# TEST REPORT

| | | |
|---|---|---|
| **Product** | : | Nano G5 |
| **Trade mark** | : | W-DMX |
| **Model/Type reference** | : | A40890G5-SPI |
| **Serial Number** | : | N/A |
| **Report Number** | : | EED32J00133501 |
| **FCC ID** | : | 2APCT-DMXG5SB |
| **Date of Issue** | : | Mar. 15, 2018 |
| **Test Standards** | : | 47 CFR Part 15 Subpart C |
| **Test result** | : | PASS |

Prepared for:

**Wireless Solution Sweden Sales AB**
**Stureparksvagen 7, 451 55 Uddevalla, Sweden**

Prepared by:

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| | | | |
|---|---|---|---|
| Tested By: | Tom chen (Test Project) | Compiled by: | Kevin Ian (Project Engineer) |
| Reviewed by: | Kevin yang (Reviewer) | Approved by: | Sheek Luo (Lab supervisor) |
| Date: | Mar. 15, 2018 | | Check No.: 2448724758 |

CENTRE TESTING INTERNATIONAL GROUP CO.,LTD. Report Seal

# 2 Version

| Version No. | Date | Description |
|---|---|---|
| 00 | Mar. 15, 2018 | Original |
| | | |
| | | |

# 3 Test Summary

| Test Item | Test Requirement | Test method | Result |
|---|---|---|---|
| **Antenna Requirement** | 47 CFR Part 15 Subpart C Section 15.203/15.247 (c) | ANSI C63.10-2013 | PASS |
| **AC Power Line Conducted Emission** | 47 CFR Part 15 Subpart C Section 15.207 | ANSI C63.10-2013 | PASS |
| **Conducted Peak Output Power** | 47 CFR Part 15 Subpart C Section 15.247 (b)(1) | ANSI C63.10-2013 | PASS |
| **20dB Occupied Bandwidth** | 47 CFR Part 15 Subpart C Section 15.247 (a)(1) | ANSI C63.10-2013 | PASS |
| **Carrier Frequencies Separation** | 47 CFR Part 15 Subpart C Section 15.247 (a)(1) | ANSI C63.10-2013 | PASS |
| **Hopping Channel Number** | 47 CFR Part 15 Subpart C Section 15.247 (b) | ANSI C63.10-2013 | PASS |
| **Dwell Time** | 47 CFR Part 15 Subpart C Section 15.247 (a)(1) | ANSI C63.10-2013 | PASS |
| **Pseudorandom Frequency Hopping Sequence** | 47 CFR Part 15 Subpart C Section 15.247(b)(4)&TCB Exclusion List (7 July 2002) | ANSI C63.10-2013 | PASS |
| **RF Conducted Spurious Emissions** | 47 CFR Part 15 Subpart C Section 15.247(d) | ANSI C63.10-2013 | PASS |
| **Radiated Spurious emissions** | 47 CFR Part 15 Subpart C Section 15.205/15.209 | ANSI C63.10-2013 | PASS |

Remark:
The tested sample(s) and the sample information are provided by the client.

# 4 Content

# 5 Test Requirement

## 5.1 Test setup

### 5.1.1 For Radiated Emissions test setup

**Radiated Emissions setup:**

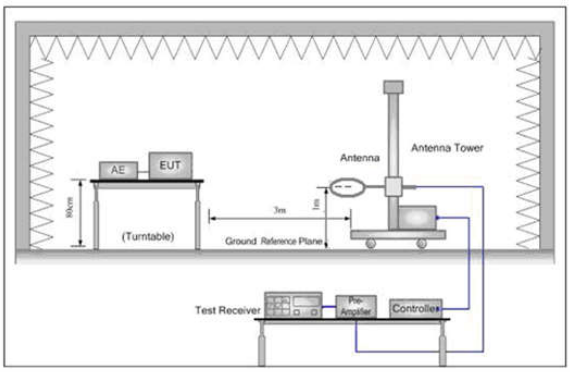



Figure 1. Below 30MHz

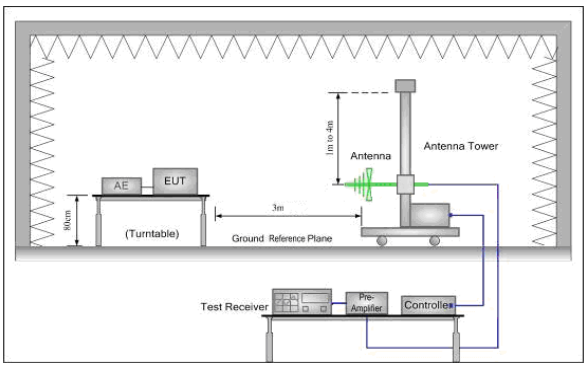



Figure 2. 30MHz to 1GHz

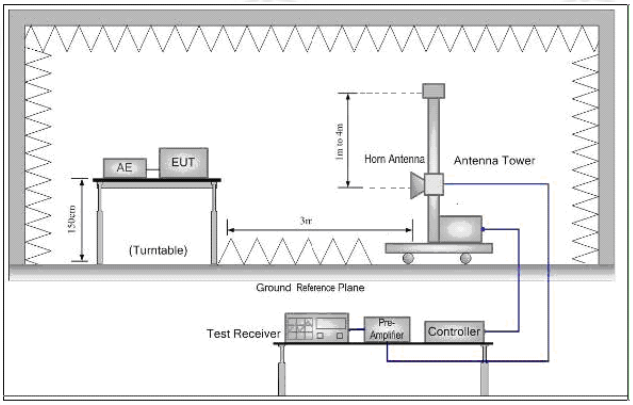



Figure 3. Above 1GHz

## 5.2 Test Environment

| **Operating Environment:** | |
|---|---|
| Temperature: | 23.5 °C |
| Humidity: | 55 % RH |
| Atmospheric Pressure: | 1010mbar |

## 5.3 Test Condition

| Test Mode | Tx/Rx | RF Channel | | |
|---|---|---|---|---|
| | | Low(L) | Middle(M) | High(H) |
| GFSK | 2403MHz ~2478 MHz | Channel 1 | Channel 38 | Channel76 |
| | | 2403MHz | 2440MHz | 2478MHz |

# 6 General Information

## 6.1 Client Information

| | |
|---|---|
| Applicant: | Wireless Solution Sweden Sales AB |
| Address of Applicant: | Stureparksvagen 7, 451 55 Uddevalla, Sweden |
| Manufacturer: | Wireless Solution Sweden Sales AB |
| Address of Manufacturer: | Stureparksvagen 7, 451 55 Uddevalla, Sweden |
| Factory: | Orbit One |
| Address of Factory: | Fridhemsvagen 15, Box 73, 372 38 Ronneby |

## 6.2 General Description of EUT

| | |
|---|---|
| Product Name: | Nano G5 |
| Model No.(EUT): | A40890G5-SPI |
| Test Model No.: | A40890G5-SPI |
| Trade mark: | W-DMX |
| EUT Supports Radios application: | 2403MHz~2478MHz |
| Power Supply: | DC 5V |
| Sample Received Date: | Dec 4, 2017 |
| Sample tested Date: | Dec 4, 2017 to Mar. 12, 2018 |

## 6.3 Product Specification subjective to this standard

| | |
|---|---|
| Operation Frequency: | 2403MHz~2478MHz |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS) |
| Modulation Type: | GFSK |
| Number of Channel: | 76 |
| Test Power Grade: | N/A |
| Test Software of EUT: | N/A |
| Antenna Type: | Dipole Antenna |
| Antenna Gain: | 3dBi |
| Test Voltage: | DC 5V |

Operation Frequency each of channel

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 1 | 2403MHz | 21 | 2423MHz | 41 | 2443MHz | 61 | 2463MHz |
| 2 | 2404MHz | 22 | 2424MHz | 42 | 2444MHz | 62 | 2464MHz |
| 3 | 2405MHz | 23 | 2425MHz | 43 | 2445MHz | 63 | 2465MHz |
| 4 | 2406MHz | 24 | 2426MHz | 44 | 2446MHz | 64 | 2466MHz |
| 5 | 2407MHz | 25 | 2427MHz | 45 | 2447MHz | 65 | 2467MHz |
| 6 | 2408MHz | 26 | 2428MHz | 46 | 2448MHz | 66 | 2468MHz |
| 7 | 2409MHz | 27 | 2429MHz | 47 | 2449MHz | 67 | 2469MHz |
| 8 | 2410MHz | 28 | 2430MHz | 48 | 2450MHz | 68 | 2470MHz |
| 9 | 2411MHz | 29 | 2431MHz | 49 | 2451MHz | 69 | 2471MHz |
| 10 | 2412MHz | 30 | 2432MHz | 50 | 2452MHz | 70 | 2472MHz |
| 11 | 2413MHz | 31 | 2433MHz | 51 | 2453MHz | 71 | 2473MHz |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12 | 2414MHz | 32 | 2434MHz | 52 | 2454MHz | 72 | 2474MHz |
| 13 | 2415MHz | 33 | 2435MHz | 53 | 2455MHz | 73 | 2475MHz |
| 14 | 2416MHz | 34 | 2436MHz | 54 | 2456MHz | 74 | 2476MHz |
| 15 | 2417MHz | 35 | 2437MHz | 55 | 2457MHz | 75 | 2477MHz |
| 16 | 2418MHz | 36 | 2438MHz | 56 | 2458MHz | 76 | 2478MHz |
| 17 | 2419MHz | 37 | 2439MHz | 57 | 2459MHz | | |
| 18 | 2420MHz | 38 | 2440MHz | 58 | 2460MHz | | |
| 19 | 2421MHz | 39 | 2441MHz | 59 | 2461MHz | | |
| 20 | 2422MHz | 40 | 2442MHz | 60 | 2462MHz | | |

## 6.4 Description of Support Units

The EUT has been tested independently.

## 6.5 Test Location

All tests were performed at:
Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101
Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385
No tests were sub-contracted.
FCC Designation No.: CN1164

## 6.6 Deviation from Standards

None.

## 6.7 Abnormalities from Standard Conditions

None.

## 6.8 Other Information Requested by the Customer

None.

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

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | Radio Frequency | $7.9 \times 10^{-8}$ |
| 2 | RF power, conducted | 0.31dB (30MHz-1GHz) |
| | | 0.57dB (1GHz-18GHz) |
| 3 | Radiated Spurious emission test | 4.5dB (30MHz-1GHz) |
| | | 4.8dB (1GHz-12.75GHz) |
| 4 | Conduction emission | 3.6dB (9kHz to 150kHz) |
| | | 3.2dB (150kHz to 30MHz) |
| 5 | Temperature test | 0.64°C |
| 6 | Humidity test | 2.8% |
| 7 | DC power voltages | 0.025% |

# 7 Equipment List

| RF test system | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Mode No.** | **Serial Number** | **Cal. Date (mm-dd-yyyy)** | **Cal. Due date (mm-dd-yyyy)** |
| Signal Generator | Keysight | E8257D | MY53401106 | 03-14-2017 | 03-13-2018 |
| Spectrum Analyzer | Keysight | N9010A | MY54510339 | 03-14-2017 | 03-13-2018 |
| Signal Generator | Keysight | N5182B | MY53051549 | 03-14-2017 | 03-13-2018 |
| High-pass filter | Sinoscite | FL3CX03WG18 NM12-0398-002 | --- | 01-10-2018 | 01-09-2019 |
| DC Power | Keysight | E3642A | MY54426035 | 03-14-2017 | 03-13-2018 |
| power meter & power sensor | R&S | OSP120 | 101374 | 03-14-2017 | 03-13-2018 |
| RF control unit | JS Tonscend | JS0806-2 | 2015860006 | 03-14-2017 | 03-13-2018 |
| Temperature / Humidity Indicator | Defu | TH128 | --- | 07-08-2017 | 07-07-2018 |

| Conducted disturbance Test | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial Number** | **Cal. date (mm-dd-yyyy)** | **Cal. Due date (mm-dd-yyyy)** |
| Receiver | R&S | ESCI | 100009 | 06-14-2017 | 06-13-2018 |
| Temperature/ Humidity Indicator | TAYLOR | 1451 | 1905 | 05-08-2017 | 05-07-2018 |
| LISN | schwarzbeck | NNLK8121 | 8121-529 | 06-13-2017 | 06-12-2018 |

| 3M Semi/full-anechoic Chamber | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial Number** | **Cal. date (mm-dd-yyyy)** | **Cal. Due date (mm-dd-yyyy)** |
| 3M Chamber&Accessory Equipment | TDK | SAC-3 | --- | 06-04-2016 | 06-03-2019 |
| Spectrum Analyzer | Agilent | E4443A | MY45300910 | 11-16-2017 | 11-15-2018 |
| Receiver | R&S | ESCI | 100435 | 06-14-2017 | 06-13-2018 |
| TRILOG Broadband Antenna | Schwarzbeck | VULB 9163 | 9163-618 | 08-15-2017 | 08-14-2018 |
| Horn Antenna | ETS-LINGREN | 3117 | 00057407 | 07-20-2017 | 07-18-2018 |
| Spectrum Analyzer | R&S | FSP40 | 100416 | 06-13-2017 | 06-12-208 |
| Microwave Preamplifier | JS Tonscend | EMC051845SE | 980380 | 01-19-2018 | 01-18-2019 |
| Loop Antenna | ETS-LINDGREN | 6502 | 00071730 | 06-22-2017 | 06-21-2019 |
| Horn Antenna | ETS-LINGREN | 3117 | 00057407 | 07-20-2017 | 07-18-2018 |
| Double ridge horn antenna | A.H.SYSTEMS | SAS-574 | 6042 | 06-30-2015 | 06-28-2018 |
| Pre-amplifier | A.H.SYSTEMS | PAP-1840-60 | 6041 | 06-30-2015 | 06-28-2018 |
| Temperature/ Humidity Indicator | TAYLOR | 1451 | 1905 | 05-08-2017 | 05-07-2018 |
| Cable line | Fulai(7M) | SF106 | 5219/6A | 01-11-2017 | 01-10-2018 |
| Cable line | Fulai(7M) | SF106 | 5219/6A | 01-09-2018 | 01-08-2019 |
| Cable line | Fulai(6M) | SF106 | 5220/6A | 01-11-2017 | 01-10-2018 |
| Cable line | Fulai(6M) | SF106 | 5220/6A | 01-09-2018 | 01-08-2019 |
| Cable line | Fulai(3M) | SF106 | 5216/6A | 01-11-2017 | 01-10-2018 |
| Cable line | Fulai(3M) | SF106 | 5216/6A | 01-09-2018 | 01-08-2019 |
| Cable line | Fulai(3M) | SF106 | 5217/6A | 01-11-2017 | 01-10-2018 |
| Cable line | Fulai(3M) | SF106 | 5217/6A | 01-09-2018 | 01-08-2019 |
| band rejection filter | Sinoscite | FL5CX01CA09 CL12-0395-001 | --- | 11-06-2017 | 11-05-2018 |
| band rejection filter | Sinoscite | FL5CX01CA08 CL12-0393-001 | --- | 11-06-2017 | 11-05-2018 |
| band rejection filter | Sinoscite | FL5CX02CA04 CL12-0396-002 | --- | 11-06-2017 | 11-05-2018 |
| band rejection filter | Sinoscite | FL5CX02CA03 CL12-0394-001 | --- | 11-06-2017 | 11-05-2018 |

