# FCC PART 15C
# TESTREPORT
## No. I16Z42442-SRD01

**for**

**TCL Mobile Communication Co. Ltd. Huizhou**

**Door & Window Sensor**

**Model Name:DS01**

**with**

**FCC ID: 2ACCJBC04**

**Hardware Version: V05**

**Software Version: DS01_00_01.00_17**

**Issued Date: 2017-01-17**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

**Test Laboratory:**

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

No.52, HuayuanNorth Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512,Fax:+86(0)10-62304633-2504

Email:cttl_terminals@catr.cn, website:www.chinattl.com

# REPORT HISTORY

| Report Number | Revision | Description | Issue Date |
|---|---|---|---|
| I16Z42442-SRD01 | Rev.0 | 1st edition | 2017-01-09 |
| I16Z42442-SRD01 | Rev.1 | 2nd edition | 2017-01-17 |

# CONTENTS

# 1. Test Laboratory

## 1.1. Testing Location

Conducted testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

Radiated testing Location: CTTL(BDA)

Address: No. 18 Jia Kangding Street, BDA District, Beijing, P. R. China 100191

## 1.2. Testing Environment

Normal Temperature: 15-35℃

Extreme Temperature: -10/+55℃

Relative Humidity: 20-75%

## 1.3. Project data

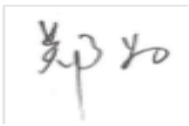
Testing Start Date: 2016-12-23

Testing End Date: 2017-01-09

## 1.4. Signature

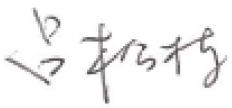
**Jiang Xue**

**(Prepared this test report)**



**Zheng Wei**

**(Reviewed this test report)**



**Lv Songdong**

**(Approved this test report)**

# 2. Client Information

## 2.1. Applicant Information

| | |
|---|---|
| Company Name: | TCL Communication Ltd. |
| Address /Post: | 5F, C-Tower, No.232, Liangjing Road, Zhangjiang High-tech Park, Pudong, Shanghai, China |
| Contact Person: | Liu Feng |
| Contact Email | liu.feng@tcl.com |
| Telephone: | 0755-33035419 |
| Fax: | 0755-33035419 |

## 2.2. Manufacturer Information

| | |
|---|---|
| Company Name: | TCL Mobile Communication Co. Ltd. Huizhou |
| Address /Post: | 70 Huifeng 4rd., ZhongKai High-Technology Development District, Huizhou, Guangdong, PRC. 516006 |
| Contact Person: | Liu Feng |
| Contact Email | liu.feng@tcl.com |
| Telephone: | 0755-33035419 |
| Fax: | 0755-33035460 |

# 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

## 3.1. About EUT

| | |
|---|---|
| Description | Door & Window Sensor |
| Model name | DS01 |
| FCC ID | 2ACCJBC04 |
| IC ID | / |
| With WLAN Function | Yes |
| Frequency Range | ISM 2400MHz~2483.5MHz |
| Type of Modulation | DQPSK |
| Number of Channels | 11 |
| Antenna | Integral Antenna |
| MAX Conducted Power | 11.21dBm(OFDM) |
| Power Supply | 3.0V DC by Battery |

## 3.2. Internal Identification of EUT

| EUT ID* | SN or IMEI | HW Version | SW Version |
|---|---|---|---|
| EUT1 | / | V05 | DS01_00_01.00_17 |
| EUT2 | / | V05 | DS01_00_01.00_17 |

*EUT ID: is used to identify the test sample in the lab internally.

## 3.3. Internal Identification of AE

| AE ID* | Description | SN |
|---|---|---|

*AE ID: is used to identify the test sample in the lab internally.

### 3.4. General Description

The Equipment under Test (EUT) is a model of Door & Window Sensor with integrated antenna and inbuilt battery.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

### 3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor k=2.

Measurement Uncertainty

| Parameter | Uncertainty |
|---|---|
| temperature | 0.48°C |
| humidity | 2 % |
| DC voltages | 0.003V |

## 4. Reference Documents

### 4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

### 4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

| Reference | Title | Version |
|---|---|---|
| FCC Part15 | FCC CFR 47, Part 15, Subpart C:<br>15.205 Restricted bands of operation;<br>15.209 Radiated emission limits, general requirements;<br>15.247 Operation within the bands 902-928MHz,<br>2400-2483.5 MHz, and 5725-5850 MHz. | 2015 |
| ANSI C63.10 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices | 2013 |

# 5. Test Results

## 5.1. Summary of Test Results

| SUMMARY OF MEASUREMENT RESULTS | Sub-clause of Part15C | Sub-clause of IC | Verdict |
|---|---|---|---|
| Maximum Peak Output Power | 15.247 (b) | / | P |
| Peak Power Spectral Density | 15.247 (e) | / | P |
| Occupied 6dB Bandwidth | 15.247 (a) | / | P |
| Band Edges Compliance | 15.247 (d) | / | P |
| Transmitter Spurious Emission - Conducted | 15.247 (d) | / | P |
| Transmitter Spurious Emission - Radiated | 15.247, 15.205, 15.209 | / | P |
| AC Powerline Conducted Emission | 15.107, 15.207 | / | NA |

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

| | |
|---|---|
| P | Pass, The EUT complies with the essential requirements in the standard. |
| NP | Not Perform, The test was not performed by CTTL |
| NA | Not Applicable, The test was not applicable |
| F | Fail, The EUT does not comply with the essential requirements in the standard |
| F | Fail, The EUT does not comply with the essential requirements in the standard |

## 5.2. Statements

The test cases as listed in section 5.1 of this report for the EUT specified in section 3 was performed by CTTL and according to the standards or reference documents listed in section 4.2

The EUT met all requirements of the standards or reference documents, and only the WLAN function was tested in this report.

The EUT is tested in engineering model, and the duty is about 100%.

## 5.3. Test Conditions

| | |
|---|---|
| T nom | Normal Temperature |
| T min | Low Temperature |
| T max | High Temperature |
| V nom | Normal Voltage |

For this report, if the test cases listed above are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

| | | |
|---|---|---|
| Temperature | T nom | 26℃ |
| Voltage | V nom | 3.0V (By battery) |
| Humidity | H nom | 44% |

## 6. Test Facilities Utilized

### Conducted test system

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration date | Calibration Due date |
|---|---|---|---|---|---|---|
| 1 | Vector Signal Analyzer | FSQ40 | 200089 | Rohde & Schwarz | 2016-06-07 | 2017-06-06 |
| 2 | Test Receiver | ESCI | 100344 | Rohde & Schwarz | 2016-03-02 | 2017-03-01 |
| 3 | LISN | ESH3Z2 | 357881052 | Rohde & Schwarz | 2016-10-06 | 2017-10-05 |
| 4 | Shielding Room | S81 | / | ETS-Lindgren | / | / |

### Radiated emission test system

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration date | Calibration Due date |
|---|---|---|---|---|---|---|
| 1 | Test Receiver | ESU26 | 100235 | Rohde & Schwarz | 2016-03-03 | 2017-03-02 |
| 2 | Loop antenna | HFH2-Z2 | 829324/007 | Rohde & Schwarz | 2014-12-17 | 2017-12-16 |
| 3 | BiLog Antenna | VULB9163 | 301 | Schwarzbeck | 2014-12-17 | 2017-12-16 |
| 4 | Dual-Ridge Waveguide Horn Antenna | 3115 | 6914 | EMCO | 2014-12-16 | 2017-12-15 |
| 5 | Dual-Ridge Waveguide Horn Antenna | 3116 | 2661 | ETS-Lindgren | 2014-06-18 | 2017-06-17 |
| 6 | Vector Signal Analyzer | FSV40 | 101047 | Rohde & Schwarz | 2016-06-29 | 2017-06-28 |
| 7 | Semi-anechoic chamber | / | CT000332-1074 | Frankonia German | / | / |

# 7. Measurement Uncertainty

## 7.1. Maximum Output Power

Measurement Uncertainty: 0.339dB,k=1.96

## 7.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dBm/MHz,k=1.96

## 7.3. DTS 6-dB Signal Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

## 7.4. Band Edges Compliance

Measurement Uncertainty : 0.62dBm,k=1.96

## 7.5. Transmitter Spurious Emission

**Conducted (k=1.96)**

| Frequency Range | Uncertainty(dBm) |
|---|---|
| 30MHz ≤ f ≤ 2GHz | 1.22 |
| 2GHz ≤ f ≤3.6GHz | 1.22 |
| 3.6GHz ≤ f ≤8GHz | 1.22 |
| 8GHz ≤ f ≤12.75GHz | 1.51 |
| 12.75GHz ≤ f ≤26GHz | 1.51 |
| 26GHz ≤ f ≤40GHz | 1.59 |

**Radiated (k=2)**

| Frequency Range | Uncertainty(dBm) |
|---|---|
| 30MHz ≤ f ≤ 1GHz | 4.86 |
| 1GHz ≤ f ≤18GHz | 5.26 |
| 18GHz ≤ f ≤40GHz | 5.28 |

## 7.6. AC Power-line Conducted Emission

Measurement Uncertainty : 3.38dBm,k=2

# ANNEX A: Detailed Test Results

## A.1. Measurement Method

### A.1.1. Conducted Measurements

Connect the EUT to the test system as Fig.A.1.1.1 shows.
Set the EUT to the required work mode.
Set the EUT to the required channel.
Set the Vector Signal Analyzer and start measurement.
Record the values. Vector Signal Analyzer

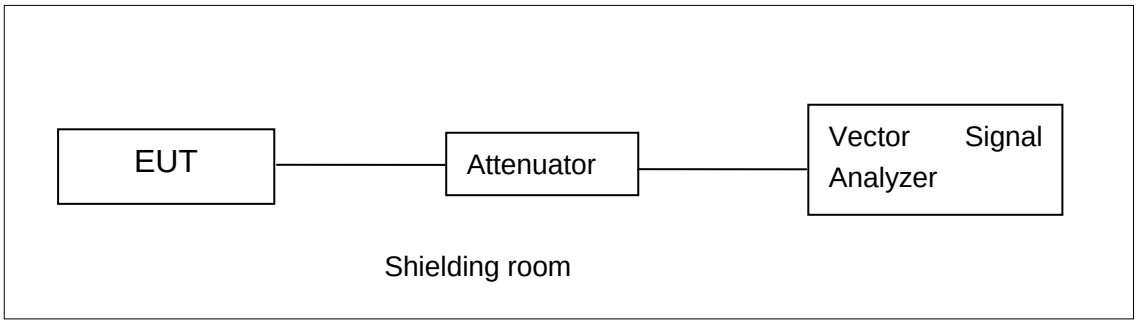



Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

### A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,
Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;
Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;

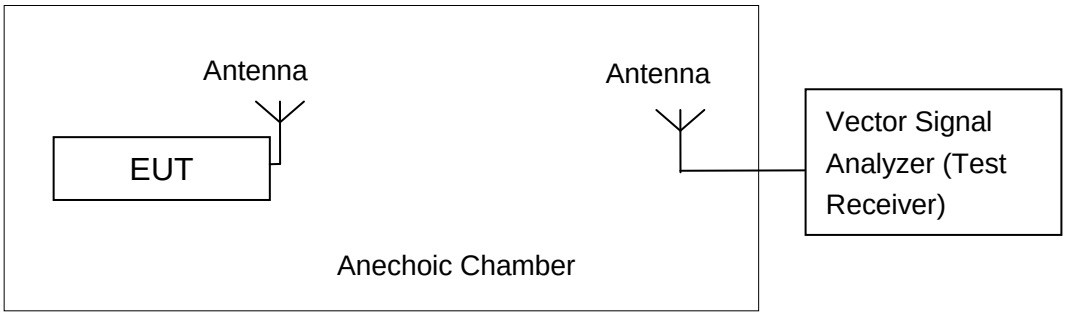



Fig.A.1.2.1: Test Setup Diagram for Radiated Measurements

## A.2. Maximum Output Power

**Method of Measurement: See ANSI C63.10-2013-clause 11.9.1.2**

a) Set the RBW = 1MHz.
b) Set the VBW = 3MHz.
c) Set the span ≥ [1.5 × DTS bandwidth].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector).

**Measurement Limit:**

| Standard | Limit (dBm) |
|---|---|
| FCC CRF Part 15.247(b) | < 30 |

**EUT ID: EUT2**

### A.2.1. Peak Output Power-conducted

**Measurement Results:**

| Mode | Test Result (dBm) | | |
|---|---|---|---|
| | 2405MHz (Ch11) | 2440MHz (Ch18) | 2480 MHz (Ch26) |
| ZigBee | 10.68 | 11.21 | 10.82 |

**Conclusion: Pass**

### A.2.2. Average Output Power-conducted

**Method of Measurement: See ANSI C63.10-2013-clause 11.9.2.2.2**

The procedure for this method is as follows:
a) Set span = 3MHz.
b) Set RBW = 100 kHz.
c) Set VBW = 300 kHz.
d) Number of points in sweep = 625
e) Sweep time = auto.
f) Detector = RMS.
g) The trigger shall be set to "free run."
h) Trace average 100 traces in power averaging (rms) mode.
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges.

| Mode | Test Result (dBm) | | |
|---|---|---|---|
| | 2405MHz (Ch11) | 2440MHz (Ch18) | 2480 MHz (Ch26) |
| ZigBee | 7.45 | 7.43 | 6.64 |

**Conclusion: Pass**

## A.3. Peak Power Spectral Density

**Method of Measurement: See ANSI C63.10-2013-clause 11.10.2**

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to RBW = 3 kHz.
d) Set the VBW = 10 kHz.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.

**Measurement Limit:**

| Standard | Limit |
|---|---|
| FCC CRF Part 15.247(e) | < 8 dBm/3 kHz |

**Measurement Results:**

| Mode | Frequency (MHz) | Power Spectral Density ( dBm / MHz) | | Conclusion |
|---|---|---|---|---|
| Zigbee | 2405(CH11) | Fig.B.3.1 | -4.30 | **P** |
| | 2440(CH18) | Fig.B.3.2 | -3.49 | **P** |
| | 2480(CH26) | Fig.B.3.3 | -4.21 | **P** |

