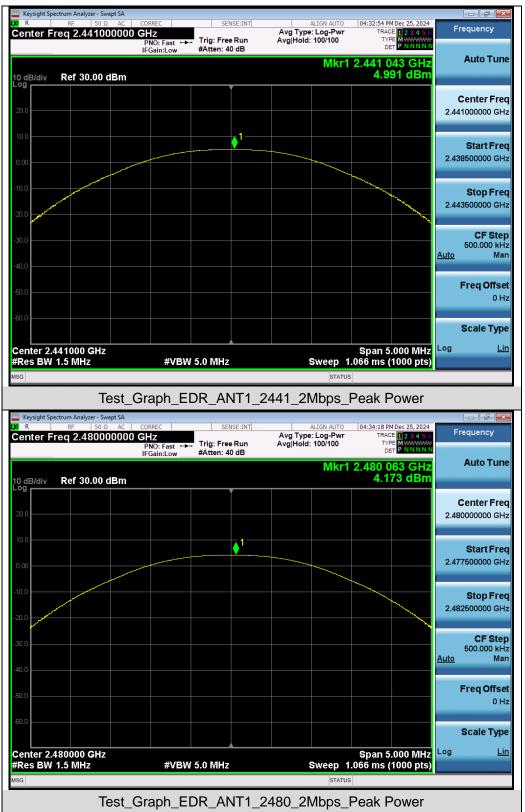


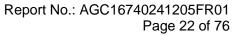




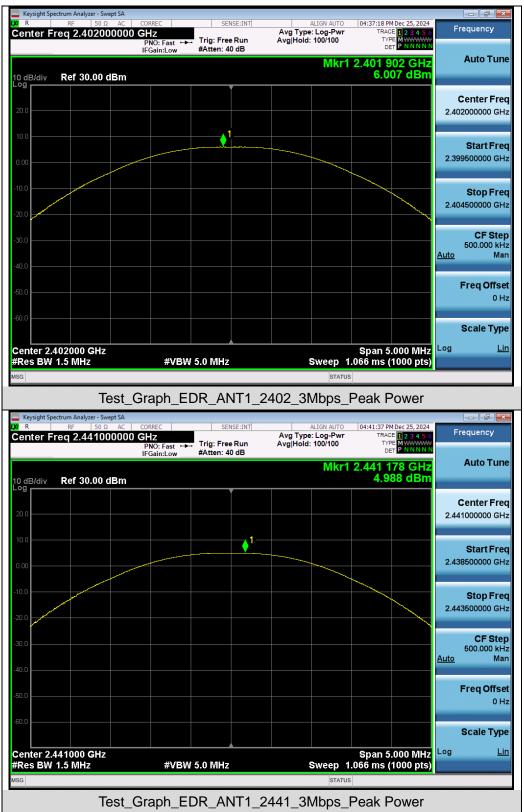














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| Keysight Spectrum Analyzer - Swept S | | | | |
|--------------------------------------|--|---------------------------------|---|----------------|
| R RF 50 Ω A Center Freq 2.4800000 | C CORREC SENSE:INT | ALIGN AUTO Avg Type: Log-Pwr | 04:42:59 PM Dec 25, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW | Frequency |
| | PNO: Fast +++ Trig: Free Run IFGain:Low #Atten: 40 dB | Avg Hold: 100/100 | | |
| | | Mkr1 | 2.479 882 GHz | Auto Tune |
| 0 dB/div Ref 30.00 dBr | n | | 4.176 dBm | |
| | | | | Center Fre |
| 20.0 | | | | 2.480000000 GH |
| 10.0 | | | | |
| 10.0 | | | | Start Fre |
| 0.00 | | | | 2.477500000 GH |
| | | | | |
| 10.0 | | | | Stop Fre |
| 20.0 | | | | 2.482500000 GH |
| | | | | CF Ste |
| 30.0 | | | | 500.000 k⊢ |
| 40.0 | | | | <u>Auto</u> Ma |
| | | | | FreqOffs |
| 50.0 | | | | |
| 60.0 | | | | |
| 00.0 | | | | Scale Typ |
| Center 2.480000 GHz | | | Span 5.000 MHz | Log Li |
| Res BW 1.5 MHz | #VBW 5.0 MHz | Sweep 1 | .066 ms (1000 pts) | |
| SG | | STATU | | |
| Τρο | t_Graph_EDR_ANT1 | 2480 3Mbns | Peak Power | |



7. 20dB Bandwidth and 99% Occupied Bandwidth Measurement

7.1 Provisions Applicable

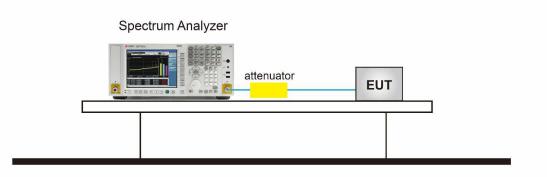
There is no corresponding limit requirement for this test item.

7.2 Measurement Procedure

The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 6.9.2 (20dB BW).

- The 20dB bandwidth spectrum analyzer setting reference is as follows:
- 1. Set RBW ≥ 1% to 5% of the 20dB bandwidth
- 2. VBW = Approximately three times RBW
- 3. Span = Approximately 2 to 5 times the 20dB bandwidth, centered on a hopping channel
- 4. Detector = Peak
- 5. Trace mode = Max hold
- 6. Sweep = Auto couple
- 7. Allow the trace to stabilize
- 8. Measure the maximum width of the emission that is constrained by the frequencies associated
- 9. with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20
- 10. dB relative to the maximum level in the fundamental emission.
- The 99% bandwidth spectrum analyzer setting reference is as follows:
- 1. Span = 1.5 times to 5 times the OBW
- 2. Set RBW = 1% to 5% the OBW
- 3. VBW \ge 3 × RBW
- 4. Detector = Peak
- 5. Trace mode = Max hold
- 6. Sweep = Auto couple
- 7. Allow the trace was allowed to stabilize

7.3 Measurement Setup (Block Diagram of Configuration)

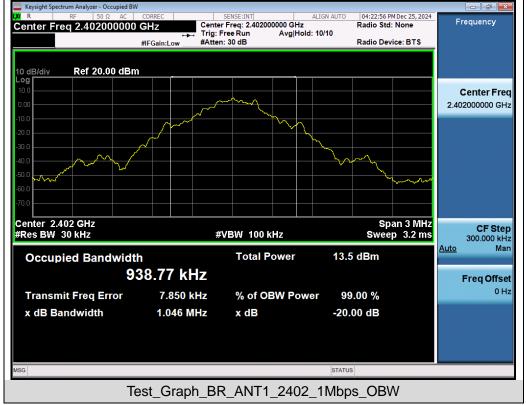




7.4 Measurement Results

| | Test Data of Occupied Bandwidth and -20dB Bandwidth | | | | | | |
|------------|---|---------------------------------|--------------------------|--------|--------------|--|--|
| Test Mode | Test Frequency (MHz) | 99% Occupied Bandwidth (MHz) | -20dB Bandwidth (MHz) | Limits | Pass or Fail | | |
| | 2402 | 0.939 | 1.046 | N/A | Pass | | |
| GFSK | 2441 | 0.907 | 1.035 | N/A | Pass | | |
| | 2480 | 0.945 | 1.047 | N/A | Pass | | |
| | 2402 | 1.138 | 1.188 | N/A | Pass | | |
| π /4-DQPSK | 2441 | 1.130 | 1.190 | N/A | Pass | | |
| | 2480 | 1.125 | 1.190 | N/A | Pass | | |
| | 2402 | 1.134 | 1.199 | N/A | Pass | | |
| 8DPSK | 2441 | 1.132 | 1.199 | N/A | Pass | | |
| | 2480 | 1.132 | 1.199 | N/A | Pass | | |

Test Graphs of Occupied Bandwidth and -20 Bandwidth



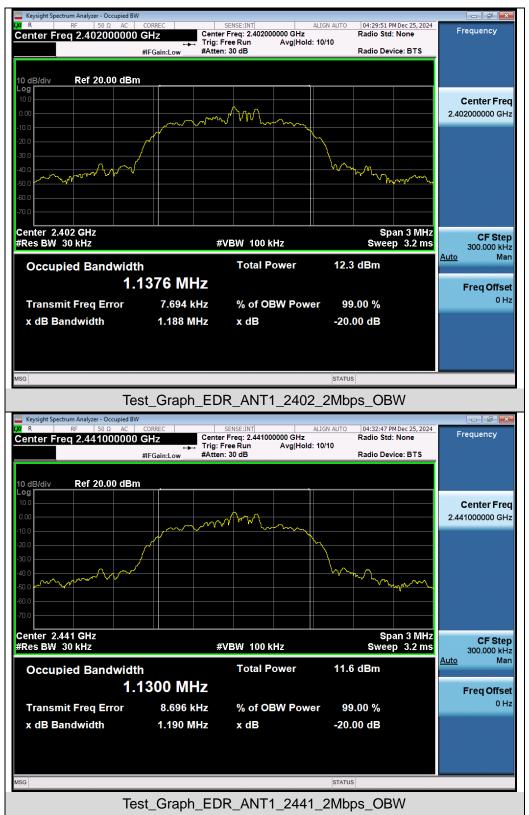


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8. Conducted Band Edge and Out-of-Band Emissions

8.1 Provisions Applicable

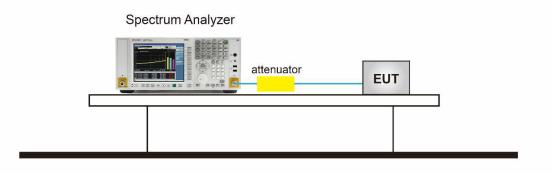
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

8.2 Measurement Procedure

The testing follows the ANSI C63.10 Section 6.10.4 and 7.8.8:

- Reference level measurement
- 1. Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation.
- 2. RBW = 100kHz
- 3. VBW = 300kHz
- 4. Detector = Peak
- 5. Sweep time = Auto couple
- 6. Trace mode = Max hold
- 7. Allow the trace to stabilize. Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission.
- Emission level measurement
- 1. Span = Wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
- 2. RBW = 100kHz
- 3. VBW = 300kHz
- 4. Detector = Peak
- 5. Sweep time = Auto couple
- 6. Trace mode = Max hold
- 7. Trace was allowed to stabilize
- 8. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

8.3 Measurement Setup (Block Diagram of Configuration)

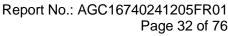




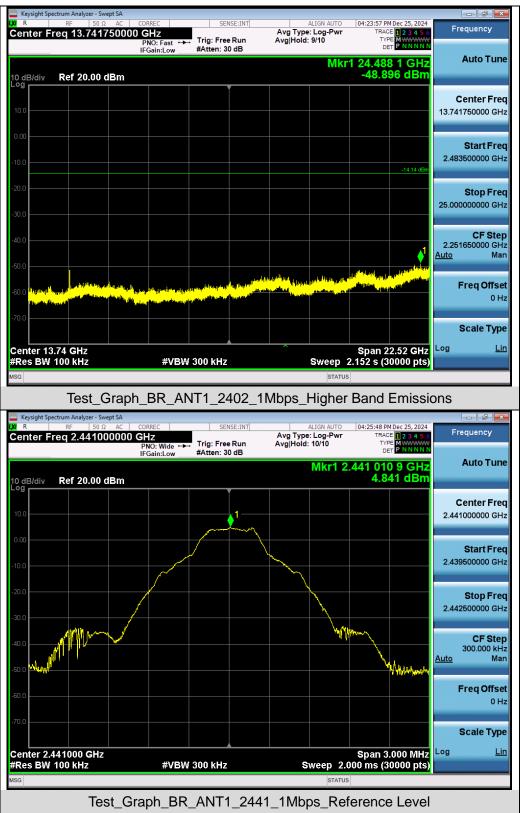
8.4 Measurement Results

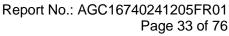


Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands

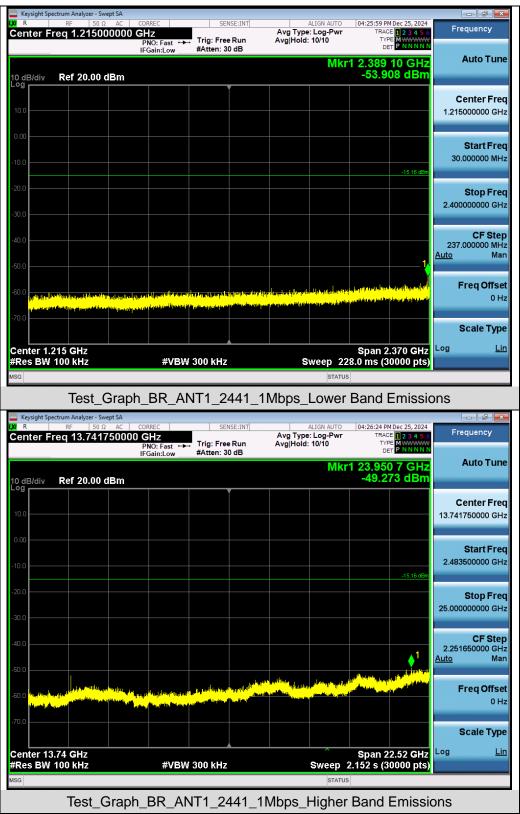


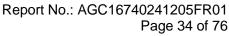






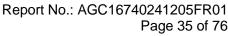




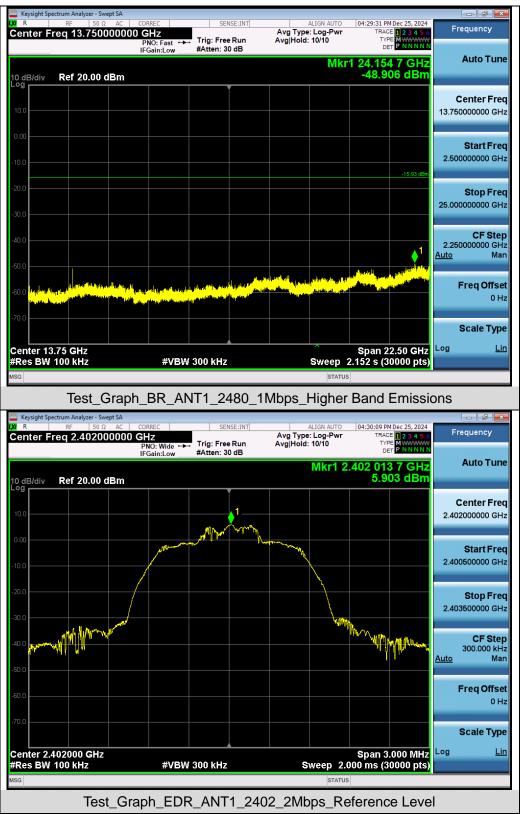


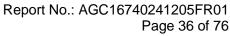




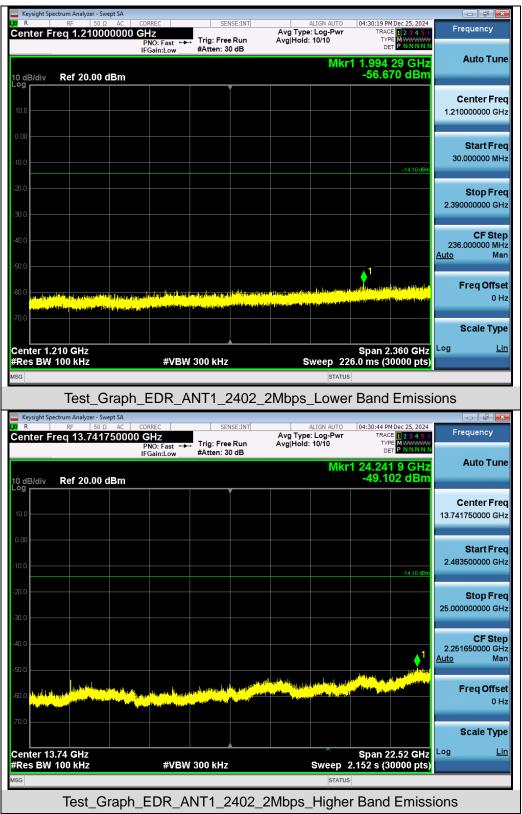


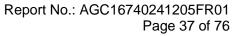




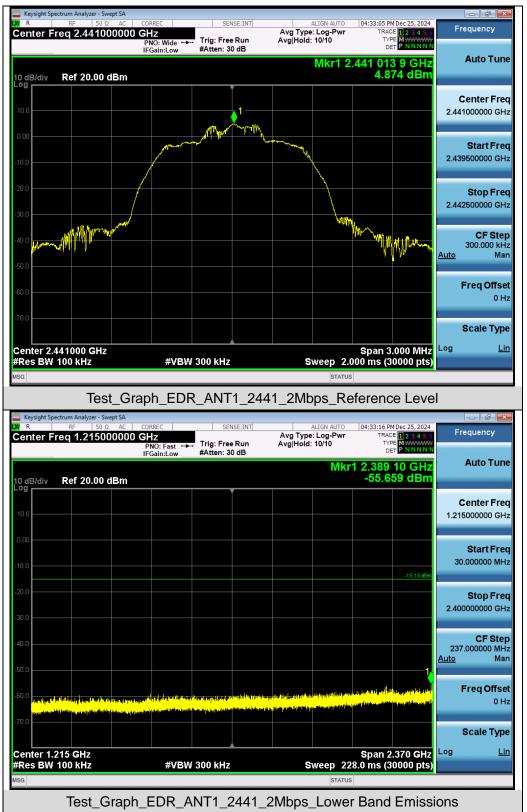


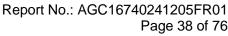




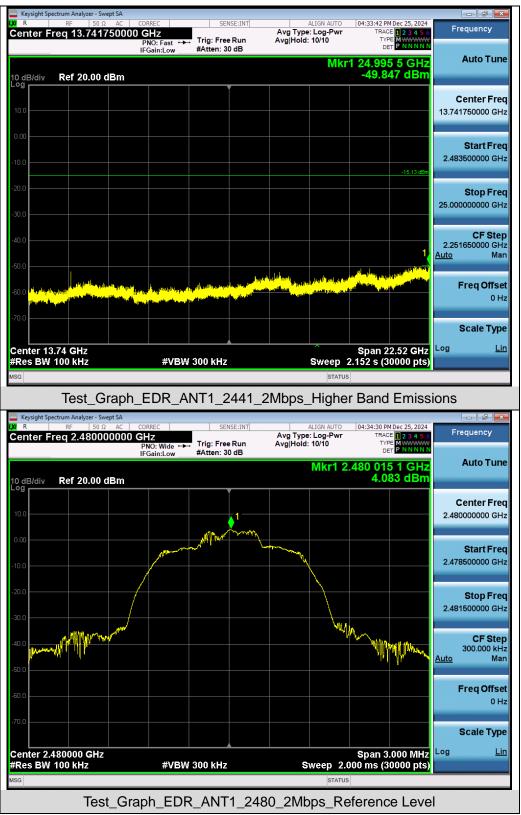


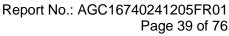




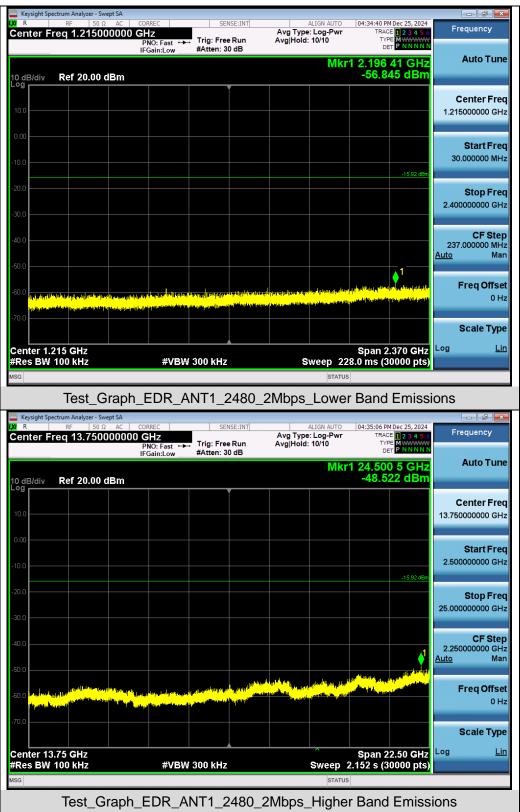


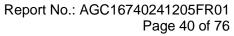




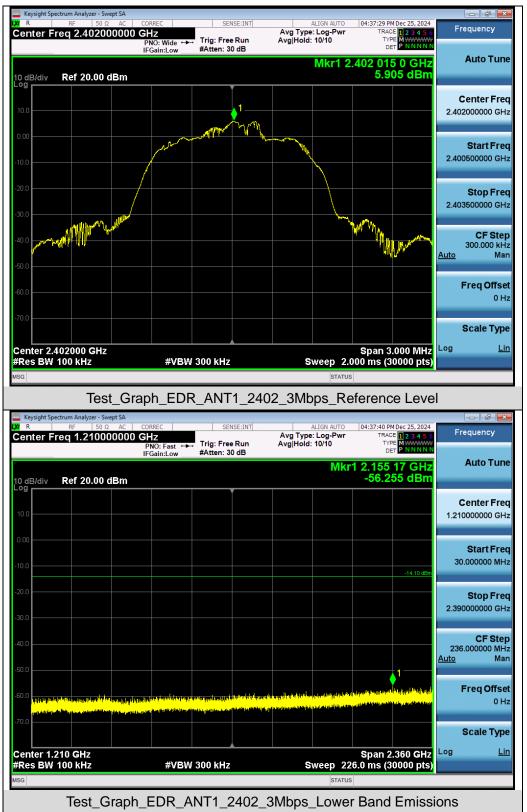


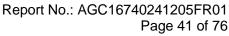




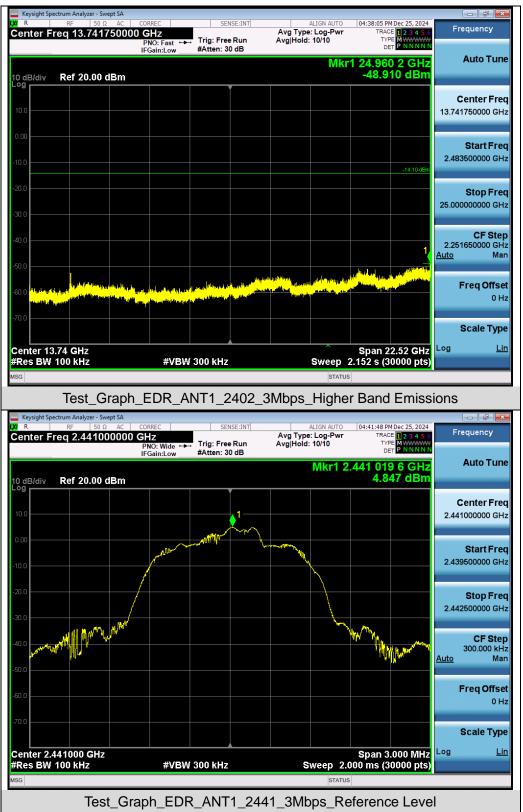


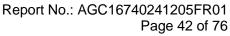




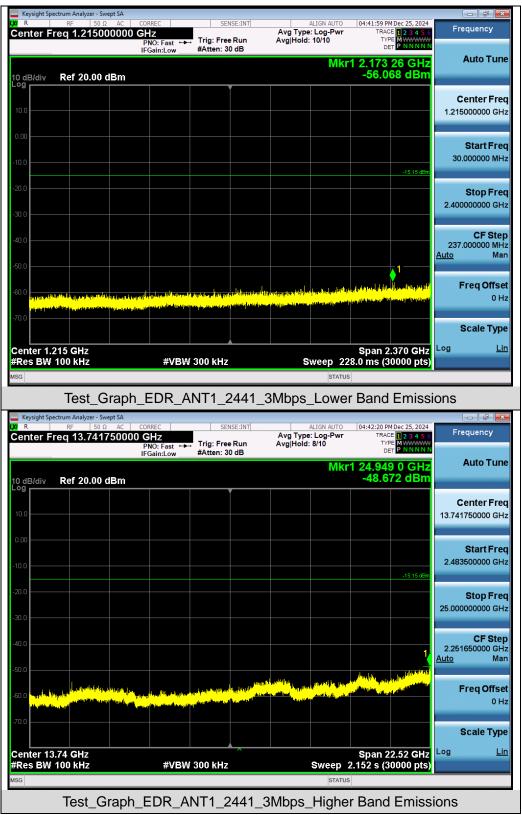


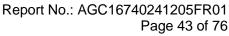














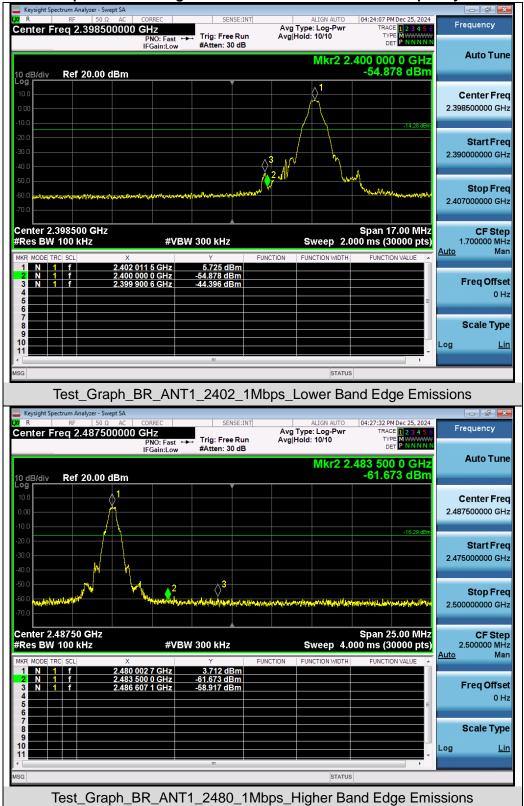




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| | /sight Spectrun | | | | | | | | | | | x |
