



SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.

Report No.: SUCR250500042203

Rev.: 01

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TEST REPORT

Application No.: SUCR2505000422AT
Applicant: Shanghai Sunmi Technology Co.,Ltd.
Address of Applicant: Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Manufacturer: Shanghai Sunmi Technology Co.,Ltd.
Address of Manufacturer: Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
EUT Description: Wireless Data Terminal
Model No.: TFB1A
Trade Mark: SUNMI
FCC ID: 2AH25M3WH
Standards: FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart C
Date of Receipt: May 13, 2025
Date of Test: May 10, 2025 to May 29, 2025
Date of Issue: June 11, 2025

| | |
|----------------------|---------------|
| Test Result : | PASS * |
|----------------------|---------------|

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone:(86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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Version

| Revision Record | | | |
|-----------------|-------------|---------------|--------|
| Version | Description | Date | Remark |
| 01 | Original | June 11, 2025 | / |
| | | | |
| | | | |

| | | | | |
|--------------------------|--|---|--|--|
| Authorized for issue by: | | | | |
| Tested By | |  | | |
| | | Hayley Zhang / Project Manager | | |
| Approved By | |  | | |
| | | Cloud Peng/Technical Manager | | |



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1 Test Summary

| Test Item | FCC Rule No. | Test Method | Test Result | Result |
|---|-------------------------|---|-------------|--------------------------------------|
| Antenna Requirement | 15.203/15.247(b) | -- | Clause 3.1 | PASS |
| AC Power Line Conducted Emission | 15.207 | ANSI C63.10 2013 Section 6.2 | Clause 3.2 | PASS |
| Duty Cycle | -- | ANSI C63.10 2013 Section 11.6 | Clause 3.3 | Reference report SUCR250200007203 |
| Conducted Output Power | 15.247 (b)(3) | ANSI C63.10 2013 Section 11.9.1.3 | Clause 3.4 | |
| DTS (6 dB) Bandwidth & 99% Occupied Bandwidth | 15.247 (a)(2) | ANSI C63.10 2013 Section 11.8 Option 2 / 6.9.3 | Clause 3.5 | |
| Power Spectral Density | 15.247 (e) | ANSI C63.10 2013 Section 11.10.2 | Clause 3.6 | |
| Band-edge for RF Conducted Emissions | 15.247(d) | ANSI C63.10 2013 Section 11.11 | Clause 3.7 | |
| RF Conducted Spurious Emissions | 15.247(d) | ANSI C63.10 2013 Section 11.11 | Clause 3.8 | |
| Radiated Spurious Emissions | 15.247(d);15.205/15.209 | ANSI C63.10 2013 Section 11.12 | Clause 3.9 | PASS |
| Restricted bands around fundamental frequency (Radiated Emission) | 15.247(d);15.205/15.209 | ANSI C63.10 2013 Section 11.12 | Clause 3.10 | PASS |

Remark:

This test report (Report No.: SUCR250500042203) is based on the original test report (Report No.: SUCR250200007203).

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report only the ac power line conducted emission and radiated spurious emissions based on the worst case of the original report with report number SUCR250200007203 and other test data in this report are based on the previous report with report number SUCR250200007203.



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2 General Information

2.1 Details of Client

| | |
|--------------------------|--|
| Applicant: | Shanghai Sunmi Technology Co.,Ltd. |
| Address of Applicant: | Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China |
| Manufacturer: | Shanghai Sunmi Technology Co.,Ltd. |
| Address of Manufacturer: | Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China |

2.2 Test Location

| | |
|----------------|--|
| Company: | SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. |
| Address: | South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone |
| Post code: | 215000 |
| Test engineer: | Ives Cheng, King-p Li |

2.3 Test Facility

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

- **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

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

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

- **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327



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2.4 General Description of EUT

| | | |
|--|--|--|
| Hardware Version: | V1.3 | |
| Software Version: | T602AA_EVT_14.0_SUNMI_202503131820.00-00 | |
| Power Supply: | 3.87V from battery | |
| Operation Frequency: | 802.11b/g/n(HT20)/ax(HE20): | 2412MHz to 2462MHz |
| Modulation Type: | 802.11b: | DSSS (DBPSK, DQPSK, CCK) |
| | 802.11g/n: | OFDM (BPSK, QPSK, 16QAM, 64QAM) |
| | 802.11ax: | OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |
| Number of Channels: | 802.11b/g/n(HT20)/ax(HE20): 11 | |
| Channel Spacing: | 5MHz | |
| Smart System: | <input checked="" type="checkbox"/> SISO | 802.11b/g |
| | <input checked="" type="checkbox"/> MIMO | 802.11n/ax: 2Tx & 2Rx |
| Antenna Type: | FPC Antenna | |
| Antenna Gain: | -1.19dBi(Ant3); 2.01dBi(Ant2) | |
| | Note: The antenna gain are derived from the gain information report provided by the manufacturer. | |
| RF Cable: | 1dB | |
| Remark: As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information. | | |



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| Operation Frequency of each channel (802.11b/g/n HT20 /ax HE20) | | | | | | | |
|---|-----------|--|-----------|---------|-----------|---------|-----------|
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 1 | 2412MHz | 4 | 2427MHz | 7 | 2442MHz | 10 | 2457MHz |
| 2 | 2417MHz | 5 | 2432MHz | 8 | 2447MHz | 11 | 2462MHz |
| 3 | 2422MHz | 6 | 2437MHz | 9 | 2452MHz | | |
| Remark: In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below: | | | | | | | |
| Channel | | Frequency for 802.11 b/g/n (HT20) /ax (HE20) | | | | | |
| The Lowest channel | | 2412MHz | | | | | |
| The Middle channel | | 2437MHz | | | | | |
| The Highest channel | | 2462MHz | | | | | |



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2.5 Test Environment and Mode

| Environment Parameter | 101 kPa Selected Values During Tests | |
|---|--------------------------------------|------------|
| Relative Humidity | 44-46 % RH Ambient | |
| Value | Temperature(°C) | Voltage(V) |
| NTNV | 22~23 | 3.87 |
| Remark: NV: Normal Voltage NT: Normal Temperature | | |

2.6 Description of Support Units

The EUT has been tested as an independent unit.