**Conclusion: Pass**

**Test graphs as below:**

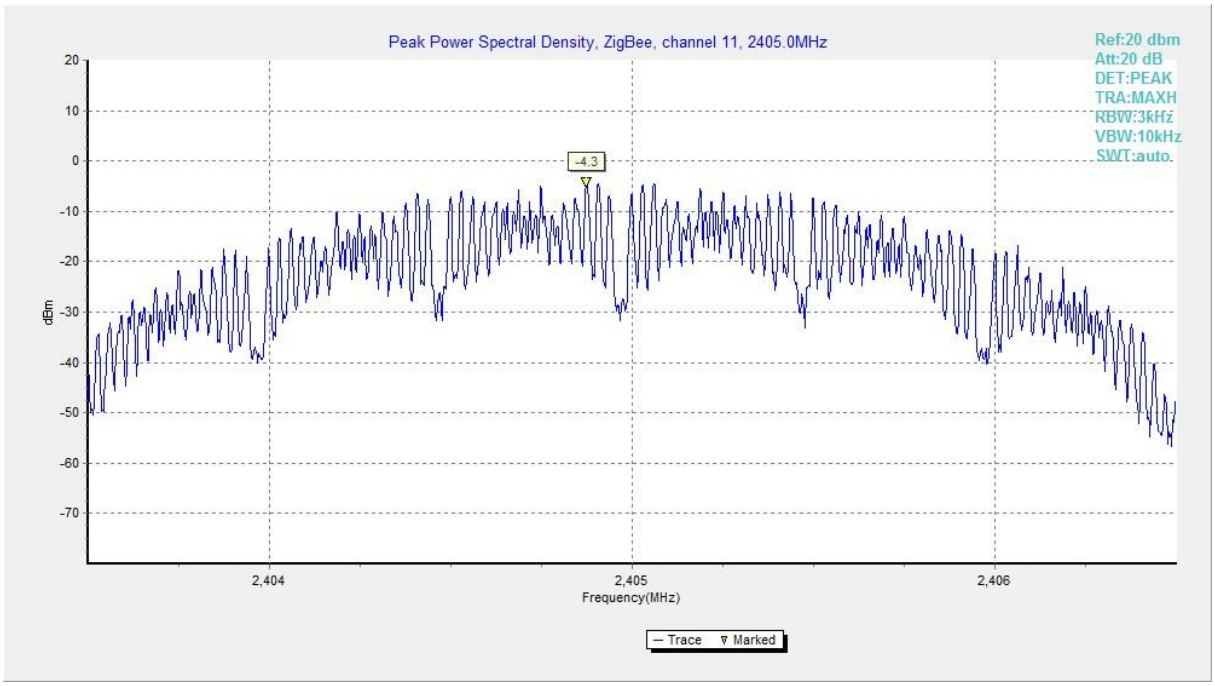



**Fig.A.3.1 Power Spectral Density(802.11b,Ch 11)**

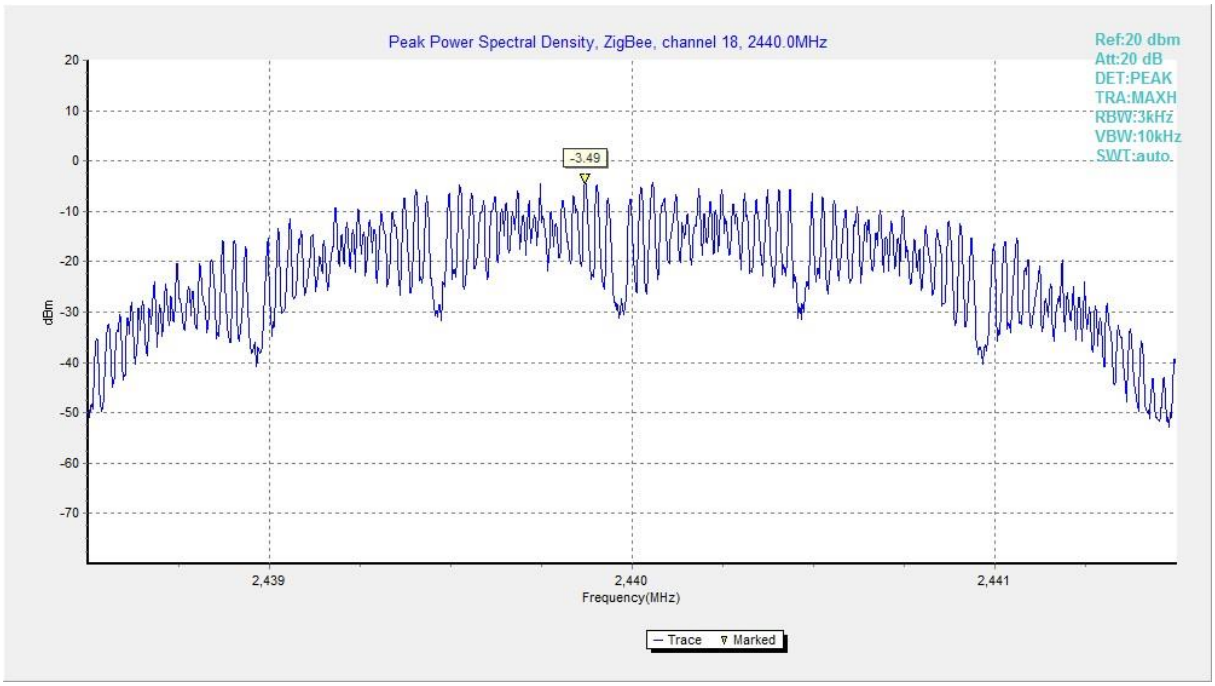



**Fig.A.3.2 Power Spectral Density (802.11b, Ch 18)**

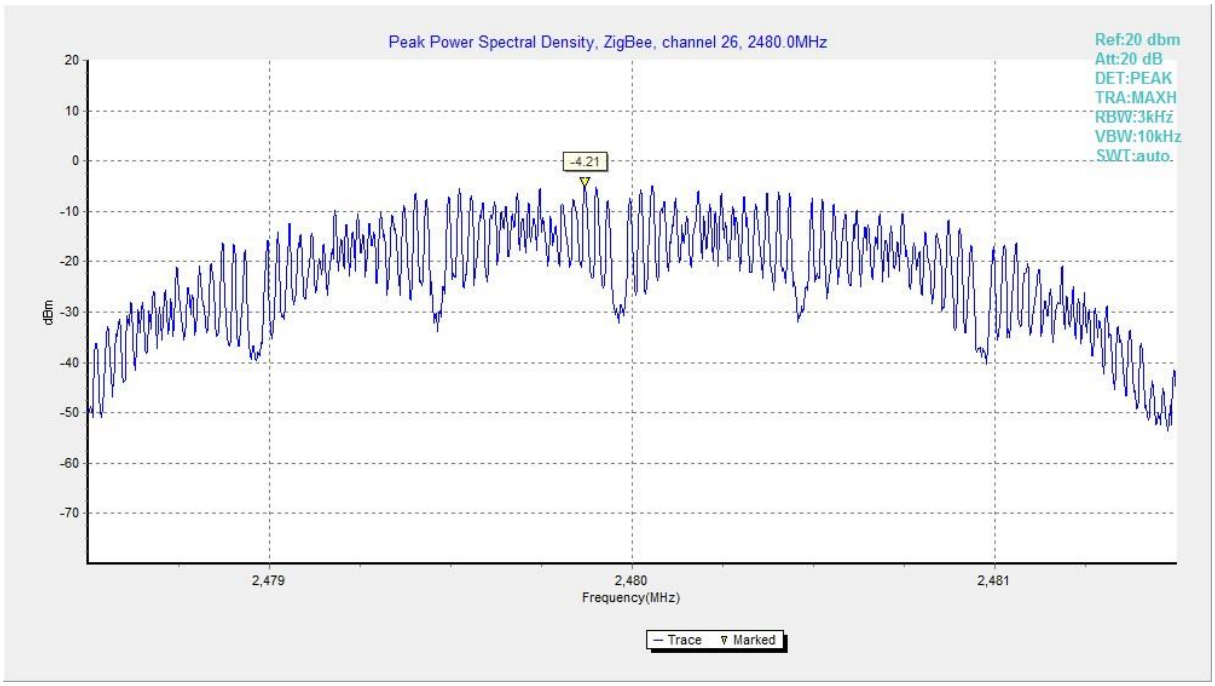



**Fig.A.3.3 Power Spectral Density (802.11b, Ch 26)**

## A.4. DTS 6-dB Signal Bandwidth

**Method of Measurement: See ANSI C63.10-2013 section 11.8.1.**

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) = 300 kHz.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

**Measurement Limit:**

| Standard | Limit (kHz) |
|---|---|
| FCC 47 CFR Part 15.247 (a) | ≥ 500 |

**EUT ID: EUT2**

**Measurement Result:**

| Mode | Frequency (MHz) | Occupied Channel Bandwidth (MHz) | | Conclusion |
|---|---|---|---|---|
| Zigbee | 2405 | Fig.B.4.1. | 1.54 | **P** |
| | 2440 | Fig.B.4.2. | 1.56 | **P** |
| | 2480 | Fig.B.4.3. | 1.56 | **P** |

**Conclusion: Pass**

**Test graphs as below:**

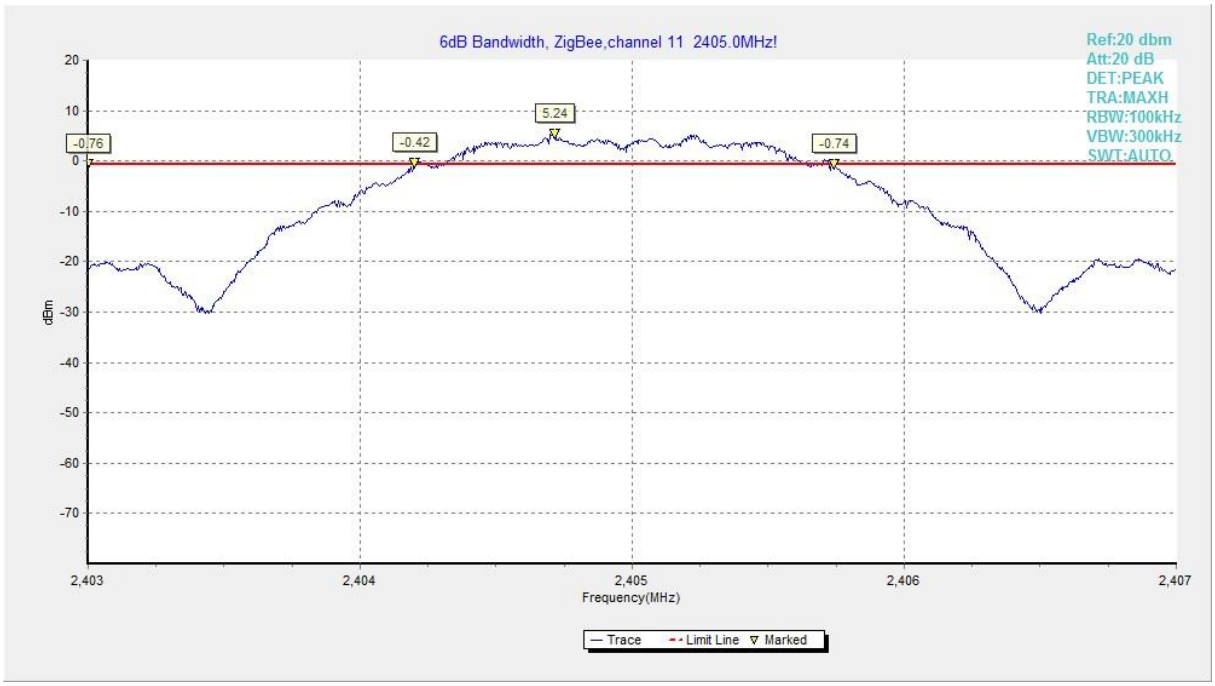



**Fig.A.4.1 Occupied 6dB Bandwidth( Zigbee Channel 11)**

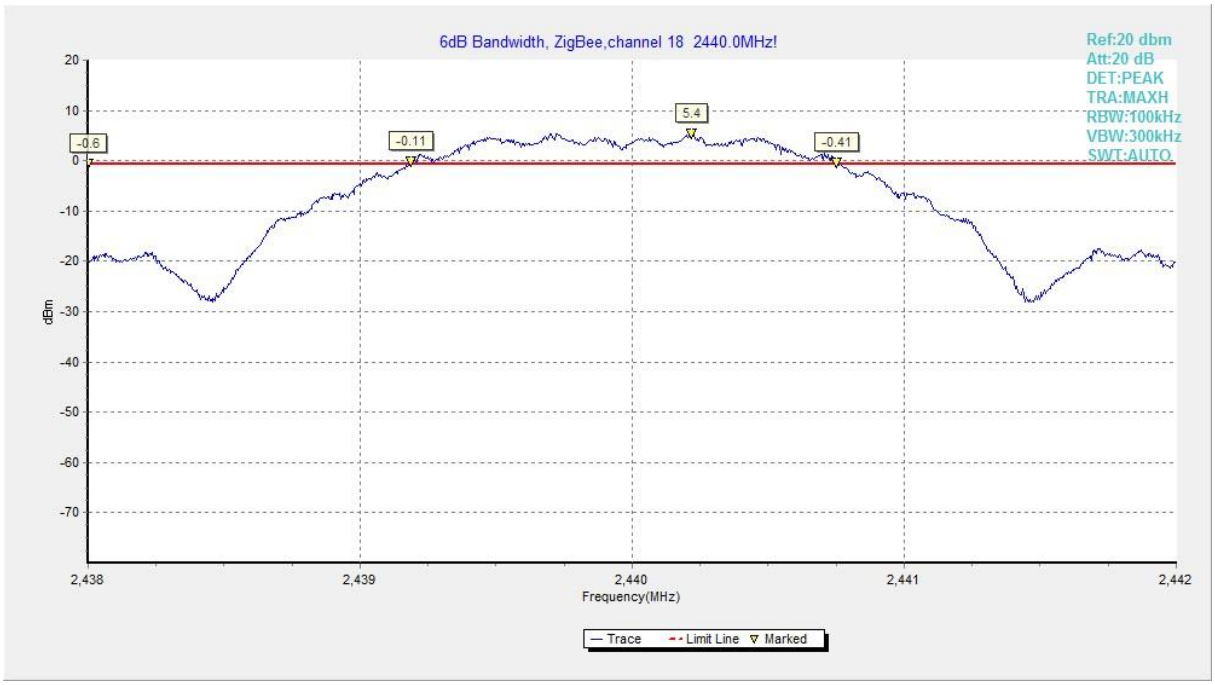



**Fig.A.4.2 Occupied 6dB Bandwidth (Zigbee Channel 18)**

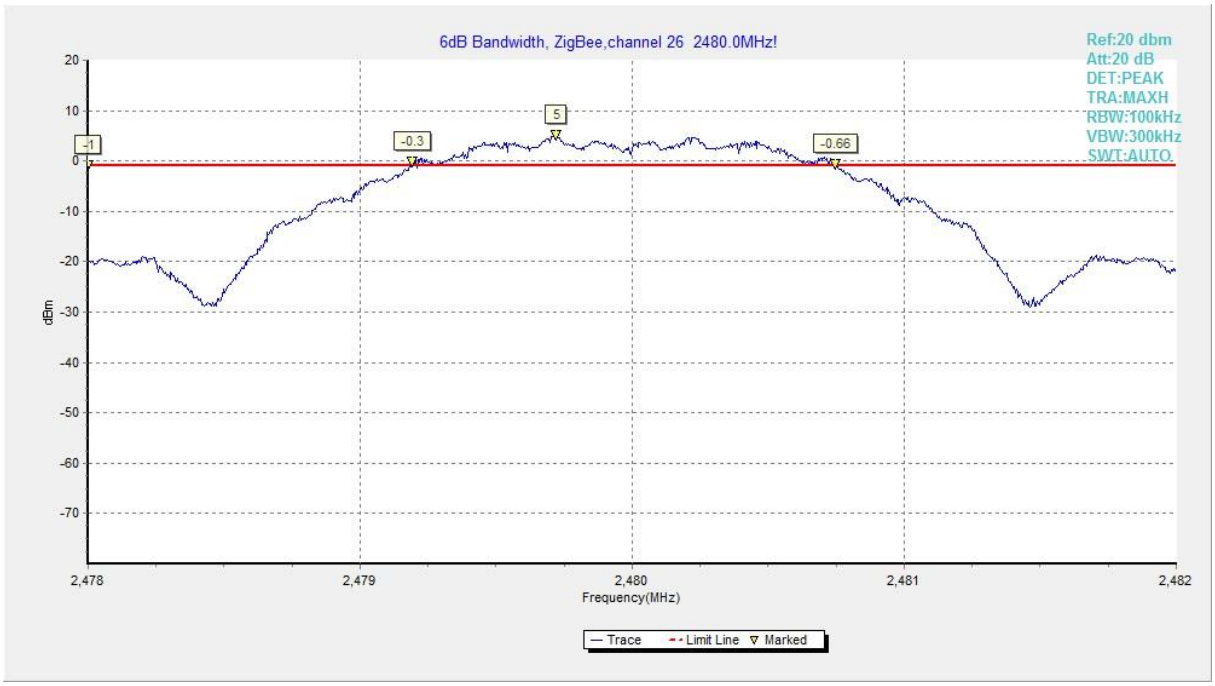



**Fig.A.4.3 Occupied 6dB Bandwidth (Zigbee Channel 26)**

## A.5. Band Edges Compliance

**Method of Measurement: See ANSI C63.10-2013-clause 6.10.4**

Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described below.

a) Set Span = 100MHz
b) Sweep Time: coupled
c) Set the RBW= 100 kHz
c) Set the VBW= 300 kHz
d) Detector: Peak
e) Trace: Max hold

**Measurement Limit:**

| Standard | Limit (dBc) |
|---|---|
| FCC 47 CFR Part 15.247 (d) | > 20 |

**EUT ID: EUT2**

**Measurement Result:**

| Mode | Channel | Test Results | Conclusion |
|---|---|---|---|
| Zigbee | 11 | Fig.A.5.1 | **P** |
| | 26 | Fig.A.5.2 | **P** |

**Conclusion: Pass**

**Test graphs as below:**

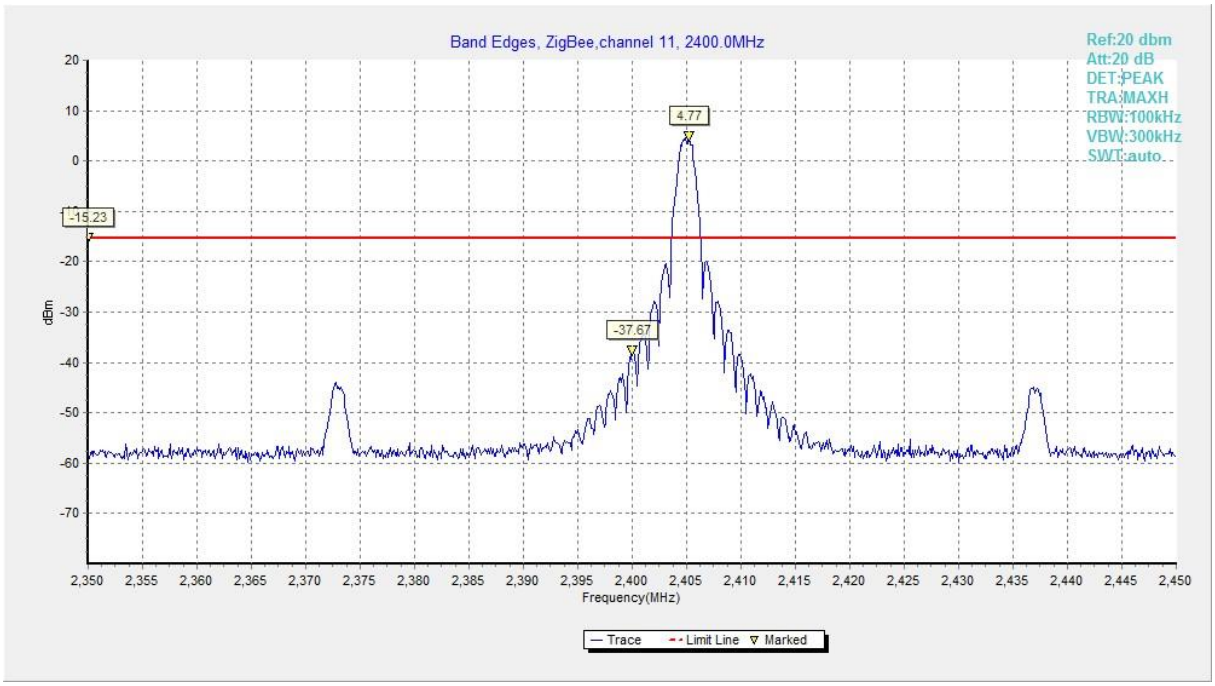



**Fig.A.5.1 Band Edges (Zigbee Channel 11)**

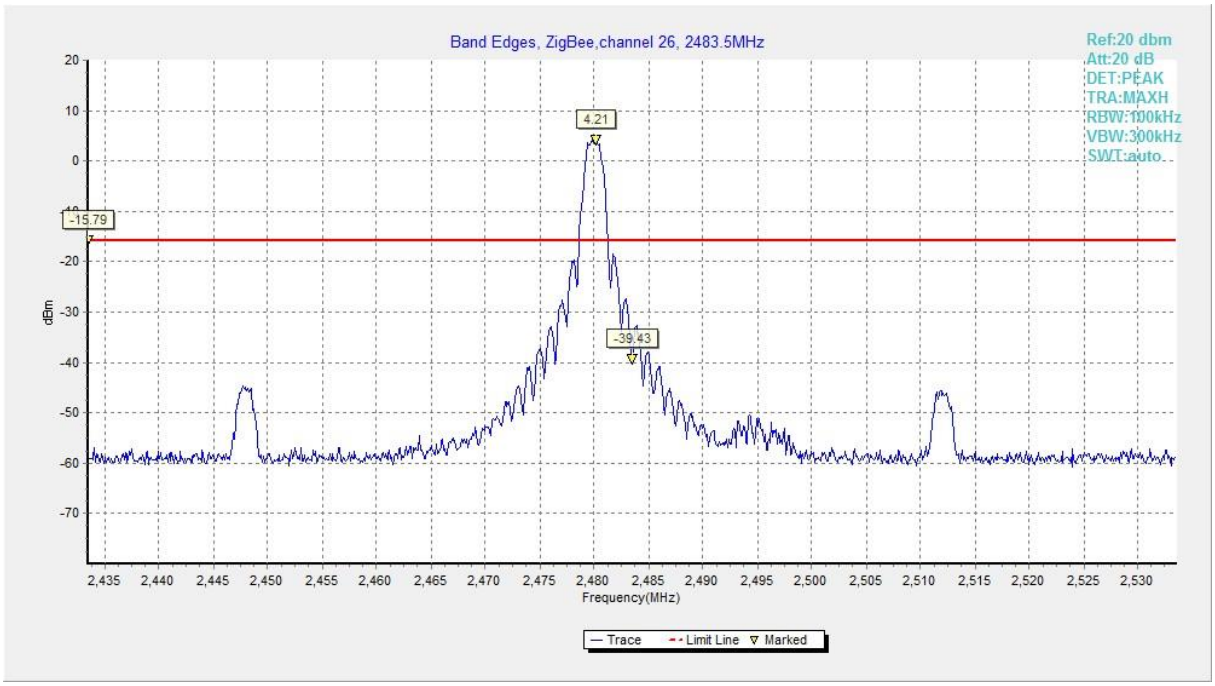



**Fig.A.5.2 Band Edges (Zigbee Channel 26)**

## A.6. Transmitter Spurious Emission

### A.6.1 Transmitter Spurious Emission – Conducted

**Method of Measurement: See ANSI C63.10-2013-clause 11.11.2**

Establish a reference level by using the following procedure:

a) Set instrument center frequency to DTS channel center frequency

b) Set the span to ≥ 1.5 times the DTS bandwidth

c) Set the RBW= 100 kHz

d) Set the VBW= 300 kHz

e) Detector = Peak

f) Sweep time = auto couple

g) Trace mode = max hold

h) Allow trace to fully stabilize

i) Use the peak marker function to determine the maximum PSD level

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Establish an emission level by using the following procedure:

a) Set the center frequency and span to encompass frequency range to be measured.

b) Set the RBW = 100 kHz.

c) Set the VBW = 300 kHz.

d) Detector = peak.

e) Sweep time = auto couple.

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

**Measurement Limit:**

| Standard | Limit |
|---|---|
| FCC 47 CFR Part 15.247 (d) | 20dB below peak output power in 100 kHz bandwidth |

**EUT ID: EUT2**

**Measurement Results:**

**802.11b mode**

| MODE | Channel | Frequency Range | Test Results | Conclusion |
|---|---|---|---|---|
| Zigbee | 11 | 2.412 GHz | Fig.A.6.1.1 | **P** |
| | | 30 MHz ~ 1 GHz | Fig.A.6.1.2 | **P** |
| | | 1 GHz ~ 2.5 GHz | Fig.A.6.1.3 | **P** |
| | | 2.5 GHz ~ 7.5 GHz | Fig.A.6.1.4 | **P** |
| | | 7.5 GHz ~ 10 GHz | Fig.A.6.1.5 | **P** |
| | | 10 GHz ~ 15 GHz | Fig.A.6.1.6 | **P** |
| | | 15 GHz ~ 20 GHz | Fig.A.6.1.7 | **P** |
| | | 20 GHz ~ 26 GHz | Fig.A.6.1.8 | **P** |
| | 18 | 2.437 GHz | Fig.A.6.1.9 | **P** |
| | | 30 MHz ~ 1 GHz | Fig.A.6.1.10 | **P** |
| | | 1 GHz ~ 2.5 GHz | Fig.A.6.1.11 | **P** |
| | | 2.5 GHz ~ 7.5 GHz | Fig.A.6.1.12 | **P** |
| | | 7.5 GHz ~ 10 GHz | Fig.A.6.1.13 | **P** |
| | | 10 GHz ~ 15 GHz | Fig.A.6.1.14 | **P** |
| | | 15 GHz ~ 20 GHz | Fig.A.6.1.15 | **P** |
| | | 20 GHz ~ 26 GHz | Fig.A.6.1.16 | **P** |
| | 26 | 2.462 GHz | Fig.A.6.1.17 | **P** |
| | | 30 MHz ~ 1 GHz | Fig.A.6.1.18 | **P** |
| | | 1 GHz ~ 2.5 GHz | Fig.A.6.1.19 | **P** |
| | | 2.5 GHz ~ 7.5 GHz | Fig.A.6.1.20 | **P** |
| | | 7.5 GHz ~ 10 GHz | Fig.A.6.1.21 | **P** |
| | | 10 GHz ~ 15 GHz | Fig.A.6.1.22 | **P** |
| | | 15 GHz ~ 20 GHz | Fig.A.6.1.23 | **P** |
| | | 20 GHz ~ 26 GHz | Fig.A.6.1.24 | **P** |