|--------------|----------------------|-----------------|---|--|--|--|---|--------------------------|---|-----------------|--------------|------|
| LXI R | | ₹F 50 Ω | | CORREC | SEI | NSE:INT | | ALIGN AUTO E: Log-Pwr | | M Dec 25, 2024 | Frequency | , |
| Cen | ter Freq | 13.7500 | 00000 | PNO: Fast ++ | , Trig: Free | | Avg Hold | | | PE MWWWW | | |
| | | | | IFGain:Low | #Atten: 3 | 0 dB | | | 5. | | Auto T | une |
| | | | | | | | | Mkr | 1 24.97 | 07GHz | Adtor | and |
| 10 dE Log | 3/div R e | ef 20.00 (| dBm | | | | | | -49.0 | 49 dBm | | |
| | | | | | | Ĭ | | | | | Center F | rea |
| 10.0 | | | | | | | | | | | 13.750000000 | |
| | | | | | | | | | | | | |
| 0.00 | | | | | | | | | | | | |
| | | | | | | | | | | | Start F | |
| -10.0 | | | | | | | | | | | 2.50000000 | GHz |
| | | | | | | | | | | -15.92 dBm | | |
| -20.0 | | | | | | | | | | | Stop F | req |
| | | | | | | | | | | | 25.00000000 | GHz |
| -30.0 | | | | | | | | | | | | |
| | | | | | | | | | | | CFS | step |
| -40.0 | | | | | | | | | | 1 | 2.250000000 | |
| 50.0 | | | | | | | | | | L | Auto | Man |
| -50.0 | | | | | | | | | و عدر فالحاطية. | | | |
| -60.0 | de nikatala sa sa di | AND IN COMPANY | all the state of the second | n | al <u>dischold die die di</u> | du du de la compañía | the local sector is a sector of the sector of the sector is a sector of the sector of | | and the state of the | Low Contraction | Freq Of | fset |
| -00.0 | No. of the second | A STREET BELLEV | a dense aller, mildense | ere an | and the second | legel and the | a a a a a a a a a a a a a a a a a a a | | | | | 0 Hz |
| -70.0 | | | | | | | | | | | | |
| 10.0 | | | | | | | | | | | Scale T | ype |
| | | | | | | | | | | | | |
| | ter 13.75 | | | -43 (1934 | | | | • | Span 2 | 2.50 GHz | Log | Lin |
| _ | 5 BW 100 | JKHZ | | #VBM | / 300 kHz | | | | | 0000 pts) | | |
| MSG | | | | | | | | STATUS | | | | |
| | Т | est G | raph | EDR_A | NT1 2 | 480 | 3Mbps | Highe | r Band | Emiss | ions | |
| | | 000 | · | / | | | | | . Duno | 0 | 10110 | |