2.7 Worst-case configuration and mode

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. Following are the worst-case data rates set for test:

| Modulation Type | SISO - Data Rate | CDD/MIMO - Data Rate |
|------------------|------------------|----------------------|
| 802.11b | 1 Mbps | / |
| 802.11g | 6 Mbps | / |
| 802.11n (HT 20) | / | MCS0 (13 Mbps) |
| 802.11ax (HE 20) | / | MCS0 (16 Mbps) |



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3 Equipment List

| Conduction Test Equipment | | | | | |
|--------------------------------|---------------|-----------|---------------|-----------|--------------|
| Equipment | Manufacturer | Model No. | Inventory No. | Cal Date | Cal Due Date |
| Test receiver | ROHDE&SCHWARZ | ESR7 | SUWI-01-10-01 | 1/15/2025 | 1/14/2026 |
| Temperature and humidity meter | MingGao | TH101B | SUWI-01-01-06 | 2/13/2025 | 2/12/2026 |
| Artificial network | ROHDE&SCHWARZ | ENV216 | SUWI-01-19-03 | 5/8/2025 | 5/7/2026 |
| Artificial network | ROHDE&SCHWARZ | ENV216 | SUWI-01-19-04 | 5/8/2025 | 5/7/2026 |
| Measurement Software | Tonscend | JS32-CE | SUWI-02-09-05 | NCR | NCR |
| | | 4.0.0.2 | | | |



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| 9*6*6 Test Equipment | | | | | |
|--------------------------------|-----------------------------------|-------------|---------------|------------|--------------|
| Equipment | Manufacturer | Model No. | Inventory No. | Cal Date | Cal Due Date |
| Semi-Anechoic Chamber | Brilliant-emc | N/A | SUWI-04-02-01 | 6/3/2023 | 6/2/2026 |
| Temperature and humidity meter | MingGao | TH101B | SUWI-01-01-05 | 2/13/2025 | 2/12/2026 |
| Signal Analyzer | ROHDE&SCHWARZ | FSW43 | SUWI-01-02-04 | 1/20/2025 | 1/19/2026 |
| Signal Analyzer | KEYSIGHT | N9020A | SUWI-01-02-07 | 11/21/2024 | 11/20/2025 |
| Test receiver | ROHDE&SCHWARZ | ESR7 | SUWI-01-10-01 | 1/15/2025 | 1/14/2026 |
| Receiving antenna | SCHWRZBECK MESS- ELEKTRONIK | VULB 9168 | SUWI-01-11-04 | 8/22/2024 | 8/21/2026 |
| Receiving antenna | SCHWRZBECK MESS- ELEKTRONIK | BBHA 9120D | SUWI-01-11-02 | 5/7/2025 | 5/6/2027 |
| Receiving antenna | SCHWRZBECK MESS- ELEKTRONIK | BBHA 9170 | SUWI-01-11-03 | 5/7/2025 | 5/6/2027 |
| Active Loop Antenna | SCHWRZBECK MESS- ELEKTRONIK | FMZB 1519B | SUWI-01-21-01 | 5/7/2025 | 5/6/2027 |
| Amplifier | Tonscend | TAP9K3G40 | SUWI-01-14-01 | 1/16/2025 | 1/15/2026 |
| Amplifier | Tonscend | TAP01018050 | SUWI-01-14-02 | 1/16/2025 | 1/15/2026 |
| Amplifier | Tonscend | TAP18040048 | SUWI-01-14-03 | 1/20/2025 | 1/19/2026 |
| Measurement Software | Tonscend | JS32-RE | SUWI-02-09-04 | NCR | NCR |
| | | V4.0.0.0 | | | |

Remark: NCR=No Calibration Requirement.



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4 Measurement Uncertainty (95% confidence levels, k=2)

| No. | Item | Measurement Uncertainty |
|-----|-------------------------------|---------------------------------------|
| 1 | Total RF power, conducted | $\pm 0.54\text{dB}$ |
| 2 | RF power density, conducted | $\pm 1.03\text{dB}$ |
| 3 | Spurious emissions, conducted | $\pm 0.54\text{dB}$ |
| 4 | Radio Frequency | 1% |
| 5 | Duty Cycle | $\pm 0.37\%$ |
| 6 | Occupied Bandwidth | 1% |
| 7 | Conduction Emission | $\pm 2.90\text{dB}$ (150kHz to 30MHz) |
| 8 | Radiated Emission | $\pm 3.13\text{dB}$ (9k -30MHz) |
| | | $\pm 4.8\text{dB}$ (30M -1GHz) |
| | | $\pm 4.8\text{dB}$ (1GHz to 18GHz) |
| | | $\pm 4.80\text{dB}$ (Above 18GHz) |

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (CISPR/ETSI Uncertainty), so the test results

– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

– non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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5 Test results and Measurement Data

5.1 Antenna Requirement

| | |
|--|--|
| Standard requirement: | 47 CFR Part 15C Section 15.203 /247(b) |
| <p>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.</p> <p>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.</p> | |
| <p>The antenna is FPC Antenna and no consideration of replacement. The best case gain of the antenna is -1.19dBi(Ant3); 2.01dBi(Ant2)</p> <p><i>Note:</i> <i>The antenna gain are derived from the gain information report provided by the manufacturer.</i></p> <p><i>Remark:</i> <i>As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.</i></p> | |



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Cyclic Delay Diversity (CDD) System:

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

If all antennas have the same gain, G_{ANT} , Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,
 $Array\ Gain = 10 \log(N_{ANT}/N_{SS}=1) \text{ dB}$.
- For power measurements on IEEE 802.11 devices:
 $Array\ Gain = 0 \text{ dB}$ (i.e., no array gain) for $N_{ANT} \leq 4$;

For power, the directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The Power and PSD limit should be modified if the directional gain of eut is over 6dbi.

The EUT supports CDD System.

All antennas have the Unequal antenna gain:

| ANT Gain0 (dBi) | ANT Gain1 (dBi) | Power DG (dBi) | PSD DG (dBi) | Power Limit Reduction(dB) | PSD Limit Reduction(dB) |
|--------------------|--------------------|-------------------|-----------------|------------------------------|----------------------------|
| 2.01 | -1.19 | 2.01 | 3.57 | 0 | 0 |

