

Test Report

Report No.: MTi220210002-04E3

Date of issue: 2022-06-29

Applicant: Zhuhai Quin Technology Co., Ltd.

Product: Smart Mini Label Maker

Model(s): D30S, D31, D31Pro, D31S, D36, D30SE, D31PRO, D20, D20PRO, D10, D26, D28

FCC ID: 2ASRB-D30S-1

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

Instructions

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2. The test results in this test report are only responsible for the samples submitted
3. This test report is invalid without the seal and signature of the laboratory.
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5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

Contents

| | | |
|----------|--|-----------|
| 1 | General Description | 5 |
| 1.1 | Description of the EUT | 5 |
| 1.2 | Description of test modes | 5 |
| 1.3 | Description of support units | 5 |
| 1.4 | Environmental conditions | 6 |
| 1.5 | Measurement uncertainty | 6 |
| 2 | Summary of Test Result..... | 7 |
| 3 | Test Facilities and accreditations..... | 8 |
| 3.1 | Test laboratory | 8 |
| 4 | List of test equipment | 9 |
| 5 | Test Results | 10 |
| 5.1 | Antenna requirements | 10 |
| 5.2 | AC power line conducted emissions | 11 |
| 5.3 | Radiated emissions | 14 |
| 5.4 | Occupied bandwidth test | 22 |
| 5.5 | Frequency stability..... | 23 |
| | Photographs of the Test Setup..... | 24 |
| | Photographs of the EUT..... | 26 |

| Test Result Certification | |
|----------------------------|---|
| Applicant: | Zhuhai Quin Technology Co., Ltd. |
| Address: | ROOM 103-029(CENTRALIZED OFFICE AREA) , 1F, BUILDING 1, NO. 18 FUTIAN ROAD, XIANGZHOU DISTRICT, ZHUHAI CITY |
| Manufacturer: | Zhuhai Quin Technology Co., Ltd. |
| Address: | ROOM 103-029(CENTRALIZED OFFICE AREA) , 1F, BUILDING 1, NO. 18 FUTIAN ROAD, XIANGZHOU DISTRICT, ZHUHAI CITY |
| Factory: | Zhuhai Quin Technology Co., Ltd. |
| Address: | BLOCK 1 FLOOR 4,5,6,7,BLOCK 2 FLOOR 1,2,3,4,5,6,NO.1 CUIZHU 4 STREET,QIANSHAN,XIANGZHOU DISCTRICT,ZHUHAI CITY |
| Product description | |
| Product name: | Smart Mini Label Maker |
| Trademark: | N/A |
| Model name: | D30S |
| Serial Model: | D31, D31Pro, D31S, D36, D30SE, D31PRO, D20, D20PRO, D10, D26, D28 |
| Standards: | FCC 47 CFR Part 15 Subpart C |
| Test method: | ANSI C63.10-2013 |
| Date of Test | |
| Date of test: | 2022-03-28 ~ 2022-06-29 |
| Test result: | Pass |

Test Engineer :

Cindy Qin

(Cindy Qin)

Reviewed By :

Leon Chen

(Leon Chen)

Approved By :

Tom Xue

(Tom Xue)

1 General Description

1.1 Description of the EUT

| | |
|--------------------------|---|
| Product name: | Smart Mini Label Maker |
| Model name: | D30S |
| Series Model: | D31, D31Pro, D31S, D36, D30SE, D31PRO, D20, D20PRO, D10, D26, D28 |
| Model difference: | All the models are the same circuit and module, except the model name, silk screen pattern and color. |
| Electrical rating: | Input: DC 5V 2A Battery: DC 3.7V 1200mAh |
| Software version: | Q183_A |
| Hardware version: | _0.1.0 |
| Accessories: | N/A |
| EUT serial number: | MTi220210002-04-S0001 |
| RF specification: | |
| Operation frequency: | 13.56 MHz |
| Modulation type: | ASK |
| Antenna type: | loop Antenna |
| Antenna gain: | -0.58dBi |

1.2 Description of test modes

All the test modes were carried out with the EUT in normal operation, the final test mode of the EUT was the worst test mode for emission test, which was shown in this report and defined as:

| No. | test modes |
|--------|------------|
| Mode 1 | TX mode |

1.3 Description of support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Support equipment list | | | |
|------------------------|--------------|------------|-----------------------------------|
| Description | Model | Serial No. | Manufacturer |
| Adapter | HW-090200CH0 | / | Huizhou BYD Electronics Co., Ltd. |
| Support cable list | | | |
| Description | Length (m) | From | To |
| / | / | / | / |

1.4 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|-----------------------|-------------------|
| Temperature: | 15°C~35°C |
| Humidity: | 20 % RH ~ 75 % RH |
| Atmospheric pressure: | 98 kPa~101 kPa |

1.5 Measurement uncertainty

| Measurement | Uncertainty |
|------------------------------------|----------------|
| Conducted emission (9 kHz~30 MHz) | ± 2.5 dB |
| Radiated emission (9 kHz ~ 30 MHz) | ± 4.0 dB |
| Radiated emission (30 MHz~1 GHz) | ± 4.2 dB |
| Radiated emission (above 1 GHz) | ± 4.3 dB |
| Occupied bandwidth | ± 3 % |
| Temperature | ± 1 degree |
| Humidity | ± 5 % |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

2 Summary of Test Result

| No. | FCC Clause | Description of test | Result |
|-----------------|-------------------|-----------------------------------|--------|
| Emission | | | |
| 1 | §15.203 | Antenna requirement | Pass |
| 2 | §15.207 | AC power line Conducted emissions | Pass |
| 3 | §15.209 & §15.225 | Radiated emissions | Pass |
| 4 | §15.215 | Occupied bandwidth | Pass |

Note: N/A means not applicable.

3 Test Facilities and accreditations

3.1 Test laboratory

| | |
|------------------------|---|
| Test laboratory: | Shenzhen Microtest Co., Ltd. |
| Test site location: | 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China |
| Telephone: | (86-755)88850135 |
| Fax: | (86-755)88850136 |
| CNAS Registration No.: | CNAS L5868 |
| FCC Registration No.: | 448573 |