# 8 Radio Technical Requirements Specification

**Reference documents for testing:**

| No. | Identity | Document Title |
|---|---|---|
| 1 | FCC Part15C | Subpart C-Intentional Radiators |
| 2 | ANSI C63.10-2013 | American National Standard for Testing Unlicesed Wireless Devices |

**Test Results List:**

| Test requirement | Test method | Test item | Verdict | Note |
|---|---|---|---|---|
| Part15C Section 15.247 (a)(1) | ANSI 63.10 | 20dB Occupied Bandwidth | PASS | Appendix A) |
| Part15C Section 15.247 (a)(1) | ANSI 63.10 | Carrier Frequencies Separation | PASS | Appendix B) |
| Part15C Section 15.247 (a)(1) | ANSI 63.10 | Dwell Time | PASS | Appendix C) |
| Part15C Section 15.247 (b) | ANSI 63.10 | Hopping Channel Number | PASS | Appendix D) |
| Part15C Section 15.247 (b)(1) | ANSI 63.10 | Conducted Peak Output Power | PASS | Appendix E) |
| Part15C Section 15.247(d) | ANSI 63.10 | Band-edge for RF Conducted Emissions | PASS | Appendix F) |
| Part15C Section 15.247(d) | ANSI 63.10 | RF Conducted Spurious Emissions | PASS | Appendix G) |
| Part15C Section 15.247 (a)(1) | ANSI 63.10 | Pseudorandom Frequency Hopping Sequence | PASS | Appendix H) |
| Part15C Section 15.203/15.247 (c) | ANSI 63.10 | Antenna Requirement | PASS | Appendix I) |
| Part15C Section 15.207 | ANSI 63.10 | AC Power Line Conducted Emission | N/A | Appendix J) |
| Part15C Section 15.205/15.209 | ANSI 63.10 | Restricted bands around fundamental frequency (Radiated) Emission) | PASS | Appendix K) |
| Part15C Section 15.205/15.209 | ANSI 63.10 | Radiated Spurious Emissions | PASS | Appendix L) |

# Appendix A): 20dB Occupied Bandwidth

## Test Result

| Mode | Channel. | 20dB Bandwidth [MHz] | 99% OBW [MHz] | Verdict | Remark |
|---|---|---|---|---|---|
| GFSK | LCH | 1.0440 | 0.98264 | PASS | Peak detector |
| GFSK | MCH | 0.9625 | 0.95725 | PASS | |
| GFSK | HCH | 0.7843 | 0.77525 | PASS | |

**Test Graph**

| Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/MCH | |  | |
| GFSK/HCH | |  | |

# Appendix B): Carrier Frequency Separation

**Result Table**

| Mode | Channel. | Carrier Frequency Separation [MHz] | Verdict |
|---|---|---|---|
| GFSK | LCH | 1.008 | PASS |
| GFSK | MCH | 0.980 | PASS |
| GFSK | HCH | 1.000 | PASS |

**Test Graph**

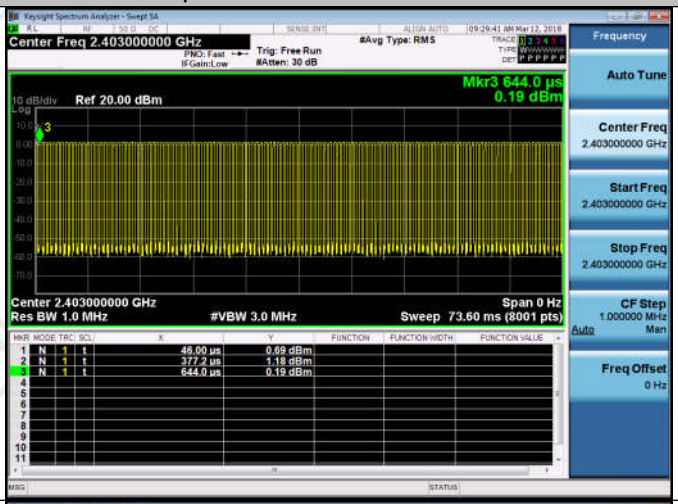
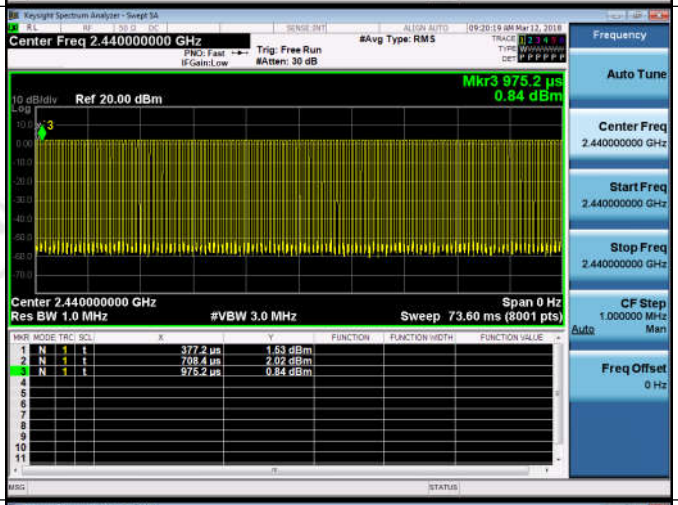
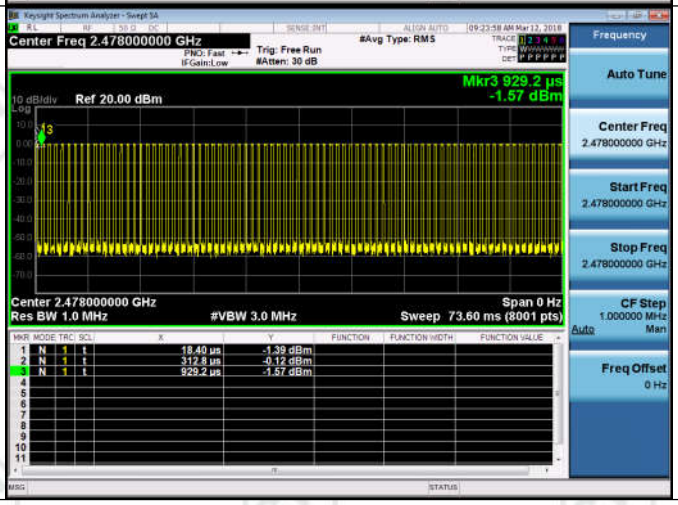
| Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/MCH | |  | |
| GFSK/HCH | |  | |

# Appendix C): Dwell Time

## Result Table

| Mode | Channel | Burst Width [ms/hop/ch] | Total Hops[hop*ch] | Dwell Time[s] | Duty Cycle [%] | Verdict |
|---|---|---|---|---|---|---|
| GFSK | LCH | 0.3312 | 106.7 | 0.035 | 0.55 | PASS |
| GFSK | MCH | 0.3312 | 106.7 | 0.035 | 0.55 | PASS |
| GFSK | HCH | 0.2944 | 106.7 | 0.031 | 0.32 | PASS |

**Test Graph**

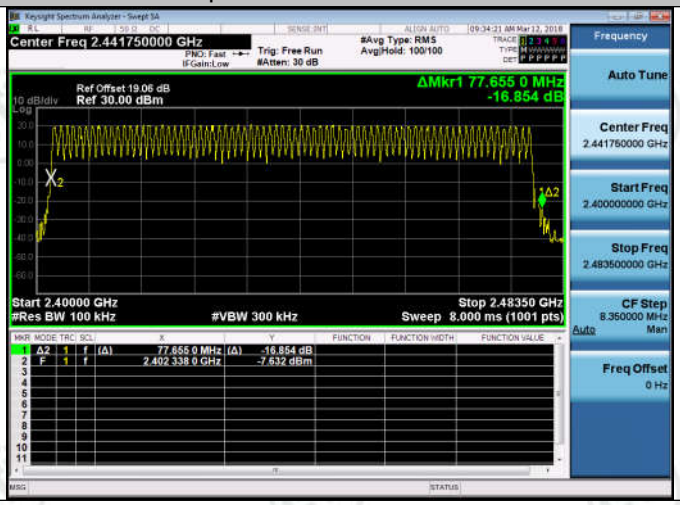
| Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/MCH | |  | |
| GFSK/HCH | |  | |

# Appendix D): Hopping Channel Number

## Result Table

| Mode | Channel. | Number of Hopping Channel | Verdict |
|---|---|---|---|
| GFSK | Hop | 76 | PASS |

## Test Graph

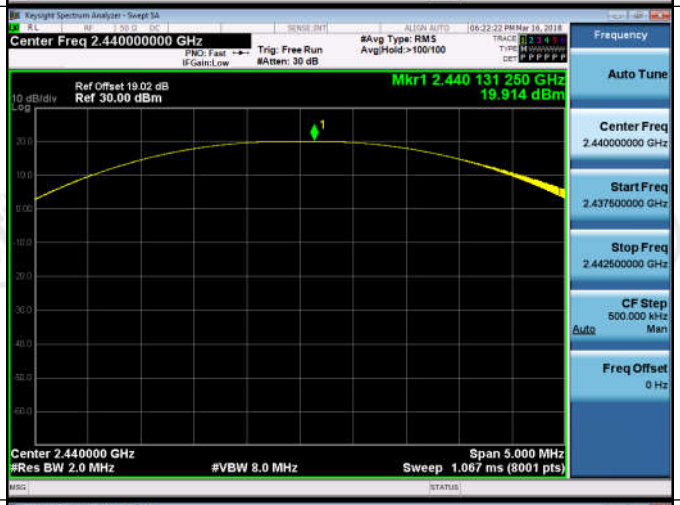
| Graphs | | | |
|---|---|---|---|
| GFSK/Hop | |  | |

# Appendix E): Conducted Peak Output Power

## Result Table

| Mode | Channel. | Maximum Peak Output Power [dBm] | Verdict |
|---|---|---|---|
| GFSK | LCH | 20.332 | PASS |
| GFSK | MCH | 19.914 | PASS |
| GFSK | HCH | 19.022 | PASS |

**Test Graph**

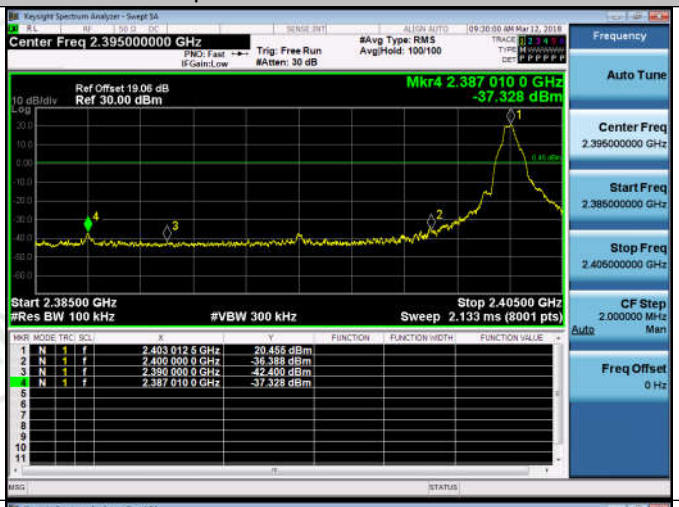
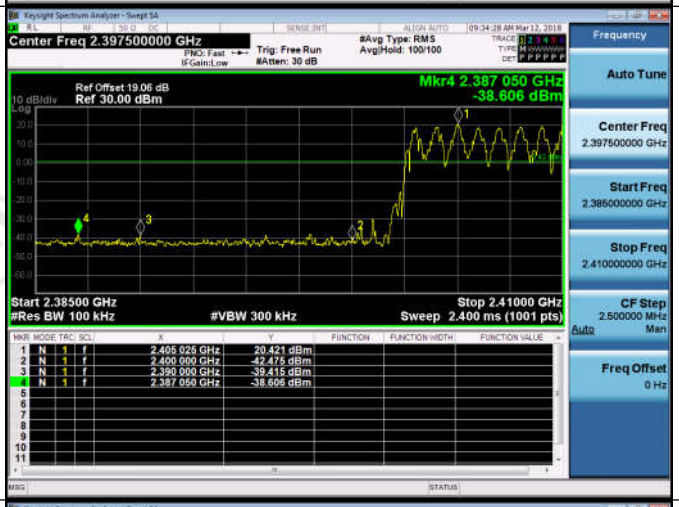
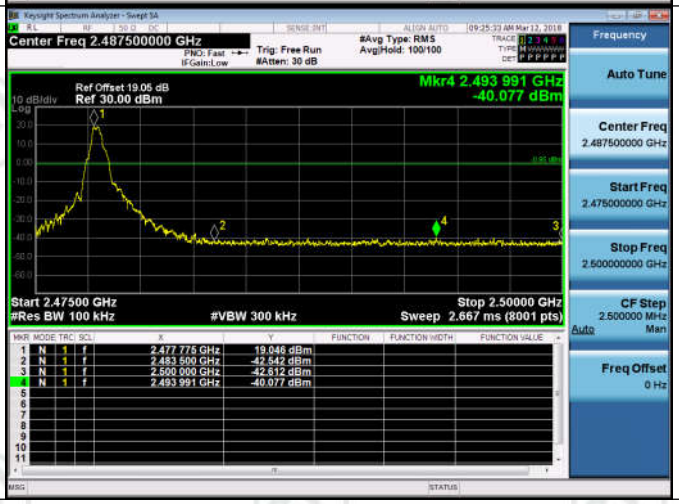
| Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/MCH | |  | |
| GFSK/HCH | |  | |