Power Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0



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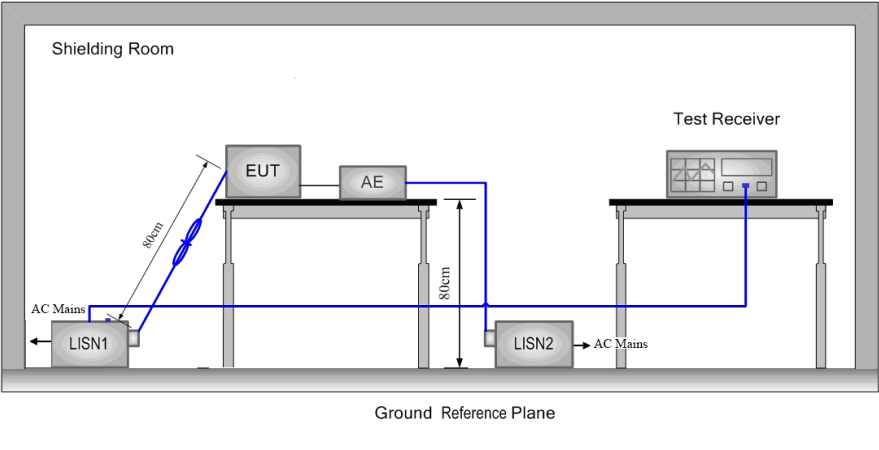
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5.2 AC Power Line Conducted Emissions

| | | | |
|--|--|--------------|-----------|
| Test Requirement: | 47 CFR Part 15C Section 15.207 | | |
| Test Method: | ANSI C63.10: 2013 Section 6.2 | | |
| Test Frequency Range: | 150kHz to 30MHz | | |
| Receiver Setup: | RBW = 9kHz, VBW = 30kHz | | |
| Limit: | Frequency range (MHz) | Limit (dBuV) | |
| | | Quasi-peak | Average |
| | 0.15-0.5 | 66 to 56* | 56 to 46* |
| | 0.5-5 | 56 | 46 |
| | 5-30 | 60 | 50 |
| * Decreases with the logarithm of the frequency. | | | |
| Test Procedure: | <p>1) The mains terminal disturbance voltage test was conducted in a shielded room.</p> <p>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</p> <p>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</p> <p>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</p> | | |

| | |
|-------------------|--|
| Test Setup: |  |
| Test Mode: | BT Link + WIFI 2.4G Link + WIFI 5G/6E Link |
| Instruments Used: | Refer to section 3 for details. |
| Test Results: | Pass |



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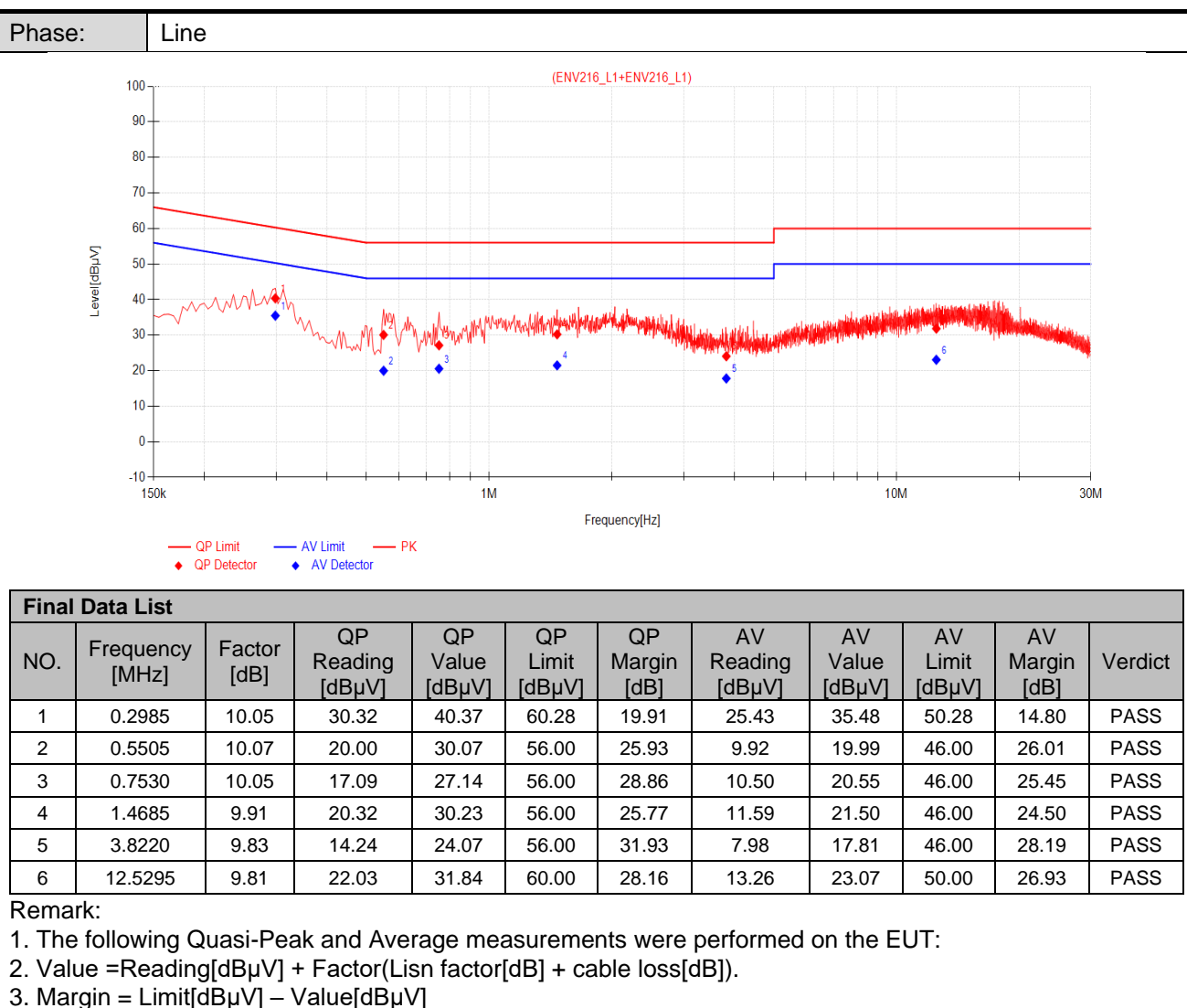
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Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.