**Conclusion: Pass**

**Test graphs as below:**

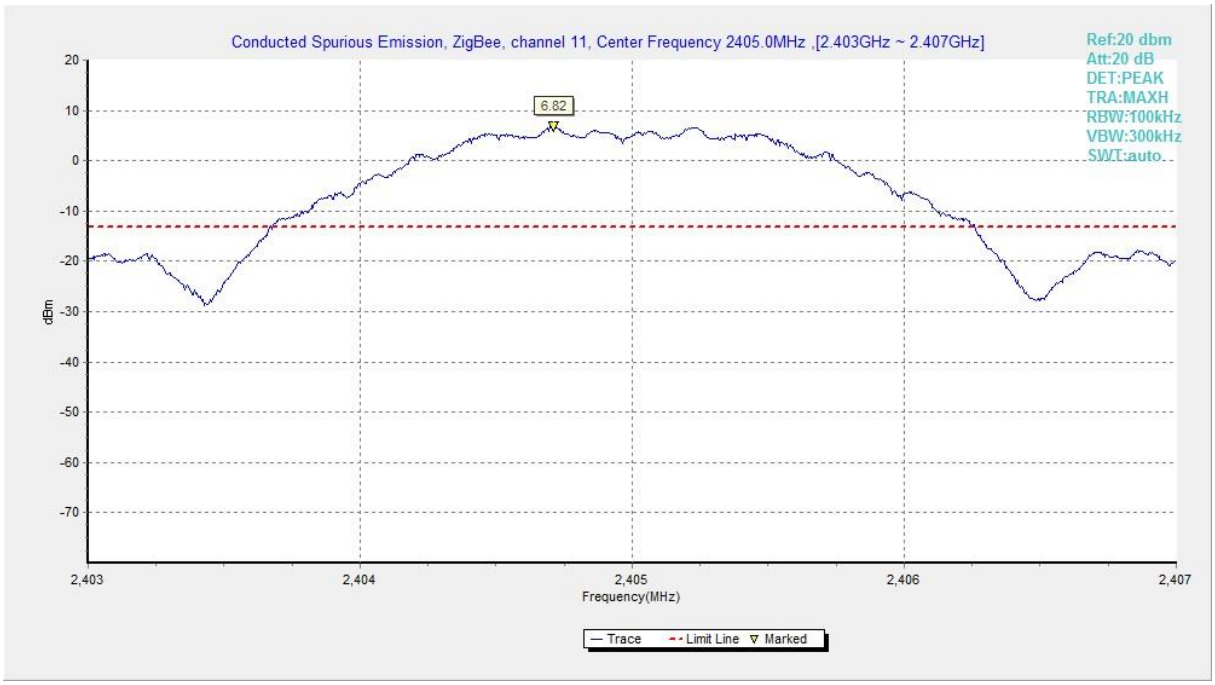



**Fig.A.6.1.1 Transmitter Spurious Emission - Conducted (Zigbee Channel 11, Center Frequency)**

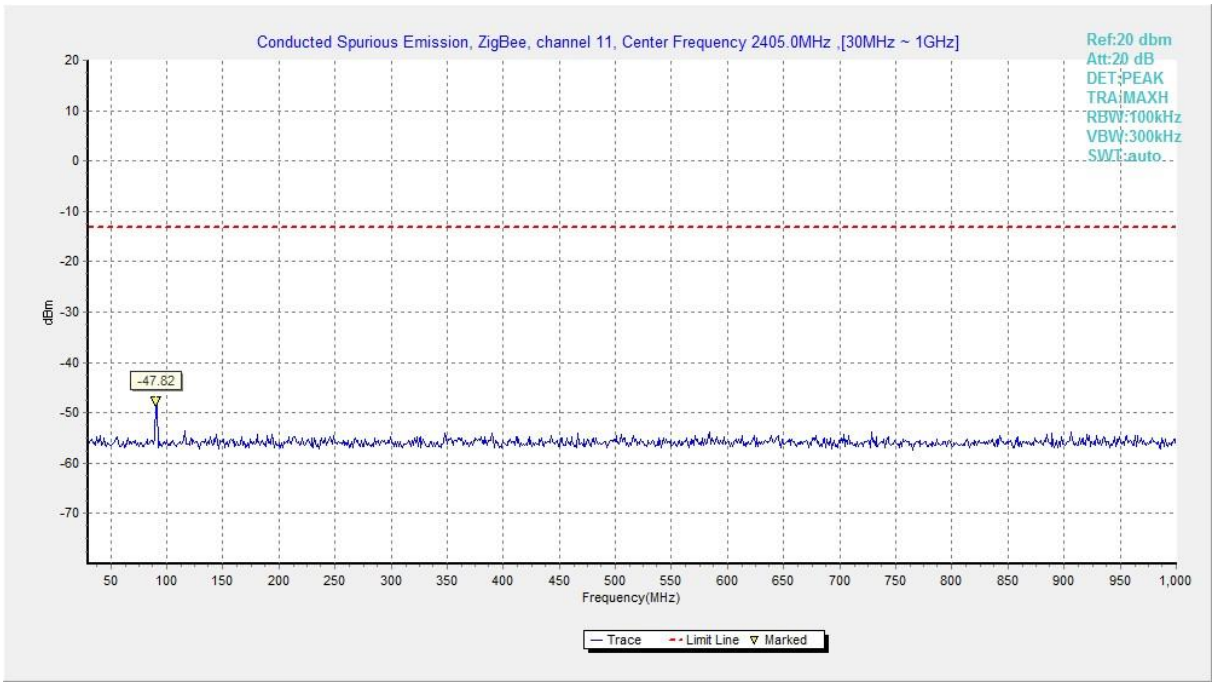



**Fig.A.6.1.2 Transmitter Spurious Emission - Conducted (Zigbee Channel 11, 30 MHz-1 GHz)**

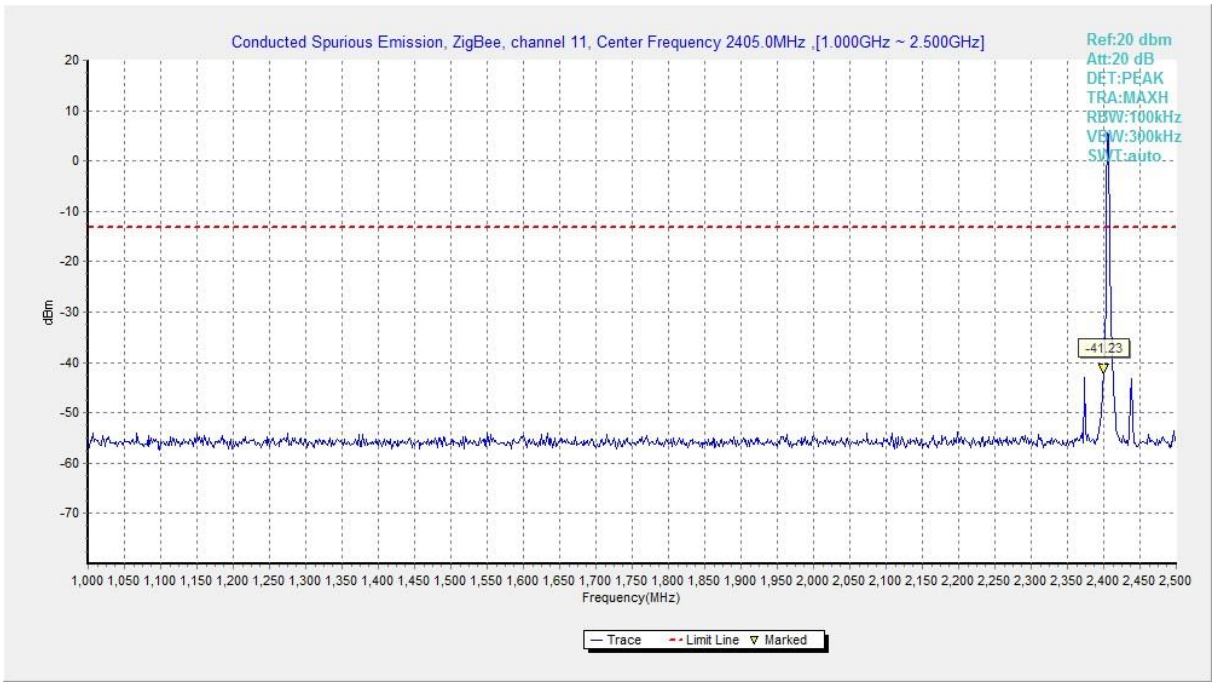



**Fig.A.6.1.3 Transmitter Spurious Emission - Conducted (Zigbee Channel 11, 1 GHz-2.5 GHz)**

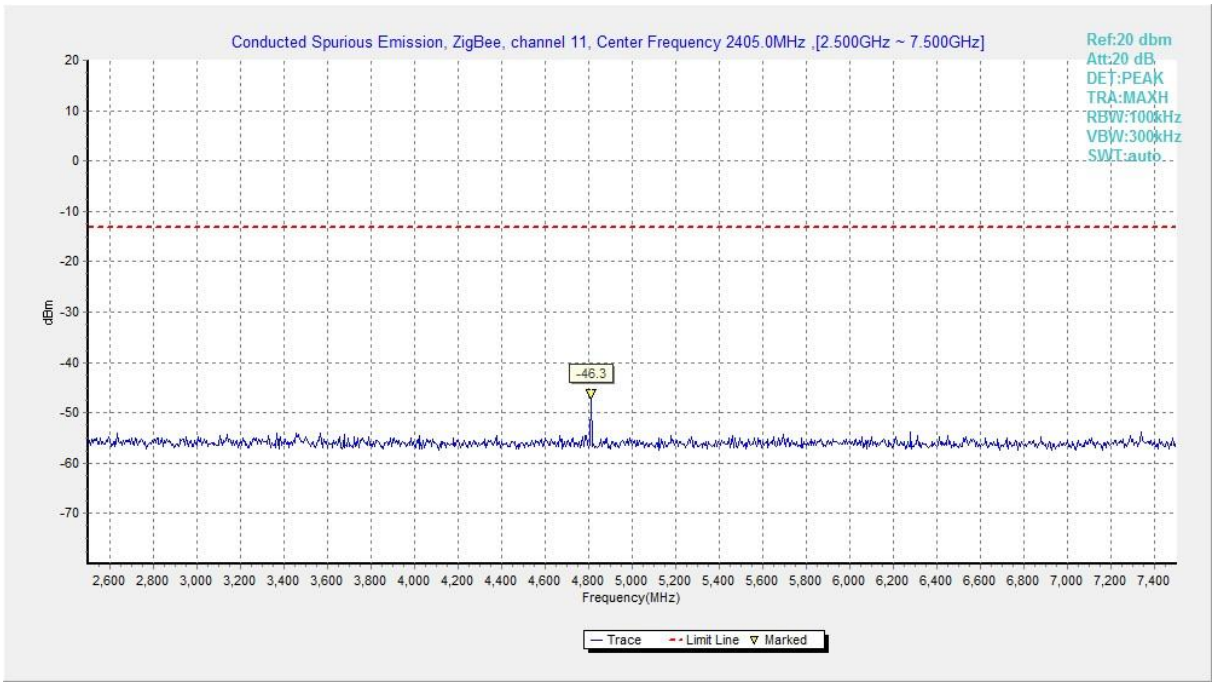



**Fig.A.6.1.4 Transmitter Spurious Emission - Conducted (Zigbee Channel 11, 2.5 GHz-7.5 GHz)**

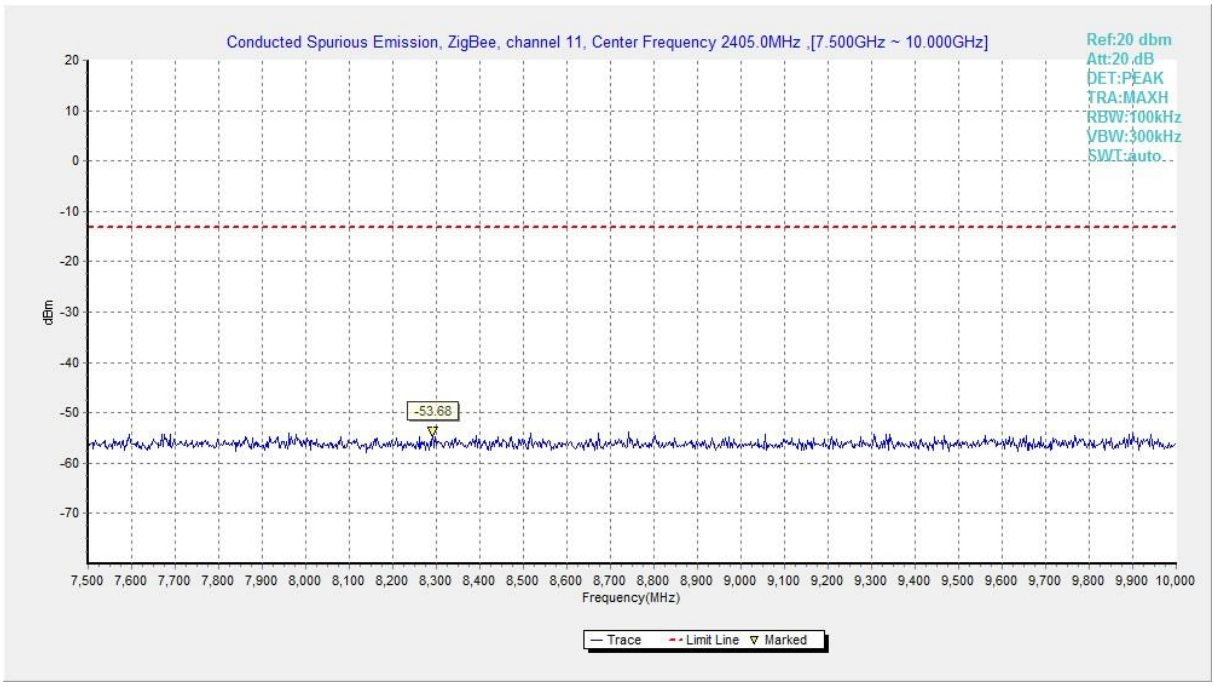



**Fig.A.6.1.5 Transmitter Spurious Emission - Conducted (Zigbee Channel 11, 7.5 GHz-10 GHz)**

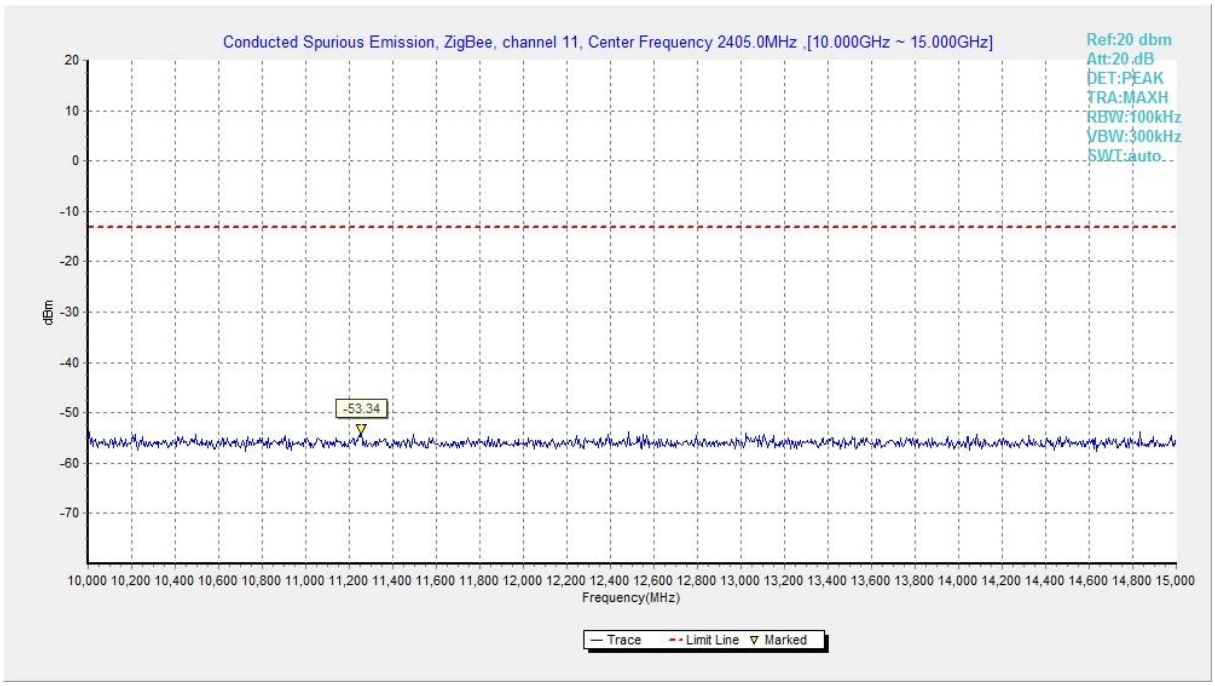



**Fig.A.6.1.6 Transmitter Spurious Emission - Conducted (Zigbee Channel 11, 10 GHz-15 GHz)**

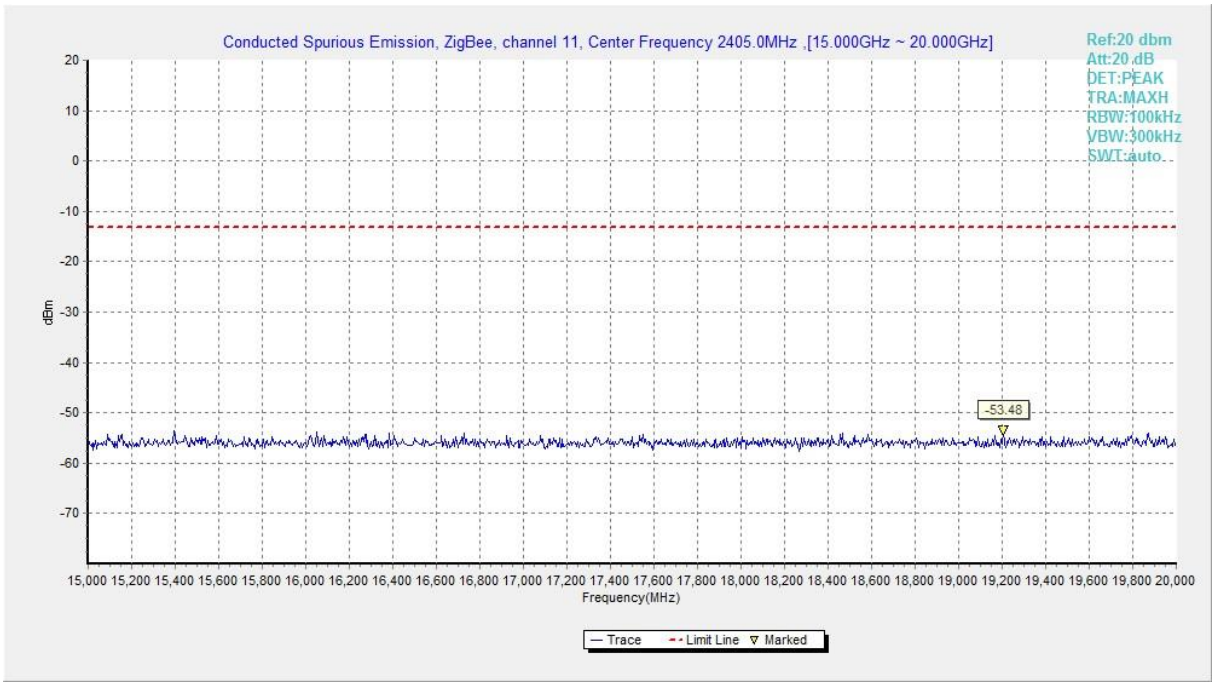



**Fig.A.6.1.7 Transmitter Spurious Emission - Conducted (Zigbee Channel 11, 15 GHz-20 GHz)**

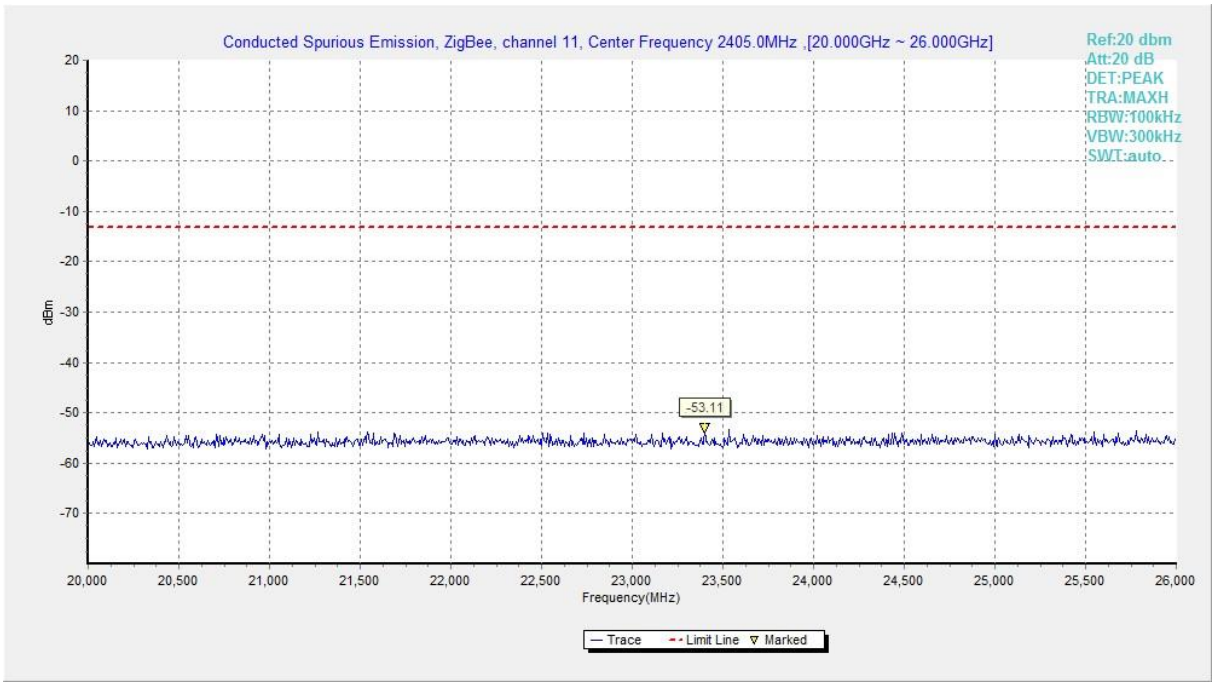



**Fig.A.6.1.8 Transmitter Spurious Emission - Conducted (Zigbee Channel 11, 20 GHz-26 GHz)**

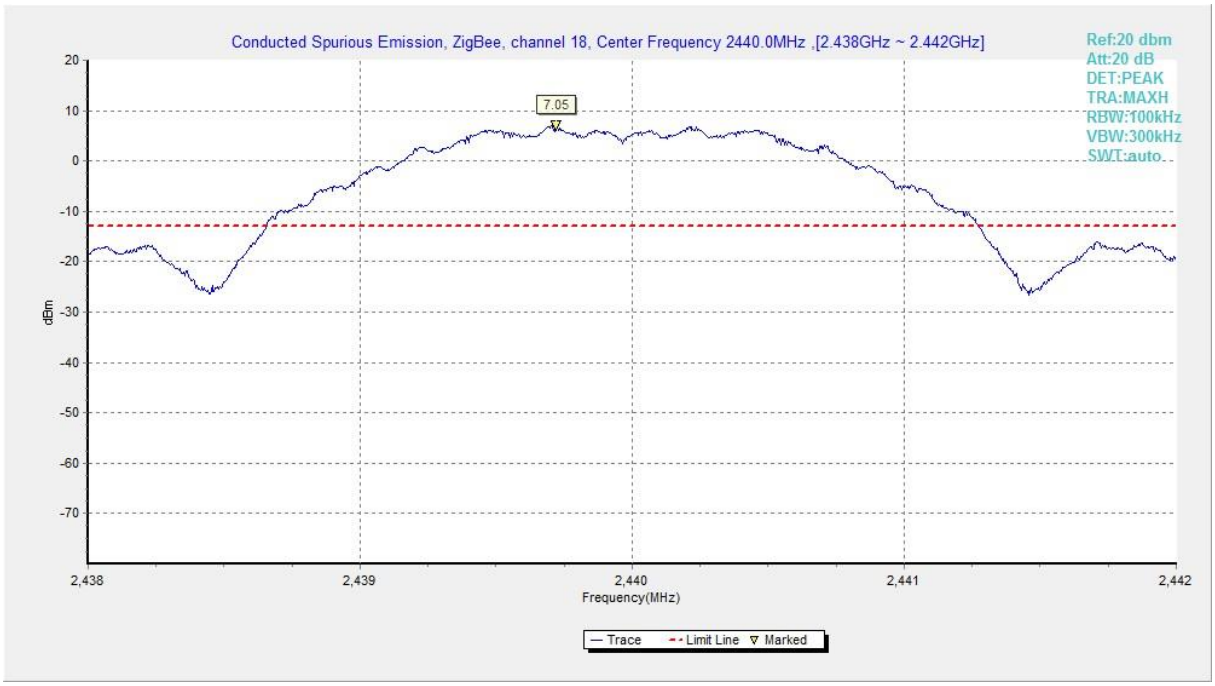



**Fig.A.6.1.9 Transmitter Spurious Emission - Conducted (Zigbee Channel 18, Center Frequency)**

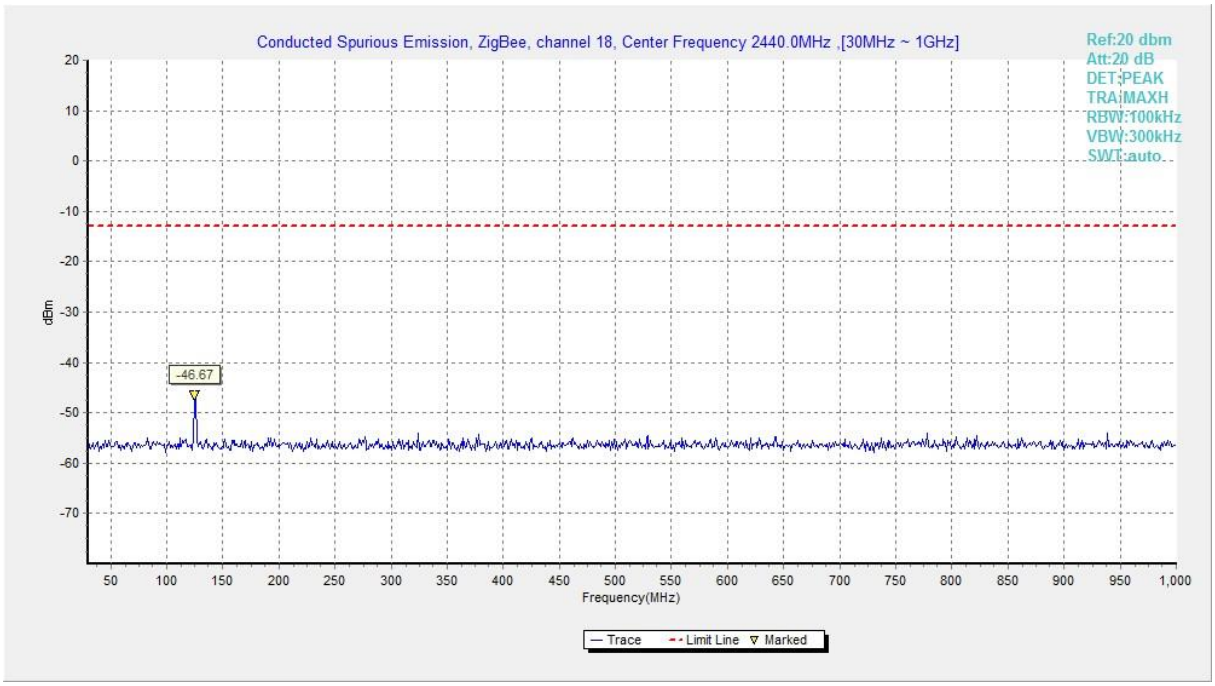



**Fig.A.6.1.10 Transmitter Spurious Emission - Conducted (Zigbee Channel 18, 30 MHz-1 GHz)**

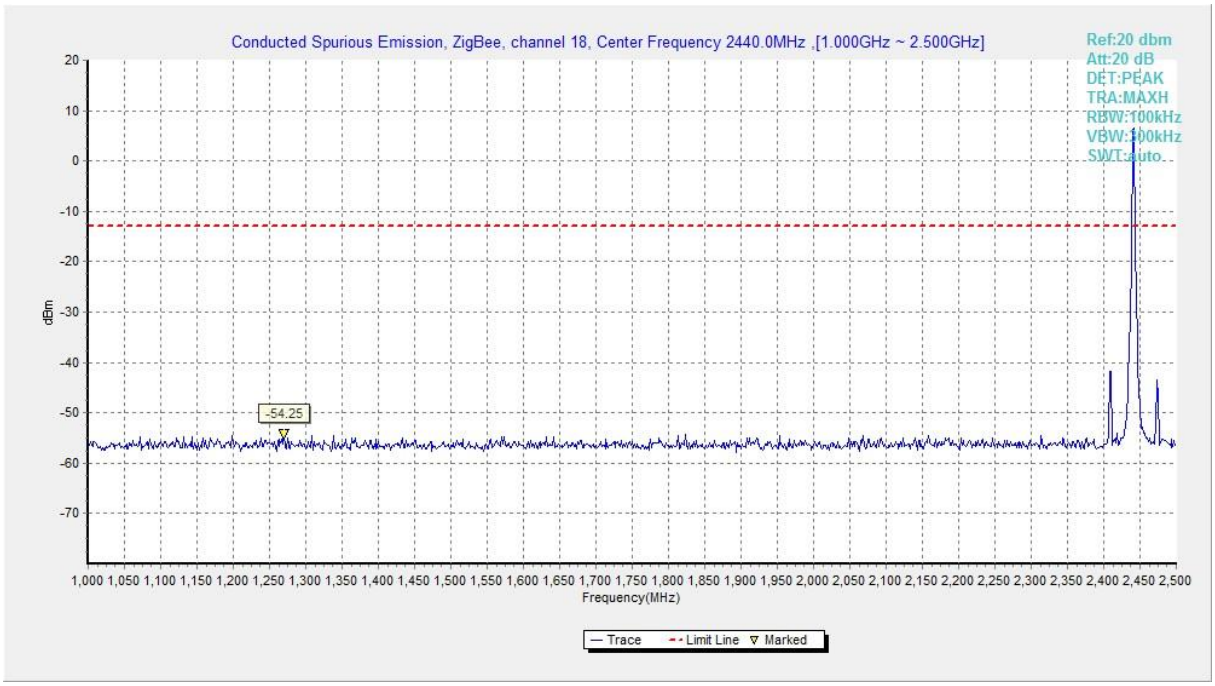



**Fig.A.6.1.11 Transmitter Spurious Emission - Conducted (Zigbee Channel 18, 1 GHz-2.5 GHz)**

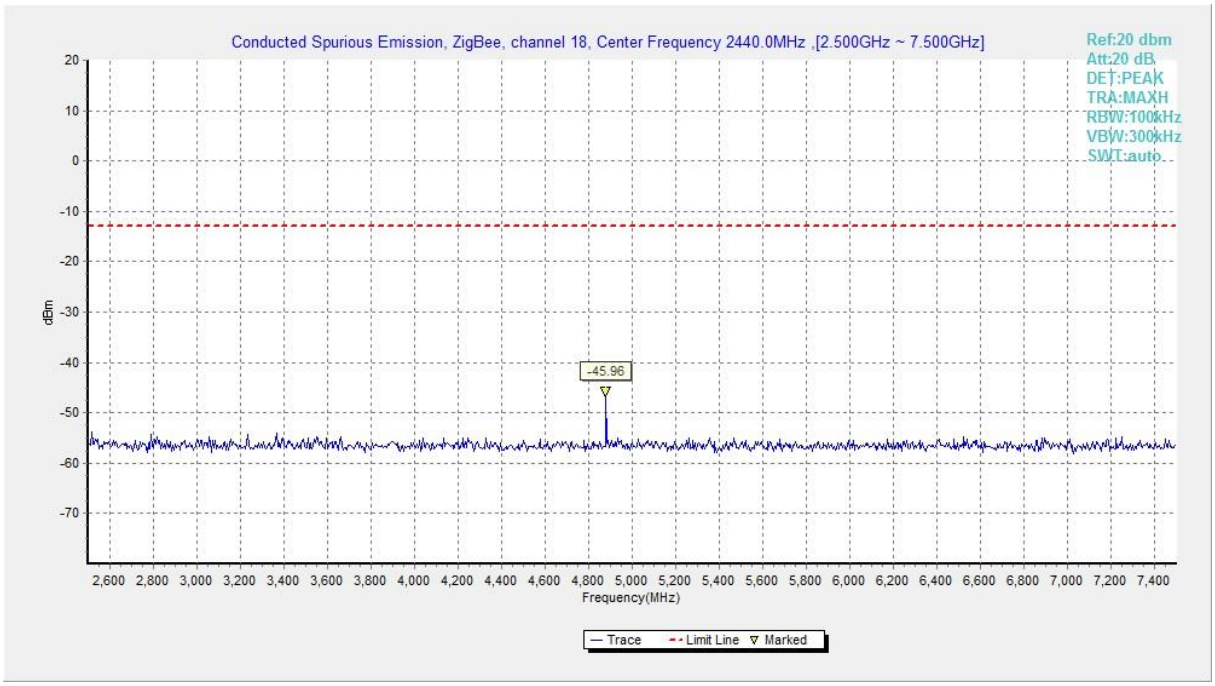



**Fig.A.6.1.12 Transmitter Spurious Emission - Conducted (Zigbee Channel 18, 2.5 GHz-7.5 GHz)**

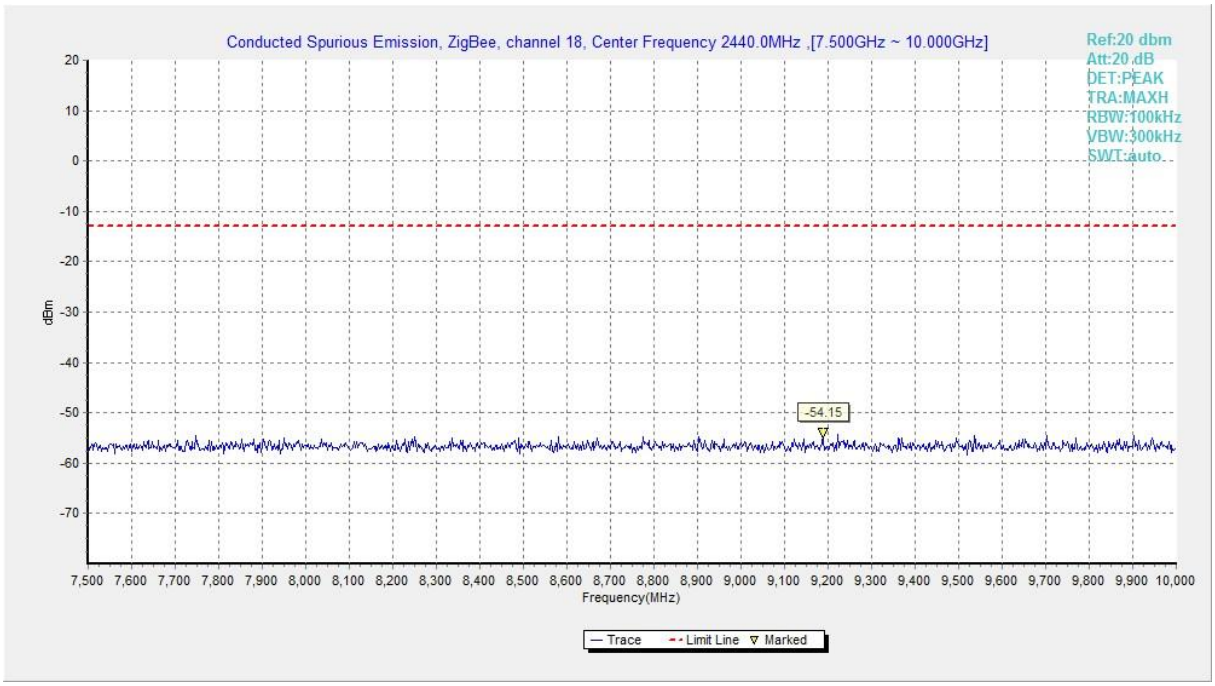



**Fig.A.6.1.13 Transmitter Spurious Emission - Conducted (Zigbee Channel 18, 7.5 GHz-10 GHz)**

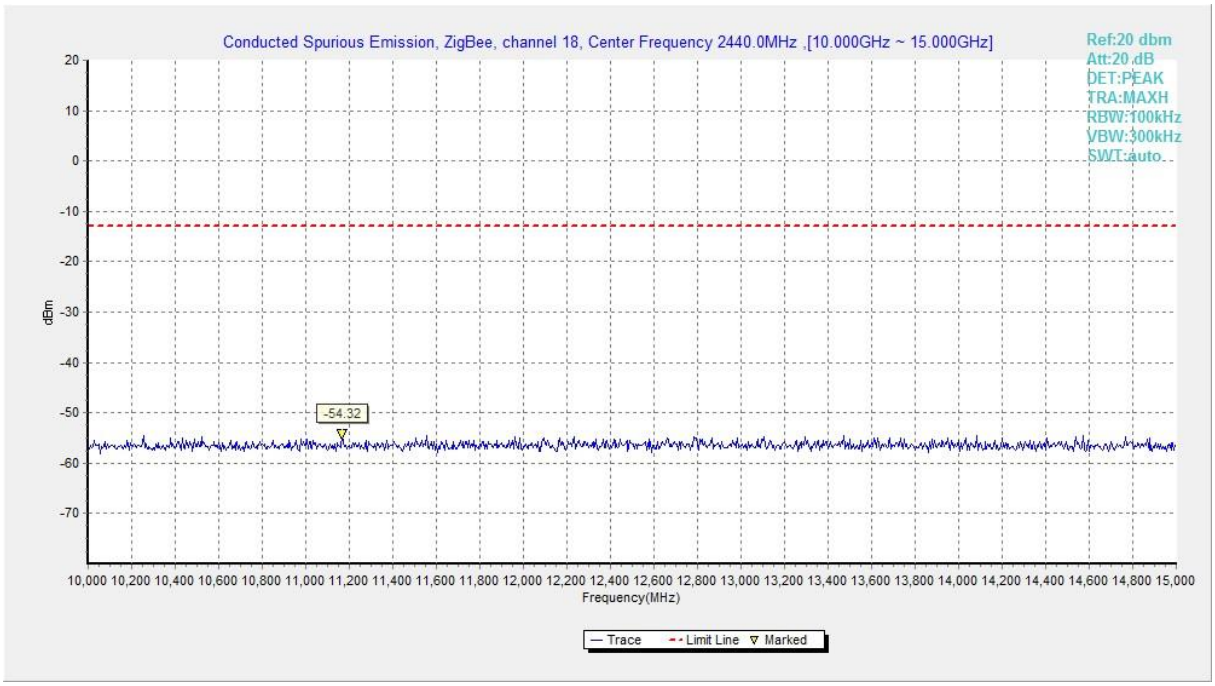



**Fig.A.6.1.14 Transmitter Spurious Emission - Conducted (Zigbee Channel 18, 10 GHz-15 GHz)**

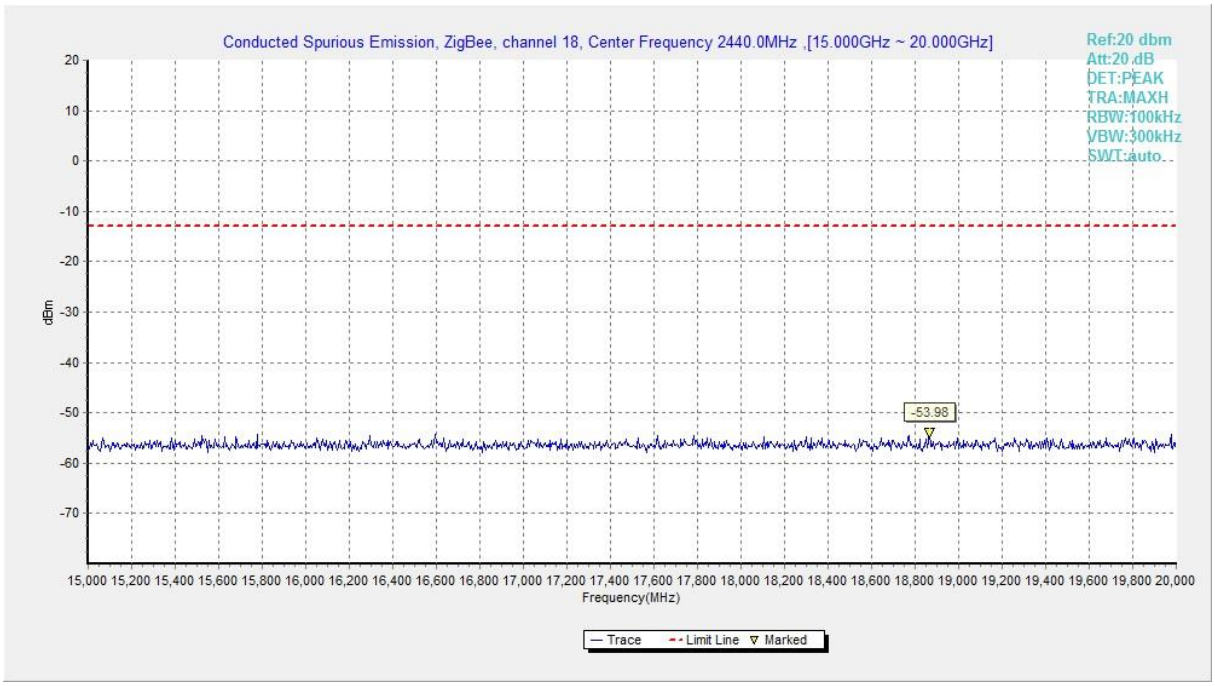