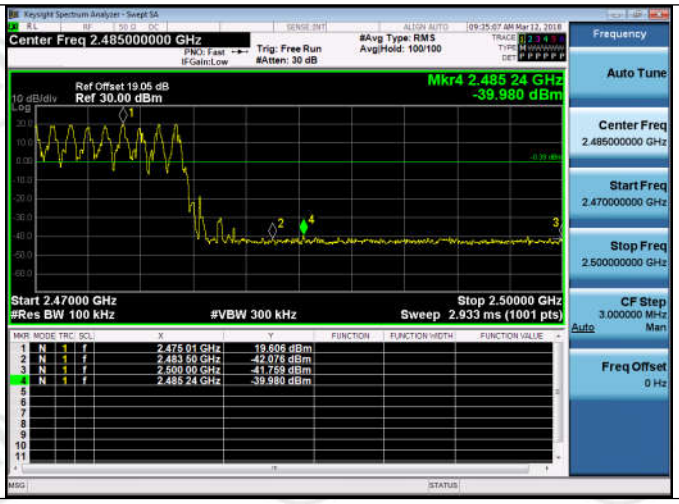
# Appendix F): Band-edge for RF Conducted Emissions

## Result Table

| Mode | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| GFSK | LCH | 2403 | 20.455 | Off | -37.328 | 0.45 | PASS |
| | | | 20.421 | On | -38.606 | 0.42 | PASS |
| GFSK | HCH | 2478 | 19.046 | Off | -40.077 | -0.95 | PASS |
| | | | 19.606 | On | -39.980 | -0.39 | PASS |

**Test Graph**

| Graphs | | |
|---|---|---|
| GFSK/LCH/No Hop | |  |
| GFSK/LCH/Hop | |  |
| GFSK/HCH/No Hop | |  |

| | |
|---|---|
| GFSK/HCH/Hop |  |

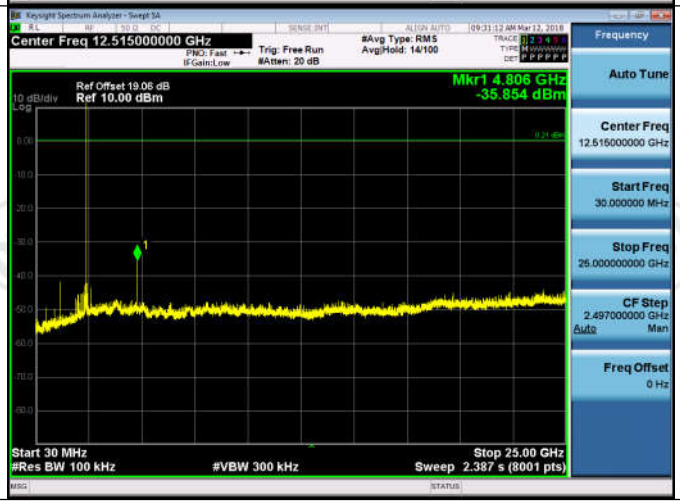
Center Freq 2.485000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
Ref Offset 19.05 dB
10 dB/div
Ref 30.00 dBm
Mkr4 2.485 24 GHz
-39.980 dBm
Start 2.47000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 2.933 ms (1001 pts)
1 N 1 f 2.475 01 GHz 19.606 dBm
2 N 1 f 2.483 50 GHz -42.076 dBm
3 N 1 f 2.500 00 GHz -41.759 dBm
4 N 1 f 2.485 24 GHz -39.980 dBm
Frequency
Auto Tune
Center Freq
2.485000000 GHz
Start Freq
2.470000000 GHz
Stop Freq
2.500000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz

# Appendix G): RF Conducted Spurious Emissions

## Result Table

| Mode | Channel | Pref [dBm] | Puw[dBm] | Verdict |
|---|---|---|---|---|
| GFSK | LCH | 20.212 | <Limit | PASS |
| GFSK | MCH | 19.785 | <Limit | PASS |
| GFSK | HCH | 18.999 | <Limit | PASS |

**Test Graph**

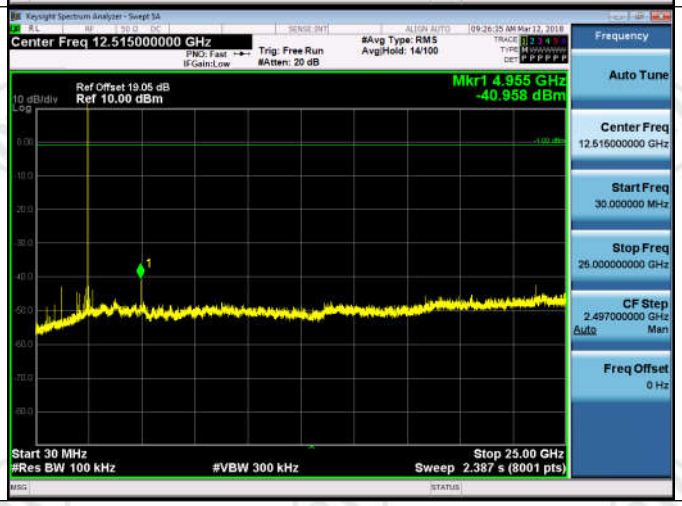
| GFSK_LCH_Graphs | | |
|---|---|---|
| Pref | |  |
| Puw | |  |





| GFSK_MCH_Graphs | | |
|---|---|---|
| Pref | |  |

| | |
|---|---|
| Puw |  |

| GFSK_HCH_Graphs | |
|---|---|
| Pref |  |
| Puw |  |

# Appendix H): Pseudorandom Frequency Hopping Sequence

| Test Requirement: | 47 CFR Part 15C Section 15.247 (a)(1) requirement: |
|---|---|

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

**EUT Pseudorandom Frequency Hopping Sequence**

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule.

This device uses a propriety radio (W-DMX) which operates in 2400-2483.5 MHz band. The used radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 76 bands (1 MHz each; centered from 2403 to 2478 MHz) in the range 2400-2483.5 MHz. The transmitter switches hop frequencies 1661 times per second to assure a high degree of data security. All receivers connected to a transmitter are synchronized to the frequency-hopping channel for the transmitter. The frequency hopping sequence is sent to the receivers during linking and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the transmitter's internal clock. Therefore, all connected receivers must know the frequency hopping sequence and synchronize their clocks with the transmitters clock.

Adaptive Frequency Hopping (AFH) was introduced to provide an effective way for the radio system to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the radio signal, or where the W-DMX signal is interfering with another device. The AFH-enabled W-DMX transmitter will then communicate with the receivers to share details of any identified "bad" channels. The transmitter will then switch to a subset of the original frequency hopping signal where the "bad" signal are avoided.

**EUT Pseudorandom Frequency Hopping Sequence**

Pseudorandom Frequency Hopping Sequence Table as below:

Channel: 13, 29, 62, 21, 51, 76, 11, 39, 60, 22, 49, 74, 7, 30, 69, 16, 52, 10, 41, 63, 18, 55, 3, 31, 68, 17, 45,1, 32, 65, 25, 50, 72, 2, 35, 58, 24, 53, 5, 34, 57, 20, 44, 71, 9, 36, 66, 23, 43, 73, 4, 38, 64, 27, 48, 75, 12, 40, 61, 26, 46,6, 37, 59, 19, 47, 8, 33, 67, 15, 54, 13, 29, 62, …

The device does not have the ability to be coordinated with other FHSS systems in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

# Appendix I): Antenna Requirement

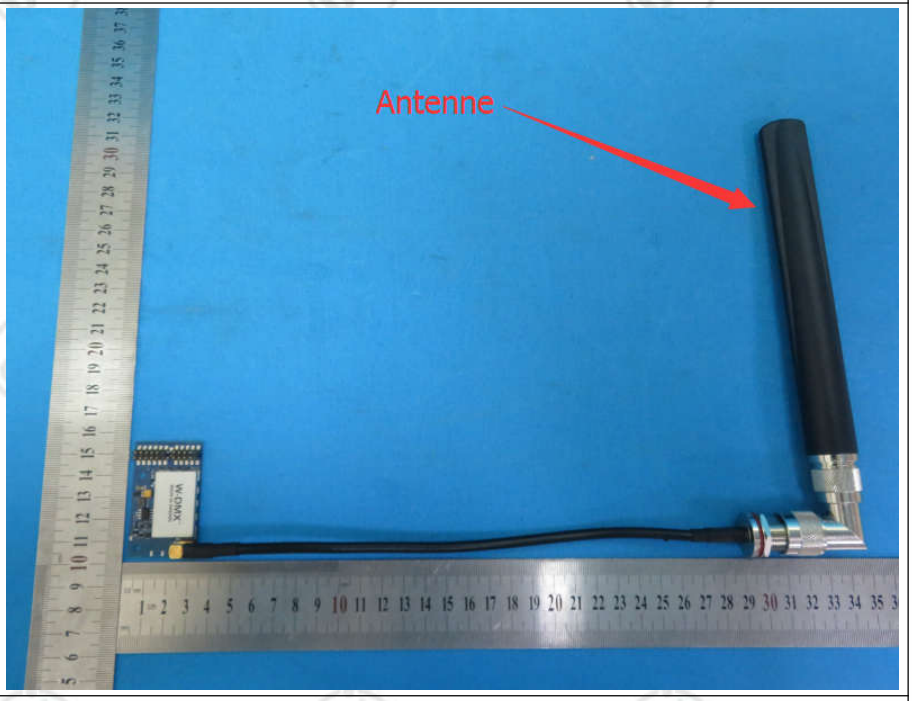
**15.203 requirement:**

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 antenna is Dipole antenna and no consideration of replacement. The best case gain of the antenna is 3dBi.

# Appendix J): AC Power Line Conducted Emission

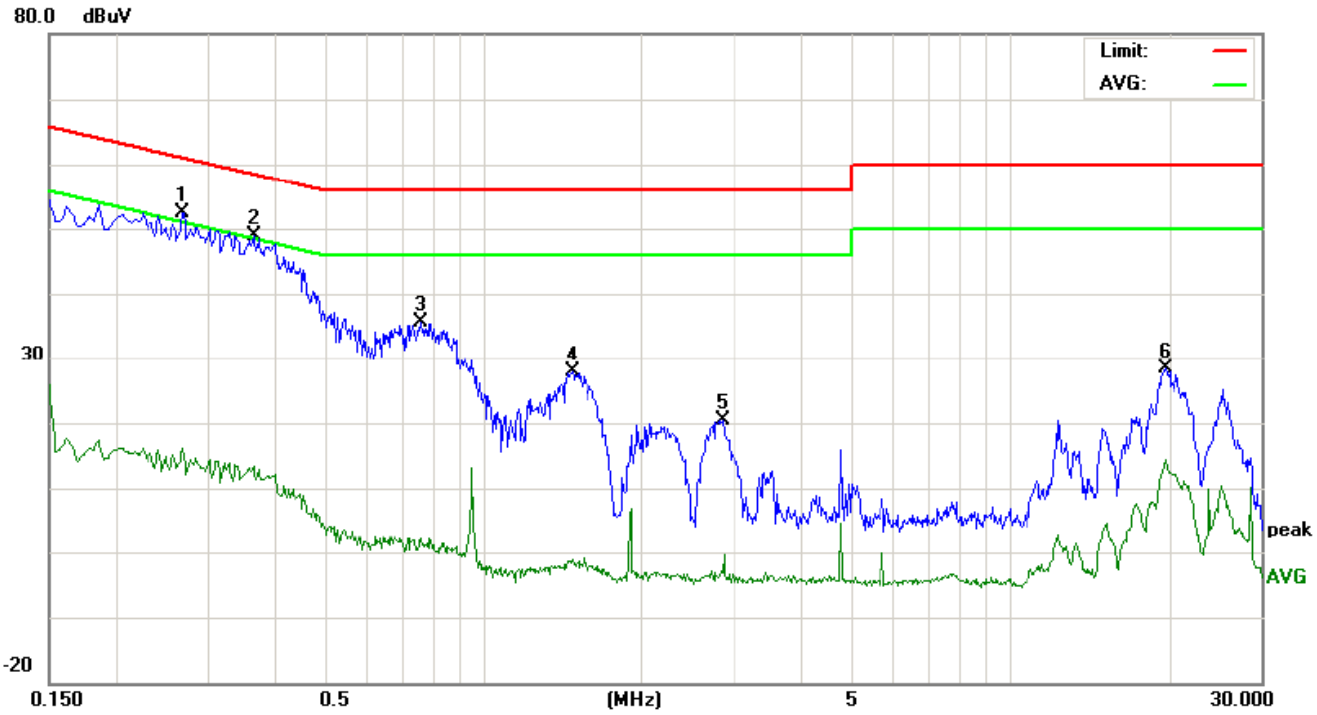
<table>
<tr><td>Test Procedure:</td><td>Test frequency range :150KHz-30MHz<br>1)The mains terminal disturbance voltage test was conducted in a shielded room.<br>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. 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.<br>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,<br>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.<br>5) 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 on conducted measurement.</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</th></tr>
<tr><th>Quasi-peak</th><th>Average</th></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.<br>NOTE : The lower limit is applicable at the transition frequency</td></tr>
</table>