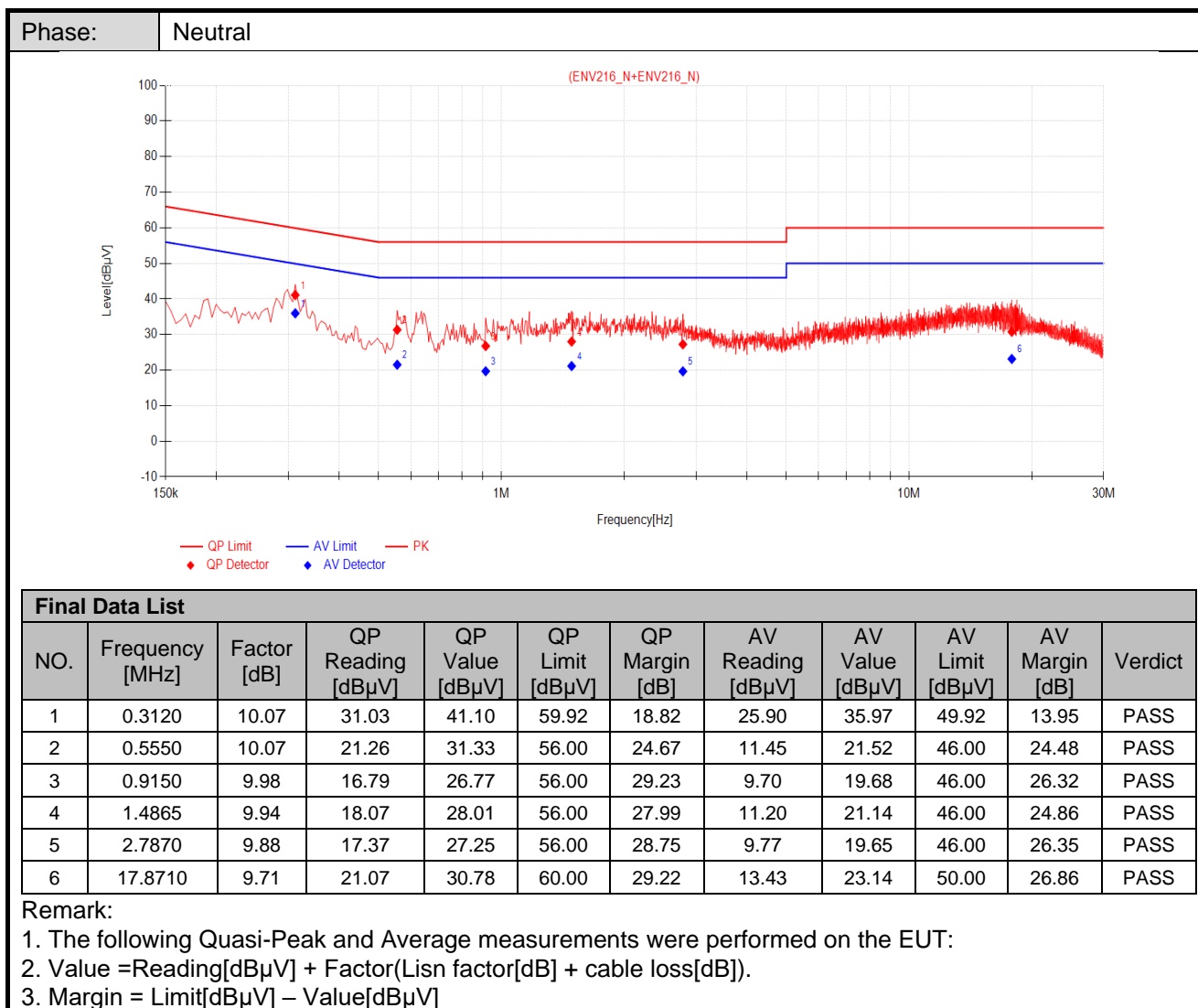


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5.3 Radiated Spurious Emissions

| | | | | | |
|-------------------|---|-------------------------------------|-------------------|------------|-----------------------------|
| Test Requirement: | 47 CFR Part 15C Section 15.209 and 15.205 | | | | |
| Test Method: | ANSI C63.10 :2013 Section 11.12 | | | | |
| Test Site: | Measurement Distance: 3m (Semi-Anechoic Chamber) | | | | |
| Test Frequency: | 9kHz ~ 25GHz | | | | |
| Receiver Setup: | Frequency | Detector | RBW | VBW | Remark |
| | 0.009MHz-0.090MHz | Peak | 10kHz | 30kHz | Peak |
| | 0.009MHz-0.090MHz | Average | 10kHz | 30kHz | Average |
| | 0.090MHz-0.110MHz | Quasi-peak | 10kHz | 30kHz | Quasi-peak |
| | 0.110MHz-0.490MHz | Peak | 10kHz | 30kHz | Peak |
| | 0.110MHz-0.490MHz | Average | 10kHz | 30kHz | Average |
| | 0.490MHz -30MHz | Quasi-peak | 10kHz | 30kHz | Quasi-peak |
| | 30MHz-1GHz | Quasi-peak | 120kHz | 300kHz | Quasi-peak |
| | Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| | | Peak | 1MHz | 3MHz | Peak |
| Limit: | Frequency | Field strength (microvolt/meter) | Limit (dBuV/m) | Remark | Measurement distance (m) |
| | 0.009MHz-0.490MHz | 2400/F(kHz) | - | - | 300 |
| | 0.490MHz-1.705MHz | 24000/F(kHz) | - | - | 30 |
| | 1.705MHz-30MHz | 30 | - | - | 30 |
| | 30MHz-88MHz | 100 | 40.0 | Quasi-peak | 3 |
| | 88MHz-216MHz | 150 | 43.5 | Quasi-peak | 3 |
| | 216MHz-960MHz | 200 | 46.0 | Quasi-peak | 3 |
| | 960MHz-1GHz | 500 | 54.0 | Quasi-peak | 3 |
| | Above 1GHz | 500 | 54.0 | Average | 3 |
| | Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device. | | | | |

Test Setup:

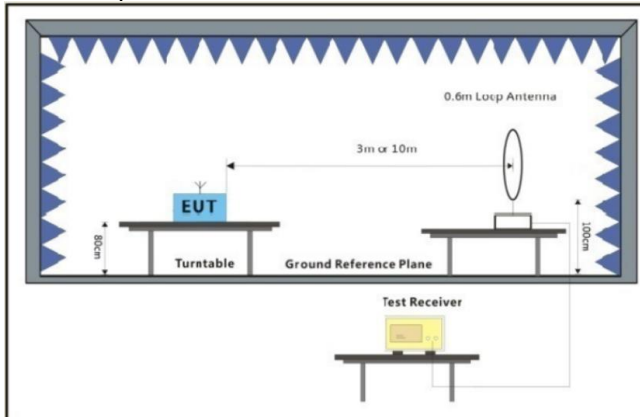


Figure 1. Below 30MHz

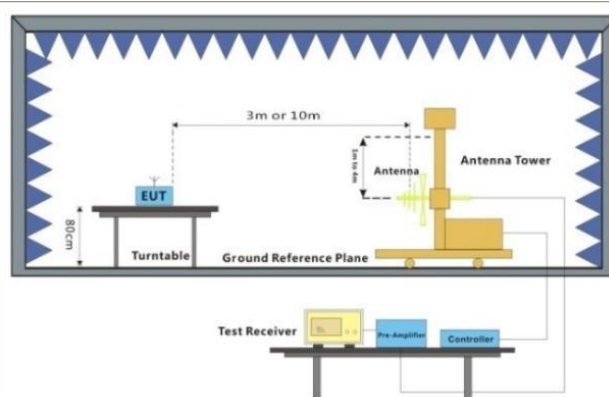


Figure 2. 30MHz to 1GHz

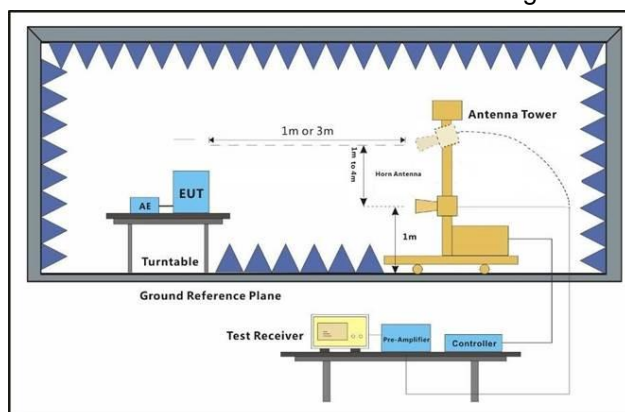


Figure 3. Above 1 GHz

Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Distance from antenna to EUT is 1m for measurements >18GHz).
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- Test the EUT in the lowest channel, the middle channel, the Highest



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| | |
|---|---|
| | <p>channel.</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>j. The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported</p> <p>k. The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed.</p> <p>l. At a measurement distance of 1 meter the limit line was increased by $20 \cdot \text{LOG}(3/1) = 9.54 \text{ dB}$.</p> |
| Test Configuration: | <p>Measurements below 30MHz</p> <ul style="list-style-type: none"> • RBW = 10 kHz • VBW = 30 kHz • Detector = Peak & Average & Quasi-peak • Trace mode = max hold <p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW $\geq 3 \text{ MHz}$ • Detector = Peak • Sweep time = auto • Trace mode = max hold <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW = 10 Hz, when duty cycle is no less than 98 percent. • VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. |
| Exploratory Test Mode: | <p>Transmitting with all kind of modulations, data rates.</p> <p>Charge + Transmitting mode.</p> |
| Final Test Mode: | <p>Refer to section 3.7 for details.</p> <p>For below 1GHz part, through pre-scan all channels, but only the worst case is recorded in the report.</p> |
| Instruments Used: | Refer to section 3 for details. |
| Test Results: | Pass |
| The detailed test data see: Appendix | |

5.4 Restricted bands around fundamental frequency

| | | | |
|-------------------|--|----------------|---------------|
| Test Requirement: | 47 CFR Part 15C Section 15.209 and 15.205 | | |
| Test Method: | ANSI C63.10: 2013 Section 11.12 | | |
| Test Site: | Measurement Distance: 3m (Semi-Anechoic Chamber) | | |
| Limit: | Frequency | Limit (dBuV/m) | Remark |
| | 30MHz-88MHz | 40.0 | Quasi-peak |
| | 88MHz-216MHz | 43.5 | Quasi-peak |
| | 216MHz-960MHz | 46.0 | Quasi-peak |
| | 960MHz-1GHz | 54.0 | Quasi-peak |
| | Above 1GHz | 54.0 | Average Value |
| | | 74.0 | Peak Value |

Test Setup:

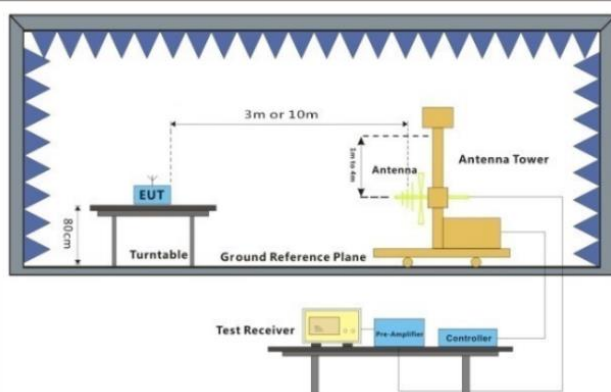


Figure 1. 30MHz to 1GHz

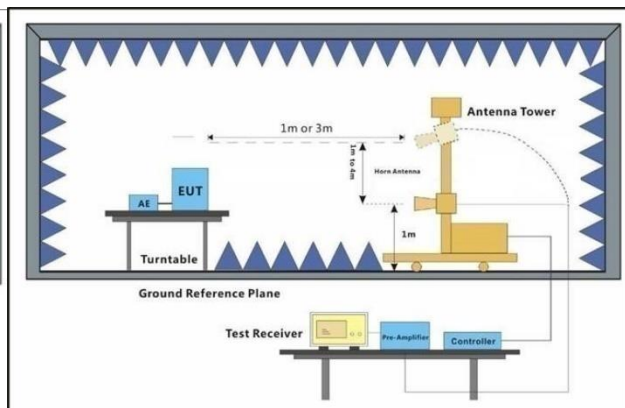


Figure 2. Above 1 GHz

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| | |
|---|---|
| Test Procedure: | <p>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</p> <p>h. Test the EUT in the lowest channel , the Highest channel</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p> |
| Test Configuration: | <p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW \geq 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW = 10 Hz, when duty cycle is no less than 98 percent. • VBW \geq 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates. Charge + Transmitting mode. |
| Final Test Mode: | Refer to section 3.7 for details. |
| Instruments Used: | Refer to section 3 for details. |
| Test Results: | Pass |
| The detailed test data see: Appendix | |



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6 Photographs - Setup Photos

Refer to Appendix A.2 BT&WIFI&NFC Setup Photos.



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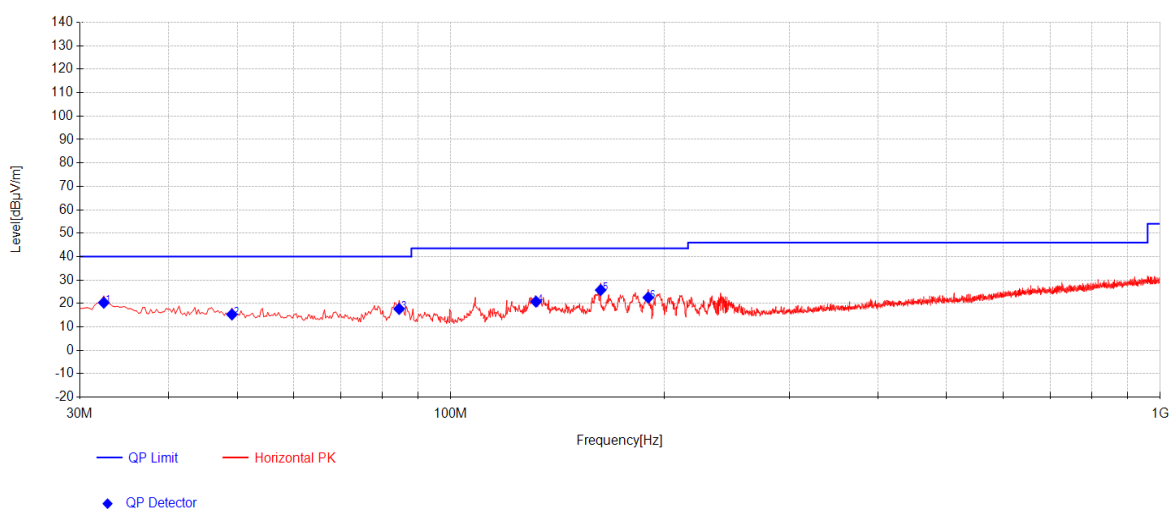
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7 Appendix