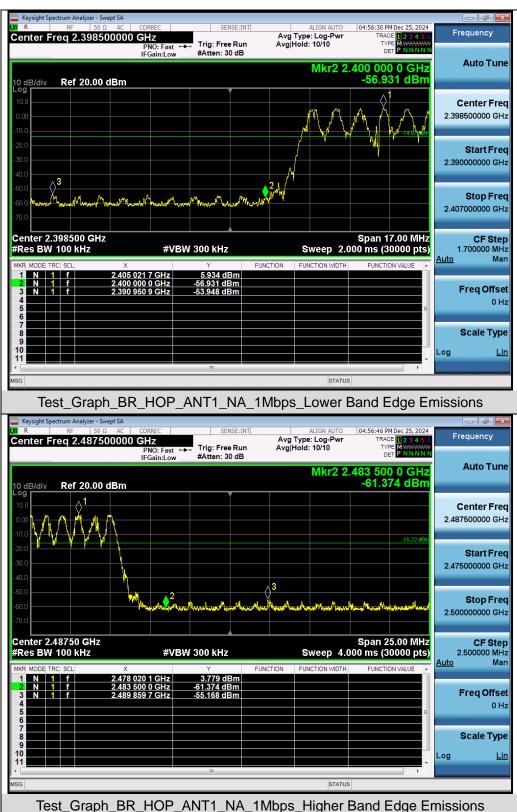




Test Graphs of Band Edge Emissions in Non-Restricted Frequency Bands

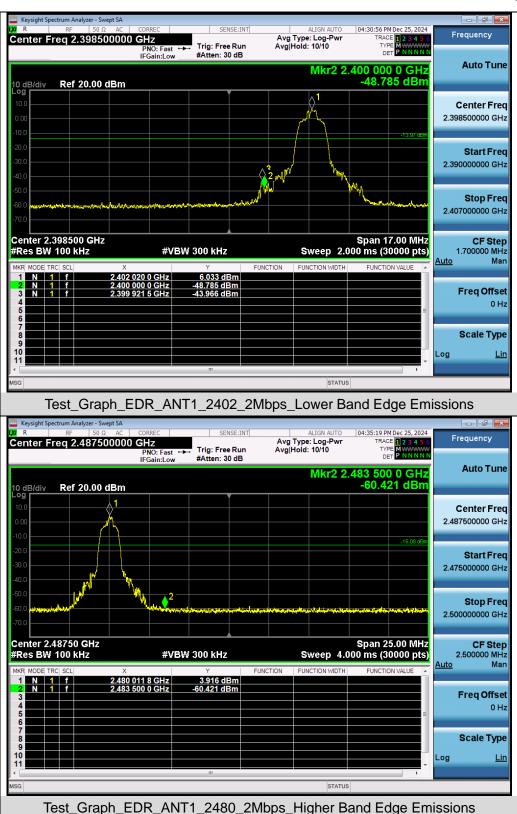
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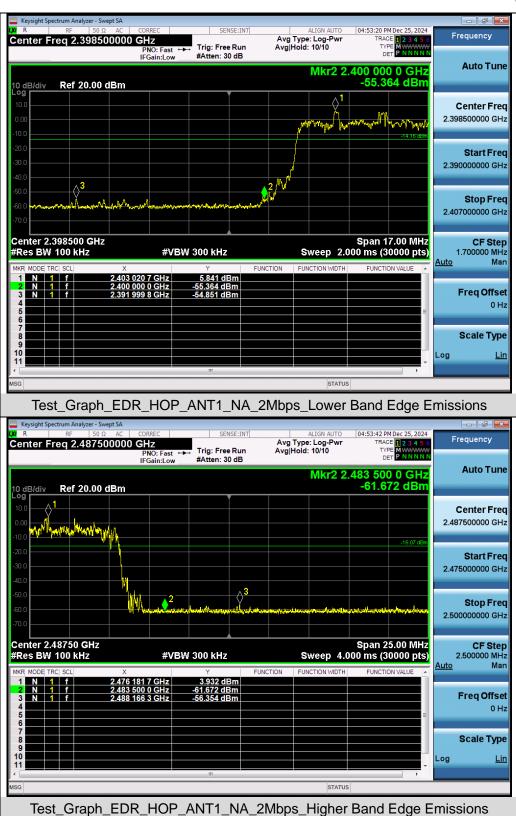
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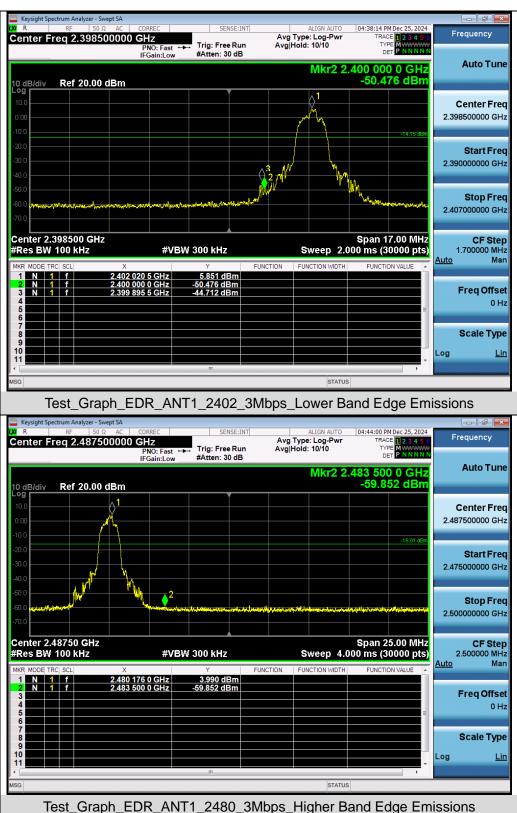
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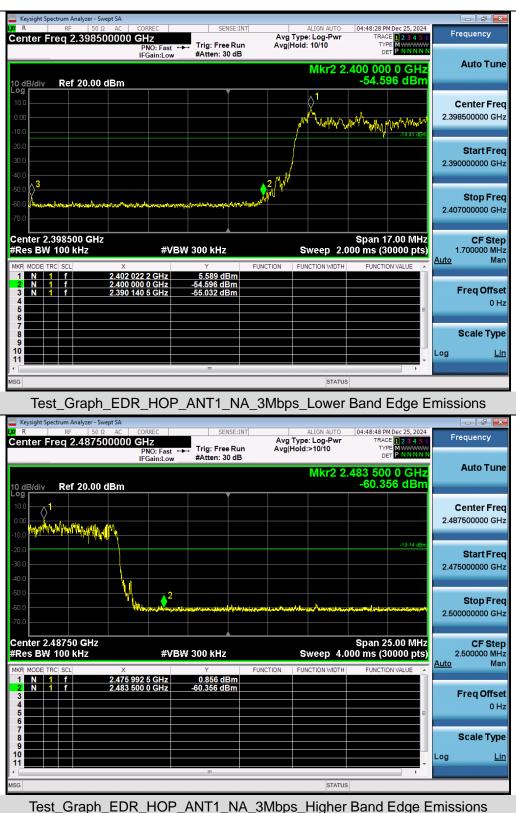
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9. Radiated Spurious Emission

9.1 Measurement Limit

15.209 Limit in the below table has to be followed

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|----------------------|--------------------------------------|----------------------------------|
| 0.009~0.490 | 2400/F(kHz) | 300 |
| 0.490~1.705 | 24000/F(kHz) | 30 |
| 1.705~30.0 | 30 | 30 |
| 30~88 | 100 | 3 |
| 88~216 | 150 | 3 |
| 216~960 | 200 | 3 |
| Above 960 | 500 | 3 |

Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.

9.2 Measurement Procedure

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.



- 8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

| Spectrum Parameter | Setting |
|-----------------------|---|
| Start ~Stop Frequency | 9KHz~150KHz/RB 200Hz for QP |
| Start ~Stop Frequency | 150KHz~30MHz/RB 9KHz for QP |
| Start ~Stop Frequency | 30MHz~1000MHz/RB 120KHz for QP |
| Start ~Stop Frequency | 1GHz~26.5GHz 1MHz/3MHz for Peak, 1MHz/3MHz for Average |

The following table is the setting of spectrum analyzer and receiver.

| Receiver Parameter | Setting |
|-----------------------|--------------------------------|
| Start ~Stop Frequency | 9KHz~150KHz/RB 200Hz for QP |
| Start ~Stop Frequency | 150KHz~30MHz/RB 9KHz for QP |
| Start ~Stop Frequency | 30MHz~1000MHz/RB 120KHz for QP |



Quasi-Peak Measurements below 1GHz

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. Span was set greater than 1MHz
- 3. RBW = as shown in the table above
- 4. Detector = CISPR quasi-peak
- 5. Sweep time = auto couple
- 6. Trace was allowed to stabilize

Peak Measurements above 1GHz

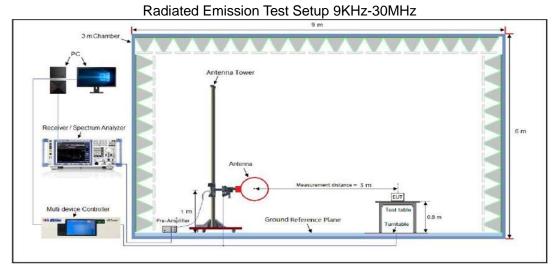
- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

• Average Measurements above 1GHz

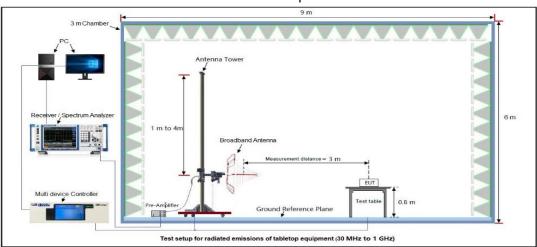
- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW \geq [3 × RBW]
- 4. Detector = Power averaging (rms)
- 5. Averaging type = power (i.e., rms)
- 6. Sweep time = auto
- 7. Perform a trace average of at least 100 traces.
- 8. The applicable correction factor is [10*log (1 / D)], where D is the duty cycle. The factor had been edited in the "Input Correction" of the Spectrum Analyzer.