4 List of test equipment

| No. | Equipment | Manufacturer | Model | Serial No. | Cal. date | Cal. Due |
|----------|--------------------------|-----------------|-------------|--------------|------------|------------|
| MTI-E043 | EMI test receiver | R&S | ESCI7 | 101166 | 2022/05/05 | 2023/05/04 |
| MTI-E044 | Broadband antenna | Schwarzbeck | VULB9163 | 9163-1338 | 2021/05/30 | 2023/05/29 |
| MTI-E045 | Horn antenna | Schwarzbeck | BBHA9120D | 9120D-2278 | 2021/05/30 | 2023/05/29 |
| MTi-E046 | Active Loop Antenna | Schwarzbeck | FMZB 1519 B | 00066 | 2021/05/30 | 2023/05/29 |
| MTI-E047 | Pre-amplifier | Hewlett-Packard | 8447F | 3113A06184 | 2022/05/05 | 2023/05/04 |
| MTI-E048 | Pre-amplifier | Agilent | 8449B | 3008A01120 | 2022/05/05 | 2023/05/04 |
| MTi-E120 | Broadband antenna | Schwarzbeck | VULB9163 | 9163-1419 | 2021/05/30 | 2023/05/29 |
| MTi-E121 | Pre-amplifier | Hewlett-Packard | 8447D | 2944A09365 | 2022/05/05 | 2023/05/04 |
| MTi-E123 | Pre-amplifier | Agilent | 8449B | 3008A04723 | 2022/05/05 | 2023/05/04 |
| MTi-E122 | MXA signal analyzer | Agilent | N9020A | MY54440859 | 2022/05/05 | 2023/05/04 |
| MTi-E002 | EMI Test Receiver | R&S | ESCI3 | 101368 | 2022/05/05 | 2023/05/04 |
| MTi-E023 | Artificial power network | Schwarzbeck | NSLK8127 | NSLK8127#841 | 2022/05/05 | 2023/05/04 |
| MTi-E025 | Artificial power network | Schwarzbeck | NSLK8127 | 8127183 | 2022/05/05 | 2023/05/04 |
| MTi-A029 | Loop antenna | SOLAR | 7334-1 | 220095-2 | 2021/04/20 | 2023/04/19 |

5 Test Results

5.1 Antenna requirements

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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Description of the EUT antenna

The antenna of EUT is loop antenna, which is no consideration of replacement.

5.2 AC power line conducted emissions

5.2.1 Limits

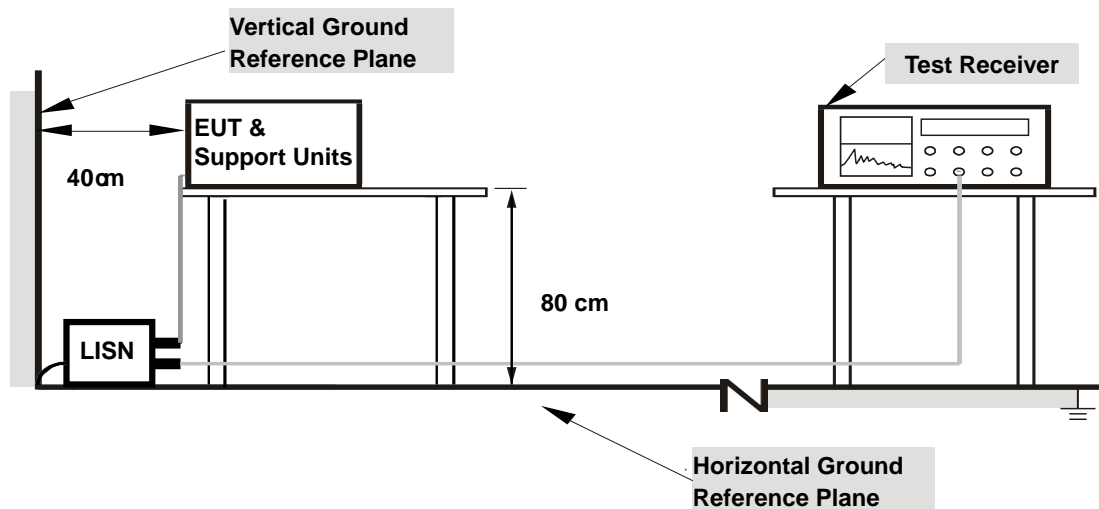
| Frequency (MHz) | Detector type / Bandwidth | Limit-Quasi-peak dB μ V | Limit-Average dB μ V |
|-----------------|---------------------------|-----------------------------|--------------------------|
| 0.15 -0.5 | Average / 9 kHz | 66 to 56 | 56 to 46 |
| 0.5 -5 | | 56 | 46 |
| 5 -30 | | 60 | 50 |

Note 1: the limit decreases with the logarithm of the frequency in the range of 0.15 MHz to 0.5 MHz.

5.2.2 Test Procedures

- The test setup is refer to the standard ANSI C63.10-2013.
- The EUT is connected to the main power through a line impedance stabilization network (LISN). All support equipment is powered from additional LISN(s).
- Emissions were measured on each current carrying line of the EUT using an EMI test receiver connected to the LISN powering the EUT.
- The test receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes described in Item 1.2.
- The test data of the worst-case condition(s) was recorded.

5.2.3 Test setup



For the actual test configuration, please refer to the related item – Photographs of the test setup.

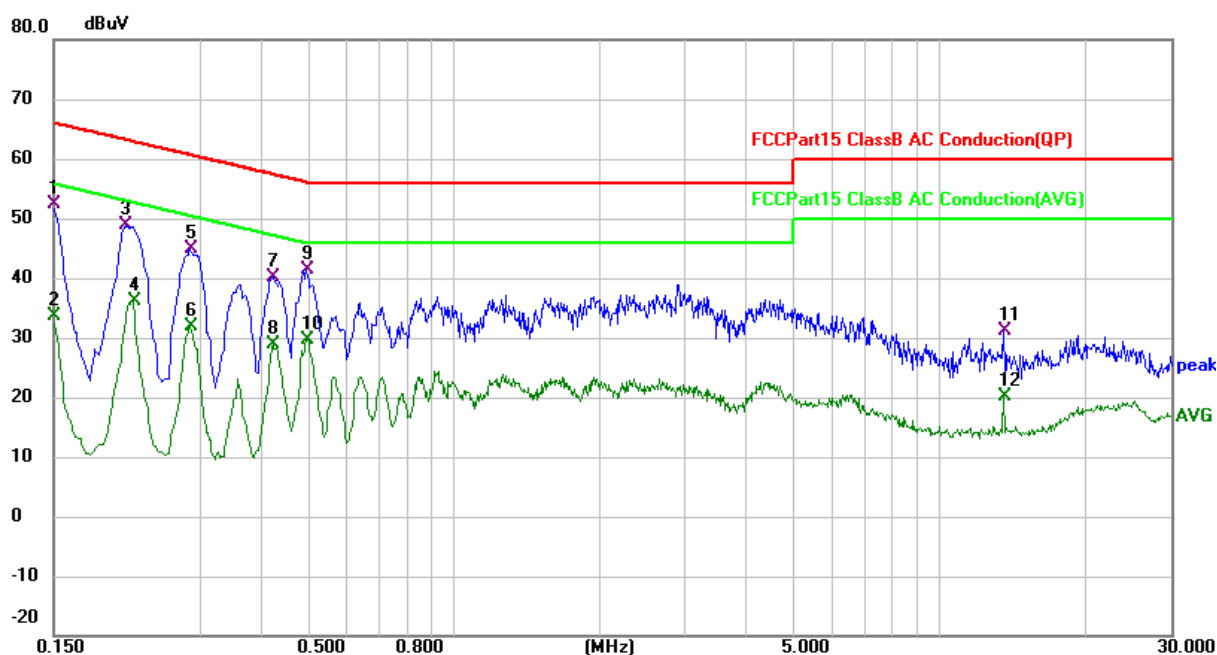
5.2.4 Test Result

Calculation formula:

Measurement (dB μ V) = Reading Level (dB μ V) + Correct Factor (dB)

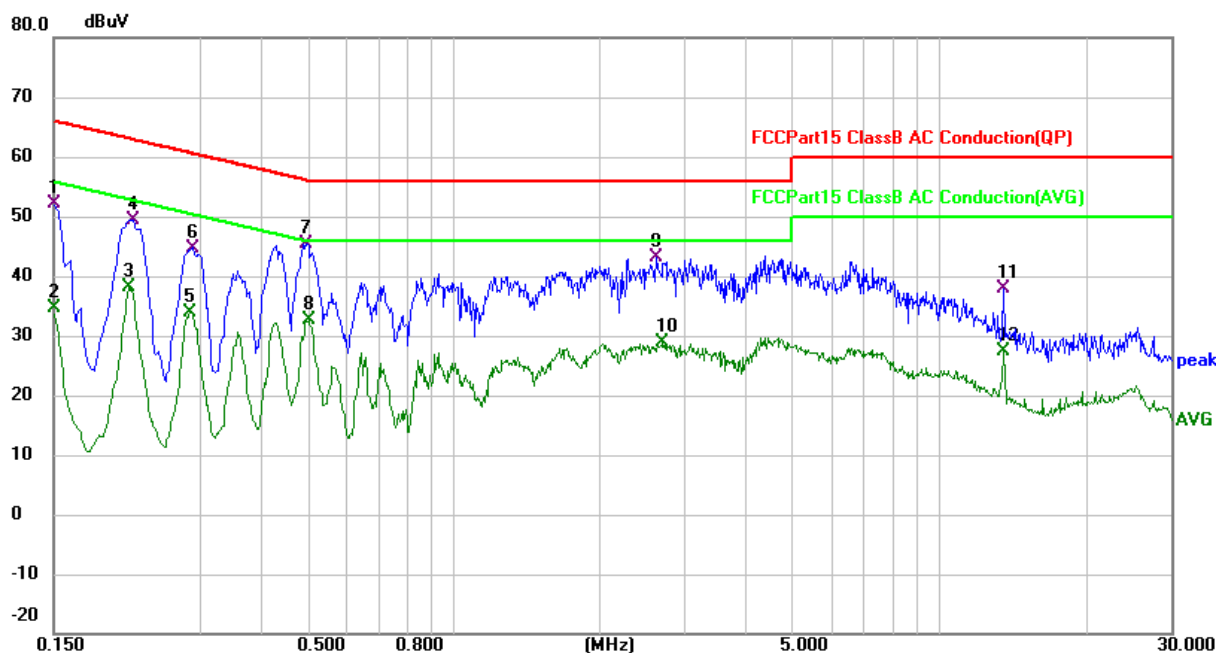
Over (dB) = Measurement (dB μ V) – Limit (dB μ V)

| | | | |
|---------------|--|------------|--------------|
| Test mode: | TX | Phase: | L |
| Power supply: | Power by AC/DC adapter (AC 120V/60Hz) | Test site: | CE chamber 1 |



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | |
|-----|-----|---------|---------------|----------------|-------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | * | 0.1500 | 41.51 | 10.99 | 52.50 | 66.00 | -13.50 | QP |
| 2 | | 0.1500 | 22.53 | 10.99 | 33.52 | 56.00 | -22.48 | AVG |
| 3 | | 0.2100 | 37.79 | 10.97 | 48.76 | 63.21 | -14.45 | QP |
| 4 | | 0.2180 | 25.07 | 10.98 | 36.05 | 52.89 | -16.84 | AVG |
| 5 | | 0.2860 | 33.86 | 10.99 | 44.85 | 60.64 | -15.79 | QP |
| 6 | | 0.2860 | 21.01 | 10.99 | 32.00 | 50.64 | -18.64 | AVG |
| 7 | | 0.4220 | 29.20 | 10.99 | 40.19 | 57.41 | -17.22 | QP |
| 8 | | 0.4220 | 17.92 | 10.99 | 28.91 | 47.41 | -18.50 | AVG |
| 9 | | 0.4980 | 30.25 | 11.07 | 41.32 | 56.03 | -14.71 | QP |
| 10 | | 0.4980 | 18.64 | 11.07 | 29.71 | 46.03 | -16.32 | AVG |
| 11 | | 13.5620 | 19.56 | 11.67 | 31.23 | 60.00 | -28.77 | QP |
| 12 | | 13.5620 | 8.49 | 11.67 | 20.16 | 50.00 | -29.84 | AVG |

| | | | |
|---------------|--|------------|--------------|
| Test mode: | TX | Phase: | N |
| Power supply: | Power by AC/DC adapter (AC 120V/60Hz) | Test site: | CE chamber 1 |



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | |
|-----|-----|---------|---------------|----------------|-------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | | 0.1500 | 41.25 | 10.99 | 52.24 | 66.00 | -13.76 | QP |
| 2 | | 0.1500 | 23.65 | 10.99 | 34.64 | 56.00 | -21.36 | AVG |
| 3 | | 0.2139 | 27.19 | 10.91 | 38.10 | 53.05 | -14.95 | AVG |
| 4 | | 0.2179 | 38.54 | 10.91 | 49.45 | 62.90 | -13.45 | QP |
| 5 | | 0.2857 | 22.88 | 10.90 | 33.78 | 50.65 | -16.87 | AVG |
| 6 | | 0.2900 | 33.87 | 10.88 | 44.75 | 60.52 | -15.77 | QP |
| 7 | * | 0.4979 | 34.56 | 10.89 | 45.45 | 56.03 | -10.58 | QP |
| 8 | | 0.5020 | 21.71 | 10.89 | 32.60 | 46.00 | -13.40 | AVG |
| 9 | | 2.6218 | 31.76 | 11.38 | 43.14 | 56.00 | -12.86 | QP |
| 10 | | 2.6979 | 17.62 | 11.38 | 29.00 | 46.00 | -17.00 | AVG |
| 11 | | 13.5617 | 26.27 | 11.66 | 37.93 | 60.00 | -22.07 | QP |
| 12 | | 13.5617 | 15.81 | 11.66 | 27.47 | 50.00 | -22.53 | AVG |

5.3 Radiated emissions

5.3.1 Limits

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

§ 15.209 Radiated emission limits:

| Frequency (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 |

Notes:

The tighter limit applies at the band edges.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector

§ 15.35 (b) requirements:

When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

According to ANSI C63.10, the tests shall be performed in the frequency range shown in the following table:

Frequency range of measurements for unlicensed wireless device

| Lowest frequency generated in the device | Upper frequency range of measurement |
|--|---|
| 9 kHz to below 10 GHz | 10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower |
| At or above 10 GHz to below 30 GHz | 5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower |
| At or above 30 GHz | 5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified |

Frequency range of measurements for unlicensed wireless device with digital device

| Highest frequency generated or used in the device or on which the device operates or tunes | Upper frequency range of measurement |
|--|---|
| Below 1.705 MHz | 30 MHz |
| 1.705 MHz to 108 MHz | 1000 MHz |
| 108 MHz to 500 MHz | 2000 MHz |
| 500 MHz to 1000 MHz | 5000 MHz |
| Above 1000 MHz | 5th harmonic of the highest frequency or 40 GHz, whichever is lower |

Test instrument setup

| Frequency | Test receiver / Spectrum analyzer setting |
|------------------|---|
| 9 kHz ~ 150 kHz | Quasi Peak / 200 Hz |
| 150 kHz ~ 30 MHz | Quasi Peak / 9 kHz |
| 30 MHz ~ 1 GHz | Quasi Peak / 120 kHz |

5.3.2 Test Procedures

The EUT is placed on a non-conducting table 80cm above the ground plane for measurement blew 1 GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10-2013.

For measurement blew 1 GHz, the resolution bandwidth is set as item 5.4.2.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned form 1 to 4m meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and horizontal positions.

Special requirements for 9 kHz to 30 MHz:

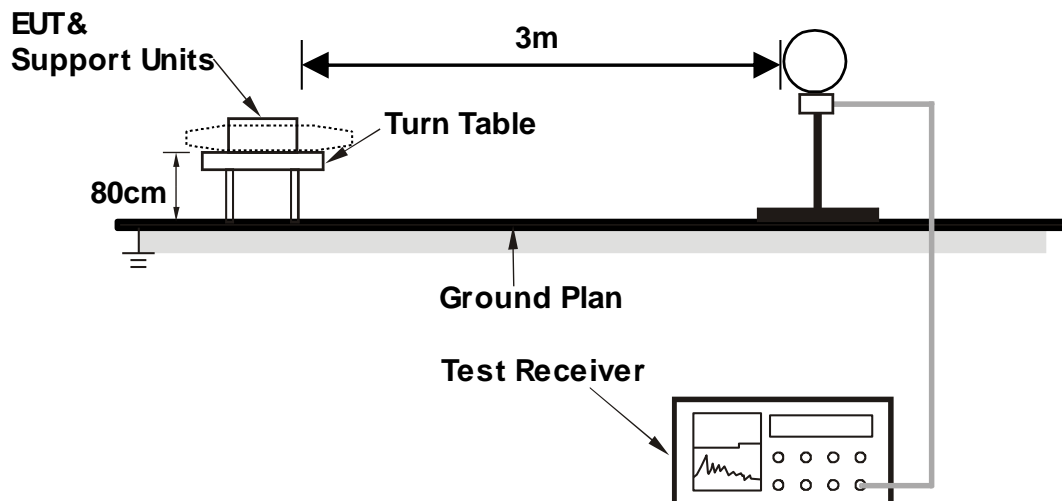
The lowest height of the magnetic antenna shall be 1 m above the ground

When the EUT contains a loop antenna that can only be placed in a vertical axis, normal measurements shall be made aligning the measurement antenna along the site axis, and then orthogonal to the axis. For each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable.

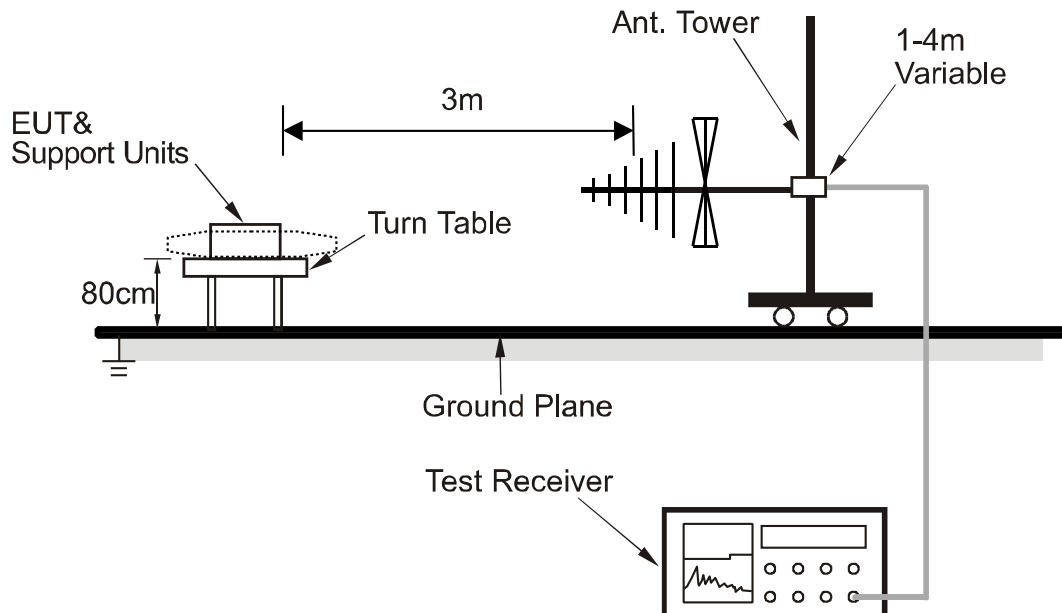
When the EUT contains a loop antenna that can be placed in a horizontal or vertical axis, normal measurements shall be made aligning the measurement antenna along the site axis, orthogonal to the axis, and then with the measurement antenna horizontal. For each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable.

5.3.3 Test Setup

Blew 30 MHz:



Blew 1 GHz:



For the actual test configuration, please refer to the related item – Photographs of the test setup.