**Fig.A.6.1.15 Transmitter Spurious Emission - Conducted (Zigbee Channel 18, 15 GHz-20 GHz)**

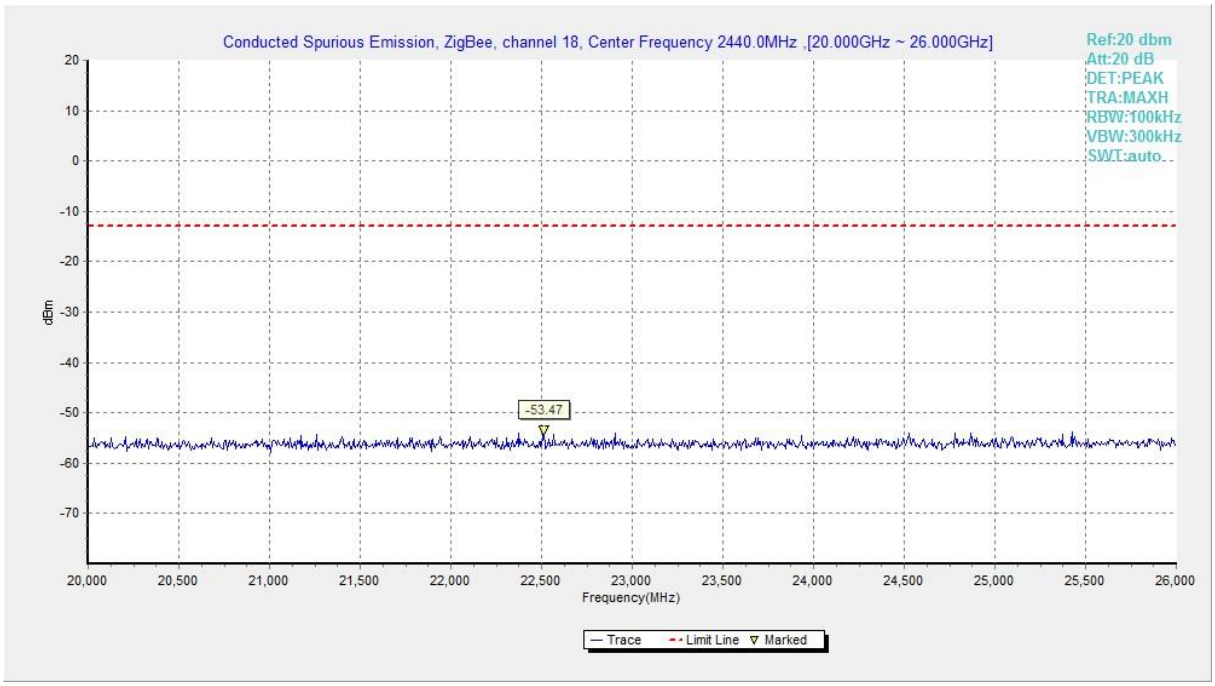



**Fig.A.6.1.16 Transmitter Spurious Emission - Conducted (Zigbee Channel 18, 20 GHz-26 GHz)**

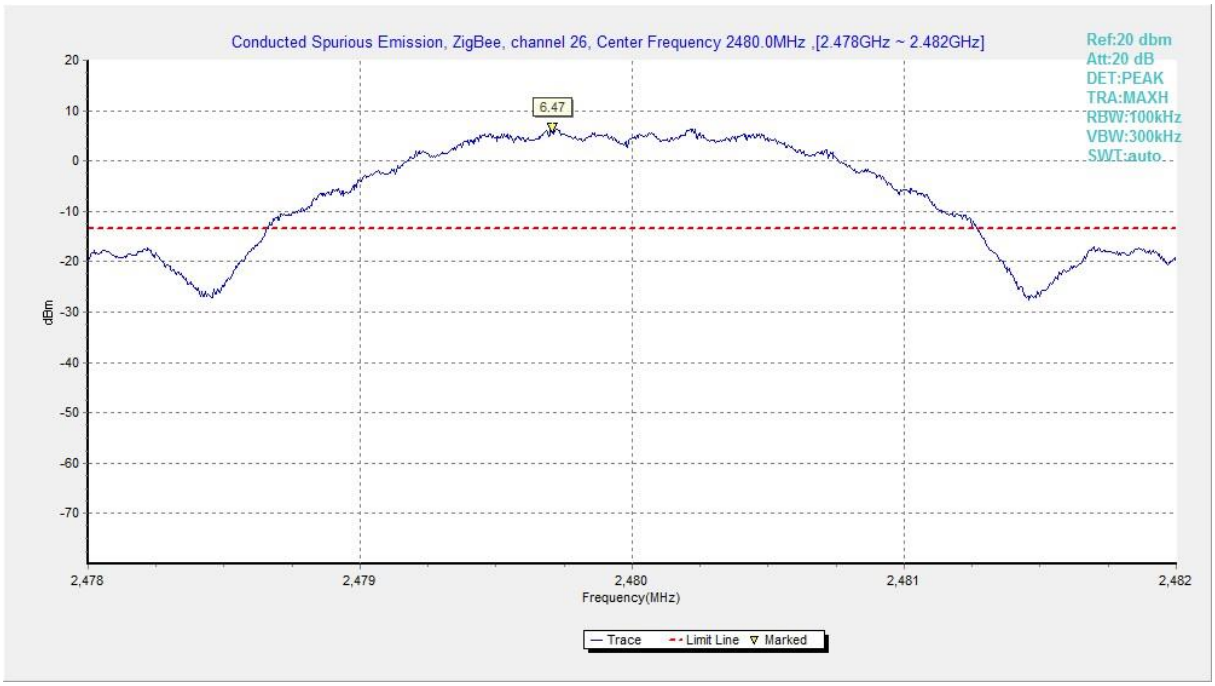



**Fig.A.6.1.17 Transmitter Spurious Emission - Conducted (Zigbee Channel 26, Center Frequency)**

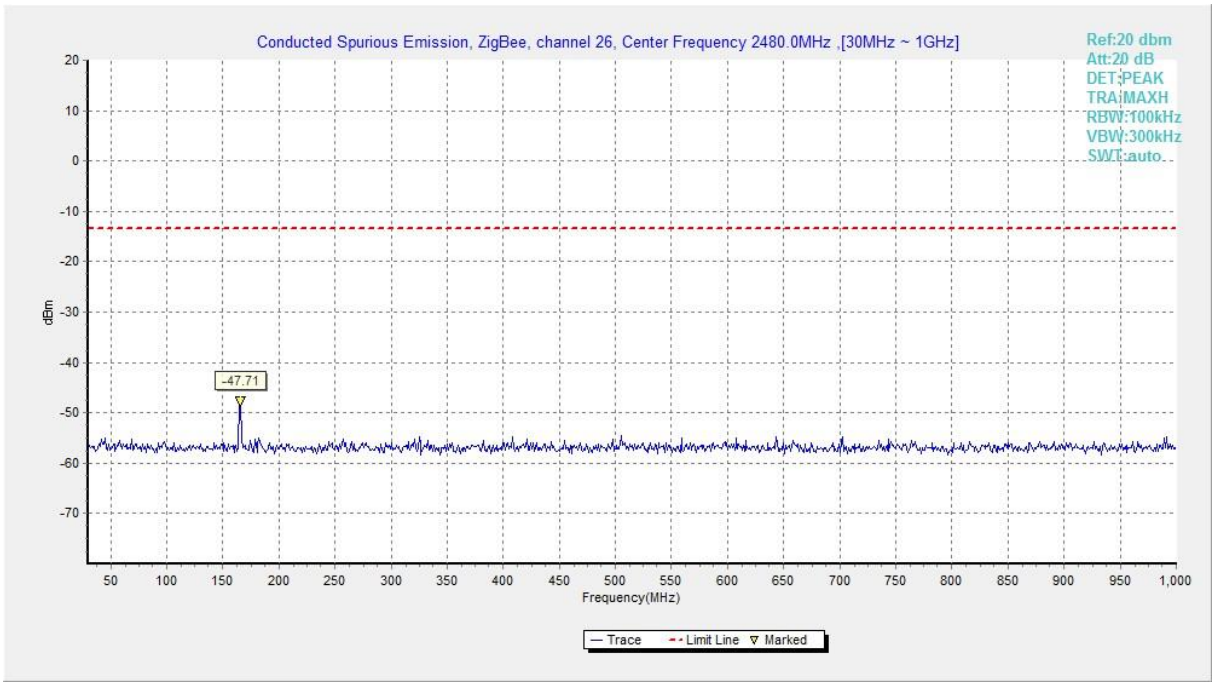



**Fig.A.6.1.18 Transmitter Spurious Emission - Conducted (Zigbee Channel 26, 30 MHz-1 GHz)**

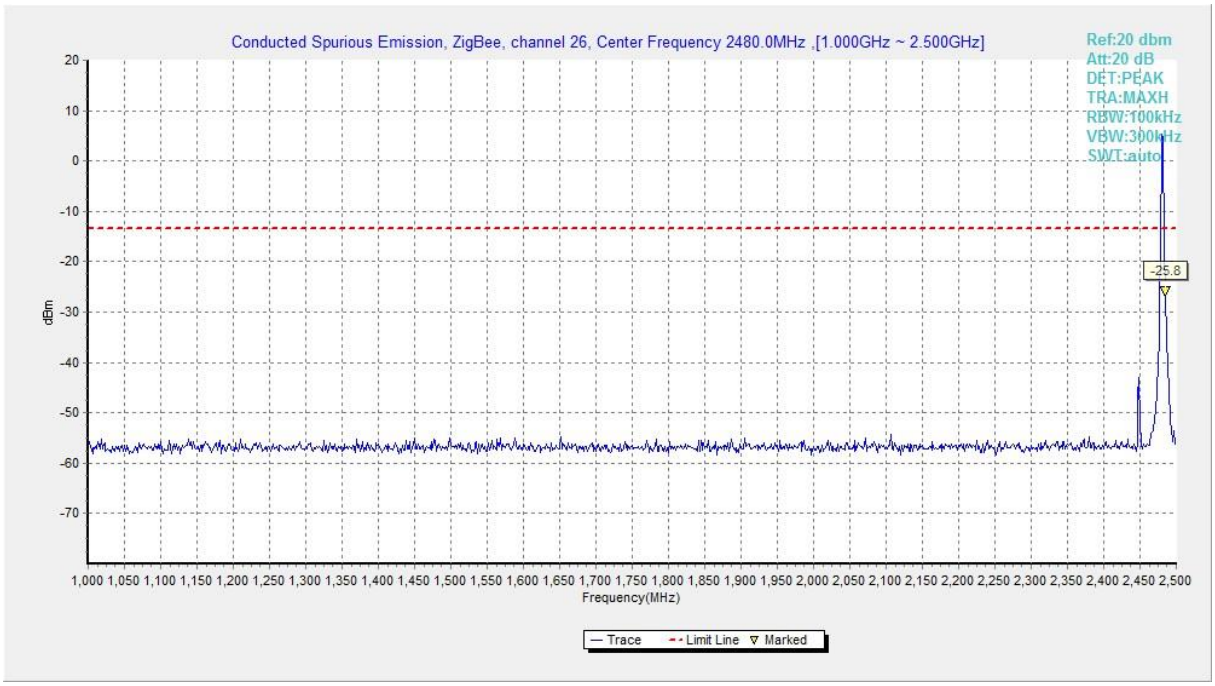



**Fig.A.6.1.19 Transmitter Spurious Emission - Conducted (Zigbee Channel 26, 1 GHz-2.5 GHz)**

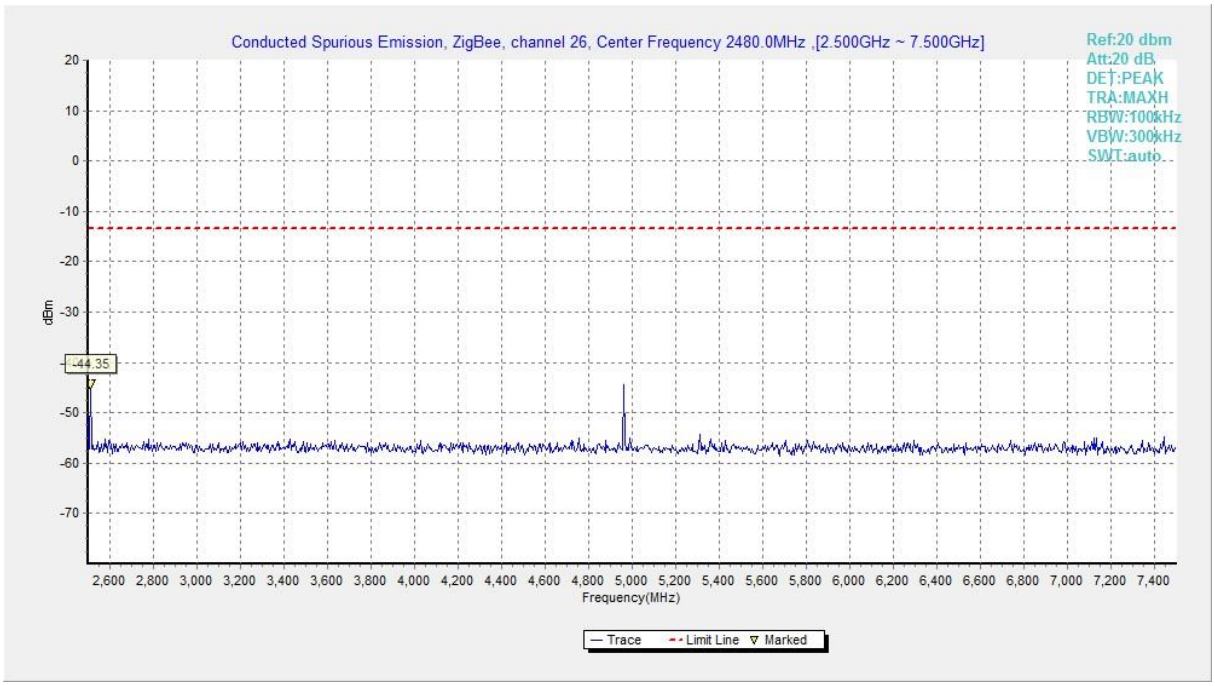



**Fig.A.6.1.20 Transmitter Spurious Emission - Conducted (Zigbee Channel 26, 2.5 GHz-7.5 GHz)**

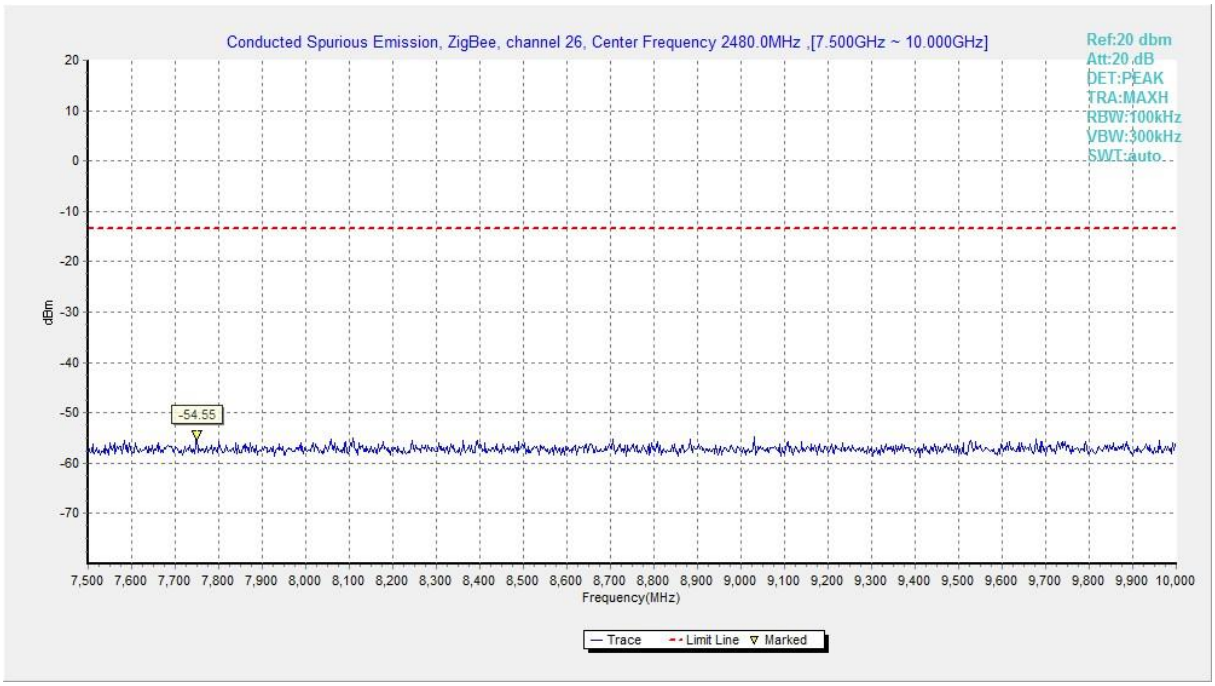



**Fig.A.6.1.21 Transmitter Spurious Emission - Conducted (Zigbee Channel 26, 7.5 GHz-10 GHz)**

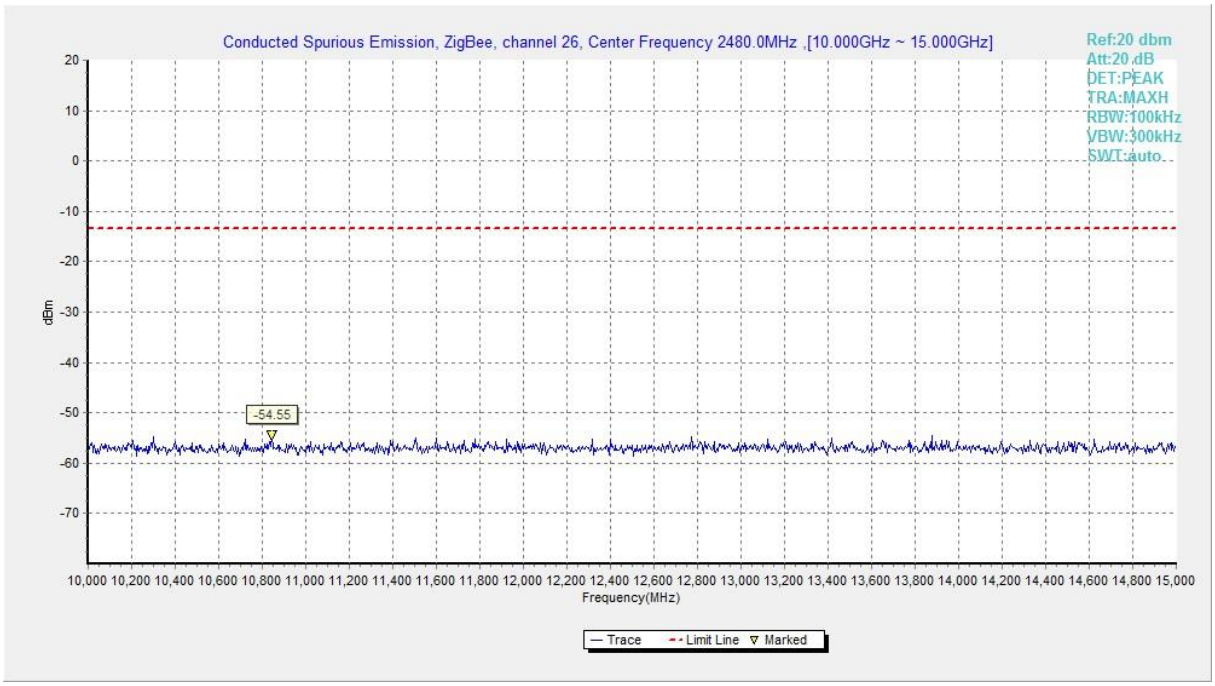



**Fig.A.6.1.22 Transmitter Spurious Emission - Conducted (Zigbee Channel 26, 10 GHz-15 GHz)**

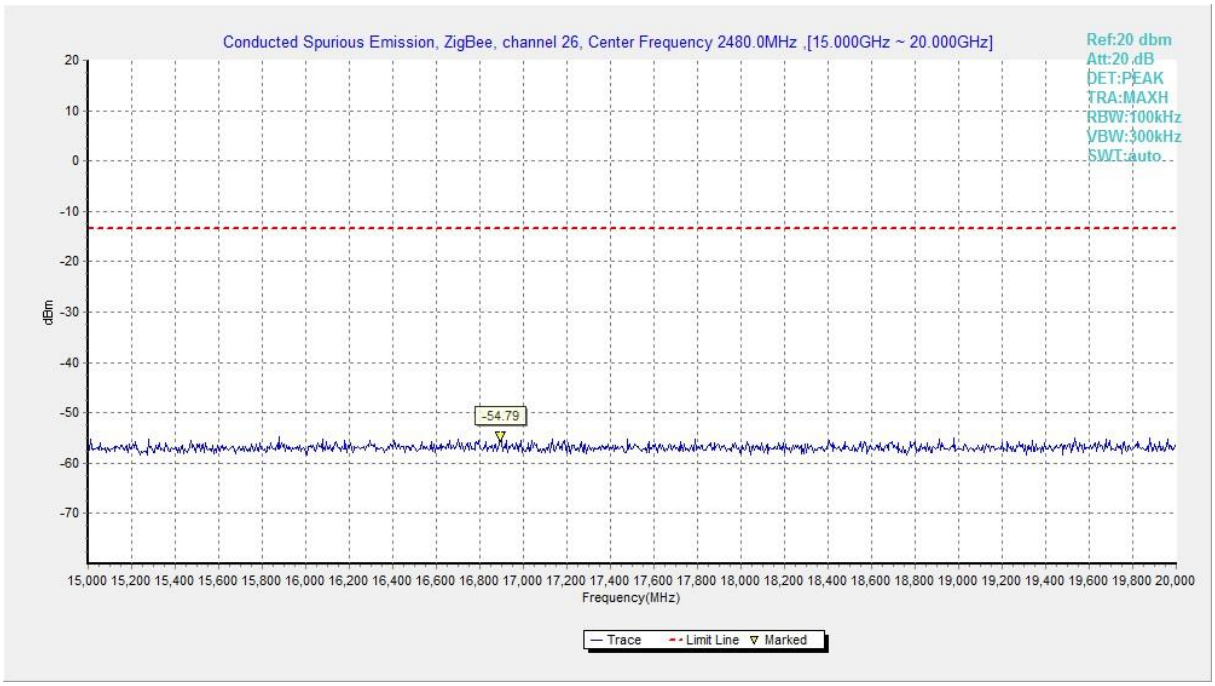



**Fig.A.6.1.23 Transmitter Spurious Emission - Conducted (Zigbee Channel 26, 15 GHz-20 GHz)**

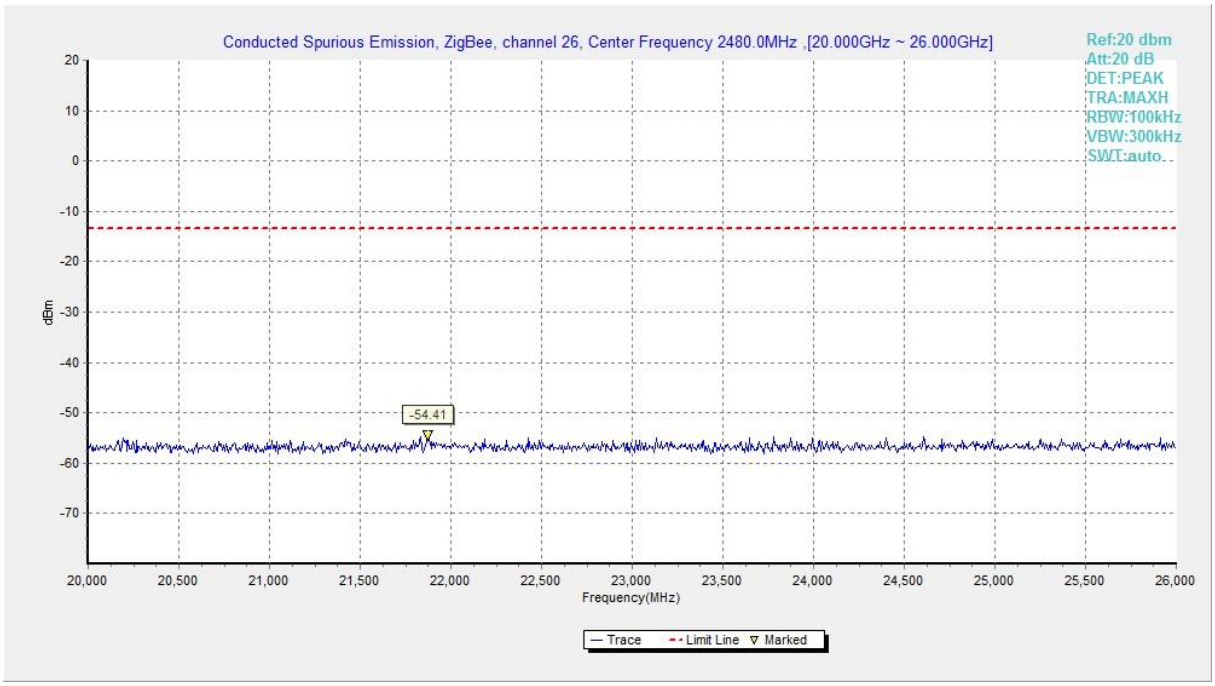



**Fig.A.6.1.24 Transmitter Spurious Emission - Conducted (Zigbee Channel 26, 20 GHz-26 GHz)**

**A.6.2 Transmitter Spurious Emission - Radiated**

**Method of Measurement: See ANSI C63.10-2013-clause 6.4 &6.5 & 6.6**

**Measurement Limit:**

| Standard | Limit |
|---|---|
| FCC 47 CFR Part 15.247, 15.205, 15.209 | 20dB below peak output power |

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

**Limit in restricted band:**

| Frequency of emission (MHz) | Field strength(uV/m) | Field strength(dBuV/m) |
|---|---|---|
| 30-88 | 100 | 40 |
| 88-216 | 150 | 43.5 |
| 216-960 | 200 | 46 |
| Above 960 | 500 | 54 |