Radiated Spurious Emissions

Worst case Mode:

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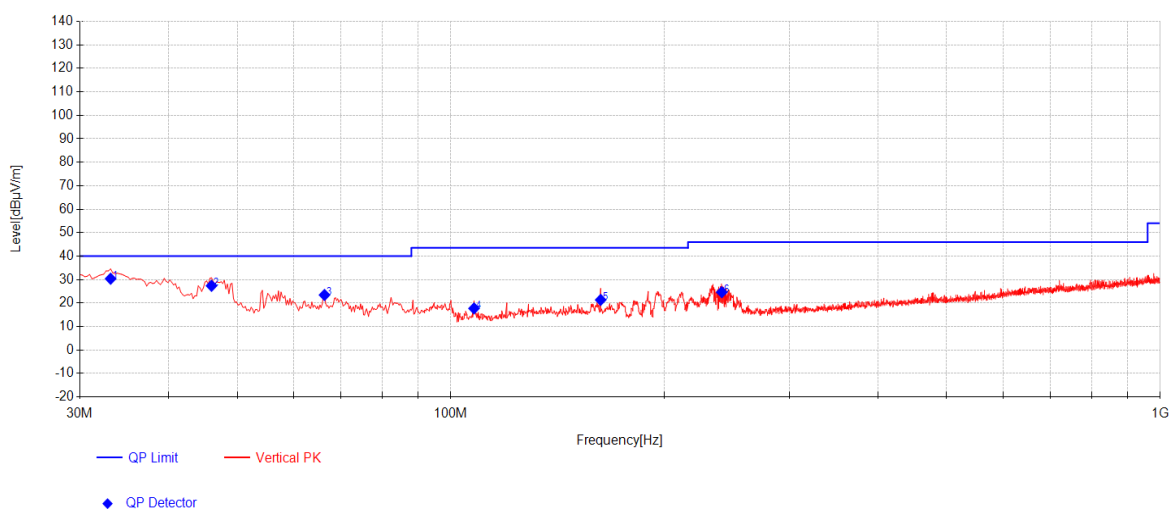
| Final Data List | | | | | | | | |
|-----------------|-----------------|----------------|-------------|-----------|-------------------|-------------------|----------------|------------|
| NO. | Frequency [MHz] | Reading [dBμV] | Factor [dB] | AF [dB/m] | QP Value [dBμV/m] | QP Limit [dBμV/m] | QP Margin [dB] | Polarity |
| 1 | 32.425 | 36.24 | -33.99 | 18.10 | 20.35 | 40.00 | 19.65 | Horizontal |
| 2 | 49.1575 | 30.26 | -33.70 | 18.77 | 15.32 | 40.00 | 24.68 | Horizontal |
| 3 | 84.5625 | 36.24 | -33.30 | 14.76 | 17.69 | 40.00 | 22.31 | Horizontal |
| 4 | 131.85 | 35.54 | -32.83 | 18.06 | 20.77 | 43.50 | 22.73 | Horizontal |
| 5 | 162.6475 | 39.35 | -32.52 | 18.91 | 25.74 | 43.50 | 17.76 | Horizontal |
| 6 | 189.8075 | 39.54 | -32.33 | 15.34 | 22.55 | 43.50 | 20.95 | Horizontal |



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| Final Data List | | | | | | | | |
|-----------------|--------------------|-------------------|----------------|--------------|----------------------|----------------------|-------------------|----------|
| NO. | Frequency [MHz] | Reading [dBμV] | Factor [dB] | AF [dB/m] | QP Value [dBμV/m] | QP Limit [dBμV/m] | QP Margin [dB] | Polarity |
| 1 | 33.1525 | 46.24 | -33.98 | 18.12 | 30.38 | 40.00 | 9.62 | Vertical |
| 2 | 46.005 | 42.03 | -33.76 | 19.10 | 27.37 | 40.00 | 12.63 | Vertical |
| 3 | 66.375 | 39.68 | -33.47 | 17.23 | 23.44 | 40.00 | 16.56 | Vertical |
| 4 | 107.8425 | 35.23 | -33.02 | 15.52 | 17.73 | 43.50 | 25.77 | Vertical |
| 5 | 162.6475 | 34.96 | -32.52 | 18.91 | 21.35 | 43.50 | 22.15 | Vertical |
| 6 | 240.975 | 40.03 | -32.03 | 16.64 | 24.64 | 46.00 | 21.36 | Vertical |