5.3.4 Test result

Calculation formula:

Measurement (dB μ V/m) = Reading Level (dB μ V) + Correct Factor (dB/m)

Over (dB) = Measurement (dB μ V/m) – Limit (dB μ V/m)

Notes:

The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

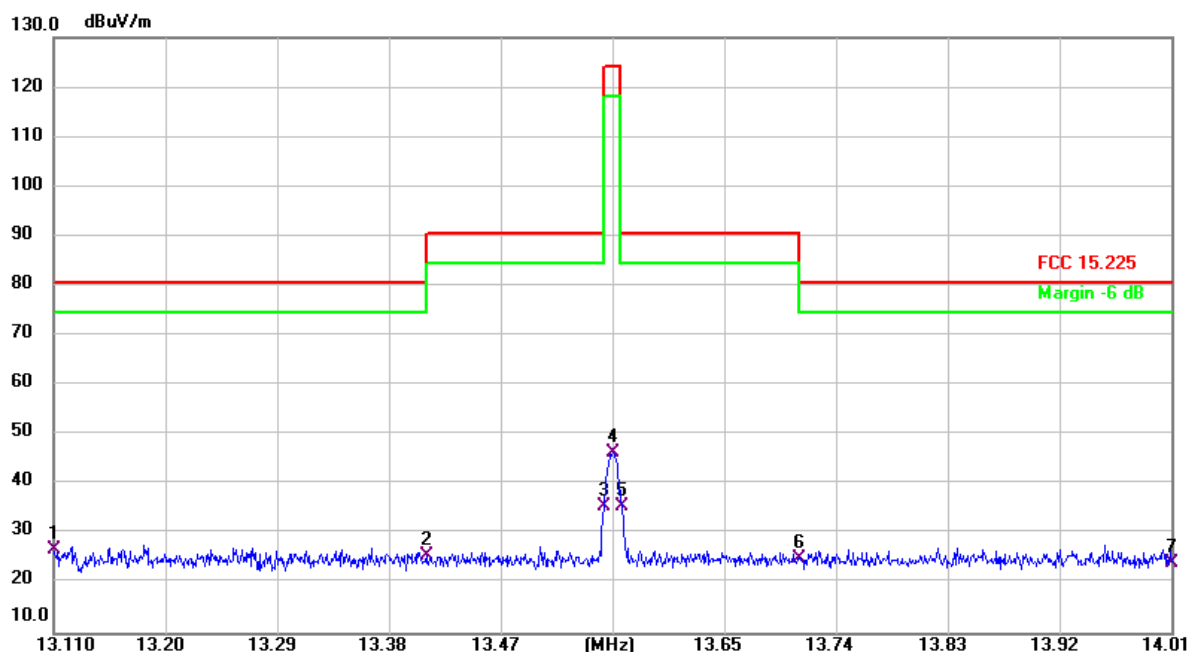
For 9 kHz - 30 MHz testing, all the required orthogonal orientations of the measurement loop antenna were performed for pre-scan, the maximum radiated transmissions (Site axis) were recorded.

Limit (dB μ V/m) = 20*log(μ V/m).

Limit (dB μ V/m) @ 3m = Limit (dB μ V/m) @ 10m + 40*log(30/3)

Fundamental & spurious emissions in 13.110 ~ 14.010 MHz

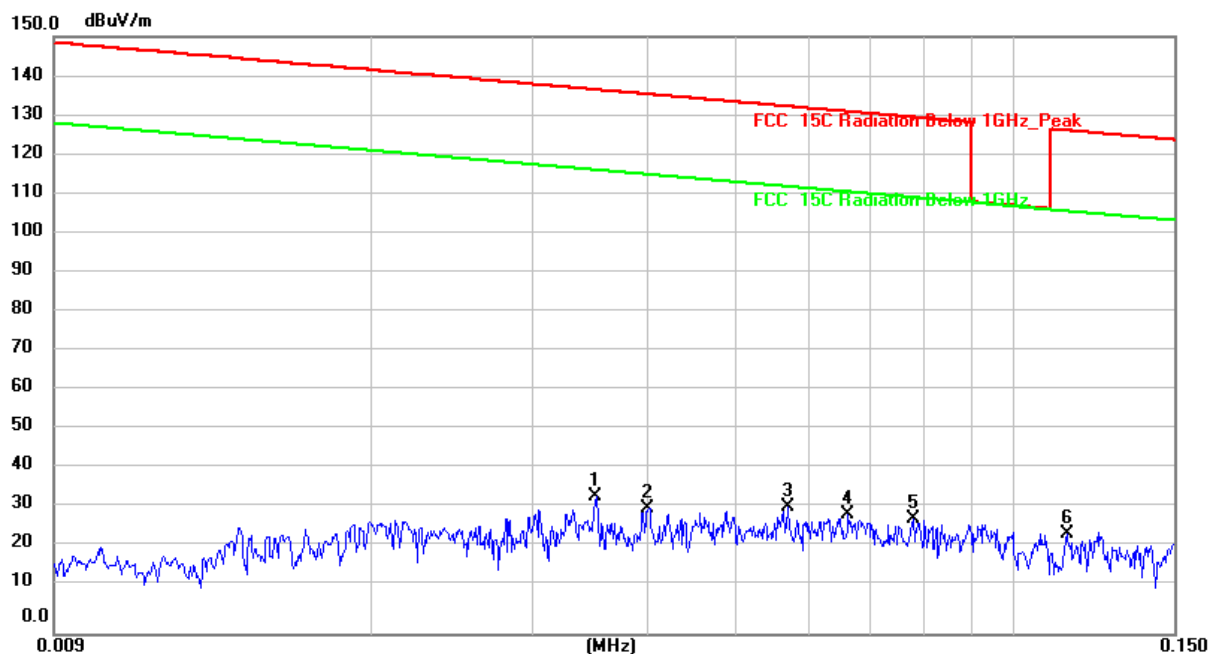
| | | | |
|---------------|---------|---------------|--------------|
| Test mode: | TX | Polarization: | Site axis |
| Power supply: | DC 3.7V | Test site: | RE chamber 2 |



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|
| 1 | * | 13.1100 | 32.25 | -5.31 | 26.94 | 80.50 | -53.56 | QP |
| 2 | | 13.4100 | 31.16 | -5.34 | 25.82 | 80.50 | -54.68 | QP |
| 3 | | 13.5530 | 40.96 | -5.35 | 35.61 | 90.50 | -54.89 | QP |
| 4 | | 13.5600 | 51.67 | -5.35 | 46.32 | 124.00 | -77.68 | QP |
| 5 | | 13.5670 | 40.99 | -5.35 | 35.64 | 90.50 | -54.86 | QP |
| 6 | | 13.7100 | 30.49 | -5.36 | 25.13 | 80.50 | -55.37 | QP |
| 7 | | 14.0100 | 29.54 | -5.39 | 24.15 | 80.50 | -56.35 | QP |

Spurious emissions (9 kHz ~ 150 kHz)