| Frequency (MHz) | Field strength(μV/m) | Measurement distance (m) |
|---|---|---|
| 0.009 - 0.490 | 2400/F(kHz) | 300 |
| 0.490 - 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 | 30 |

**Test Condition**

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

| Frequency of emission (MHz) | RBW/VBW | Sweep Time(s) |
|---|---|---|
| 30-1000 | 100KHz/300KHz | 5 |
| 1000-4000 | 1MHz/1MHz | 15 |
| 4000-18000 | 1MHz/1MHz | 40 |
| 18000-26500 | 1MHz/1MHz | 20 |

**EUT ID: EUT1**

**Measurement Results:**

**Zigbee**

| Mode | Channel | Frequency Range | Test Results | Conclusion |
|---|---|---|---|---|
| Zigbee | Power | 2.38GHz ~2.45GHz | Fig.A.6.2.1 | **P** |
| | 11 | 1 GHz ~ 3 GHz | Fig.A.6.2.2 | **P** |
| | | 3 GHz ~ 18 GHz | Fig.A.6.2.3 | **P** |
| | 18 | 9 kHz ~30 MHz | Fig.A.6.2.4 | **P** |
| | | 30 MHz ~1 GHz | Fig.A.6.2.5 | **P** |
| | | 1 GHz ~ 3 GHz | Fig.A.6.2.6 | **P** |
| | | 3 GHz ~ 18 GHz | Fig.A.6.2.7 | **P** |
| | | 18 GHz~ 26.5 GHz | Fig.A.6.2.8 | **P** |
| | Power | 2.45GHz ~2.5GHz | Fig.A.6.2.9 | **P** |
| | 26 | 1 GHz ~ 3 GHz | Fig.A.6.2.10 | **P** |
| | | 3 GHz ~ 18 GHz | Fig.A.6.2.11 | **P** |

**Conclusion: Pass**

**Note:**

A "reference path loss" is established and the $A_{Rpl}$ is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

$P_{Mea}$ is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result=$P_{Mea}$+$A_{Rpl=}$ $P_{Mea}$+Cable Loss+Antenna Factor

**Average Result:**

**Zigbee**

Ch11

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | $P_{Mea}$ (dBuV/m) | Polarization |
|---|---|---|---|---|---|
| 2386.250 | 42.0 | -38.8 | 27.7 | 53.100 | V |
| 17973.500 | 43.7 | -17.7 | 45.6 | 15.800 | H |
| 17875.000 | 43.5 | -18.5 | 45.6 | 16.400 | V |
| 17869.000 | 43.4 | -18.5 | 45.6 | 16.300 | V |
| 17885.500 | 43.4 | -18.5 | 45.6 | 16.300 | H |
| 17879.000 | 43.4 | -18.5 | 45.6 | 16.300 | H |

Ch18

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | $P_{Mea}$ (dBuV/m) | Polarization |
|---|---|---|---|---|---|