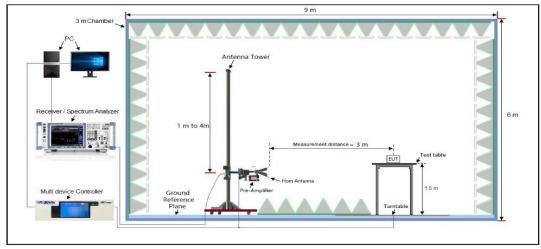
9.3 Measurement Setup (Block Diagram of Configuration)



Radiated Emission Test Setup 30MHz-1000MHz



Radiated Emission Test Setup Above 1000MHz





9.4 Measurement Result

Radiated Emission Below 30MHz

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

| | | | Ra | diate | esults at | ts at 30MHz-1GHz | | | | | | | | |
|---|--|-----------------------------|---|------------------------------|-------------------------------------|---|---|--|-------------------------------------|-----------------------------------|---------------------------------|------------------------|----------------------------|---------|
| EUT Name | PRO | PROFESSIONAL SCAN TOOL | | | | | | del Nam | e | | Ма | axiDi | iag N | MD909 F |
| Temperature | 22.4°C Relativ | | | | | | | ative Hu | umid | nidity 55.5% | | | | |
| Pressure | 960h | iPa | | | Tes | Test Voltage | | | DC | DC 3.8V | | | | |
| Test Mode | Mode 7 | | | | | | Ant | Antenna Polarity | | | Но | Horizontal | | |
| 72.0 d | BuV/m | | | | | | | | | | | | | |
| | | | | | | | | | | | Limit Margi | | _ |] |
| | | | | | | | | | | | maiy | ···. | - | |
| | | | | | | | | | | | | | Г | |
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| | | | | | | | | | | | | | -6 | |
| 32 | | | | | | | | | 4 | 5 | | M | MA. | |
| 32 | | | | | | ž | | | Ň | 5 Munit | when has | V | | |
| | | 1 VANNAMM | | | where the second | May making | 3 Martin Mallina Mal | 1. Martin Martin Marth | *** | | | | | |
| مىللەيىيىدە | Att Martin Strategy | 4 Min Marin | a ta sula di a | فلمر السور بالملك | | | | 1 | | | | | | |
| ALC: N. C. | NAME AND | · | | . Maria and | | - Marine Marine | | | | | | | | |
| (Contraction of the Contraction | | | | | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | | | | | | | | |
| NO. N. | | | | | | | | | | | | | | |
| -8 | | | | | | "Many Ar | | | | | | | | |
| | | 50 | | 70 80 | | (MHz) | | 300 4 | 400 | 500 € | 600 70 | DO | 1000. | 000 |
| -8 30.000 | 40 | 50 | 60 | 70 80 Rea | adinç | (MHz) Correct | Measur | 300 ¢ | 400 | | | DO | 1000. | 000 |
| -8 30.000 | | 50 Fr | 60 eq. | 70 80 Rea | evel | (MHz) Correct Factor | Measur ment | 300 (e- Lin | 400 nit | Ove | er | | | |
| -8 30.000 | 40 Mk. | 50 Fr | 60 Peq. | 70 80 Rea Le | evel BuV | (MHz) Correct Factor dB | Measur ment dBuV/m | 300 d e- dBu | 400 nit V/m | Ove dB | er 3 | Dete | ector | |
| -8 30.000 | 40 Mk. | 50 Fr | 60 req. | 70 80 Rea Le | evel | (MHz) Correct Factor | Measur ment | 300 (e- Lin | 400 nit V/m | Ove | er 3 | Dete | | |
| -8 30.000 | 40 Mk. | 50 Fr | 60 eq. Hz 402 | 70 80 Rea Le | evel BuV | (MHz) Correct Factor dB | Measur ment dBuV/m | 300 d e- dBu | +00 nit V/m DO | Ove dB | er 3 19 | Dete | ector | |
| -8 30.000 No. | 40 Mk. | 50 Fr Mi 46.34 | 60 eq. Hz 402 286 | 70 80 Res Le | evel BuV 6.35 | (MHz) Correct Factor dB 13.46 | Measur ment dBuV/m 19.81 | 300 / e- dBu 40.0 | 400 nit V/m 00 50 | Ove dB -20. | er 3 19 94 | Dete pe pe | ector eak | |
| -8 30.000 No. 1 2 | 40 Mk. 1 | 50 Fr 46.34 | 60 eq. Hz 402 286 550 | 70 80 Res Le | evel BuV 6.35 1.27 | (MHz) Correct Factor dB 13.46 16.29 | Measur ment dBuV/m 19.81 27.56 | 300 d e- dBu 40.0 43.5 43.5 | nit V/m 50 50 | Ove dB -20. -15. | er 3 19 94 20 | Dete pe pe | ector eak eak | |
| -8 30.000 No. 1 2 3 | 40 Mk. 1 2 4 | 50 Fr 46.34 109.02 | 60 eq. Hz 402 286 550 073 | 70 80 Res Le d (| evel BuV 5.35 1.27 7.82 | (МН2) Correct Factor dB 13.46 16.29 14.48 | Measur ment dBuV/m 19.81 27.56 22.30 | 300 d e- dBu 40.0 43.5 43.5 | 400 nit √/m 50 50 00 | Ove dB -20. -15. -21. | er 3 19 94 20 77 | Dete pe pe pe | ector eak eak eak | |



| | | | Ra | diate | ed Er | nissi | IOII Test r | Results | at 30 | MHz- | 1GH | z | | | | |
|------------------------------|-------------------|--|---|------------------|---|----------------------------------|---|---|---|-------------------------------------|--------------------------------------|--|--------------------------------------|-----------------|-----------------------------|-------|
| EUT Name | PROF | PROFESSIONAL SCAN TOOL | | | | | | | Mode | l Nam | e | | Ma | axiD | iag N | /D909 |
| Temperature | 22.4°C | 2 | | | | | | | Relati | ive Hu | umid | lity | 55 | 5% | | |
| Pressure | 960hPa Test Volta | | | | | | /oltag | ge D | | D | DC 3.8V | | | | | |
| Test Mode | 7 | | | | | | | Anter | nna Po | olari | ty | Ve | ertica | al | | |
| 72.0 | dBuV∕m | | | | | | | | | | | | | | | |
| 32 | | | | | | 2 | | 3 | | المرزير | | illion allow | | | <u>}</u> | |
| -8 | | -4,5-secondision | fe ^{the} enned | Mayna | juer | | hand all hand | www. | hap i dette en sinta | | | | | | | |
| -8 30.00 | 0 40 | - <u>1, Nuddy</u> 50 | 60 | 70 80 |) | | (MHz) | | | DO | 400 | 500 | 600 7 | 700 | 1000. | 000 |
| 30.00 | 0 40 | 50 | | 70 80 Re | | ng | | Mea | asure- ent | 00 | | 500 | | /00 | 1000. | 000 |
| 30.00 | | 50 Fr | 60 | 70 80 R€ | eadii | ng | (MHz) Correct | Mea | asure- | oo - Lir | 400 | 500 | 600 7 | | 1000. | _ |
| 30.00 | . Mk. | 50 Fr | 60 req. | 70 80 Re L | eadii | ng I | (MHz) Correct Factor | Mea m dBu | asure- ent | oo - Lir | 400 nit ıV/m | 500 O\ d | 600 7 Ver | Det | | _ |
| 30.000 No. | . Mk. | 50 Fr M | 60 eq. Hz 160 | 70 80 Re L | eadir evel dBuV | ng I / | (MHz) Correct Factor dB | Mea m dBu 28 | asure- ent iV/m | oo - Lir dBu | 400 nit 1∨/m 00 | 500 Ov d -11 | 600 7 Ver | Det | ector | _ |
| 30.000 No. | . Mk. | 50 Fr Mi 38.67 | 60 eq. Hz 160 | 70 80 Re L | eadir evel dBuV | ng I 7 4 | (MHz) Correct Factor dB 16.44 | Mea m dBu 28 30 | asure- ent iV/m .48 | oo Lir dBu 40. | 400 mit 1V/m 00 50 | 500 Ov d -11 -13 | 600 7 Ver IB | Det pe | tector eak | _ |
| 30.000 No. 1 | . Mk. | 50 Fr Mi 38.6 ⁷ 07.5 ⁷ | 60 eq. Hz 160 101 | 70 80 Re 1 | eadin evel dBuV 12.04 | ng I 7 4 5 9 | (MHz) Correct Factor dB 16.44 15.51 | Mea m dBu 28 30 27 | asure- ent IV/m .48 .36 | 00 - Lir dBu 40. 43. | 400 nit iV/m 00 50 50 | 500 Ov d -11 -13 -16 | 600 7 Ver IB I.52 3.14 | Det pe pe | ector eak eak | _ |
| 30.000 No. 1 2 3 | . Mk. | 50 Fr M 38.6 07.5 02.8 | 60 eq. Hz 160 101 103 100 | 70 80 Re L | eadin evel dBuV 12.04 14.85 9.39 | ng I 7 4 5 9 9 | (мнг) Correct Factor dB 16.44 15.51 17.69 | Mea m dBu 28 30 27 32 | asure- ent V/m .48 .36 .08 | 00 Lir dBu 40. 43. | 400 mit iV/m 50 50 00 | 500 Ov d -11 -13 -16 -13 | 600 7 Ver 1.52 3.14 5.42 | Det pe pe | tector eak eak eak | _ |

RESULT: Pass

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. All test modes had been pre-tested. The mode 7 is the worst case and recorded in the report.