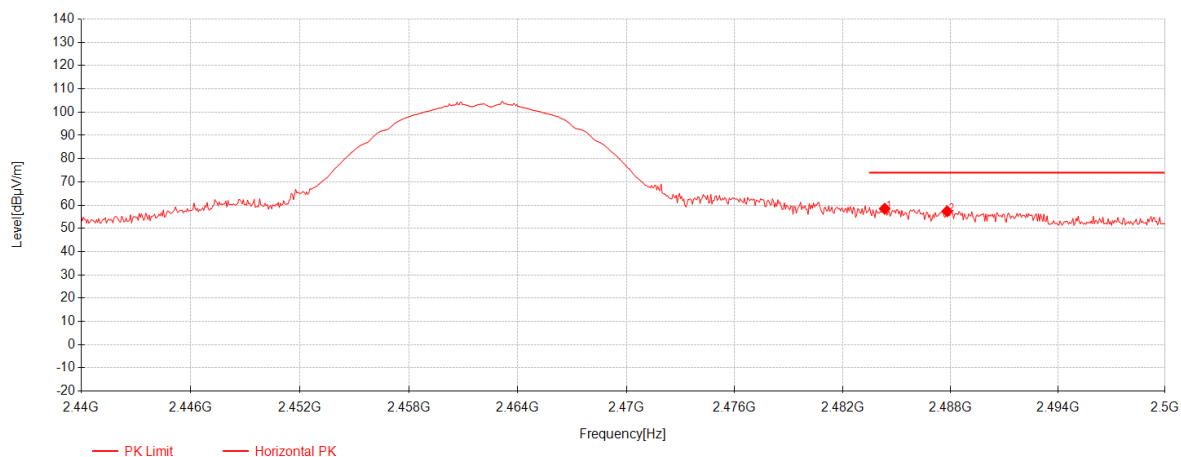
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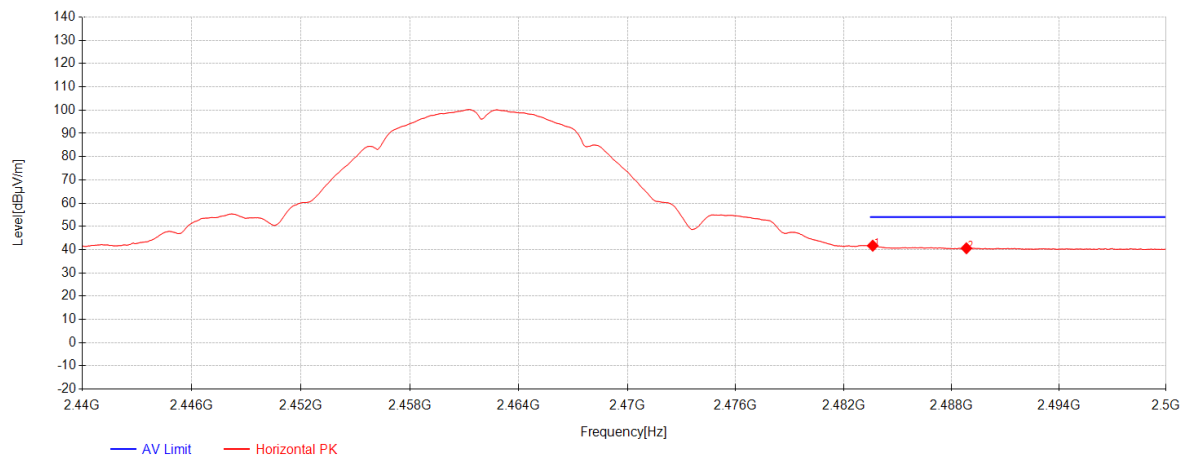
| Data List | | | | | | | | |
|-----------|-----------------|----------------|-----------|-------------|----------------|----------------|-------------|------------|
| NO. | Frequency [MHz] | Reading [dBμV] | AF [dB/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Polarity |
| 1 | 2484.34 | 54.34 | 27.37 | -23.27 | 58.44 | 74.00 | 15.56 | Horizontal |
| 2 | 2487.82 | 53.25 | 27.37 | -23.27 | 57.36 | 74.00 | 16.64 | Horizontal |



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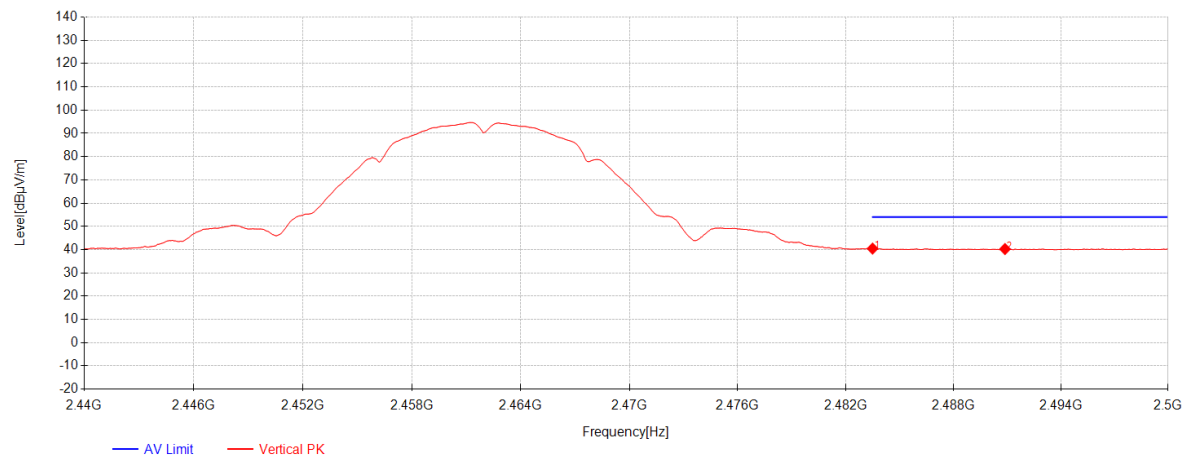
| Data List | | | | | | | | |
|-----------|-----------------|----------------|-----------|-------------|----------------|----------------|-------------|------------|
| NO. | Frequency [MHz] | Reading [dBμV] | AF [dB/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Polarity |
| 1 | 2483.62 | 37.61 | 27.36 | -23.27 | 41.70 | 54.00 | 12.30 | Horizontal |
| 2 | 2488.84 | 36.48 | 27.38 | -23.27 | 40.59 | 54.00 | 13.41 | Horizontal |



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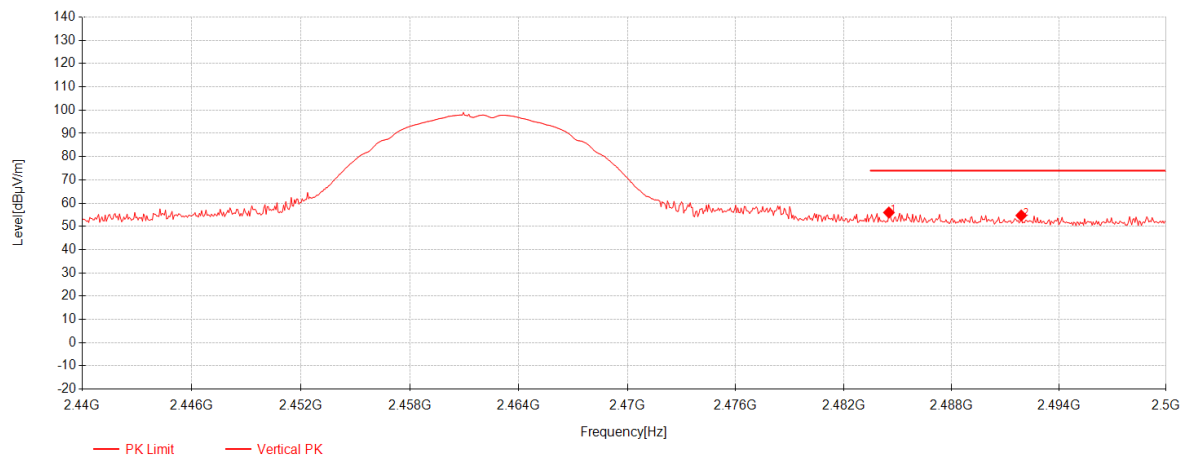
| Data List | | | | | | | | |
|-----------|-----------------|----------------|-----------|-------------|----------------|----------------|-------------|----------|
| NO. | Frequency [MHz] | Reading [dBμV] | AF [dB/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Polarity |
| 1 | 2483.5 | 36.36 | 27.36 | -23.27 | 40.45 | 54.00 | 13.55 | Vertical |
| 2 | 2490.88 | 36.15 | 27.38 | -23.27 | 40.26 | 54.00 | 13.74 | Vertical |