| 17874.000 | 43.6 | -18.5 | 45.6 | 16.500 | H |
| 17887.000 | 43.5 | -18.5 | 45.6 | 16.400 | V |
| 17880.500 | 43.5 | -18.5 | 45.6 | 16.400 | V |
| 17901.500 | 43.4 | -18.5 | 45.6 | 16.300 | H |
| 17874.500 | 43.4 | -18.5 | 45.6 | 16.300 | V |
| 17891.000 | 43.4 | -18.5 | 45.6 | 16.300 | H |

Ch26

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | $P_{Mea}$ (dBuV/m) | Polarization |
|---|---|---|---|---|---|
| 2484.535 | 42.2 | -38.9 | 27.7 | 53.400 | H |
| 17880.000 | 43.8 | -18.5 | 45.6 | 16.700 | H |
| 17864.000 | 43.8 | -18.5 | 45.6 | 16.700 | V |
| 17875.000 | 43.8 | -18.5 | 45.6 | 16.700 | V |
| 17879.500 | 43.7 | -18.5 | 45.6 | 16.600 | H |
| 17876.000 | 43.6 | -18.5 | 45.6 | 16.500 | H |

**Peak Result:**

**Zigbee**

Ch11

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | $P_{Mea}$ (dBuV/m) | Polarization |
|---|---|---|---|---|---|
| 2386.195 | 54.9 | -38.8 | 27.7 | 66.000 | V |
| 17909.000 | 56.0 | -18.5 | 45.6 | 28.900 | H |
| 17875.000 | 55.3 | -18.5 | 45.6 | 28.200 | V |
| 17929.500 | 55.2 | -17.7 | 45.6 | 27.300 | H |
| 17863.500 | 55.1 | -18.5 | 45.6 | 28.000 | H |
| 17669.500 | 54.9 | -18.9 | 45.6 | 28.200 | V |

Ch18

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | $P_{Mea}$ (dBuV/m) | Polarization |
|---|---|---|---|---|---|
| 17877.000 | 55.3 | -18.5 | 45.6 | 28.200 | H |
| 17889.500 | 55.1 | -18.5 | 45.6 | 28.000 | H |
| 17961.500 | 55.0 | -17.7 | 45.6 | 27.100 | V |
| 17860.000 | 54.9 | -18.5 | 45.6 | 27.800 | H |
| 17862.500 | 54.8 | -18.5 | 45.6 | 27.700 | V |
| 17974.500 | 54.7 | -17.7 | 45.6 | 26.800 | V |

Ch26

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | $P_{Mea}$ (dBuV/m) | Polarization |
|---|---|---|---|---|---|
| 2483.645 | 55.2 | -38.9 | 27.7 | 66.400 | V |
| 17983.000 | 56.1 | -17.7 | 45.6 | 28.200 | H |
| 17860.500 | 55.8 | -18.5 | 45.6 | 28.700 | V |
| 17885.000 | 55.8 | -18.5 | 45.6 | 28.700 | V |
| 17869.000 | 55.3 | -18.5 | 45.6 | 28.200 | H |
| 17888.000 | 55.3 | -18.5 | 45.6 | 28.200 | H |