| EUT Name | PROFESSIO | PROFESSIONAL SCAN TOOL | | | | | MaxiDiag MD909 Pro | | |
|--|--|--|---|--|---|------|---|--|--|
| Temperature | 22.4 °C | | | Relat | ive Humidity | | 55.5% | | |
| Pressure | 960hPa | 960hPa | | | | | DC 3.8V | | |
| Test Mode | Mode 7 | Mode 7 | | | | | Horizontal | | |
| | · | | | | | | | | |
| Frequency | Meter Reading | Factor | Emission | Level Limits | | Ν | <i>l</i> largin | Value Type | |
| (MHz) | (dBµV) | (dB) | (dBµV | //m) | (dBµV/m) | | (dB) | value Type | |
| 4804.000 | 47.52 | 0.08 | 47.6 | 6 | 74 | | -26.4 | peak | |
| 4804.000 | 38.18 | 0.08 | 38.2 | 6 | 54 | - | 15.74 | AVG | |
| 7206.000 | 42.19 | 2.21 | 44.4 | 4 | 74 | | -29.6 | peak | |
| 7206.000 | 31.35 | 2.21 | 33.5 | 6 | 54 | - | 20.44 | AVG | |
| | | | | | | | | | |
| | | | | | | | | | |
| Remark: | | | | | | | | | |
| | | | | | | | | | |
| Factor = Ante | nna Factor + Cable | e Loss – Pre- | amplifier. | | | | | | |
| Factor = Ante | nna Factor + Cable PROFESSIC | | | Mode | el Name | | MaxiDia | ag MD909 Pro | |
| | | | | | el Name ive Humidity | | MaxiDia 55.5% | ag MD909 Pro | |
| EUT Name | PROFESSIO | | | Relat | | | | | |
| EUT Name Temperature | PROFESSIO | | | Relat Test | ive Humidity | | 55.5% | V | |
| EUT Name Temperature Pressure Test Mode | PROFESSIO 22.4°C 960hPa Mode 7 | DNAL SCAN | TOOL | Relat Test | ive Humidity Voltage nna Polarity | | 55.5% DC 3.8 ^v Vertical | V | |
| EUT Name Temperature Pressure Test Mode | PROFESSIC 22.4°C 960hPa Mode 7 Meter Reading | DNAL SCAN | TOOL | Relat | ive Humidity Voltage nna Polarity Limits | N | 55.5% DC 3.8 [\] Vertical | V | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) | PROFESSIC 22.4°C 960hPa Mode 7 Meter Reading (dBµV) | DNAL SCAN Factor (dB) | TOOL Emission (dBµV | Relat Test | tive Humidity Voltage nna Polarity Limits (dBµV/m) | N | 55.5% DC 3.8 ¹ Vertical /argin (dB) | V Value Type | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4804.000 | PROFESSIC 22.4℃ 960hPa Mode 7 Meter Reading (dBµV) 47.53 | Factor (dB) 0.08 | TOOL Emission (dBµV 47.6 | Relat Test Anter Level //m) | tive Humidity Voltage nna Polarity Limits (dBµV/m) 74 | N | 55.5% DC 3.8 ¹ Vertical /argin (dB) 26.39 | V Value Type peak | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4804.000 4804.000 | PROFESSIC 22.4 °C 960hPa Mode 7 Meter Reading (dBµV) 47.53 38.51 | Factor (dB) 0.08 0.08 | Emission (dBµV 47.6 38.5 | Relat Test Anter Level //m) 11 99 | Limits (dBµV/m) 74 54 | | 55.5% DC 3.8 ¹ Vertical /argin (dB) 26.39 15.41 | V Value Type peak AVG | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4804.000 4804.000 7206.000 | PROFESSIC 22.4°C 960hPa Mode 7 Meter Reading (dBµV) 47.53 38.51 42.61 | Factor (dB) 0.08 0.08 2.21 | ТООL Emission (dBµV 47.6 38.5 44.8 | Relat Test M Anter M Level (/m) 11 99 12 | ive Humidity Voltage nna Polarity Limits (dBµV/m) 74 54 74 | | 55.5% DC 3.8 ¹ Vertical /argin (dB) 26.39 15.41 29.18 | V Value Type peak AVG peak | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4804.000 4804.000 | PROFESSIC 22.4 °C 960hPa Mode 7 Meter Reading (dBµV) 47.53 38.51 | Factor (dB) 0.08 0.08 | Emission (dBµV 47.6 38.5 | Relat Test M Anter M Level (/m) 11 99 12 | Limits (dBµV/m) 74 54 | | 55.5% DC 3.8 ¹ Vertical /argin (dB) 26.39 15.41 | V Value Type peak AVG | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4804.000 4804.000 7206.000 | PROFESSIC 22.4°C 960hPa Mode 7 Meter Reading (dBµV) 47.53 38.51 42.61 | Factor (dB) 0.08 0.08 2.21 | ТООL Emission (dBµV 47.6 38.5 44.8 | Relat Test M Anter M Level (/m) 11 99 12 | ive Humidity Voltage nna Polarity Limits (dBµV/m) 74 54 74 | | 55.5% DC 3.8 ¹ Vertical /argin (dB) 26.39 15.41 29.18 | V Value Type peak AVG peak | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4804.000 4804.000 7206.000 7206.000 | PROFESSIC 22.4°C 960hPa Mode 7 Meter Reading (dBµV) 47.53 38.51 42.61 | Factor (dB) 0.08 2.21 2.21 | TOOL Emission (dBµV 47.6 38.5 44.8 33.5 | Relat Test M Anter M Level (/m) 11 99 12 | ive Humidity Voltage nna Polarity Limits (dBµV/m) 74 54 74 | | 55.5% DC 3.8 ¹ Vertical /argin (dB) 26.39 15.41 29.18 | V Value Type peak AVG peak | |

RESULT: Pass



Radiated Emissions Test Results for Above 1GHz

| EUT Name | PROFESSIC | NAL SCAN | TOOL Mo | del Name | MaxiD | MaxiDiag MD909 Pro | | |
|--|---|---|--|--|--|--|--|--|
| Temperature | 22.4 °C | | Rel | ative Humidity | 55.5% | | | |
| Pressure | 960hPa | | Tes | t Voltage | DC 3.8 | DC 3.8V | | |
| Test Mode | Mode 8 | | Ant | enna Polarity | Horizo | ntal | | |
| | | | | | | | | |
| Frequency | Meter Reading | Factor | Emission Leve | I Limits | Margin | Value Type | | |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | value Type | | |
| 4882.000 | 47.61 | 0.14 | 47.75 | 74 | -26.25 | peak | | |
| 4882.000 | 37.94 | 0.14 | 38.08 | 54 | -15.92 | AVG | | |
| 7323.000 | 42.16 | 2.36 | 44.52 | 74 | -29.48 | peak | | |
| 7323.000 | 31.58 | 2.36 | 33.94 | 54 | -20.06 | AVG | | |
| | | | | | | | | |
| Remark: | 1 1 | | | 1 | | · | | |
| | | | | | | | | |
| Factor = Ante | nna Factor + Cable | e Loss – Pre- | amplifier. | | | | | |
| | nna Factor + Cable PROFESSIC | | | del Name | MaxiD | ag MD909 Pro | | |
| EUT Name | | | TOOL Mo | del Name ative Humidity | MaxiD 55.5% | ag MD909 Pro | | |
| EUT Name | PROFESSIC | | TOOL Mo Rel | | | | | |
| EUT Name Temperature Pressure | PROFESSIC 22.4°C | | TOOL Mo Rel Tes | ative Humidity | 55.5% | 3V | | |
| EUT Name Temperature Pressure Test Mode | PROFESSIC 22.4°C 960hPa Mode 8 | DNAL SCAN | TOOL Mo Rel Tes Ant | ative Humidity It Voltage Ienna Polarity | 55.5% DC 3.8 Vertica | 3V | | |
| EUT Name Temperature Pressure Test Mode | PROFESSIC 22.4°C 960hPa Mode 8 Meter Reading | DNAL SCAN | TOOL Mo Rel Tes Ant Emission Leve | ative Humidity It Voltage Itenna Polarity | 55.5% DC 3.8 Vertica Margin | 3V | | |
| EUT Name Temperature Pressure Test Mode | PROFESSIC 22.4°C 960hPa Mode 8 Meter Reading (dBµV) | DNAL SCAN Factor (dB) | TOOL Mo Rel Tes Emission Leve (dBµV/m) | ative Humidity at Voltage eenna Polarity | 55.5% DC 3.8 Vertica Margin (dB) | 3V II Value Type | | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4882.000 | PROFESSIC 22.4 °C 960hPa Mode 8 Meter Reading (dBµV) 47.54 | PNAL SCAN Factor (dB) 0.14 | TOOL Mo Rel Tes Ant Emission Leve (dBµV/m) 47.68 | ative Humidity at Voltage eenna Polarity | 55.5% DC 3.8 Vertica Margin (dB) -26.32 | 3V II Value Type peak | | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4882.000 4882.000 | PROFESSIC 22.4°C 960hPa Mode 8 Meter Reading (dBμV) 47.54 38.52 | Factor (dB) 0.14 0.14 | TOOL Mo Rel Tes Ant Emission Leve (dBµV/m) 47.68 38.66 | ative Humidity It Voltage I Limits (dBµV/m) 74 54 | 55.5% DC 3.8 Vertica Margin (dB) -26.32 -15.34 | V I Value Type peak AVG | | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4882.000 4882.000 7323.000 | PROFESSIC 22.4°C 960hPa Mode 8 Meter Reading (dBμV) 47.54 38.52 42.97 | Factor (dB) 0.14 0.14 2.36 | TOOL Mo Rel Tes Emission Leve (dBµV/m) 47.68 38.66 45.33 | ative Humidity t Voltage enna Polarity I Limits (dBµV/m) 74 54 74 | 55.5% DC 3.8 Vertica Margin (dB) -26.32 -15.34 -28.67 | 3V I Value Type peak AVG peak | | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4882.000 4882.000 | PROFESSIC 22.4°C 960hPa Mode 8 Meter Reading (dBμV) 47.54 38.52 | Factor (dB) 0.14 0.14 | TOOL Mo Rel Tes Ant Emission Leve (dBµV/m) 47.68 38.66 | ative Humidity It Voltage I Limits (dBµV/m) 74 54 | 55.5% DC 3.8 Vertica Margin (dB) -26.32 -15.34 | V I Value Type peak AVG | | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4882.000 4882.000 7323.000 7323.000 | PROFESSIC 22.4°C 960hPa Mode 8 Meter Reading (dBμV) 47.54 38.52 42.97 | Factor (dB) 0.14 0.14 2.36 | TOOL Mo Rel Tes Emission Leve (dBµV/m) 47.68 38.66 45.33 | ative Humidity t Voltage enna Polarity I Limits (dBµV/m) 74 54 74 | 55.5% DC 3.8 Vertica Margin (dB) -26.32 -15.34 -28.67 | 3V I Value Type peak AVG peak | | |
| EUT Name Temperature Pressure Test Mode Frequency (MHz) 4882.000 4882.000 7323.000 7323.000 | PROFESSIC 22.4°C 960hPa Mode 8 Meter Reading (dBμV) 47.54 38.52 42.97 | Factor (dB) 0.14 0.14 2.36 2.36 | TOOL Mo Rel Tes Ant Emission Leve (dBµV/m) 47.68 38.66 45.33 33.9 | ative Humidity t Voltage enna Polarity I Limits (dBµV/m) 74 54 74 | 55.5% DC 3.8 Vertica Margin (dB) -26.32 -15.34 -28.67 | 3V I Value Type peak AVG peak | | |