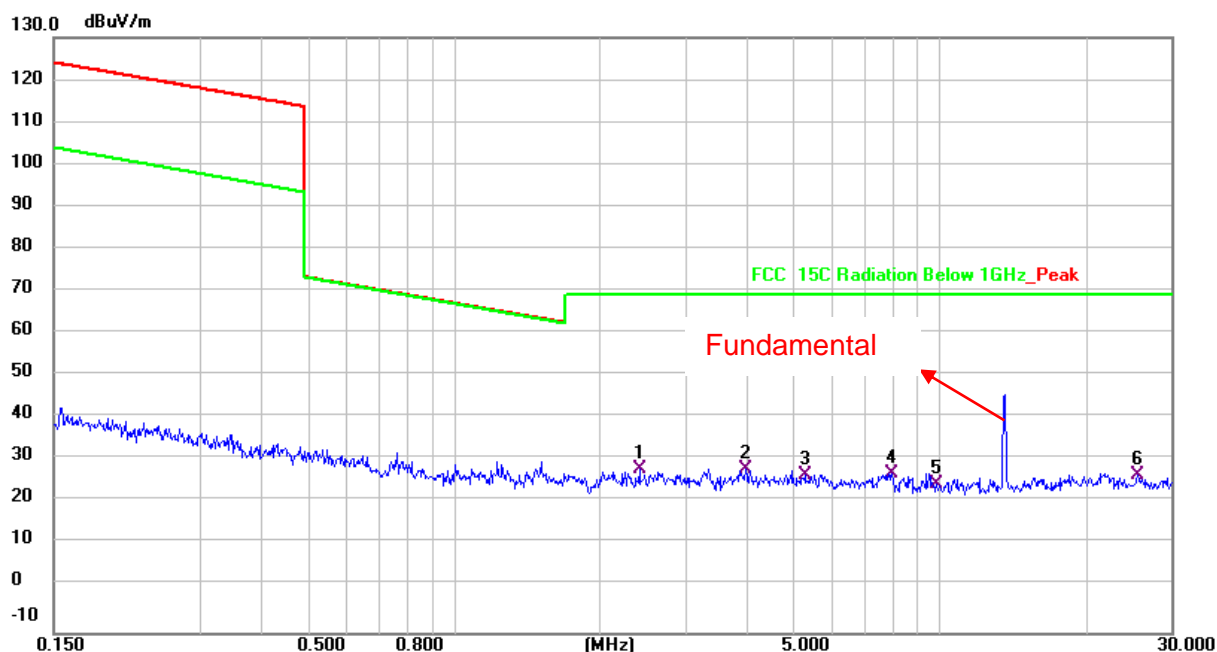
| | | | |
|---------------|---------|---------------|--------------|
| Test mode: | TX | Polarization: | Site axis |
| Power supply: | DC 3.7V | Test site: | RE chamber 2 |



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|
| 1 | | 0.0350 | 37.99 | -3.37 | 34.62 | 136.66 | -102.04 | QP |
| 2 | | 0.0400 | 34.93 | -3.41 | 31.52 | 135.51 | -103.99 | QP |
| 3 | * | 0.0568 | 35.57 | -3.58 | 31.99 | 132.48 | -100.49 | QP |
| 4 | | 0.0661 | 33.68 | -3.66 | 30.02 | 131.17 | -101.15 | QP |
| 5 | | 0.0777 | 32.71 | -3.78 | 28.93 | 129.77 | -100.84 | QP |
| 6 | | 0.1144 | 29.45 | -4.07 | 25.38 | 126.46 | -101.08 | QP |

Spurious emissions (150 kHz ~ 30 MHz)

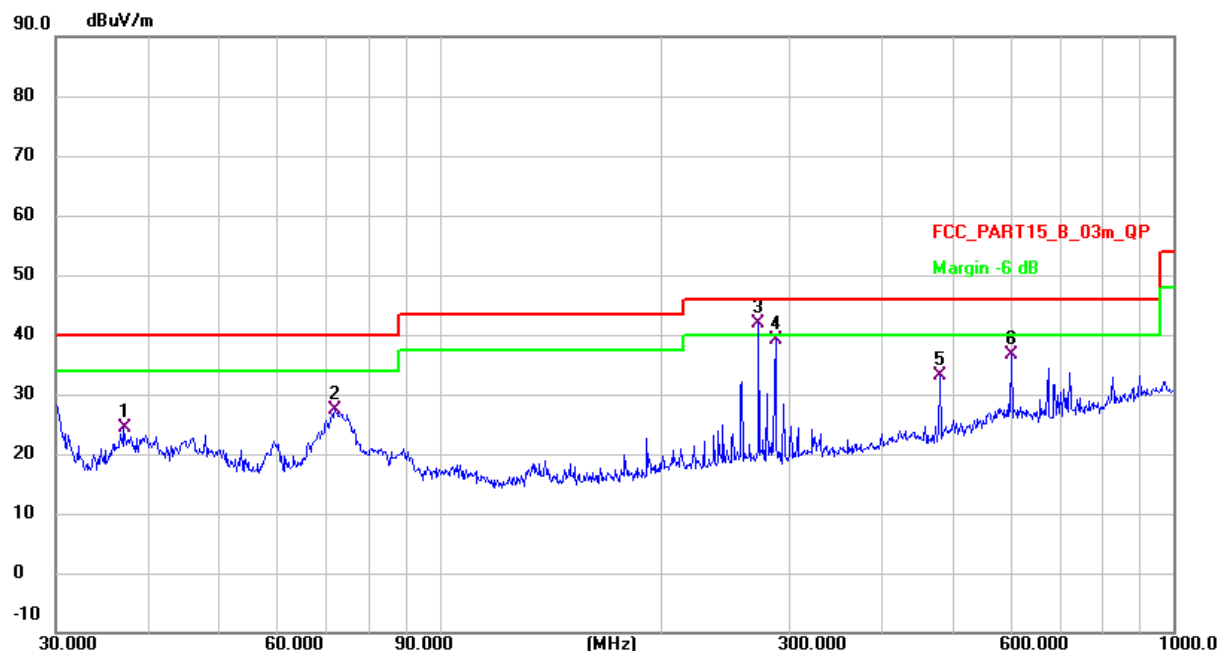
| | | | |
|---------------|---------|---------------|--------------|
| Test mode: | TX | Polarization: | Site axis |
| Power supply: | DC 3.7V | Test site: | RE chamber 2 |



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|
| 1 | * | 2.4089 | 34.31 | -5.60 | 28.71 | 69.50 | -40.79 | QP |
| 2 | | 3.9849 | 34.21 | -5.57 | 28.64 | 69.50 | -40.86 | QP |
| 3 | | 5.2769 | 33.05 | -5.61 | 27.44 | 69.50 | -42.06 | QP |
| 4 | | 7.9774 | 33.64 | -5.95 | 27.69 | 69.50 | -41.81 | QP |
| 5 | | 9.8605 | 31.29 | -5.96 | 25.33 | 69.50 | -44.17 | QP |
| 6 | | 25.5911 | 32.83 | -5.60 | 27.23 | 69.50 | -42.27 | QP |

Spurious emissions (30 MHz ~ 1 GHz)