**Test graphs as below:**

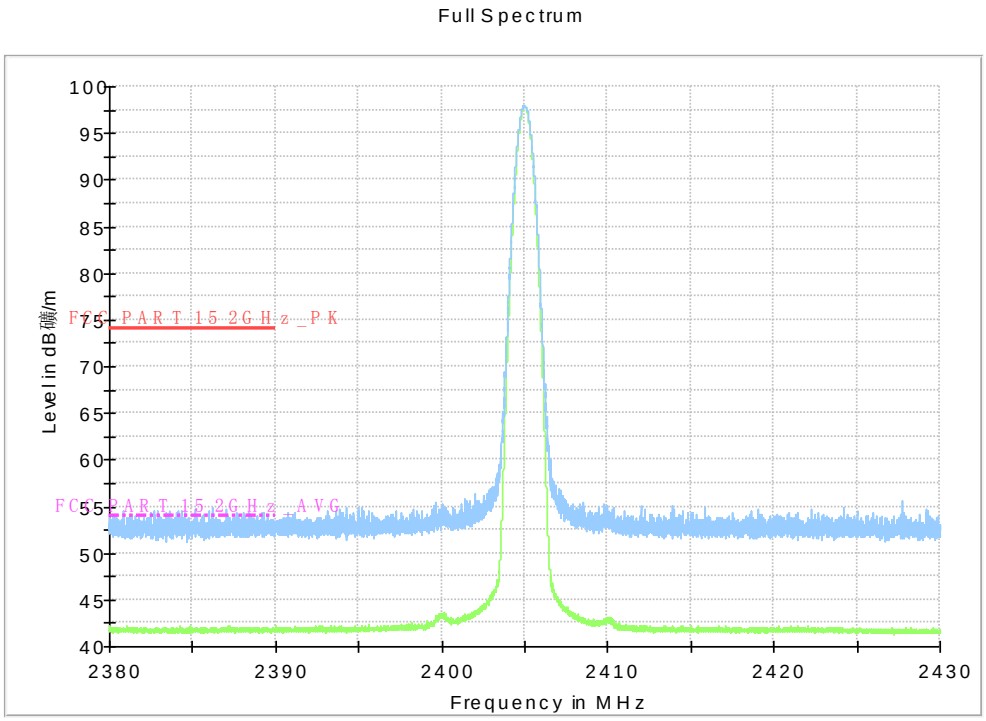



**Fig.A.6.2.1 Transmitter Spurious Emission - Radiated (Power): Zigbee, ch11, 2.38 GHz – 2.43GHz**

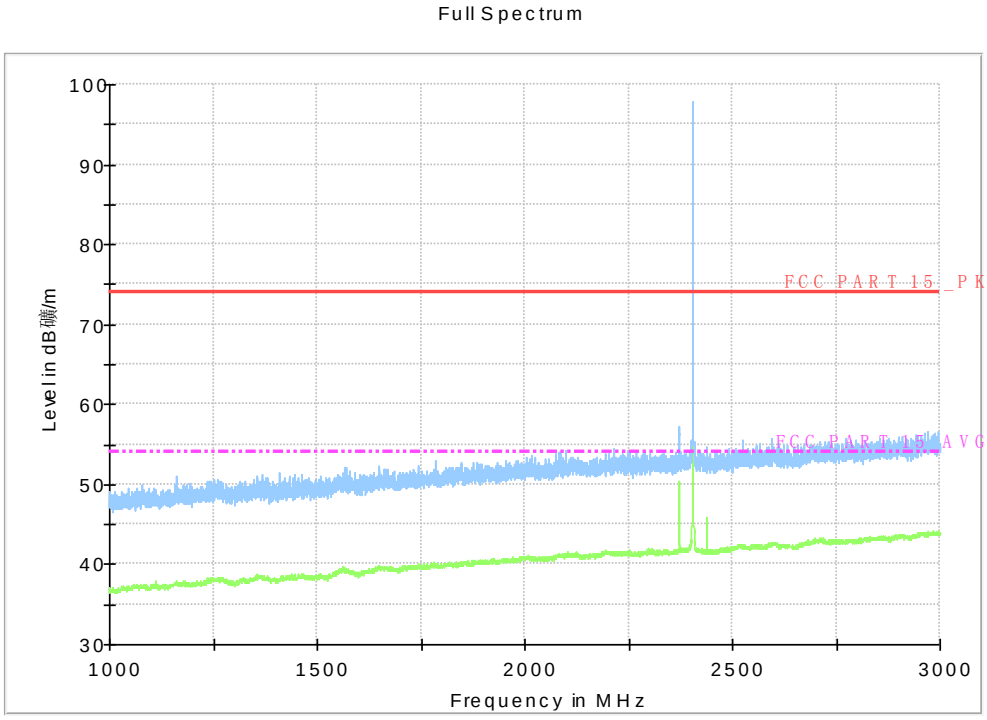



**Fig.A.6.2.2 Transmitter Spurious Emission - Radiated (Zigbee, ch11, 1 GHz-3 GHz)**

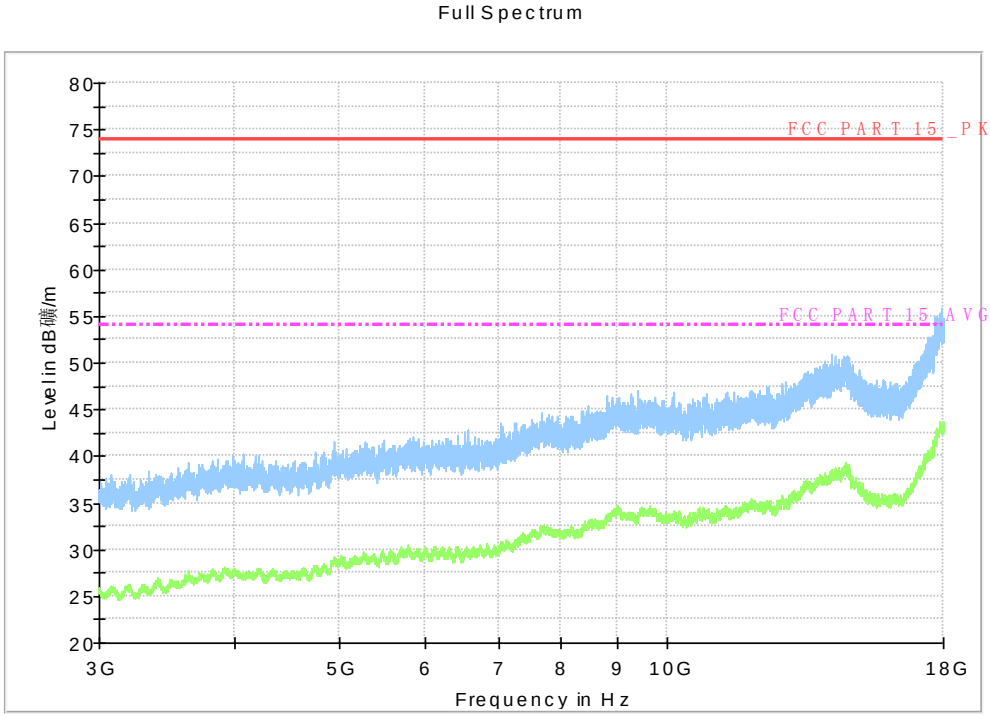



**Fig.A.6.2.3 Transmitter Spurious Emission - Radiated (Zigbee, ch11, 3 GHz-18 GHz)**

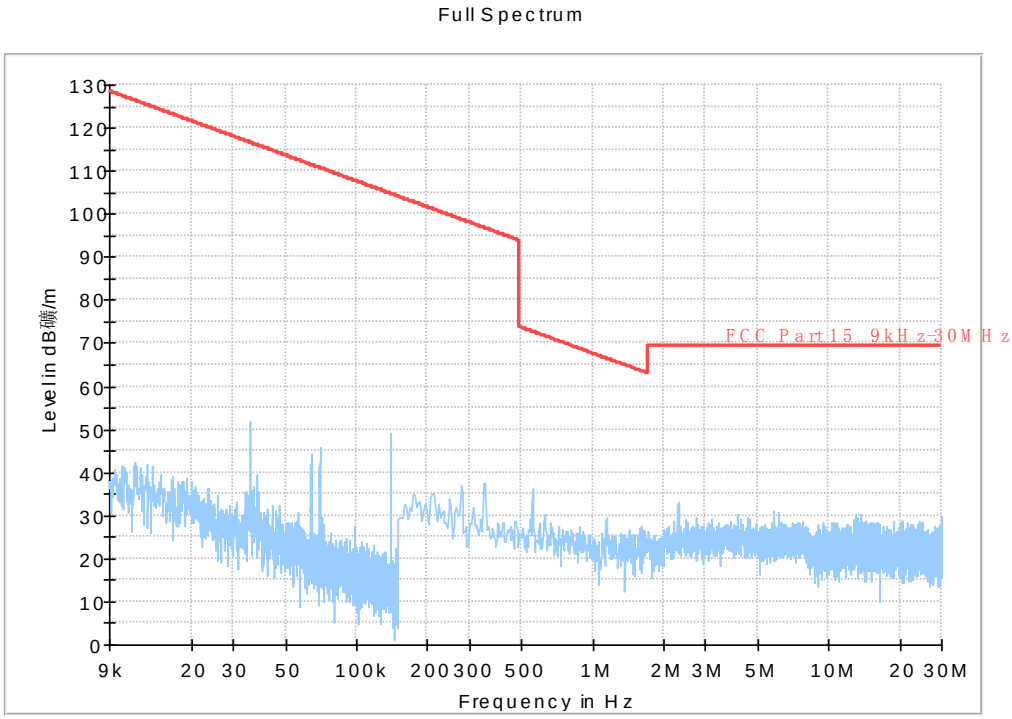



**Fig.A.6.2.4 Transmitter Spurious Emission - Radiated (Zigbee, ch18, 9kHz-30 MHz)**

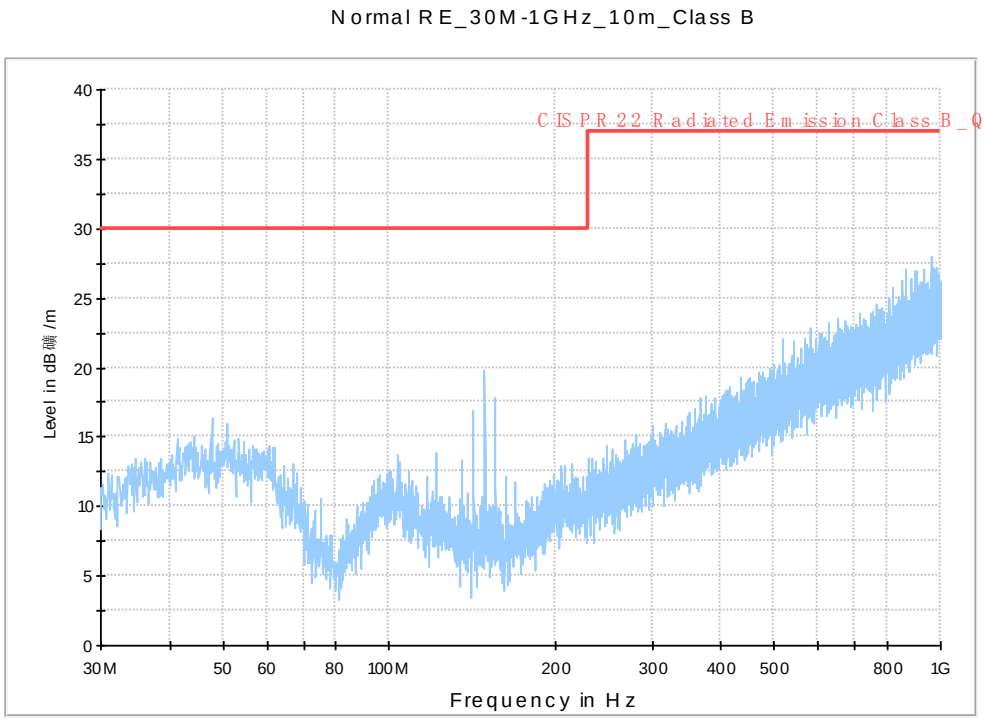



**Fig.A.6.2.5 Transmitter Spurious Emission - Radiated (Zigbee, ch18, 30 MHz-1 GHz)**

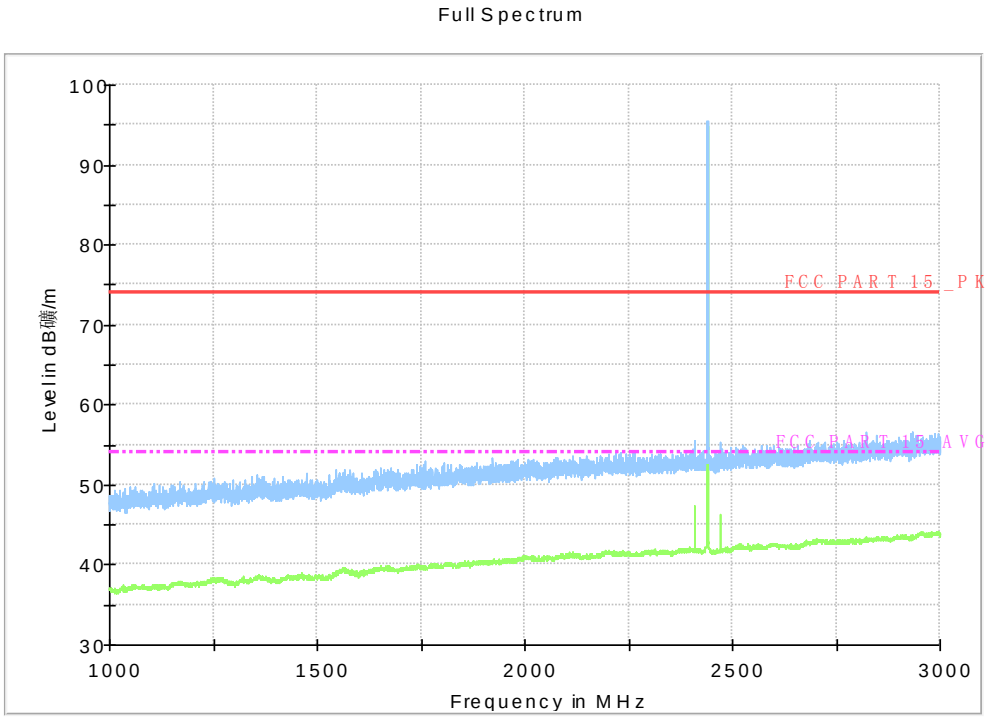



**Fig.A.6.2.6 Transmitter Spurious Emission - Radiated (Zigbee, ch18, 1 GHz-3 GHz)**

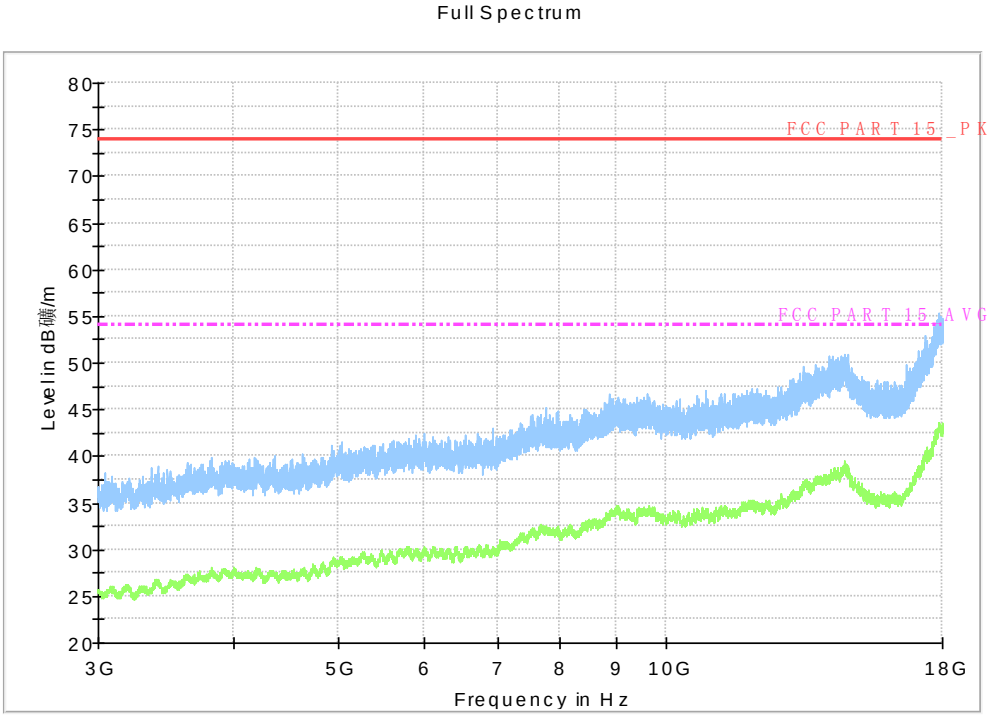



**Fig.A.6.2.7 Transmitter Spurious Emission - Radiated (Zigbee, ch18, 3 GHz-18 GHz)**

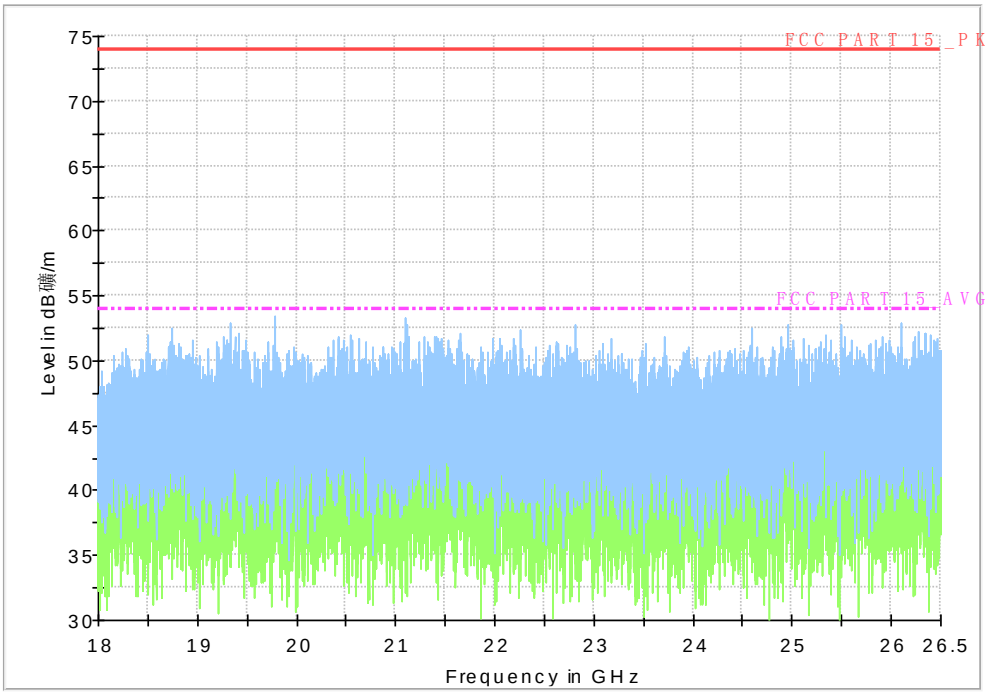



**Fig.A.6.2.8 Transmitter Spurious Emission - Radiated (Zigbee, ch18, 18GHz – 26.5GHz)**

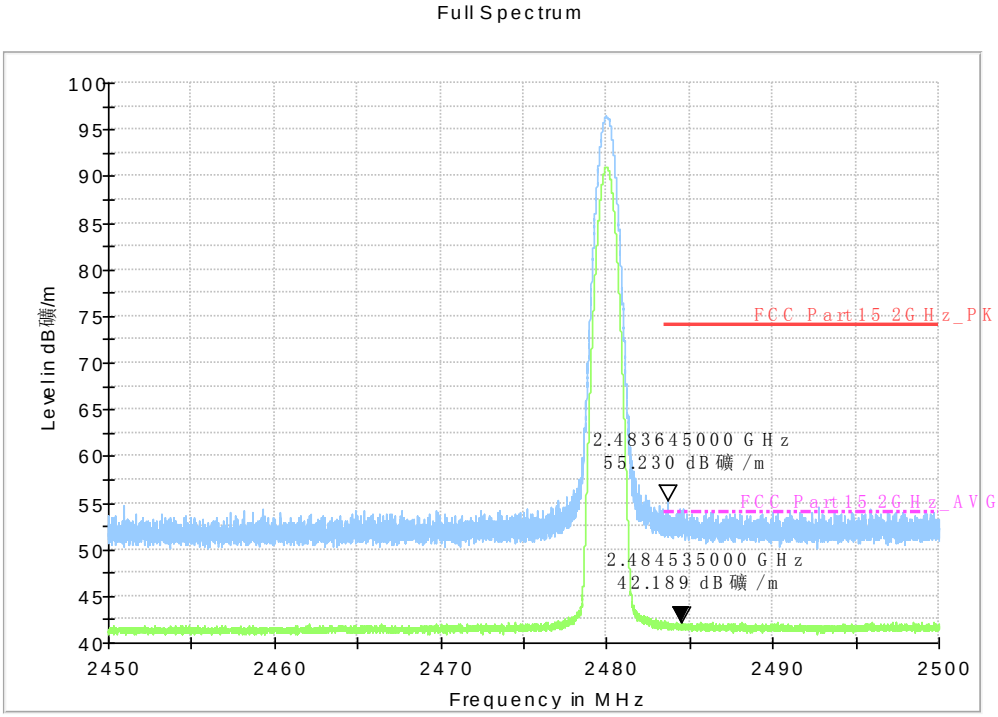



**Fig.A.6.2.9 Transmitter Spurious Emission - Radiated (Power): Zigbee, ch26, 2.45 GHz - 2.50GHz**

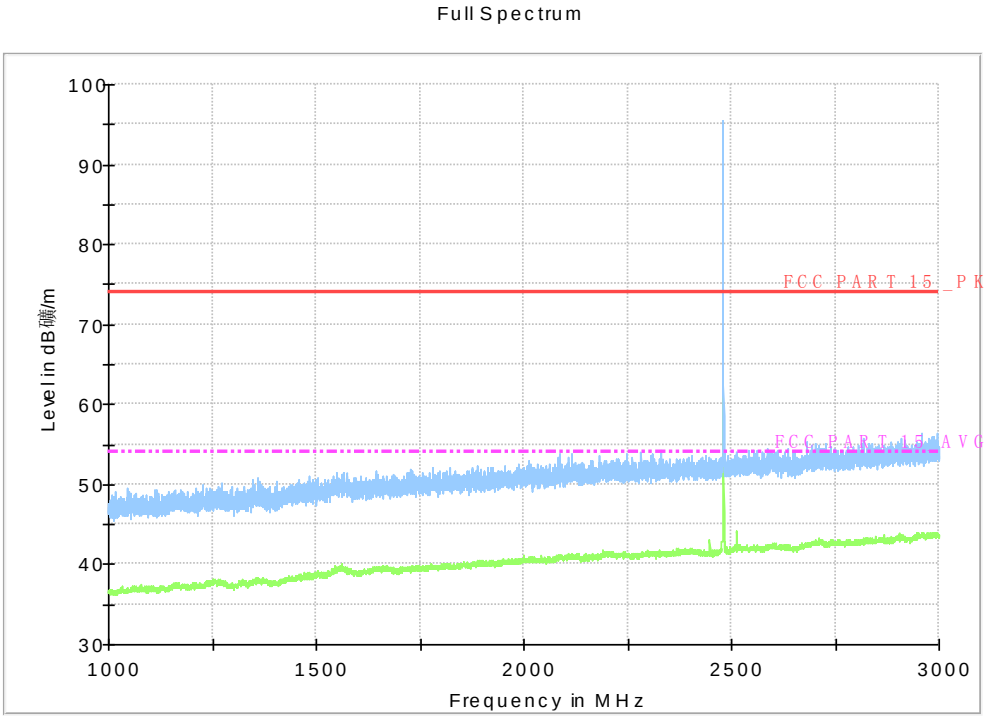



**Fig.A.6.2.10 Transmitter Spurious Emission - Radiated (Zigbee, ch26, 1 GHz-3 GHz)**

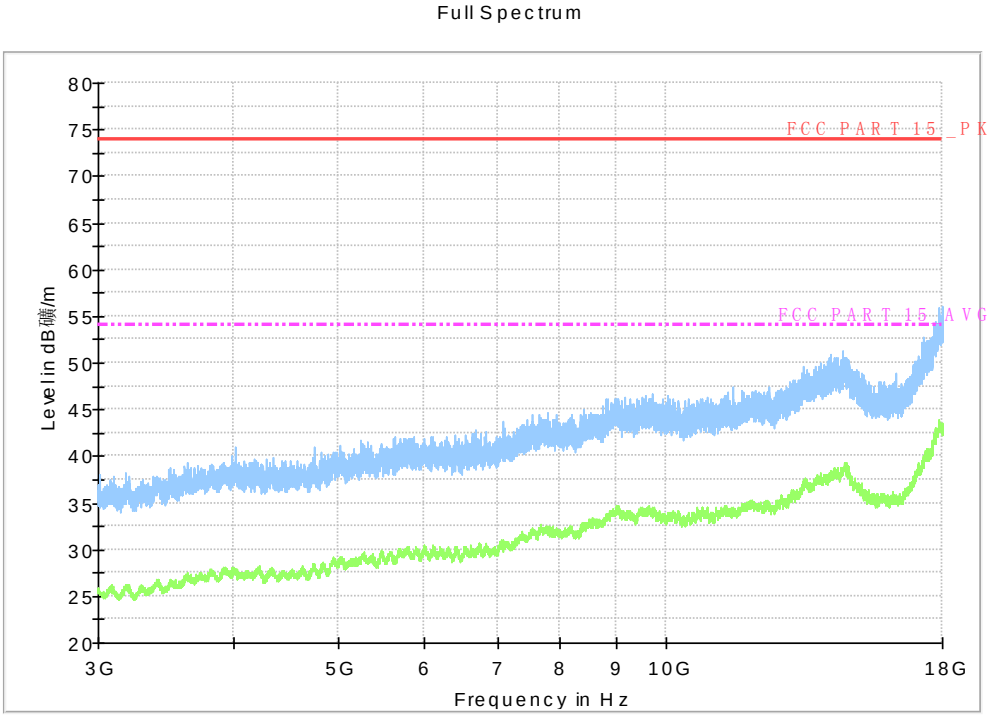



**Fig.A.6.2.11 Transmitter Spurious Emission - Radiated (Zigbee, ch26, 3 GHz-18 GHz)**

*****END OF REPORT*****