**Measurement Data**

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

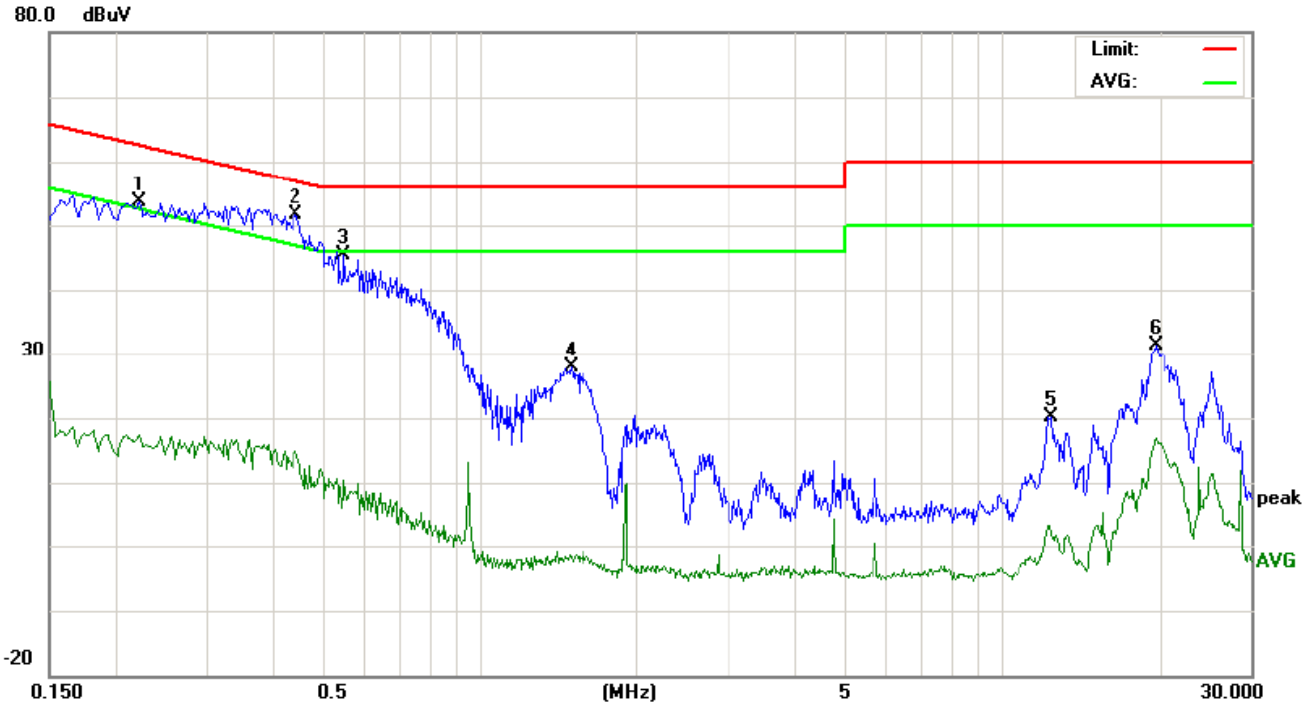
Quasi-Peak and Average measurement were performed at the frequencies with maximized peake mission were detected.

Live line:




| No. | Freq. | Reading_Level (dBuV) | | | Correct Factor | Measurement (dBuV) | | | Limit (dBuV) | | Margin (dB) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | Peak | QP | AVG | dB | peak | QP | AVG | QP | AVG | QP | AVG | P/F | Comment |
| 1 | 0.2700 | 42.71 | 38.23 | 6.49 | 9.76 | 52.47 | 47.99 | 16.25 | 61.12 | 51.12 | -13.13 | -34.87 | P | |
| 2 | 0.3660 | 39.09 | 35.29 | 3.66 | 9.76 | 48.85 | 45.05 | 13.42 | 58.59 | 48.59 | -13.54 | -35.17 | P | |
| 3 | 0.7620 | 25.86 | 20.67 | -7.73 | 9.74 | 35.60 | 30.41 | 2.01 | 56.00 | 46.00 | -25.59 | -43.99 | P | |
| 4 | 1.4780 | 18.23 | 14.33 | -10.9 | 9.72 | 27.95 | 24.05 | -1.23 | 56.00 | 46.00 | -31.95 | -47.23 | P | |
| 5 | 2.8540 | 10.66 | 7.11 | -12.7 | 9.69 | 20.35 | 16.80 | -3.05 | 56.00 | 46.00 | -39.20 | -49.05 | P | |
| 6 | 19.8420 | 18.29 | 13.55 | 4.39 | 10.06 | 28.35 | 23.61 | 14.45 | 60.00 | 50.00 | -36.39 | -35.55 | P | |

Neutral line:




| No. | Freq. | Reading_Level (dBuV) | | | Correct Factor | Measurement (dBuV) | | | Limit (dBuV) | | Margin (dB) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | Peak | QP | AVG | dB | peak | QP | AVG | QP | AVG | QP | AVG | P/F | Comment |
| 1 | 0.2220 | 43.86 | 38.45 | 7.59 | 9.73 | 53.59 | 48.18 | 17.32 | 62.74 | 52.74 | -14.56 | -35.42 | P | |
| 2 | 0.4460 | 41.89 | 36.21 | 5.13 | 9.73 | 51.62 | 45.94 | 14.86 | 56.95 | 46.95 | -11.01 | -32.09 | P | |
| 3 | 0.5500 | 35.55 | 29.54 | 0.57 | 9.73 | 45.28 | 39.27 | 10.30 | 56.00 | 46.00 | -16.73 | -35.70 | P | |
| 4 | 1.4980 | 18.09 | 14.32 | -11.4 | 9.72 | 27.81 | 24.04 | -1.70 | 56.00 | 46.00 | -31.96 | -47.70 | P | |
| 5 | 12.4860 | 10.30 | 6.98 | -7.85 | 9.90 | 20.20 | 16.88 | 2.05 | 60.00 | 50.00 | -43.12 | -47.95 | P | |
| 6 | 19.6500 | 21.20 | 16.47 | 6.91 | 10.06 | 31.26 | 26.53 | 16.97 | 60.00 | 50.00 | -33.47 | -33.03 | P | |

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

# Appendix k): Restricted bands around fundamental frequency (Radiated)

Receiver Setup:

| Frequency | Detector | RBW | VBW | Remark |
|---|---|---|---|---|
| 30MHz-1GHz | Quasi-peak | 120kHz | 300kHz | Quasi-peak |
| Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| | Peak | 1MHz | 10Hz | Average |

Test Procedure:

**Below 1GHz test procedure as below:**

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. 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.
d. 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.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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

**Above 1GHz test procedure as below:**

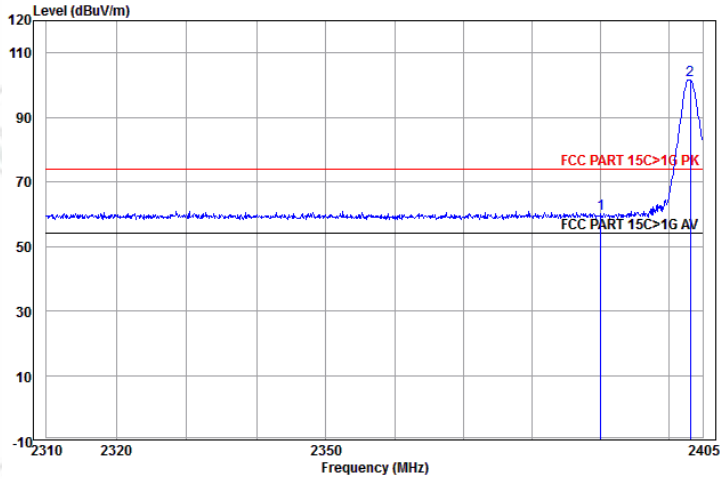
g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter( Above 18GHz the distance is 1 meter and table is 1.5 meter).
h. b. Test the EUT in the lowest channel , the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

Limit:

| Frequency | Limit (dBμV/m @3m) | Remark |
|---|---|---|
| 30MHz-88MHz | 40.0 | Quasi-peak Value |
| 88MHz-216MHz | 43.5 | Quasi-peak Value |
| 216MHz-960MHz | 46.0 | Quasi-peak Value |
| 960MHz-1GHz | 54.0 | Quasi-peak Value |
| Above 1GHz | 54.0 | Average Value |
| | 74.0 | Peak Value |

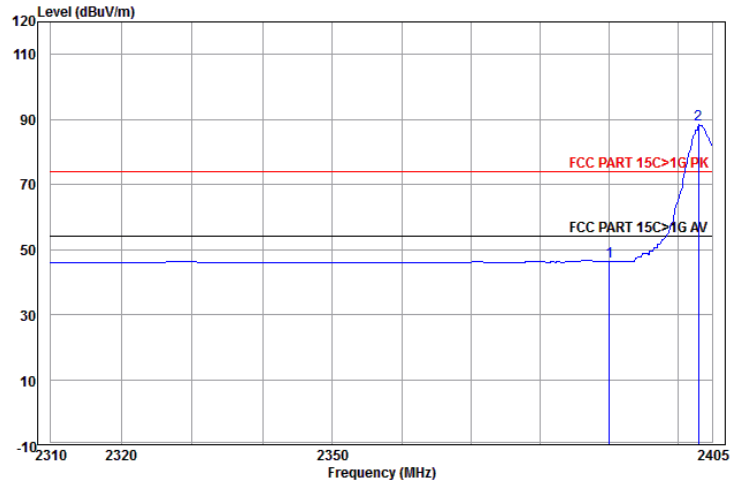
**Test plot as follows:**

| Frequency: 2403MHz | Test channel: Lowest | Polarization: Horizontal | Remark: Peak |
|---|---|---|---|



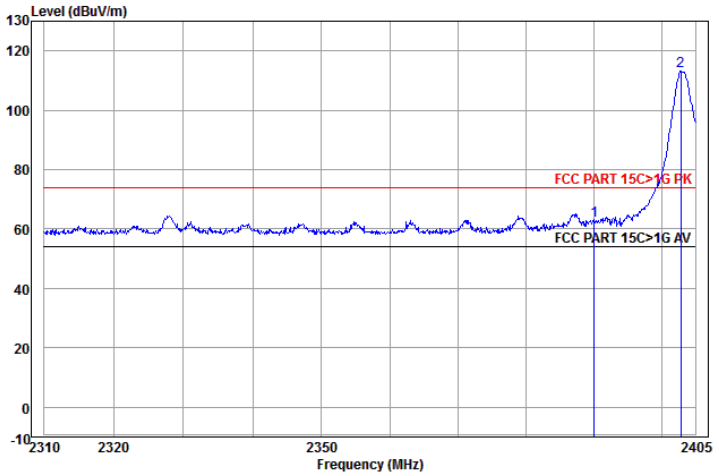

| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 | 2390.000 | 32.53 | 3.07 | 24.49 | 60.09 | 74.00 | -13.91 | Horizontal | |
| 2 pp | 2403.159 | 32.56 | 3.08 | 65.94 | 101.58 | 74.00 | 27.58 | Horizontal | |

| Frequency: 2403MHz | Test channel: Lowest | Polarization: Horizontal | Remark: Average |
|---|---|---|---|



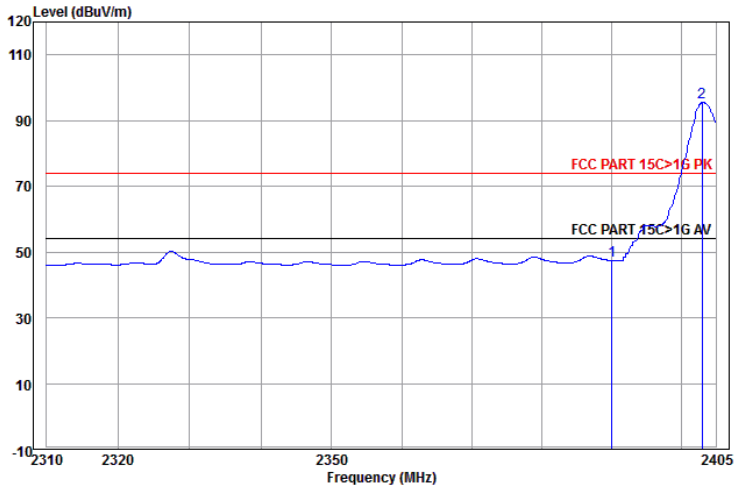

| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 | 2390.000 | 32.53 | 3.07 | 10.63 | 46.23 | 54.00 | -7.77 | Horizontal | Average |
| 2 pp | 2403.062 | 32.56 | 3.08 | 52.69 | 88.33 | 54.00 | 34.33 | Horizontal | Average |

| Frequency: 2403MHz | Test channel: Lowest | Polarization: Vertical | Remark: Peak |
|---|---|---|---|



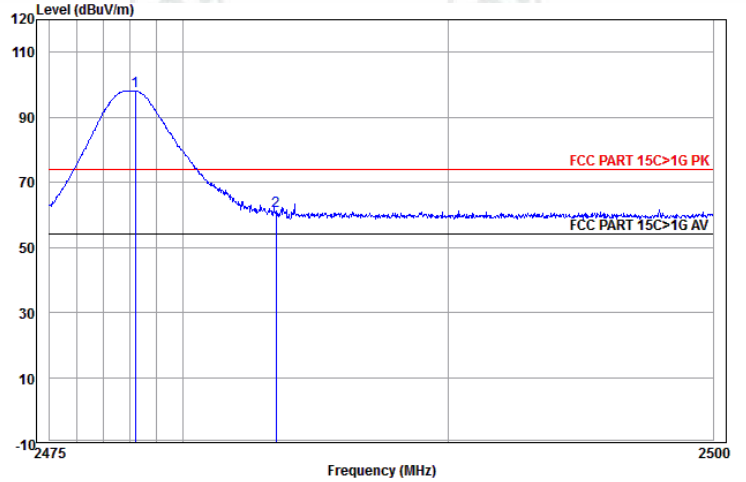

| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 | 2390.000 | 32.53 | 3.07 | 27.27 | 62.87 | 74.00 | -11.13 | Vertical | |
| 2 pp | 2402.869 | 32.56 | 3.08 | 77.39 | 113.03 | 74.00 | 39.03 | Vertical | |

| Frequency: 2403MHz | Test channel: Lowest | Polarization: Vertical | Remark: Average |
|---|---|---|---|