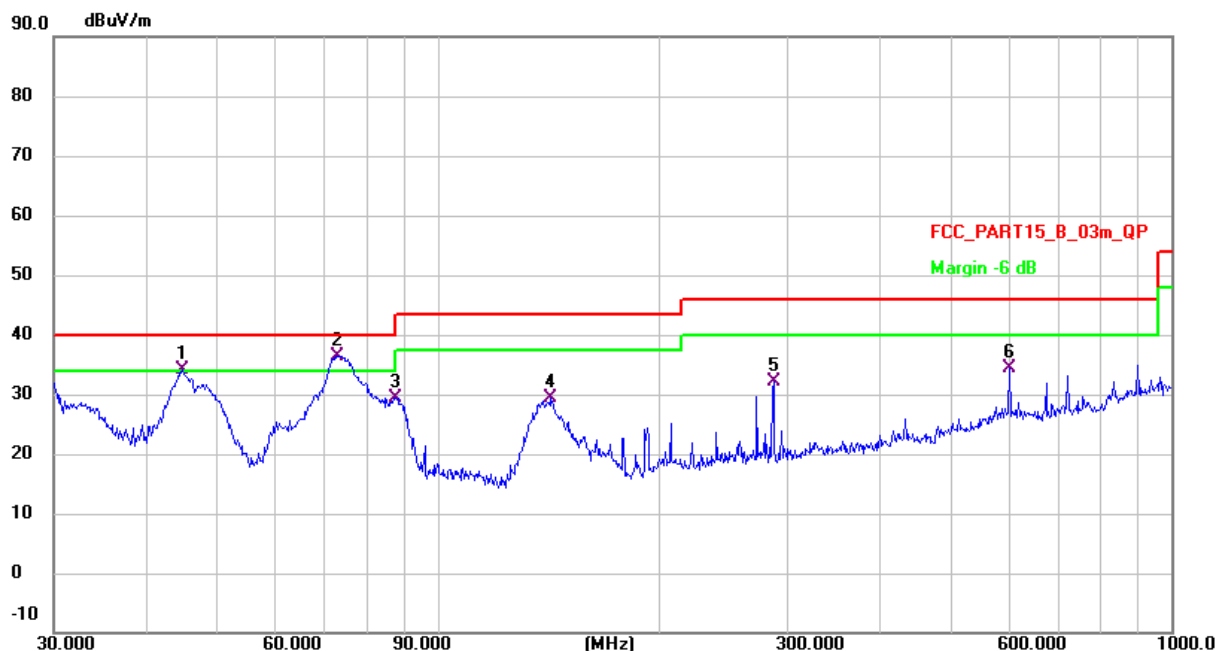
| | | | |
|---------------|--|---------------|--------------|
| Test mode: | TX | Polarization: | Horizontal |
| Power supply: | Power by AC/DC adapter (AC 120V/60Hz) | Test site: | RE chamber 2 |



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|
| 1 | | 37.1550 | 32.49 | -8.14 | 24.35 | 40.00 | -15.65 | QP |
| 2 | | 72.0843 | 37.30 | -10.04 | 27.26 | 40.00 | -12.74 | QP |
| 3 | * | 272.2776 | 47.48 | -5.64 | 41.84 | 46.00 | -4.16 | QP |
| 4 | | 286.9823 | 44.95 | -5.74 | 39.21 | 46.00 | -6.79 | QP |
| 5 | | 480.5276 | 36.42 | -3.22 | 33.20 | 46.00 | -12.80 | QP |
| 6 | | 601.4265 | 36.60 | 0.14 | 36.74 | 46.00 | -9.26 | QP |

Spurious emissions (30 MHz ~ 1 GHz)

| | | | |
|---------------|--|---------------|--------------|
| Test mode: | TX | Polarization: | Vertical |
| Power supply: | Power by AC/DC adapter (AC 120V/60Hz) | Test site: | RE chamber 2 |



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|
| 1 | ! | 44.9006 | 41.50 | -7.40 | 34.10 | 40.00 | -5.90 | QP |
| 2 | * | 73.1025 | 46.54 | -10.06 | 36.48 | 40.00 | -3.52 | QP |
| 3 | | 87.4177 | 38.75 | -9.26 | 29.49 | 40.00 | -10.51 | QP |
| 4 | | 142.8243 | 40.16 | -10.74 | 29.42 | 43.50 | -14.08 | QP |
| 5 | | 286.9823 | 37.94 | -5.74 | 32.20 | 46.00 | -13.80 | QP |
| 6 | | 601.4265 | 34.33 | 0.14 | 34.47 | 46.00 | -11.53 | QP |

5.4 Occupied bandwidth test

5.4.1 Limits

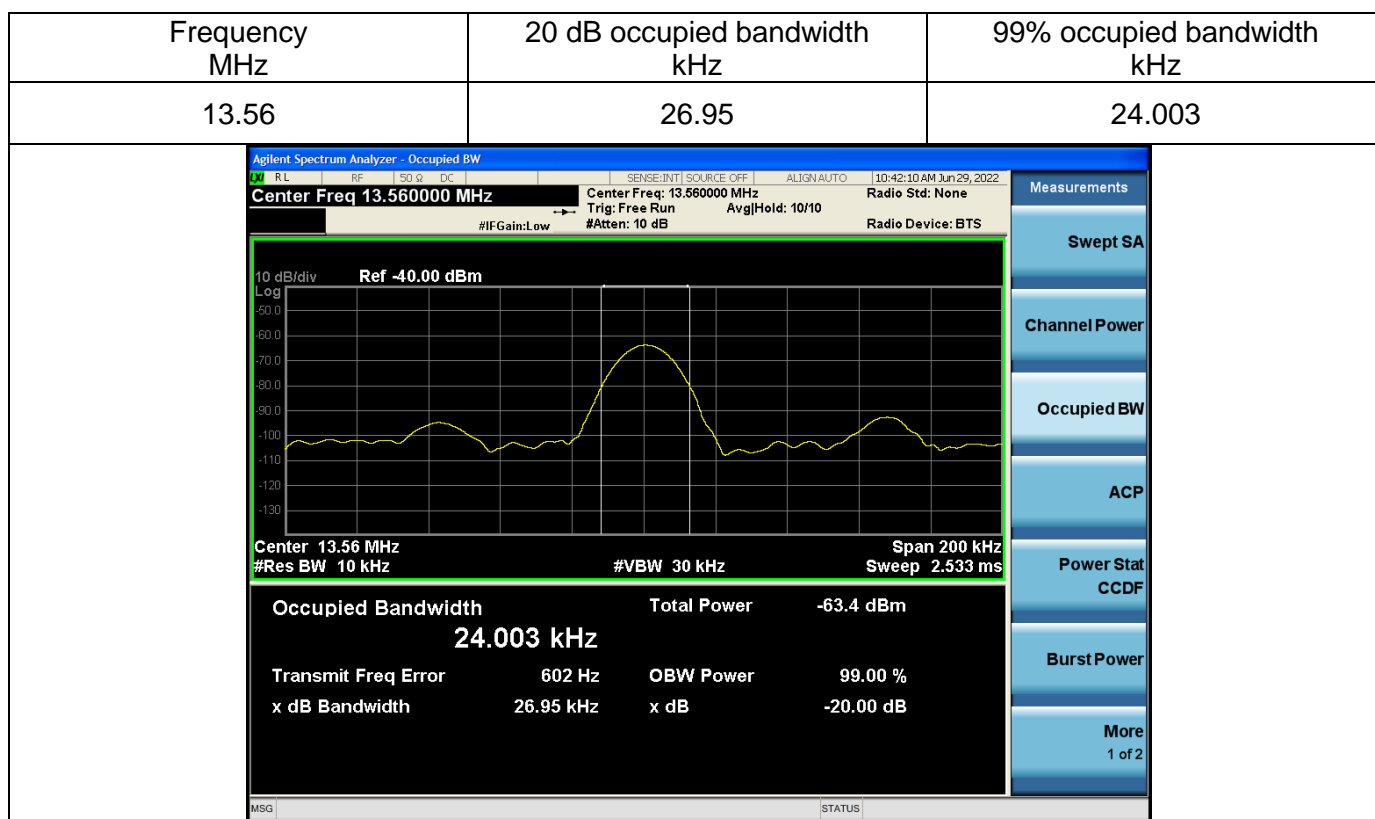
None, for reporting purposes only.