RESULT: Pass



Radiated Emissions Test Results for Above 1GHz

| EUT Name | PROFESSIO | NAL SCAN | TOOL Mode | I Name | MaxiDiag MD909 Pro | | |
|--|--|--|---|--|---|-------------------------------------|--|
| Temperature | 22.4 ℃ | | Relat | ive Humidity | 55.5% | | |
| Pressure | 960hPa | | Test | Voltage | DC 3.8V | | |
| Test Mode | Mode 9 | | Ante | nna Polarity | Horizontal | | |
| | | | | | | | |
| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Value Type | |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | value Type | |
| 4960.000 | 47.54 | 0.22 | 47.76 | 74 | -26.24 | peak | |
| 4960.000 | 38.62 | 0.22 | 38.84 | 54 | -15.16 | AVG | |
| 7440.000 | 42.16 | 2.64 | 44.8 | 74 | -29.2 | peak | |
| 7440.000 | 31.28 | 2.64 | 33.92 | 54 | -20.08 | AVG | |
| | | | | | | | |
| Remark: Factor = Anter | na Factor + Cable | e Loss – Pre- | amplifier | | | | |
| | nna Factor + Cable PROFESSIO | | | I Name | MaxiDia | g MD909 Pro | |
| Factor = Anter | | | TOOL Mode | I Name | MaxiDia 55.5% | g MD909 Pro | |
| Factor = Anter | PROFESSIO | | TOOL Mode Relat | | | | |
| Factor = Anter EUT Name Temperature Pressure | PROFESSIO | | TOOL Mode Relat Test | ive Humidity | 55.5% | | |
| Factor = Anter EUT Name Temperature Pressure | PROFESSIO 22.4℃ 960hPa | | TOOL Mode Relat Test | ive Humidity Voltage | 55.5% DC 3.8V | · · | |
| Factor = Anter EUT Name Temperature Pressure Test Mode | PROFESSIO 22.4℃ 960hPa Mode 9 | NAL SCAN | TOOL Mode Relat Test | ive Humidity Voltage nna Polarity | 55.5% DC 3.8V Vertical | | |
| Factor = Anter | PROFESSIO 22.4°C 960hPa Mode 9 Meter Reading | PNAL SCAN | TOOL Mode Relat Test Anter Emission Level | ive Humidity Voltage nna Polarity Limits | 55.5% DC 3.8V Vertical Margin | · · | |
| Factor = Anter EUT Name Temperature Pressure Test Mode Frequency (MHz) | PROFESSIO 22.4℃ 960hPa Mode 9 Meter Reading (dBµV) | PNAL SCAN ⁻ Factor (dB) | TOOL Mode Relat Test Anter Emission Level (dBµV/m) | ive Humidity Voltage nna Polarity Limits (dBµV/m) | 55.5% DC 3.8V Vertical Margin (dB) | - Value Type | |
| Factor = Anter EUT Name Temperature Pressure Test Mode Frequency (MHz) 4960.000 | PROFESSIO 22.4 ℃ 960hPa Mode 9 Meter Reading (dBµV) 47.52 | PNAL SCAN | TOOL Mode Relat Test Anter Emission Level (dBµV/m) 47.74 | ive Humidity Voltage nna Polarity Limits (dBµV/m) 74 | 55.5% DC 3.8V Vertical Margin (dB) -26.26 | - Value Type peak | |
| Factor = Anter EUT Name Temperature Pressure Test Mode Frequency (MHz) 4960.000 4960.000 | PROFESSIO 22.4 °C 960hPa Mode 9 Meter Reading (dBμV) 47.52 38.62 | Factor (dB) 0.22 0.22 | TOOL Mode Relat Test Anter Emission Level (dBµV/m) 47.74 38.84 | ive Humidity Voltage Inna Polarity Limits (dBµV/m) 74 54 | 55.5% DC 3.8V Vertical Margin (dB) -26.26 -15.16 | - Value Type peak AVG | |
| Factor = Anter EUT Name Temperature Pressure Test Mode Frequency (MHz) 4960.000 7440.000 | PROFESSIO 22.4°C 960hPa Mode 9 Meter Reading (dBµV) 47.52 38.62 42.16 | PNAL SCAN ⁻ Factor (dB) 0.22 0.22 2.64 | TOOL Mode Relat Test Anter Emission Level (dBµV/m) 47.74 38.84 44.8 | ive Humidity Voltage na Polarity Limits (dBµV/m) 74 54 74 | 55.5% DC 3.8V Vertical Margin (dB) -26.26 -15.16 -29.2 | - Value Type peak AVG peak | |
| Factor = Anter EUT Name Temperature Pressure Test Mode Frequency (MHz) 4960.000 7440.000 | PROFESSIO 22.4°C 960hPa Mode 9 Meter Reading (dBµV) 47.52 38.62 42.16 | PNAL SCAN ⁻ Factor (dB) 0.22 0.22 2.64 | TOOL Mode Relat Test Anter Emission Level (dBµV/m) 47.74 38.84 44.8 | ive Humidity Voltage na Polarity Limits (dBµV/m) 74 54 74 | 55.5% DC 3.8V Vertical Margin (dB) -26.26 -15.16 -29.2 | - Value Type peak AVG peak | |

RESULT: Pass

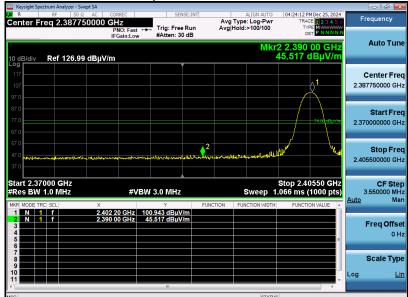
Note:

- 1. The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.
- 2. Factor = Antenna Factor + Cable loss Pre-amplifier gain, Margin = Emission Level-Limit.
- 3. The "Factor" value can be calculated automatically by software of measurement system.
- 4. All test modes had been pre-tested. The mode 8DPSK is the worst case and recorded in the report.

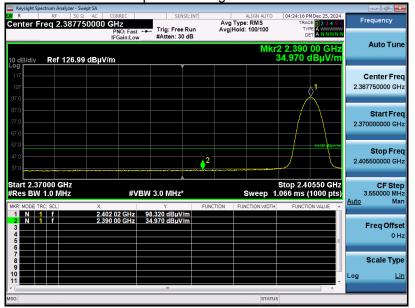


| EUT Name | PROFESSIONAL SCAN TOOL | Model Name | MaxiDiag MD909 Pro |
|-------------|------------------------|-------------------|--------------------|
| Temperature | 20.9 ℃ | Relative Humidity | 50% |
| Pressure | 960hPa | Test Voltage | DC 3.8V |
| Test Mode | Mode 1 | Antenna Polarity | Horizontal |

Test Graph for Peak Measurement



Test Graph for Average Measurement

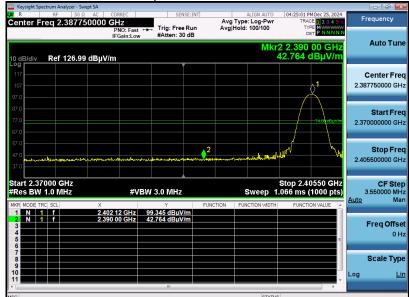


RESULT: Pass

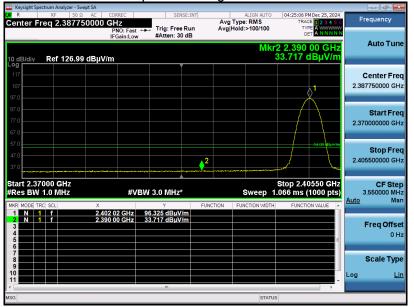


| EUT Name | PROFESSIONAL SCAN TOOL | Model Name | MaxiDiag MD909 Pro |
|-------------|------------------------|-------------------|--------------------|
| Temperature | 20.9 ℃ | Relative Humidity | 50% |
| Pressure | 960hPa | Test Voltage | DC 3.8V |
| Test Mode | Mode 1 | Antenna Polarity | Vertical |

Test Graph for Peak Measurement



Test Graph for Average Measurement

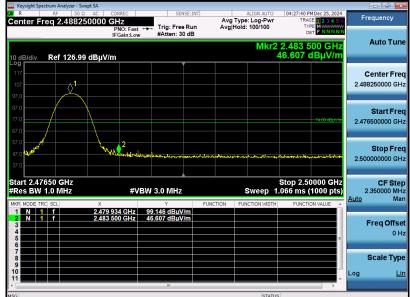


RESULT: Pass

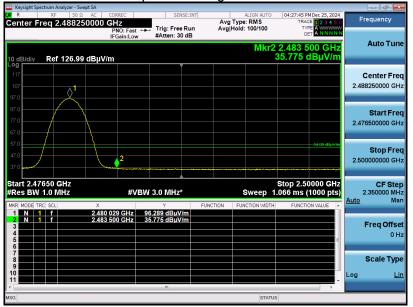


| EUT Name | PROFESSIONAL SCAN TOOL | Model Name | MaxiDiag MD909 Pro |
|-------------|------------------------|-------------------|--------------------|
| Temperature | 20.9 ℃ | Relative Humidity | 50% |
| Pressure | 960hPa | Test Voltage | DC 3.8V |
| Test Mode | Mode 3 | Antenna Polarity | Horizontal |