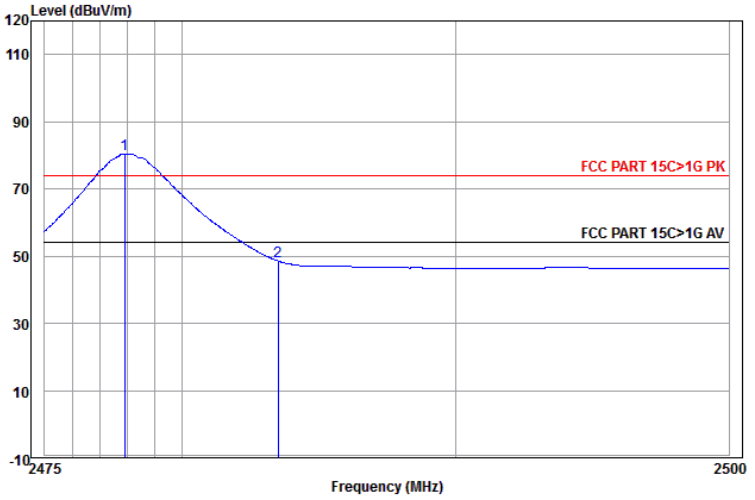

| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 | 2390.000 | 32.53 | 3.07 | 11.82 | 47.42 | 54.00 | -6.58 | Vertical | Average |
| 2 pp | 2403.062 | 32.56 | 3.08 | 59.91 | 95.55 | 54.00 | 41.55 | Vertical | Average |

| Frequency: 2478MHz | Test channel: Highest | Polarization: Horizontal | Remark: Peak |
|---|---|---|---|



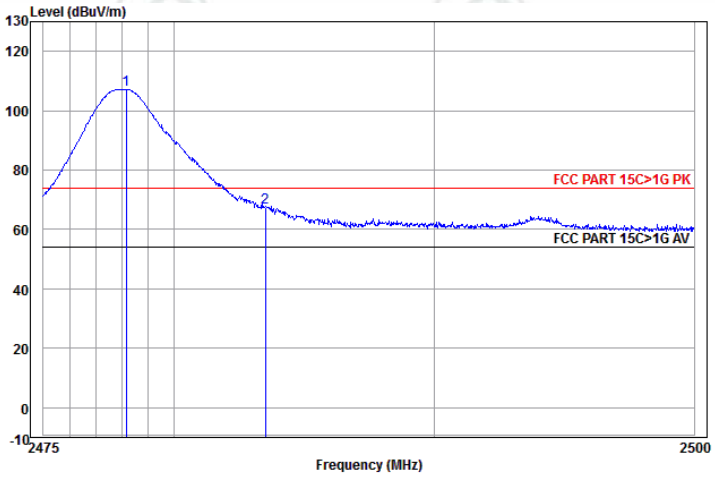

| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 pp | 2478.211 | 32.70 | 3.11 | 62.31 | 98.12 | 74.00 | 24.12 | Horizontal | |
| 2 | 2483.500 | 32.71 | 3.12 | 25.49 | 61.32 | 74.00 | -12.68 | Horizontal | |

| Frequency: 2478MHz | Test channel: Highest | Polarization: Horizontal | Remark: Average |
|---|---|---|---|



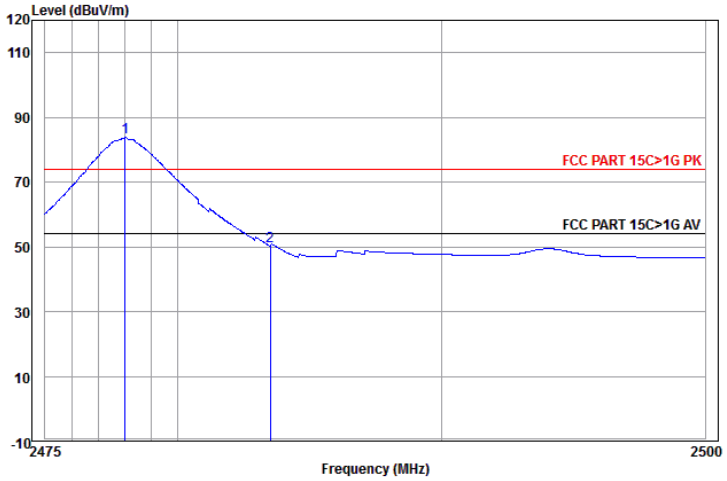

| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 pp | 2477.912 | 32.70 | 3.11 | 44.53 | 80.34 | 54.00 | 26.34 | Horizontal | Average |
| 2 | 2483.500 | 32.71 | 3.12 | 12.68 | 48.51 | 54.00 | -5.49 | Horizontal | Average |

| Frequency: 2478MHz | Test channel: Highest | Polarization: Vertical | Remark: Peak |
|---|---|---|---|




| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 pp | 2478.161 | 32.70 | 3.11 | 71.34 | 107.15 | 74.00 | 33.15 | Vertical | |
| 2 | 2483.500 | 32.71 | 3.12 | 31.56 | 67.39 | 74.00 | -6.61 | Vertical | |

| Frequency: 2478MHz | Test channel: Highest | Polarization: Vertical | Remark: Average |
|---|---|---|---|




| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 pp | 2478.012 | 32.70 | 3.11 | 48.03 | 83.84 | 54.00 | 29.84 | Vertical | Average |
| 2 | 2483.500 | 32.71 | 3.12 | 14.40 | 50.23 | 54.00 | -3.77 | Vertical | Average |

Note:The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier.

The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading -Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

# Appendix L): Radiated Spurious Emissions

**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 | 10Hz | Average |

**Test Procedure:**

**Below 1GHz test procedure as below:**

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on the top of a variable-height antenna tower.
c. 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.
d. 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.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**Above 1GHz test procedure as below:**

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter( Above 18GHz the distance is 1 meter and table is 1.5 meter).
h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel
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.
j. Repeat above procedures until all frequencies measured was complete.

Limit:

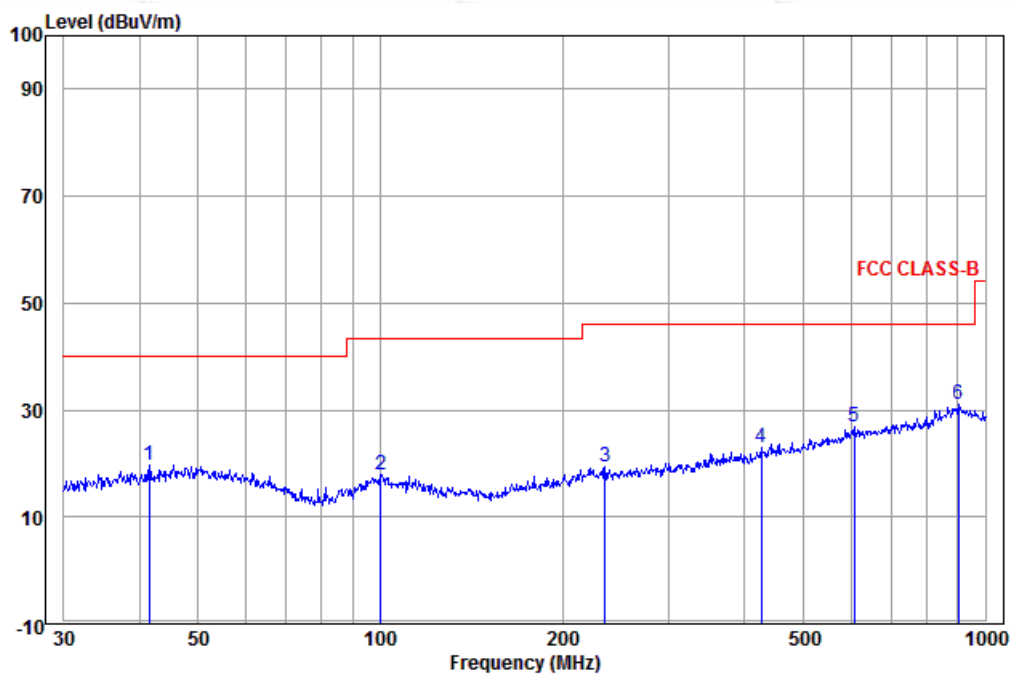
| Frequency | Field strength (microvolt/meter) | Limit (dBμV/m) | Remark | Measurement distance (m) |
|---|---|---|---|---|
| 0.009MHz-0.490MHz | 2400/F(kHz) | - | - | 300 |
| 0.490MHz-1.705MHz | 24000/F(kHz) | - | - | 30 |
| 1.705MHz-30MHz | 30 | - | - | 30 |
| 30MHz-88MHz | 100 | 40.0 | Quasi-peak | 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 |

Note: 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.

# Radiated Spurious Emissions test Data:

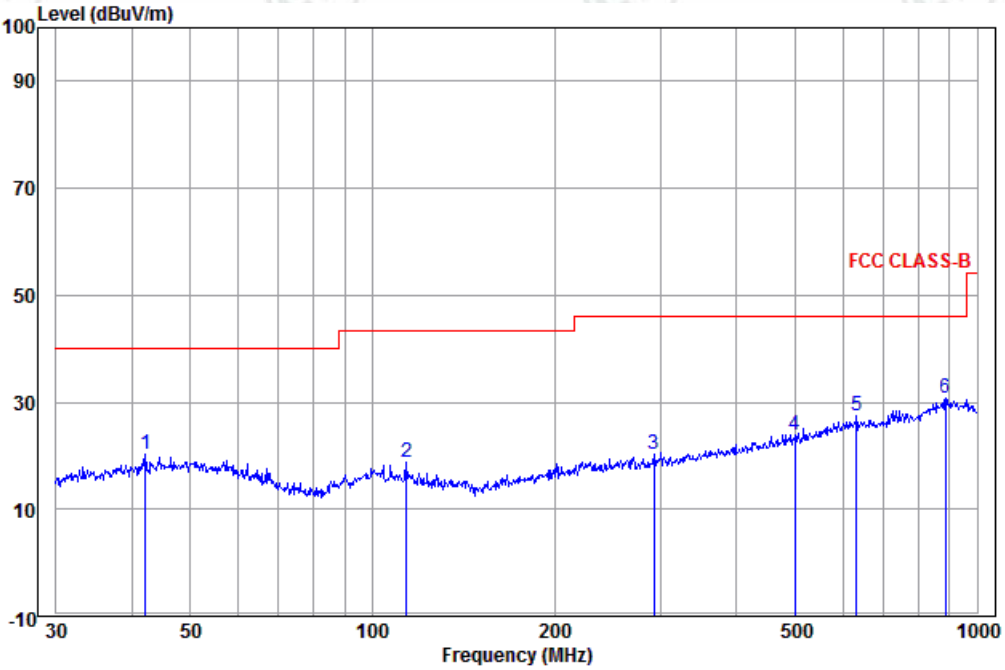
## Radiated Emission below 1GHz

| | | |
|---|---|---|
| 30MHz~1GHz (QP) | | |
| Test mode: | Transmitting | Vertical |




| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 | 41.567 | 13.94 | 0.06 | 5.55 | 19.55 | 40.00 | -20.45 | Vertical | |
| 2 | 100.229 | 12.48 | 0.59 | 4.90 | 17.97 | 43.50 | -25.53 | Vertical | |
| 3 | 234.991 | 12.29 | 1.27 | 5.69 | 19.25 | 46.00 | -26.75 | Vertical | |
| 4 | 426.521 | 15.75 | 1.40 | 5.70 | 22.85 | 46.00 | -23.15 | Vertical | |
| 5 | 607.787 | 18.73 | 1.83 | 6.20 | 26.76 | 46.00 | -19.24 | Vertical | |
| 6 pp | 903.309 | 22.09 | 2.48 | 6.40 | 30.97 | 46.00 | -15.03 | Vertical | |

| Test mode: | Transmitting | Horizontal |
|---|---|---|




| | Freq | Ant Factor | Cable Loss | Read Level | Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB | | |
| 1 | 42.154 | 13.99 | 0.06 | 6.07 | 20.12 | 40.00 | -19.88 | Horizontal | |
| 2 | 113.714 | 11.33 | 0.60 | 6.87 | 18.80 | 43.50 | -24.70 | Horizontal | |
| 3 | 292.058 | 13.28 | 1.11 | 5.75 | 20.14 | 46.00 | -25.86 | Horizontal | |
| 4 | 499.425 | 16.89 | 1.52 | 5.57 | 23.98 | 46.00 | -22.02 | Horizontal | |
| 5 | 631.688 | 18.83 | 1.83 | 6.78 | 27.44 | 46.00 | -18.56 | Horizontal | |
| 6 pp | 887.610 | 21.91 | 2.48 | 6.41 | 30.80 | 46.00 | -15.20 | Horizontal | |