5.4.2 Test Procedures

- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
- The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW.
- Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation.
- The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “-xx dB down” requirement
- Set detection mode to peak and trace mode to max hold.
- Determine the “-xx dB down amplitude” using [(reference value) – xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.

5.4.3 Test Result

Note: Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measurement bandwidth will always follow the RBW. The RBW is set to 10 kHz to perform the occupied bandwidth test.



5.5 Frequency stability

5.5.1 Limit

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+ 50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.5.2 Test Procedure

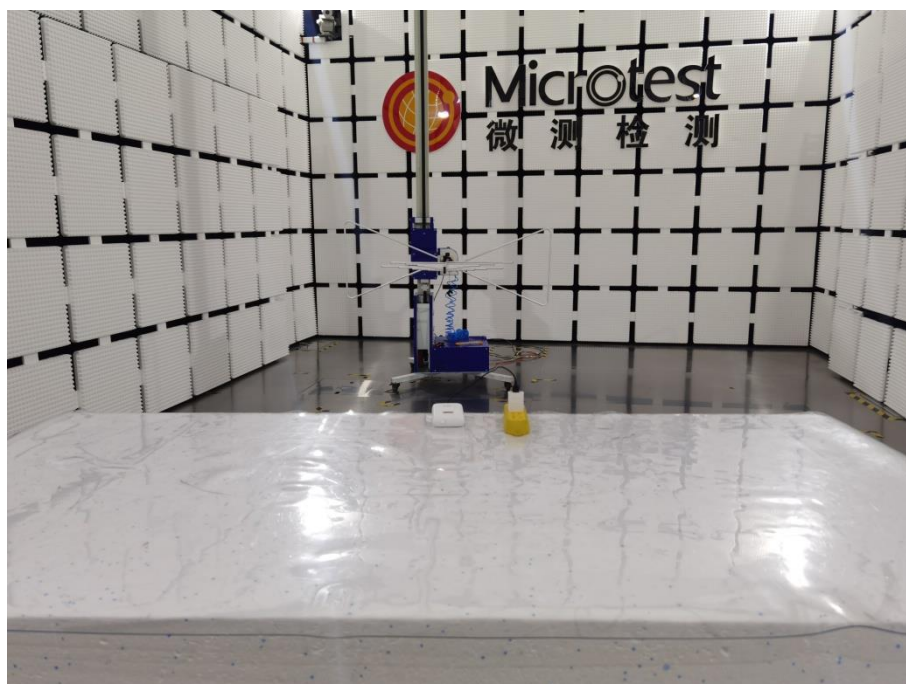
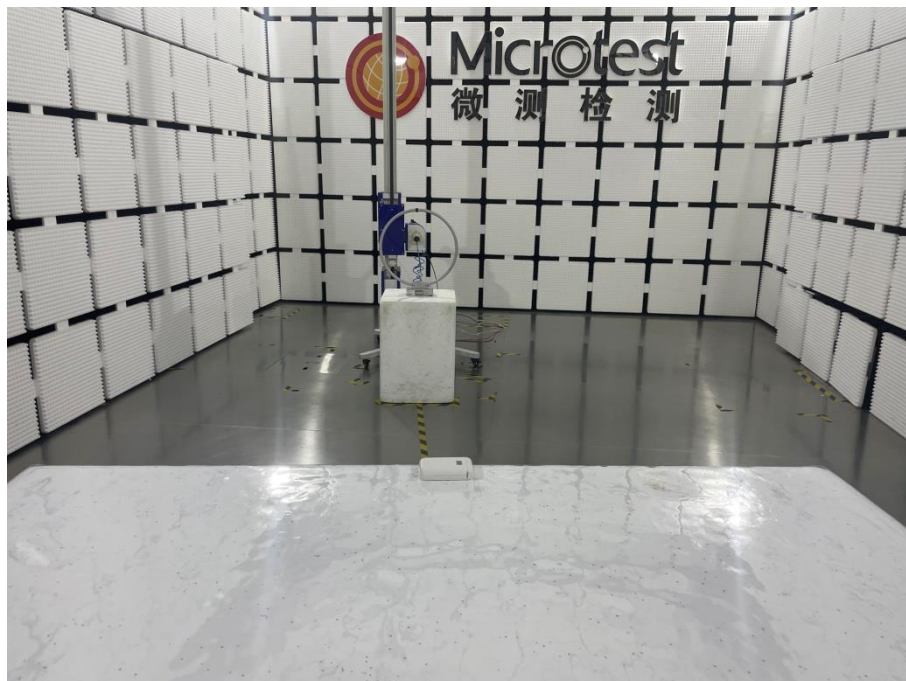
ANSI C63.10-2013 Clause 6.8.

5.5.3 Test result

| Power Supply (VDC) | Temperature (°C) | Measured Frequency (MHz) | Frequency Deviation | Limit |
|--------------------|------------------|--------------------------|---------------------|----------|
| 3.7 | -20 | 13.560346 | 0.0026% | +/-0.01% |
| | -10 | 13.560264 | 0.0019% | |
| | 0 | 13.560538 | 0.0040% | |
| | 10 | 13.560672 | 0.0050% | |
| | 20 | 13.560469 | 0.0035% | |
| | 30 | 13.560583 | 0.0043% | |
| | 40 | 13.560588 | 0.0043% | |
| | 50 | 13.560264 | 0.0019% | |
| 3.145 | 20 | 13.560683 | 0.0050% | |
| 4.255 | 20 | 13.560395 | 0.0029% | |

Photographs of the Test Setup

Radiated emission



Conducted emission



Photographs of the EUT

See the Appendix – EUT Photos.

----End of Report----