Test Graph for Peak Measurement



Test Graph for Average Measurement

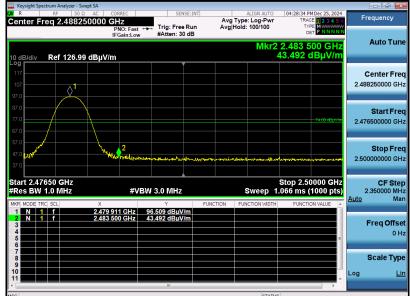


RESULT: Pass

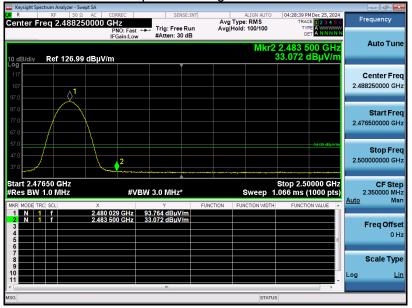


| EUT Name | PROFESSIONAL SCAN TOOL | Model Name | MaxiDiag MD909 Pro |
|-------------|------------------------|-------------------|--------------------|
| Temperature | 20.9 ℃ | Relative Humidity | 50% |
| Pressure | 960hPa | Test Voltage | DC 3.8V |
| Test Mode | Mode 3 | Antenna Polarity | Vertical |

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: Pass

Note: The factor had been edited in the "Input Correction" of the Spectrum Analyzer.



10. Number of Hopping Frequency Measurement

10.1 Provisions Applicable

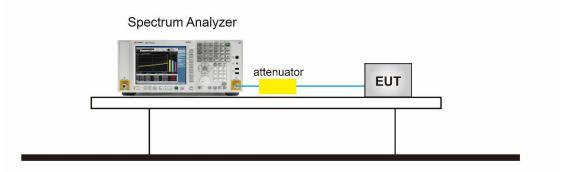
This frequency hopping system must employ a minimum of 15 hopping channels.

10.2 Measurement Procedure

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- 1. Span = The frequency band of operation. Depending on the number of channels the device
- 2. supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
- 3. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- 4. VBW \geq RBW
- 5. Sweep time = Auto couple
- 6. Detector = Peak
- 7. Trace mode = Max hold
- 8. Allow the trace to stabilize

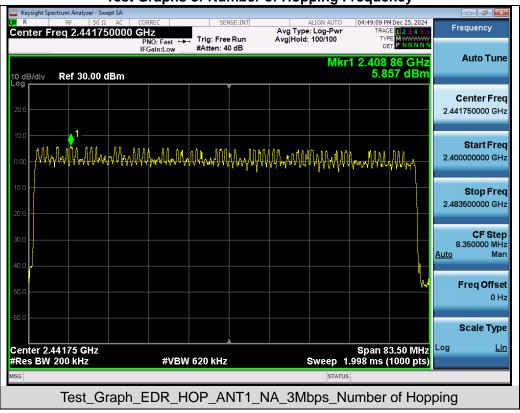
10.3 Measurement Setup (Block Diagram of Configuration)



10.4 Measurement Result

| Test Data of Number of Hopping Frequency | | | | |
|--|-----------------------------|--------|--------------|--|
| Test Mode | Number of Hopping Frequency | Limits | Pass or Fail | |
| 8DPSK Hopping | 79 | >=15 | Pass | |





Test Graphs of Number of Hopping Frequency

Note: All mode rates are tested and evaluated, 8DPSK modulated 3DH5 mode is the worst case and documented in the report.



11. Time of Occupancy (Dwell Time) Measurement

11.1 Provisions Applicable

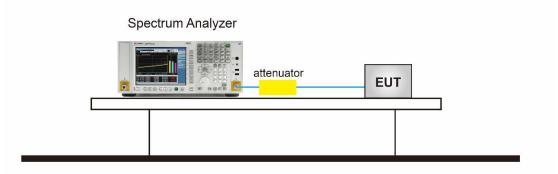
The maximum permissible time of occupancy is 400ms within a period of 400ms multiplied by the number of hopping channels employed.

11.2 Measurement Procedure

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- 1. Span = Zero span, centered on a hopping channel.
- 2. RBW shall be \leq channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
- 3. VBW \geq RBW
- 4. Sweep time = As necessary to capture the entire dwell time per hopping channel
- 5. Detector = Peak
- 6. Trace mode = Free Run
- 7. Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time. An oscilloscope may be used instead of a spectrum analyzer. The EUT shall show compliance with the appropriate regulatory limit for the number of hopping channels. A plot of the data shall be included in the test report.

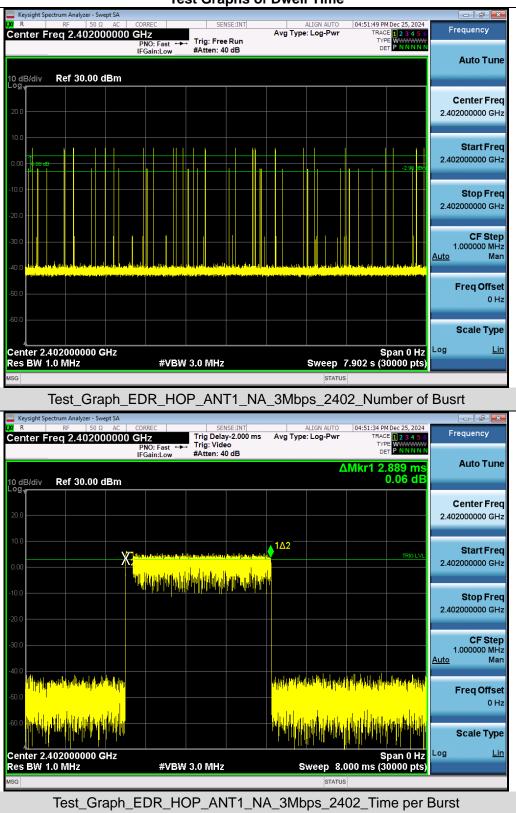
11.3 Measurement Setup (Block Diagram of Configuration)



11.4 Measurement Result

| Test Data of Dwell Time | | | | | | |
|-------------------------|--------------------------------|--|--------------------|---------------|--------------|--|
| Channel | Time of Pulse for 3DH5 (ms) | Number of hops in the period specified in the requirements | Dwell Time (ms) | Limit (ms) | Pass or Fail | |
| 2402 | 2.889 | 24.0*4 | 277.344 | 400 | Pass | |
| 2441 | 2.889 | 21.0*4 | 242.676 | 400 | Pass | |
| 2480 | 2.889 | 24.0*4 | 277.344 | 400 | Pass | |

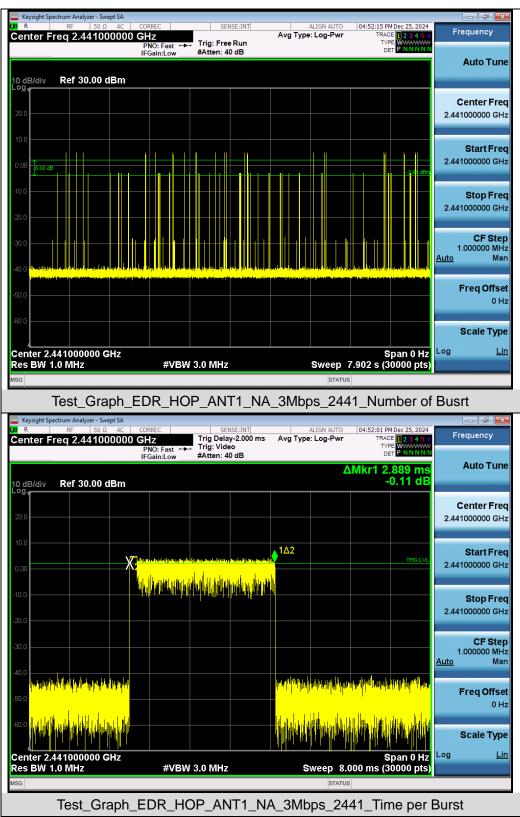




Test Graphs of Dwell Time

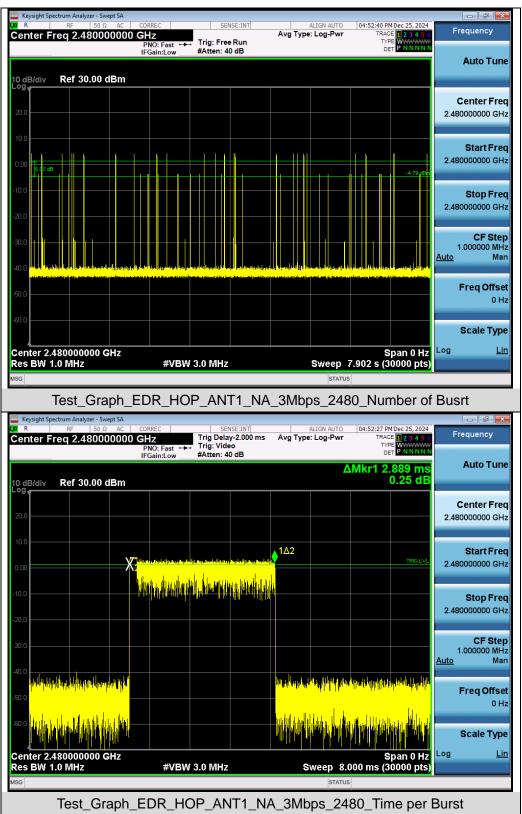
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Note: All mode rates are tested and evaluated, 8DPSK modulated 3DH5 mode is the worst case and documented in the report.