**Transmitter Emission above 1GHz**

| Worse case mode: | | GFSK | | Test channel: | | Lowest | Remark: Peak | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Gain (dB) | Read Level (dBμV) | Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Result | Antenna Polaxis |
| 1179.935 | 30.18 | 1.83 | 44.41 | 48.81 | 36.41 | 74.00 | -37.59 | Pass | H |
| 1577.198 | 31.01 | 2.38 | 43.91 | 47.92 | 37.40 | 74.00 | -36.60 | Pass | H |
| 4806.000 | 34.69 | 5.98 | 44.60 | 49.49 | 45.56 | 74.00 | -28.44 | Pass | H |
| 5821.207 | 35.77 | 7.26 | 44.52 | 49.17 | 47.68 | 74.00 | -26.32 | Pass | H |
| 7209.000 | 36.42 | 6.97 | 44.78 | 48.15 | 46.76 | 74.00 | -27.24 | Pass | H |
| 9612.000 | 37.89 | 6.98 | 45.58 | 45.89 | 45.18 | 74.00 | -28.82 | Pass | H |
| 1270.334 | 30.39 | 1.97 | 44.29 | 48.27 | 36.34 | 74.00 | -37.66 | Pass | V |
| 1791.273 | 31.38 | 2.63 | 43.69 | 48.52 | 38.84 | 74.00 | -35.16 | Pass | V |
| 4806.000 | 34.69 | 5.98 | 44.60 | 52.29 | 48.36 | 74.00 | -25.64 | Pass | V |
| 6577.752 | 36.20 | 7.29 | 44.56 | 49.09 | 48.02 | 74.00 | -25.98 | Pass | V |
| 7209.000 | 36.42 | 6.97 | 44.78 | 48.16 | 46.77 | 74.00 | -27.23 | Pass | V |
| 9612.000 | 37.89 | 6.98 | 45.58 | 45.71 | 45.00 | 74.00 | -29.00 | Pass | V |

| Worse case mode: | | GFSK | | Test channel: | | Middle | Remark: Peak | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Gain (dB) | Read Level (dBμV) | Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Result | Antenna Polaxis |
| 1267.104 | 30.38 | 1.96 | 44.29 | 47.97 | 36.02 | 74.00 | -37.98 | Pass | H |
| 1814.218 | 31.42 | 2.65 | 43.67 | 48.18 | 38.58 | 74.00 | -35.42 | Pass | H |
| 4880.000 | 34.85 | 6.13 | 44.60 | 47.57 | 43.95 | 74.00 | -30.05 | Pass | H |
| 5821.207 | 35.77 | 7.26 | 44.52 | 50.34 | 48.85 | 74.00 | -25.15 | Pass | H |
| 7320.000 | 36.43 | 6.85 | 44.87 | 46.82 | 45.23 | 74.00 | -28.77 | Pass | H |
| 9760.000 | 38.05 | 7.12 | 45.55 | 47.17 | 46.79 | 74.00 | -27.21 | Pass | H |
| 1170.959 | 30.16 | 1.81 | 44.43 | 48.49 | 36.03 | 74.00 | -37.97 | Pass | V |
| 1732.967 | 31.29 | 2.57 | 43.75 | 48.08 | 38.19 | 74.00 | -35.81 | Pass | V |
| 4880.000 | 34.85 | 6.13 | 44.60 | 47.85 | 44.23 | 74.00 | -29.77 | Pass | V |
| 5806.408 | 35.76 | 7.25 | 44.52 | 48.88 | 47.37 | 74.00 | -26.63 | Pass | V |
| 7320.000 | 36.43 | 6.85 | 44.87 | 46.94 | 45.35 | 74.00 | -28.65 | Pass | V |
| 9760.000 | 38.05 | 7.12 | 45.55 | 46.99 | 46.61 | 74.00 | -27.39 | Pass | V |

| Worse case mode: | | GFSK | | Test channel: | | Highest | Remark: Peak | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Gain (dB) | Read Level (dBμV) | Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Result | Antenna Polaxis |
| 1299.773 | 30.46 | 2.01 | 44.25 | 49.03 | 37.25 | 74.00 | -36.75 | Pass | H |
| 1755.164 | 31.32 | 2.59 | 43.73 | 48.33 | 38.51 | 74.00 | -35.49 | Pass | H |
| 4956.000 | 35.01 | 6.28 | 44.60 | 48.15 | 44.84 | 74.00 | -29.16 | Pass | H |
| 5986.509 | 35.89 | 7.43 | 44.50 | 48.76 | 47.58 | 74.00 | -26.42 | Pass | H |
| 7434.000 | 36.45 | 6.74 | 44.96 | 45.73 | 43.96 | 74.00 | -30.04 | Pass | H |
| 9912.000 | 38.21 | 7.25 | 45.52 | 46.76 | 46.70 | 74.00 | -27.30 | Pass | H |
| 1273.572 | 30.40 | 1.97 | 44.28 | 48.53 | 36.62 | 74.00 | -37.38 | Pass | V |
| 1805.005 | 31.40 | 2.64 | 43.68 | 48.49 | 38.85 | 74.00 | -35.15 | Pass | V |
| 4956.000 | 35.01 | 6.28 | 44.60 | 46.23 | 42.92 | 74.00 | -31.08 | Pass | V |
| 6172.197 | 35.99 | 7.39 | 44.52 | 48.84 | 47.70 | 74.00 | -26.30 | Pass | V |
| 7434.000 | 36.45 | 6.74 | 44.96 | 47.87 | 46.10 | 74.00 | -27.90 | Pass | V |
| 9912.000 | 38.21 | 7.25 | 45.52 | 47.97 | 47.91 | 74.00 | -26.09 | Pass | V |

Note:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

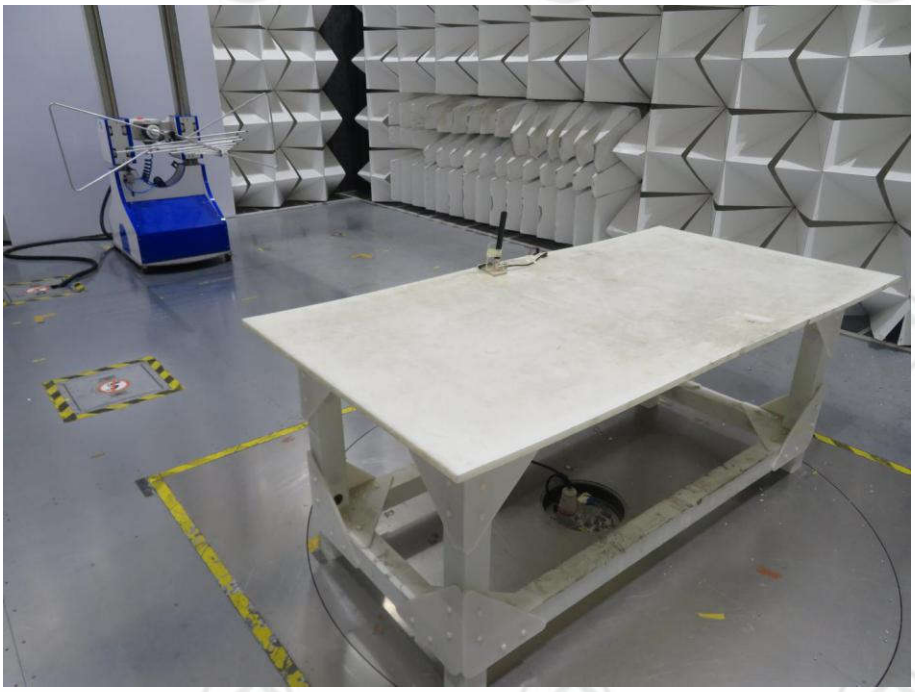
Final Test Level =Receiver Reading -Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

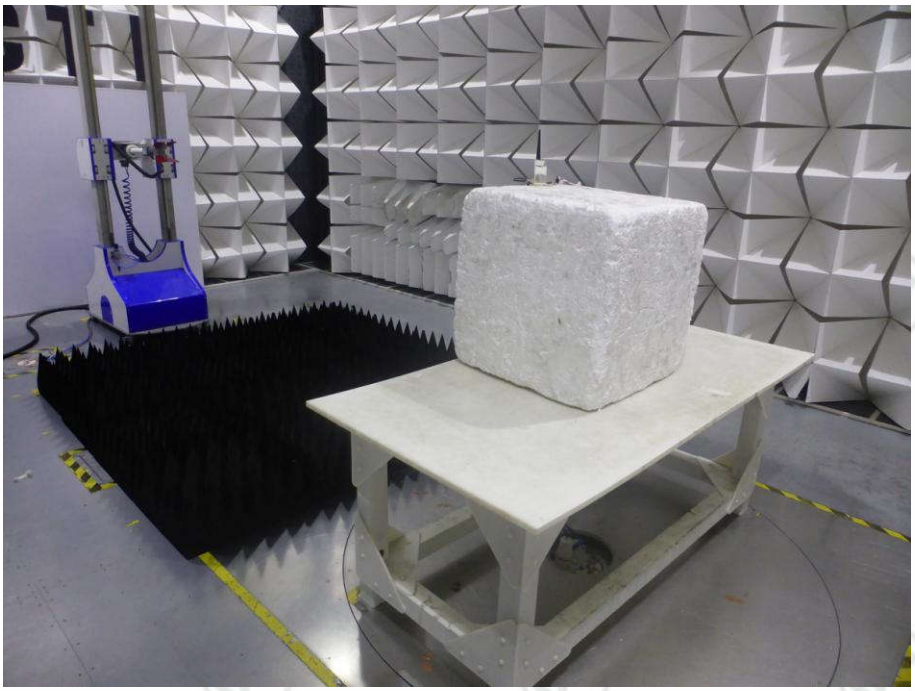
2) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