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| Data List | | | | | | | | |
|-----------|-----------------|----------------|-----------|-------------|----------------|----------------|-------------|----------|
| NO. | Frequency [MHz] | Reading [dBμV] | AF [dB/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Polarity |
| 1 | 2484.52 | 51.86 | 27.37 | -23.27 | 55.96 | 74.00 | 18.04 | Vertical |
| 2 | 2491.9 | 50.55 | 27.38 | -23.26 | 54.67 | 74.00 | 19.33 | Vertical |



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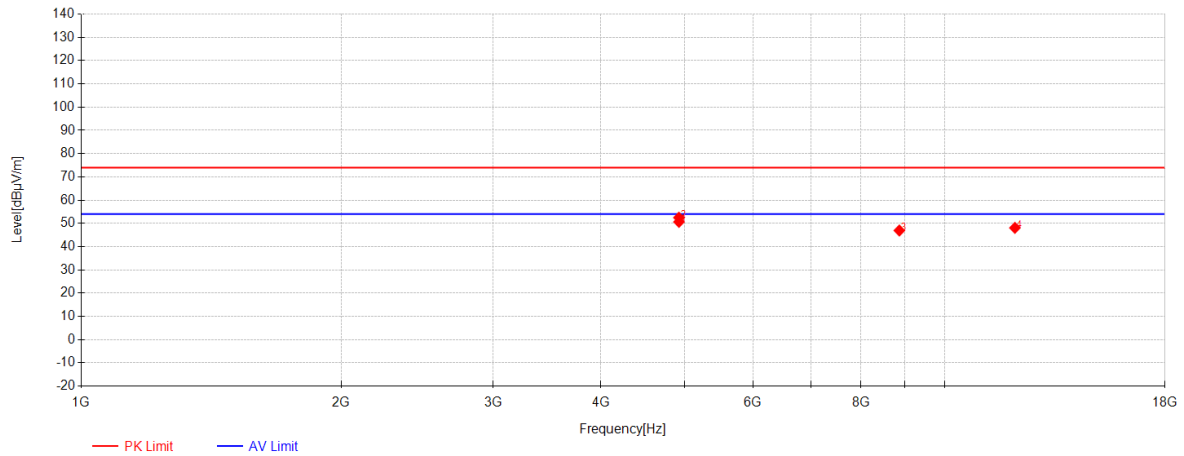
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Restricted bands around fundamental frequency

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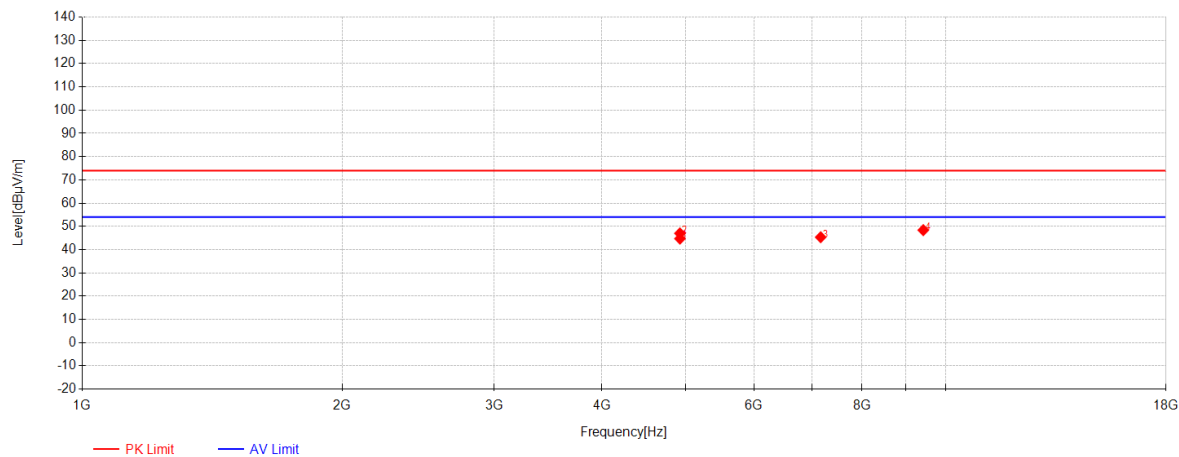
| Data List | | | | | | | | |
|-----------|-----------------|----------------|-----------|-------------|----------------|----------------|-------------|------------|
| NO. | Frequency [MHz] | Reading [dBμV] | AF [dB/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Polarity |
| 1 | 4924.5 | 58.88 | 33.03 | -41.27 | 50.65 | 54.00 | 3.35 | Horizontal |
| 2 | 4924 | 60.68 | 33.03 | -41.26 | 52.45 | 74.00 | 21.55 | Horizontal |
| 3 | 8862.5 | 44.38 | 37.53 | -34.97 | 46.94 | 74.00 | 27.06 | Horizontal |
| 4 | 12061.5 | 39.00 | 38.47 | -29.40 | 48.08 | 74.00 | 25.92 | Horizontal |



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| Data List | | | | | | | | |
|-----------|-----------------|----------------|-----------|-------------|----------------|----------------|-------------|----------|
| NO. | Frequency [MHz] | Reading [dBμV] | AF [dB/m] | Factor [dB] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Polarity |
| 1 | 4924.5 | 52.96 | 33.03 | -41.27 | 44.73 | 54.00 | 9.27 | Vertical |
| 2 | 4924 | 55.22 | 33.03 | -41.26 | 46.99 | 74.00 | 27.01 | Vertical |
| 3 | 7166.5 | 47.23 | 36.20 | -38.08 | 45.35 | 74.00 | 28.65 | Vertical |
| 4 | 9422.5 | 44.43 | 37.73 | -33.78 | 48.38 | 74.00 | 25.62 | Vertical |

---End of Report---