# PHOTOGRAPHS OF TEST SETUP

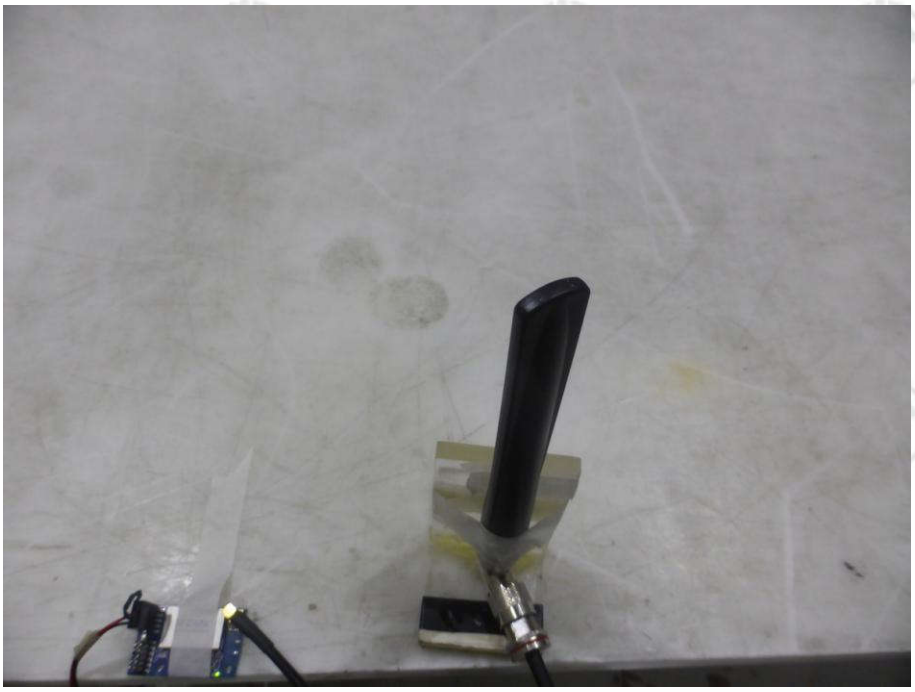
Test model No.: A40890G5-SPI



**Radiated spurious emission Test Setup-1(Below 1G)**



**Radiated spurious emission Test Setup-2(Above 1G)**

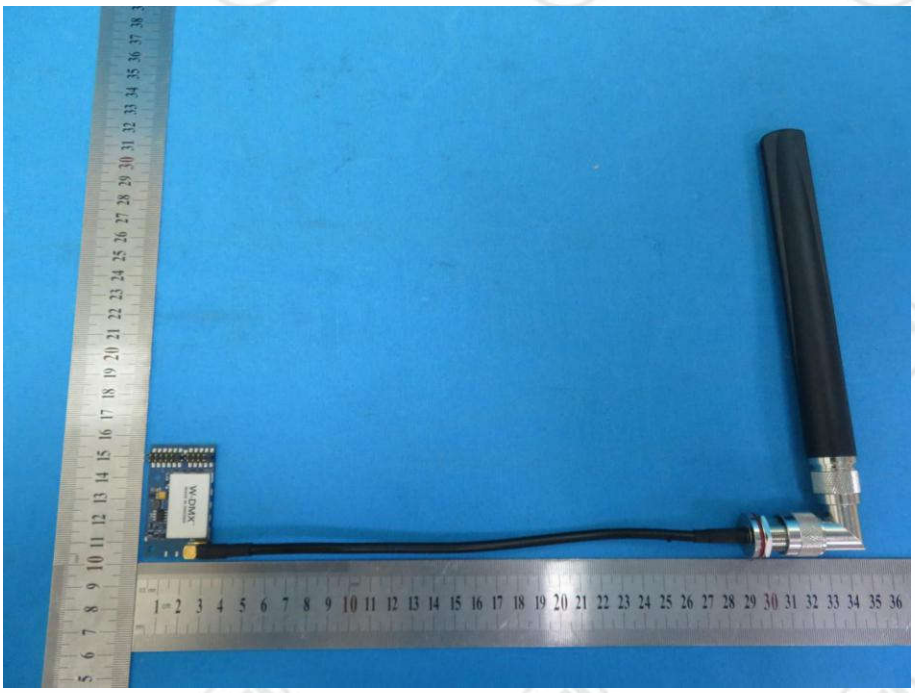


**Radiated spurious emission Test Setup for close-up**

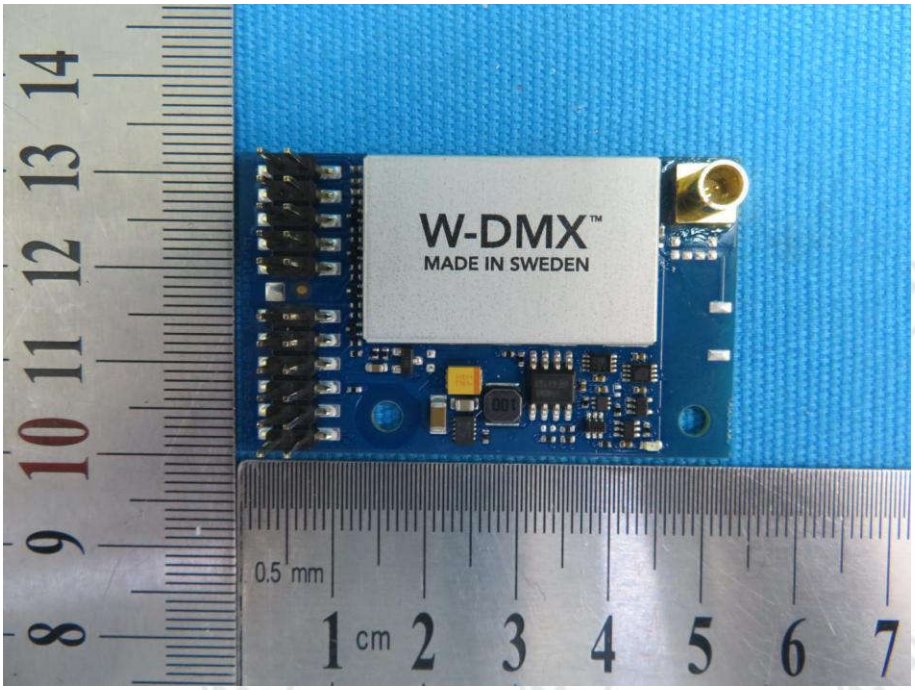

**Conducted emission Test Setup**

# PHOTOGRAPHS OF EUT Constructional Details

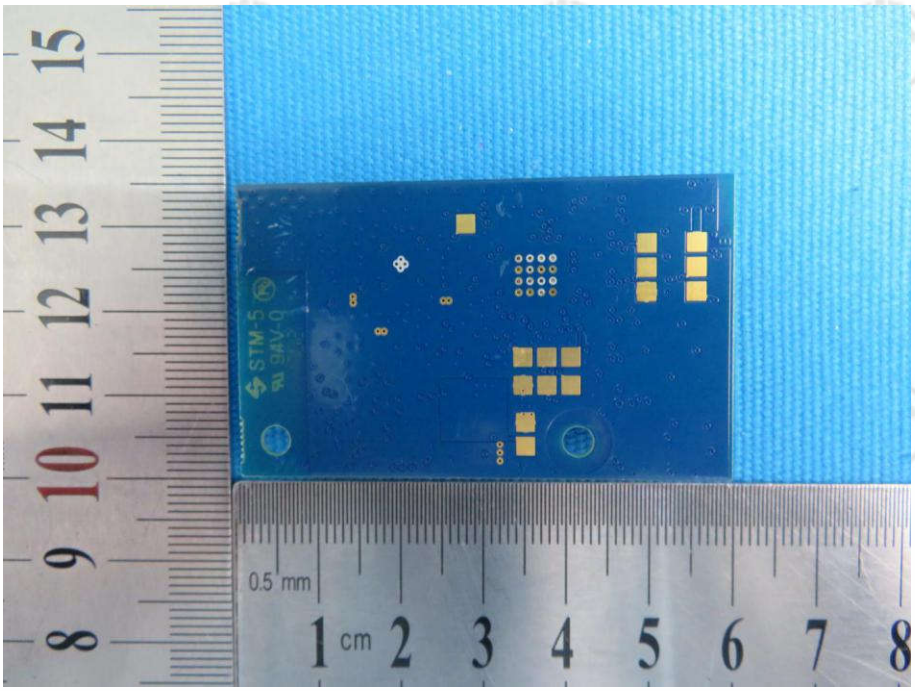
Test model No.: A40890G5-SPI



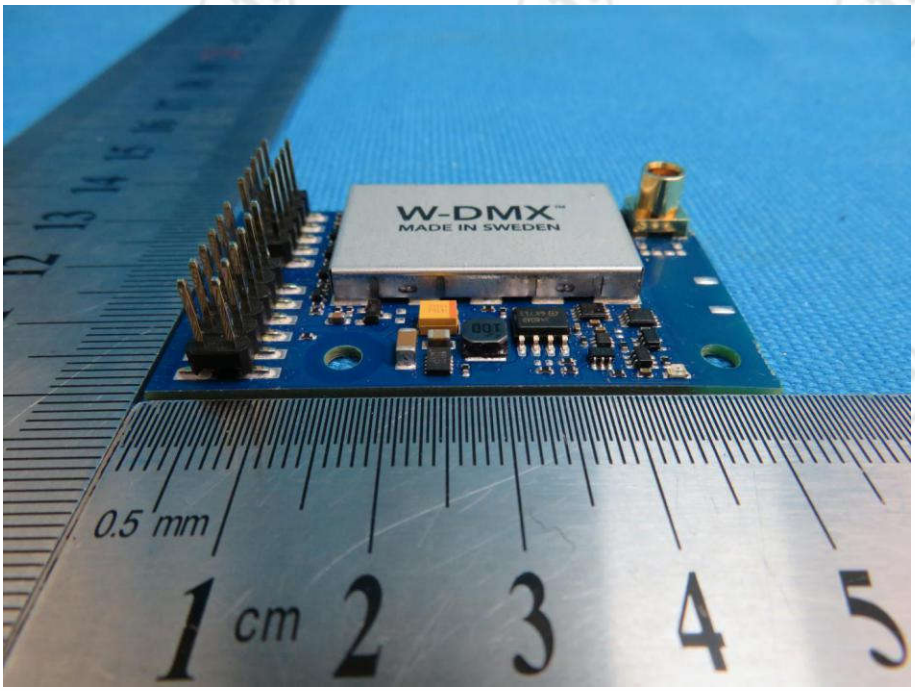
View of Product-1



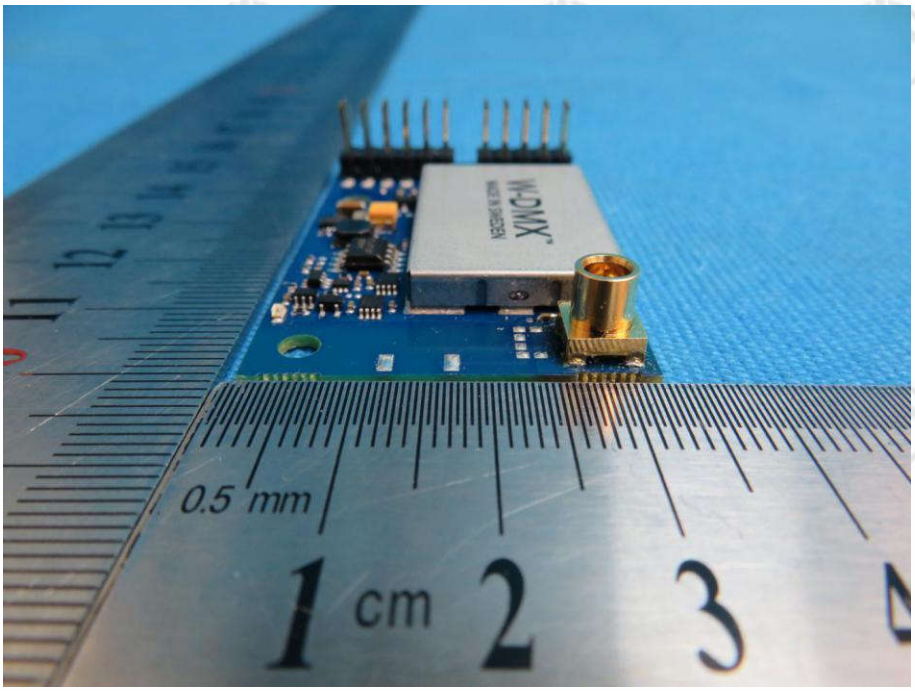

View of Product-2



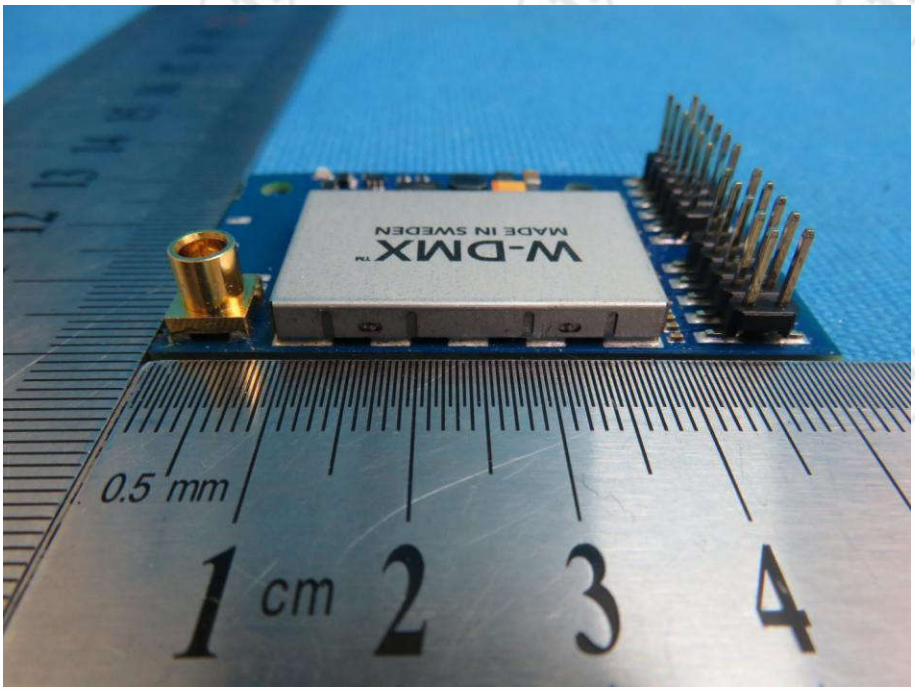

View of Product-3



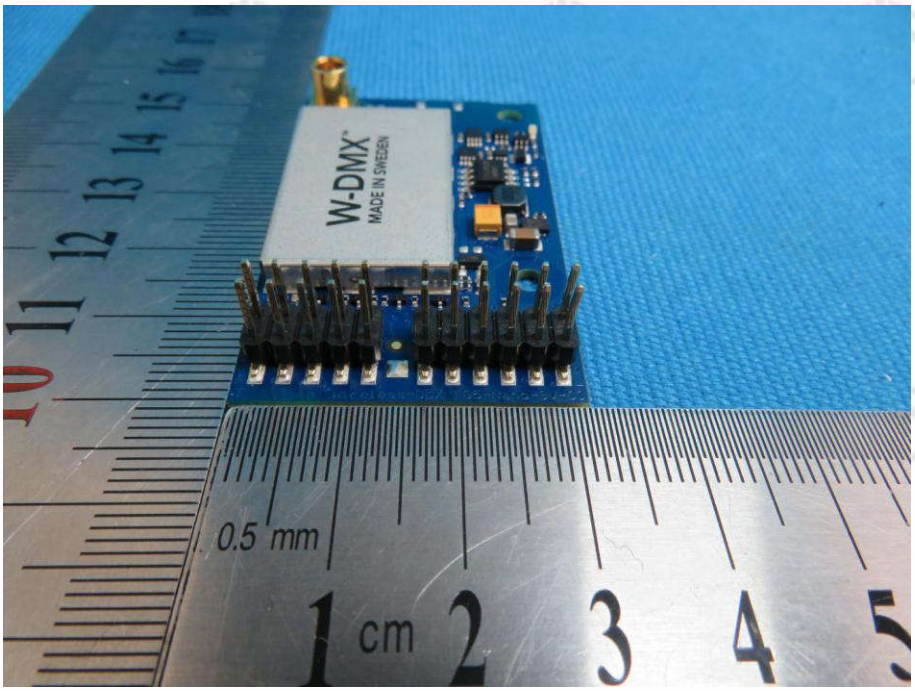

View of Product-4



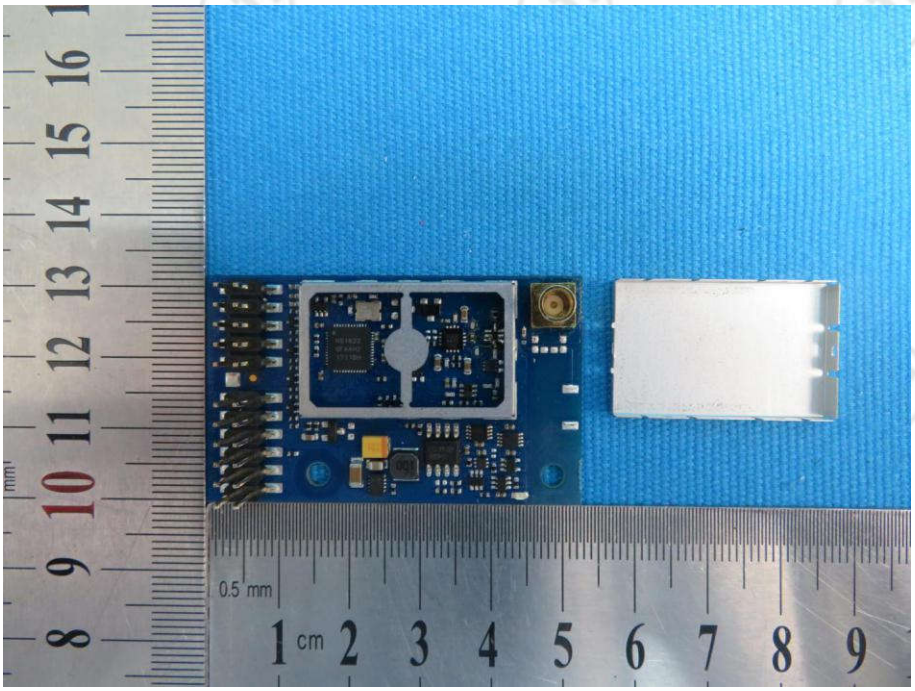

View of Product-5



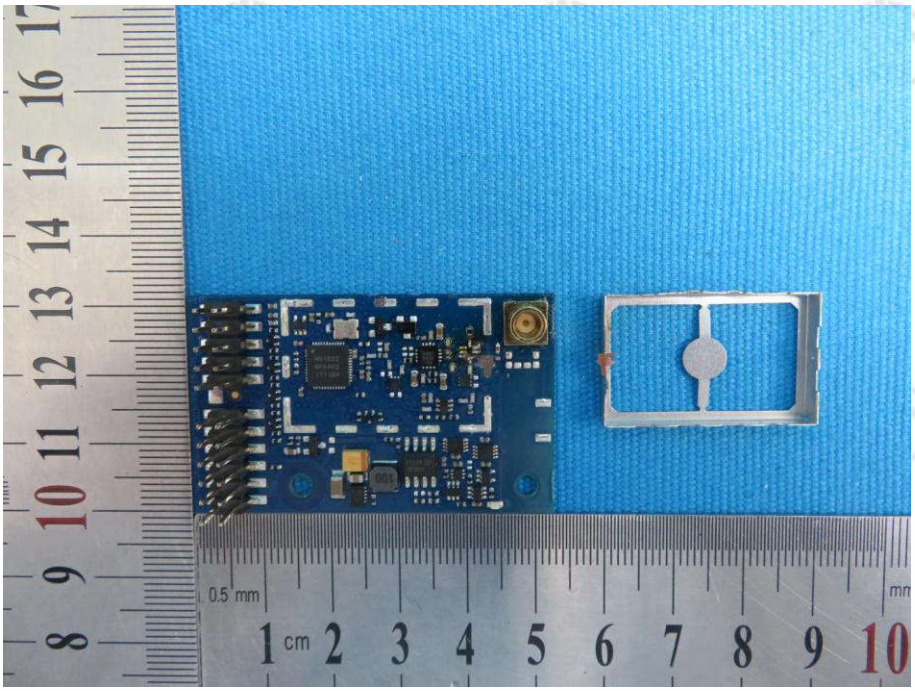

View of Product-6



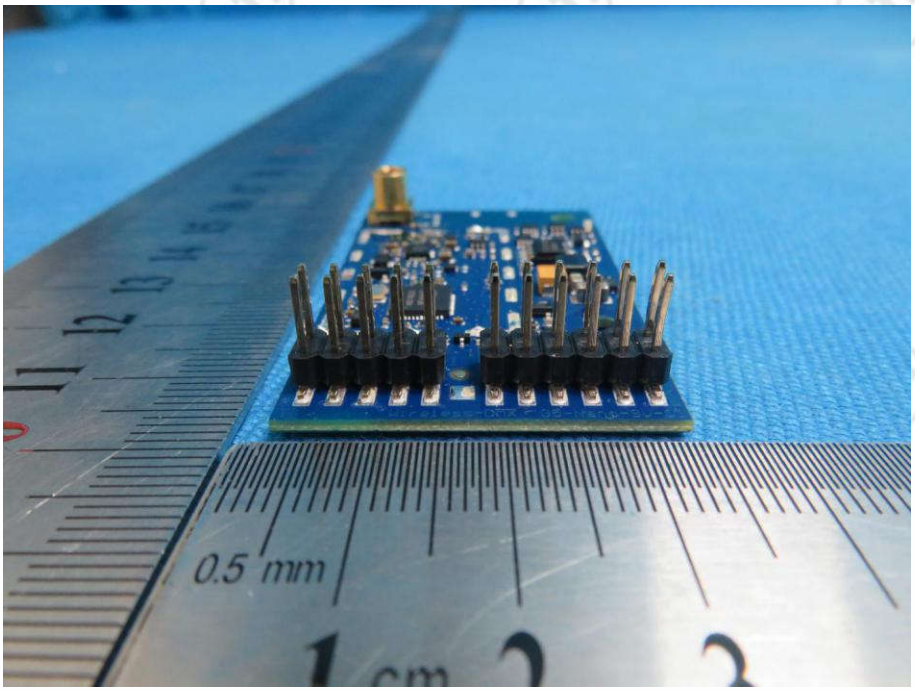

View of Product-7



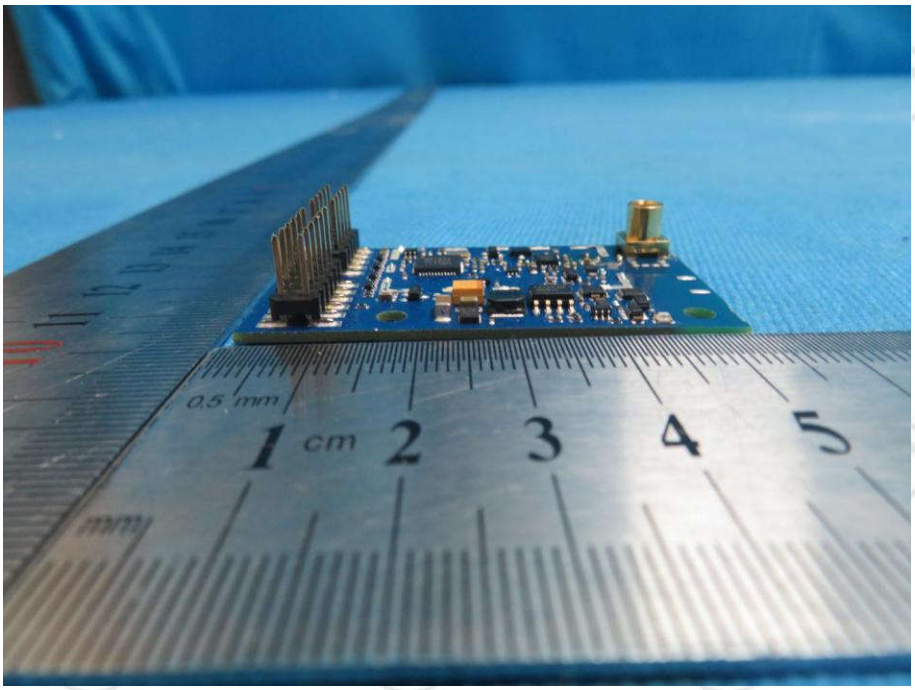

View of Product-8



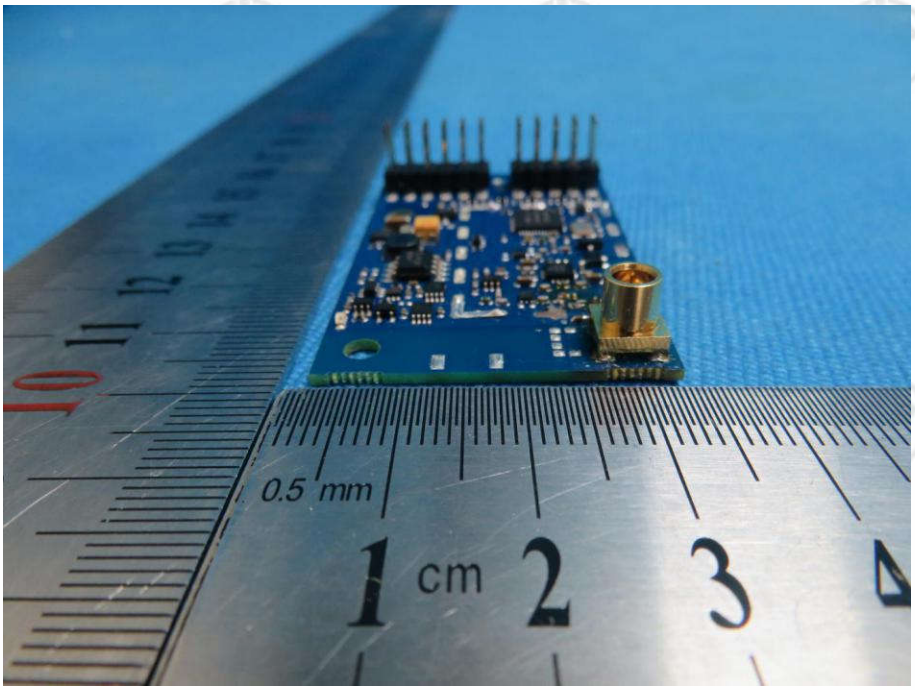

View of Product-9



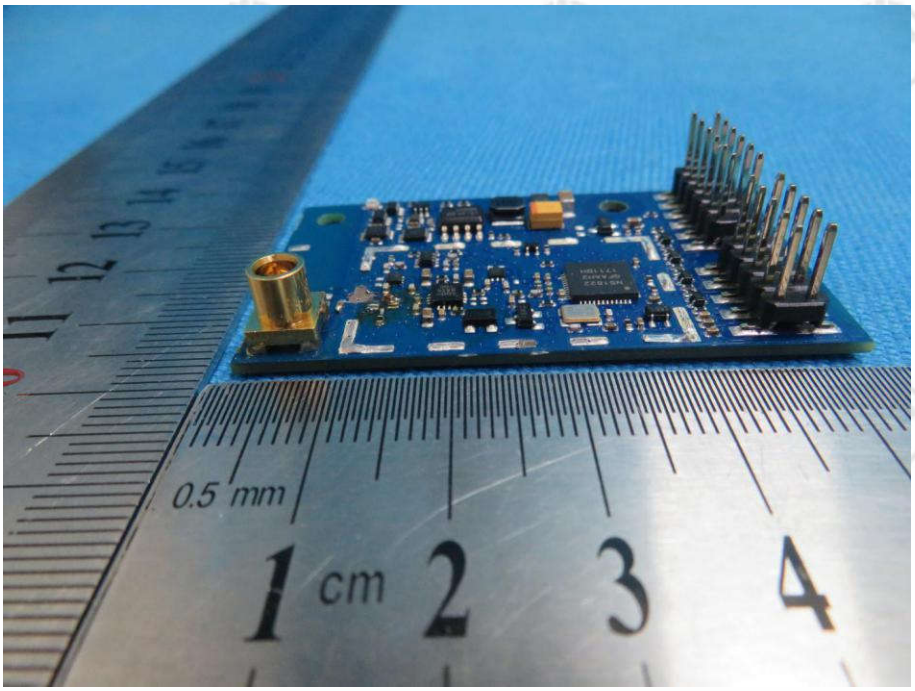

View of Product-10



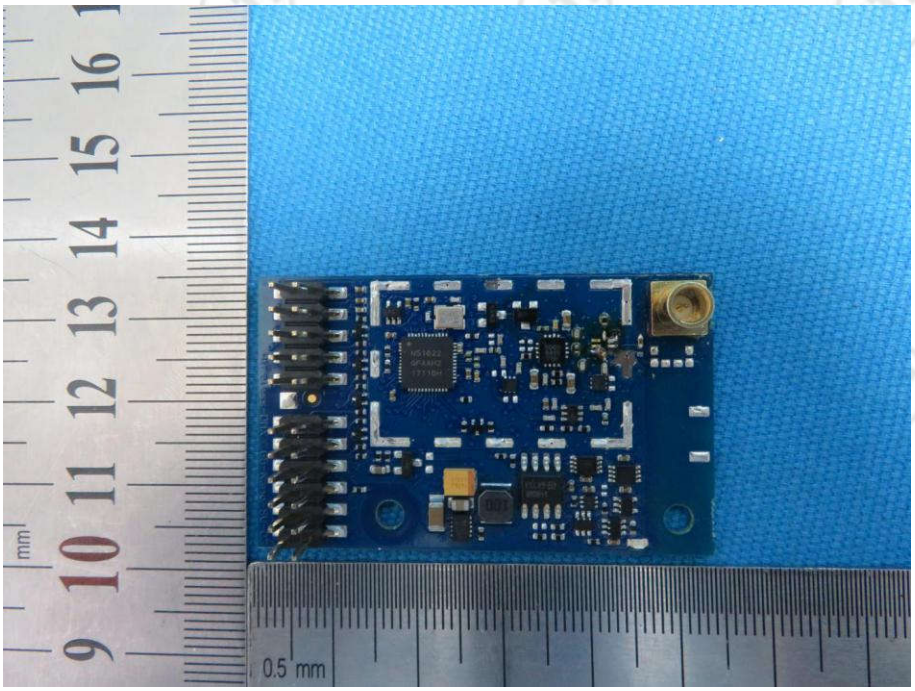

View of Product-11



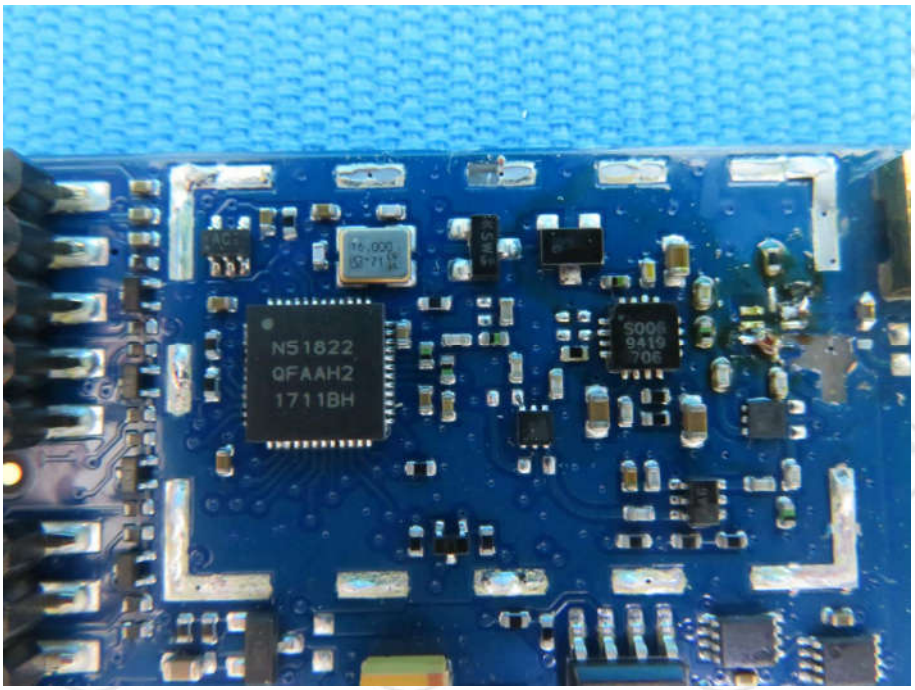

View of Product-12




View of Product-13




View of Product-14




View of Product-15

*** End of Report ***

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